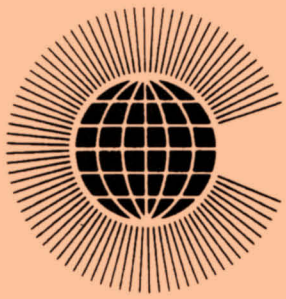
Commonwealth Economic Papers: No 20

Variable Exchange Rates and Trading on Commodity Markets



Commonwealth Secretariat

COMMONWEALTH ECONOMIC PAPERS: No. 20

VARIABLE EXCHANGE RATES AND TRADING ON COMMODITY MARKETS

Papers prepared by
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and

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VARIABLE EXCHANGE RATES AND TRADING ON COMMODITY MARKETS

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VARIABLE EXCHANGE RATES AND TRADING ON COMMODITY MARKETS

PREFACE

The volatility of the floating exchange rate system in operation for currencies during the last decade or so has had profound effects on the world economy. The precise nature of many of these effects remains controversial but it is clear that exchange rate fluctuations and misalignments have had a particularly marked impact on the livelihoods of those who produce for or sell on international commodity markets. Though the amount of literature on the effects of exchange rates on international trade has increased greatly during recent years, comparatively little of it has been directed towards the concerns of developing countries or the marketing of the primary commodities on which many of them still depend for their economic survival. This volume is a contribution towards rectifying that deficiency.

The volume contains two papers. The first, by Landell Mills Commodities Studies, is concerned with the effects of exchange rate instability upon primary product exporters in Africa. After surveying the theoretical issues on the way in which exchange rate fluctuations affect commodity markets, and analysing the special factors at work during the first half of the 1980s, the paper reviews the policy options available to the commodity exporting countries in effecting the necessary adjustments to exchange rate fluctuations and misalignments. A final section summarises the theoretical issues and empirical evidence and draws together the policy-related conclusions resulting from the research.

The second paper, by Graham L. Rees, relates to the operations of the London commodity exchanges. Prof.Rees, who has written extensively on this subject, first considers the need for futures markets and how traders seek to protect themselves from the risk of price fluctuations. This is followed by a survey of the organisation and operation of commodity exchanges in general and of the London market in particular. A final section looks at trends in and prospects for the London market in the light of increasing international competition, external interventions, the development of new forms of trading (especially countertrading), and the revolution in information technology.

These two papers formed part of the background documentation for participants at a recent workshop on trading in primary products which was co-sponsored by the Commonwealth Secretariat. The interest shown in the papers, together with the continuing importance of the subject, has led the Secretariat to believe that there would be value in making the texts more widely

available. It is hoped that they will make a useful contribution to the ongoing search for a greater degree of understanding and a wider measure of consensus on the need for improved arrangements for the marketing of primary products from developing countries.

Finally, I should like to thank the authors for their papers; in doing so I should add that the views they express do not necessarily reflect those of the Commonwealth Secretariat or of Commonwealth Governments.

B. Persaud
Director and Head,
Economic Affairs Division

January 1986

EXCHANGE RATE INSTABILITY:

ITS EFFECT UPON AFRICAN PRIMARY PRODUCT EXPORTERS

Landell Mills Commodities Studies Ltd.

October 1985

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EXCHANGE RATE INSTABILITY

Its Effect Upon African Primary Product Exporters

I. Introduction

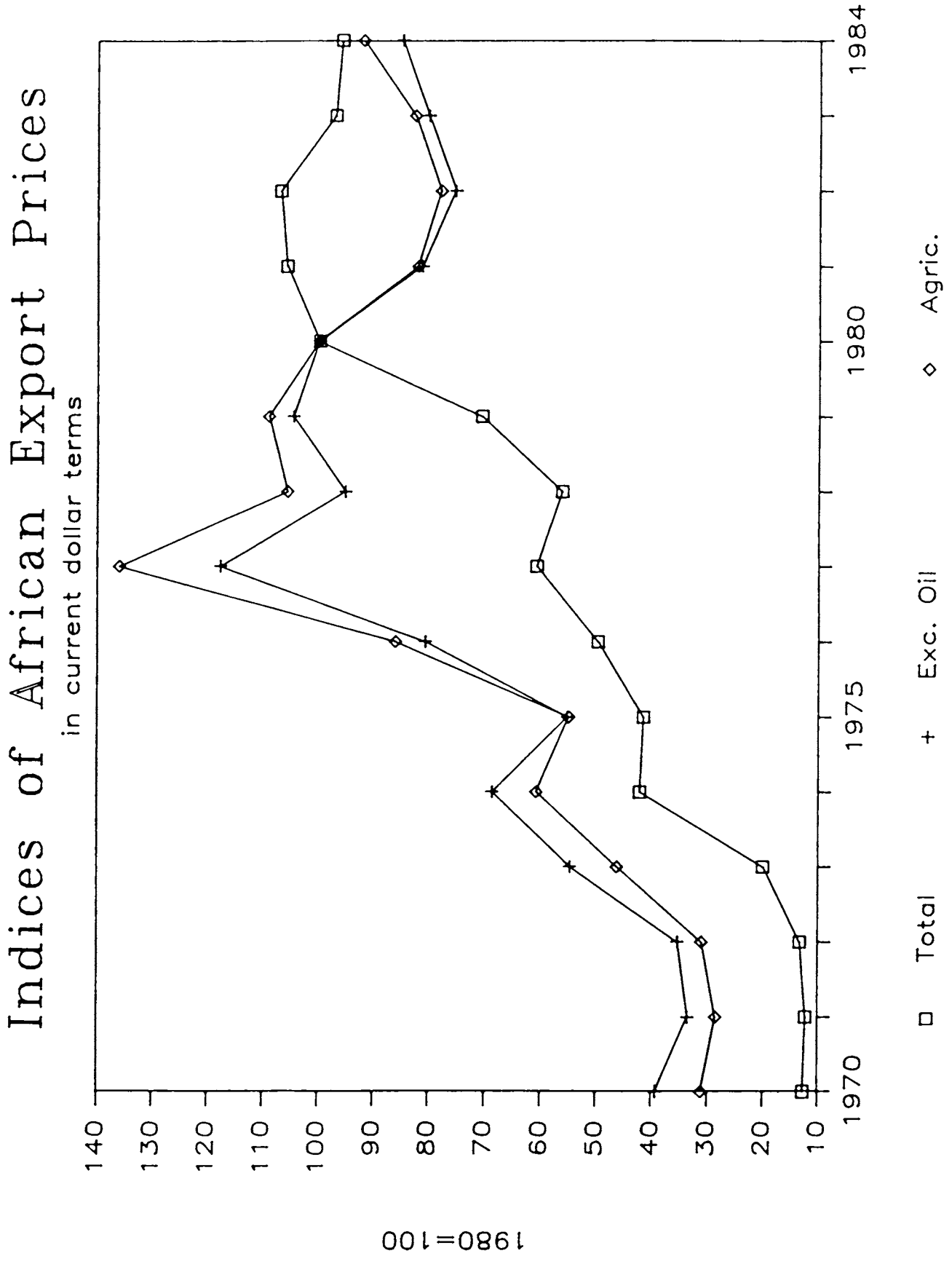
In the past, commodity prices have shown a tendency to move in response to the trade cycle in industrial countries. Supply shocks are of importance to individual commodities, but they can be expected to occur randomly, so that they tend to cancel each other out in any index of commodity prices as a whole. If we consider such an index, and leave to one side the issue of long-term trends in the terms of trade, the fluctuations *around* the trend can reasonably be expected to have much to do with changes in demand in the industrial countries. At present, there seem to be strong reasons for supposing that this relationship has been behaving in an odd way. Since the autumn of 1982, when a sudden boom on the New York stock exchange heralded the US's emergence from recession, commodity prices do not seem to have responded to the renewed growth in the industrialised economies to anything like the degree that would have been expected. As one surveys the principal commodity markets - grain, sugar, cocoa, petroleum, coffee, rubber - the prevailing impression is one of continued weakness; in all of these markets problems of excess supply and low prices seem endemic despite a macro-economic recovery which, in the United States at least, has been remarkable, even if it is now well past its peak.

This paper sets out to investigate, with particular reference to the commodities exported by sub-Saharan Africa (excluding South Africa), whether this impression is well-founded, and, if so, to investigate some of the causes of the phenomenon. It will be concerned especially with the relationship between developments in commodity markets, and those in international financial markets: after briefly surveying the issue in general terms, its prime concern will be a policy-oriented analysis of recent developments.

Diagram 1 below provides a simple illustration of the phenomenon with which we are concerned: it can be seen that the dollar index of all African commodity export prices falls fairly steadily through the recession without picking up much during the subsequent 1982-1984 recovery. (The way in which the indices have been derived, the adequacy of this particular measure, and the results of using other measures, will be discussed in detail in Section III below.)

One of the most striking features of world trade over the period from 1981 to the first half of 1985 has been the surge in the international value of the US dollar: the 27% rise in its value in terms of SDRs, from 0.77 in 1980 to 0.98 in 1984, is an obvious measure of this dramatic change, but one which is biased downwards to the extent that the dollar is itself a part of the basket of currencies making up the SDR. Since currencies serve as measures of value, one of the principal issues that will need to be addressed is that of measurement: before it is possible to analyse the real effects of currency fluctuations on commodity exporters, it will first be necessary to devise methods of showing to what extent the fluctuations have been real, and to what extent they are illusory appearances deriving from the use of inadequate measures.

Diagram 1.


Indices of African Export Prices
in current dollar terms
1980=100
140
130
120
110
100
90
80
70
60
50
40
30
20
10
1970
1975
1980
1984
□ Total
+ Exc. Oil
◇ Agric.

The paper contains four principal sections. The *first* analyses the theoretical issues concerning the way in which exchange rate fluctuations affect commodity markets. This theoretical discussion is itself divided into two parts. In the first, the question of risk and uncertainty is addressed: the problems posed by the fact that, not only are commodity prices themselves volatile and unpredictable, but also, even if a means is found of stabilising their value when expressed in terms of a particular currency, there remains the problem posed by the uncertainty attaching to the value of that currency.

The second issue addressed in the theoretical survey is the impact of the rise in a particular currency on the supply, demand and prices of commodities. It explores the relevance of such issues as commodity-exporting countries' import patterns, and the pricing of substitutes, to show the way in which a change in the international value of a major currency (over and above such changes needed to compensate for differing internal inflation rates) can have a complex set of real effects, as well as merely changing the unit of measurement.

The *second* section begins by analysing the macro-economic developments in the USA which are associated with the strength of the dollar, and also with other phenomena that have affected commodity markets (such as the high level of real interest rates, and the massive US trade deficit). This section continues with a detailed empirical investigation of the recent experiences of African commodity exporters. It discusses the appropriate measure of real prices, in the absence of stability among the major currencies. It also shows the influence of the monetary policies (exchange rates and inflation rates) of commodity-exporting countries on the local purchasing power of the revenues accruing to exporters of commodities. Having clarified the history of real price movements, the second section goes on to analyse the chain of causation between US government economic policy (the principal cause of the three linked phenomena of dollar fluctuations, high real interest rates, and the US current account deficit) and commodity prices. Finally, it looks at the effect on commodity markets of IMF-sponsored adjustment policies.

The *third* section analyses those policy options that are available to the international community, and more particularly to governments and enterprises in commodity-exporting countries, to deal with the problems analysed in the preceding section. It looks both at trade policy, in the shape of international commodity agreements and counter-trade, and also at financial measures to limit the damage caused by instability among the major currencies. These include measures to deal with mis-matches between the currencies in which outgoings, including debt obligations, are due, and those received from commodity exports; they also include measures to reduce risks of fluctuations in commodity prices, exchange rates and interest rates.

The *final* section summarises the study and provides the conclusions and policy recommendations of the research.

II. A Survey of the Theoretical Issues

The monetary arrangements which have governed international transactions since the collapse of Bretton Woods in the early 1970s have a number of implications for international trade, two of which are of particular importance. In the first place, the crucial difference between present arrangements and those which characterised the Bretton Woods period is the increased uncertainty about future exchange rates, and the associated risks borne by exporters and importers, which are important features of present trade. While risk management institutions, especially futures markets in currencies and interest rates, have been developed to reduce these risks, and although the use of these facilities has grown rapidly, international trade and investment decisions are still risky; not least because the time horizon over which international investments yield returns is generally much longer than the time horizon of futures contracts. The first question that arises, therefore, is: how does this exchange rate risk affect the volume of trade, and the prices at which trade takes place?

Second, while debate continues about whether international flows of speculative capital are, in the international economics jargon, autonomous or simply accommodating of variations in countries' current accounts, the fact remains that, in the short term, major international currencies can change in value in response to developments which have little to do with the international market for goods. Moreover, it is apparent that the "short-term" in this context can be several years in duration. This creates the possibility that movements in the exchange rate of a major currency can affect the market for goods: indeed, there is widespread agreement that the upward drift in the international value of the dollar, which began in late 1981, has affected world commodity markets, although there is no agreement about why. The second question, therefore, is: what has been the effect on traded goods of the high-valued dollar?

These two issues are closely related, although they can be treated separately. The first is a problem of the impact of uncertainty about future exchange rates, whereas the second is a problem about a persistent trend in the international price of a single major currency. The second problem, therefore, can be analysed abstracting from the risk which is central to the first, even though there was considerable uncertainty about the path of the dollar while it was rising. In the following sections, we consider these two issues in turn.

A. Exchange rate risk and international trade

Exchange rate risk arises when trade is invoiced in the currency of the exporter or importer, but there is uncertainty, at the time of invoicing, about the exchange rate which will obtain when the invoice is settled, and when it is not possible for the parties to the trade to cover all their future currency positions in futures or forward markets. It appears to be the case that most trade among developed countries is financed in the currency of the exporter; the major exception is US imports, which are frequently invoiced in dollars. In the case of trade involving developing countries, it has been estimated (see Page, 1981) that 85% of their exports and 72% of their imports are invoiced in dollars. In these circumstances, it is apparent that most currency risks in international trade are borne by the importer.

In the framework of competitive firms which seek to maximise expected profits and to minimise the standard deviation of those profits, it is easy to show that

an increase in exchange rate uncertainty will, *ceteris paribus*, shift the demand curve for imports downwards, in much the same way as a decrease in income in an importing country. A similar result can be derived assuming the exporter bears the risk. There are, therefore, good reasons to expect the *volume* of international trade in goods to be adversely affected by an increase in uncertainty.

A priori, the effect of increased risk on *prices* is ambiguous; the more risk averse importers are, the fewer imports they will buy, thereby decreasing demand and pushing the foreign currency price downwards. On the other hand, the more risk averse exporters are, the more they will restrict their export supply and charge a higher price to obtain a risk premium.

These theories about the consequences of exchange rate instability have been tested empirically using models of international trade flows. (For example, see Hooper & Kohlhagen (1978), Wilson & Takacs (1979) and Cushman (1983).) These models typically use large data sets, deal with trade flows at a high level of aggregation and concentrate on trade among industrial countries. The inevitable consequence of using large sets of aggregated data is econometric difficulty in separating different effects, but the studies cited above do provide some evidence that in the *short term*, contrary to theoretical expectation, the principal impact of increased exchange risk is on price, rather than on quantity. This is probably the result of price-inelastic export supply when price falls and price-inelastic import demand when price rises. In the longer term, however, the studies do provide support for the view that increased exchange risk reduces the volume of international trade, and has little impact on price.

A recent study by the IMF (IMF 1984) called attention to the serious statistical problems experienced with such large data sets, and was unable to discover a statistically significant link between exchange rate volatility and international trade. Moreover, as this study emphasised, existing statistical techniques would only allow detection of the direct impact of exchange rate volatility on trade. It would not be unreasonable to expect there to be indirect effects through shifts in the pattern of investment, especially in the production of traded and non-traded goods. Yet the available empirical work has not so far attempted to measure these effects. One further indirect effect which is suggested by the IMF study that a high degree of exchange rate volatility may generate increased demands for protectionism from those industries which are most vulnerable when the exchange rate changes. Since there is asymmetry, in this context, between the effects of exchange rate increases and decreases, an overall increase in protectionism may result if governments accede to these demands for protection. It is, however, difficult to determine the importance of different factors which lead industries to request protection.

Two caveats must be issued about the available empirical research. The first is that, as risk-averse profit-maximisers continue to experience exchange risk, their use of risk management facilities will increase, lessening the impact on trade volumes. Second, these studies concern aggregated trade flows, not trade in individual commodities. Since price risk and institutions for moderating price risk have long been present in primary commodity markets, participants in these markets may be more sophisticated in risk management than participants in markets for manufactured goods. The implications of the above hypotheses about exchange rate risk for trade in primary commodities have not been explicitly considered by economists, despite the large volume of writing about the impact of risk on commodity production.

Nonetheless, to the extent that primary commodities face substitutes which can be produced in the importing country, exchange rate risk may well reduce the volumes of commodity trade by encouraging importers to look for less risky supplies. Many commodities exported from developing countries do face competition from substitutes produced in their export markets: natural rubber competes with synthetic rubber, cotton with polyester and other synthetic fibres, cane sugar with beet sugar and HFCS; and the EEC's agricultural policy has produced a number of distortions in the markets for animal feeds and oilseeds, affecting the trade off between imports and European production. The available theoretical and empirical economic literature, therefore, suggests that commodity markets may have suffered somewhat from exchange rate variability, although the effect is likely to have been small.

B. The price of the dollar and the prices of goods

The international value of the dollar has appreciated considerably since late 1981. Throughout its rise in value, there has been considerable uncertainty about the heights to which it would climb, and the time scale of its ascent and expected descent. To a large extent, therefore, the "problem" of the dollar has been a problem of risk and uncertainty. In this section, however, we abstract from this aspect of the problem, and consider simply the impact of the dollar's appreciation on commodity prices.

The reasons for the appreciation in the international value of the dollar are set out in Chapter 2 below; from the point of view of primary commodity markets, this appreciation can be treated as exogenous. There is very little economic literature on the impact of this appreciation on commodity markets. What literature is available is concerned with the impact on US primary commodity exports of the dollar's appreciation; but since US producers receive dollars for their production, the US research has been more concerned with the US market share (which has declined, as one would expect) than with price. This literature, therefore, is not particularly relevant to other countries.

In order to assess the impact of dollar appreciation on commodity prices, therefore, it is necessary to set out a simple analytical framework. In what follows, we assume a competitive market for commodities, and a world with two countries (the USA and the rest of the world) and two currencies (the dollar and the local currency). We also assume that we have a commodity produced in the rest of the world and consumed in the USA and the rest of the world.

Let S equal supply;
D equal demand;
M equal share of world demand;
P_D equal demand price and P_S equal supply price;

r equal \$/unit of local currency (the exchange rate);
variables with the superscript us denote the USA, and
variables with the superscript 1 denote the rest of the world.

Supply in the rest of the world is a function of the local currency supply price:

$$S = S(P_S^1)$$

and demand in the rest of the world is a function of the local currency demand price:

$$D^{l} = D(P^{l}_{D})$$

Demand in the USA depends on the dollar price:

$$D^{us} = D^{us}(P^{us}_{D}), \text{ where } P^{us}_{D} = rP^{l}_{D}$$

Then, the equilibrium condition is that

$$S = D^{l} + D^{us}$$

Taking the total differential, we obtain, with some manipulation,

$$\dot{P}^{l} = [E^{us}_{D}D^{us}/(E_{S}S - E^{l}_{D}D^{l} - E^{us}_{D}D^{us})]\dot{r} \tag{1}$$

where E_S is the elasticity of supply, and E_D is the elasticity of demand, in the USA or the rest of the world, depending on the superscript.

Since the two countries constitute the entire market,

$$D^{l}/S + D^{us}/S = M^{l} + M^{us} = 1$$

we can substitute in (1),

$$\dot{P}^{l} = [(E^{us}_{D}M^{us})/(E_{S} - E^{l}_{D}M^{l} - E^{us}_{D}M^{us})]\dot{r} \tag{2}$$

It is possible to derive some conclusions about price changes using these results. In the first place, since supply elasticities are positive, and demand elasticities negative, we know

$$[(E^{us}_{D}D^{us})/(E_{S}S - E^{l}_{D}D^{l} - E^{us}_{D}D^{us})] \leq 0$$

And, of greater interest, expression 2 tells us that the impact of a change in the dollar exchange rate on the local price of a commodity is positively correlated with the importance of the US in world demand. A polar case is represented by a zero supply elasticity and the US accounting for all of world demand: in this case, a rise in the dollar (i.e. a decline in r) would produce an identical percentage rise in the local currency price. The dollar price, on the other hand, declines: we can derive

(3) $$\dot{p}^{us} = [(E_S - E_D^l M^l)/(E_S - E_D^l M^l - E_D^{us} M^{us})]\dot{r}$$

Since the expression in brackets is non-negative, a decline in r (i.e. an appreciation in the dollar) causes the dollar price to fall. It can also be shown, however, that the decline in dollar prices is smaller, and the increase in local currency prices is greater, when the USA's share in world demand is larger.

In general, therefore, the impact of dollar appreciation on commodity prices depends on the elasticities of demand and supply and the share of world demand accounted for by the USA. It will be the case, except under perverse conditions, that dollar prices decline, and non-dollar prices rise, when the dollar appreciates. Countries producing commodities for which the US is the major market will experience the greatest gains in their local prices (and thus the greatest incentive to increase production.)

In broad outline, these results continue to hold when the assumption of perfect competition is relaxed, although for individual producers who face downward sloping demand curves the precise effects of exchange rate changes depend on whether the original price in the local market is above or below the local currency price which maximises profits. However, since the assumption of competition is not unreasonable for African commodity exporters, and since the algebra is rather complex, this case is not examined in detail here.

The theoretical evidence, therefore, indicates that the strength of the dollar in recent years has affected commodity prices, although it also indicates that the effect has not been the same across all commodities. The empirical aspects of commodity price behaviour are examined later in this document.

III. Analysis of Special Issues Raised by the Experience of 1980-1985

A. US Government Macro-Economic Policy

(i) Macro-economic background

The period with which we are mainly concerned - the years from 1981 to the present - is characterised by a number of phenomena occurring simultaneously, of which the high dollar is one, and the two others of most immediate concern to us are the massive US current account deficit and the high level of real interest rates. The previous section has analysed theoretically the impact of the high dollar, but since each of the other two phenomena is potentially capable, in its own right, of exerting an effect on commodity prices, any understanding of recent developments in commodity markets must incorporate some attempt to ascertain the relationship between these phenomena, and to disentangle the chains of causation. Unless this is done, the danger exists that false conclusions will be drawn by imputing cause-and-effect relationships where none exist.

For example, one could produce a diagram that would appear to show a very strong tendency in recent years for the oil price, expressed in dollars, to decline when the US current account deficit widens. Clearly such a diagram would be seriously misleading, since it is apparent on *a priori* grounds that there is no plausible chain of causation which could lead from a deteriorating US trade balance to a weakening of the oil market: the cause for weakening dollar oil prices must be sought elsewhere, and particularly (though not exclusively) in the other two phenomena listed above. This illustration should alert one to the danger of phoney correlations, and to the importance of understanding the macro-economic roots of all three of the phenomena.

Fundamentally, many of the disturbances in commodity markets in this period can be traced back to the effects of the growth in the US budget deficit, and it is necessary to give an account of the ramifying effects of this internal change in the US if there is to be any chance of identifying causal relationships.

The close relationship between the deficit and the deterioration in the US trade balance can be seen clearly by using flow-of-funds analysis. This is based on the necessary ex-post identity of net borrowing and net saving in an economy. If one agent within the economy expands its net borrowing (for example, if the government increases its net fiscal deficit) then, either other groups within the economy must increase their net lending, or, if this does not occur, the current account balance, which represents the net lending to, or borrowing from, the rest of the world, will deteriorate.

The other groups within the economy who could increase their lending to offset the increased net borrowing by the public sector are, firstly, the corporate sector and, secondly, households. Changes in household net lending have played a relatively minor role in the recent developments: the propensity to save in the US is low, and has tended to decline at times of falling inflation and to rise when inflationary expectations are strong. It appears that households act to build up a target level of savings, and during inflationary periods, far from being deterred by the low or negative rate of return on their savings, they save more to keep pace with the erosion of the value of their balances.

The level of corporate net borrowing has much to do with the volume of investment: in the initial period in which the Federal deficit grew (i.e. until the summer of 1982) corporate investment expenditures were low, and some of the additional net lending came from this sector. However, when the boom got under way, so did corporate demands for funds, and at this stage the current account deficit began to bear the brunt of financing the Federal deficit. At present, the current account deficit corresponds to over a half of the total net lending needed to finance the Federal deficit.

Financing a current account deficit requires either an increase in lending *by* foreigners, or a decrease in lending *to* foreigners. In the case of the USA, the latter has played the largest role. US capital outflows collapsed from $119 bn in 1982 to $49 bn in 1983, and in 1984 again fell by more than half, to $21 bn. In particular, net lending to developing countries has fallen: as Latin American countries have cut back sharply on their imports in the wake of the debt crisis, so has export credit finance and similar short-term lending by the USA fallen back, while increases in long-term lending have been jeopardised by the crisis of confidence in the ability of developing countries to service even their present level of indebtedness, let alone increases in real borrowing.

To go, as the USA has done, from a $6bn surplus on current account in 1981 to a $100bn deficit in 1984 might be expected to bring about a crisis of confidence in a currency which would be associated with a fall in its international value, rather than the surge that took place in 1981-1984. While the emergence of the current account deficits can be seen as a direct counterpart of the Federal deficit, monetary policy needs to be brought into the picture to provide an explanation for the changes in interest and exchange rates. Bearing in mind that government debt comprises both money and non-money assets, any attempt to limit the growth of money supply to a rate of increase that is lower than the rate of increase of the public deficit must necessarily imply increasing the *share* of total public debt that is in the form of non-money assets such as long-term debt. Thus sales of bonds must rise proportionally even faster than total public debt. Such a massive funding operation is bound to force bond prices down and interest rates up, and this was indeed the case, particularly in the earlier years of the 1981-1984 period.

The commitment to tight money supply had begun in the final years of the Carter administration, and the results in terms of lower inflation rates and lower inflationary expectations began to appear in 1980. However, the rise in real interest rates that was needed as lax fiscal policies began to collide with money supply targets was not mirrored in nominal interest rates: rather what happened was that the rate of inflation subsided, but nominal rates did not. After August 1982, when a loosening of monetary policy, quickly followed by a stock market boom, triggered off the period of rapid economic growth that lasted till the end of 1984, nominal interest rates even fell back somewhat. But it was not until the end of the period that real interest rates began to subside, as the monetary reins were slackened further in an attempt to prolong the recovery when it showed signs of flagging in early 1985.

Positive real interest rates are a relatively novel phenomenon in the post-war era: in the 1970's only West Germany, of the major industrial economies, consistently provided a return on government debt that was in excess of the rate of inflation. While the need for high real interest rates was dictated by internal monetary and fiscal policies, they also had international repercussions. The US became an increasingly attractive haven for international lenders. The reduction

in US overseas lending had already borne the initial brunt of financing the deterioration of the current account deficit, and high real interest rates brought an increase in the demand for dollar assets which was more than sufficient to meet the rise in supply associated with the current deficit: consequently the exchange rate soared.

This explanation traces both the height of the dollar and the size of the US current account deficit back to changes in the size and method of financing of the US Federal deficit. An alternative explanation of the current account deficit is simply to take it as the direct result of the height of the dollar, regarding the latter as the cause and the former as the effect. While these two events are clearly closely related, and there is a sense in which this explanation is correct, consideration of the flow-of-funds analysis suggests that this latter view is a more superficial way of looking at matters. Without the growth in net public borrowing, neither of the other two sectors, households or enterprises, are likely to have altered their net savings in the way that would have been the necessary counterpart of the growth in net foreign lending in the US.

The foregoing analysis suggests just how complex is the task of assessing the effect of the recent exchange rate changes on commodity markets. To look at the overall effect of the growth of US public borrowing on commodity markets would have been difficult enough, since it implies correctly allowing for the effects of exogenous supply changes. But in addition to this, focusing specifically on exchange rate changes implies also attempting to discount the effects on commodity markets of the two other effects of the same root cause, (high interest rates and a growing US current account deficit). The problem of identification is a formidable one, and in a strictly econometric sense probably an insuperable one. For this reason, a great deal of caution and common sense is necessary in interpreting the statistical data.

(*ii*) *The Effect of Macro-Economic Developments on Commodity Prices*

The introduction to this paper contained a Diagram in which was plotted the evolution of the prices of commodity exports of importance to African countries, in terms of current US dollars. Current dollars were used as a measure of value, both in order to highlight the problem, and also because that is the unit in which most transactions actually take place. However, it is time to look more closely at the evidence, using measures of value that are perhaps more meaningful.

Table I below shows the relative importance of certain major commodities to sub-Saharan Africa (excluding South Africa). In total, the commodities listed below account for 68% of the region's total exports, and for over 90% of their commodity exports. It can be seen that oil exports, principally from Nigeria, massively predominate: not only do they account for 94% of Nigeria's exports, but for over three quarters of those of the whole region.

Table 1: Importance of Principal Commodities in Africa's commodity Exports

	Total	Exc. Oil	Agric.
Cocoa	5.0	20.3	26.4
Coffee	7.5	30.6	39.7
Tea	0.8	3.3	4.3
Sugar	1.8	7.4	9.7
Groundnut	0.5	2.1	2.8
Cotton	2.0	8.1	10.8
Tobacco	1.3	5.2	6.7
Copper	5.6	23.0	
Oil	75.5		
Total	100.0	100.0	100.0
As Percent of Total African Exports	68.3	17.0	13.2

Source: Weights based on 1980-82 average export value, derived from IBRD "Commodity Trade and Price Trends", 1985

The second column shows the relative weights if oil is excluded, while the third column excludes copper and shows only the agricultural commodities. The weightings in this Table were used to construct the Indices of African export prices shown in Diagram 1.

In order to go from the current dollar value of the commodity to a more meaningful measure of its "real" value, it is necessary to find an appropriate deflator. However, the appropriateness of a deflator depends on the nature of the expenditures made by the exporting country. In the case of a hypothetical country whose entire export earnings were used to service dollar-denominated debt, it would be incorrect to use any deflator at all. If the whole of the countries export earnings were used to import oil, the correct deflator would be the cif oil price paid by that country. For manufactured goods, the "law of one price" seldom prevails, by reason of inadequate information, product differentiation, and rigidities in the marketing chain, and the correct deflator for this purpose would be the manufactured export unit values of the exporting country's trading partners, weighted by their share in its imports.

In Diagram 2 below, we show the same data as in Diagram 1, deflated by the IMF's index of the unit value of developed country manufactured exports. Like the index that has been constructed of African commodity export prices, this is also a US-dollar based index. Since the deflated index is a dollar index divided by another dollar index, currency effects have now been cancelled out: what remains is a relationship expressing the purchasing power of one basket of goods in terms of another. Diagram 3 shows the total index (deflated in the same way) in conjunction with the OECD Index of Industrial Production; in Diagram 4, the same data is plotted in terms of annual rates of change.

Diagram 2.

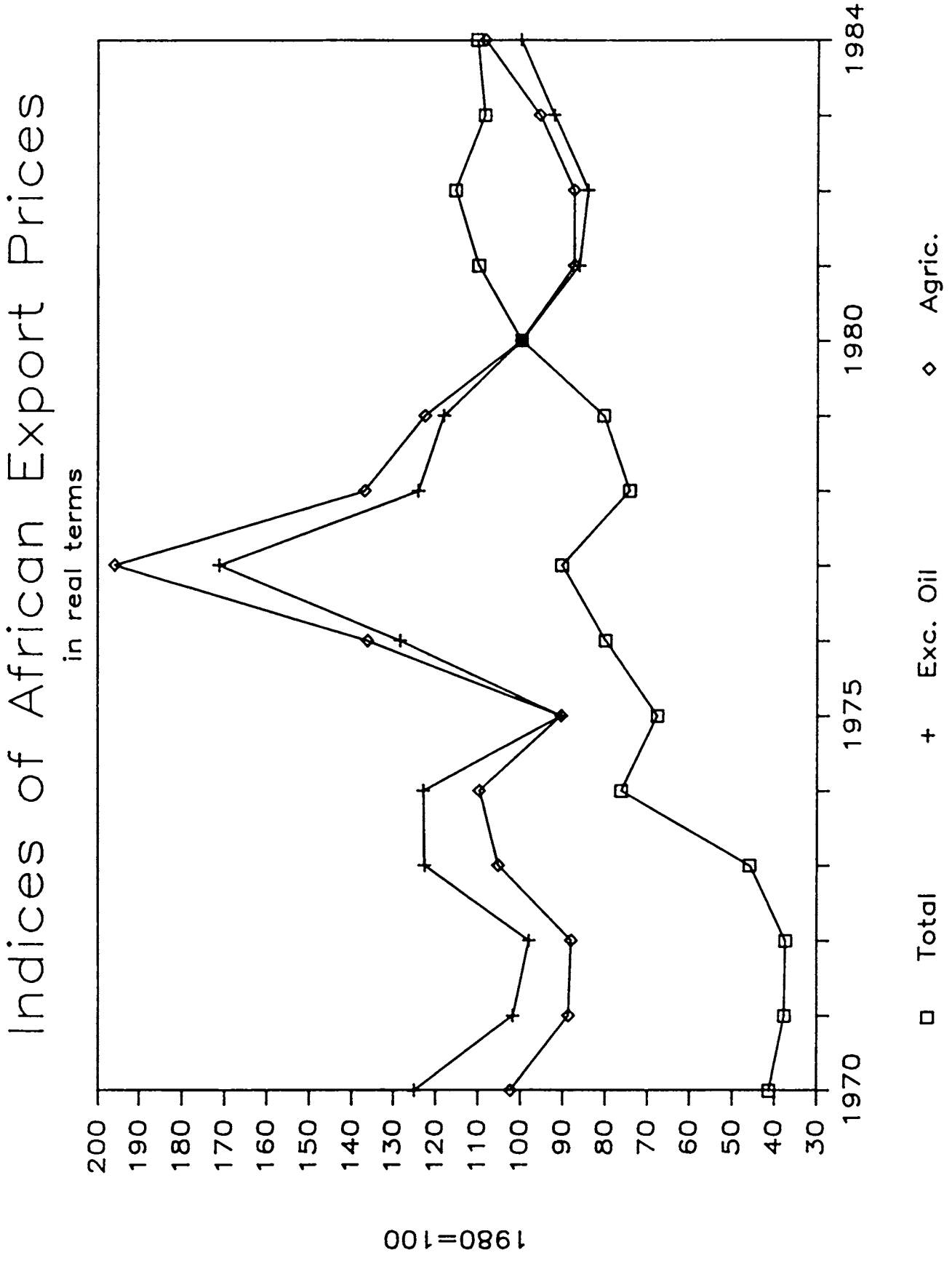

Indices of African Export Prices
in real terms
1980=100
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
1970
1975
1980
1984
□ Total
+ Exc. Oil
◇ Agric.

Diagram 3.

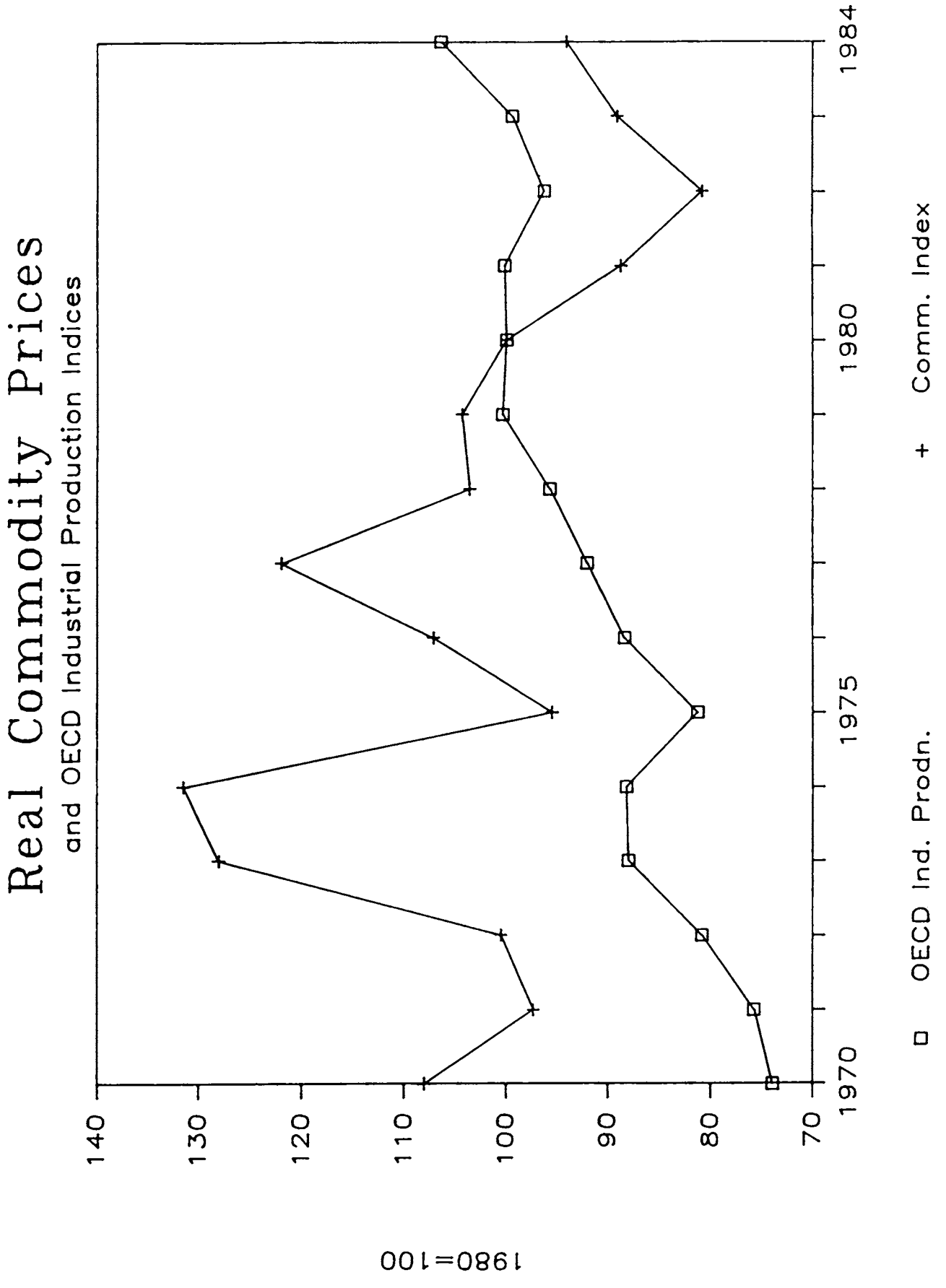

Real Commodity Prices
and OECD Industrial Production Indices
1980=100
140
130
120
110
100
90
80
70
1970
1975
1980
1984
□ OECD Ind. Prodn.
+ Comm. Index

Diagram 4.

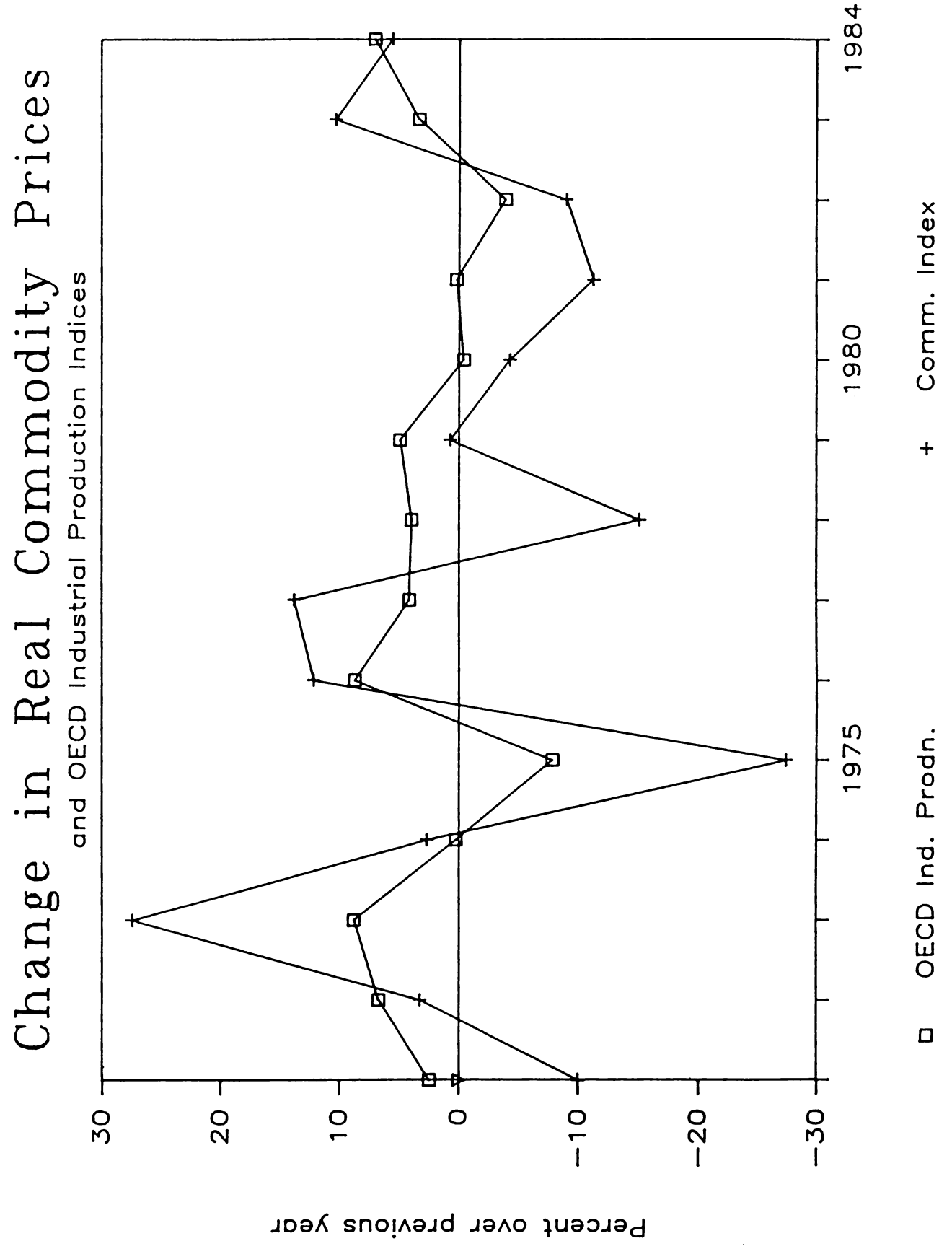

Change in Real Commodity Prices
and OECD Industrial Production Indices
Percent over previous year
30
20
10
0
-10
-20
-30
1975
1980
1984
□ OECD Ind. Prodn.
+ Comm. Index

Diagram 5.

