The terms of trade

The evolution of the United Kingdom's balance of external trade depends not only on changes in the volume of goods and services exported and imported but also on the prices at which they are traded. The ratio of export to import prices—the terms of trade—determines the volume of exports necessary to pay for a given volume of imports or, analogously, the volume of imports which can be purchased with the proceeds of a given volume of exports. Other things being equal, if the price of exports falls relative to that of imports (a fall in the terms of trade), the trade balance will deteriorate, and vice versa.

This article[1] first considers alternative measures of the terms of trade and some general influences on them, and then examines the impact of changes in the terms of trade on the current balance and on real national disposable income. Finally, some influences on the terms of trade in manufactured goods in particular are considered: previous articles[2] sought to explain the recovery in the terms of trade in manufactures between 1974 and 1980 in terms of inflation differentials and exchange rate movements; those explanations are reconsidered in the light of the subsequent stability of the terms of trade. In this context the role of profit margins and structural developments in UK industry are examined.

Measurement of the terms of trade

The terms of trade are conventionally expressed as the ratio of indices of export and import prices. There are, however, several possible ways in which these indices can be constructed. The two most common indices used in international trade statistics are unit value indices (UVI) and average value indices (AVI). Their construction is discussed in the appendix. The most important difference between them is in the weighting system used: UVIs reflect the composition of export or import volumes in a base year whereas AVIs reflect the current composition. Thus, if the composition of either exports or imports changes over time, it is possible to observe divergent movements between the AVI and UVI terms of trade. The upper part of Chart 1 shows, for example, a marked divergence in 1986, much of which is explained by the fall in the oil price, which reduced the AVI measure because the United Kingdom is nowadays a significant net exporter of oil, but scarcely affected the UVI measure since UK trade in oil was close to balance in 1980—the base year in present calculations of UVIs.

The choice between AVI and UVI depends in part on the purpose for which the index is being used. Since it has current-period weights, the AVI is influenced by both changes in composition and price movements, whereas movements in the UVI can be attributed solely to changes in price.[3] In assessing the overall effect of price changes on the trade balance or on real national disposable income, the preferred measure is the AVI. However, in seeking to understand the interplay between prices and volumes the UVI, which excludes compositional effects, may be more relevant.

Chart 1
AVI and UVI terms of trade

········ AVI
———— UVI

All goods

1980 = 100

Manufactures(a)
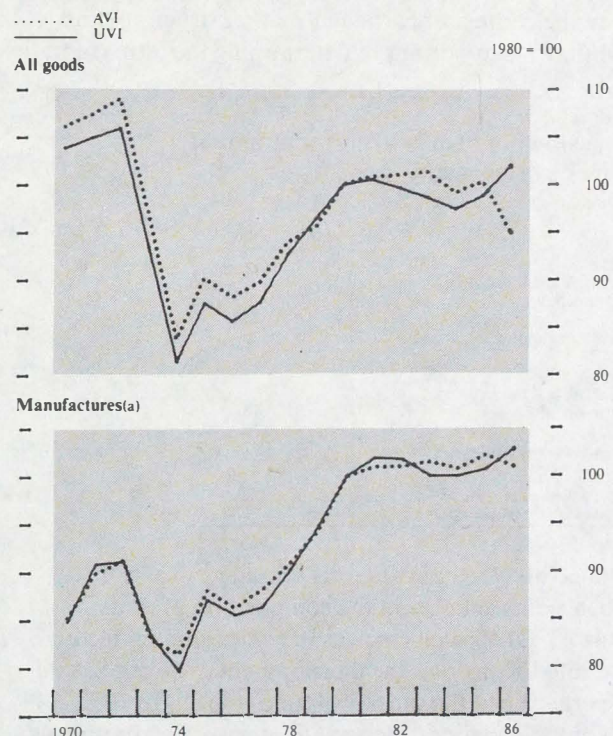
(a) Excluding erratic items.
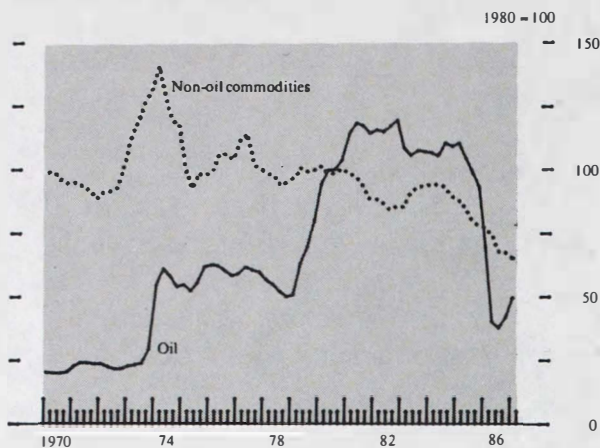
General influences on the terms of trade

