Extracted from *Economic Trends* No. 247, May 1974

World commodity prices

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The movement of world commodity prices has become a topic of increasing concern during the last year or two. This article deals not with the economic impact of and problems arising from their fluctuation but with the task of measuring the size of the changes that take place.

There are two regularly published commodity price index numbers that expressly include the adjective 'world' in their description, those of the United Nations and of *The Economist*. In what follows, these are compared with each other, and are related to two United Kingdom index numbers—that for prices of materials and fuel purchased by the manufacturing sector, and that for import unit values. Problems of interpreting the index numbers in the context of the changing value of currencies are briefly examined. The article also introduces a new service in its provision of more up-to-date estimates of one of the two 'world' index numbers discussed.

Before describing the two world price index numbers, it is worth examining what is generally meant by 'world commodity prices'. In itself 'commodity' is no more specific a word than 'product', and in many contexts may properly cover goods which have undergone a high degree of processing as well as cruder foodstuffs and industrial materials. But in the context of world prices, highly fabricated products are generally intended to be excluded. The dividing line is not always drawn in the same place, but in this article, it will be drawn to cover all primary commodities *plus* one particular class of manufactured goods—non-ferrous base metals. It is convenient to include non-ferrous metals because the corresponding primary commodities—their ores and concentrates—are not exported nearly as much as the crude metal form. Primary commodities include foodstuffs such as wheat, but not flour, ores such as iron ore but not steel, minerals such as crude oil but not petrol. A list is given in Table 1 of the Appendix.

Often 'world prices' of these commodities are taken to mean the average prices at which they enter into foreign trade among the countries of the world, and this is the way in which the term will be used here. But in a not uncommon alternative usage, the world price is taken to mean not an average but a price common to the exports of all countries. A commodity that is exported at widely differing prices at the same point in time can not, on this latter usage, be said to have a world price.

The United Nations index numbers of world export prices

As their description implies, the United Nations index numbers are designed to measure changes in export prices throughout the world. For measuring changes in world commodity prices the relevant index numbers are those for primary commodities and for non-ferrous metals. Though the United Nations does not combine these two groups of goods into a single series, the user can quite easily do so.

The weighting pattern for combining price changes for individual commodities is at present based on 1963 world export values, and is being rebased to that of 1970. The primary commodities included covered just over 90 per cent of the Organisation for Economic Co-operation and Development (OECD) imports of all primary commodities in 1970. The corresponding figure for non-ferrous metals was slightly under 90 per cent.

Use is made of a wide variety of sources of price changes for the individual commodities. While a major source is export prices quoted in the principal exporting countries, domestic prices in these countries are also used where they do not differ significantly from export quotations. Prices—some spot, some forward—on internationally used commodity exchanges in both producing and consuming countries are also used. Among other sources of information are government contract prices and the export price index numbers compiled by producing countries.

Recourse is also made to export or import unit values, amounting to about one-eighth of the total weight of the primary commodities index. Unit values are, so far as practicable, avoided by compilers of price index numbers for two reasons: the items included are generally much less tightly specified than is the case with 'pure' price information which typically covers particular grades (albeit only a selection of the grades actually sold) with particular terms of delivery. This means that changes in commodity mix, quality or delivery terms, which show up as a change in unit value, tend to be (wrongly but unavoidably) counted as price changes. Secondly the recording of the quantities and values in trade statistics, from which unit values are calculated, tends to be in arrears of contracts between buyers and sellers, in terms of which price index numbers are defined. This timing difference is much less prevalent in export than in import unit values so it has only a small impact on the UN index.

The prices and price changes comprising the basic data from which the UN compile the price index numbers are expressed in a variety of different currencies. These are converted to a US dollar basis by the use of spot exchange rates, in order to express the published index numbers in terms of a single currency.

The usefulness of the UN index numbers is limited by the fact that only quarterly figures are published and those nearly three months following the quarter to which they relate. The second of the two published 'world' index numbers, *The Economist*'s world commodity price index, is published weekly with only a few days' delay.

The Economist's world commodity price index

In this index the commodities covered are confined to those traded on the various organised commodity exchanges in Britain and elsewhere. It is by no means the only price index on this basis—other well known examples are those compiled by the *Financial Times*, Reuter's and Moody's but *The Economist*'s index is the only one (of this group) described as a world index.