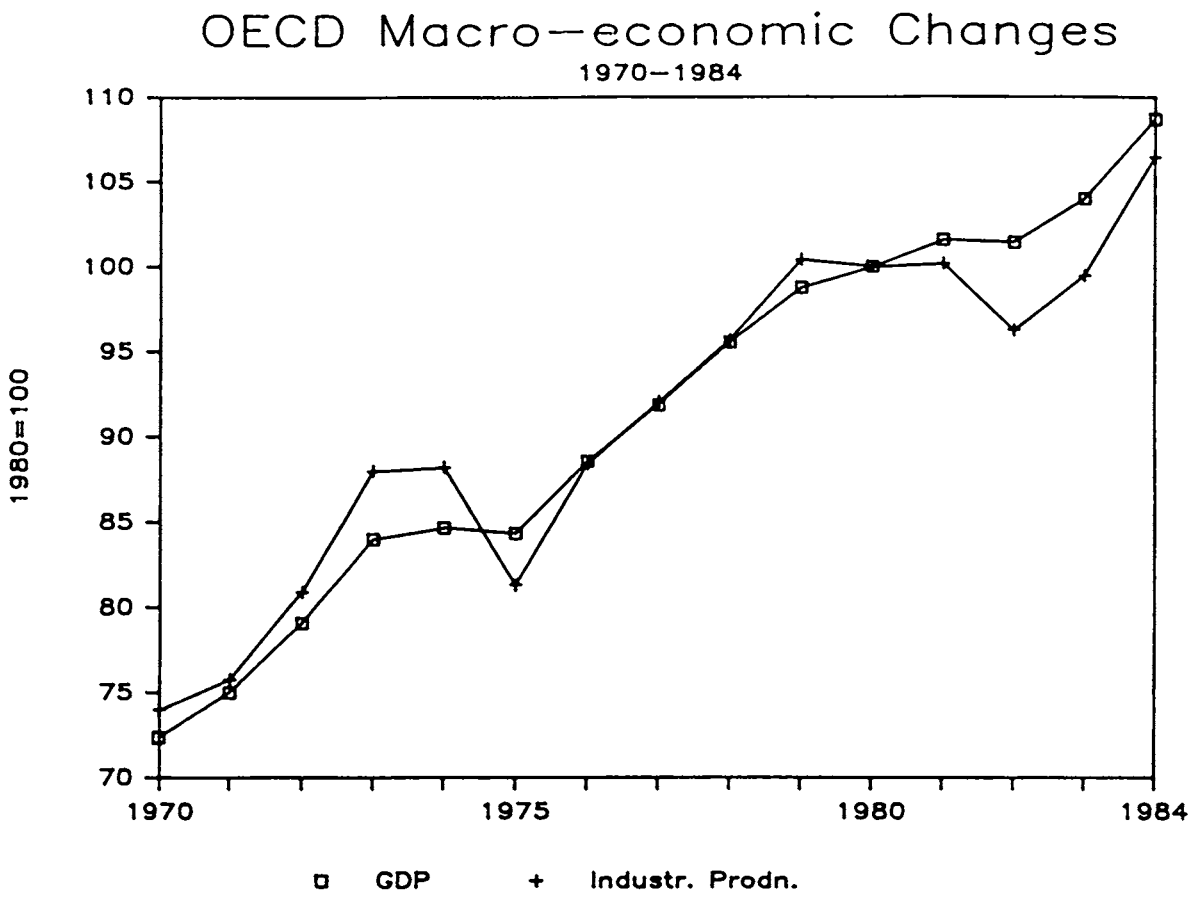


Diagram 6.

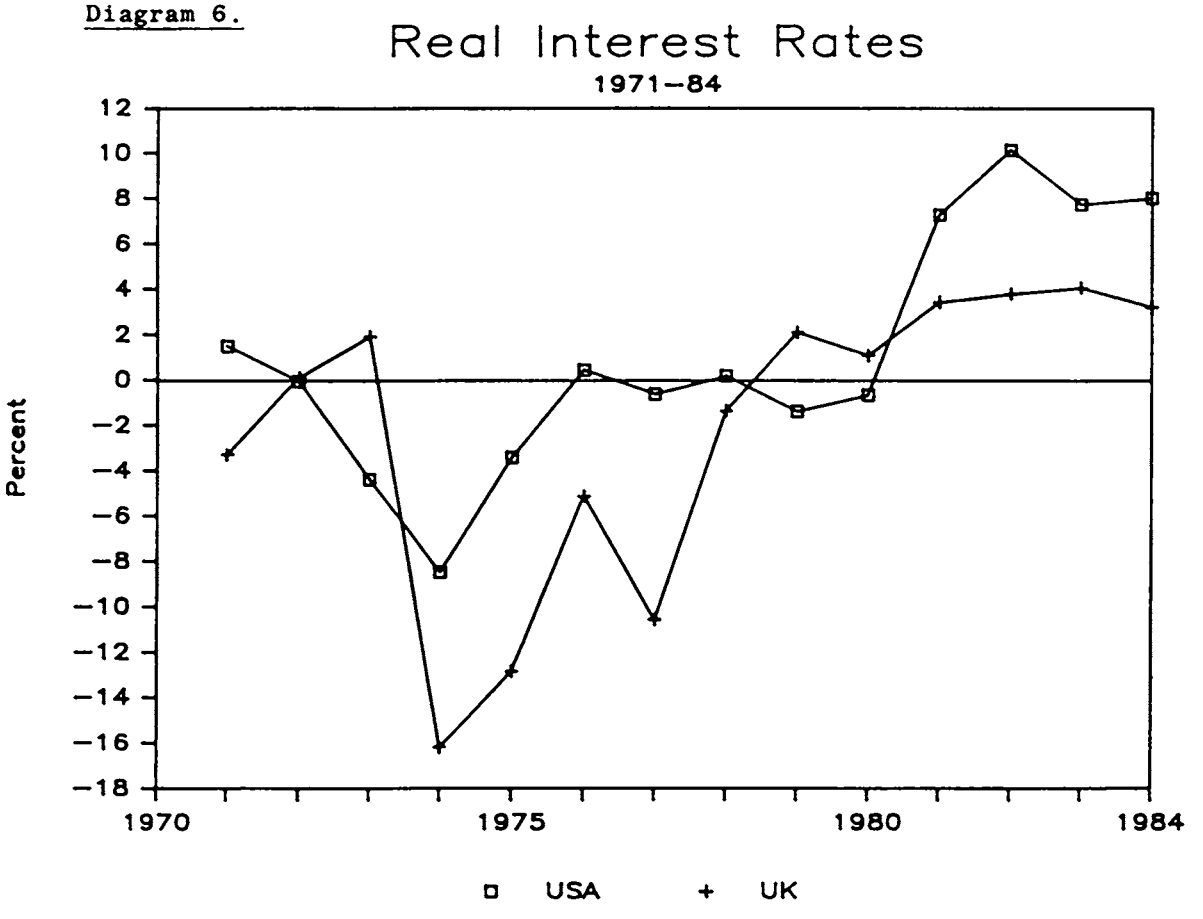


Diagram 2 presents a substantially less gloomy picture of developments since 1980 than did Diagram 1. In particular, the steep fall in prices between 1980 and 1982 that was apparent from the earlier Diagram can now be seen to be attributable to the use of the US dollar as a measure of value in the earlier Diagram. The rise since then was, however, much weaker than the decline in the preceding period.

Having arrived at what is arguably a truer picture of the developments in commodity prices, the next step is to examine whether there is evidence that currency-related developments exerted a particular adverse influence on commodity prices during the recent past, either by depressing demand, or by stimulating supply, or by affecting the demand for stocks of commodities.

In considering the evidence relating to possible currency effects on supply, one must consider the links between world commodity prices and the returns to individual producers. Three links in this chain can be distinguished, of which only one has to do with exchange rate considerations, and will therefore be examined in the present study. This is the *exporting country's own exchange rate policies*. These could be termed "neutral" if the changes in the exporting country's exchange rate are simply such as to cancel out the disparity between its domestic inflation rate and the rate of inflation of the currencies in which its imports are denominated. However, any other movement in its exchange rate will serve either to mitigate, or to reinforce, the effects of changing world prices on the commodity producers. The remaining two influences, which will not be considered here are, firstly, the *efficacy of the country's export marketing policies*, in terms of the proportion of the world price that is received by the country. In part, this also depends on quality considerations, and it is not easy to separate these from other considerations. However, if the trend in the exporting country's export unit values for a particular commodity is very different from that in world market prices, that should alert one to the existence of a marketing problem. While this issue is potentially of great importance, its investigation requires a more careful case study of country-specific data than could be attempted in the context of this paper. Secondly, there are the *internal marketing policies of the exporting country*: the share of the f.o.b. price that is received by the producer. Any changes in this share can also serve either to mitigate or to reinforce the effects of changing world prices.

In addition to seeking evidence of currency-related effects on supply, it is necessary to examine demand: in order to do this, data were collected on indicators of the levels of OECD consumption of the relevant commodities. The following data series were used: for cocoa, grindings in Canada, the USA, West Europe, Japan and Oceania; for coffee, tea and groundnuts, imports by developed market economies; for cotton, consumption data for the same group of countries as for cocoa, derived from ICAC; for copper and sugar, consumption data for these countries derived from CIPEC and ISO respectively; for tobacco, apparent consumption data for the developed market economies were derived from FAO production and trade data.

This data was used in order to throw light on two separate issues. Firstly, has there recently been an adverse shift in the level of demand? Secondly, how much of any shift in demand has been due to changes in the level of economic activity, and how much to changes in the pattern of demand which alter the relationship between income growth and growth in demand for African commodity exports? If abnormalities in the level of demand are found, over and above those due to the trade cycle (for example, some evidence that physical

demand for commodities had failed to rise to the extent that the economic recovery would normally imply) there would remain the difficult problem of establishing whether currency instability could be blamed for these abnormalities. But if no such abnormalities are found, it seems safe to reject the hypothesis that currency changes have distorted demand.

Establishing whether there has been an adverse shift in the level of demand is difficult, because of the problem known as "identification". If one observes a fall in the level of demand by OECD countries, this could be either due to a shift in the demand function, or to a shift in supply. It would be wrong to automatically attribute falls in consumption to demand changes. Strictly speaking, this problem can only be solved by recourse to a comprehensive economic model of the commodity market. However, we have attempted to use a more rough and ready approach to clarify what is going on in the commodity's market. In the Diagrams below, we plot, for most of the main commodities, the deviations from trend in OECD demand, and also in real price. (The trend has been defined for this purpose as a linear time trend from 1970 to 1984). If one sees demand falling *below* trend at the same time as price is *above* trend (or vice versa), this provides an a priori reason for supposing that both deviations have been caused by a shift in supply.

However, when both price and volume are simultaneously on the same side of the trend line, it is likely that shifts in demand lie behind this disturbance.

The indices of consumption per unit of OECD GDP are shown below. In the case of copper and cotton, they are shown in relation to OECD industrial production instead of GDP. For these industrial commodities, it was considered that, since the pattern of growth in the developed countries has recently favoured the development of services and information technology, the rate of growth of GDP might have been above that of industrial production. However, this phenomenon is not as strong as suspected, and it would have made very little difference if GDP had been used to construct the index for these commodities also. Diagram 5 shows the recent tendency in both OECD Gross Domestic Product (at 1980 prices and exchange rates) and in the OECD Index of Industrial Production.

Table 2: Indices of OECD demand per unit of GDP or IP

	Cocoa	Coffee	Copper	Tea	Groundnuts "	Groundnuts Oil	Cotton	Sugar
1970	165	119	120	137	234	112	159	139
1971	159	120	114	135	177	97	155	133
1972	159	117	116	122	154	123	145	129
1973	152	116	118	120	176	112	131	126
1974	135	106	108	122	153	87	117	125
1975	125	114	98	114	147	89	126	110
1976	127	111	106	113	168	90	125	115
1977	113	88	109	120	123	88	113	112
1978	104	95	111	88	122	77	105	106
1979	100	104	108	95	115	93	102	105
1980	100	100	100	100	100	100	100	100
1981	113	98	102	85	98	66	94	95
1982	117	100	98	94	97	77	98	95
1983	114	100	96	NA	NA	NA	99	91
1984	113	95	98	NA	NA	NA	93	86

Source: Computed from IMF, International Financial Statistics and other sources.

(a) Cocoa

The Table below shows the evolution of cocoa prices, in 1980 US cents/lb. In the first column, the current prices have been deflated by the index of world export unit values, to give an impression of the change in the volume of imports that could be purchased with a given volume of cocoa. In the three subsequent columns, the world price has been converted into the local currencies of the countries shown, and deflated by an index of domestic prices within that country. In order to facilitate comparison, they have then been converted back from local currencies into US dollars at the 1980 exchange rates.

Since the procedure used for calculating these three columns may appear obscure, it is worth setting out its economic meaning in more detail. In the case in which changes in exchange rates exactly compensate for differences in inflation rates, these three columns would coincide with the first. However, it can be seen that they do not. If the exchange rate is devalued by more than the difference in inflation rates would warrant, then the domestic purchasing power commanded by exportable commodities will rise above the real level of the world price: domestic resources are being transferred from importers to exporters, and currency changes are exerting a stimulative effect on supply. If the exchange rate remains above the level that would offset differences in inflation rates, then resources are being transferred from exporters to importers, and supply is likely to be reduced.

Table 3: Real Cocoa Prices (1980 US cents/lb)

	World	Ghana	Nigeria	Sierra Leone
1970	103.6	222.8	179.6	75.7
1971	75.7	181.4	119.0	58.8
1972	82.0	232.9	127.0	63.8
1973	135.8	325.7	240.0	123.1
1974	171.8	397.6	321.5	177.5
1975	111.2	229.9	169.4	112.4
1976	177.3	274.5	223.2	189.5
1977	316.0	313.0	370.0	348.6
1978	221.2	221.1	242.7	227.8
1979	179.8	222.4	194.5	177.2
1980	126.9	126.9	126.9	126.9
1981	105.4	67.8	94.2	90.7
1982	92.1	42.0	81.1	62.4
1983	113.2	27.4	86.2	59.3
1984	132.9	NA	NA	58.6

Source: Computed from IMF, International Financial Statistics.

The data are plotted below. The first Diagram shows the evolution of real cocoa prices as shown in the first column of Table 2. The second shows the way in which exchange rate considerations contributed to the changes in real price facing producers within cocoa-exporting countries. A neutral exchange rate regime, in the sense defined above, would lead to the line being horizontal. Of course, it must be emphasised again that there are other factors, apart from those considered here, which affect the actual terms of trade faced by farmers and enterprises within developing countries producing export commodities.

The next two Diagrams attempt to throw light on the causes of the price fluctuations. The first shows the trend in OECD consumption per unit of GDP over the period as a whole, and brings out whether, in the recent past, consumption has been below or above the trend level that would be consistent with the current level of GDP. The second Diagram has the aim of throwing light on the relative importance of supply and demand in causing price changes. It illustrates the deviations from the trend level of real price, and from the trend level of OECD consumption (in absolute terms, not in relation to OECD GDP). For expositional purposes, the deviations from trend in volume have been multiplied by 10. Thus a 2% deviation from trend shows up on the Diagram as 20%, while the price deviations are those actually occurring. This has been done in all the Diagrams except copper, where the percentage volume deviations have been almost as violent as those in price, and tobacco, where the deviations in both price and volume have been equally mild. In the case of cocoa, it can be seen that, with the exception of 1975, there is a clear negative correlation between price and volume deviations, suggesting strongly that supply fluctuations have been the principal cause of price fluctuations. The volume of demand has been above trend, not only in absolute terms, but also in relation to OECD GDP, which suggests that there is little evidence of perverse developments in demand during the recent cycle. Rather the problem on the demand side is the strongly negative *trend* in demand, due to the low income-elasticity of demand for this commodity.

Diagram 7.

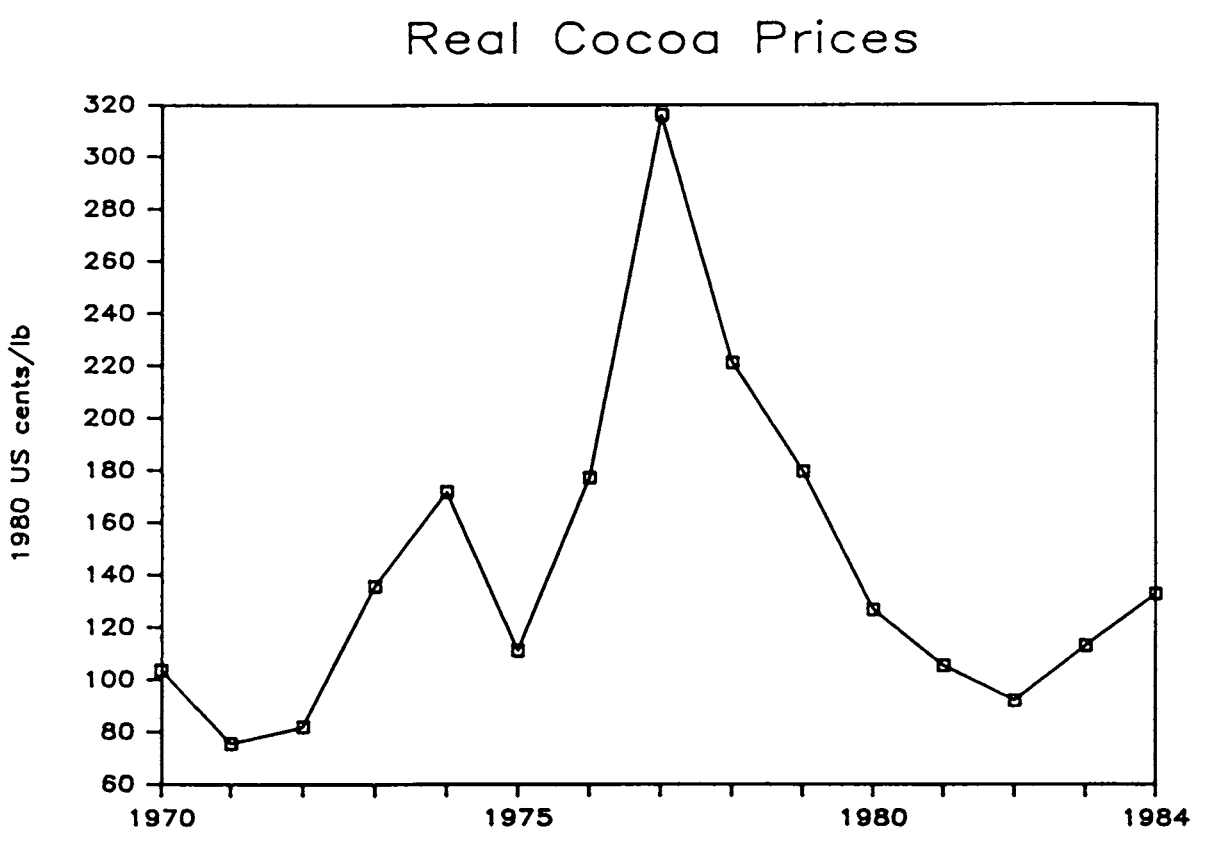


Diagram 8.

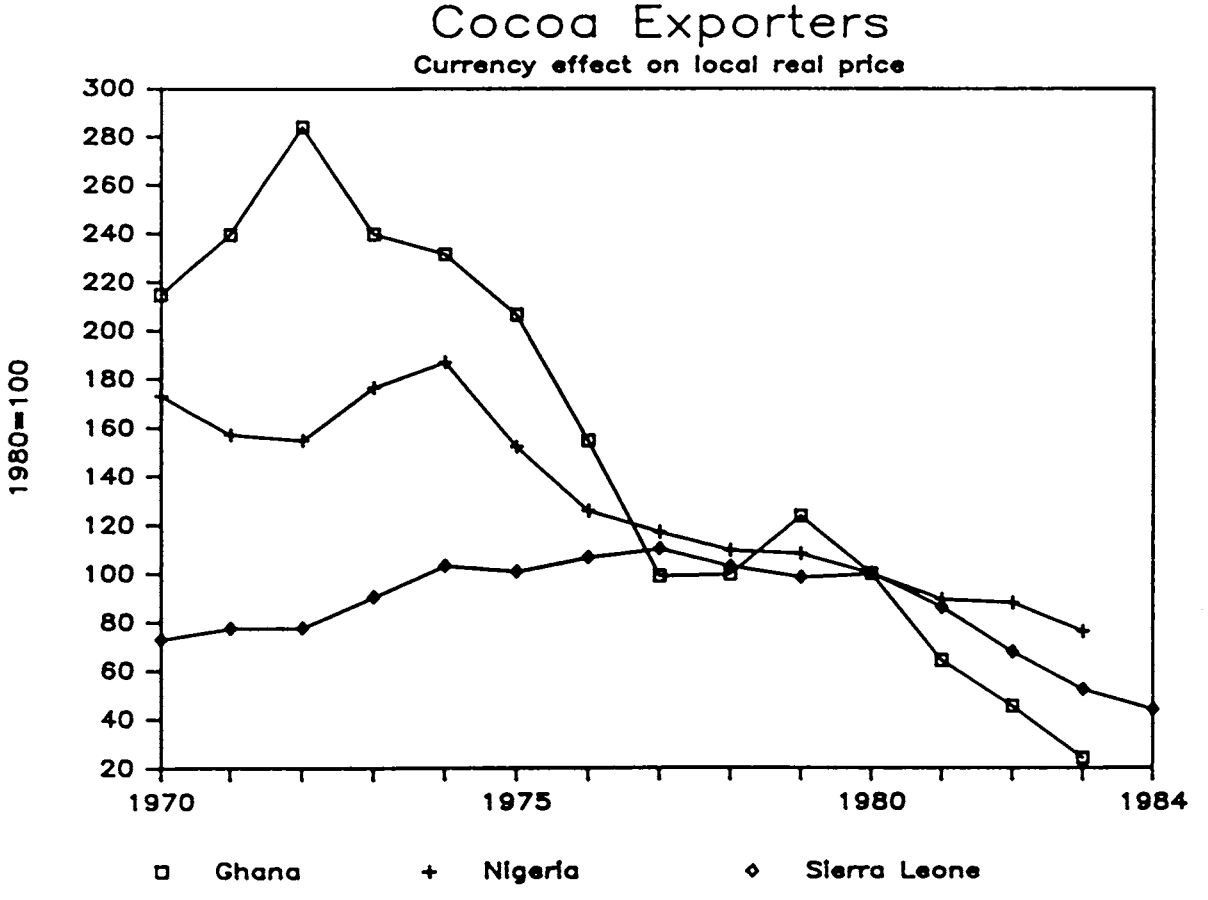


Diagram 9.

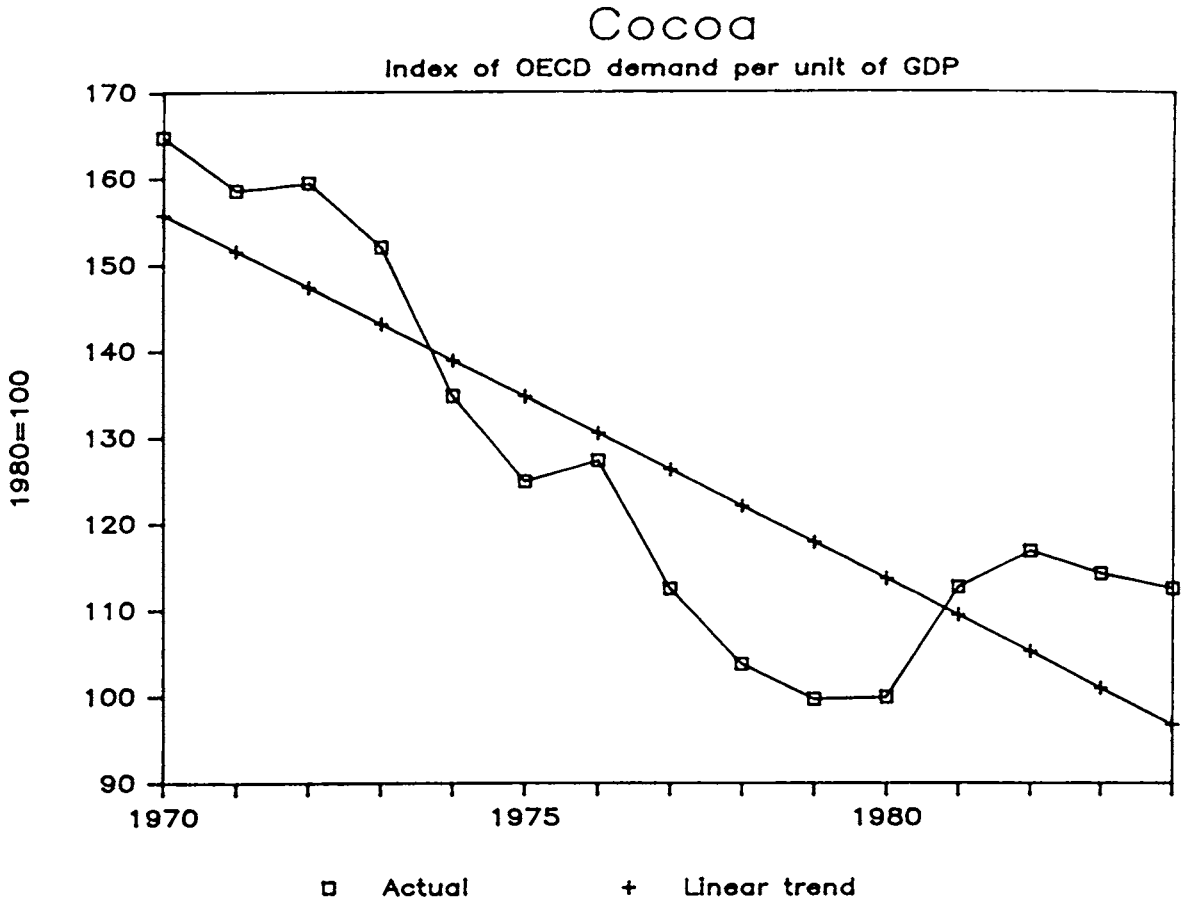
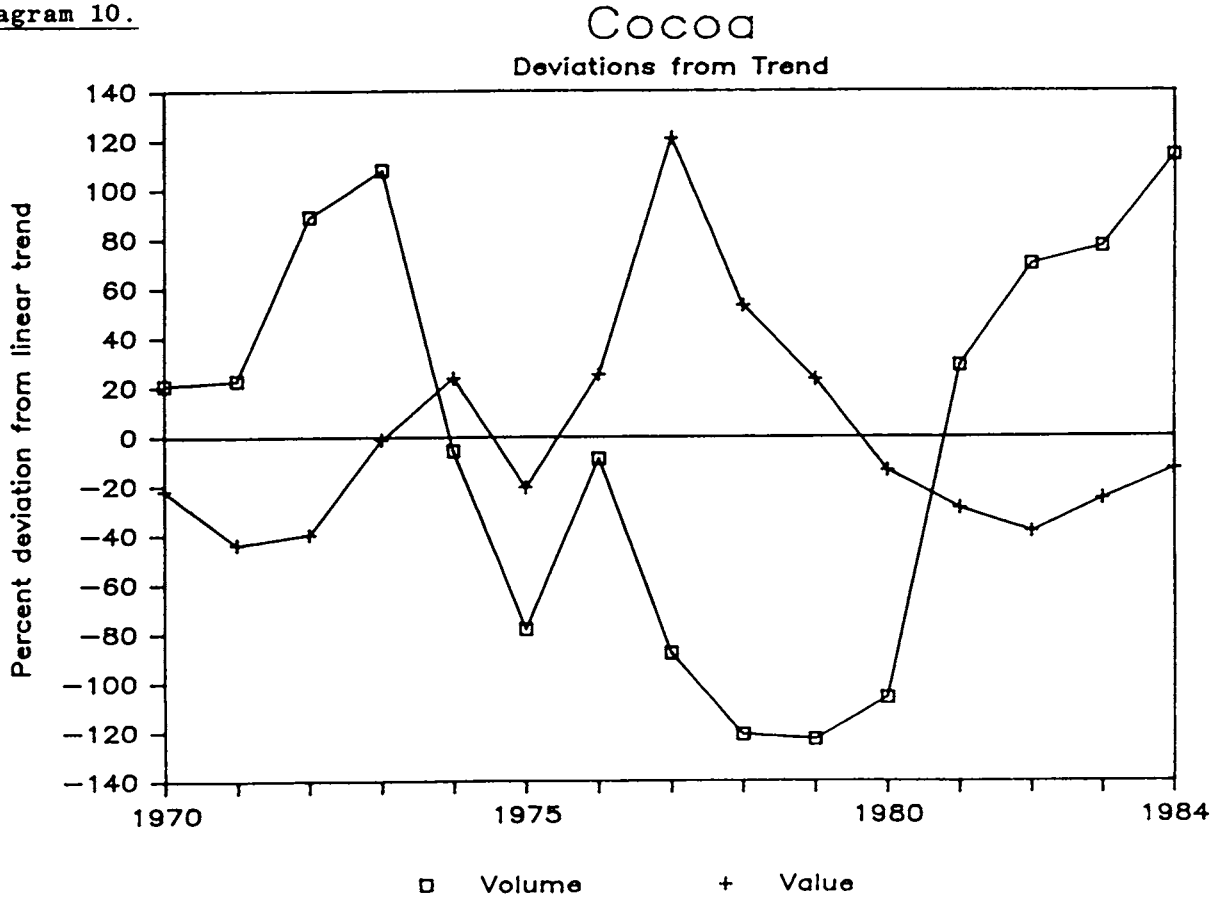


Diagram 10.



(b) Coffee

The evolution of coffee prices is shown below in a similar form. The currency effects on local producers have been broadly neutral in Kenya, but in recent years strongly negative among the other African producers of coffee.

Table 4: Real Coffee Prices (1980 US cents/lb)

	World	Kenya	Tanzania	Sierra Leone	Uganda
1970	157.4	151.1	162.5	182.3	136.7
1971	131.7	128.7	137.5	163.7	104.3
1972	135.5	136.7	144.0	181.8	121.3
1973	138.8	151.6	158.0	208.3	118.3
1974	121.8	143.1	147.1	189.6	78.6
1975	116.7	131.9	128.2	160.4	72.5
1976	226.8	264.2	267.2	217.7	107.9
1977	338.9	367.1	382.3	313.7	92.3
1978	203.1	198.4	216.1	208.6	42.9
1979	192.4	194.3	221.2	187.0	NA
1980	150.7	150.7	150.7	150.7	NA
1981	120.4	126.3	93.2	85.2	NA
1982	135.2	137.3	87.8	65.9	NA
1983	142.5	152.8	84.5	29.2	NA
1984	161.8	165.9	94.3	12.5	NA

Source: Computed from IMF, International Financial Statistics.

Looking at the evidence on demand, what is striking is the comparatively minor nature of the deviations from trend in both OECD demand and price in the period with which we are primarily concerned, 1980-1984. This was also the period in which quotas were re-imposed under the International Coffee Agreement, and the conclusion that is principally suggested by this data is that the Agreement has been successful in containing fluctuations in real prices and in volume. (There has, however, recently been increased downward pressure on prices in non-quota markets: some reasons for this will be discussed in subsequent sections of this paper).

Once again, the principal problem affecting demand has been its failure to keep pace with the rate of growth of OECD incomes, but this is again a problem that has to do with a long-term trend: the experience of recent years, as with cocoa, has if anything been more favourable than the long-term trend, not only because of the recovery in the OECD economies, but also in the sense that consumption per unit of GDP has been above trend.

Diagram 14 makes clear that the principal price fluctuation was due to supply instability; as is well known, it was the result of a Brazilian frost which drastically cut export availability. Apart from this period, the remaining deviations in price and volume have also tended to be in opposite directions, showing that supply changes have been more important in causing the minor, as well as the major, price changes.

Diagram 11.

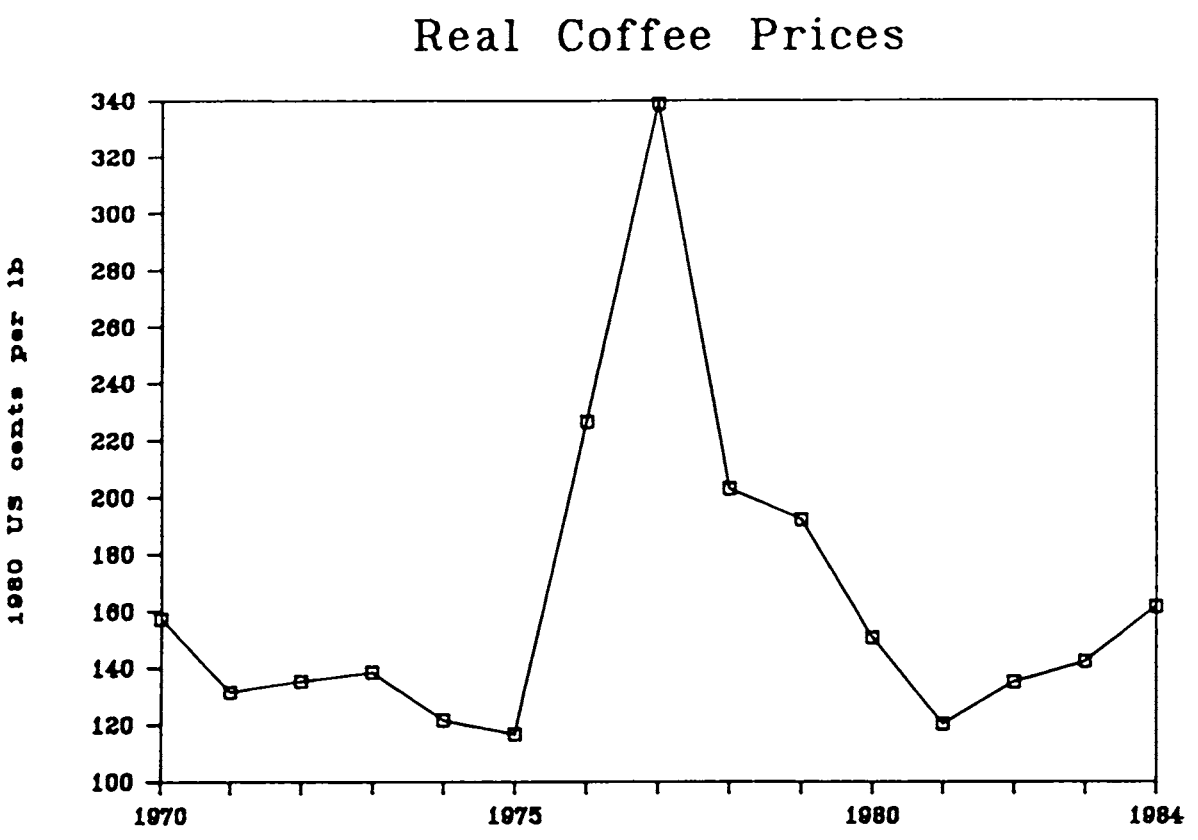


Diagram 12.

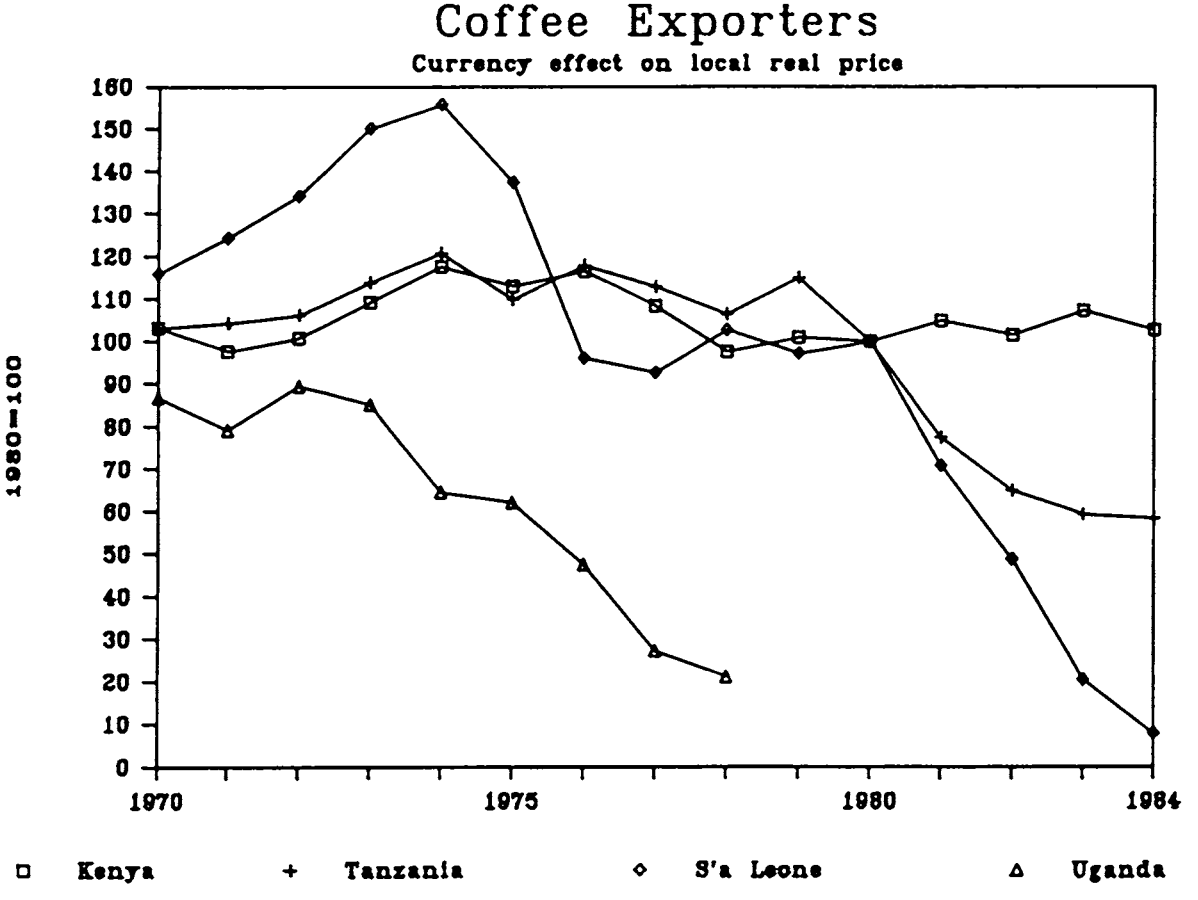


Diagram 13.

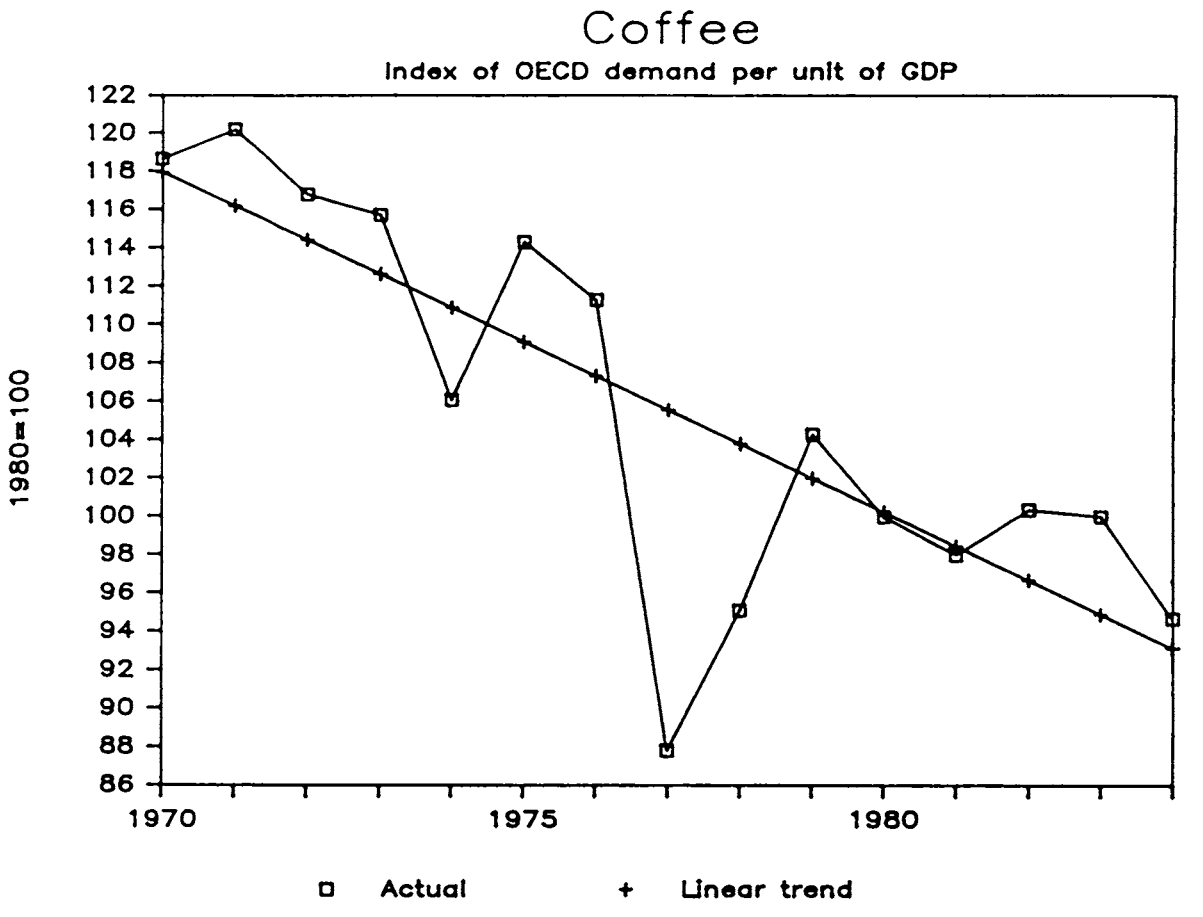
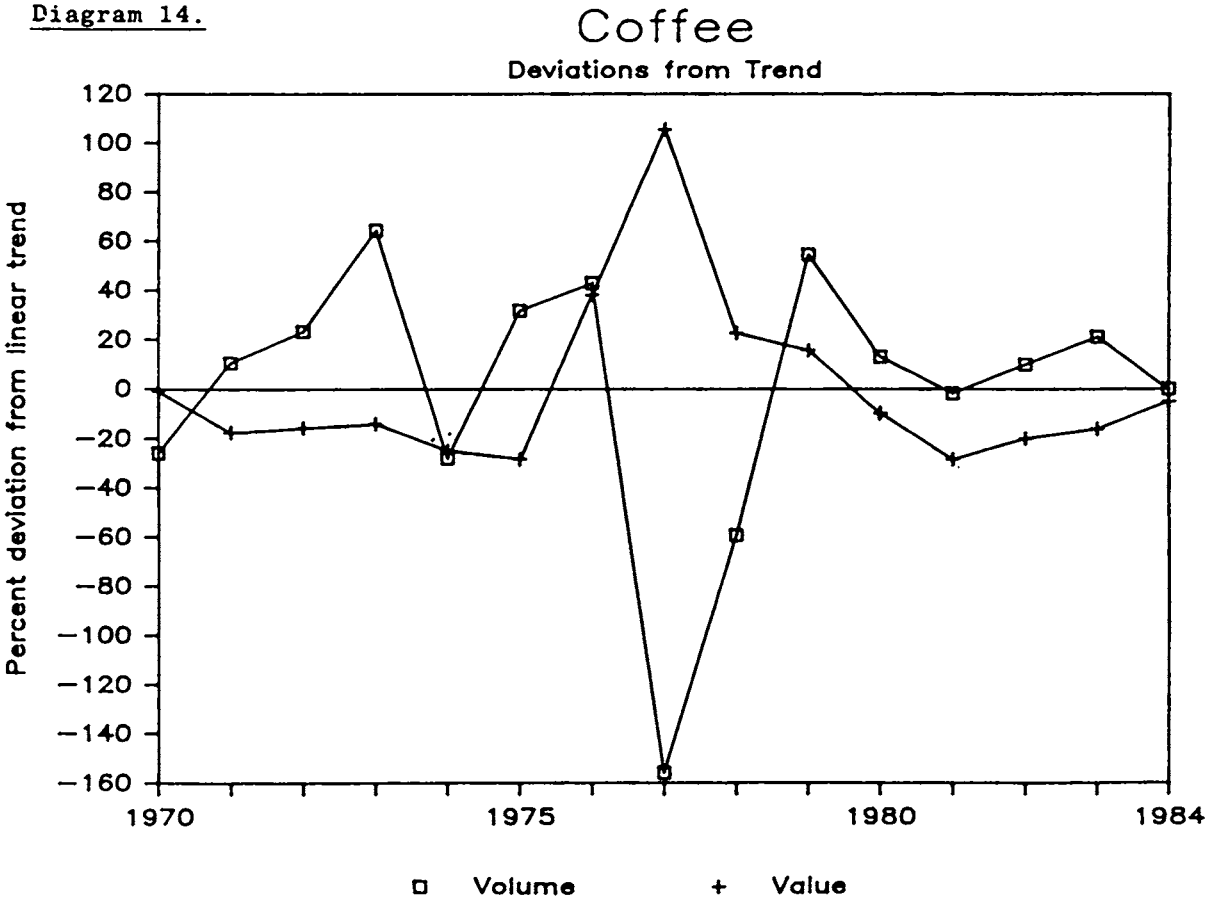


Diagram 14.