Movements in the United Kingdom's terms of trade will in part reflect global shifts in relative prices between different categories of goods and services—for example, changes in the prices of oil or other commodities relative to those of manufactures. The case of oil has already been

Chart 2
Real commodity prices(a)

(a) Ratios of oil price (UK Brent) and non-oil commodity prices (UN series for food, drink and tobacco, and basic materials) to world price for exports of manufactures, expressed in common currency.

noted. As the United Kingdom is a net importer of non-oil commodities, there has been a direct benefit to its terms of trade from relatively cheaper food and raw materials in recent years (Chart 2). Most of the United Kingdom's trade in goods is, however, still in manufactures (Table A), where pricing behaviour, both at home and overseas, in response to movements in costs and exchange rates, and in the context of particular market structures and conditions, is important in determining the terms of trade.

Table A
Composition of visible export and import volumes by commodity group
Percentage shares

	1975	1980	1985	1986
Exports				
Food, drink and tobacco and basic materials	9	10	10	10
Fuels	6	14	20	19
Manufactures and miscellaneous	85	76	70	71
Imports				
Food, drink and tobacco and basic materials	24	20	18	18
Fuels	25	14	10	10
Manufactures and miscellaneous	51	66	72	72

Source: Department of Trade, *Monthly Review of External Trade Statistics, Annual Supplement.*

As noted above, the AVI terms of trade will also be influenced by changes in the composition of trade (Table A). Of all such changes in composition affecting the United Kingdom, the development of North Sea oil has perhaps had the most profound impact. In 1973–74 the United Kingdom, along with other net oil importing countries, suffered a marked deterioration in the terms of trade as a result of the quadrupling of oil prices. A sharp reduction in UK net oil imports after 1975 meant that the second oil price shock in 1979 had far less direct impact. The United Kingdom then became a net exporter of oil so that, as already mentioned, the collapse of oil prices in late 1985 led to a weakening of the terms of trade.[1]

In a heterogeneous grouping of goods such as manufactures, changes in composition are likely to be associated with shifts in relative prices through developments on both the demand side, involving a complex interaction of income and substitution effects, and the supply side, as producers respond to competitive pressures and technological change. In particular, it has been argued that, as a response to the real appreciation of sterling in the late 1970s, UK manufacturers may have shifted into high-value-added products, the demand for which might be relatively insensitive to price and would rise more than proportionately with incomes. Evidence for the possible influence of this process of 'trading-up' on the terms of trade is sought in the final section of the article.

Effects on the current balance

Although movements in volumes and prices are by no means independent, particularly over the longer term, it is possible to effect a statistical decomposition of the change in the trade balance into direct contributions from volume and price movements.

Table B shows the results of such a decomposition[2] in the period since 1971, with price and volume components identified separately for changes in the balances on visible trade (separated into oil and non-oil goods) and services. For completeness, the table also shows the balances of interest, profits and dividends, and of transfer payments. For non-oil trade the price effect is broken down further between the contributions of general inflation (if the trade balance is non-zero the surplus or deficit will be increased by general inflation even if the terms of trade are static) and the terms of trade.

The influence of the first oil price shock more than accounts for the deterioration in the current balance as a whole in 1974, and price movements other than for oil had a sizable influence on the non-oil balance in the years 1973–75. During the late 1970s and early 1980s the rising volume of North Sea production was a major influence. Over the period 1978–84 there was a steady deterioration in the contribution of net non-oil export volumes in each year except 1980,[3] although this was considerably offset up to 1982 by the contribution of non-oil trade prices. 1985 saw the first improvement in net non-oil export volumes since 1980, but there was again a negative contribution in 1986. (More recently the improvement appears to have resumed.) The substantial effect of the fall in the oil price accounted for most of the deterioration in the current balance last year.