Restricting the coverage to goods traded on the exchange leaves out a number of primary commodities (that is, non-manufactured goods), of which important examples are timber, woodpulp and crude oil. The selection of primary commodities included in the index accounted for nearly 40 per cent of the value of OECD countries' imports of primary commodities in 1970 (against 90 per cent in the UN index). Apart from primary commodities, the index includes non-ferrous base metals, and those covered accounted for about 60 per cent of OECD imports of these materials. One other manufactured product—jute goods—is included.

The index is designed to measure changes in the prices of the selected commodities imported by major western industrial countries. The weights for individual commodities are proportional to imports by these countries, a three-year moving average being used to smooth any irregularities in particular years.

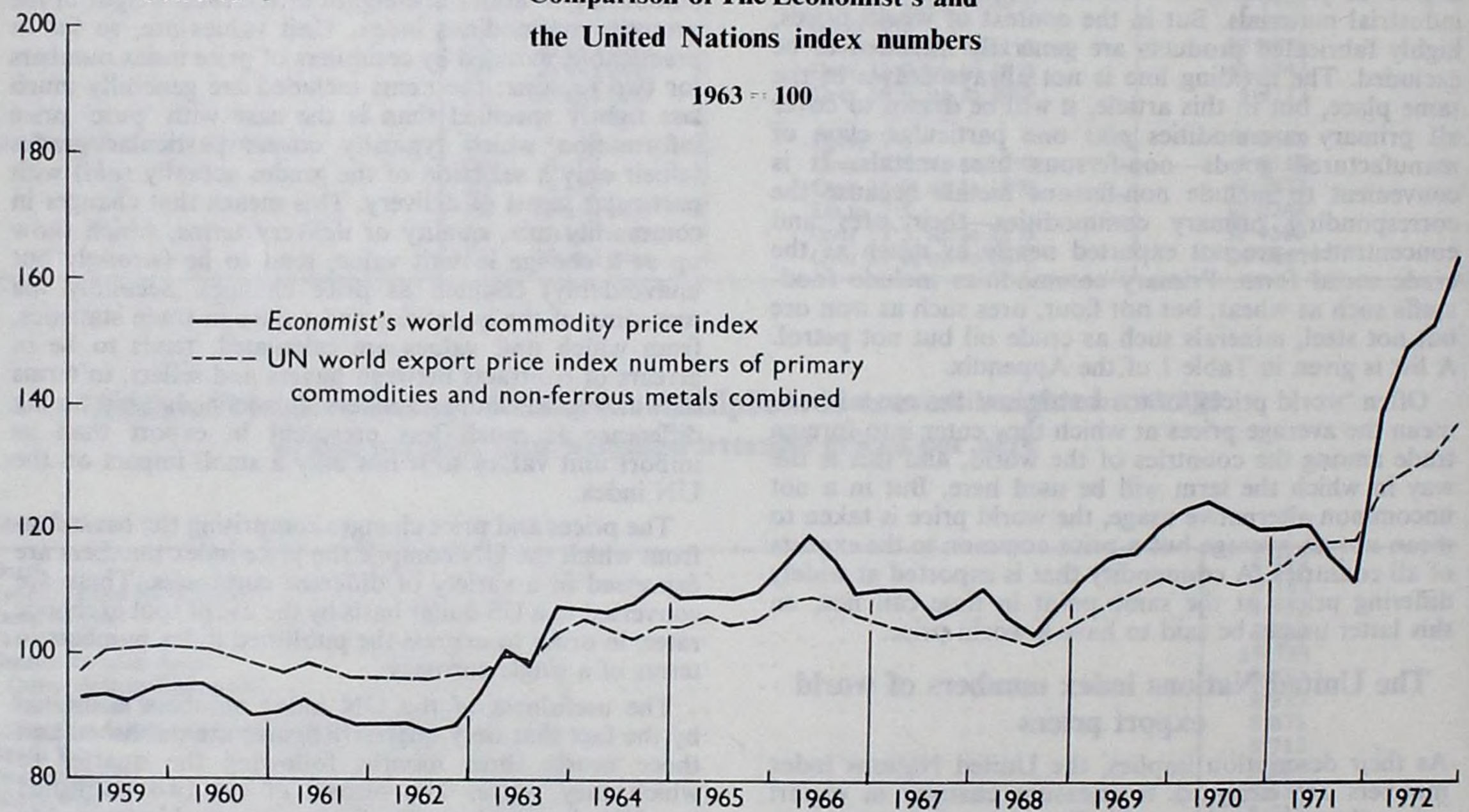
Just as the commodities covered are confined to those traded on the exchanges, so the price indicator taken as representative of the change in import prices of each commodity is also calculated by (spot) price changes on these markets. Though a high volume of transactions by-pass the commodity exchanges, often under longer term arrangements with producers, the prices at which they take place are directly or indirectly linked with prices on the exchanges.