(c) Sugar

The Table below shows two columns of "world" prices: the first represents what is happening on the open market, while the second represents EEC import prices. This has of late been the more relevant series for ACP sugar exporters, and the data for Malawi and Swaziland have been computed on that basis. As the second Diagram on sugar shows, both these countries have experienced fairly neutral local currency effects, so that the divergence between the domestic real value of sugar exports and that on world markets has altered little.

Table 5: Real Sugar Prices (1980 US cents/lb)

	New York	EEC	Malawi	Swaziland
1970	11.7	15.9	12.8	16.7
1971	13.4	15.2	12.0	16.5
1972	20.1	18.3	14.7	19.8
1973	21.5	14.9	14.0	19.0
1974	53.7	19.1	19.9	26.0
1975	33.1	24.9	25.6	30.9
1976	18.5	21.4	22.5	21.5
1977	12.0	20.7	22.3	18.7
1978	10.2	20.9	21.8	19.7
1979	11.0	21.6	22.8	20.8
1980	28.7	22.1	22.1	22.1
1981	17.6	19.7	19.1	14.1
1982	9.1	19.5	19.7	9.8
1983	9.4	19.6	18.4	8.3
1984	6.0	18.4	NA	NA

Source: Computed from IMF, International Financial Statistics.

If we look to the demand Diagrams for enlightenment about the causes of the extraordinary slide in world sugar prices, we find strong evidence that this has been, in recent years, essentially a demand-related problem. Both price and volume have been below trend from 1982 to 1984. Indeed, for sugar as for some of the other commodities studied, the focus on OECD demand may not bring out completely the effect of recent macro-economic developments in developed countries. Demand for sugar has until recently tended to grow particularly rapidly in the developing countries themselves, and the effect of high debts and high real interest rates has been to necessitate programmes of austerity which have had an adverse effect on the rate of growth of demand *within* the developing countries.

However, if one turns to examine the evolution of sugar demand per unit of OECD GDP, a somewhat different conclusion is suggested. The steady and extensive decline totally dominates the small deviations from trend: again, it seems that the long-run problems of demand (which, in the case of sugar, relate principally to the inroads made by alternative sweeteners, as well as to the low income-elasticity of demand) are of much greater importance than the short-run fluctuations around the trend in the volume of demand.

Diagram 15.

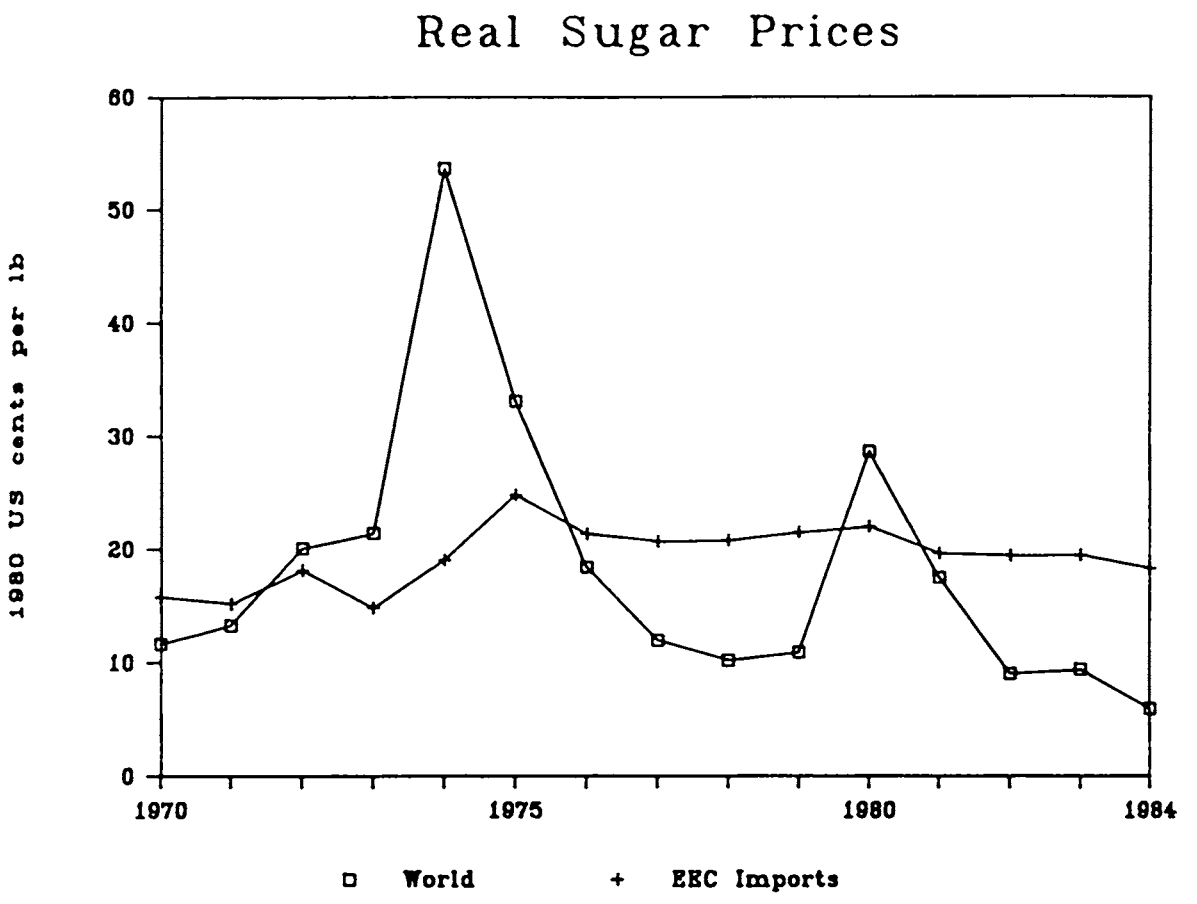


Diagram 16.

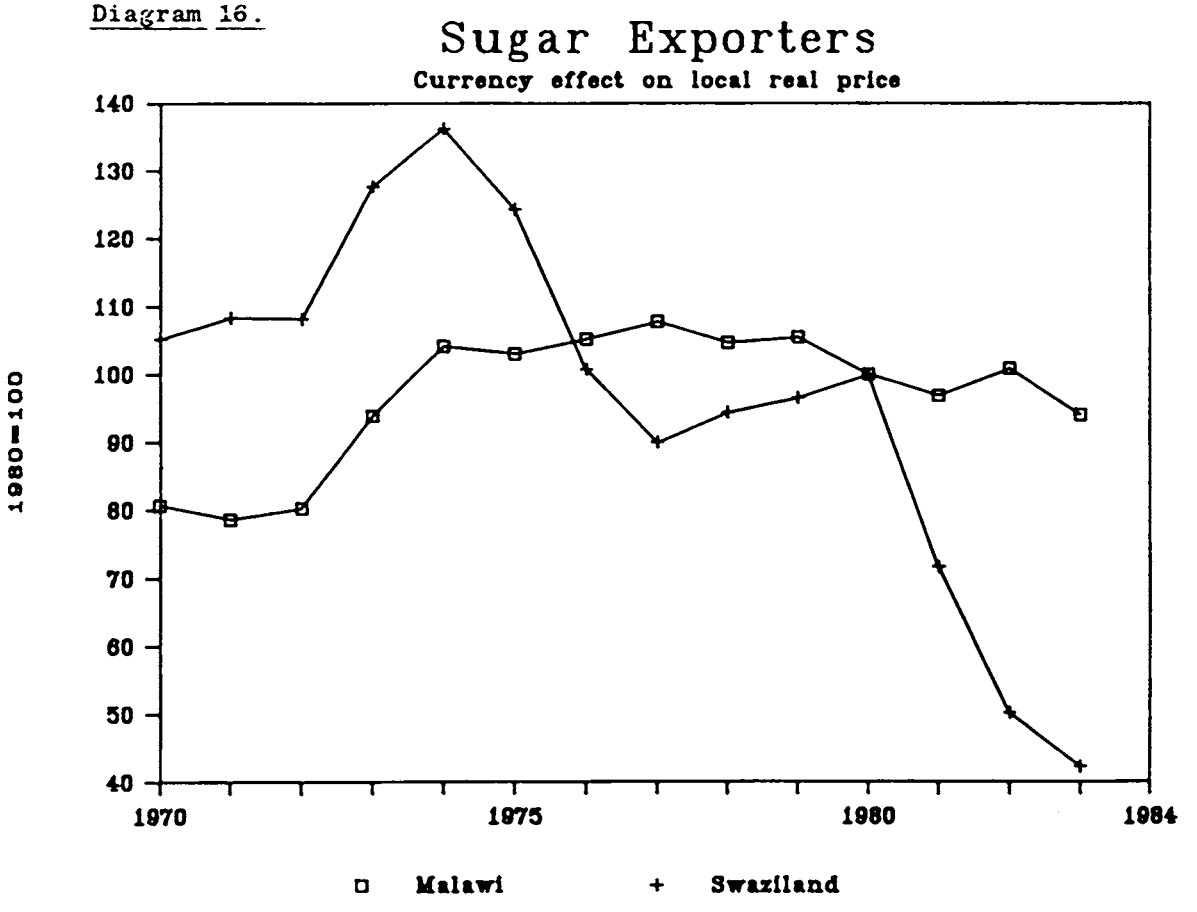


Diagram 17.

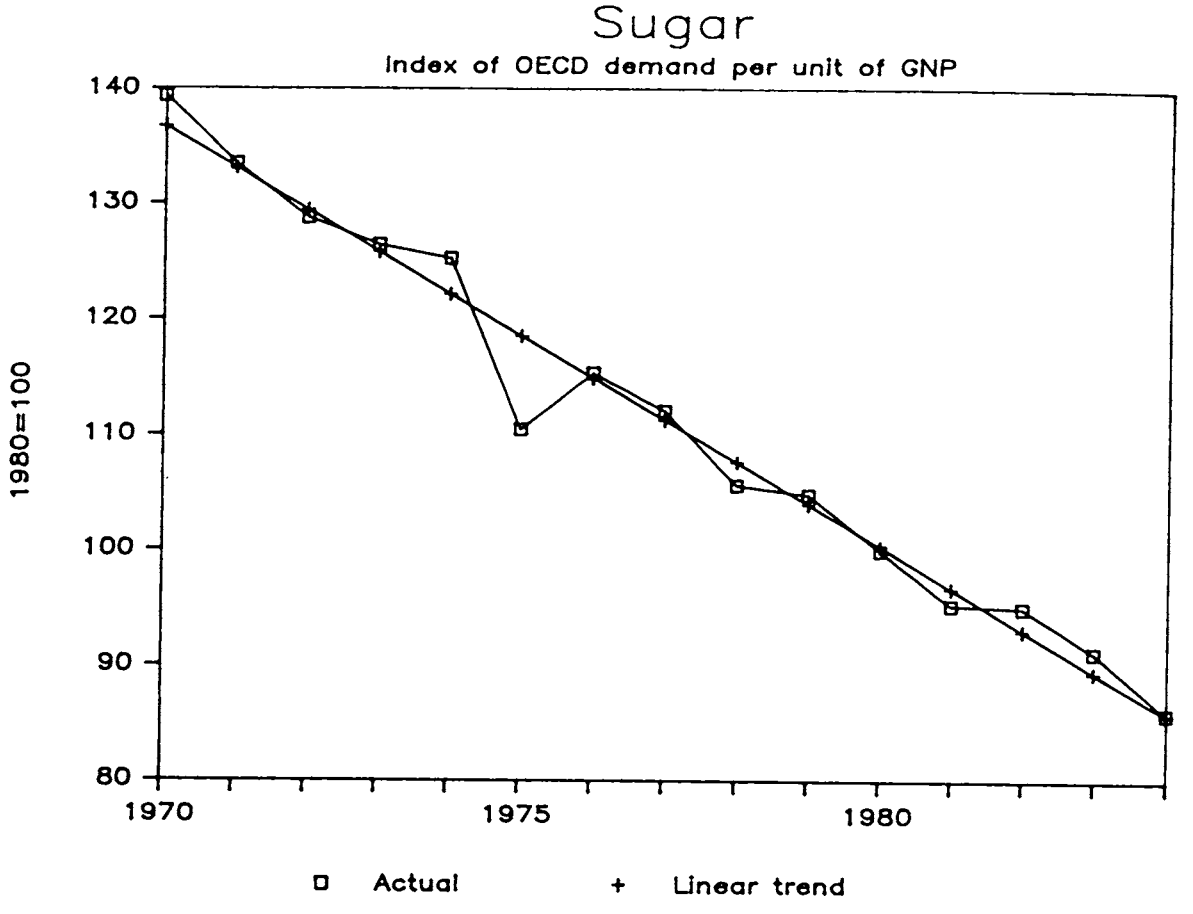
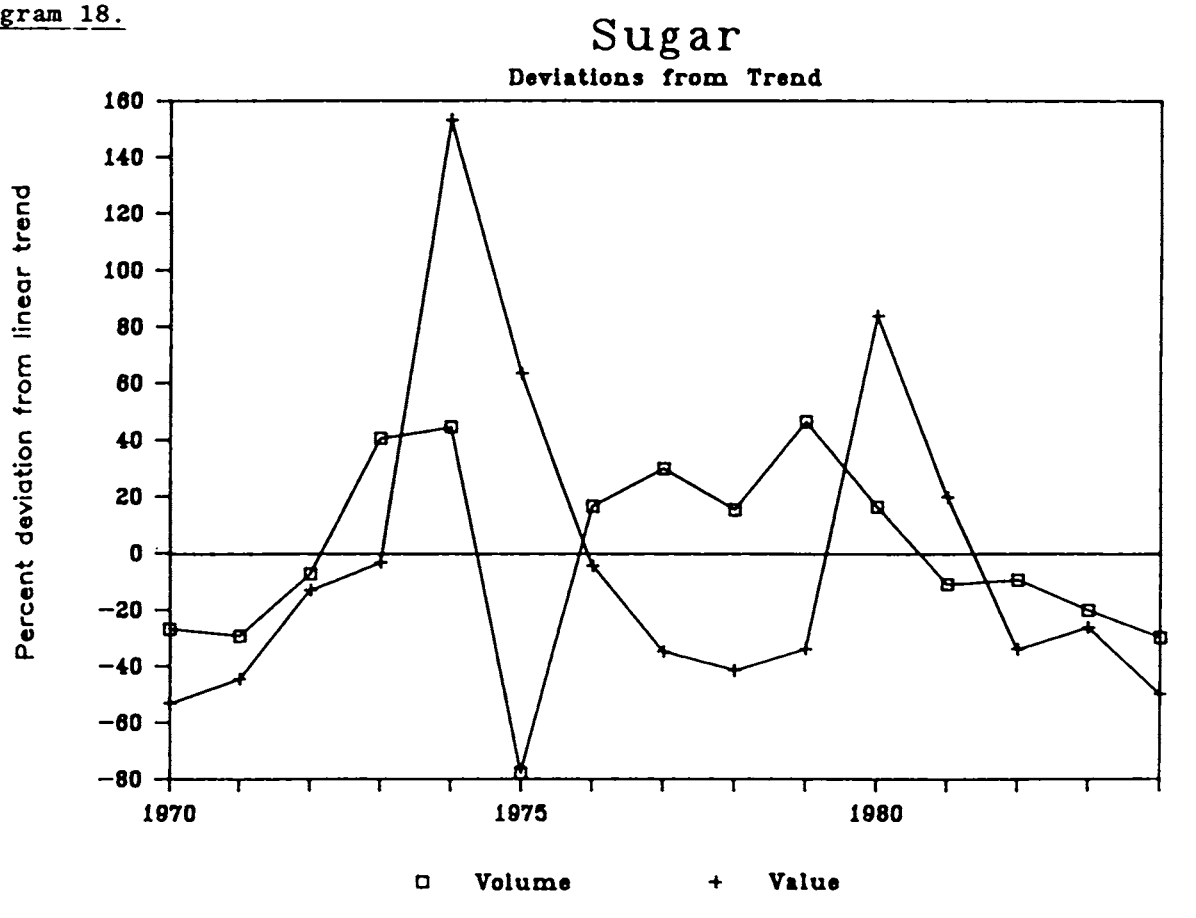


Diagram 18.



(d) Copper

The trends in copper prices are shown below: once again, the local currency effects on the internal purchasing power of copper exports have been particularly severe in the recent past, in the case of both major African exporters. Over a longer period, however, the principal problem has been the severe change in the level of world prices: prices throughout the period from 1975 have fluctuated around a level that is about half of the average over the previous five years.

Table 6: Real Copper Prices (1980 US cents/lb)

	World	Botswana	Zambia
1970	199.9	NA	206.5
1971	144.7	NA	168.2
1972	130.3	NA	157.8
1973	180.4	NA	236.8
1974	166.8	209.1	244.7
1975	89.9	104.0	155.5
1976	101.6	89.1	135.5
1977	87.9	76.0	93.7
1978	80.9	73.6	82.6
1979	102.0	97.7	97.6
1980	99.2	99.2	99.2
1981	81.9	63.2	67.9
1982	72.2	39.4	50.7
1983	80.3	35.8	32.6
1984	71.5	24.6	NA

Source: Computed from IMF, I.F.S.

The evidence of the fluctuations in price and in OECD consumption make it clear that demand disturbances lie at the root of the problems that have been experienced by copper exporters: in only six out of the fifteen years plotted have price and volume deviated in opposite directions from their respective trend lines. (One should also enter a note of caution against using a device as crude as a linear trend in a case in which prices have shifted from one plateau to another: a more sophisticated measure would probably bring out yet more clearly the influence of demand shifts).

As with the other commodities studied, there is a clearly negative long-run trend in the relationship between OECD industrial production and copper demand. The deviations of OECD demand around this trend have to do with the pro-cyclical nature of copper demand: when industrial production is recovering, and investment is gathering pace, copper demand rises more rapidly than industrial production, only to fall again (by more than the previous rise) during periods of recession.

The weakness of the rise in copper demand per unit of GDP during the recent recovery appears surprising at first. It can largely be ascribed to changes in technical preferences among consumers. The rise of alternatives such as optical fibres, and the greater use of electronic circuits instead of electrical wiring, has offset many of the positive effects of the recovery in demand. Where older

Diagram 19.

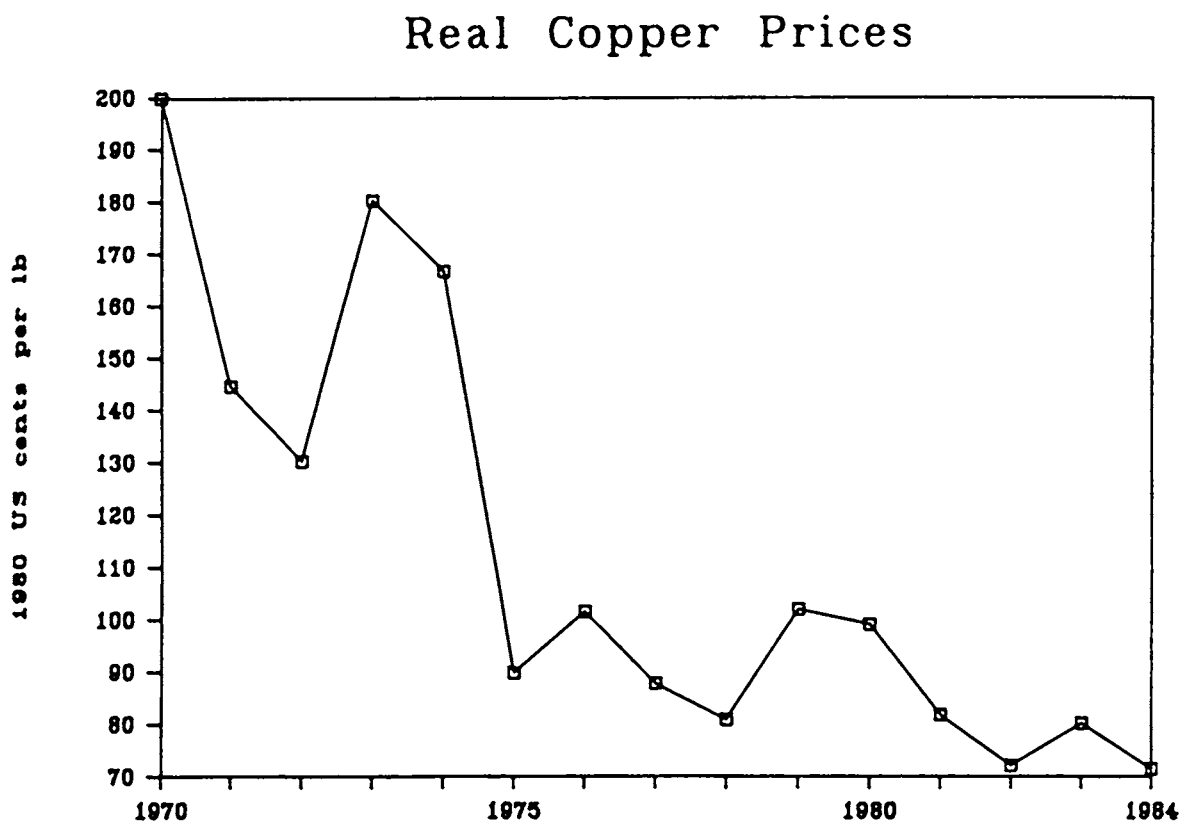


Diagram 20.

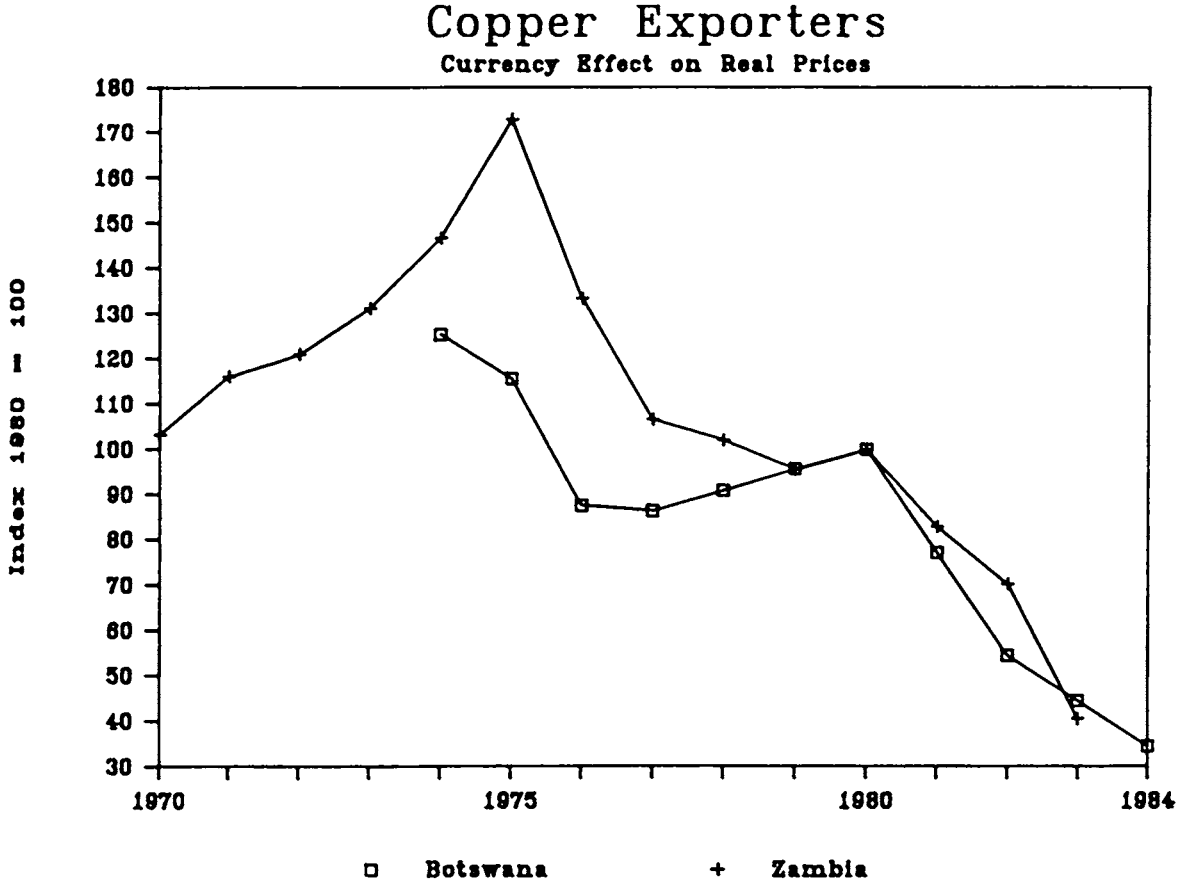


Diagram 21.

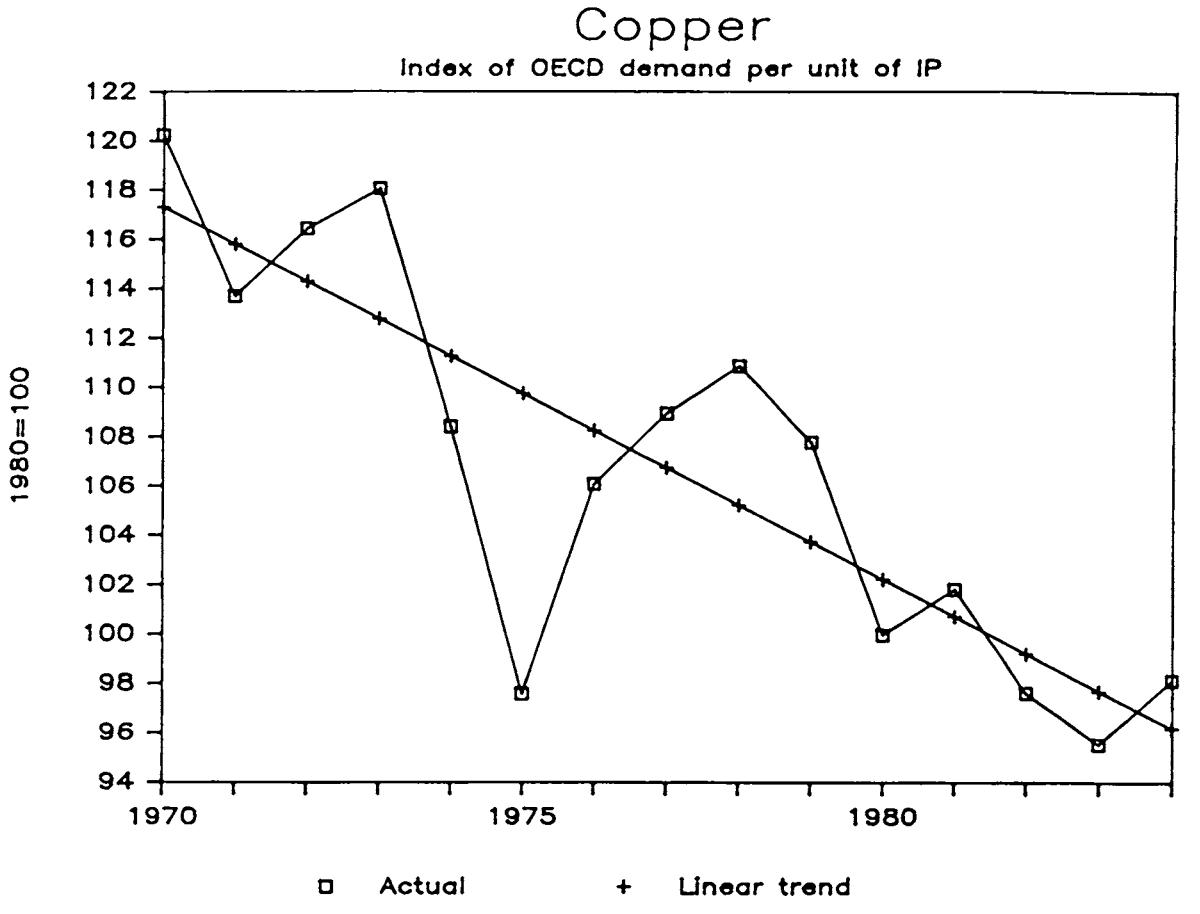
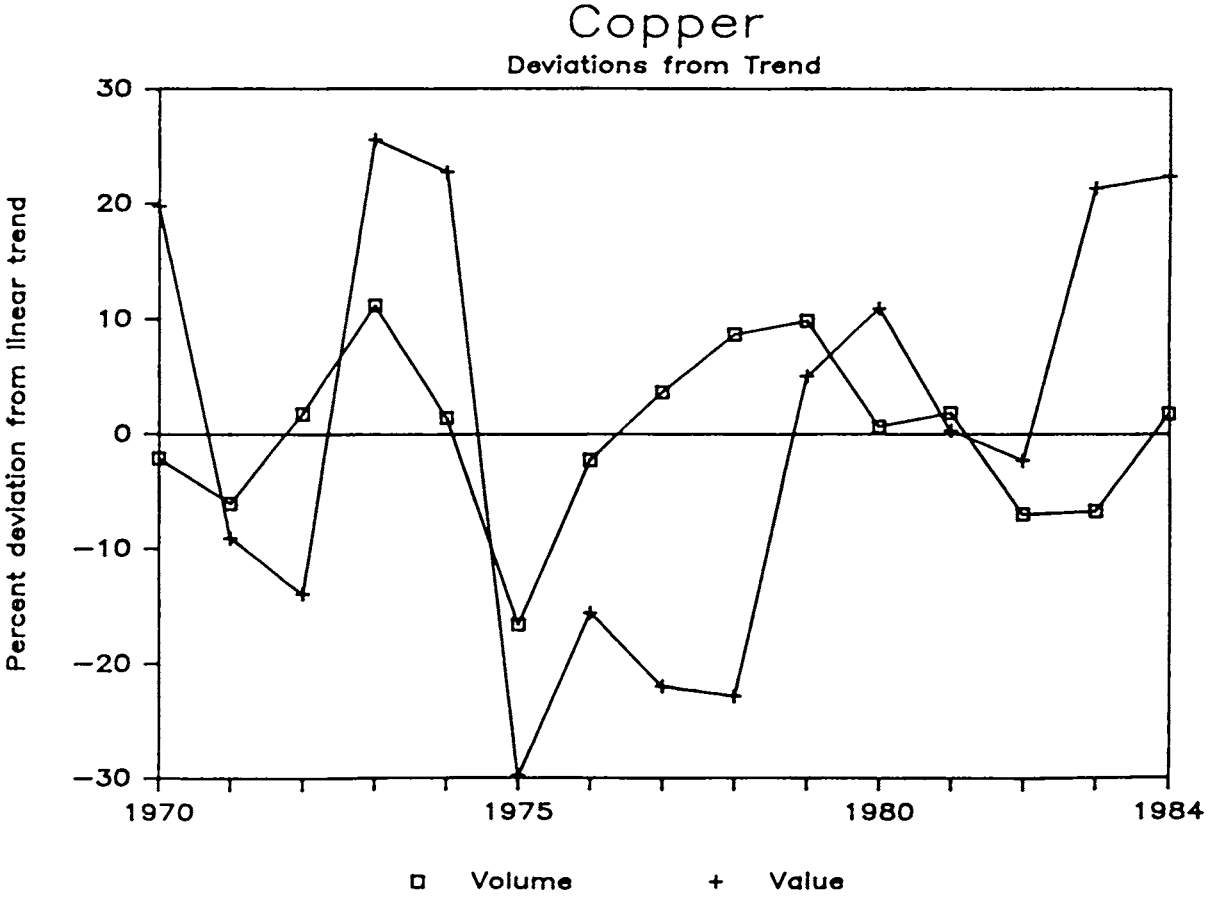


Diagram 22.



copper-using systems have been scrapped to make way for less copper-intensive alternatives, this has not only affected the demand side, but also, via the effects on scrap availability, the supply side.

In addition, in the motor industry the move to smaller and more fuel-efficient vehicles (in response, not only to the fuel price rises of 1974 and 1979, but also to the Corporate Average Fuel Economy regulations in the USA) has hit copper demand by favouring aluminium and other light-weight materials. In summary, copper is one of the commodities in which demand disturbances in the developed countries seem most responsible for recent low prices, but these disturbances do not appear to be directly caused by the macro-economic fluctuations; rather they appear to be due to shifts in technical preferences.

(e) Cotton

Real cotton prices have remained fairly steady in recent years, as can be seen both from the Table below and from the accompanying Diagrams. Since the principal cotton exporters' local currency effects have been shown in previous Diagrams, they are not reproduced here.

Table 7: Real Cotton Prices (1980 US cents/lb)

	World	Tanzania
1970	90.1	93.0
1971	99.9	104.3
1972	70.6	75.0
1973	138.6	157.8
1974	116.7	141.0
1975	85.5	93.9
1976	123.4	145.4
1977	105.5	119.0
1978	94.3	100.3
1979	87.6	100.7
1980	93.7	93.7
1981	87.3	67.6
1982	78.1	50.7
1983	82.5	48.9
1984	92.7	54.0

Source: Computed from IMF, I.F.S.

Perhaps the most important development in the cotton market has been the shifting of the location of mill consumption of cotton away from the developed countries: if one were to measure the OECD consumption of cotton products, as opposed to cotton itself, this would remove much of the downward trend in the "cotton-intensity" of OECD industrial production which is evident from the Diagram.

Abstracting from this trend, it appears that shifts in OECD demand have indeed played a causative role in many of the fluctuations in real price. However, it is clear, from both of the second two Diagrams, that the recovery of the last two years did have a noticeable impact on the volume of developed country demand, and that this has had a positive effect on real prices.

Diagram 23.

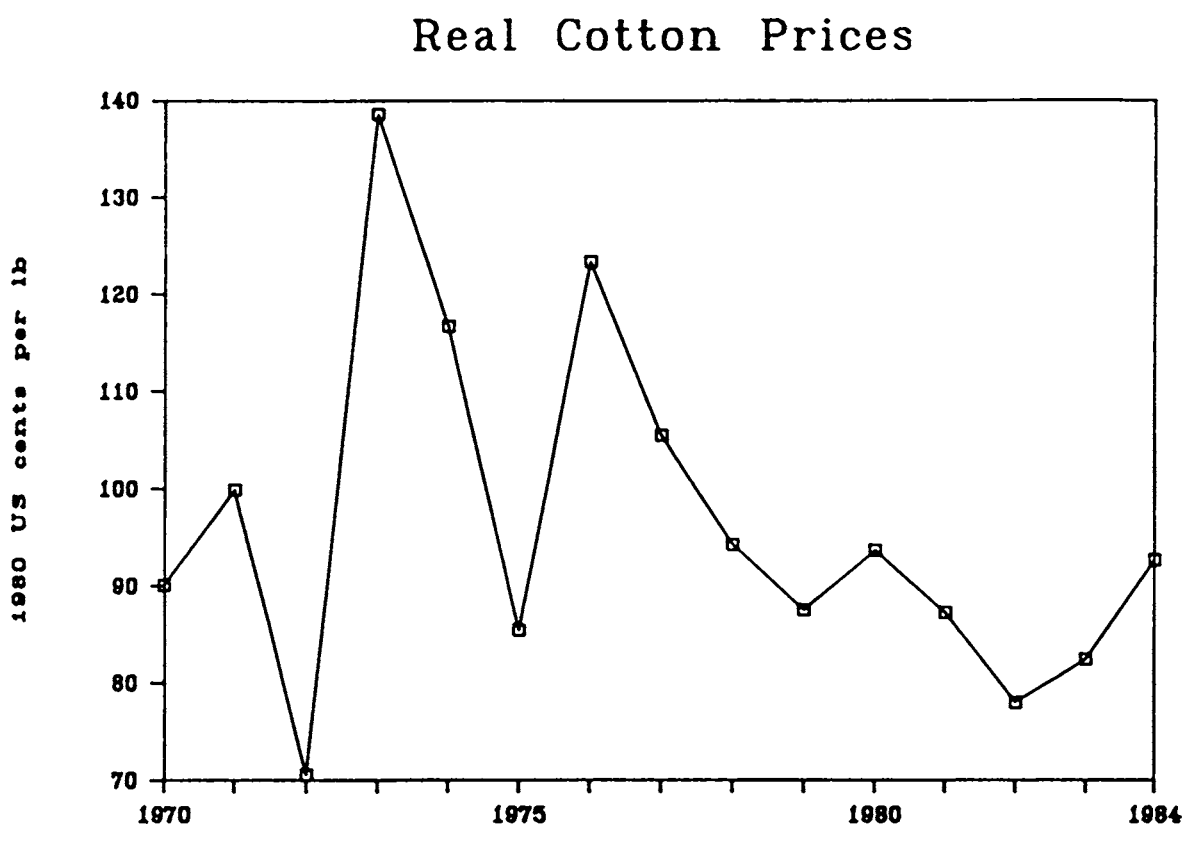


Diagram 24.

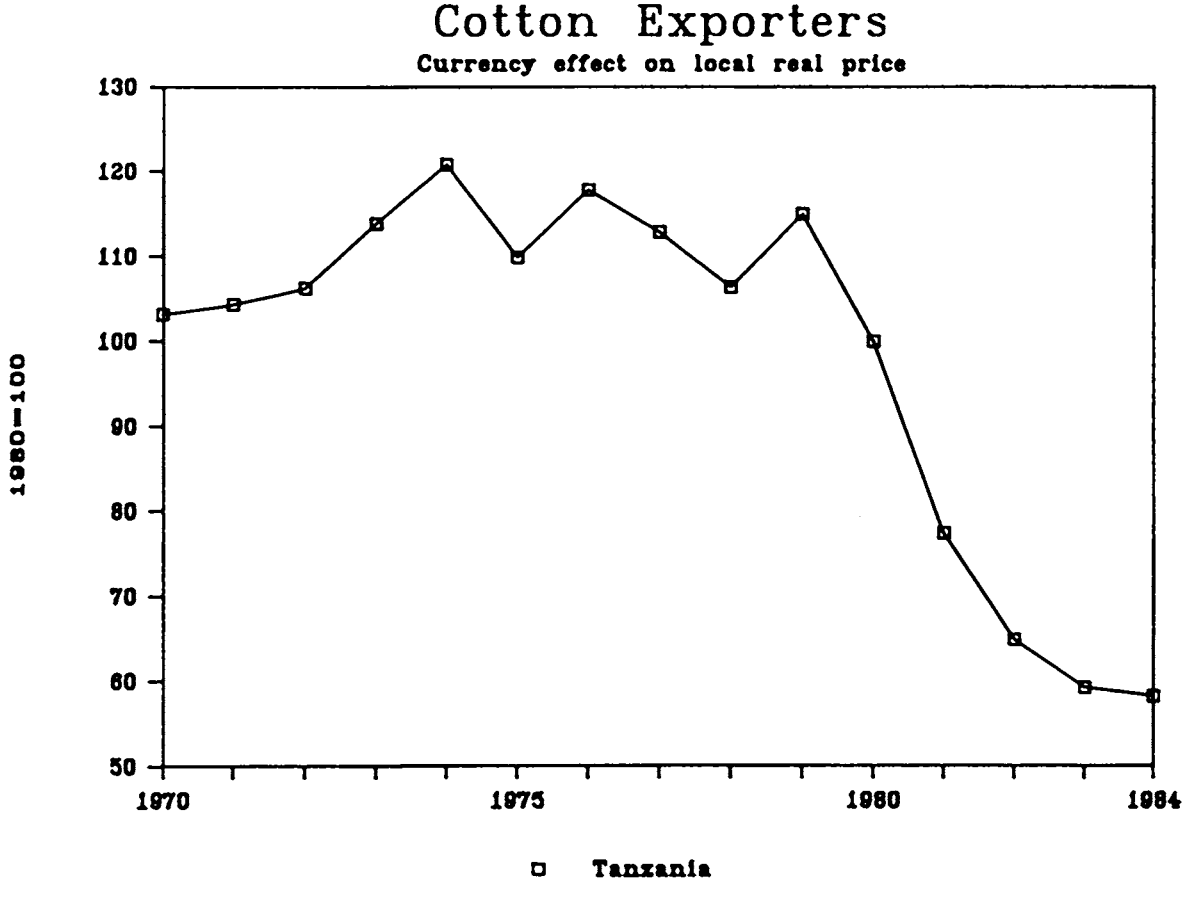


Diagram 25.