The Economist's index is compiled weekly from the prices ruling each Wednesday, though the other index numbers whose coverage is confined to the commodity exchanges are compiled in respect of each working day on which the exchanges transact business.

Comparison of *The Economist*'s and the United Nations index numbers

Chart 1 shows the two UN index numbers of primary commodities and non-ferrous metals combined into a single series, and *The Economist*'s index of world commodity prices, for the period 1959 to 1972. The recently published revised version of *The Economist*'s index has been linked to the previously published version at the first quarter of 1971. The distinctive feature of the old series was that price changes for some commodities were measured in sterling terms, but for others in dollars. Between 1949 and 1970 this mixture of currencies was of little consequence as there was only one major change in the sterling/dollar exchange rate, and at that time (November 1967) a technique was employed that effectively converted sterling price changes to dollars

CHART 1 **Comparison of The Economist's and the United Nations index numbers**



Since 1971 the exchange rate has fluctuated, and in the new version of *The Economist*'s index both a wholly dollar and a wholly sterling index is provided. In the chart here, the dollar version has been used, so that during the whole period covered it is effectively on a dollar basis.

The main feature of the comparison is the general agreement of the two index numbers on the direction of change—one does not lead the other—but with *The Economist*'s index showing a much greater amplitude in its fluctuations. There is one period only, of comparatively short duration, where there is a rather marked disagreement on direction of change(1).

Which of the two main differences in compilation—the wider commodity coverage of the UN index or its wider coverage of prices—has the greater effect can be determined by recalculating *The Economist*'s index by applying UN price indicators to its weights(2). An example covering only one period is given here, in which the change between the third quarter of 1968 and the fourth quarter of 1969 is taken. This was selected because it was a lengthy period in which, typically, both index numbers moved in the same direction, but *The Economist*'s much faster:

	Percentage increases			Difference between percentage increases in		
	Economist index (1)	United Nations index (2)	Index with *Economist* weights, United Nations prices (3)	Indexes (1) and (2)	Indexes (1) and (3)	Indexes (2) and (3)
Food ..	15	9	13	6	2	4
Non-food	17½	11	15	6½	2½	4

The last two columns apportion the difference in percentage increase (between *The Economist*'s and UN index numbers) between the use of different prices and the use of different weights. In this period the greater part of the difference was owing to the different commodity composition of the two index numbers, implying that prices of goods traded on commodity exchanges rose much faster than those of other commodities. The use of only exchange prices in *The Economist*'s index for the goods common to the index numbers increased the divergence between the two measures.

More up-to-date estimates of the United Nations index

Because the price development of commodities not traded on the commodity exchanges has differed so considerably from those of the commodities that are so traded, the combination of the two groups in the UN index makes it more comprehensive than index numbers of exchange prices, but it is much slower to be published. However, a price index compiled by the Department of Industry has for some time been proved to be a good projector of a major part of the UN index (commodities other than food and fuel). This index is compiled by using the same commodity weights as the UN. But for the price indicators used by the UN are substituted exactly the same ones as are used in compiling the primary commodities and non-ferrous metals components of the Department of Industry's price index of materials and fuel purchased by UK manufacturing industry—but converted to dollar terms at the prevailing rate of exchange. Recent comparisons with the corresponding part of the UN index are given in the following table.