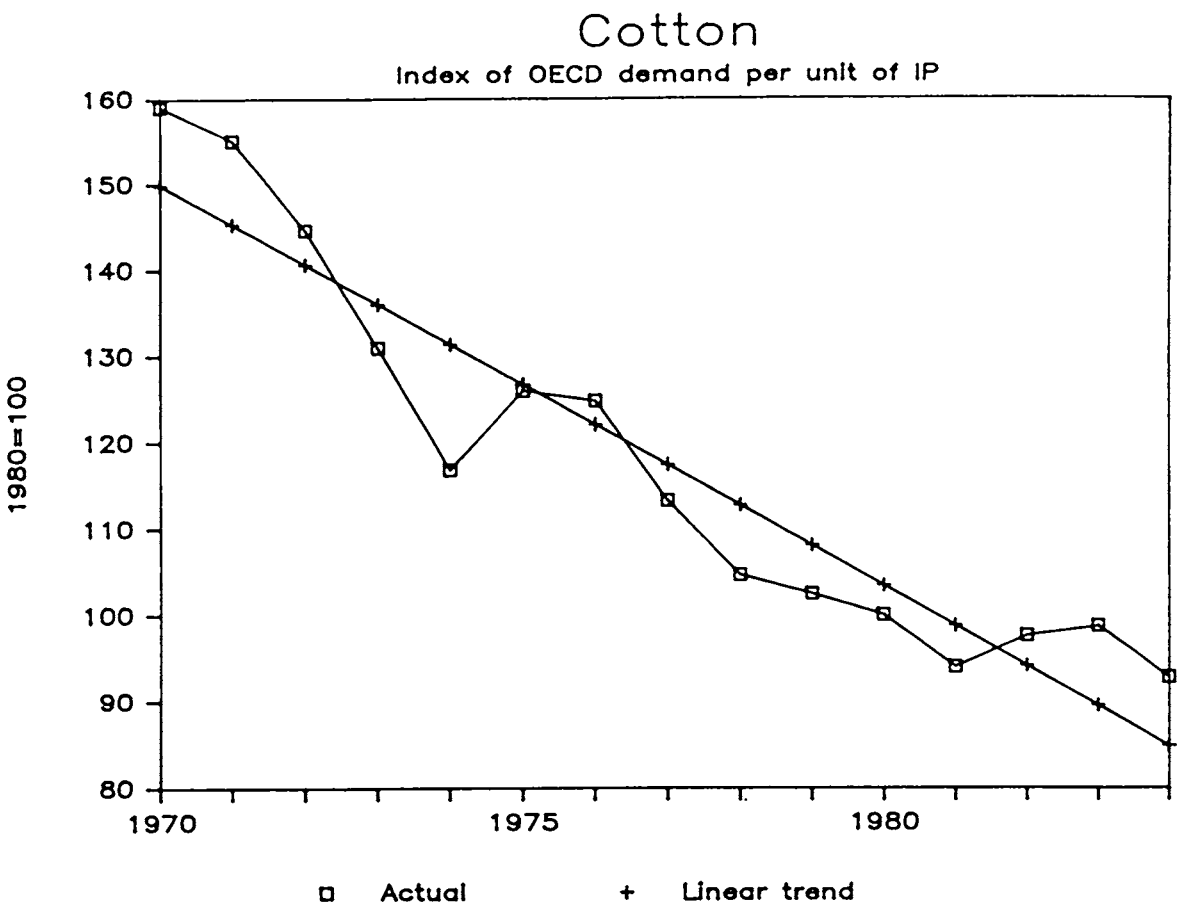
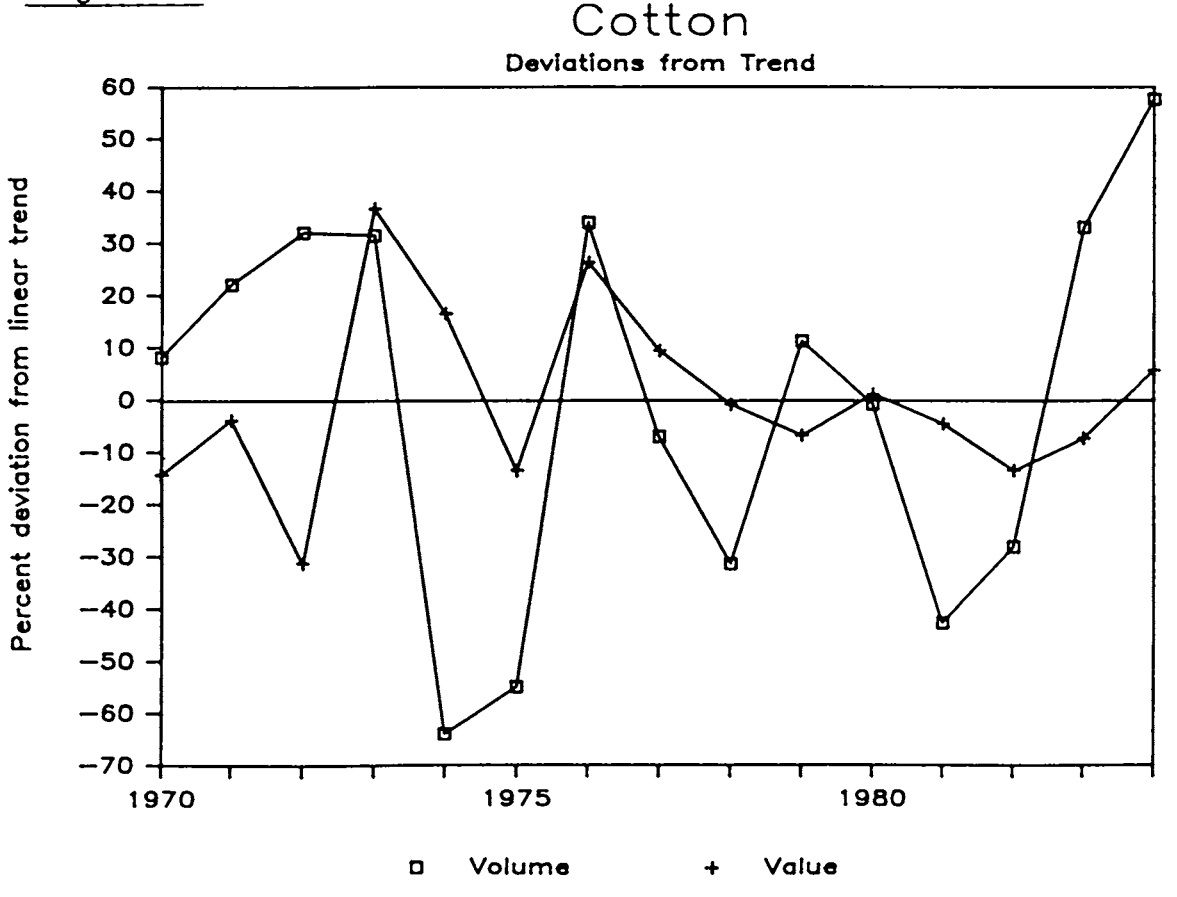


Diagram 26.



(f) Tea

Neither in the case of the volume of tea imported by OECD countries, nor in the case of the price of tea, is there any clear trend. Although the same Diagrams have been plotted for tea as for other commodities, this has been done with some misgivings, since the Diagrams are somewhat misleading. The absolute volumes imported by the OECD countries have remained broadly stable, so that the downward trend in consumption per unit of GDP merely reflects the upward trend in GDP itself. The large and growing volume of consumption in the producing countries, especially India, account for much of the recent strength of tea prices.

Table 8: Real Tea Prices (1980 US cents/lb)

	World	Kenya	Malawi
1970	154.4	148.1	124.6
1971	140.9	137.7	110.8
1972	128.0	129.1	102.8
1973	107.3	117.2	100.8
1974	113.6	133.5	118.3
1975	100.4	113.4	103.5
1976	111.6	130.0	117.4
1977	179.0	193.9	193.0
1978	130.0	127.0	136.2
1979	111.1	112.2	117.2
1980	101.4	101.4	101.4
1981	94.6	99.3	91.6
1982	96.7	98.2	97.6
1983	117.2	125.7	110.2
1984	178.9	183.5	NA

Source: Computed from IMF, I.F.S.

Because the main demand-side changes came from outside the OECD countries, little can meaningfully be deduced from the Diagram showing deviations from trends in volumes and prices (moreover the absence of any clear trend also serves to detract from the value of the Diagram).

For present purposes, it suffices to conclude that there is no evidence that disturbances to the volume of OECD demand resulting from exchange rate fluctuations have been an important factor affecting tea prices.

Diagram 27.

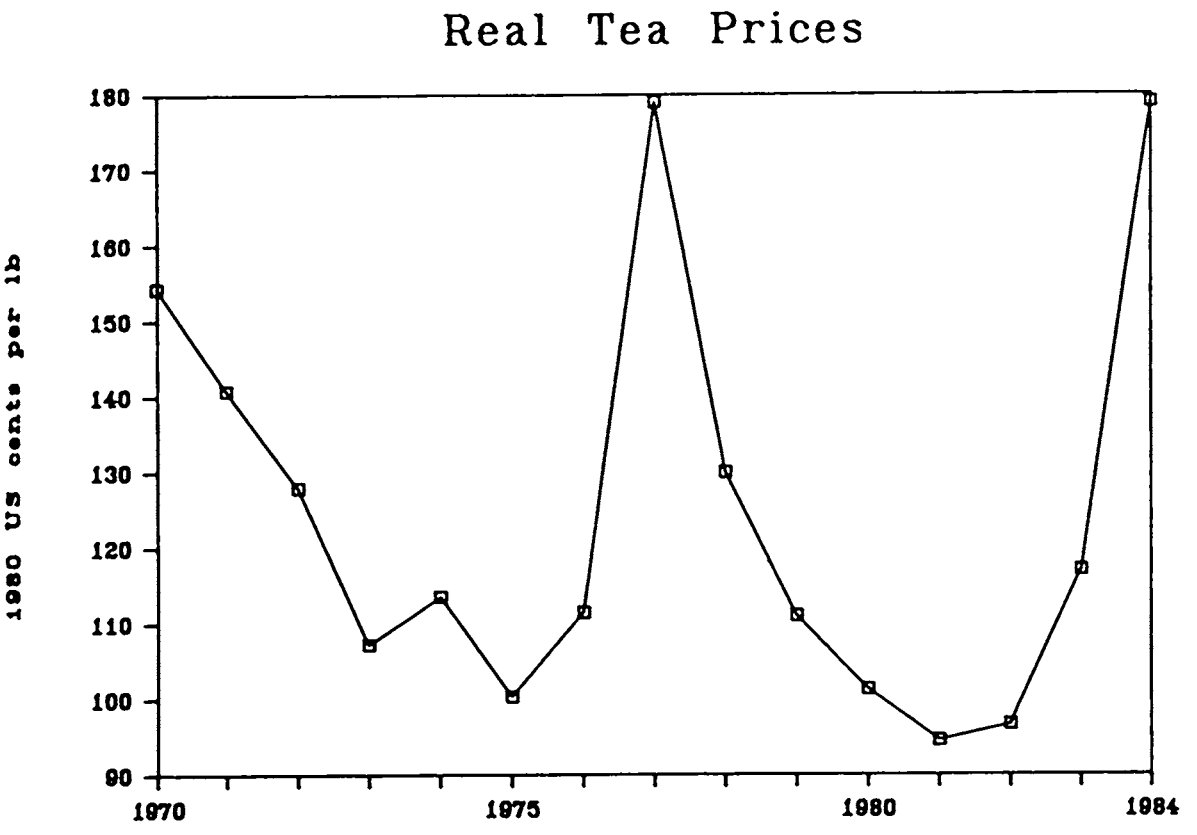


Diagram 28.

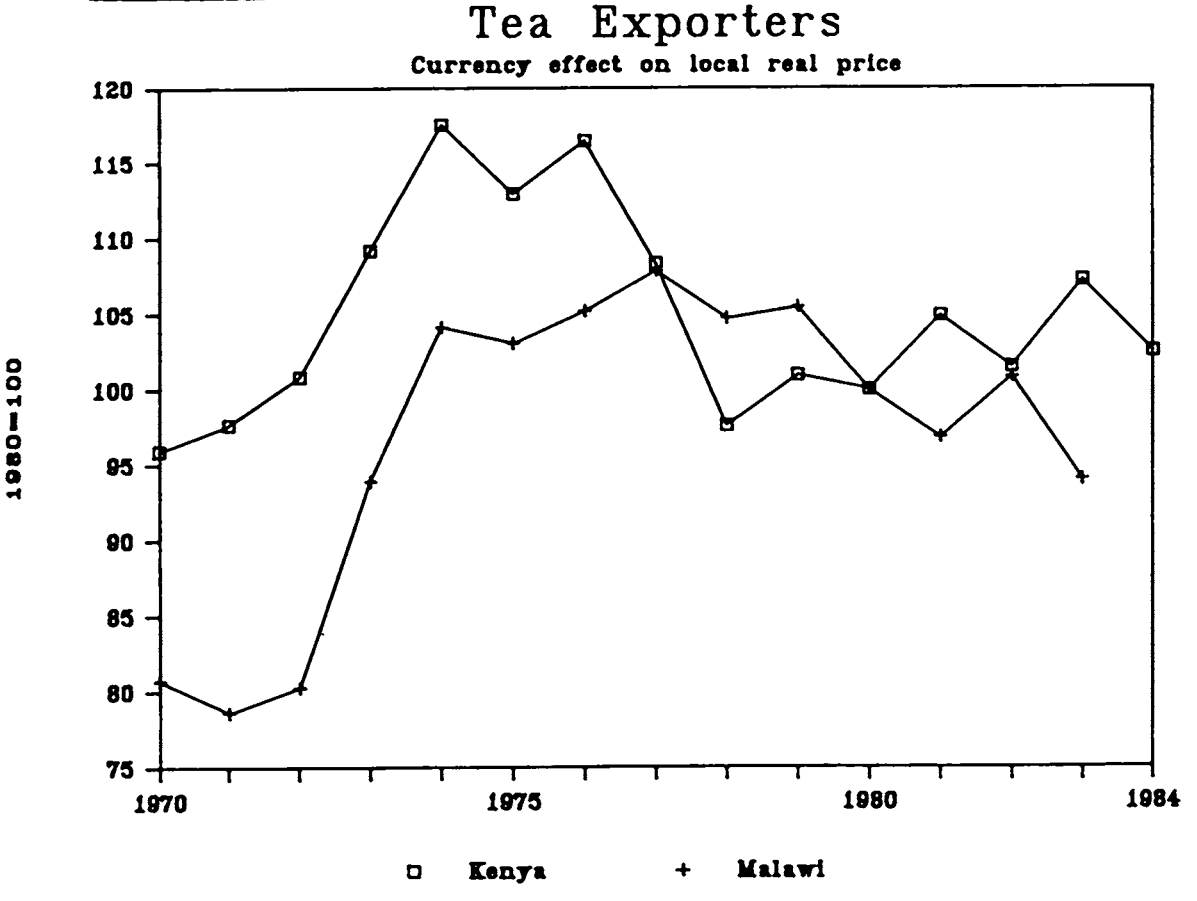


Diagram 29.

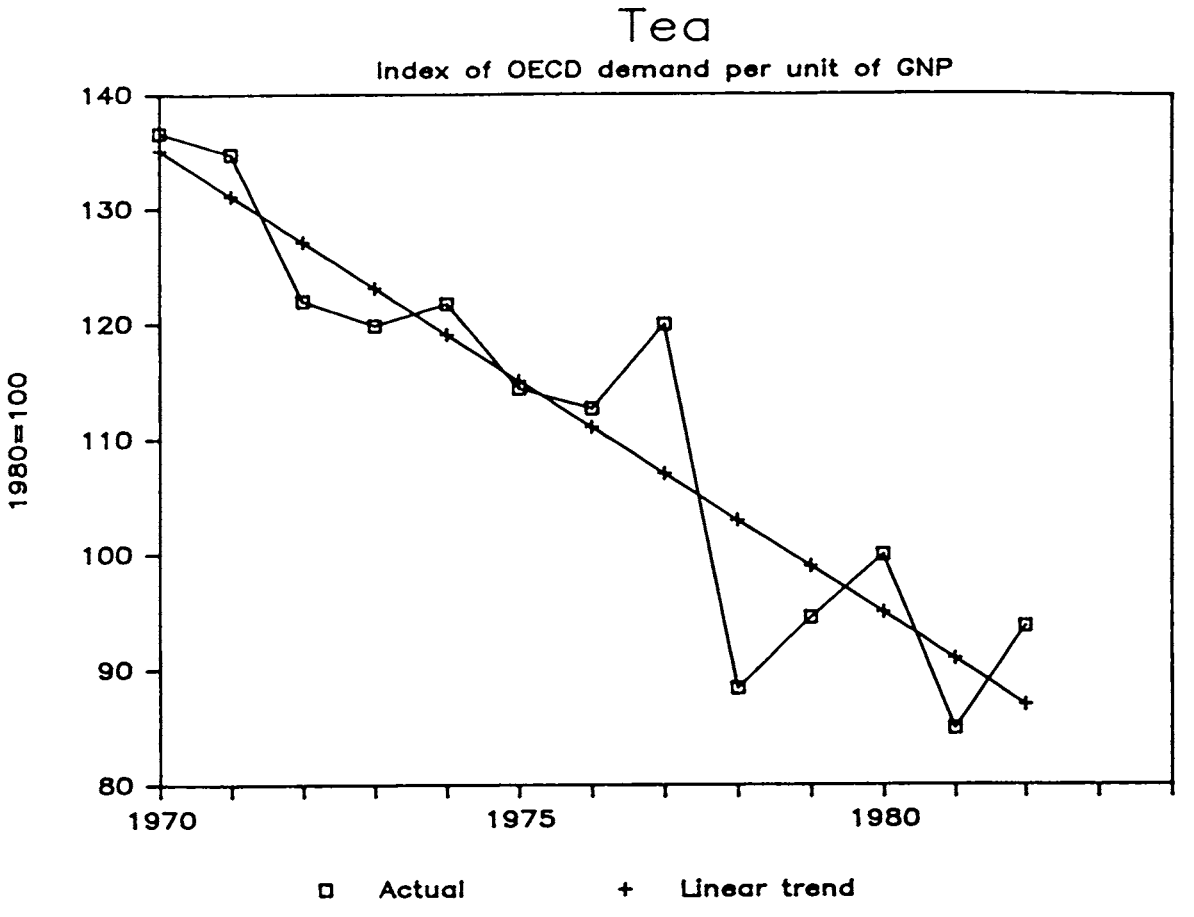
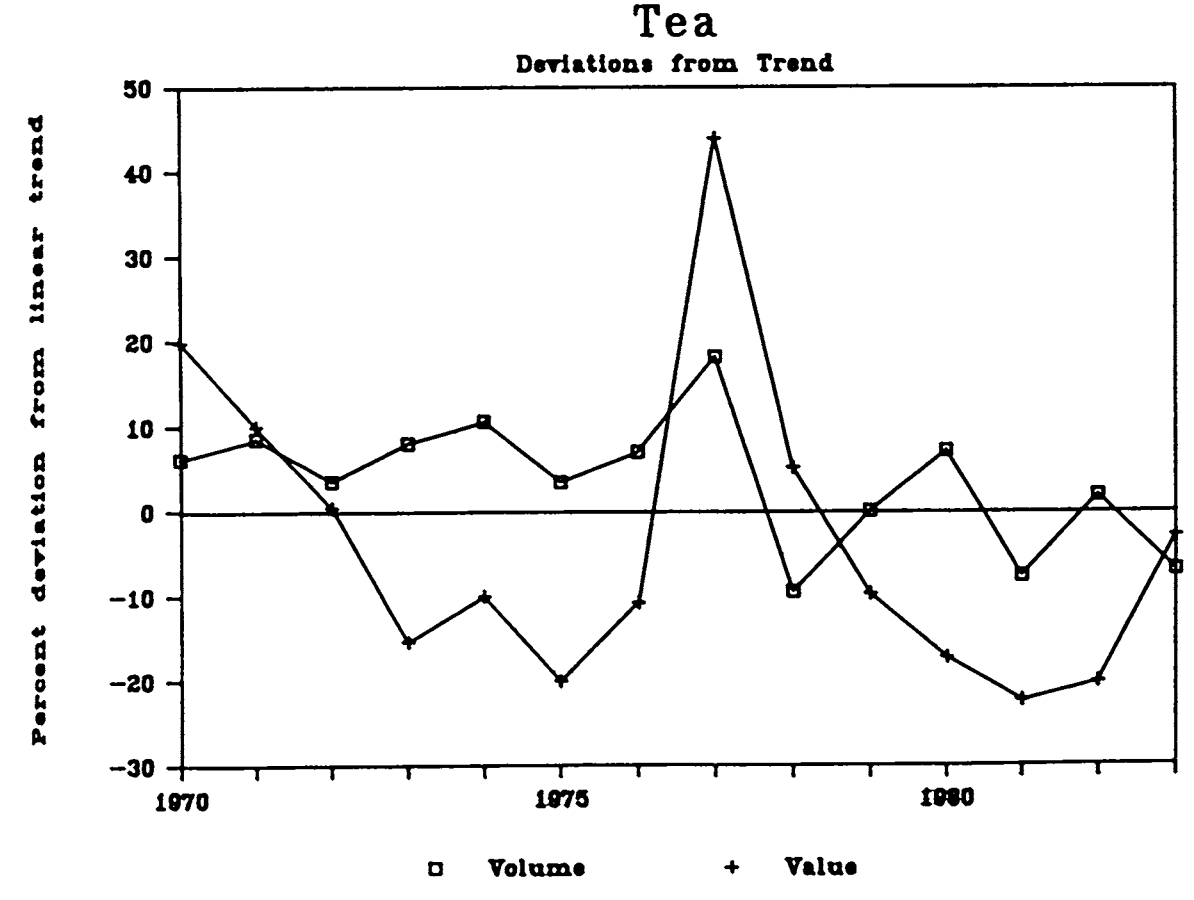


Diagram 30.



(g) Groundnuts

As with many other commodities, sharply adverse local currency effects predominated over the trend in world prices in recent years. However, a cautionary note must be sounded about the quality of the data on groundnut prices. The series below, derived from IMF sources, is lower in recent years than other sources: we have chosen to use it because it specifically refers to Nigerian groundnuts. However, at a time when the value of groundnut oil has risen from $585/tonne in 1982 to $1,017/tonne in 1984, the decline in the price of the raw material from $383/tonne to $350 seems hard to explain (meal prices, it is true, fell from $208 to $188 over this period, but this hardly suffices to explain the curious trend in groundnut prices). As crushing has moved from developed to developing countries, the product prices have become, except in the case of confectionery nuts, the more relevant measure.

Table 9: Real Groundnut Prices (1980 US $/tonne)

	World	Gambia	Malawi
1970	710.8	502.2	573.9
1971	740.2	544.2	582.1
1972	682.7	521.6	548.5
1973	873.5	890.8	820.7
1974	1324.5	1516.6	1379.4
1975	697.2	670.2	718.5
1976	675.7	454.9	710.8
1977	809.0	505.3	872.3
1978	826.9	589.6	865.9
1979	638.8	547.7	673.9
1980	485.6	485.6	485.6
1981	647.3	511.6	627.0
1982	412.5	245.2	416.1
1983	389.1	175.2	366.0
1984	400.6	105.6	NA

Source: Computed from IMF, I.F.S.

The volume Diagrams have been omitted, because it is not meaningful to look at trends in groundnut demand in isolation from the entire range of products in the world oils and fats economy. Adverse trends in meal prices, related more to agricultural policies in developed countries than to macro-economic or exchange rate developments, have influenced those oilseeds for which the meal is a major contributor to the product's value (notably soya), but meanwhile oil prices have soared, partly because of shifts in the supply of soya beans related to the developments in meal markets, and partly because of the rapid growth in oil demand in developing countries. The edible oil market has thus been one of the most attractive to producers in recent years, and it is safe to conclude that for producers of oil palm, coconut, groundnuts and other oilseeds whose value derives mainly from their oil content, recent macro-economic events in developed countries have not had an adverse effect on the volume of demand, or on prices.

Diagram 31.

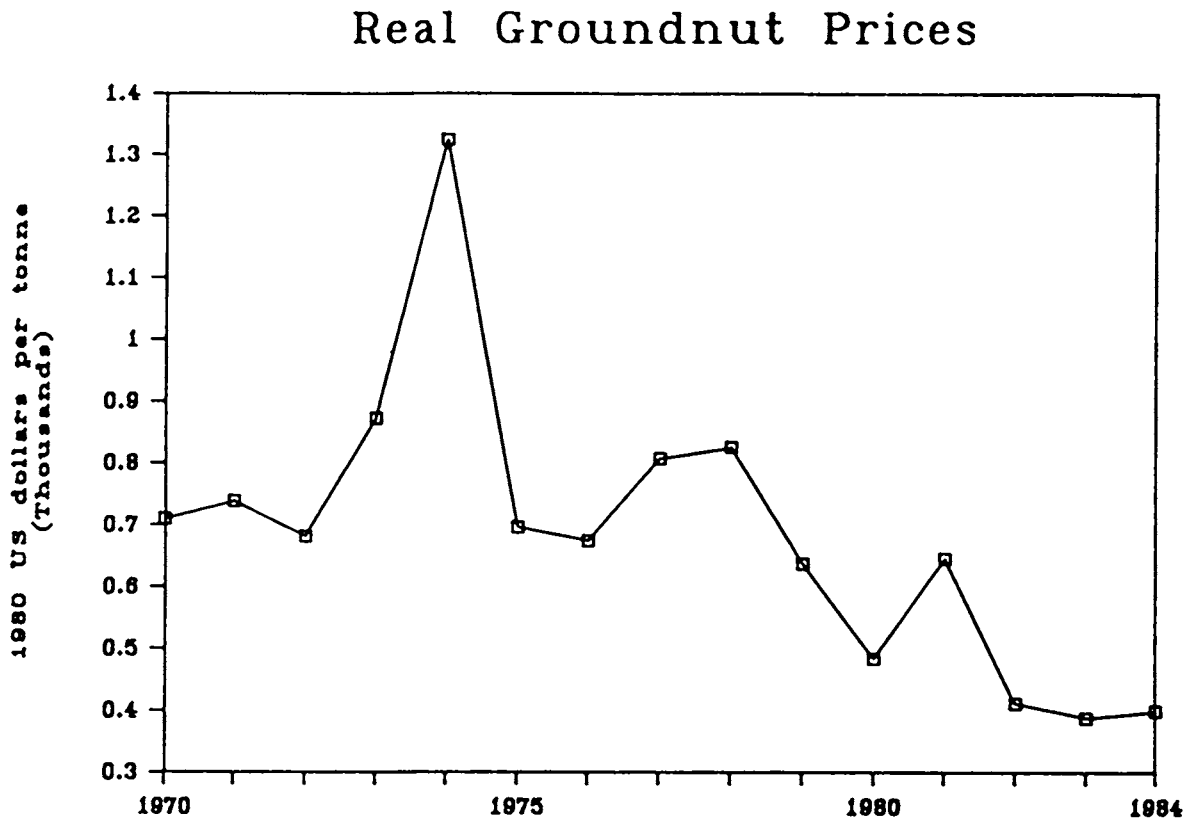
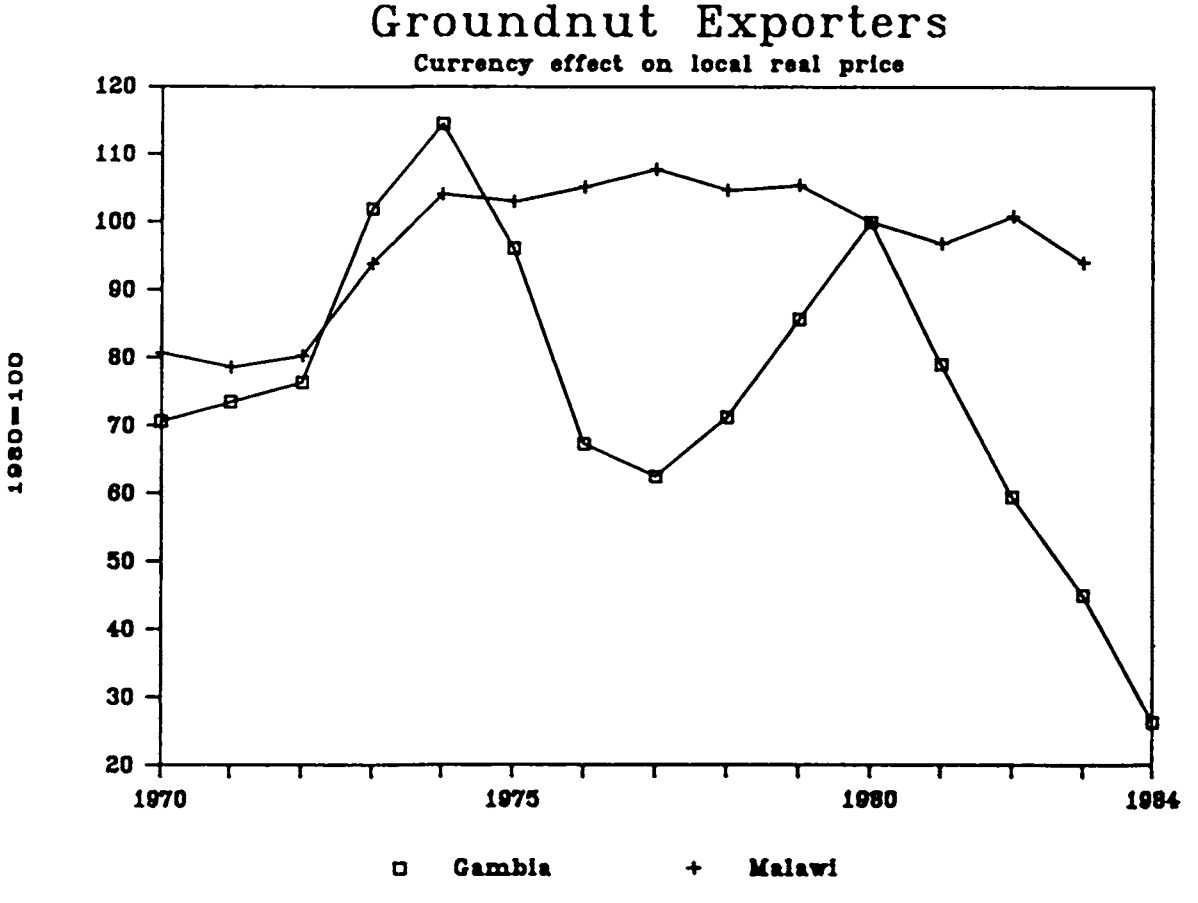


Diagram 32.



(h) Tobacco

Real tobacco prices have yet to regain the high levels reached in 1970, but if any subsequent year is taken as a base, their evolution has not been unfavourable. However, internal currency effects within one of the principal exporting countries in Africa, Zimbabwe, have been unfavourable to producers in recent years.

Table 10: Real Tobacco Prices (1980 US cents/lb)

	World	Malawi	Zimbabwe
1970	251.1	202.7	149.8
1971	216.8	170.5	132.9
1972	215.1	172.8	151.9
1973	186.5	175.2	173.5
1974	171.2	178.3	187.7
1975	167.1	172.2	188.2
1976	169.0	177.8	157.7
1977	170.2	183.6	154.9
1978	162.6	170.3	146.6
1979	152.9	161.3	134.2
1980	142.6	142.6	142.6
1981	166.9	161.6	132.4
1982	196.6	198.3	123.8
1983	206.6	194.3	76.6
1984	212.5	NA	51.8

Source: Computed from IMF, I.F.S.

The Diagram showing deviations from trends in OECD demand illustrates that demand was above trend in 1981 and 1982, but below trend in 1983. However, if we turn to the Diagram showing deviations in volume and price, it suggests that the reduction in apparent consumption in 1983 may have been due to changes on the supply side. Much of the deviation in apparent consumption may be due to changes in stocks held by tobacco processors in the developed countries. Both demand and supply have been comparatively stable throughout the period considered, and the major phenomenon, the downward trend in OECD consumption, is due principally to health concerns.

(i) Summary of Commodity Data

Two relatively straightforward conclusions emerge from this examination of the commodity data. Firstly, most African countries have experienced substantial real revaluations, which, other things being equal, would have served to render commodity exporting relatively less remunerative. There is thus no evidence that exchange rate changes served to depress prices by artificially boosting supply: rather the reverse. Secondly, the examination of demand and its relation to price fluctuations shows that, while for most commodities there is a strong adverse trend in the relationship between OECD demand and OECD macro-economic growth, there is no evidence that demand has been unusually depressed in recent years. Only in the case of copper and sugar do demand problems seem to be the primary reason for adverse price changes, and in both of these cases, the problem is one that has to do with long-run tendencies, rather than with the particular features of the recent years in which the dollar has been high.

Diagram 33.

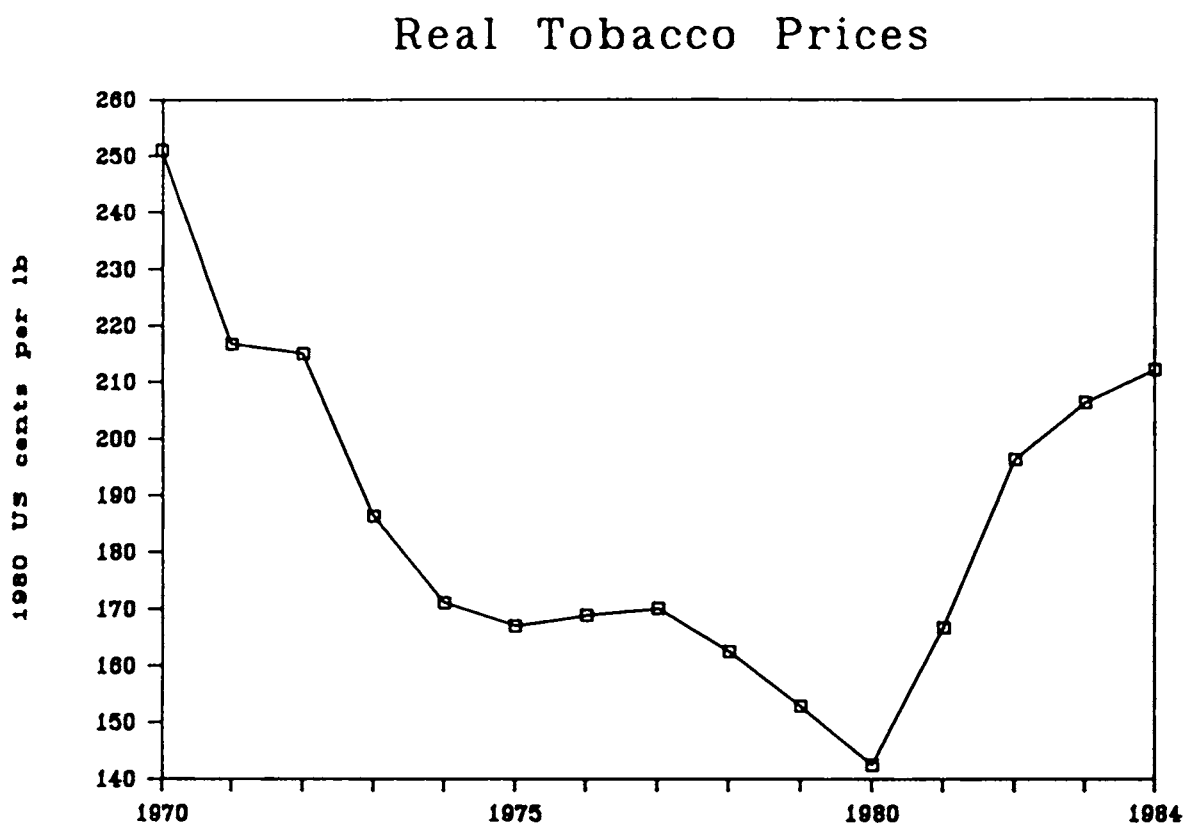


Diagram 34.

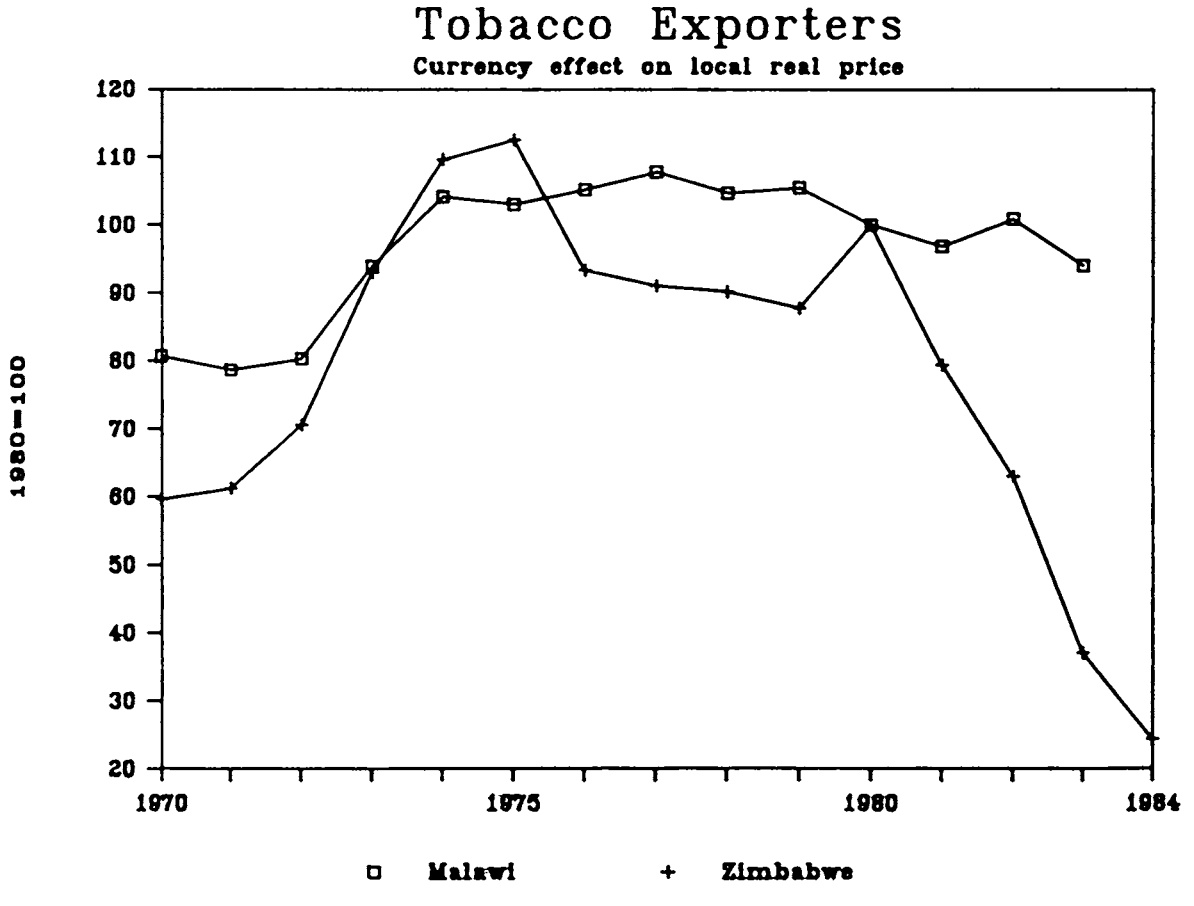


Diagram 35.

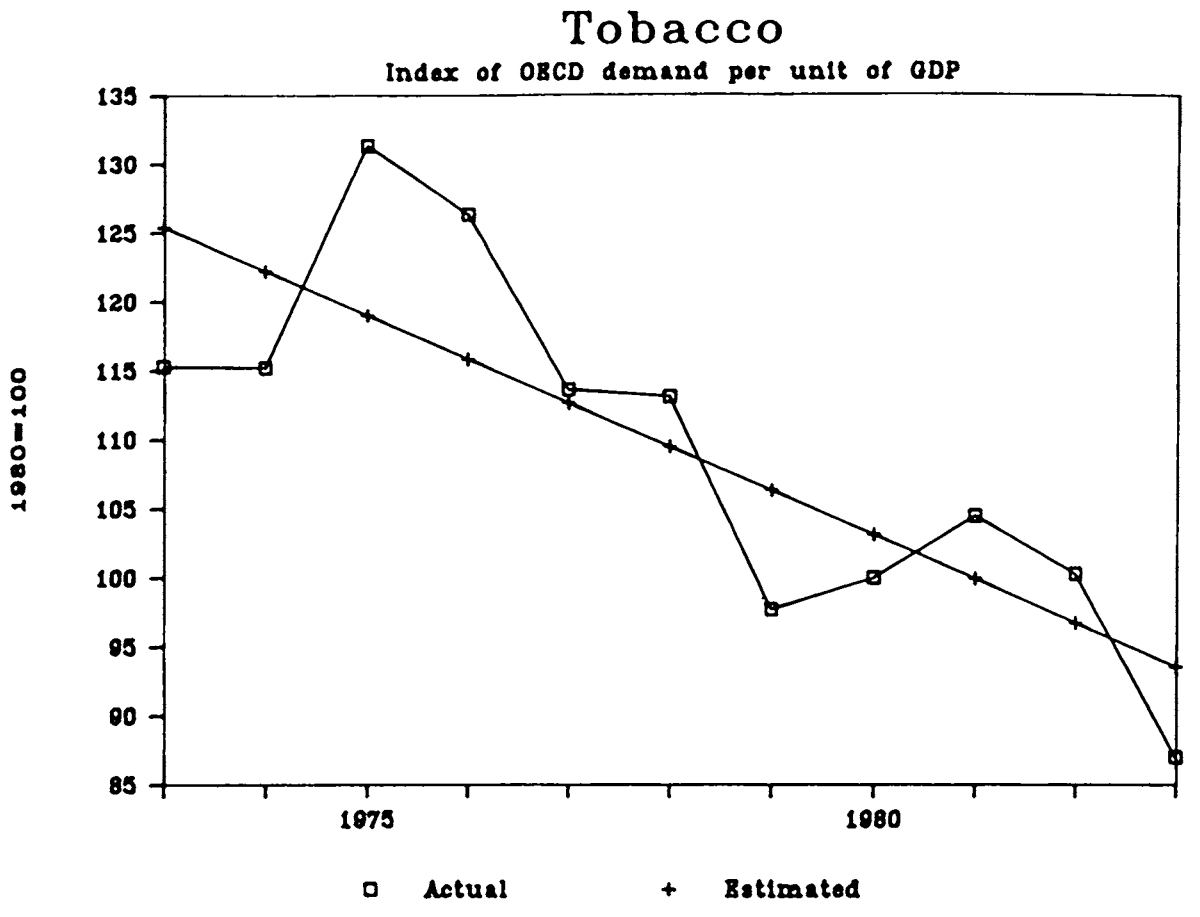
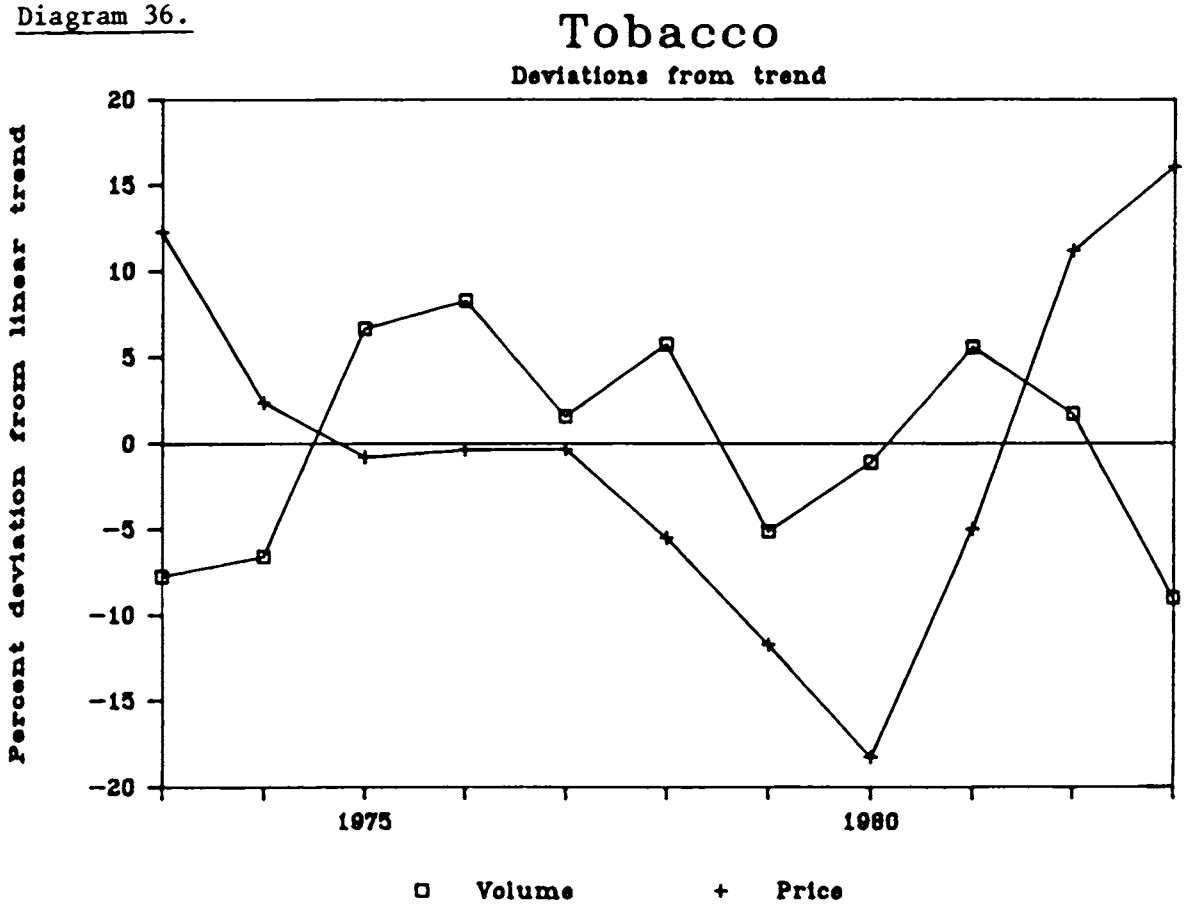


Diagram 36.



(iii) The effect of recent high real interest rates on commodity prices

In the previous discussion, three separate effects of recent US macro-economic policies were distinguished. Two of these (the high dollar and the trade deficit) affect commodity markets principally through their influence on the demand schedule. These influences have been analysed in the discussion of trends in physical volumes of demand.

The third effect *does* also affect the demand schedule in various ways, notably via its effects on the share of investment in GDP, which will influence the allocation of demand between commodities primarily used in the industrial sector (such as copper) and those associated with final consumption expenditure (such as the beverages). But in addition to this, interest rates also exercise a further effect which is probably more important. This effect operates via the *demand for stocks.*

The relation between stock levels and commodity prices lies at the heart of commodity markets. Since both supply and demand usually respond to price changes only after substantial time lags, the first effect of an emerging imbalance normally shows up in the volume of physical stocks (or, in the case of annual crops where crop surveillance permits accurate forecasting of harvests, in the anticipated volume of post-harvest stocks). For this reason, attempts to explain and forecast commodity price movements normally have at their centre a postulated inverse relationship between price and stocks.

However, this relationship will remain stable only if the demand for stocks remains stable. This demand for stocks can be de-composed into three elements: a *transactions* demand for stocks in the pipeline between producer and consumer, a *precautionary* demand to avoid disruption in the event of unexpected hiccups in supply, and a *speculative* demand emanating from those who believe that the price of the commodity is likely to rise by more than the cost of holding it. The developments of recent years, and particularly the surge in real interest rates which was shown in Diagram 6, will have had an impact on each of these motives for holding stocks: whatever the reason for which stocks are held, the cost of holding them depends critically on the rate of interest, which determines the opportunity cost of holding physical stocks rather than financial assets.

In the case of the transactions demand, a rise in interest rates will shift the demand curve in favour of those commodities with shorter marketing chains. In the case of competition between natural and synthetic commodities, tropical commodities such as sisal, jute, or natural rubber tend to have much longer marketing chains than their synthetic substitutes, which are normally produced very nearby to the location of the end-user (and frequently by the companies which are vertically integrated with the end-user). If interest rates rise, the preservation of a given price relationship at the end-user's factory gate will therefore imply a relative decline in the fob price received by the producer for the natural commodity. The same effect will be felt within the markets for natural commodities: those produced near at hand, in areas with rapid transport links, will suffer less than those produced in areas more remote from the end-user.

There has been a further powerful influence on the transactions demand for stocks in recent years. Stock management techniques are becoming continually more sophisticated, and the advent of low-cost computing power, coinciding with

the rise in interest rates, has provided a strong incentive towards the uptake of such techniques. Many American and European companies have seen Japanese methods of stock management (such as the famous "kanban" or just-in-time system developed in the Japanese auto industry) as a powerful contributor towards Japan's competitive success, and have made the adoption of such techniques an important part of their attempts to modernise management.

Turning to the precautionary element in the demand for stocks, the relationship with interest rates is fairly straightforward: precautionary stock management aims to hold stocks up to a level at which the expected loss from disruption of supplies (i.e. the actual cost of disruption multiplied by its probability) equals the cost of holding stocks. When this cost rises, precautionary demand falls.

The changes in the speculative demand for stocks have probably been more profound than in either of the two preceding cases. The Diagram presented above shows that in the period from 1970 to 1980, negative real interest rates were the norm in both the USA and the UK. Clearly this made investment in stocks of commodities (and in related instruments such as futures) an attractive alternative to financial assets: depending on the storage costs of the commodity, the investor would not necessarily require any rise in the real price for the holding of stocks to outperform the holding of financial assets. Moreover, in the period immediately after both oil price rises (in 1974 and 1980) inflationary expectations were given such a boost that commodities came to seem uniquely attractive havens from the uncertainties of paper assets. On both occasions a sudden swelling of speculative demand boosted commodity prices to levels which were quickly eroded by the recession which was the longer-term effect of the oil price rises.

During the subsequent period, the extraordinarily high levels of real interest rates that have been available have cut deeply into speculative demand for commodity stocks, by making speculative stockholding profitable only when prices rise very rapidly.

Providing quantitative evidence of these interest-rate effects on commodity prices is difficult because of the general paucity of reliable stock data, and the problem of removing other influences on prices. However, rubber provides a typical example, in which the existence of an effective international buffer stock provides a way of measuring the shift in the demand for stocks. Over the period since the buffer stock became active in 1981 up to the middle of 1985, nearly 300,000 tonnes of rubber were acquired, of which only about half corresponded to the actual excess of physical supply over demand during this period. The other half represented the mopping up by the buffer stock of rubber that had previously been held by commercial participants in the market, but which they were no longer willing to hold in current market conditions. (However, it is hard to determine how much of this mopping up of commercial stocks was due to high interest rates, and how much to the effect of any successful buffer stock on market expectations). Similarly, in the coffee market, the high cost of stockholding may have been one of the factors which have increased the competition among producers in selling to the non-quota market, thus widening further the divergence between prices in the two tiers of the market.

Thus in recent years any commodity market in which there has been a balance between the physical volumes of demand and supply could not expect to have experienced a constant real price. The conditions for the price to remain unchanged are that there should have been a shortfall of supply compared to

current demand, and that this shortfall should have been equal to the decline in the demand for stocks, for all of the reasons listed above.

Commodity producers can, however, take some comfort from the fact that this decline in the demand for stocks cannot be a long-term phenomenon. While improvements in transport networks and in stock management techniques can continue to push the transactions demand down, obviously it cannot become negative; while the changes in the other two components of demand for stocks can be rapidly reversed in response to changes in financial markets. Unfortunately for producers, in many markets the decline in commercial stocks has been offset by rises in officially held stocks (by commodity agreements or national authorities), which continue to overhang the market.

(iv) Repercussions of a strong dollar on the debt burden of developing countries

One of the most profound effects of the recent changes in both exchange rates and real interest rates has been to deal a double blow to countries with a high proportion of debt expressed in US dollars, and a high proportion at floating rates. Although Africa has felt this problem less forcibly than other regions, it has still been highly significant.

The Table below shows the proportion of sub-Saharan Africa's debt that is denominated in US dollars.

Table 11: Currency Composition of Debt in sub-Sahara Africa

	1975	1976	1977	1978	1979	1980	1981	1982	1983
Flexible rate									
US Dollar	93.4	93.7	90.5	90.7	78.3	71.2	73.8	73.8	80.0
Deutsche Mark	1.0	1.7	1.7	1.4	7.5	10.9	10.8	11.6	8.8
Other	5.6	4.6	7.8	7.9	14.2	17.9	15.4	14.6	11.2
Fixed rate									
US dollar	37.0	40.7	40.0	38.4	38.9	41.5	44.8	45.4	45.9
French franc	9.6	10.4	11.3	13.0	13.2	12.9	11.4	11.8	10.6
Other	53.4	48.9	48.7	48.6	47.9	45.6	43.8	42.8	43.5
Memo Item									
US dollar's share of total public debt	42.7	46.4	45.6	46.5	46.0	47.1	51.0	52.0	54.2
Debt service as percent of total exports	N.A.	7.1	N.A.	8.6	9.0	12.8	17.7	23.8	31.4

Source: I.B.R.D. World Debt Tables, 1985.
Note: The Debt service data refer specifically to low income Africa, the rest of the data to sub-Saharan Africa

Africa's 54% share of dollar debt to total debt in 1983 compares with 89% for Latin America and the Caribbean, and 68% for East Asia. As can be seen (from the fact that the US dollar' share in total debt is much closer to its share in fixed rate debt to that in floating rate debt), Africa also has a relatively small

share of total debt in floating rate form. The OECD publication "External Debt of Developing Countries" 1984, states that "many African low income countries have less than 25% of their debt denominated in dollars", but does not provide more detail.

However, if a smaller volume of debt is denominated in dollars than for other developing countries, it is also true that a relatively small share of Africa's export earning accrue in dollars. Of Africa's total exports of 43.3bn in 1983, only 6.2bn went to the USA. 44% went to industrialised countries other than the USA and Canada, and a further 6% was to other African countries. There are no data specifying the proportion invoiced in dollars; however, it has been shown above that, regardless of the currency in which exports are invoiced, the dollar price of commodities is likely to decline as a result of a rise in the international value of the dollar.

To what extent did the burden of dollar-denominated debt cancel out the modest rise in the index of African commodity prices in recent years? While that is a crucial question, it is a very hard one to answer with confidence. It will be helpful to distinguish between the purely currency-related effects on the volume of debt, and the effects of the rise in real interest rates, even though, as has been shown, these two phenomena actually have the same root cause.

Firstly, the rise in the dollar will have lowered the dollar value of the stock of debt outstanding (other things being equal). Thus if commodity prices in nominal dollar terms remain stable, the burden of debt repayment is eased, in the sense that a lower physical volume of commodity exports will be needed to meet debt service obligations. The first Diagram presented showed the evolution of dollar prices of African commodity exports. Taking 1980 as a base year, and restricting the discussion to currency effects on the burden of debt, it is probable that the fall in the real burden of the 46% of African debt not denominated in dollars was greater than the decline in dollar prices of commodities. However, it is likely that when the large swing in real interest rates is also brought into the discussion, the adverse effects on the debt burden have been greater than the decline in the dollar burden of non-dollar debt. Quantifying these conclusions would require, first, an agreement on which is a meaningful base year for comparison and second, considerably more data on the nature and composition of African debt than are currently available.

What can be said with certainty is that the rise in real interest rates, and the weakness of the upturn in commodity prices, have between them creamed off much of the benefits that commodity exporters would normally expect to derive from an upturn in activity in the industrialised countries such as has occurred from 1982 to 1984.

B. The Importance of IMF-sponsored Economic Policies

In preceding sections, we have seen the consequences for commodities of the rapid appreciation in the exchange rates of many African countries in the 1980s. The overvaluation of exchange rates, however, has consequences far beyond commodity production: it discourages exports, and, by lowering the prices of imports relative to non-tradeables, encourages imports of both intermediate and consumer goods rather than the use of local substitutes. The increased flow of imports will increase the demand for foreign exchange to unsustainable levels,

leading to the imposition of quantitative controls on imports and administrative allocation of foreign exchange. The lower cost of imports leads to increased demands for protection for import-competing industries, further harming efficient resource allocation. There are also important redistributive consequences: the beneficiaries of overvalued exchange rates are those who benefit from cheap imports, especially those who have protected markets for their goods but require imported inputs, and urban dwellers who consume imported food. Export industries suffer.

In conjunction with the economic difficulties faced by African nations as a result of the decline in their terms of trade since 1973 (caused by increased oil import expenditures and weak industrial-country markets for their exports) and the stagnation of inflows of private capital and official development assistance into the continent, overvaluation has led to serious balance of payments crises in many countries. These, in turn, have prompted many nations to seek assistance from the IMF in solving these crises: among African countries which have borrowed from the IMF in the 1980s are the Central African Republic, Equatorial Guinea, Ethiopia, Gabon, The Gambia, Ivory Cost, Kenya, Liberia, Malawi, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, Zaire and Zimbabwe. While the IMF does lend with a low degree of conditionality from its oil and compensatory financing facilities, large scale assistance is only available when an agreed programme of economic reform is implemented.

Economic adjustments required by the IMF have three principal features. In the first place, they aim to restrain domestic inflation by reducing budget deficits and limiting the growth of the money supply, measures which imply considerable austerity; second, major devaluations are required to correct the balance of payments imbalance; and third, a variety of measures are implemented to increase the openness and flexibility of the economy. Most of the controversy over IMF-imposed adjustment policies centres on the first two measures.

To a certain extent, difficulties faced by developing countries in implementing these policies are political: devaluation and austerity imply major reductions in income for certain sections of the population, and these sections, concentrated in urban areas, tend to be politically powerful. Nonetheless, there is concern that these policies are harmful to the economic development of poorer countries. This concern is expressed in four arguments about developing countries' economies:

first, that any attempt to change the real exchange rate will fail because of the inflationary consequences of nominal devaluations;

second, that production, and especially export production, is not elastic with respect to the export price (the "elasticity pessimism" argument);

third, that total imports are not elastic with respect to the exchange rate, so access to foreign exchange should be regulated by the government rather than the market;

and fourth, that a successful devaluation, which directs resources to exports, can only avoid triggering inflation if the reduction in domestic demand brought about by other policy measures is extremely severe.

The empirical evidence on all these propositions is not unambiguous. The evidence shown above makes it abundantly clear that massive real *re*valuations are not only possible, but have occurred in the recent past in many African

countries, though by no means in all. This lead to some presupposition that real *de*valuations must also be possible. The third argument, of those put forward for the inefficacy of nominal devaluations, is perhaps the weakest. In many African countries, demand for imports at official exchange rates has exceeded available foreign exchange, and rationing procedures have been implemented. Given the difficulties in establishing criteria for allocation, in predicting available exchange and in obtaining skilled personnel to evaluate applications, however, the result has been the creation of substantial black markets in currency and the direction of economic activity into black market manipulation. While the allocation of foreign exchange by a market may well produce an outcome which is not socially optimal (because of monopolies, externalities and inequalities in income), recent experience with rationing systems does not indicate that they have been successful, although there has been no attempt to examine this experience in great detail. Also, it is true that developing countries' demands for imports are affected by the level of domestic economic activity, but the price and availability of foreign exchange must affect the choices made about the relative attractiveness of imports and import substitutes.

In the case of the first proposition, there is a substantial body of economic opinion which holds that the real exchange rate cannot be altered. The fear has frequently been expressed that nominal devaluations, and the consequent increase in domestic prices of imported goods can precipitate demands for increases in money wages which, if granted, lead into an inflationary wage-price spiral, eroding the benefits of the devaluation. This body of opinion, however, is largely theoretical, and what empirical evidence is available suggests that real exchange rates can be changed, although for small, open economies and for developing countries, the change in the real rate is much smaller than the change in the nominal rate. (Killick et al.) The evidence also suggests that nominal devaluations can be more successful if accompanied by a wide range of other economic policies designed to improve economic performance. Nonetheless, there are countries, the particular features of whose economies are such that devaluation, if unaccompanied by other measures, will produce no change in the real exchange rate. Moreover, the short term inflationary consequences, even in countries where the policy can produce long term benefits, can be severe, and can lead to serious political problems since a real devaluation will redistribute income to farmers and exporters from government workers and importers.

This, of course, is closely related to the fourth argument. If a devaluation is successful in directing resources into exports, the volume of production available to satisfy domestic demands is reduced. Unless domestic demand is itself lowered by fiscal and monetary measures, the excess of demand over available supply will intensify inflationary pressures in the economy. This has been happening in recent years in Brazil and Argentina. The consequences for certain sectors of the economy, and hence the general political consequences, of austerity programmes can be severe.

Perhaps the greatest controversy, however, is over the second proposition, that the elasticity of export supply is very low. A real depreciation in the exchange rate will push up the prices of export goods and import substitutes relative to the prices of non-traded goods (such as local goods and services and land.) The issue at stake is whether such a shift in relative prices affects the volume of production for export.

There is abundant evidence that, for developing countries *as a whole*, and for their exports *as a whole*, exchange rate changes do affect the volume of exports

and, in cases where the exchange rate does not change equally against the currencies of all trading partners, the pattern of distribution of exports also changes. (See Bautista and Tecson, Bautista (1977) and Bautista (1981).) This evidence, however, is not especially relevant in the present context, since the greatest response to exchange rate changes is shown by exports of manufactured goods from non-African countries. The evidence about the supply elasticity of African commodity exports is ambiguous. Since many commodity exports are the products of perennial crops, one would expect the short term output response to be small. The empirical evidence for nine commodities and ten countries is reviewed by Bond, who concludes that short-run, own price elasticities are positive but not large, that long-run own price elasticities are larger than those in the short-run, and that aggregate agricultural supply is elastic with respect to overall producer prices. Specific estimates of the elasticity of aggregate agricultural supply range from .07 in the case of Uganda to 0.34 for Ghana. (Of course, to the extent that marketing boards or other factors ensure that a change in world prices is not reflected in a change in producer prices, the impact of exchange rate changes is lessened, but we shall return to these institutional factors later.)

Conversely, in a detailed study of the Sudan, which over the period 1978-80 introduced a major economic adjustment package, including a large devaluation, with the collaboration of the IMF, Hussain and Thirlwall found that the elasticities of supply of Sudan's main exports (cotton, gum arabic, groundnuts and sesame) were very low; moreover, because Sudan is not a price taker in world markets for these exports, (and therefore demand facing Sudanese exports is not perfectly elastic) the effect of devaluation was, in part, to lower the foreign currency price of exports, and not simply to raise their domestic price. They also found that, since the demand for imports was very inelastic in the short run, and that devaluation led to increases in money wages, both labour and intermediate input costs were pushed up by the currency changes. Their conclusion is that the overall effect of devaluation on the profitability of exporting was neutral.

Clearly, the specific circumstances of the Sudan may not be relevant throughout sub-Saharan Africa. Nonetheless, it is worth stressing that this is an empirical, not a theoretical issue: that is to say that the impact of a devaluation on primary commodity exporting depends on the particular relevant elasticities, and the empirical evidence about those elasticities in Africa is not very encouraging. Nonetheless, elasticities are estimated on the basis of past producer behaviour often in unfavourable circumstances: and a crucial part of IMF-sponsored adjustment programmes has been a range of measures designed to improve the flexibility and price responsiveness of agriculture. If successful, these measures would change the supply elasticities. Since the growth rate of world exports of no commodity produced in and exported from Africa is, on World Bank projections, expected to exceed 3% per annum in the next ten years, African exporters anxious to raise their export earnings will increasingly find that such rises will only be possible if they displace other exporters in markets which, overall, will be growing very slowly. To do this, they will need highly competitive primary producers; real devaluations coupled with measures to improve the performance of agriculture will be an essential component in a strategy designed to achieve this.

Moreover, the impact of a real devaluation is on the entire export and import substitution sectors of the economy, not simply on agricultural exporters. To the extent that African manufacturing industry suffers from low capacity utilisation,

it is possible that industrial production would have a larger elasticity than agricultural production. Certainly, the impact of devaluation ought to be assessed in terms of the economy as a whole, not simply in terms of the agricultural exporters.

IV. A Review of the Adjustment Process in Exporting Nations

A. The Development of New Patterns of Trade

(i) Countertrade

Countertrade encompasses many forms of compensatory trade, ranging from pure barter, in which only goods are exchanged, usually at the same time, to various types of offset agreements, whereby part of the value of one transaction is offset against another, and in which one transaction may take place at a different time from the other. The principal types of trade which are encompassed by the term are the following:

a) Counterpurchase, whereby imports are accepted on the understanding that the trading partner will receive exports over a specified period of time;

b) Offset, whereby the importer produces some of the components which will be used in the final product;

c) Barter, which has featured in some government to government deals, for example the exchange of New Zealand lamb for Iranian oil;

d) Buy back, in which one partner provides equipment or complete facilities, and is paid in the product of the equipment;

e) Bilateral agreements which are favoured by Eastern bloc countries and which call for trade between the signatories to balance over a specified period of years;

f) Switch trading, in which a large number of intermediaries are involved in complex arrangements covering trade credits, debts and a range of products.

There is nothing new about countertrade: pure barter is, obviously, very old, and more sophisticated forms of countertrade have long been used in trade with East Europe, the USSR and the People's Republic of China. Recent interest in countertrade, however, springs from the increased, and more heavily publicised, involvement of developing countries. Also contributing to the greater level of awareness of the phenomenon has been the stance of international organisations: in an apparent attempt to thwart the growth of countertrading, the IMF, the GATT and the OECD have all condemned it as a breach of free, multi-lateral trading principles, as delaying needed economic adjustments in developing countries and as more costly than conventional trade. Nonetheless, there seems little doubt that the practice is growing, and banks and both trading and manufacturing companies are developing expertise, and specialist divisions, in countertrade. In this section, we attempt to assess the importance of countertrade, and its costs and benefits. As we shall see, African commonwealth countries have not been heavily involved in the recent growth in countertrade: has their caution been justified, or ought they to be developing skills in this area?

There are few published data on countertrade, and estimates of its importance vary up to 30% of world trade. Since, in recent years, the value of world trade has been about $2,000 billion per year, this would imply that countertrade transactions, if they are as much as 30% of trade, are worth $600 billion. A

conservative estimate of the value of world countertrade would be at least 10% of world trade, or $200 billion. More important than the total value of this type of trade, however, is the fact that individual transactions are typically for very large sums, partly because the costs of arranging them are quite large. One source (EIU, 1984) suggests that transactions costs on a $10 million countertrade deal are $300,000. These costs arise because very few transactions are pure barter; typically, modern countertrade involves an international trading company or a specialist division of a manufacturer as well as the importer and exporter, and these participants demand a return on the activities.

Countertrade appears to be geographically rather concentrated. Table 12 below presents some statistics on the trade partners in over 250 countertrade transactions between 1977 and 1983. This is not comprehensive, in that the analysis is based on reported countertrade transactions, and many transactions are never reported; but it represents the most comprehensive data set available and, if it is representative, it indicates that countertrade deals between the OECD and Asian countries are by far the most important. One other interesting feature of the data, however, is that intra-Asian deals are also numerous, and comprise the only major intra-developing country countertrade flows. (Although intra-Latin American countertrade is probably understated.)

Table 12: Partner Countries in Developing Country Countertrade Deals, 1977 - 1983

	Partner Countries:					
	OECD	East Bloc	Middle East	Latin America & Caribbean	Asia	Africa
	(number of transactions)					
Africa	10	2	1	6	3	2
Asia	91	22	5	7	36	
L.A. & Carib.	33	20	6	9		
Mid East	9					
Total	143	44	12	22	39	2

Source: EIU, 1984

The product/country composition of countertrade can also be examined, using the same data set. In Table 13, we list the important developing countries, and the products they exported, in the 143 cases of developing country-OECD trade reported in Table 12.

Table 13: Commodity/Country Composition of Developing Country Countertrade Deals with the OECD, 1977 - 1983

Commodity	No of transactions	Major Countries
Oil	14	Iran, Libya, Qatar, Peru Iraq, Algeria, Mexico
Rubber	11	Indonesia
Bauxite/Alumina	12	Jamaica, Brazil, India Indonesia
Textiles	14	China, Indonesia, Sudan Mexico, Tunisia
Fish & Products	9	Indonesia, Ecuador
Coffee	7	Indonesia, Costa Rica Ecuador
Other Agricultural Commodities	19	Uruguay, Indonesia, Ecuador
Other Primary Commodities	35	Indonesia, Brazil
Manufactures	12	Brazil, China, Mexico

Note: Manufactures excludes textiles. 51 of 193 commodities in the 143 transactions were not specified.

Source: EIU, 1984

While it is important not to attach too much weight to these data, a number of conclusions are suggested. First, a small number of countries account for a very large part of the world's countertrade: indeed, Indonesia alone accounts for over half of the transactions in this data set. Second, primary commodities account for a large part of developing countries' exports in these transactions. (The data set also includes information on the products supplies by OECD countries in the offsetting transactions, and these products are overwhelmingly manufactures.) Third, very few African Commonwealth countries have been involved. Ghana has countertraded timber for a US atomic reactor in a well-publicised deal, but other countries, apart from Nigeria, have had little involvement (as far as one can tell.) Nigeria has very recently begun a major countertrade programme, swapping oil for manufactures with a range of countries, including Brazil, Austria, Italy and France.

There are three reasons why developing countries have become involved in countertrade, of which by far the most important is the severe foreign exchange shortages they are experiencing. In general terms, when real interest rates are

high, there is a large opportunity cost associated with keeping the cash balances necessary to finance conventional trade; and in many developing countries financial circumstances are such that foreign currency is simply not available. A country which has exhausted its reserves of foreign currency and which is unable to obtain conventional import financing, may offer a Western company the opportunity to export local products to obtain the foreign currency which pays for needed imports. One important additional advantage to the developing country in cases like this is that the foreign exchange earned through a countertrade deal can be applied directly to purchase imports, whereas currency earned in a conventional way becomes available for repayments to the IMF or private bank and non-bank creditors. (This is an important reason why the IMF has adopted such a public, hostile stance on countertrade.) This type of arrangement also allows developing countries to unblock debts to developed country exporters.

A second factor in stimulating countertrade is that the responsibility for marketing developing country exports is shifted from the country and its exporters to the trade partner, or the international trading company, involved in the countertrade deal. This opens up the possibility that new markets can be found for developing country exports, or market share increased in existing markets. This transferring of marketing responsibilities is attractive whenever the producer is risk-averse or lacks marketing expertise. Closely related to this type of motive is the desire to increase commodity export earnings in cases where commodity markets are under a form of self-regulation. Oil exporters, for example, have used countertrade to sell oil at prices below OPEC levels, and coffee exporters have used countertrade to export coffee outside the quotas established by the International Coffee Agreement. The lack of transparency of countertrade transactions means that prices and volumes can be concealed, at least to some extent.

Third, a number of developing countries have used countertrade to finance joint ventures: China, for example, has encouraged foreign investment in its mining industry by paying investors in the coal produced from the mines opened up by the investment, and Uruguay has established a frozen vegetable plant by paying for overseas technical help in the product of the factory. In this type of transaction, countertrade ensures that foreign investment and involvement with a project does not end when the factory opens, in addition to providing a guaranteed market for the product.

Corporations in developed countries have increased their involvement with countertrade, but for the most part this is because their trading partners have insisted on this form of trade. While banks and trading companies have entered this area as intermediaries because they see opportunities for profit, manufacturers' involvement is usually to maintain a presence in an established market or to obtain a market share in a new market.

Do these reasons constitute a good case for engaging in countertrade? The argument which is usually advanced against countertrade is based on the prices which are likely to be realised in countertrade transactions. The evidence suggests that most developing country exports under countertrade are bulk commodities, for which international markets exist. Exporting them as countertrade is likely simply to yield lower real prices, since the higher transactions costs must be met, and displace existing sales. Some countries, recognising this risk, have attempted to insist that countertraded commodities be "additional" to existing sales, or are exported to new markets, but this

requirement is frequently impossible to enforce, given the number of intermediaries in most countertrade transactions. Secondly, the same pressures which may depress export prices may inflate import prices; and, since the goods developing countries import under countertrade deals are usually manufactures, for which no clear international prices exist, the scope for price manipulation to cover the costs and risks of countertrading is greater. It is not surprising, in these circumstances, that most proposed countertrade deals collapse during negotiation under the burden of establishing fair prices.

Clearly, therefore, countertrade has the potential to damage developing countries through the undervaluation of exports and overvaluation of imports. The argument in favour of countertrade is, therefore, to be found in terms of the quantities traded, not the prices at which trade takes place. Hence the requirement, mentioned above, of "additionality". For individual countries, it is possible that countertrade will boost overall trade; and for developing countries with heavy import commitments arising from long term development plans, their concern is more with maintaining or increasing the physical flow of imports than with specific prices. Countertrade may well lower prices of exports; it may, however, increase total revenues, or increase the effective flow of imports. For countries faced with severe shortages of foreign exchange, this effect will outweigh the consequences of poorer realised prices on particular countertrade transactions.

It is, therefore, hard to assess the merits of countertrade in the abstract. There are circumstances where the price effect is probably more important, and so the transaction is not in the interest of the developing country exporter. Equally, there are circumstances where the revenue effect allows trade to be continued at a higher level than would otherwise be possible. This suggests that a good deal of care is needed in designing countertrade packages to minimise the possibility that bad consequences will result.

The difficulty of establishing that the implicit prices in countertrade transactions are fair prices is also present in bilateral trade deals and long term contracts (if they include price provisions, which many do not.) These arrangements are often negotiated on a government-to-government basis. Some developing country exporters have attempted to fix pre-determined prices in anticipation of a price fall, an attempt which has been particularly marked in the case of sugar. This is, perhaps, not surprising since sugar displays an extremely high degree of price volatility. These long term agreements achieve greater and lesser degrees of popularity: Producers have the greatest enthusiasm for long term contracts at pre-determined prices when free-market prices are depressed below long term levels, and the least enthusiasm for them when free-market prices are above long term levels. This makes it difficult to agree with consumers on a price close to long-term trend values.

A more serious difficulty with long-term contracts between sovereign countries is that they are unenforceable. With long-term, fixed-price contracts, there is enormous pressure on exporters to break the agreement when prices are high, and on importers to break the agreement when prices are low. (Even international commodity agreements suffer the loss of members when prices are unfavourable: Hungary and Israel left the International Coffee Agreement when it became apparent they could meet their coffee requirements more cheaply outside the agreement.) With conventional contracts between traders, arbitration or other legal remedies exist when one party defaults, but when government-to-government agreements are broken (as they have been, in the case of the US-China grain agreement, and Indonesia's contracted sugar imports) there are no sanctions available. What has happened in the past is that the injured party has

simply ignored the breach, in the hope of retaining some share of the market and agreeing to re-price the contract. In the event that re-pricing takes place, of course, the entire rationale for long-term agreements is eroded.

(ii) Attempts to Renew and Extend International Commodity Agreements

International Commodity Agreements comprise both those with price provisions (such as a target price or price range together with measures to be taken to maintain the range), and those with more limited objectives in the field of exchange of information, co-ordination of research, and so on. For present purposes, those commodity agreements without price provisions are not relevant; however, in the case of those that do incorporate such provisions, the host of problems that were raised by the rise of the dollar's international value were among its most prominent effects on commodity markets.

The second half of the 1970's saw a flurry of international activity, in the wake of UNCTAD IV, to attempt to increase the range of international measures relating to developing country exports of commodities. Chief among these measures were international commodity agreements. However, the achievements reached were modest. Prior to this period, international commodity agreements with price provisions existed for cocoa, coffee, sugar and tin. Only one commodity, rubber, was added to this list as a result of negotiations under the Integrated Commodity Programme.

The incorporation of price provisions into an international agreement clearly requires a unit in which the price provisions will be expressed. The prominence of the dollar made it an obvious choice, and three of the five commodity agreements, those for cocoa, coffee and (when its agreement had price provisions) sugar, denominate their price objectives in terms of US dollars. Of the other two, the price provisions of the tin agreement are denominated in Malaysian ringgits, while those of the rubber agreement are denominated in a mixture of Malaysian ringgits and Singapore dollars. However, both these two currencies have in effect been closely tied to the US dollar during its recent upheavals. The Malaysian ringgit's exchange rate was US$2.212 at the beginning of 1981, as the dollar's rise was beginning, and so far the monthly average has never fallen more than 9% below this level (while, for example, the Deutsche Mark rate fell by a maximum of 53% over the same period). The Singapore dollar fluctuated still less against the US dollar. Their linkage to the US dollar can also be shown by the fact that the standard deviation of their exchange rates against the dollar is much less than the standard deviation vis-a-vis the SDR.

Thus all of the commodity agreements with price ranges were directly or indirectly linked to the US dollar. Clearly, at a time when the dollar was fluctuating, any attempt to maintain a price range denominated in dollars imposed additional burdens on the Agreements. During periods of excess supply, the floor price that was being defended was set much higher, in terms of its purchasing power against a representative bundle of internationally traded goods, than had been anticipated at the time the Agreement was drawn up.

In all of these commodity agreements, the defence of the floor price posed the greatest problems during the period of the dollar's strength. In the case of *sugar*, the other weaknesses of the Agreement, notably the lack of effective disciplines on the growth of EEC exports and the inadequacy of the stock and export quota

provisions, were such that it is most probable that the Agreement would have been ineffective in maintaining the price within the range even if the dollar had not become over-valued. Thus, it can be argued that deep-seated structural imbalances lay at the root of the failure to renew the economic (price-supporting) provisions of the International Sugar Agreement at the end of 1984. But in the case of the other commodities, dollar-related problems were very much to the forefront.

In the case of *coffee*, the floor price was effectively defended, but European consumers, who saw supplies being restricted at a time when prices in their currencies were at relatively high levels by historical standards, were embittered, and their resentment may endanger the future viability of the Agreement. In the event, only two consumers actually left the Agreement (Hungary and Israel), but the strong incentive to quit that emerged may be remembered by many consumers when the Agreement is re-negotiated.

The coffee Agreement is based on quotas restricting supplies to importing member countries, while exports to non-Members are not restricted. Inherent in it, therefore, is the potential for a two-tier market at times of excess supply. The disparity between quota and non-quota prices was certainly increased as a result of the raising of the real value of the Agreement's price range: this held back demand in quota areas, at the same time as it stimulated supply. The depression of non-quota coffee prices that resulted from oversupply, as well as the combination of a dollar-denominated price range and a high exchange value of the dollar, was thus particularly onerous to those countries with a high proportion of non-quota exports (Indonesia being the most striking example).

The *cocoa* Agreement differs from the coffee Agreement in two important respects: the USA is not a member, and, instead of operating by export quotas, it defends its price range by means of a buffer stock. The importance of the USA is also much smaller in the world cocoa economy than in the case of coffee: while the USA accounted for 21% of world coffee consumption in 1984, it accounted for only 12.5% of world cocoa consumption. Moreover, a much higher proportion of world coffee production derives from countries for whom the US is a major trading partner: Latin America accounts for two thirds of world coffee production, and only one third of world cocoa production. Thus the use of the dollar as a numeraire has much less justification in the cocoa Agreement than in the coffee Agreement.

Comparing the experience of the cocoa and coffee Agreements, it will be recalled from the theoretical discussion that the local-currency price effect of a change in the dollar exchange rate is expected to be greater for those commodities in which the USA is more important. The stimulus given to coffee supply, for this reason, may have been greater, and added further to the pressure on prices in non-quota markets.

Two years of ample cocoa supply, in 1981 and 1982, coincided with the period in which the dollar's value was rising, and the result was straightforward: very quickly the resources of the buffer stock proved inadequate to defend a price range that was rising in terms of the local currencies both of the principal exporting and importing countries. When prices came back within the range, this was not due to further support measures within the context of the Agreement, but to exogenous developments affecting supply. In the case of coffee, the strong dollar arguably raised the revenues of member countries from their coffee exports, but in the case of cocoa neither producers nor consumers are content

with the effect of currency fluctuations on the Agreement. Producers see the rise in the dollar as having been one of the reasons why the Agreement's sole price support mechanism was rendered ineffective at an early stage, while consumers resisted appeals for further resources for the buffer stock on the grounds that the prices they were paying were well above those contracted for when the Agreement started.

Similar strains arose in the *tin* and *rubber* Agreements. (The USA is a member of the latter Agreement, but not of the former). Both had a greater degree of success than the cocoa Agreement in defending the floor price of the range. Rubber is unique among those commodities having an Agreement in that, for a brief period, a rise in demand pushed the price to the top of the range, so that it looked for a time as though sales would be made from the Buffer Stock: but in the event this did not occur, and at the time of writing the price has slumped back to a level at which further support buying is being undertaken by a buffer stock that has now accumulated more than half of its maximum permissible volume.

The experience of this period serves to reinforce a message that had become clear, for other reasons, in the previous decade. In the 1970's, rapid inflation in the dollar had put strains of a quite different kind on commodity Agreements. At that time, the problem that was posed by the use of the dollar as a numeraire was as follows: since the price range that is negotiated is normally valid for a pre-determined period, in a time of inflation producers will anticipate the real value of the price range at the end of the period, and will argue for a price range that meets their objectives even after allowance has been made for the effects of inflation. Consumers, however, may find such a price range unacceptable in the immediate future, even though they may feel that it will have been eroded to an acceptable level by the end of the period of its validity.

This is the same problem as the problem posed for commodity Agreements by the soaring dollar, but in another guise. In both cases, the moral is clear: commodity Agreements have enough difficulty in anticipating and devising measures to cope with the physical fluctuations in the volume of supply and demand of the commodity. They should not also have to deal with the additional problem of anticipating and dealing with purely monetary phenomena.

This may sound like a plea for an unattainable goal: a constant and universally applicable measure of value. However, there are practical steps that can be taken in the context of commodity Agreements to move closer to this ideal, even if it cannot be fully reached. The step that has been most widely canvassed is the use of the SDR as a unit of value, rather than the dollar, in commodity Agreements.

The SDR is a basket of currencies with weights assigned to them, roughly in proportion to their importance in financing world trade. As such, it has the advantage of being less subject than any individual currency to fluctuations that may result from internal policy changes within a single country. It falls short of the ideal, however, in two important respects. In a period of rapid inflation among many major economies, such as occurred in the latter half of the 1970's, the SDR will not preserve its purchasing power: it will lose purchasing power as a weighted average of the rates of inflation of the currencies composing the basket.

Secondly, there is no guarantee that the set of weights used for calculating the SDR is the appropriate set of weights for a particular commodity agreement. As pointed out in contrasting the coffee and cocoa agreements, the importance of the currencies used to denominate the price range should reflect the pattern of trade in the commodity, and the pattern of imports of the countries exporting the commodity.

However, to overcome these shortcomings would require the use of artificially constructed hypothetical currencies. One could even advocate that instead of using currencies at all, the price be denominated in relation to an agreed basket of physical goods reflecting the characteristics of the commodity (in particular its substitutes) and of the countries that export it. This would lead even further away from a readily understandable and instantly recognisable measure of value. Even the SDR, despite its increasing use, suffers from the fact that it is poorly understood and lacks the markets that exist for the major currencies, in which futures and forward transactions can be made.

Notwithstanding these shortcomings, the use of the SDR in commodity Agreements would certainly lessen the pressures imposed on them by currency instability. In present circumstances, its use should be advocated by members of commodity agreements. In the event that the decline of the dollar gives rise to even greater turmoil in currency markets than did its rise, consideration could be given to some of the more radical suggestions made above about denominating price ranges, but in the present climate the complication they would cause is probably not justified by the benefits they would bring.

In addition to the International Commodity Agreements in the proper sense of the word (implying membership by both producing and consuming countries), the problems faced by OPEC, a producer-only organisation, also deserve mention. The OPEC marker price, which, like the International Coffee Agreement, its members attempt to defend by a set of export quotas, has been denominated in dollars, and has come under severe pressure during the period in which the dollar has been high (more recently, during 1985, the price has at last begun to slip even when denominated in other currencies). In part this pressure represents the lagged effect of adjustments made on the supply and demand side, in non-OPEC countries, in response to the 1979 oil price increases. However, here too the use of the dollar undoubtedly added to the difficulties of maintaining the price. OPEC's problems show up with particular clarity a difficulty which has beset other commodity agreements to a lesser degree: the problem of *market confidence*. Expressed in, for example, Deutsche Marks, prices of crude oil have been on a rising trend throughout this period, (though there have been signs of pressure since the beginning of 1985). However, the dollar range has come under severe pressure, and had to be revised downwards on two occasions. These revisions have created a perception of lack of success in maintaining the cartel, which in turn may have influenced sentiment on oil markets, and may have contributed to the decline in the demand for oil stocks which has exacerbated OPEC's problems. As always, there are great difficulties in separating currency-related effects from the multitude of other influences, but it is likely that the oil price, however expressed, would have been higher towards the end of this period if the crisis of confidence had been avoided by defending a non-dollar related range. Whether OPEC's net revenues over the *entire* period would have been higher is a separate, and more doubtful, question.

B. Attempts to Cope with New Forms of Uncertainty

(i) The Choice of Currency Basket for Debt Financing

A previous section of this paper showed the level of debt service obligations, and the currency in which they are denominated, to be of great importance in determining the real value of commodity exports (i.e., the appropriate deflator to use for transferring nominal price changes into real price changes). Another section of the paper showed how significant have been the currency revaluations, in real terms, which have been experienced by many African commodity-exporting countries. This section addresses the policy choices implied by these issues. In what currencies should debt be contracted? To which other currencies should national currencies be linked?

Turning to the first of these questions, two dimensions need to be considered. The first is the question of how to minimise the *level* of the future real burden of debt service payments, and the second is how to minimise the *risk* of an adverse mismatch between the currencies in which debt obligations are due and those in which payments for exports are received.

Here the concern is with the second of these issues. Minimising the level of future debt services might, under certain circumstances, imply forming an opinion of which currency is likely to undergo the most severe devaluations, vis-a-vis other currencies and, providing that the interest rate differential does not cancel out the expected loss from devaluation, choosing to contract debt in that currency. This is in effect an attempt to second-guess financial markets: in an efficient financial market, interest rate differentials will exactly cancel out expected future exchange rate changes. (It could be argued that there is little evidence that financial markets *are* efficient in this sense: if one were to look at interest rate differentials between currencies over the last few years, and interpret these as the market's implicit predictions of future exchange rate changes, one would find that the market had been predicting a fall in the dollar consistently, and consistently wrongly, over the last few years).