World export price index of non-ferrous metals and primary commodities (other than food and fuel)

Dollar terms, 1963=100

	Based on United Nations figures		Department of Industry index
	First published	Revised	
1972 1st quarter	123	125	125
2nd quarter	129	128	127
3rd quarter	131	128	126
4th quarter	133	133	133
1973 1st quarter	147	154	157
2nd quarter	164	174	179
3rd quarter	197	199	212
4th quarter	213	..	222
1974 1st quarter	..		238

Checks have shown that good proxies for the food and fuel components of the UN index are also available with little delay. Projections of the UN index for primary commodities (including food and fuel) and non-ferrous metals will in future be published in *Trade and Industry* with the monthly index numbers of wholesale prices, for the month preceding that in which it is published. The most recent projections are included in Table 2 of the Appendix.

Relationship with United Kingdom index numbers

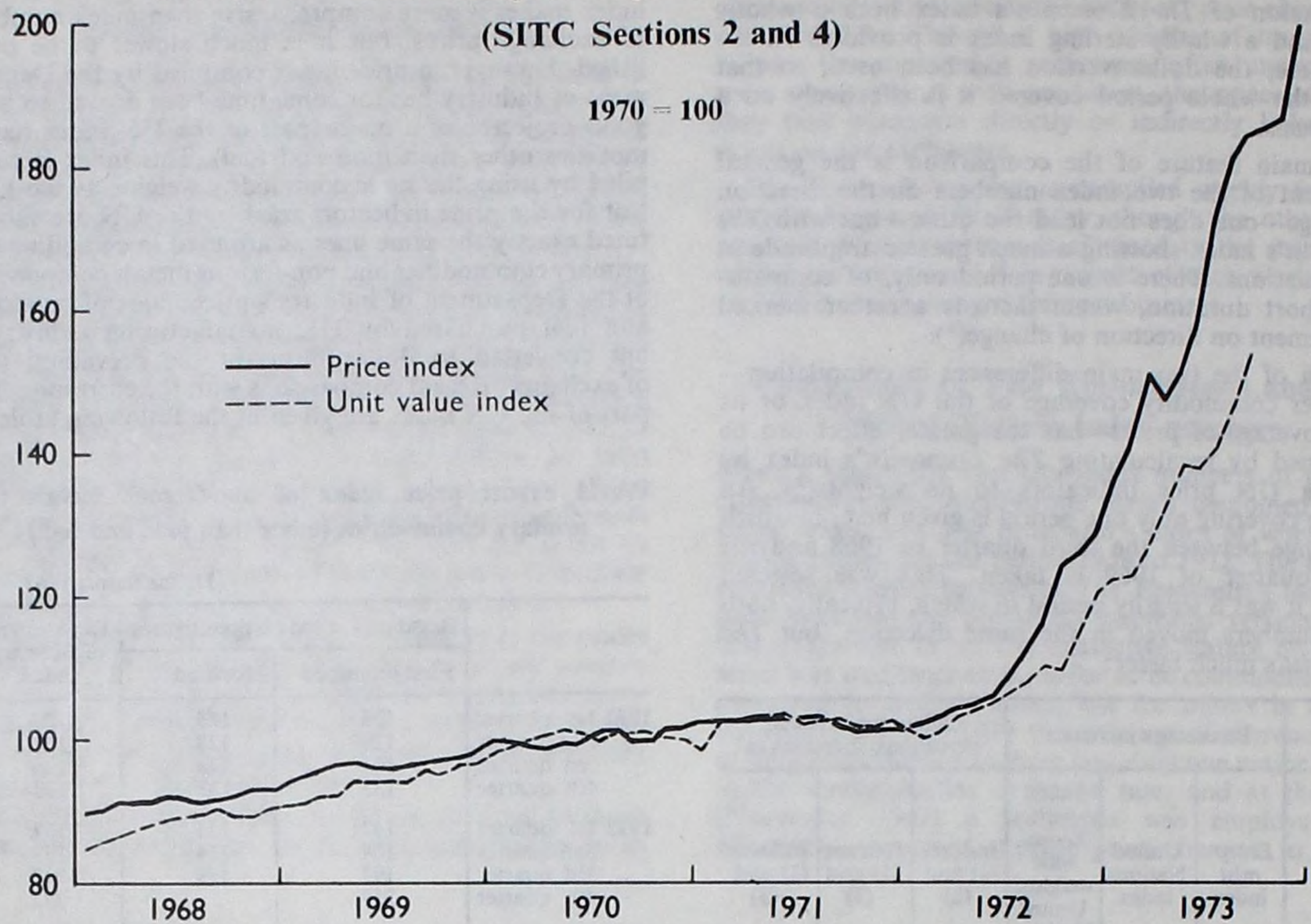
The last table showed a quite close correspondence between major components of the UN world export price index and the index with the same weights but with UK price indicators. This correspondence suggests that for the group of commodities covered—and it must be emphasised that the analysis has not included food and fuel(3)—the changes in prices at which UK manufacturing industry purchased its materials have approximated to changes in average world export prices, after allowance for exchange rate fluctuations. This is not a particularly surprising conclusion—it merely suggests that British importers have had to pay much the same as those in other countries and that differential changes in freight costs,

(1) That is, between the second and fourth quarters of 1971. Then the UN index rose 1 per cent and *The Economist*'s fell 7½ per cent. During the same period Reuter's index was about unchanged in dollars, and the *Financial Times*'s commodity index fell 4 per cent.

(2) Applying the UN price index for jute fibres to *The Economist*'s weight for jute goods.

(3) Areas of less direct concern to the Department of Industry.

CHART 2 **United Kingdom imports of basic materials (SITC Sections 2 and 4)**



etc. to various destinations are not of great importance—but it is perhaps useful to have this confirmatory evidence.

It is not unknown for agreement between two apparently independent statistical series to reflect the difficulties faced by the compilers of each—in that both of them have to make do with proxies for the information they would prefer to have, and may draw on the same source. As a further check it is possible to make some comparisons with one of the UK import unit value index numbers published by the Department of Industry, covering basic materials (as defined by Sections 2 and 4 of the Standard International Trade Classification). A price index with the same coverage and base year (1970) was constructed, again from the individual commodity price indicators used in compiling the price index for materials and fuel purchased by UK manufacturing industry. The results are shown in Chart 2.

The correspondence between the two index numbers is reasonably close if the unit value index is shifted back in time by two or three months(4). (It was pointed out earlier that the recording of values and quantities in trade statistics is in arrears of the corresponding contracts.) During 1973, however, there was a growing divergence between the two series and this is under examination.

The conclusion is that changes in world export prices of basic materials (SITC Sections 2 and 4) tend to be reflected—allowing for the different commodity composition—in much the same proportion in the UK price index of materials purchased by manufacturing industry, and at much the same time (both index numbers showing changes in price at time of contract rather than at time of delivery). They tend to be reflected in UK import values after a time lag.

The changing value of currencies

An index of world export prices has to be compiled in terms of a particular currency. This currency, like others, will change in value in terms both of what goods and services it will buy and in terms of other currencies. Two supplementary index numbers may be useful as an aid to the interpretation of the index numbers of world export prices of primary commodities and non-ferrous metals compiled by the UN in US dollar terms.

One is a price index, also in dollar terms, of world exports of manufactured goods, since the context in which changes in prices of primary commodities is often considered is their relationship with prices of manufactured goods.

(4) The coefficients of correlation between the month to month changes in the two index numbers are:

No timing difference	$r^2 = \cdot 09$
Unit value index lagged one month behind price index	$r^2 = \cdot 06$
Unit value index lagged two months behind price index	$r^2 = \cdot 34$
Unit value index lagged three months behind price index	$r^2 = \cdot 27$
Unit value index lagged four months behind price index	$r^2 = \cdot 12$

The coefficients only for lags of two and three months are significant at the 95 per cent level.

The closest index available is the UN unit value index of world exports of manufactured goods. By dividing this into the price index of primary commodities an indication of changes in their terms of trade against manufactured goods is obtained. With 1963 as 100 the index for manufactured goods was 164 in the last quarter of 1973 and the index for primary commodities 221, giving a terms of trade index of 135, that is, to purchase 1963 exports of primary commodities would require 35 per cent more manufactured goods.