Such a strategy is inherently risky. An alternative low-risk strategy is to try to ensure that the effect on debt service obligations of any fluctuations in the value of the major currencies is offset by an equal effect on export earnings. For countries exporting manufactured goods, the obvious way to do this is to ensure, as far as possible, that the share of different currencies in external debt is approximately equal to their share in export earnings: thus, for example, if one half of manufactured exports go to the EEC and one half to North America, external debt would be divided between ECUs and dollars.

For commodity exporters, the issue is a little different. Consider, first, the case of a country where all commodity exports are based on spot transactions. Given the possibility of arbitrage, the price received for the commodity will be the same (give or take transport costs) wherever it is exported to. However, changes in exchange rates between the major currencies *will* exert an influence on its real price, in the ways discussed in the theoretical section above. As was shown in that section, the extent of this influence will depend on the share in world consumption of the country whose currency fluctuates. Thus the avoidance of a mis-match, caused purely by currency fluctuations, between export earnings and debt service obligations would imply contracting debt in proportions equal to the relevant currency's share in world consumption of the commodity. For example,

a country exporting only coffee, even if all its coffee exports go to the EEC, should contract a higher proportion of its debt in dollars than another country exporting cocoa, even if all that country's cocoa exports are destined for the USA; because the higher proportion of coffee consumption in the USA makes its real price more dependent on dollar fluctuations.

Of course such a strategy only guards against those influences on commodity export earnings that are specifically currency-related. The issue of safeguarding against other effects on commodity prices is addressed below.

When commodities are sold on a basis other than simple spot transactions, the choice of currency in the debt basket must then be modified so as to take into account the currencies in which transactions are denominated. For example, a country entering into commitments to deliver commodities at a price fixed in sterling is uninsured against windfall gains or losses if its debt is denominated mainly in other currencies. The mis-match can be solved, either by raising the proportion of sterling in the debt basket, or by entering into parallel transactions on financial futures markets to ensure that, when forward transaction denominated in sterling are entered into, they are accompanied by measures to ensure that the foreign currencies required for debt service are available at known rates (for example, by entering into forward transactions to purchase the foreign currency needed in exchange for sterling).

Concerning the choice of currency to which the exchange rate is pegged, the principal message that emerged from the empirical data was the need to avoid the massive real revaluations that have taken place in recent years. This requires, first and foremost, the need to ensure that the local currency's purchasing power is kept roughly in line with that of its trading partners. The choice of a link with another currency is a secondary matter, though, when the "linked" currency experiences major shifts in real value, the link should be reviewed. Again, the use of the SDR presents some attractions, but, of course, choosing the SDR in no way detracts from the primary importance of keeping domestic monetary policy and exchange rate policy closely in step.

(ii) Risk management in financial and commodity markets

In commodity markets, there are three principal kinds of risks faced by exporters. First, there are risks from exceptional and inherently unpredictable events, such as bad weather, political upheavals and strikes, which change the short term movements in price. Second, in the long term there is uncertainty over the secular trend in prices. Third, over both the short and the long term there are risks from fluctuations in exchange rates and interest rates. All three types of risk have to be managed in the context of each producer's seasonally fluctuating production and input patterns.

Developing countries are not alone in facing these risks, however. Multinational companies which produce or market commodities, banks which lend money to such companies, and producers of primary products in developed countries have had to face identical problems. Like developing countries, these organisations have learned at considerable cost that sudden changes in exchange rates, selling prices, interest rates and input costs can seriously affect their returns on existing production facilities and the profitability of new investments. Their response to these new risks has been to adapt their management strategies to give themselves as much protection as possible against uncertainty in the markets for commodities and financial instruments.

Accordingly, since the early 1970s there has been extremely rapid growth in the use of a wide range of financial instruments for managing the risks inherent in commodity price volatility. This growth in usage has resulted in the accumulation of a great deal of knowledge of, and experience in the application to newer types of risk of risk management tools which have been used for at least a century in the traditional commodity markets. Central to this development has been the expansion of futures markets. Traditional futures markets offer commodity exporters the chance to hedge export earnings, thereby moderating the risk of price uncertainty. (Of course, two types of risk remain: first, basis risk, the risk that the difference between the futures market price and the market into which the cash product is sold will alter, and, second, output risk, the risk that the quantity eventually exported will be different from the quantity hedged. The presence of output risk means that hedging cannot eliminate revenue variability, but it can reduce it.) But the availability of futures markets in currencies makes it possible to ensure a certain level of, say, dollar receipts from the future sales of a commodity whose price is denominated in sterling, by selling sterling futures equal to the value of the hedged sterling sales of the commodity. In this way, a commodity exporter earning sterling but paying for imports (or repaying debt) in dollars obtains protection against movements in the sterling/dollar exchange rate as well as movements in the sterling commodity price. Similarly, interest rate futures allow hedging against changes in international interest rates. Since small changes in interest rates and exchange rates can bring about huge changes in developing countries' balance of payments (by altering their debt repayment burdens), the value of locking in repayment obligations is obvious. World Bank calculations indicate that, if the oil-importing developing countries had insulated their dollar debt repayment obligations against the recent dollar appreciation, a savings of almost $5 billion in annual payments would have been realised.

The use of futures markets confers benefits additional to price protection. Producers can use the relationships between futures contracts of different maturities to cover the costs of storing commodities. Moreover, hedged stocks or hedged production provide a higher quality of collateral for a lender than unhedged production, allowing exporters access to better borrowing terms. This can assist in short-term marketing strategies, but some futures and option market techniques allow producers to construct long term price hedges extending over several years. These make it possible to guarantee price levels from new projects, and thus help obtain project finance. In practice, this technique has been used in some recent mining investments to arrange better borrowing terms.

One feature of futures markets is that, in addition to protecting the hedger from adverse price movements, they also make it impossible for hedgers to benefit from favourable price movements. Options, however, which are presently available on a wide range of internationally traded primary commodities, can be used only to provide insurance against adverse outcomes, without removing the possibility of windfall profits in the event of favourable changes in price. Although trading in options is less established than trading in futures, and there is not as large a body of accumulated experience in the application of options to risk management in commodity markets, there would appear to be considerable scope for the increased use of options in commodity markets. Moreover, although there is a large number of traded options available on the world's commodity exchanges, non-traded options can be written for specific purposes by a number of banks and trading houses. This increases the flexibility of options compared to futures markets.

Options confer the right to buy or to sell at a specified price, and impose the corresponding obligation to sell or to buy on the grantor of the option. (In this respect they differ fundamentally from futures contracts, where each purchase must correspond to a sale.) The holder of the option, however, does not have to exercise his option: he can simply let it lapse if spot market developments are favourable, and he will in this case simply forfeit the money he originally paid for the option. In this respect, they resemble a form of insurance premium, which allows bad outcomes to be insured against for the price of the insurance contract. (Clearly, the insurance premium is forfeited in each year where there is no bad outcome.) Options are available on stocks, on commodity physicals and on commodity futures: in each case, they confer the right to make a transaction at an agreed price during a specified future period.

Options which confer the right to buy are known as "calls". Most stock options are of this type. Options which confer the right to sell are known as "puts", and it is these options which are of interest to producers and exporters of commodities. Puts, therefore, resemble an insurance premium against falls in the price: if a producer buys a put option on a futures contract, he can exercise the option if prices decline below the level specified in the option, or he can let the option lapse if prices rise. A simple example is the following. Suppose that a producer buys, on April 1st, options on August futures which give him the right to sell August futures at $100. (Let us assume that, at $100, his production costs are covered.) If the price of August futures in June turns out to be $75, the producer can exercise his option, and he will buy (at $75) the futures which he has the right to sell at $100. The profit on this transaction can offset whatever losses he may make on selling physicals at $75. Conversely, if the price rises to $125, the producer will choose not to exercise his option, and will simply sell his physical output at $125. Clearly, the grantor of the option faces price risk, and this risk is reflected in the price of the option. (The price of an option will, therefore, reflect expectations about the future price of the underlying good.)

To producers, there are two principal advantages of options over futures. The first is that protection is afforded against adverse outcomes without removing the possibility of windfall gains from rises in price. The second is that once the option has been purchased, there is no risk of having to meet expensive margin calls. Two disadvantages, however, are, first, that the option has to be purchased outright. This can be expensive, and, like any insurance payment, it can turn out to have been unnecessary. If the price does not fall, there is no return on the funds invested in the option. (Equally, of course, risk reduction cannot be costless.) Second, it is not possible to roll options forward in the straightforward way which is possible in futures markets. A combination of options and futures can do the same job as rolling options forward, but this does make the operation rather complicated.

It appears to be the case that developing countries make little use of futures markets. While much use of futures markets is by dealers who may be acting on behalf of developing country exporters, the indirect evidence suggests this is on a limited scale. While the existence of a futures market can be expected to improve the efficiency of the operation of the spot market, and thus yield benefits to market participants who do not use the futures markets, it is appropriate to ask why developing countries do not make more extensive use of them. There are two principal reasons.

The first is connected with the institutional structure of export marketing in

developing countries. Many commodity exports are handled by parastatal bodies which serve a variety of functions in addition to maximizing the profits of exporting, and personnel are rarely trained in techniques of futures trading. Developing country governments, which often keep a close watch on their commodity exporters, frequently view futures trading as inherently speculative. This is by no means uniformly true in all developing countries, but it is interesting to note that even in those developed countries where commodity trade is handled by parastatal bodies, use of futures markets is very limited: for example, a parastatal controls Norway's wheat imports and makes very little use of futures markets to hedge its purchases. To some extent, the hesitant attitude towards futures markets characteristic of parastatal bodies simply represents a slow learning process, and as risk continues in world markets, the high costs of failing to use risk management techniques will eventually constitute a sufficiently powerful case for their use. Yet there is undoubtedly a role for commodity exchanges and others involved in futures and options trading in educating export marketers in the benefits of futures and options markets.

A second, and perhaps more important reason, is that both futures and options trading require access to foreign exchange. In the case of options, which must be purchased outright, there is a high initial currency requirement. In the case of futures markets, foreign exchange may be needed throughout the life of the contract to meet margin calls. These have to be paid very quickly, and can amount to very large sums; and, even in developing countries where there is no serious shortage of foreign exchange, licensing procedures can often take too long to allow exporters to meet these margin calls. Developing country governments are also frequently sceptical about the wisdom of entrusting large amounts of foreign exchange to a small number of individuals, and so will not suspend these licensing procedures. Moreover, the sums of money can be very large. For example, Zambia produces over 400,000 tonnes of copper which, at a price of 60 cents/lb, is worth over $550 million. Zambia could hedge this production by selling, on the New York Commodity Exchange, 400,000 tonnes of futures, and the initial margin on the hedge sale would not pose a major problem. If the price of copper doubles to 120 cents/lb, however, Zambia would be faced with an immediate margin call of $550 million. This is a large sum in relation to Zambia's foreign exchange reserves: and, while it could be borrowed and easily paid off in the course of a year, if price remained at the higher level, interest costs would be substantial. (A further problem is that hedging in rising market will prove to have been unnecessary, since higher revenues would have resulted if no hedging takes place. In this instance, therefore, the margin calls come at the same time as opportunity losses.)

The large size of the sums of money involved militates against the use of futures markets by most developing countries to construct hedges over periods longer than the marketing year. Within the marketing year, however, improved access to credit would allow exporters to reduce the uncertainty they face. Within developed countries, a similar problem has been faced, since margin calls are typically beyond the financial means of individual grain farmers, for example, who might otherwise hedge their production. What typically occurs in developed countries is that banks have special commodity credit facilities under which they take the crop as collateral. Banks are then willing to make margin payments, because the value of their collateral increases as the margin calls are made. (This is a further important reason why futures are rarely used for longer periods than the marketing year, at least in the case of grains, where producer hedging in developed countries is quite advanced: in a particular year, actual output is available as collateral, whereas for future years, the output is not actual, and thus loans raised against future output are less secured than those where the present crop is the collateral.)

There is no reason why a similar type of measure could not be operated at the international level, with some kind of financing facility available to developing countries, analogous to the IMF's compensatory financing facility. Monies lent under this facility would only be available to finance margin calls, but it would be a risk-less form of lending, and it would not increase developing countries' net indebtedness (since the loans would be automatically self-liquidated as the hedged commodity is sold.) An alternative would be for international guarantees to be provided for commercial bank lending for margin calls. Clearly, in either case, lending would be conditional on proper hedging practices being followed.

The disadvantage from developing countries' point of view is that hedging both eliminates the possibility of windfall profits and would be prohibitively expensive for more than one season. Options contracts have neither of these disadvantages, and have several advantages as well: the requirement for credit is fixed at the outset, and there is much less scope for officials of exporting organisations to back a view of the market's development with financial obligations. The options which are presently traded, however, are unlikely to be suitable for developing countries concerned to stabilise export revenues. Options can be specially written by trading and lending institutions (they are called off-market, or dealer options) but it is by no means clear that the market will be able to provide options on a scale which would be required if a large number of developing countries wished to pursue the idea. Options certainly are an important tool of risk management whose potential value for developing country exporters needs to be examined in greater detail.

V. Summary and Conclusions

This paper explores the effects of the recent (1981 to date) period of currency instability on markets for certain commodities, particularly those exported by sub-Saharan Africa. It examines the performance of commodity prices and consumption of commodities, and seeks to find answers to two questions:

(i) Have commodity prices failed to benefit from the recent period of economic growth in the OECD?

(ii) If so, to what extent has this to do with currency instability, or to the underlying factors which themselves have caused currency instability?

In addition, the study considers the policy issues that confront commodity exporting countries during a period of currency instability, and examines the efficacy of various tools for coping with currency instability, both at the national and international levels.

(1) Theoretical considerations

A survey of the theoretical literature indicates two ways in which one would expect currency fluctuations to affect commodity markets. The first issue relates to the effects of **instability** itself. If consumers of commodities are risk-averse, greater currency instability will lead them to import less. Equally, the incentive to export commodities is reduced, if exporters are risk-averse. One would therefore expect the **volume** of international trade (in commodities as in other products) to be adversely affected by commodity instability. The effect on **price** is ambiguous, and depends on whether importers are more risk-averse than exporters.

The second issue relates to the effect of rises in a particular currency, such as the dollar, on prices of commodities expressed in that currency or in other currencies. Under most realistic assumptions, a rise in the dollar will lead to a fall in the price of commodities expressed in dollars, and a rise in their price expressed in other currencies. The extent of these changes will depend both on the share of the US in total consumption of the commodity, and on the sensitivity of demand and supply to price changes. As a rule, the greater the share of the US in total consumption of the commodity, the less will be the decline in the dollar price and the greater the rise in the price when expressed in other currencies.

(2) The Macro-economic Context

The rise of the dollar between 1981 and 1984 was not an isolated phenomenon, and it would be inadequate simply to look at commodity market behaviour over this period, and conclude that all the observed changes were due solely to the rise in the dollar, and not to any other causes. The attempt to isolate the effects of currency instability must start with an analysis of the macro-economic context within which these changes took place.

The period from 1981 to 1984 saw three related developments, all of which had profound implications for the world economy. The rise in the dollar was one; a rapid rise in real interest rates was another; and a ballooning of the USA's deficits on trade and, more generally, in the current account of the balance of payments, was the third. Each of these phenomena is intimately related to the

expansion of the US budget deficit, its effects on interest rates in a low-savings economy like the US, and its effect on exchange rates in a period when falls in capital outflows bore the brunt of financing the current account deficit. To isolate the effects of currency fluctuations implies finding some way of taking account of changes caused by the other two results of the US budget deficit.

(3) Empirical findings

The first task of the empirical analysis is to look for unexpected changes in the volume of physical demand. For each of the major commodities exported by sub-Saharan Africa (excluding South Africa), the level of OECD consumption over the period 1981 to 1984 has been deflated by an appropriate index of the level of activity in the OECD economies (i.e by total OECD GDP, or total OECD industrial production), in order to look for any recent aberrations in the relationship between the OECD economic cycle and the volume of demand for commodities. For all of the commodities studied, there is strong evidence of a low income elasticity of demand (i.e., over the period as a whole, the trend in commodity consumption per unit of GDP or IP has been falling). However, in nearly all cases OECD consumption has been on or above the trend line during the 1981-1984 period. It is concluded that the peculiar macro-economic developments of the 1981-1984 period had no adverse effect on the level of physical consumption of commodities in the OECD.

In addition, the relationship between volume changes and price changes is examined. For most commodities, periods of below-trend price levels have been associated with periods of above-trend supply. This suggests that, for these commodities, fluctuations in supply, rather than in demand, are the main reason for price fluctuations. The important exceptions to this finding are, firstly, copper: as would be expected, low copper price have been due mainly to demand disturbances, particularly in the post-1975 slump. Secondly, sugar price fluctuations too, in the recent past, have been due more to the weakness of demand. However, in the case of both sugar and copper, as the previous paragraph's findings suggested, the weakness of demand recently represents a long-standing adverse trend rather than any special disturbance in the period of the strong dollar.

Having rejected the hypothesis that there has been some disturbance to previous patterns of demand during the period when the dollar was high, attention turns to supply. For sub-Saharan commodity exporters, the question of exchange rate influences on the real returns to commodity producers is examined: did domestic inflation proceed more rapidly than exchange rate depreciation, thus damaging exporters' interests, or was the reverse the case? For most countries, (with Malawi and Kenya the most notable exceptions) a strongly negative effect on the domestic real price was observed, as a result of an appreciation of the real exchange rate. For countries that linked their currencies to the dollar, this could have been exacerbated by the rise in the dollar's exchange rate against other currencies. The effect on supply would have been negative, but the effect on price positive.

Diagrams 8-26 provide a graphical summary of the main findings discussed in the two foregoing paragraphs.

The very high real interest rates (illustrated in Diagram 6) that were associated with the rise in the dollar could also have had an adverse impact on commodity prices. Even though the effects on the flow of physical demand during the 1981-1984 period seem to have been slight, a reduction of the willingness to hold

stocks could have caused commodity prices to decline until a new equilibrium between stock levels and demand is established. There is evidence from a number of commodities that this has indeed occurred. Speculative, precautionary and transactions demand for stocks have all been reduced by the higher cost of stock-holding that is associated with high real interest rates, and there is evidence from a range of commodity markets, including cocoa, oil and rubber, that previous relationships between stocks and price have broken down, in a way that is adverse for producers.

Currency instability also causes problems relating to **the matching of the currency composition of debt to that of income**. Sub-Saharan Africa is fortunate in having a lower share of dollar-denominated debt (53% in 1983) than other regions of the developing world. Here too, it is the rise in real interest rates, rather than the currency changes themselves, that have imposed the highest costs on developing countries.

The hypothesis that **IMF-sponsored adjustment** policies have caused a fall in commodity prices by encouraging competitive devaluations and over-stimulating commodity supply is examined (though of course the much wider issue of the appropriateness of such policies is beyond the scope of the study). It is rejected on the basis of the evidence already cited, that, far from devaluing, the African countries at least (though not necessarily other developing countries) have experienced for the most part very substantial real revaluations of their currencies.

(4) Adjustment to currency instability

The evidence that greater recourse has been had to **countertrade** is examined. It is concluded that countertrade can normally be expected to lead to an adverse movement in the barter terms of trade against commodity exporting countries using these techniques, but that there may be instances in which such transactions lead to an overall increase in the capacity to import. In such cases, the price of an adverse movement in the terms of trade may have been worth paying to avoid disruption to the flow of imports.

Currency instability has clearly added greatly to the **difficulties of operating International Commodity Agreements**. Where such agreements have price provisions (as in cocoa, coffee, tin and rubber) these prices are denominated either in dollars or, in the case of the rubber and tin agreements, in currencies such as the Malaysian or Singapore dollar which are closely linked to the US dollar. Fluctuations in the US dollar have meant that the real values of the price ranges have been very different from those anticipated when the range was set, or those compatible with equilibrium in the commodity market. It is concluded that the use of the SDR to denominate price ranges in such agreements would be preferable.

In order to **match debt to commodity earnings** with the minimum risk of a mismatch, a policy whereby the proportion of each currency in the country's debt is approximately equal to that currency's share in *total* consumption of the commodity is most suitable for country's exporting solely commodities on spot terms. The modifications needed to take account of forward supply commitments denominated in particular currencies, and for non-commodity exports, are considered in the report.

Various **financial instruments** are available to reduce risk, whether related to currency fluctuations or to commodity price movements. The most important of

these are futures markets and options trading. Futures provide a way for countries to tie their future commodity sales to the presently prevailing price structure, ruling out both losses and gains that would accrue from fluctuations in prices or exchange rates. Options provide a way of insuring against losses without necessarily foregoing windfall gains. The limitation of both of these tools, from the point of view of developing countries, is that they require initial access to substantial foreign exchange. In addition, futures trading becomes very expensive if undertaken further than one season ahead, while options trading requires further developments in existing options markets if it is to meet the needs of developing countries. Both tools, however, could play a part in a strategy to limit the risks faced by commodity exporting countries.

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LONDON'S COMMODITY EXCHANGES: AN INTRODUCTION

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Index of Charts and Tables

LONDON'S COMMODITY EXCHANGES

1. Why Futures Markets Exist: Price Instability

Futures markets organized by Commodity Exchanges - often called Terminal Markets in London, the terms being synonymous - exist, in essence, because of the volatile nature of primary commodity prices.[1] Commodity prices have always exhibited this instability. For example, The Economist index for all non-fuel commodities, which is available continuously since 1860, shows that the largest annual decline in commodity prices - no less than 33 per cent - occurred from 1920 to 1921 (40 per cent from 1920 to 1922). A few years later, starting in 1924, the largest and longest cumulative decline of which we have record took place. This lasted until 1932. During this period, commodity prices fell every year, declining in total by some 47 per cent. More recently, during 1981-82, there was a cumulative price decline of 25 per cent, in itself a fall exceeded only on the two occasions recorded above and during two other periods, viz. from 1864 to 1869 (28 per cent) and from 1951 to 1953 (26 per cent).

When we turn our attention to the period since 1957, we find that from this date to 1971, commodity price instability was relatively subdued, while from that date it increased very markedly. Historically, reference once more to the Economist index of commodity prices reveals that, while the instability for 1911 to 1956 - during which there were three major wars - was almost twice as great as that for 1957 to 1971, the instability from 1972 to 1982 was more than three times as great as

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1. This price instability may be defined as the average percentage deviation of the actual price from the trend for a certain period.

for the comparatively tranquil period of 1957-1971. This last span of years included a phenomenal increase in commodity prices during 1973 and 1974, when the overall index approximately doubled, before plummeting by 19 per cent in 1975. Clearly, this increased instability was connected with "post Bretton-Woods" instabilities in currency markets, interest rates, fluctuations in industrial production and world-wide inflation. However, though the fluctuations in the dollar exchange rate vis-a-vis other major currencies following the dismantling of the Bretton Woods system of stable exchange rates played its part in commodity price fluctuations, the conclusion that commodity prices were significantly less stable during this last period is unaffected when these prices are measured in SDRs, or deflated by the U.N. index of prices of manufactured exports of developed countries, i.e. in real terms. The conclusion is, furthermore, unaffected by whether the instability is measured around a long-term or a medium-term trend.

The increase in instability during the ten years to 1982 was true for all the major commodity groups. The instability around long-term trends was largest - fourfold - for food, among which cereals price fluctuations were greatest. For beverages and agricultural raw materials, price instability about trebled over the period, coffee and cotton being particularly affected. Metal price instability rose only by some 30 per cent.

The prices of primary commodities can, of course, be expected to fluctuate over time and, within broad limits, the price of primary goods taken together in relation to manufactures, manifest a cyclical swing. This is because, in general, they are related quite closely to periods of prosperity and recession in the developed world. The growth in industrial requirements gives rise to an increase in the demand for commodities, thus driving up their prices. These price increases eventually tend, in turn,

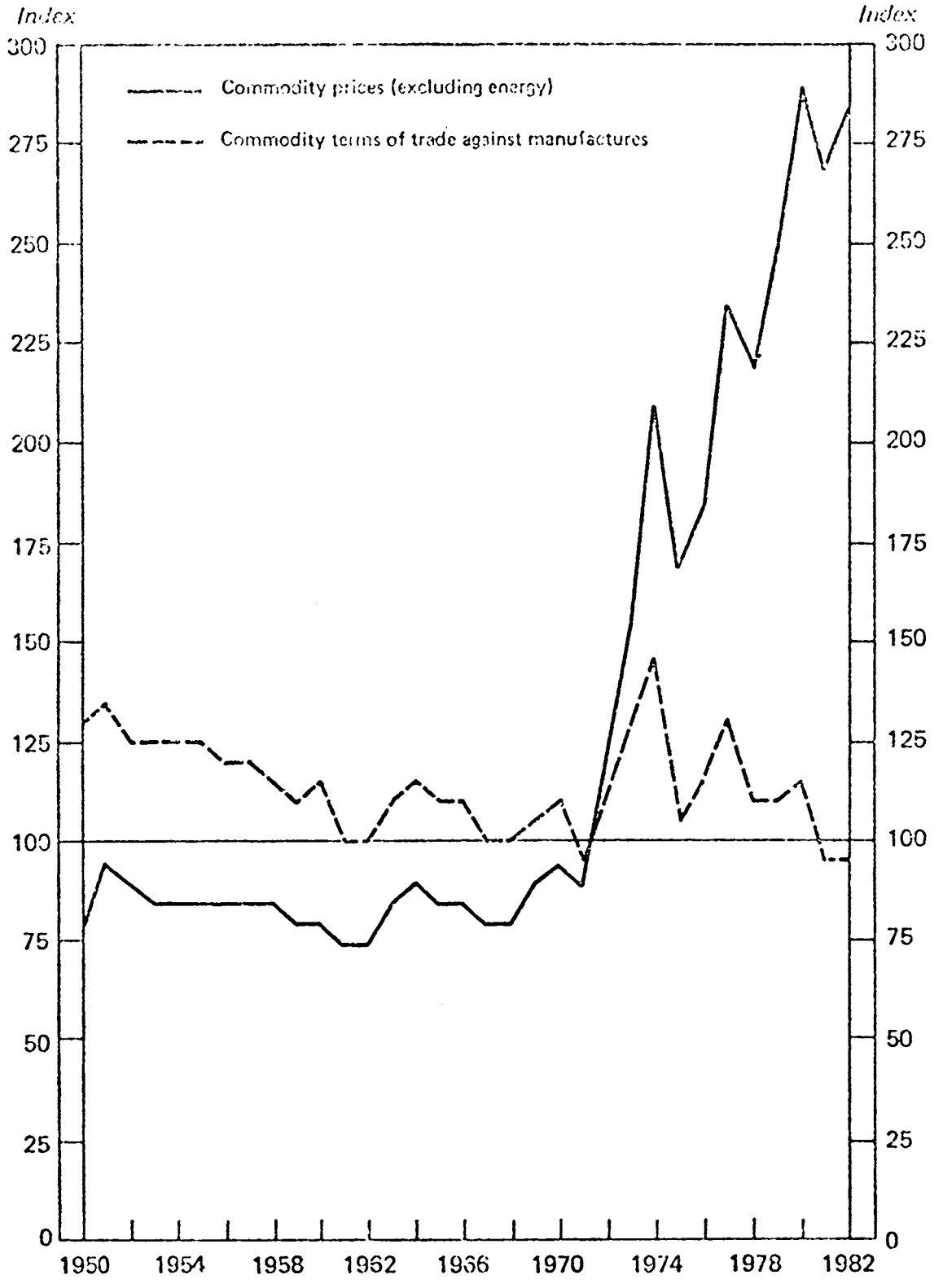
both to check industrial growth and to stimulate the production of primary goods, leading once more to a decline in the prices of the latter. The accompanying chart shows the consequent wave-like changes in the terms of trade between commodity prices and manufactures, reflecting this approximate process of checks and balances (Chart 1) (page 76).

Unfortunately, this process does not make the prices of individual commodities any more predictable, even when we are able to disentangle the different relationship of each of a broad group of commodities to changes in activity in the industrialized world. For example, the supply of many agricultural commodities, such as cocoa, coffee and sugar, respond to changes in their price only after a long period, when additional acreages have been planted. The metals, on the other hand, together with oil and rubber, respond much more quickly to demand changes. A final group, that of the precious metals, has no fixed pattern of price movements because the demand for them stems mainly from their role as alternative means of holding assets. Even this breakdown into commodity groups, fails, however, to result in predictable price changes for commodities, as is best illustrated by Chart 2 (pages 77-78) of the range of annual price changes for selected major commodities. As may be seen, these ranges are mostly very great, as prices over days, weeks and months, are influenced by currency uncertainties, interest-rate changes, crop reports or industrial and political unrest.

It is, then, this marked volatility of prices which is such a feature of commodity trade and the economic reason for the existence of futures markets, upon which traders seek to protect themselves from the losses which price changes may occasion, and on which financial interests - speculators - hope to participate gainfully. In fact, historically, the

CHART 1

Commodity prices and terms of trade,* 1950-1982
(1972 = 100)



UNCTAD Trade & Development Report, 1981.

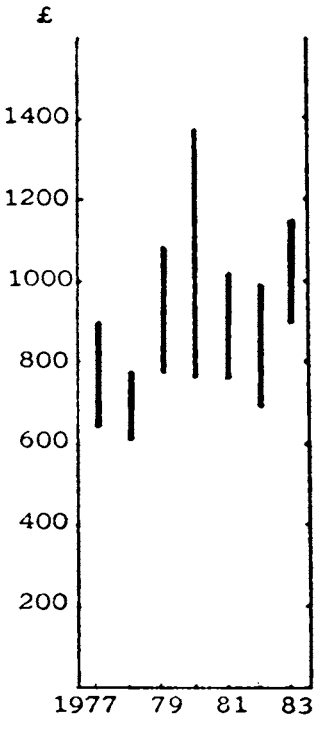
* *Excluding mineral fuels.*

CHART 2

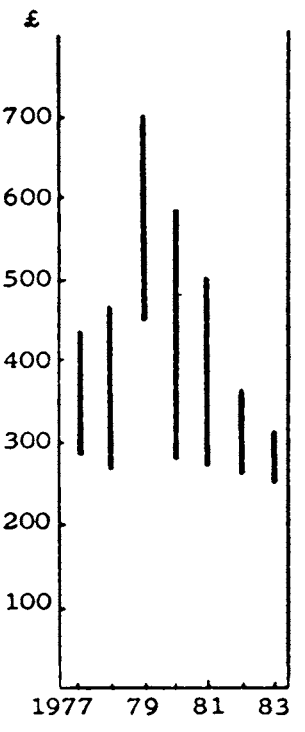
Commodity Price Changes, highest and lowest prices, 1977-83

(per tonne unless otherwise stated)

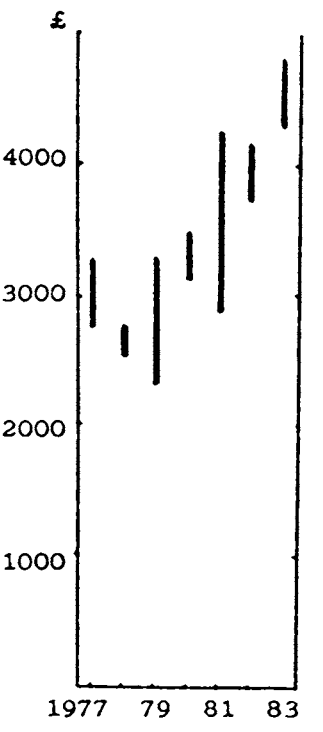
Copper



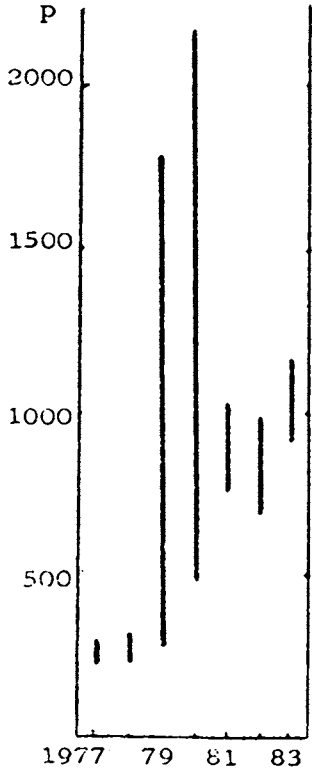
Lead



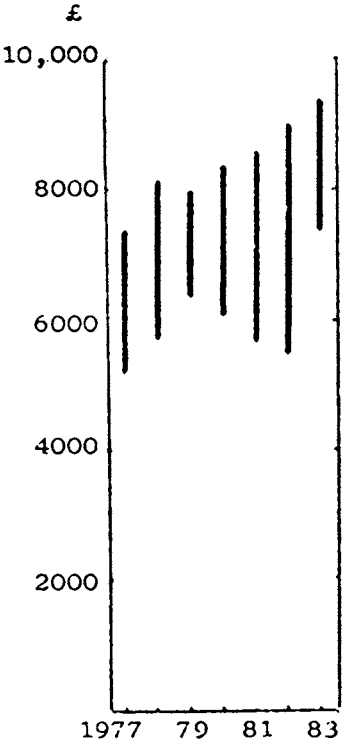
Nickel



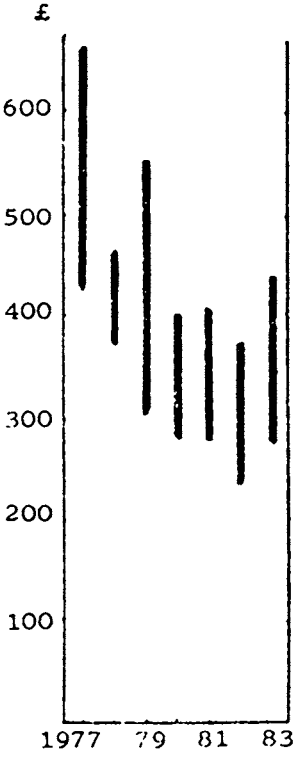
Silver (/oz)



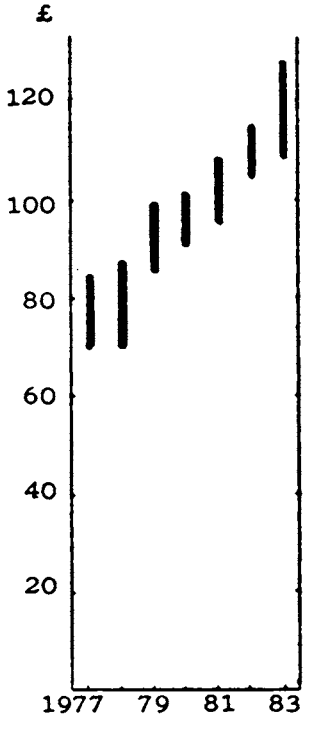
Tin



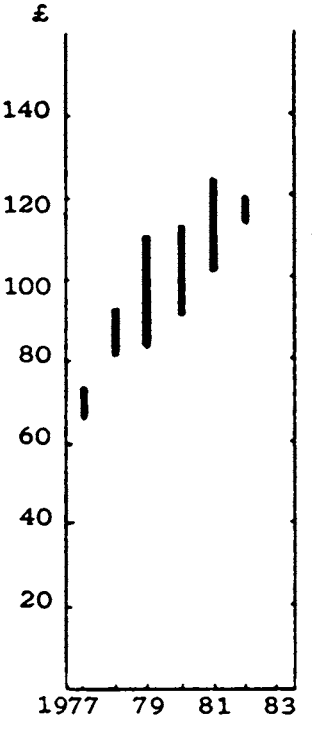
Zinc



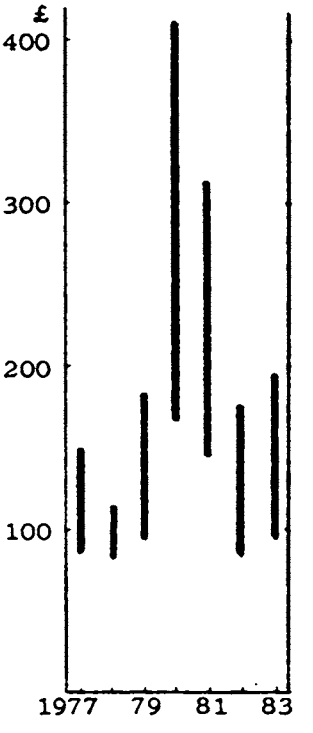
Barley (futures)



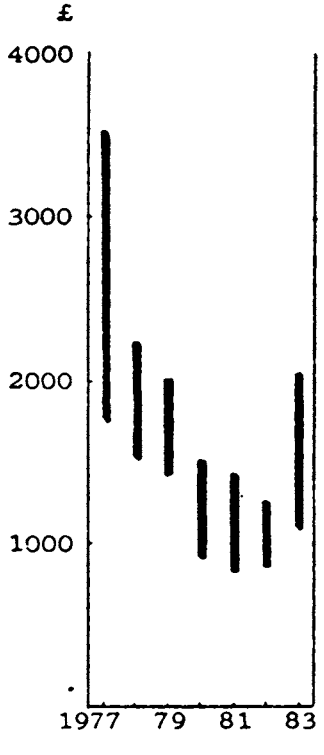
Wheat (American Hard Winter)



Sugar (Raw)



Cocoa



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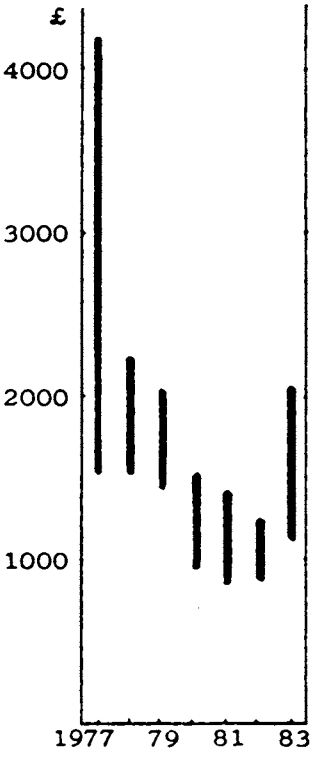
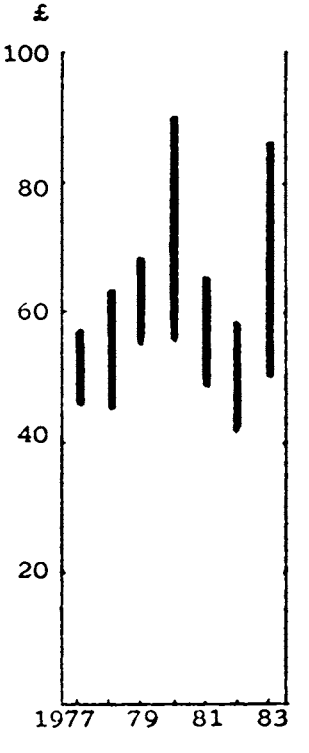


Rubber (/kilo)



Source: Financial Times

initial inspiration seems often to have been this latter ambition. Moreover, unless both trade and non-trade interests are present, markets of this sort are not broad enough to flourish. The next stage in the analysis must, therefore, be to examine how traders attempt to safeguard their profit margins and prevent them from turning into losses due to adverse price changes, i.e. we need to know how the markets function.

2. How Market Users Seek to Protect Themselves Against Price Risk

(a) The Development of Forward Trading

Until the nineteenth century was well advanced, the predominant method of sale was of goods "on the spot", that is, which had already arrived in manufacturing or consuming countries. (Such transactions are still called "spot" sales). Most commodities reached the central markets via the following three routes: the consignment of shipments by producers themselves, by commercial banks with an interest in the commodity, or by shipping firms which, for the most part, established their headquarters in the principal market centres. Inevitably, the producer was separated from his market by middlemen since the alternative - not very realistic for most - was to provide the finance, and run the necessary risks, in order to market the commodity himself. In the market centres, stocks were held by market dealers and substantial merchants, while the brokers provided the link between buyers and sellers. For very many commodities this link was at one time between selling and buying broker, with the auction chamber as the venue for purchase and sale.

In earlier times many causes contributed to the predominance of sale after the arrival of the produce. The uncertainties of long-distance transport by sail meant that manufacturers and others needed to have stocks near at hand. The total amounts bought and sold, moreover, were

much smaller than is now the case. In order to establish a market price, under these circumstances, it was necessary to arrange for a good assembly of buyers and clearly, periodic auctions constitute the best method of ensuring this. Finally, public sales (i.e. auctions) continued to be a necessary method of distribution for most produce until accurate systems of grading developed. For raw materials, especially, the demand for reliability in this respect became more insistent with industrialization, for an even-running quality is usually more crucial for machine-production than for more primitive handicrafts.

Obviously, as far as transport was concerned, the most profound revolution occurred with the introduction of the steamship, the electric telegraph, and the opening of the Suez canal. Henceforward, the importer was able to order commodities for forward delivery in the reasonably secure knowledge that they would be delivered on the due date. With concomitant improvements in grading, moreover, he became increasingly confident of getting what he really needed, and so commodity trades evolved from sales by auction to sales by sample of the "lot" or "parcel" of produce concerned, and from that to sales by description based upon standard "type-samples" (as used for example in the rubber trade). Such samples could be appealed to in cases of dispute or else, where this method was inappropriate, to a further method which was developed, and is now widely used. This is the formula "fair average quality" (f.a.q.) which may well vary from season to season. The determination of f.a.q. involves the sampling of the bulk after arrival so as to ensure a standard of comparison in cases of dispute. This method is, for example, widely used in the grain trade. In fact, the effect of the changes detailed above was to eliminate, at an early date, the old system of consignment for spot sale upon arrival, in both the grain and the cotton trade and, in

time, forward trading became more general. (It should be noted that in these trades, such transactions for the delivery of goods at some forward date, is frequently called 'c.i.f. trade'. The term c.i.f., it will be recalled, relates to the inclusion not only of cost, but of insurance and freight also, in the quoted price. It therefore implies the purchase of the produce with the shipping documents as the proof of entitlement to the goods.)

In all trades the rapid and almost continuous links established between producer and consumer countries implied improved market intelligence. The demand and supply pressures thus focussed upon the central market became a more accurate record of the world situation for that commodity. Local shortages were less able than formerly to give rise to substantial price increases when supplies existed elsewhere: news of scarcity and, accordingly, a hardening of prices henceforward resulted in the transmission of this intelligence to producer countries and so, the assurance of additional supplies. Central markets thus became more truly world markets than they had ever been before. Clearly, however, the trader's ability to order confidently from producer countries meant that the merchant's need to hold stocks was reduced. To the extent that this happened, it diminished the importance of the merchant, who tended from this time to be replaced by firms of brokers, and with a consequent shortening in the channel of distribution between producer and consumer. In the sugar trade, for example, the chain of distribution through sugar factors and brokers to manufacturers gave way to the establishment of firms of international brokers, who dealt directly with the producers, selling for them in London and on other markets. Despite the reduction in the stocks which needed to be held at international market centres, however, the ability to absorb and produce supplies according to changes in demand and supply pressures continued to be an essential feature of

these markets. What happened after the introduction of steam and the cable was simply that the function of such markets as "reservoirs" applied, not to the total flow of produce from producer to consumer, but only to that proportion which did not find direct final purchasers. The London Metal Exchange, for example, still performs this function even though only a very small proportion of the world's output of the metals concerned actually passes through this market.

In summary, therefore, apart from the comparatively few commodities sold by auction these days, most produce is now bought on a c.i.f. basis; that is, bought forward, upon description according to trade. Transactions are therefore concerned with contracts in rights to the delivery of a commodity, rather than of the commodity itself, so that the market place can be far removed from the physical commodity. Indeed, the market has increasingly become one in which business is transacted by telephone, cable or telex etc., with brokers in "physicals", i.e. the actual commodity - where these intermediaries are still used - marrying up supply to demand from their offices. Few if any transactions in shipments of grain, for example, are now actually concluded on the floor of the Baltic Exchange. Similarly, provision on the floor of the London Commodity Exchange, where buyers and sellers of actual spices, jute, copra etc. could meet, has now disappeared.

In the meantime, the growth of trade led to an increase in specialization, and this encouraged many firms of brokers to establish Associations for the particular produce in which they specialized. In this way, organizations pertaining to tea, coffee, cocoa, hemp, skins, rubber, shellac, and a host of other commodities were brought into being. (For example, the General Produce Brokers' Association of London was

established in 1876). Thus, whereas previously each firm made its own conditions of sale and held its own auctions, frequently in its own saleroom, the Associations brought uniformity to the trades. Disputes concerning quality, compensation and other matters, which were becoming increasingly troublesome with the growth of trade, were dealt with in accordance with sets of rules devised by these organizations. Standard forms of contract were drawn up, and periodically revised, while arbitration panels were brought into being for settling disputes by reference to the defined standards which have already been alluded to. In brief, then, the functions of the Commodity Associations enabled forward trading (as well as spot transactions) to be reduced to determining a mutually agreeable price, the conditions governing delivery, quality and other pertinent matters having been made uniform throughout each commodity trade by standard contract forms - one of the prime responsibilities of these Associations.

Though it is useful, for purposes of exposition, to consider a "classic" pattern of commodity marketing from producers via shippers to merchants, brokers, and thence to manufacturers and consumers, this process has been much disrupted in a number of commodities, especially since World War I. In some cases, such as those of Canadian and Australian wheat, or West African cocoa, selling agencies have made their appearance. Other commodities, for example, American cotton, or shellac from India, have been affected from time to time by government price support or export-pricing programmes. Producer cartels have been formed (e.g. on more than one occasion in copper) which resulted in the markets being by-passed, though in some cases, despite intervention to fix prices (e.g. O.P.E.C. oil pricing) the distribution has remained in the hands of private firms. Not only do patterns of marketing and distribution vary from the producers' end, but also due to changes on the purchasers' side.

Considerable amalgamations sometimes take place, as for example among U.K. millers, or cotton spinners, which have led to the by-passing of brokers and merchant stock-holders of these commodities, in favour of direct purchases from large shippers, or marketing boards. Finally, as is well known, there has, in other cases, been backward integration to sources of supply (e.g. the development of plantations by Unilever, Tate and Lyle, Brook Bond, Dunlop, etc.) though for political reasons this is now mostly on the decline.

b) Hedging on Forward Markets

In the United Kingdom, futures, or terminal, markets are traditionally associated with goods from overseas. There are historical reasons for this, for when goods travel a considerable distance, this takes time, and whoever owns the produce is then a stockholder at the mercy of price fluctuations. Clearly, however, the commodities need not be afloat in order to constitute a risk of loss, for the same reasoning applies whenever produce has to be stored in warehouses, silos, etc. (American grain futures trading, for example, originated from such considerations). Thus, producers, importers, or others who possess stocks, stand to lose possibly very considerable amounts due to a fall in price. Similarly, on the other side of the market, merchants, manufacturers or others who, without having stocks of a commodity, and having promised to supply at some forward date at a price already fixed, stand to lose from a rise in price by the time they need to buy and deliver.

Producers, stockholding merchants, manufacturers and other traders are in business essentially as traders rather than as speculators. Their problem therefore is how to protect their legitimate profit margins

(remembering that, in the long run, prices must be sufficient to avoid losses, otherwise traders will go out of business and producers likewise, or else they become progressively poorer). Historically, the answer to this problem of protection against adverse price changes lay in the ability of producers and traders to "hedge"; that is, to enter into an offsetting transaction in the forward market. Such protection by hedging could therefore only be contemplated where forward markets had been established - and we have already examined the conditions which needed to be fulfilled for this type of trade to exist. The classic case in the commercial history of the United Kingdom is that of American cotton, and the trader who felt the need to hedge his position most keenly was the importer, "long" of cotton, being the owner of the produce for the six weeks or more during which the shipments made the journey by sailing vessel (while from 1840, samples and orders went via Cunard steamers, which took only about a week to cross the North Atlantic).

In principle, of course, all that any trader had to do in order to hedge on forward markets was to enter into a transaction which offset that which put him at the risk of price movements. Thus, any importer who owned stocks tied up as they would be on-board ship, i.e. who was "long" of the commodity, would hedge by appearing as a "short seller" on the forward market, i.e. would sell contracts to deliver forward at the same time, and therefore for approximately the same price, as his purchases. Suppose the price of cotton fell before he got his cotton to the Liverpool market. Clearly, the straight-forward sale of his produce would result in a loss. However, having also sold for forward delivery some six weeks previously, at the higher price, all he had to do was to deliver his cotton in fulfilment of his contracts to supply. Having both bought and sold at approximately the same price he would not therefore need to fear a price fall. Similarly, for any trader without stocks (i.e. "short" of the

commodity) but committed to supply at a future date at an agreed price. To hedge his commitment, he would need to enter the forward market on the "long" side, i.e. to buy contracts for future delivery at the same time, and therefore for approximately the same price. Without hedging in this way, were prices to rise above the agreed price before he fulfilled his contract to deliver, he would clearly lose on the transaction. As it is, however, he would be covered by the contracts which he had purchased at the same (lower) price at which he had entered into the commitment to supply. His action then would simply be to take delivery of the produce against these contracts, and pass the goods across to the manufacturer or to whoever he had undertaken to supply. It should be noted, incidentally that, in addition to covering himself against risk of loss through price movements in this way, his hedge also has the effect of precluding his making any windfall gains through what would, without his hedging action, have been a favourable price movement.

(c) Shortcomings of Forward Markets

What, then, is amiss in continuing to use forward contracts in this way as a hedging medium? One reason is that operations on forward markets are closely circumscribed by the particular collection of quantities, qualities and delivery dates of available contracts. In brief, a producer or trader, say, seeking a suitable contract, might not be able to match up his risk with suitable cover for it. Forward markets, moreover, do not provide complete security for transactors. (For example, were the price of the produce to fall significantly before delivery, the question arises as to whether the producer or the seller can always be assured of the buyer's integrity. If, for example, the price of the commodity falls before delivery is made, the buyer may attempt to repudiate the

transaction. Again, he may, for example, while wishing to take delivery, have run into financial difficulties in between agreeing to buy and taking delivery. However, perhaps even more serious for the producer selling his crop, for example, is that a crop failure might force him to buy his way out of a forward contract at a loss. The implication, when output risks are considerable, is, then, that forward sales - where they are undertaken at all - have to be limited to a portion only, of the expected output.

Accepting that speculation is necessary in order to broaden the market, the further shortcoming of forward markets is that, being essentially markets in actual produce, it is less easy to operate on them without some expertise in the physical produce. This is very inhibiting to financial interests which therefore makes for a narrower market. Moreover, whereas there is nothing to prevent speculators from buying produce in the hope of a subsequent rise in its price (i.e. "bull" speculation) "short selling", i.e. selling contracts in produce which the seller does not possess, in the hope of a subsequent fall in price (sometimes known as "bear" speculation) is extremely risky on forward markets. This is especially true when commercial stocks of the commodity are not very high. This is because it is easy in these circumstances for other market traders to buy up such stocks as exist in order to create an artificial scarcity which drives the price up, that is, the wrong way for the bear speculators. The bears then have to cover themselves at a loss, while the operators who have imposed the squeeze make profits. There are, however, many examples from earlier times, especially, when those who have "squeezed the bears" have in turn come to grief because the stocks which they needed to buy to impose the squeeze to increase the price, have eventually to be disposed of, which drives the price back down again against them; unless that is, they are very lucky and market conditions

have moved in their favour in the meantime.

(d) Futures Markets

Clearly, then, hedging on cash forward markets (as they are sometimes called) provided - as indeed they continue to provide - valuable benefits to producers and other sellers and buyers, especially since such transactions in the physical commodity enabled the contract terms to be devised so as to suit the producer's and purchaser's exact requirements. These markets can, however, present difficulties for the contracting parties, as already described, which have led, over the years, to the development of futures markets.

In brief, futures markets enable a greater integrity of contracts, and permit widespread accessibility at low cost. This is achieved through the purchase of standard contracts on an organized commodity exchange. It is possible for anyone to enter into a contract on a commodity exchange through the acknowledged channels, and then to offset this when appropriate by entering into an opposite contract. A futures contract is, then, simply a forward contract traded under the rules of an organized commodity exchange, the delivery terms and methods of trading being highly standardized. The contracts are, in other words, promises to deliver a commodity of a stated grade, with an undertaking to deliver at a named location, with specified accompanying services, a unit quantity of a commodity, during a named future period, at a price which has been agreed between buyer and seller. The price is, in fact, the only matter which has to be decided between the buyer's and seller's agents on the trading floor, all other conditions of sale being standardized and therefore not part of the "higgling of the market".

Such a degree of standardization obviously makes the futures markets widely accessible, even to those with little knowledge of the physical commodity. Markets are thus broadened out, it is argued; the speculative interest so engendered making it more effective for hedging purposes. Clearly, therefore, these terminal markets are "paper markets", having perhaps, on first encounter, little to do with the physical processes of growing or mining commodities, storing, processing, and then distributing them. This, however, would be a mistaken view. Financial markets, too, deal in promises (as an examination of say, a tl note will verify!). And like the indispensible instruments traded on financial markets, the crucial element is that futures contracts are in effect saleable to third parties on organized exchanges. However, the very ease with which anyone may enter into the standardized promise which is of the essence of a futures contract, implies a possible shortcoming for the individual transactor. This is that such contracts may quite often not describe exactly the produce which the producer wishes to deliver, or that the buyer wishes to purchase. This is why futures contracts are usually liquidated before maturity; that is, offsetting futures commitments are entered into, to close an "open" position. Futures markets are not, therefore, primarily delivery markets.

Normal hedging action can, however, involve some risk. This is that the price which may have to be paid for a futures contract to liquidate the position, may not correspond to the price for which the seller can sell his physical commodity. This price disparity is known as a "basis risk", which will obviously affect the transactor's return. In seeking to divest himself of price risk, therefore, a producer, for example, has to weigh up the advantages of using the cash forward market against those of the futures market, while considering the disadvantages for his purpose.

By using the forward market he avoids "basis risk" and may find a purchaser who wishes to purchase exactly what he wishes to sell, in terms of time, place and quality. On the other hand, this might prove difficult and, even should such a purchaser be found, the problem arises of ascertaining his creditworthiness. Against this, he has to weigh the far greater integrity which a suitable transaction on the futures market provides, as an accompaniment to concluding a deal in the "actuals" market.

In addition to the use of organized commodity exchanges for purposes of hedging and speculation, the prices established on futures markets are also useful to non-participants in the market. This is because these markets enable the achievement of "price discovery", that is, the determination of prices under competitive conditions, for forward "positions", (i.e. for forward delivery months) up to a year, and sometimes more, ahead. Closing prices are announced by the Exchange authorities each day. Thus, for sugar, for example, during April, prices would be quoted for May, July, September, November, January, March and May. This "price discovery" function of the terminal markets facilitates the scope for "pricing options", i.e. for deferred pricing, a procedure whereby buyers may select, for physical transactions in many commodities, a particular day on which the price is fixed by a formula after the contract has been entered into. Formulas of this sort are often based upon futures market prices, being priced at so many points premium above the relevant futures position to allow for the various transactions costs associated with the sale of the physical commodity.

3. Market Organization

Each market in a commodity exchange is organized by a Terminal Market (i.e. Futures Market) Association of elected members and paid officials, for each of the "soft" commodities (i.e. non-metal commodities) while the London Metal Exchange (L.M.E.) has its own Committee responsible for the conduct of business. One of the main issues for all these bodies must, clearly, be the suitability of the contract. A futures contract must, as previously mentioned, be highly standardized, and transactions in it have to be closely circumscribed by various rules and safeguards. Thus, the contract must not be exclusively for one quality or grade of a commodity, but, rather, what is known as a "basis" contract which permits delivery of qualities other than the standard grade, at an appropriate premium or discount. It is also devised, when appropriate, so as to cover a range of places for possible delivery and considerable latitude as far as period of delivery is concerned; usually a delivery month, except for L.M.E. contracts.

Such considerations are obviously important because futures markets are highly developed and dependent on specialized trading procedures, and so subject to abuses. The prevention of difficulties, such as "corners" and "squeezes" should there be an artificially contrived scarcity of supply is obviously an important issue. The right to tender the actual commodity, or to demand it in fulfilment of a futures contract, is - as it must be - a feature of every futures market, since it is by this means that the price of "actuals" and of futures are kept in an appropriate approximate relationship with each other. This right to tender the actual commodity in fulfilment of a futures contract, or to demand delivery, may create some difficulties, as has already been mentioned. It is, however, one of the functions of the market clearing

system to arrange for the disposal of such tenders, should the brokers acting for their clients not do so. Clearly, then, the committees of the Associations responsible for each market, which draw up contracts and deal with grading issues, are essential to organized commodity exchanges, as are their arbitration panels which settle disputes as to the quality of the commodity tendered, and so forth.

The market Associations are also responsible for the regulation of admission to the exchange floors. The purchase or sale of futures contracts is effected through broker firms who are members of the exchange. Trading on the floor of the exchange is conducted by floor traders who trade for their own account, and by floor brokers who execute orders on behalf of their clients. Bargains are struck by "open outcry" of these floor traders - bidding, counter-bidding and accepting at astonishing speed, often amidst a frantic uproar - around a trading ring (known as a "pit" in Chicago). For the purposes of such trading, numbers have to be limited, and it is the Association concerned which decides upon the floor membership. These "seats" as they are sometimes called, are bought from the organization and are resold by retiring members.

The Associations prescribe the hours of trading, and supervise the "kerb trading" which takes place outside the official market times, whether on or off the floor. Most markets are 'called over" once or twice a day by a chairman or an equivalent controller, hence the term "Call Markets" sometimes used to describe this form of trading. The bargains struck during ring trading are illuminated on a display panel and also available in brokers' offices and further afield on video screens. Thus, information concerning latest prices and quantities sold for each forward position can be perused at a glance both on and off the market floor. As previously remarked, official closing prices, as determined by a sub-

committee of the Association concerned after the market has been "called over", are particularly important and are often widely used, as described, as a guide for pricing transactions in physical commodities.

Even more important is the function of official prices for purposes of market clearing. A clearing process is obviously an essential and integral feature of a futures market. When, exceptionally, a contract is allowed to run to maturity rather than liquidated by traders, the clearing organization, as mentioned, arranges for settlement by delivery of the actual commodity. Other than this, the main function of clearing is to calculate the difference in price of matching purchases and sales to be settled, and to effect such settlements. In essential particulars, all clearing processes operate in this way, for which purpose the announcement of official prices on which these calculations must be based, is evidently essential.

Beyond these features, common to all clearing organizations, two different types of market organization may be distinguished, namely clearing-house markets and principals' markets. As will be explained in more detail in connection with a description of London's terminal markets, the International Commodities Clearing House Ltd. (I.C.C.H.) is the clearing house for transactions in "soft" commodity futures. By contrast, the London Metal Exchange is a principal's market, having implications for the system of clearing, which is a separate one.

It is the practice on clearing-house markets not only for brokers, but also their major clients, to become members of the clearing house. "Original deposits" (called "initial margins" in the U.S.A.) usually of no more than 10 per cent, are required from all clients when they buy or sell

a contract through their floor members. When it is desired to control speculation, however, larger deposits may be required. When prices move adversely for a client, the clearing house will call for a "variation margin" from him to cover changes in the price of his "open" contracts (i.e. contracts which he has not "closed-out" by means of an offsetting transaction). Should a contract not be kept "fully margined" by the client when these additional margins are required by the clearing house, it is terminated by this body which, if the margins already paid by the client are insufficient to re-imburse the other party to the contract, must itself supplement the outstanding sum. Conversely, when prices move favourably for a client, his margin deposits will be reduced by the amount of his variation margins, though an amount equal to the original deposit will always be retained in case of default. By this method of operation, the clearing house is able effectively to guarantee the performance of the contracts which it clears. These features obviously represent a considerable advance over the use of forward markets as a secure means for both hedging and speculating.

On principals' markets, by contrast, no guarantees against default are provided by the market organization, members themselves being fully responsible for their own contractual obligations. No variation margins are required between ring-dealing members, since each contract is guaranteed by them as principals (though their clients will usually be asked for margin payments). On principals' markets, therefore, entrants are required to provide proof of satisfactory financial standing before acceptance. The number of ring-dealers on such markets has to remain small in order to retain confidence in one another's ability to honour contracts. As already noted, the London Metal Exchange is the best known principals' market, on which the maximum number of dealers is restricted to forty, though at present the actual number is less than this. (Though

it still remains a principals' market, the procedures of the L.M.E. have been modified somewhat of recent years to enable the trading positions of members to be monitored on behalf of the Exchange, by I.C.C.H.).

4. Trading on the Commodity Exchanges

Introduction

There is no straightforward answer to the question "Should I be using the futures markets?" or to that of "How should I best use the futures markets?". As far as individual producers or traders are concerned, the answers will depend upon their outlook. Thus, some may feel that they can best use their particular skills if they are spared the problems which arise from price changes, even if this means that favourable, as well as unfavourable, changes are avoided. Others, by contrast, may view price fluctuations not as a problem to be avoided but as something which can be turned to advantage through accurate anticipation; the latter preferring, in other words, to back their judgement against the market. Even though these may for example be producers or merchants, such individuals then become speculators. Unless they are protected by some other means, in other words, every producer, merchant, manufacturer, etc. who has not hedged his stocks or fixed-price commitments, is arguably - and however unwillingly - a speculator.

There are, of course, a number of sound reasons for not using the futures markets. In the first place, there are some acceptable alternative ways of avoiding price risks, though some will be unable to make use of these. The chief possibility is for a trader to so adjust his commitments and orders as to reduce or eliminate any price risk. An extreme example of such behaviour would be the ability on the part of a merchant to negotiate the purchase and subsequent sale of a parcel of a

commodity so that both prices are tied to the price ruling on a particular day. By so doing, the merchant would be assured of his margin and thus faces no price risk. However, all that has really been accomplished is the transfer of the risk either to his supplier or to his customer. In effect, the merchant will have assumed the role of a broker. A less extreme possibility is evidently that of ensuring that the volume of stocks on which there is a price risk is as small as possible. Unfortunately, it is likely that in both cases the trader will lose much flexibility in operation and this may affect his business adversely.

A further alternative to the use of terminal markets is the adoption of various accounting methods to average out price fluctuations over a long period. In essence, however, these are only book-keeping exercises to spread out price risks, and cannot alter a trader's real cost or competitive position.

Even if a trader is unable to take steps to avoid price risk, it does not necessarily follow that he should make use of the futures markets. Their use carries certain disadvantages and, though their importance will vary in the assessment of different individuals, these may be felt to outweigh the benefits derived from using the markets. The principal disadvantages are as follows:

(a) The pecuniary costs which will be incurred from two sources:

(i) Brokerage charges,

(ii) Original margins and subsequent margin calls.

Though (ii) itself does not represent a true cost, since any amounts deposited are used to offset the final settlement, provision of the necessary capital does, of course, involve a real

cost.

(b) A user of the terminal market will have to carry out a certain amount of research to begin using the market, and to keep abreast of developments, market intelligence, etc., and this in itself constitutes a cost.

(c) Few hedging operations are ever perfect, so it must be accepted that the use of futures will result in incomplete cover. Clearly, the degree of imperfection relative to the risk of price fluctuations will determine the usefulness of the market in a particular case.

It will be evident that (a) and (b) above may be regarded together as the cost and inconvenience of using the futures market, while (c) arises from the imperfections of the market itself. In the case of a particular market user, (a) and (b) are to some extent quantifiable at the outset, but (c) will generally remain uncertain.

Types of Futures Market Operation

(a) Conventional Hedging

This is the type of activity with which any introduction to this subject must be mainly concerned, in addition to which it forms the basis for certain other forms of hedging. As explained above, the essence of conventional hedging is to match every physical commitment with an exactly opposite futures commitment, in the expectation that the parallelism of the two prices will eliminate price risk. The accompanying table shows how this might be achieved. In this example, the spot and futures prices were not equal either at the start or finish of the transaction, but because the basis was the same throughout it constitutes a perfect hedge.

(The "basis", it will be recalled, is the price disparity between the physical and the futures price, which is £5 per tonne in the example in Table 1 on page 99.)

By contrast, Table 2 (page 99) shows a less than perfect hedge, due to the change in basis between the start and finish of the transaction. Though in this case the "imperfect" hedge resulted in a profit of £200, this could equally well have been a loss of £200, so that imperfect hedges should generally be regarded as unfavourable.

(b) Carrying-Charge Hedging

Hedging of this type is appropriate to a market user who holds a commodity for profit. Unlike conventional hedging, which relies for its effectiveness on the parallelism of spot and future prices, the essence of this type of hedging is its reliance on changes in these relative prices. Consider the following examples.

Example 1

Suppose that in, say, October, a grower or a merchant has a stock of some commodity for which the spot price is £50 per tonne. He intends to retain the commodity until January, for which month, the forward futures price is £40 per tonne.

Clearly, the spot price is at a premium to the futures price. (This situation is referred to as a "backwardation", and the basis is referred to as a "risk premium".) It is to be expected that by maturity the two prices will be equal; this may be achieved by a fall in the spot price, by an increase in the futures price, or a combination of both. Suppose

TABLE 1

An Ideal Conventional Hedging Transaction

		Futures Market Transaction	Physical Market Transaction
Month 1			
(i)	Purchase 100 tonnes of the physical commodity at £60 per tonne		£6,000
(ii)	Sell 100 tonnes of futures in the commodity at £65 per tonne	£6,500	
Month 4			
(iii)	Sell 100 tonnes of the physical commodity at £55 per tonne		£5,500
(iv)	Purchase 100 tonnes of futures in the commodity	£6,000	
		+ £500	- £500

TABLE 2

An Imperfect Conventional Hedging Transaction

		Futures Market Transaction	Physical Market Transaction
Month 1			
(i)	Purchase of 100 tonnes of physical commodity at £60 per tonne.		£6,000
(ii)	Sell 100 tonnes of futures in the commodity at £65 per tonne	£6,500	
Month 4			
(iii)	Sell 100 tonnes of the physical commodity at £55 per tonne		£5,500
(iv)	Purchase 100 tonnes of futures in the commodity at £58 per tonne	£5,800	
		+ £700	- £500

that this last possibility prevails. The situation is then as summarized below:

Spot Market		Futures Market	
Stock held on 1st October tonne	£50 per tonne	Futures sold on 1st October	£40 per tonne
Stock sold on 1st January	£45 per tonne	Futures bought on 1st January	£45 per tonne
Loss on spot	£5 per tonne	Loss on Futures	£5 per tonne

Thus, by storing the commodity, the grower or merchant has lost £10 per tonne.

Example 2

If, however, the spot and futures prices in January had been reversed, that is, £40 and £50 per tonne respectively, the situation would have been very different. In this case the futures price is at a premium to the spot price, the difference being referred to as the "carrying charge". Once again it is to be expected that the two prices will equate as maturity approaches, and the situation is as follows:

Spot Market		Futures Market	
Stock held at £40 per tonne		Futures sold at £50 per tonne	
Stock sold at £45 per tonne		Futures bought at £45 per tonne	
Profit on Spot	£5 per tonne	Profit on Futures	£5 per tonne

Net Profit = £10 per tonne

In this example, because the spot-futures basis represented a carrying charge the merchant was assured of a profit, provided that the two prices equated as maturity approached. Note that the profit does not depend upon an increase in the spot price. The same result would have been achieved if the spot price had fallen, provided the spot and futures prices had ended up equal. This is illustrated by the third example.

Example 3

Assume spot price to fall to £35 per tonne.

Spot Market		Futures Market	
Stock held at £40 per tonne		Futures sold at £50 per tonne	
Stock sold at £35 per tonne		Futures bought at £35 per tonne	
Loss on Spot	£5 per tonne	Profit on futures	£15 per tonne

Net Profit + £10 per tonne

It is clear, therefore, that regardless of what happens to absolute prices, it is possible to hedge profitably provided that relative prices are favourable, the profit being equal to the carrying charge when the hedge is placed. Obviously, then, for a grower, trader, or financial institution wishing to store for a profit, the correct course of action is straightforward: if there is a carrying charge basis of sufficient magnitude, the grower or merchant simply needs to store and hedge. Should the carrying charge not be of sufficient size, he - or the organization holding the commodity - would be well-advised to sell.

(c) Operational Hedging

Unlike carrying charge hedging, the essence of operational hedging is

that it is carried out incidentally to some other activity, such as manufacturing, milling, grinding, fermenting etc. It is distinguished by the fact that because each hedge is assumed to be placed and lifted within a fairly short space of time, it should be possible to ignore changes in the basis and hence the undesirable effects which these bring. Because the length of each hedge is short, the absolute price risk will generally be small, and so this alone may be insufficient to explain this type of hedging. Of considerable additional advantage, however, is the fact that such hedging will enable the grower or trader to ignore absolute price levels when making his regular purchases or sales. Instead, he can concentrate on the price of the commodity relative to the futures price. Thus, even if purchases are made at a time of very high absolute prices, a hedge should provide protection against any price decline before the sale of the processed commodity, thereby facilitating regular purchases.

(d) Selective or Discretionary Hedging

As the title suggests, this type of hedging is characterized by its intermittent incidence. The trader, or grower etc., in other words, hedges, or refrains from doing so, according to his view of the market, i.e., his hedging is selective. For example, a grower or fabricator say, who is "long" of a commodity (i.e. who holds stocks) may welcome price changes when the trend is upwards, and will therefore not hedge. But when he anticipates a price fall, he will wish to avoid losses by hedging if no other means - such as a reduction of stocks - are available. Thus, the purpose of this type of hedging is to avoid loss rather than to avoid or reduce risk. Clearly, selective hedging is essentially similar to conventional hedging and will depend for full effectiveness on the parallelism of spot and futures prices.

(e) Anticipatory Hedging

All the futures market activities considered so far have assumed that the trader has some firm (short or long) physical commitment which he wishes to protect. However, circumstances may arise where a trader has no such present commitment but foresees purchase or sales requirements which could most favourably be transacted at current prices. One solution is to enter into a futures contract as a temporary substitute, thus securing the benefits of present prices. An example of this would be a grower (or a selling organization) with a crop yet to be harvested, who feels that present prices are higher than those likely to be obtained at harvest. By means of sales of futures approximately equal to his estimate of the likely harvest, he can "lock-in" to the present price. Once again, this operation obviously depends, for full effectiveness, upon the parallelism of spot and futures prices.

(f) Procurement or Disposal

As will already be clear from the description of the regulations governing the trading of futures contracts, it is possible to use terminal markets to procure or to dispose of physical commodities. All that is required is to enter a futures commitment in the usual way and to omit to "close-out" the contract before maturity. If the transaction involved was the sale of a futures contract, then clearly, it would be necessary to deliver the physical commodity in fulfilment. Conversely for the purchase of a futures contract: failure to "close-out" will result in the tender of the commodity to the holder of the "open" position at the maturity of the contract.

Obviously, growers or traders wishing to dispose of a commodity via the terminal market will be in a much more favourable situation to use

this facility than traders using the market for procurement purposes. This is because, in the case of disposal, delivery can be made of the available grade of the commodity, at the most convenient delivery point (where a choice of points is specified on the official association contract forms). Where the terminal market is used for procurement, therefore, the obverse side of this coin is that a trader may well receive what is for him an inappropriate grade of the commodity in fulfilment of such a "basis" contract. Nevertheless, as previously indicated, procurement and disposal on futures contracts remains an important potential function because it provides the essential link between the physical and futures markets. In addition, to tender or to accept delivery of a physical commodity in fulfilment of a terminal market contract may be a useful possibility which in certain circumstances may prove the most profitable alternative.

How the Futures Markets may be used by Primary Producers

Extractive industries are not affected by the seasons, whereas many crops are harvested so that markets are affected by peaks and troughs of supply. Notwithstanding this, farmers, cooperatives and other marketing institutions can use the futures markets throughout the year. It is, of course, important to realize, particularly because most hedges are imperfect, that the use of the terminal markets will not relieve producers of all uncertainty, but they should enable them to ensure an acceptable minimum price for their crops or other commodities, under market conditions.

Let us consider a harvested crop, firstly in the pre-harvest situation. For a grower (or his cooperative, etc.) to achieve an acceptable return, the crop will have to be sold for a certain minimum price. However, in the absence of a futures market (or forward

contracting) there is no way in which a farmer can be sure of receiving this price. By using the futures market for anticipatory hedging, a minimum (or "target") price can be assured. For example, a grower with a crop in the ground which is expected, say, to yield 500 tonnes, may need to receive a price of £57 per tonne in order to make a satisfactory return. If he, or his agency, knows that in normal circumstances he would be able, at harvest time, to sell his crop for, say, £1.50 per tonne below the prevailing price for September futures - or whatever happens to be the harvest month - then at any time before harvest that the September futures price rises to £58.50 or above, he has only to sell a total of 500 tonnes of futures to ensure the minimum price of £57. If, after he has done this, prices for the new crop fall, the farmer (or agency) can plainly be seen to have acted wisely.

Suppose the price for the new crop falls to £55 per tonne, and the produce is sold at this price. As expected, the futures price also falls, to £56.50, and the futures are bought back at this price when the physical produce is sold. Thus, on the futures transaction he makes £2 per tonne and this, added to the price received for the physical commodity, gives the desired return of £57 per tonne. Should it transpire that, at harvest, spot prices are depressed relative to futures, the farmer has the option of tendering under the futures contract instead of selling on the open market. With a price decline he obviously acted wisely, but what if prices had risen? If the produce had sold at harvest for £60 per tonne, he would have had to buy back the futures at £61.50. This would entail a loss of £3 per tonne on the futures which, subtracted from the physical price, still leaves the desired return of £57 per tonne.

The above example serves to illustrate that, using this simple method

of hedging will only ensure a minimum price; it cannot maximize returns in the sense of ensuring that the best possible price is received, and does not therefore remove all uncertainty.

A modification of the simple hedging procedure is to reverse the original transaction as soon as it appears that prices are rising. In the last example the grower, as soon as he realized that prices were on an upward trend, could have bought back the futures, say at £59.50. This would have meant a loss of £1 per tonne on futures, but when the crop was sold for £60 per tonne the net return would have been £59, i.e. £2 per tonne better than had futures been held until harvest.

While the simple hedge required a certain amount of judgement to decide when to enter the transaction, the use of a policy of reversals requires an even sharper appreciation of price trends. The reversal procedure could, of course, be carried out more than once in response to changes in expectations, but to do so too often leaves the grower acting more like a short-term speculator than a hedger, and may still not result in any particular advantage.

Secondly, we consider the grower's position, or that of the agency which sells his crop, after it has been harvested. The choice here is between selling the produce immediately or storing it for later sale. Normally, this decision will depend on (i) availability of storage facilities, (ii) price expectations, (iii) the grower's liquidity position.

In this situation, conventional hedging of a stored commodity will achieve nothing, except to ensure that the present price is obtained when the produce is eventually sold. Clearly, since some return from storage

is to be expected, this is not acceptable but a satisfactory return can be ensured by embarking on carrying-charge hedging. As an example of this, assume that in September, say, (after the crop has been collected) the spot price is £57 per tonne, and March futures stand at £63. Even if it is known that futures usually close at £1.50 above local prices for this particular grade of the commodity, a return of £4.50 per tonne can still be made by storing the produce until March, provided relative prices behave as expected, and regardless of whether spot prices rise or fall. If this is considered an acceptable return, the produce should be stored and hedged; if not, it may well be best to sell it. Note that hedging of this sort is what economists call satisficing behaviour; a fixed return is guaranteed by foregoing the possibility of a higher - or lower! - return from unhedged spot price changes. A grower seeking to maximize his return on the commodity would have to decide on price trends and use his judgement as to when to sell.

Anticipatory hedging might be employed where produce has to be sold immediately due to lack of storage space or because the cash is needed, but where the grower judges that prices will rise substantially. In this case he may buy futures to replace the physical crop, in anticipation of the rise. Since this holding is not matched by any physical commitment, it serves to illustrate the indistinct nature of the division between hedging and speculation.

Hedging a stored or growing crop may also help improve a grower's liquidity position by making finance more easily available. Offsetting this, however, are the costs of using the market; margins in particular may present problems because with a selling hedge in a rising market they may amount to a considerable sum. An additional difficulty is that when

hedging before harvest, the quantity to be hedged is - within certain limits - uncertain, due to the variability in yields. There is ample evidence that when growers do make use of hedging before harvest in the way suggested (as for example many grain farmers do in North America, Britain and elsewhere) their use of the futures markets is combined with a large element of judgement, so that hedging as such is only actually used when harvest-time price expectations are relatively poor.

Futures Markets' Use by Merchants or Shippers

As is the case with growers, many variations of ways that merchants can use terminal markets exist, but we will deal only with the principal types of transaction.

For merchants, futures market uses will generally be of the conventional or operational hedging type, though there may be some carrying-charge hedging. Essentially, a merchant using the futures market will wish to divest himself of price risk (which may arise in a number of ways) by hedging his commitments. Thus, for example, suppose a merchant agrees to buy forward from a grower, prior to harvest, at a fixed price. This relieves the grower of any price risk, but the merchant, of course, now faces the danger of a fall in price before he can find a buyer, a situation which he overcomes by hedging in futures. If the produce is sold again immediately, the hedge can be lifted, but if not, the hedge will be maintained until the produce is eventually sold.

Conversely, a merchant may agree to supply a commodity, which he does not at the time possess, at a fixed price, in which case he is once again carrying a price risk. As soon as the transaction has been entered into, the merchant can cover his risk by buying futures, which he would normally hold until he has bought the physical commodity with which to honour his

agreement.

In both these cases the merchant has succeeded in divesting himself of price risk (in the one case of a fall, in the other of a rise) so that he could then concern himself with a satisfactory margin by buying and selling at the appropriate differences from the futures price, and watching for changes in the basis.

Going a step further, prices may be explicitly fixed relative to the futures prices, so that customers could be offered the price at which to conclude a transaction.

More generally, merchants may wish to hedge stocks of the commodity which they hold, whether on a short- or long-term basis. If a merchant stores produce specifically to make a profit from storage, he may wish to ensure a satisfactory return by employing carrying-charge hedging. He will then decide whether to store by reference to the basis.

Naturally, the extent to which a particular merchant uses the market will depend on a number of factors, in particular the size and nature of his trade. Thus, for example, a large merchant who typically carries extensive open positions in a physical commodity (i.e. is either "long" or "short" of it) may feel a strong need to hedge, while a small merchant with no large stock or open commitment will suffer little price risk. Again, a merchant may hedge only when he expects a fall in price; he may only partially hedge open positions in the physical produce or, again, seek to adjust his timing in placing and lifting hedges so as to obtain maximum benefit.

In practice many large merchants do make considerable use of terminal markets; indeed, in many trades it is suggested that merchants represent the largest category of users.

In essence, the futures transactions of commodity shippers is similar to that of merchants.

Futures Markets and Processors

Manufacturers and processors, i.e. crushers, millers, grinders, compounders, smelters, fabricators, etc., have available to them, two broad ways of using the markets though, once again, there can be many variations on the basic methods.

Firstly, it is, obviously, desirable to purchase raw commodities for processing at times when prices are low, but at such times supplies are often likely to be difficult to obtain since suppliers will be reluctant to sell if they expect a rally. Under these circumstances, futures may be bought as a temporary substitute for the physical commodity. When supply becomes easier, the commodity can be bought and the futures sold out, with the net result that the purchaser secures the commodity at a lower price. For example, assume that prices generally are depressed, with the physical commodity at £60 per tonne and the "near-month" futures contract at £65, but with supplies difficult to obtain. Futures can be bought at £65 and then sold at some later date when "actuals" (i.e. the physical commodity) are more readily available. Assume that, when this happens, actuals are £63 per tonne and futures are £68. A profit of £3 per tonne will be made on the futures transaction, which will cover the extra £3 per tonne which had to be paid for the physical supplies. Clearly, this type of hedge depends upon the basis remaining constant.

The second type of use provides for the possibility that, after the commodity has been purchased but before it can be processed and resold, prices fall. This will inevitably exert pressure on the final product price, and if it falls, profit margins will, naturally, be reduced. By hedging purchases, either on a regular basis or only when price falls are anticipated, this risk can be avoided.

In practice, there are a number of considerations which will determine the degree to which this type of hedging is utilized, as follows:

(i) Rigidity of the final product price. If this does not fall in the short-term in line with the price of the primary products being utilized, no loss is suffered.

(ii) Volume of primary product held in relation to turnover: the higher the volume of raw materials held, the larger the potential loss.

(iii) Length of the manufacturing process: a long process, with a considerable volume of work in progress, will mean a larger price risk.

Futures Markets' Use by Livestock Rearers

Rearers of livestock not only face a price risk with their finished product, but also with their raw materials, i.e., their feedstuffs. The possibilities of hedging clearly depend upon the availability of terminal markets in both livestock and feedstuffs, matters which will be briefly examined in the next section.

An important consideration for the rearer is that he will be disadvantaged by a fall in the market price of a large stock of feedstuffs, since his animals may have to compete with animals fed at lower cost by rearers who did not carry a large stock and so could benefit from the lower prices. It will be possible, where feedstuffs are related to grain prices, to hedge stocks of the former on grain futures markets. It then becomes a simple matter of lifting the hedge progressively as the feedstuffs are consumed.

An alternative scenario is that the rearer may make purchases over the production cycle, in which case there is a risk that prices may rise and so increase budgeted costs. The strategy to overcome this by means of the use of the futures market is to purchase futures equivalent to total feed requirements for a particular batch of animals, and then to progressively lift the hedge as the feedstuffs are bought.

Finally, futures can be used as a temporary substitute for the physical commodity when prices are low but difficult to obtain.

i. London's Commodity Exchanges

Until the recent past, London's commodity markets were almost entirely concerned with imported goods, many of which at one time served a significant re-export trade. Clearly, this is not a necessary relationship, but in part the outcome of Britain's commercial history, and in part the result of the growth of specialization in exporting manufactures and the consequent need to import food and raw materials. (Many markets in the U.S.A., by contrast, have always been of mainly domestic interest.) However, while history may provide the basic framework for London's commodity exchanges, new developments, some of

which have led to the establishment of entirely new exchanges, have transformed the scene over the past decade or so. We examine these institutions in turn.

(a) The London Commodity Exchange

The commodities grouped under the umbrella of the London Commodity Exchange Co. Ltd. (L.C.E.) stem mainly from the growth, over a very long period, of a wide variety of tropical and semi-tropical produce. In time, some of these trades, for reasons adumbrated above, developed futures markets. At present the most important of these are sugar, cocoa, coffee, wool and rubber, with vegetable oils having a more chequered history. These markets are organized by their respective trade associations, namely:-

The Coffee Terminal Market Association of London Ltd.

The London Cocoa Terminal Market Association Ltd.

The London Rubber Terminal Market Association Ltd.

The London Vegetable Oil Terminal Market Association Ltd.

The United Sugar Terminal Market Association Ltd.

The London and New Zealand Futures Association Ltd.

The last-named Association supervises a crossbred wool contract set up jointly by the London Wool Terminal Market Association and the New Zealand Crossbred Wool Terminal Market Association. (At the time of writing, however, some difficulties are emerging in this interesting joint-venture.)

Other semi-tropical imports do not have terminal markets, but transactions are concluded, usually by means of c.i.f. contracts, drawn up

by such bodies as the General Produce Brokers' Association. Tea is, of course, very much a separate market, though - despite a number of proposals from time to time - it has no futures market. Both private and public sales (i.e. auctions) come under the surveillance of the Tea Brokers' Association which, together with the offices of some of the brokers and dealers etc., and the auction chamber, are housed separately at Sir John Lyon House, in Upper Thames Street. The London Commodity Exchange Co., many member brokers' and dealers' offices, and the trading-rings for the commodities already mentioned, are situated in Cereal House, Mark Lane, in the City.

The International Petroleum Exchange (I.P.E.) came into being as recently as 1981 as, with the onset of recession and increased output from non-member countries, the Organization of Petroleum Exporting Countries (O.P.E.C.) found it more difficult to dictate world oil prices. The use of producer contracts has consequently diminished dramatically in importance in favour of a far greater use, these days, of the Rotterdam spot market, on which prices fluctuate unpredictably. Though the I.P.E. is called an exchange, it actually operates under the aegis of the L.C.E. Its trading-rings (because more than one type of contract is traded) are situated at Dunster House, Mark Lane, across the road from Cereal House.

(b) The Baltic Exchange

As the nineteenth century progressed, and Britain became increasingly dependent upon imports of basic foodstuffs, London grain and shipping interests forsook their coffee house origins to amalgamate as The Baltic Mercantile and Shipping Exchange Co. Ltd. - popularly known simply as "The Baltic" - built at St. Mary Axe in 1902.

At present, this very large Edwardian exchange-floor houses futures

markets for E.E.C. barley and wheat, pigmeat, potatoes, soyameal and freight futures. Some of these activities are organized by the Grain and Feed Trade Association (G.A.F.T.A.) which has offices adjacent to the Exchange itself. Recently, however, a separate Meat Futures Exchange was brought into being to administer both the pigmeat (carcase) contract and a more recent live-pig futures contract. (The contract unit for the latter, i.e. the "lot", is for 50 pigs of 65 kg. average weight.) Meanwhile, plans are afoot to establish a contract in beef sides.

Thus, whereas the G.A.F.T.A. Futures Association is responsible for the grain contracts, The Soyabean Meal Futures Association and The London Potato Futures Association oversee the contracts in the other commodities. The genesis of the soyabean-meal contract owes not a little to Britain's membership of the E.E.C. and the peculiarities of this organization's Common Agricultural Policy (C.A.P.), the U.S. Government's intervention policies and, of course, the vagaries of the weather. It was this last cause, also, which gave rise to potato futures trading on The Baltic, following the U.K. drought of 1975 and 1976, together with the abnormally severe winter of 1981-82. Potato processing has, too, become an increasingly important industry in the United Kingdom.