The other supplementary index is of currency exchange rates. The US dollar is worth less in terms of many other currencies than it was several years ago, and it would be more useful to express a world index not in terms of the dollar but in terms of a currency that has not changed in value relatively to others. There being no such currency, one might try to use an average of all currencies. Though there seems no 'right' mix of currencies to use in the compilation, there is some economic significance in at least one mix. That is the one in which the currencies are combined in proportion to imports (of the group of commodities covered) by the countries that manage the currencies. This mix of currencies([5]), when used to adjust a world price index that is measured in dollars, has one feature in particular that makes it more appropriate than the well known index of the dollar's effective exchange rate. It is that it includes a weight for the dollar itself.

A portfolio of the currencies of the ten Western countries with the largest import bills for primary commodities and non-ferrous metals, each currency (including the US dollar) being in proportion to those imports in 1963, was nominally worth 12 per cent more in dollars in the fourth quarter of 1973 than in 1963. Dividing 112 into the fourth quarter 1973 estimate of the UN index of 223, gives 199. In order to purchase the 1963 quantities of world exports of primary commodities and non-ferrous metals, it would be necessary to increase the amount of each currency held in the portfolio by 99 per cent. Or put another way, countries who were the main customers for primary commodities in 1963 faced a rise in price, in terms of their own currencies, of 99 per cent on average by the last quarter of 1973, as opposed to a 123 per cent increase measured in dollars([6]).

([5]) Suggested by HM Treasury.

([6]) For convenience the monthly table in *Trade and Industry* will show the index numbers in these 'average currency' terms as well as in sterling and dollars.

APPENDIX

Comparison of two world commodity price indexes

TABLE 1

	United Nations world export price index of primary commodities and non-ferrous metals	*The Economist*'s world commodity price index
Frequency of publication	Quarterly(1)	Weekly
Delay in publication	Three months (1)	Three days
Sources of price data	Various	Commodity exchanges
Weighting base	1963 value of world exports	Three-year moving average of value of OECD imports
Relative importance (in 1969) of commodities included	*Per cent*	*Per cent*
Primary commodities: food		
Wheat	5·9	5·1
Maize	2·2	6·6
Rice	2·3	—
Barley	0·7	—
Coffee	5·1	10·9
Tea	1·1	2·2
Cocoa	1·8	2·7
Meat	6·9	8·5
Sugar	2·1	6·7
Dairy produce	3·4	—
Fruit	3·0	—
Fish	2·2	—
Animal feedingstuffs	1·1	3·6
Wine	1·1	—
Primary commodities: non-food		
Vegetable oils	1·6	3·4
Oilseeds	2·5	7·9
Animal fats and oils	0·7	—
Cotton	4·0	6·9
Wool	2·9	9·6
Sisal	0·2	0·5
Jute	0·4	0·8
Flax	0·2	—
Lumber	5·5	—
Woodpulp	2·7	—
Rubber	2·4	3·3
Tobacco	1·9	—
Hides	1·5	1·4
Furskins	0·5	—
Iron ore	2·0	—
Non-ferrous metal ores	2·7	—
Crude oil	12·9	—
Coal	3·5	—
Fertiliser	0·4	—
Manufactured goods: non-ferrous metals		
Copper	7·9	14·8
Aluminium	2·0	—
Nickel	0·9	—
Tin	0·9	2·4
Zinc	0·4	0·1
Lead	0·5	1·3
Manufactured goods: other		
Jute goods	—	1·3
Total	100·0	100·0
Value of commodities included as proportion of OECD countries' 1970 imports of all primary commodities and non-ferrous metals	91·0	42·0

(1) As explained in the article, a monthly projection, with about two weeks delay, is to be published by the Department of Industry.

United Nations index numbers of world export prices(1)

1963=100

TABLE 2

	Primary commodities				Non-ferrous metals		Primary commodities and non-ferrous metals(2)	
	Total		Agricultural non-food					
	$	£	$	£	$	£	$	£
1973 1st quarter	155	179	152	176	169	196	156	181
2nd quarter	174	192	171	189	195	216	176	194
3rd quarter	197	222	196	221	226	255	199	225
4th quarter	221	260	206	242	252	296	223	263
1974 1st quarter(3)	*298*	*367*	*220*	*270*	*274*	*336*	*297*	*364*

(1) Published by the UN in terms of US dollars. For convenience the index numbers are also shown in sterling terms by converting the dollar index at prevailing exchange rates.

(2) This combined index is not published as such by the UN.

(3) Projections by Department of Industry shown in italics.