Shipping freight transactions have a long history associated with The Baltic, and even ships themselves are, from time to time, bought and sold there. In addition to being a pre-eminent market for marrying-up cargoes with cargo-space availability, since World War II the air-freight market established there has become increasingly important. However, perhaps the most interesting development of all has been the very recent inauguration of the Baltic International Freight Futures Exchange (to be known as Biffex) which has announced the commencement of trade in a freight futures contract from May 1985.

Biffex is interesting in a number of respects, not least because it is the fruit of cooperation from a number of quarters. Bargains - by traditional "open outcry" - are to be concluded on the basis of a Freight Futures Index, the property of The Baltic Exchange itself. The London Commodity Exchange has provided advice from the wide experience of its members; G.A.F.T.A. for its part advised from the standpoint of the commodities handled by it (and which constitute so much of the bulk cargo business) while the International Commodities Clearing House has agreed to act as market clearer - thus adding a further futures market to its clientele. (I.C.C.H. provides clearing facilities for all the London futures markets with the exception of grain futures and the London Metal Exchange. In addition, it has associated companies serving futures exchanges in Hong Kong, Kuala Lumpur, Paris and Sydney.)

The Baltic International Freight Futures Exchange is not unique in employing an index as the basis for transactions, since this is also a feature of some financial futures contracts, as we shall have occasion to remark below. It has, however, taken considerable ingenuity to develop as a useful instrument for present purposes, for the index has been calculated from 13 individually weighted dry bulk-cargo voyages, chosen for their representative character. (The actual or estimated rates for every voyage are supplied by each of eight shipbrokers daily.) Should the contract prove a success, futures contracts for tankers and other freight rates will almost certainly follow. The 30 floor members will trade by buying and selling the index, with premiums or discounts reflecting market expectations of whether the Baltic Freight Index (B.F.I.) will rise or fall from the current spot level. Contract units are for up to two years ahead, with four delivery months annually. The index will also be used,

obviously, to calculate cash payments due on any outstanding contracts to buy or sell that have not been closed-out by the four settlement dates each year when the monthly positions quoted expire. This is only expected to happen infrequently, since the purpose is to provide a hedging medium against adverse changes in freight rates. However, since any futures contract has to have the facility either for physical delivery or an equivalent cash settlement, the Index is vital in providing a basis for cash settlement (since freight rates are obviously not deliverable!).

(c) The London Metal Exchange

As domestic non-ferrous metal ore supplies were depleted in Britain with the progress of industrialization, more especially because of the increasingly voracious demands of the "new technologies" of electricity and the internal combustion engine, so U.K. imports grew. The London Metal Exchange, dealing (with some variations over the years) mainly in copper, tin, lead and zinc became correspondingly more important as traders and manufacturers sought to divest themselves of the increased price risk due to overseas supply uncertainties.

Following its release from the control exercised by the U.S. Treasury over silver during the 1960s, a silver contract was introduced on the London Metal Exchange (L.M.E.) in 1968. More recently still, the growing importance of aluminium and nickel and the increase in the volatility of their prices led to the introduction of contracts in these metals on the L.M.E. in 1978 and 1979 respectively. However, despite much opposition to the introduction of the aluminium contract, it has flourished and is now the second most important metal on the Exchange (after copper) in terms of turnover.

Following the pressures which resulted in the abandonment of a fixed

price for gold by the end of the 1960s, and the abandonment of the Bretton Woods exchange-rate arrangements a few years later, transactions in this metal have been subject to considerable risk due to price fluctuations. Accordingly, a joint venture was set up between London gold bullion interests and the L.M.E., to establish a London Gold Futures Market, with a contract traded on the floor of the L.M.E. Unhappily, however, the contract has not found favour, as the result of which negotiations are in train at the time of writing to wind up this market.

Of the commodity markets in London, the Metal Exchange is probably the best known, and the most international. As already remarked, it is a principals' market, with no clearing house as such, though I.C.C.H. these days monitors transactions. It is, moreover, used as a procurement and delivery market to a greater extent than the other London exchanges, an activity more acceptable to participants than would be the case for most "soft" commodities because grades of the physical commodity tend to be fewer in number, making delivery more acceptable.

After very many years at Whittington Avenue, the London Metal Exchange is, these days, housed at Plantation House in Mincing Lane. This is a commodity trading centre originally built for rubber trade interests in the 1930s and which became, for some years after World War II, the scene of the activities of the London Commodity Exchange markets.

(d) Options, Currency Risks and the London Markets

Options are a form of trading which the commodity markets have in common with The Stock Exchange and - from June 1985 - the London International Financial Futures Exchange (L.I.F.F.E.), though this type of bargain has so far remained a minor feature of the commodity scene.

The traditional option contract - and they are still sometimes referred to by the older description as "privileges" - have a very long history indeed. An option confers the right, i.e. the privilege, (but not the obligation) to the buyer to buy or to sell (i.e., to "call" or to "put") the underlying commodity at a price agreed when the bargain is struck, within a specified time limit. For a small premium, the producer, merchant, etc., can lay-off a risk or else speculate on market movements. Let us suppose that a producer who is "long" of a commodity, has straightforwardly hedged the risk of a price fall by selling futures. He can, in addition, grant (i.e. "write") an option which will allow the purchaser, in return for a premium, to "call" the commodity (i.e. to purchase it), at the previously agreed price. The "writer" of the option gains the premium paid to him for the option whether the option contract is abandoned by the purchaser or, alternatively, the seller is called upon to deliver either a futures contract or the physical commodity against it. A trader who purchases an option does so in the knowledge that the premium represents the extent of his possible loss. An option to "put" or to "call" thus acts as an insurance at times when future commodity prices are particularly hard to discern. In London, the traditional type of option contract has long been available for all the soft commodities, with I.C.C.H. both guaranteeing and clearing the contracts.

It is exchange-traded options which are comparatively new. The notion of a traded option in a financial instrument, having been established in the U.S.A. during the 1970s, then crossed the Atlantic and was introduced on The London Stock Exchange in connection with transactions in shares. By this time, however, it has been extended to cover bonds, precious metals, stock indices and foreign currencies. Traded commodity options were first introduced in the U.S.A. towards the

end of 1982 and, during 1983, the London exchanges made a start with the Raw Sugar contract, followed by option trading in copper. To date, however, this form of activity remains a very minor feature of the markets.

The exchange-traded option is a transferable option, which thus permits the development of a free secondary market. This market then determines the changing value of the contract, according to changes in market conditions, until it expires. With the non-tradeable contract, the purchaser's maximum loss is limited to the buying price of the option. By contrast, when the option is transferable even this loss may be reduced by resale. It is likely that most options will be closed-out by offsetting purchases or sales and this possibility may well, in time, attract considerable additional liquidity into the market, but this is not happening as yet. It is argued that exchange-tradeable options clearly have a very significant attraction for the small investor nervous of additional margin calls when he trades directly in futures contracts.

With the breakdown of the Bretton Woods exchange-rate arrangements during the early 1970s and the floating of the world's leading currencies, the costs and risks of trading internationally in primary commodities has obviously increased. It has, moreover, worked particularly to the disadvantage of producers. Following these changes, it became much more difficult to find some unit in which to quote world commodity prices, and more necessary to cover exchange risks. The cost of laying-off such risks, however, increased with the greater instability in exchange rates as exchange rates became quoted with larger forward spreads, while dealing margins, too, tended to increase. These changes have borne particularly hard upon primary producers if, by selling in many markets they need to

cover exchange risks in a larger number of currencies than purchasers do. Moreover, the tendency is for developing country producers to have less expert representation in the world's main financial centres, thus adding further to their difficulties.

Quite simply, then, in summary, volatility in exchange rates implies that the producer selling on international markets without protection can not be sure as to the returns he will obtain for his produce, while the buyer faces the uncertainty of not knowing precisely what he will be called upon to pay when it comes to buying foreign currency to do so. Both, in other words, need to protect themselves, ideally, against swings in the price of money, as well as of commodities. As ever, the actual scenario is somewhat different from the theoretical picture. In practice, most of the international trade in commodities is invoiced in U.S. dollars, regardless of the currency in which market prices are denominated in individual countries (though there are, of course exceptions, such as tea, and wool). Because of this, commodity prices the world over change to reflect the price in the base currency [1] with, of course, leads and lags, since the process is not perfect. Recent experience suggests very strongly that when currency prices are sufficiently volatile, they dominate other influences which go to determine prices. Thus, on markets around the world, the crucial issue for commodity prices at the time of writing appears to be the likely future exchange-rate of the dollar.

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1. An example serves to illustrate the point. In London, three months copper was about £1,000 a tonne at the start of 1984, and £1,150 per tonne a year later. In March 1985 it peaked at just under £1,300 a tonne and, as sterling appreciated, fell back again to £1,200 by early April. In New York, price movements were almost exactly the reverse of this over the same period. They declined from 65.75 cents a pound when the London prices were rising, and, with the subsequent appreciation of sterling, then recovered to 65 cents a pound.

Traditionally, the method of laying-off currency risks is through the forward exchange market. The commercial banking system provides this service for clients. The banks themselves, in their turn, use the London interbank forward currency market, which is very well developed. However, of recent years even more sophisticated methods of laying-off currency and interest rate risks have become available. The institutions which provide this facility are The Stock Exchange and the London International Financial Futures Exchange (L.I.F.F.E.) which opened in the Royal Exchange in September 1982, having been inspired by the financial futures contracts introduced in the early 1970s by the Chicago Board of Trade and Chicago Mercantile Exchange.[1]

The techniques involved in financial futures trading are essentially similar to those of commodity futures trading. The contracts consist of standardized amounts of a specific financial instrument, for which the parties enter into a simultaneous right and obligation to buy/sell at a price agreed between them. Contract units of £25,000 in the case of the

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1. The London International Financial Futures Exchange is an organized market for which I.C.C.H. provides the clearing. The contracts consist of standardized amounts of financial instruments. There is, for example, a Eurodollar contract (trading units $1 million). A "long-gilt" is also traded, the underlying "commodity" for which is a basket of gilt-edged stocks of between 15 and 20 years to maturity, any one of which is deliverable. Trading is conducted in terms of a notional 20-year stock with a 12 per cent coupon, and £50,000 nominal value. To allow for differences in maturity and coupon from the notional stock, each stock in the "basket" has a "price factor" which, when multiplied by the futures price, gives the quantity required for delivery.

   L.I.F.F.E. and its contracts are evolving rapidly. Thus, for example, a Stock Index Futures has recently been introduced, reminiscent of the Baltic Freight Index described above. Unfortunately, a full discussion of the uses of L.I.F.F.E. takes us far beyond the subject-matter of the present study.

currency contract, with standardized maturity dates, means that they are readily tradeable and hence highly liquid. A currency futures market is - as is true for commodities - thus more sophisticated than a forward market, the forward contracts on which can not always be readily unwound (i.e. tradeable), since they may be for any quantity of money and for any date. Cancelling the transaction on a forward market requires agreement with the original contracting party, whereas the standard futures contract can be sold to a buyer other than the one with whom it was first concluded. The upshot of this greater sophistication should, among other things, clearly be keener rates.

All currency contracts, viz. for sterling, deutchmarks, yen and Swiss francs, are expressed in U.S. dollars and, as previously mentioned, much trade in raw commodities is also transacted in dollars. The producer/exporter may, for example, consider that he is taking an unjustifiable risk that his profit margin may be eroded should there be a decline in the price of dollars viz a viz, say, sterling by the time he receives his money. If so, he can hedge his position. Suppose, for example, that an exporter sells commodities for an agreed sum of $300,000 in February, but is nervous about the value of the dollars he is due to be paid in April. With each contract unit at a standard value of £25,000 and a dollar value of $37,500 (£1 = $1.50), he accordingly buys 8 contracts, with a sequence as follows:

Cash Market	Futures Market
10 February	
Commodity exporter sells goods for an agreed sum of $300,000. Spot Exchange rate is £1 = $1.50 Sterling equivalent = £200,000	Buys eight 4 June sterling futures at £1 = $1.50 for a cost of $300,000 = £200,000.
10 April	
Exporter receives $300,000 Exchange rate £1 = $1.45 Sterling equivalent = £206,896	Sells eight 4 June sterling futures at £1 = $1.45 for $290,000, i.e. a loss of $10,000, or
Gain = £6,896	Loss = £6,896

As will be evident from this example, his fears were not realized, for the dollar hardened against sterling between February and April, from £1 = $1.50 to £1 = $1.45. Thus, with his $300,000 he makes a gain on the cash sale, of £6,896. This, in the usual way, is offset by a loss (of £6,896) on the futures market. In the example, the hedge is a perfect one, so that his final position is one of zero gain (or loss) but he has safeguarded his margin on the physical trade. As will be recalled, an imperfect hedge owing to a change in basis results in either some residual gain or loss on a hedge.

In the summer of 1985, L.I.F.F.E. hopes to introduce traded options for some financial futures contracts in which it deals, starting with the dollar. (Currency options trading already exists in North America and the Far East.) Again, the principles of operation are identical with the traded options in commodities already described. For a small premium - much less of course than the cost of the underlying financial commodity (i.e. the currency involved) - a participant can either divest himself of (most of the) risk involved in fluctuating currencies, or else speculate upon market movements. For this premium, the trader buys the right either to "put" (i.e. to sell) or else to "call" (i.e. to buy) the currency concerned at the exchange-rate agreed when the bargain was entered into. While the investor may lose his premium should he decide that it would be unprofitable to exercise his option, the advantage of protecting himself in this way is that he knows from the outset what his maximum loss can be. On the other hand, should market movements prove profitable for him, he stands to earn possibly several times his outlay on the option premium. In brief, while the downside risk is limited (and more easily quantifiable than the margin requirements of futures contracts) the upside potential is unlimited.

Up to the time of writing, however, currency futures contracts themselves have not been a notable success on L.I.F.F.E. Despite this, it is to face competition from the London Stock Exchange (L.S.E.) from May 16th 1985, when the L.S.E. starts trading on its new Currency Options Market, thus stealing a march over L.I.F.F.E. which is not due to open its currency options market until June 17th (Life Options p.l.c.). Both start with a dollar-sterling contract. It remains to be seen, therefore, whether tradeable currency options will be successful. They appear to be making progress on the Philadelphia Stock Exchange which originated them (in December 1982) and on the International Monetary Market (part of the Chicago Mercantile Exchange). The latter trades a dollar-deutschmark contract, while The European Options Exchange at Amsterdam trades a dollar-guilder contract.

In the meantime, some banks in both London and New York have stepped into the breach by writing currency options for their corporate customers. This is not, of course, the same operation as trade in a standardized contract on an organized market, but has, nevertheless attracted a very considerable demand.[1]

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1. The first banks in this field include Barclays and Hambros, Hill Samuel, Citibank, Lloyds, Bank of America and International Treasury Management (a joint venture between the Hong Kong and Marine Midland banks).

   Like those already described, these options can be either to "put" or to "call". Moreover, a distinction is made between a "European" option and an "American" option. The former generally has a fixed exercise (i.e. expiry) date, whereas the latter can be exercised at any time up to its expiry date. (Banks are prepared to consider writing options over different periods, whereas on the exchanges, contracts are for three, six, or nine months.) These institutions will quote for either "European" or an "American" type of option, as well as for any reasonably widely traded currencies.

   The institutions striking the option bargain must decide where to pitch the strike price, and whether to base it on the spot or forward rate. This will partly depend upon the volatility of the exchange rate, and normally takes into account the risk felt to be involved. The life of the option is another factor in the evaluation, for the longer the option has to expiry, the greater the risk to the writer.

6. Trends and Prospects

(a) International Competition

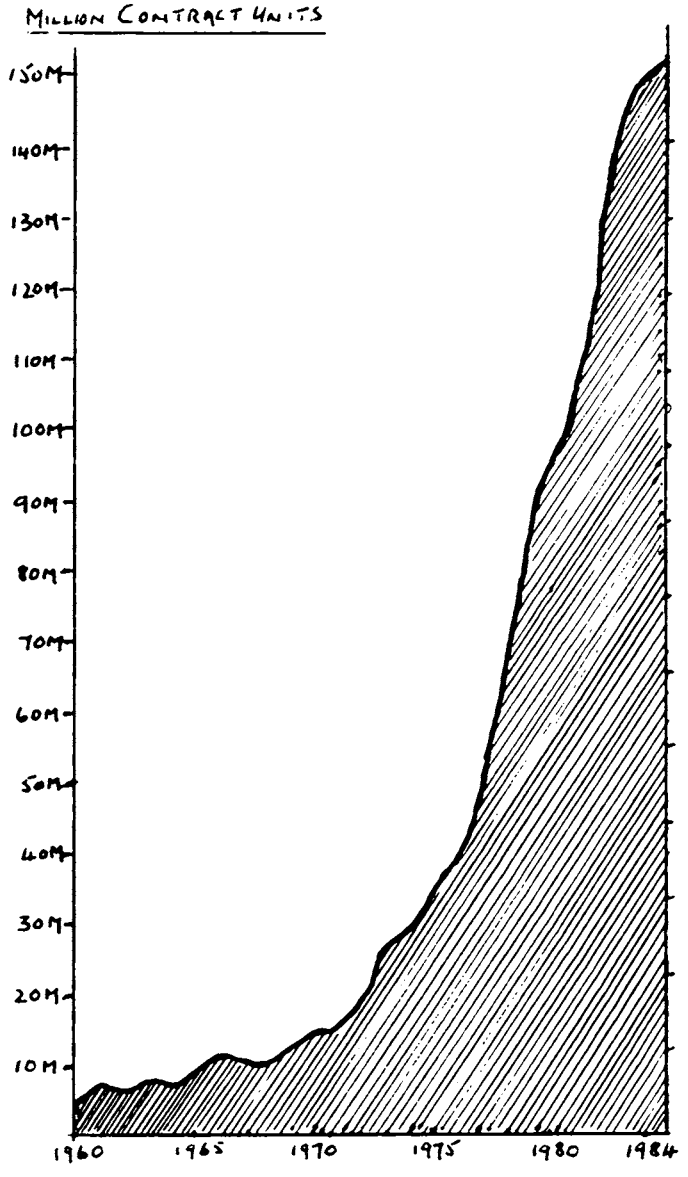
As we indicated in Part 1 of this study, the decade of the 1970s was a period of inflation, of increased exchange-rate and interest-rate instability and commodity price volatility. Because of this growth in uncertainty, business was correspondingly brisk on the world's commodity exchanges, as traders sought to lay-off risks and speculators were attracted towards active markets. The figures on the accompanying tables provide some illustration of the present size of the markets.

During the 1980s, however, the situation has been changing quite rapidly. World trade has been in recession and inflation in all the major trading countries has been reduced to more manageable proportions, though the uncertainties surrounding interest- and exchange-rate movements are as impenetrable as ever. As far as the future of London's exchanges are concerned, clearly, recession is an adverse influence for the level of turnover, with uncertainty playing the opposite role. These, however, are not by any means the only considerations involved for London itself, which has to face considerable competition from other commodity exchanges overseas, notably in North America, but increasingly, too, from the exchanges in Asia and elsewhere. The phenomenal growth of the U.S. markets is indicated in Chart 3 (p.127); Table 3 (pp.128-130) shows the present size of some other overseas exchanges as well as of the London market.

Any detailed examination of the U.S. exchanges would obviously take us far beyond the remit of the present study. Very broad orders of magnitude may however be gleaned from the following figures: in 1983, if we subtract the financial futures - which started much later in London - commodity futures market turnover in London was some 9.2 million "lots" and 88.8 million "lots" on the U.S. exchanges. A detailed examination

CHART 3

VOLUME OF FUTURES TRADING IN THE U.S.A.



Source: Futures Industry Association.

The graph shows a vastly increased rate of growth since c.1970, to reach 149.4million for 1984. The figures include financial futures turnover.

TABLE 3

London Commodity Market Trading Volumes:

Turnover for 1984

(a) L.C.E./G.A.F.T.A./L.G.F.M.

	Lot Size	Lots
Cocoa	10 Tonnes	1,317,706
N.Z. Crossbred Wool	2,500 Kilos	31,720
Robusta Coffee	5 Tonnes	948,117
Gas Oil	100 Tonnes	535,495
Raw Sugar (No. 4 Contract)(1)	50 Tonnes	87,610
Raw Sugar (No. 6 Contract)	50 Tonnes	663,750
White Sugar (No. 5 Contract)	50 Tonnes	16,546
Rubber	15 Tonnes	9,565
Rubber	5 Tonnes	1,687
Potatoes	40 Tonnes	196,581
Soyabean Meal (100 Tonne £ Contract)	100 Tonnes	19,321
Soyabean Meal(2) (U.S. $ Contract)	100 Tonnes	29
Soyabean Meal(3) (20 Tonne £ Contract)	20 Tonnes	27,938
Pigmeat(4) (50 carcases each of 65 Kilos)		24,263
Gold (U.S. $ Contract)	100 oz. Troy	93,266
		3,973,594

Notes: L.C.E. = London Commodity Exchange; GAFTA = Grain and Feed Trade Association; L.G.F.M. = London Gold Futures Market.

(1) Raw Sugar No. 4 Contract expired 30/4/84.

(2) The Soyabean Meal U.S. $100 Tonne Contract expired 22/8/84.

(3) The Soyabean Meal 20 Tonne £ Contract commenced trading 8/5/84.

(4) Pigmeat commenced trading 16/3/84.

(b) L.I.F.F.E.

	Lot Size	Lots
F.T. - S.E. Indicies[1]	£25,000	73,590
3 Month Euro-$ Interest Rate	U.S. $1 million	1,027,269
3 Month Sterling Interest Rate	£250,000	304,831
20 Year Gilt Interest Rate	£50,000	777,722
Sterling Currency	£25,000	146,065
Deutsch Mark Currency	D.M. 125,000	28,425
Swiss Franc Currency	S.Fr. 125,000	12,708
Yen Currency	Yen 12.5 million	11,898
3 Month Sterling Interest Rate[2]	£500,000	37,297
U.S. $ Treasury Bond[3]	U.S. $100,000	168,142
		2,587,947

Notes: L.I.F.F.E. = London International Financial Futures Exchange.
(1) Commenced 3/5/84.
(2) Commenced 26/1/84.
(3) Commenced 21/6/84.

(c) London Metal Exchange

	Lot Size	Lots
Aluminium	25 Tonnes	1,224,881
Copper H.G./W.B.[1]	25 Tonnes	1,303,665
Copper S.C.[2]	25 Tonnes	17,813
Lead	25 Tonnes	537,547
Nickel	6 Tonnes	258,706
Silver	10,000 oz Troy	132,802
Silver	2,000 oz Troy	719
Tin (Standard)	5 Tonnes	218,502
Tin (High Grade)	5 Tonnes	43,219
Zinc (Standard)	25 Tonnes	404,966
Zinc (High Grade)	25 Tonnes	1,584
		4,144,409

(1) H.G. = Higher Grade copper; W.B. = Wire Bars.
S.C. = Standard cathodes.

Overall Total Turnover, 1984, London Terminal Markets	10,705,945

(d) Sydney Futures Exchange

	Lot Size	Lots
Greasy Wool	1,500 Kilos	9,257
Trade Steer	10,000 Kilos	20,788
Gold	50 oz Troy	2,299
90 Day Acceptance Bills	Ans $500,000	172,607
U.S. Dollars	U.S.$100,000	60,131
Fat Lambs	260 live lambs	9
Fat Lambs (Revised Contract)		477
Silver	1,000 oz Troy	1,741
All Ordinary Share Index		237,011
2 Year Treasury Bonds		10,788
10 Year Treasury Bonds		1,917
All Industrial Share Index		123
Metals and Minerals Share Index		228
		517,376

(e) Hong Kong Commodity Exchange

	Lot Size	Lots
Cotton (Contract suspended)	2,500 lbs	
Raw Sugar	50 Tonnes	167,524
Soyabeans	15,000 Kilos	372,352
Gold	100 oz. Troy	5,845
		545,721

(f) Kuala Lumpur Commodity Exchange

	Lot Size	Lots
Palm Oil	25 Tonnes	50,757
Rubber	75 Tonnes	168
Rubber	25 Tonnes	12,507
		63,432

(g) Bermuda International Exchange

Gold	100 Troy oz.	9,695

obviously serves to reveal great differences in relative significance. Thus, the London Metal Exchange is the world's premium market in the non-precious metals, while some of the major London Commodity Exchange contracts in "softs", especially sugar, cocoa and coffee, can still be accounted major markets when comparison is made with their U.S. counterparts. Clearly, the U.S.A., being a much larger country - indeed a sub-continent running through many climatic zones, and with a very high national income per head - inevitably has a greater assortment of markets.(1)

There are "rival" Commodity Exchanges also in other developed countries. The Sydney Greasy Wool Futures Exchange, for example, has now become the Sydney Futures Exchange, trading a wider range of commodities. Thus, in addition to wool, live cattle, silver and fat lambs, gold futures are now traded. The New Zealand Futures Association's responsibility for wool contracts has already been mentioned. The Paris market, on the other hand, trades principally in robusta coffee, cocoa beans and white sugar but remains a very small centre in international terms. (For 1984, for example, the turnover in the three contracts mentioned accounted for only 8.2 per cent of international trading, with London, by comparison, accounting for 25.9 per cent and New York 65.9 per cent.)

Meanwhile, in Asia, new futures contracts continue to make their appearance. Thus, the Singapore International Monetary Exchange (Simex) has introduced financial futures. Gold and rubber futures are already traded in Singapore (though the focus for rubber is now moving to Kuala

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1. Those of international significance (the statistics for which are reported in the world's press) include the following:
New York: Aluminium, Cocoa, Coffee, Copper, Cotton, Crude Oil, Gold, Heating Oil, Orange Juice, Platinum, Silver, Sugar.
Chicago: Live Cattle, Live Hogs, Maize, Pork Bellies, Soyabeans, Soyabean Meal, Soyabean Oil, Wheat.

Lumpur) with talk of opening an Energy Exchange. Meanwhile, as mentioned, The Kuala Lumpur Commodities Exchange trades a rubber contract but owing to defaults the palm oil futures contract has not, at the time of writing, been instituted. It is hoped, nevertheless, to introduce both tin and cocoa futures in the near future. In Hong Kong, the Commodities Exchange has been re-organized and re-named the Hong Kong Futures Exchange, but it has not, at the time of writing, been opened. Financial futures, including currency futures contracts, are planned, with contracts for metals and some agricultural products also mooted.

Japan already has very well developed futures markets in a number of commodities, traded altogether on nineteen exchanges. However, Japan's presence on the world scene is not yet as significant as the number and size of its exchanges would suggest, since the Ministry of International Trade and Industry (M.I.T.I.) has deemed that its terminal markets should be opened to overseas participation only gradually.

Clearly, the picture which emerges even from such a brief description as the present one, is of razor-sharp international competition. London remains a very important centre, aided by the fact that its exchanges are all in one city. The ambition is, moreover, that by the beginning of 1987, all of them will be housed under one roof in a purpose-built edifice near the Tower of London. The other point traditionally made in favour of an optimistic outlook for London's markets is that it is very conveniently situated in the international time zones. It is also argued to be useful to U.S. traders for arbitrage trading. With the advance of information technology, however, these can be argued to be a less crucial factor than formerly, since international exchanges between U.S. exchanges and others other than London are now becoming common, with moves in some cases to

enable cross-clearing of contracts to take place. At the moment, such factors, together with the remarkable burst of innovations of recent years on U.S. Exchanges - especially in financial futures - imply that London can have no grounds for complacency, even though it remains the most important international commodity exchange centre outside the United States.

However, such considerations mainly affect the possibility of "market shares" as between competing exchanges, though the bouyancy of world trade and the extent of the uncertainties which plague traders are obviously influences which, in their different ways, will affect all markets. Can we usefully say anything further concerning changes in general conditions which are likely to modify in any way the attractions of commodity markets and the way in which they conduct their business?

(b) Market Interventions

From time to time interventions have been made in the market which have sought to restrict, or even to prevent, commodity price movements at all. As a result, they can have a major influence on the use made of the commodity markets. Such interferences with the price mechanism may take the form of inter-governmental agreements, i.e. International Commodity Agreements (I.C.A.s); of price fixing by producers (who may, in certain countries be represented by their governments) or, finally, by partial or complete circumvention of the markets by modern variants of bilateral barter, commonly called countertrading.

Most I.C.A.s have as their object a reduction in the exposure to the considerable fluctuations in price to which the exports of primary producers are subject. More ambitiously, such interventions sometimes

aspire to eliminate long-term adverse price trends. At the extreme end of the spectrum, some inter-governmental agreements, in which consumer interests have played little if any part, have sought to raise price significantly above marginal production costs. The OPEC cartel is, obviously, the classic case of this type of agreement.

When there has been some reconciliation of the conflicting interests of producers and consumers - usually after protracted negotiations under the aegis of UNCTAD this past 20 years or so - an I.C.A. has resulted which seeks to limit the range of price fluctuations. The techniques usually involve export limitations, possibly production quota limitations, and sometimes stockpiling. However, if appreciable deviations are permitted from the mid-range price, then clearly, the commodity markets can live with this state of affairs. Even so, success will depend upon the re-negotiation from time to time, of the absolute levels at which the permitted bands of price fluctuation are pitched. For some strategic commodities such as tin, moreover, the markets are rendered more unstable by the unpredictability of the actions of governments, especially those of the U.S. General Services Administration (the G.S.A.) in selling from, or buying for, its stockpile. The same is true of U.S.S.R. and other Eastern-bloc countries' sales (e.g. gold) on Western markets.

The extent to which price has been permitted to fluctuate in past agreements has varied quite considerably. Thus, it has been one of the reasons for the comparative success of the successive sugar and tin agreements that the permitted range of price fluctuations has been liberal. Even so, the history of I.C.A.s is littered with lapses and failures. Thus, the International Sugar Agreement collapsed in 1984 and has now been replaced by a pact without any price or supply provisions. (There is now merely a centre for collecting and disseminating statistics and other market information.)

The International Cocoa Agreement is due to expire in October 1986. Negotiations failed (for the third time) early in 1985. There are to be more talks later in 1985, but with the U.S.A. having decided definitely to stay out, it is not possible to be sanguine as to the outcome. The existing Agreement, meanwhile, exerts little influence on the world cocoa market, for its buffer stock has run out of cash, having bought over 100,000 tonnes of surplus cocoa. Prices are now below the floor of the Agreement, and so stocks cannot be disposed of.

The International Tin Agreement survives, but only just. It has, at the time of writing, however, accumulated no less than 38,000 tonnes of the metal, together with another 23,000 tonnes carried over from a previous pact. This total, at present worth $7.8 billion, is a depressing influence upon prices into the foreseeable future, even though there are stringent export controls in force in producer member countries.[1]

The International Coffee Agreement can claim to be effective at present. It controls the market by using export quotas linked to trigger price levels, so that prices in member countries are some 50 per cent above those in non-member countries. However, it is reported that resentment is directed towards the rigidity of quotas, which are not freely transferable among the producing countries. As a result, the

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1. Since the above was written, there has been a major debacle in the tin market. This occurred when the manager of the buffer stock declared that the International Tin Council had run out of funds, and was therefore unable to honour existing commitments, much less support the tin price. As a result, a financial crisis among tin traders was precipitated and the L.M.E.'s tin market was declared closed. These events provide a dramatic instance of the arguments deployed in the text. The price levels set by the sixth Agreement of the I.T.C. in 1982 for the buffer stock's interventions to maintain the agreed ceiling and floor prices were inappropriately high. Tin thus became uncompetitive with substitutes in prevailing world demand conditions; the I.T.C.'s support funds dwindled to exhaustion, while new producers outside the I.T.C.'s quotas were encouraged. Meanwhile, the I.T.C. experienced considerable difficulty in raising the additional finance from its member countries, necessary to repay some dealing members of the L.M.E., who appeared to have loaned money to the buffer stock manager to enable him to buy tin from them.

prices of some types of coffee are being maintained at an artificial differential. European consumers are more restive than those of the U.S., which is widely known to wish to maintain the Agreement for political reasons. (Latin America produces most of the world's coffee.)

Finally, the International Wheat Agreement has no price or supply provisions. It merely serves as a forum for discussion for grain producers.

Thus, with the exception of the successful Coffee Agreement, perhaps, I.C.As seem unlikely to pose a serious threat to business done on the world's commodity markets.

Producer cartels also seem destined, ultimately, at least to weaken sufficiently for the existence of a commodity market to be eminently worthwhile. As previously remarked, despite the continuing relative strength of O.P.E.C. and its posted prices a focus of the world's attention as far as oil prices are concerned are the free markets, for as world demand fluctuates, a number of O.P.E.C. members are inclined by economic necessity to "break rank" and exceed their quotas. As a result, Gas Oil and Heating Oil futures contracts on the New York Mercantile Exchange have been one of the great successes among recent developments, while the International Petroleum Exchange in London, though newer and less successful to date, seems set fair to continue, and possibly to flourish ultimately.

A number of commodities are, of course, still traded on long-term contracts, even though these do not account for the entire trade. (Examples include iron ore, copper concentrates, bauxite and alumina, phosphate rock, some sugar and rubber, meat, wheat, rice natural gas,

nickel uranium and coal.) However, not even the contracts which the U.K. concluded shortly after World War II could run their full course without price adjustments although, seen in retrospect, this was a period of comparatively modest inflation, and of currency stability. These conditions no longer hold, so, not surprisingly, there has been of recent years a trend away from fixing prices at the outset. Indeed, some contracts do not fix a price at all, but refer to the market price (which, of course, presupposes the existence of a market). Copper concentrates, for example, are sold on the basis of the prices of copper metal established on the L.M.E. Thus, unless producers can remain in a very dominant position indeed, markets survive, though their turnover can obviously be adversely affected for an appreciable period on occasion. It must therefore be concluded that there is a far greater compatibility between contractual arrangements for commodity trading and the continued use of futures markets than might initially be imagined.

(c) Countertrading

A further method of concluding transactions, potentially more threatening to commodity-market turnover, has made a strong appearance over the past two years. This is known as countertrading, though there are a number of variants of the basis of these transactions which is, in essence, barter. Very frequently, however, the transactions are much more sophisticated than is currently implied by the term barter, so that institutions are developing to provide expertise in negotiating the deals. If such a trade has a centre of origin, it would be in European banking centres, but particularly Vienna. Within the recent past, however, professional provision of services has spread to London and New York, with Hong Kong and Singapore probably poised to participate, especially since it is proving particularly useful in the growing trade with China and Indonesia. Further factors which have given ah impetus to the development

of countertrading of recent years are firstly the enormous accumulation of debt by the world's developing countries, leading to more stringent exchange controls and tending to close avenues to traditional forms of credit. Secondly, there are the gyrations of the world's leading trading currencies in relation to one another. Thirdly, the onset of recession in the early 1980's, depressed the prospects for exports and frustrating attempts to reduce the level of indebtedness. In brief, countertrading can be seen as a means of circumventing the expenditure of scarce foreign exchange and promoting sales abroad.

According to Frank Gray of The Financial Times, for the big transnational corporations and trade brokers engaged in countertrade, there are at least half a dozen techniques of trade - and many more intermediaries - utilized, in order to close what is essentially a bilateral trade deal. The key phrases used in countertrade provide a flavour of the sorts of activities involved.

(i) Barter: this corresponds to the sort of transaction with which everyone is familiar, viz. a straightforward exchange of goods and or services. Its use is comparatively rare.

(ii) Counterpurchase: this is the description for the type of transaction engaged in. In essence, the exporter is required to accept part-payment in kind in return for his goods. Money is therefore involved, and the goods offered are often quite unrelated to those provided by the exporter. Sometimes, the deal requires the involvement of third - and often many more - partners. The use of counterpurchase has long been used between the West and the Comecon bloc, but is now increasingly a feature of trade with the developing world also.

(iii) Buy-back: this, too, is a familiar form of trade between the West and the Eastern bloc. It is a form of long-term barter, with repayment

often in terms of the output of any investment involved. It is often possible, by this means, to establish a presence in a market with long-term potential.

(iv) Offset: a technique often used for transactions between industrialized and developing countries. It involves an "offsetting" investment by an exporter in an importer's country, in order to foster more employment and so help provide the importer with the means to pay for the goods (often used in commercial aircraft and defence deals).

(v) Switch Trading: a technique employed to correct imbalances in long-term bilateral agreements. Thus, one nation's trade surpluses with a partner country can be utilized by third parties.

(vi) Evidence Accounts: these enable the exporter to debit its own counterpurchased imports and credit its exports over a period of time rather than counterpurchasing goods on an item-by-item basis to match the exports. The aim is to maintain the evidence account in balance year by year.

Estimates of the growth of countertrading vary from some 8 per cent of world trade to more than double that proportion. Moreoever, though it may be viewed as an emergency solution to currency and financing problems, now that some major institutions have become deeply involved, these forms of barter trading are as unlikely to disappear in the short term as are the enormously inflated debts owed by the third world which have partly inspired the emergence of those techniques. As such, they clearly pose a

threat to any growth of turnover on the commodity markets on the same scale as during the 1970s.[1] (Financial futures, of course, are another matter altogether.)

Meanwhile, some of the more innovative traders in raw materials have been quick to seize opportunities in the field of countertrading. Metallgesellschaft of West Germany is a prime example. It recently established a countertrade partnership linking it with First Boston (the U.S. merchant bank) and Louis Dreyfus, the French commodities group. Advertisements in the financial press reveal other famous institutions anxious to provide intermediation in this field. They range from well-known names in the merchant banking field, such as Kleinwort Benson, to a consortium of four leading British banks, viz. Lloyds, Barclays, National Westminster and Midland, which have joined two Belgian trading houses to set up Bastis, an international clearing house for countertraders. There are many other examples.

(d) Information Technology and the Commodity Markets

A large firm of London brokers will by today expect to spend well over £250,000 a year in rent to providers of information. Reuters will often take a large slice of this money, providing in return, information on about 100 video-screens in the dealing room. This information will include data on foreign exchange movements, stocks and shares, the money

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1. Not only does countertrading imply that more commodity transactions by-pass the markets, but it appears at present as a development which is eroding the cohesion of O.P.E.C. At the time of writing, Nigeria argues (Times report, 10 May, 1985) that the oil involved in its counter trading should not come from its OPEC-agreed quota of oil exports. The first deal of this kind - also outside quota limits - was made by Saudi Arabia in 1983, when it bought ten Boeing jumbo jets in return for oil. Countertrading transactions as between commodities are by no means rare, of course. Thus, for example, New Zealand is to sign a barter deal with Iran through which it will trade 30,000 tonnes of butter, for oil. This follows two previous oil-for-lamb deals between N.Z. and Iran.

markets, and commodities. In the same vein, Reuters international network can flash a message across the world in about one and a half seconds (compared with about thirty seconds to connect a telephone call to, say, Australia).

Reuters started the world's first international securities/commodities service in 1964, with close-of-trade details. At present it has some 20,000 subscribers in 100 countries, with more than 50,000 terminals in all. As far as U.K. commodity information is concerned, Reuters now has competition from the U.S. giants in the form of Quotron, an enterprise in a joint-venture with Associated Press and Dow Jones, and Telerate, backed by the same companies, which specialize in foreign-exchange and the money markets. Quotron has recently opened a computer centre in London to link with its centre in New York, and will serve a network of computers in the rest of Western Europe.

These networks, moreover, can be inter-active, i.e. they can provide two-way communications so that dealers outside financial centres can buy and sell electronically. Reuters has run a two-way system of this sort for gold and currency dealing for some time, called Monitor Dealing. This is, however, "hard-wired". The stage has now been reached where a computerized trading system with built-in clearing facilities will become a reality. The start point here appears to have been McGraw-Hill's "Emis" (i.e., Electronic Information and Marketing System) used by oil traders and petrochemical feedstock traders since 1981. This system, however, required traders to provide or accept delivery. The Emis System is in four basic parts. It allows users to do trades; it broadcasts market activity to all subscribers; it has a break-in news capability which feeds off the McGraw-Hill news-gathering network, and it can process deals down into graphic form (with the software automatically taking a weighted

average of all completed transactions). This "electronic broking facility thus lies halfway between a trading and an information service. The commodity trade is, then, catching-up with electronic dealing in securities in the U.S.A. where the National Association of Security Dealers' Automatic Quotation System (N.A.S.D.A.Q.) has been providing dealers nationwide with an over-the-counter service for their clients for some years by this time.

These developments pose an obvious question: is information technology (I.T.) going to make the commodity market floor obsolete in the foreseeable future? The drift is clearly in that direction, and, some would argue, sooner rather than later. Others, however, are of the opinion that there is no substitute for the reactions from a throng of traders all in one place around a trading-ring or pit, when the volume of trade is high. They already concede, on the other hand that, when the volume is modest, computer trading can be very effective. It is, moreover, anonymous and lessens the chance of errors in the execution of orders (that is, of "out-trades", where two traders' records of the same deal fail to match, for the computer would provide an immediate record).

The test for the complete computerization of commodity exchanges will be provided by "Intex", the international futures exchange based in Hamilton, Bermuda, which goes far beyond the international electronic links already established between many exchanges (mainly for arbitrage purposes when there are price discrepancies between markets). This is an even more ambitious "follow-on" from the entirely computerized World Energy Exchange opened in Dallas in 1983. "Intex" was initially designed to achieve round the clock trading by means of an automated commodity exchange linking desk-top terminals to data centres, initially in New York and London, and later Chicago and the Far East. The data centres would be

linked to the central computer at Bermuda via dedicated telephone lines running to mainframe computers in London, Virginia or Vienna. I.C.C.H. has secured the business of guaranteeing and clearing the contracts which are to consist, at first, of gold, followed by a long-term U.S. Treasury bond contract, a silver contract and a freight-rate index (i.e. the B.F.I.).[1]

Of an estimated membership total of some 600 envisaged, some 265 have already paid subscriptions, though fewer than this will have active video screens. A trader's screen displays, for each price close to the current market level, the total volume of bids and offers put into the system by all trading members. The computer matches them and provides a record for each side, but does not disclose the identity of the one to the other.

Will these major new devices persuade market traders to abandon market floors completely? It is doubtful whether this will happen in the near future to the world's major trading floors. On the other hand, information technology has undoubtedly made a major impact by increasing the flow of information. Moreover, it would not be too surprising to see some of the lesser futures markets become fully automated within the next few years.

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1. As of mid-1985, there were 45 trading stations linked to Intex, doing an average of 300 contracts a day in gold futures. Since 1 May 1985, when Intex started trading an ocean freight rates contract - an identical one to that of "Biffex" in London - turnover has been some 200 contracts a day, well above expectations. In August, Intex will start trading a stock index futures contract based on the Financial News Composite Index (FNCI, pronounced "fancy"). This is expected to be very successful, with 4,000 a day turnover predicted and adding about another 30 trading stations. Intex is also about to lease its system to outside users. They will then put their own name to it and reimburse Intex according to the volume traded.

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