Since the early 1970s there has been a general improvement in the balance on services. The influence of services volumes has moved in three distinct phases, broadly associated with exchange rate movements and

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(1) This description of the impact of oil developments relates to the AVI measure. The UVI measure was affected similarly to the AVI in both 1973–74 (for which period it is based on 1975 weights) and 1979 (1980 weights), but, as noted earlier in the text, was less affected in 1986. See also the appendix.
(2) The method is described in the appendix.
(3) With the exception of 1981 (when domestic output and demand were very weak) this reflected increases in import volumes that outpaced those in export volumes.

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Table B
Contributions to changes in the current balance[a]
£ billions, balance of payments basis

| | Change in current balance from previous year | Contribution of : Changes in visible balance | | | | | | Changes in invisible balance | | | |
| | | Oil | | Non-oil | | of which: | | Services | | Interest, profits and dividends | Transfers |
		Volume	Price	Volume	Price	General inflation	Terms of trade	Volume	Price		
1971	+0.3	—	-0.1	+0.1	+0.3	—	+0.2	+0.1	—	—	—
1972	-0.9	-0.1	—	-1.1	+0.2	+0.1	+0.1	—	+0.1	—	-0.1
1973	-1.2	-0.1	-0.1	-0.2	-1.4	+0.2	-1.5	+0.1	—	+0.7	-0.2
1974	-2.3	+0.1	-2.5	+0.8	-1.1	+0.3	-1.3	+0.3	-0.1	+0.2	—
1975	+1.7	+0.8	-0.5	+0.4	+1.3	+0.3	+1.0	+0.1	+0.3	-0.6	-0.1
1976	+0.7	+0.1	-1.0	+0.4	-0.2	+0.6	-0.7	+0.8	+0.1	+0.7	-0.3
1977	+0.8	+1.3	-0.1	—	+0.5	+0.7	-0.2	+0.5	+0.3	-1.3	-0.3
1978	+1.1	+0.6	+0.2	-1.7	+1.6	+0.2	+1.4	-0.1	+0.5	+0.6	-0.7
1979	-1.7	+1.6	-0.4	-4.6	+1.5	+0.2	+1.2	-0.7	+1.1	+0.4	-0.5
1980	+3.6	+1.3	-0.2	+1.7	+2.0	—	+2.0	-1.1	+1.2	-1.4	+0.2
1981	+3.2	+2.9	-0.2	-1.0	+0.3	+0.1	+0.2	-0.3	+0.3	+1.2	+0.1
1982	-2.2	+1.7	-0.3	-2.7	+0.2	—	+0.2	-1.6	+0.4	+0.1	—
1983	-0.8	+2.1	+0.3	-5.2	-0.4	-0.2	-0.2	+1.3	-0.2	+1.5	-0.1
1984	-1.9	-0.1	+0.1	-2.0	-1.5	-0.7	-0.8	+0.2	—	+1.8	-0.2
1985	+1.7	+1.0	+0.2	+0.6	+0.5	-0.5	+0.9	+1.2	+0.6	-1.0	-1.2
1986	-4.0	-0.3	-3.6	-1.5	-0.6	-0.1	-0.5	-0.7	+0.3	+1.7	+1.1

(a) The contributions may not sum to the total because of rounding.

See appendix for methodology.

related changes in competitiveness. Trade volumes in services appear to be influenced more quickly and more powerfully by changes in price competitiveness than are their visible trade counterparts. Prior to 1977, as the exchange rate depreciated, net exports of services improved steadily. The net volume position deteriorated during the period of appreciation between 1977 and 1981, but has improved on balance since 1983 as the exchange rate has fallen. The pattern of the direct contribution of price changes to the services balance has been broadly similar to that relating to the non-oil trade balance.

## Effects on real national disposable income

A country's national disposable income is the sum of factor incomes received from activity whether at home or abroad, less net transfer payments overseas (such as net budgetary payments to the European Community), which are, by statistical convention, regarded as prior claims on income. *Real* national disposable income (RNDI) represents the resulting command over resources and is affected by the terms of trade, since movements in the latter alter the purchasing power of exports in terms of imports.[1]

The potential significance of this terms of trade effect may best be illustrated by the example of a small economy whose domestic output is almost entirely exported and whose domestic absorption (consumer spending and investment) consists predominantly of imported goods and services. Being a small economy it could expect to have little, if any, influence over the price of its exports and imports. A sharp rise in import prices would, assuming unchanged output, have a deleterious impact on RNDI because (unchanged) export receipts would no longer buy the former volume of imported goods and

services. The previous level of real domestic absorption could only be sustained by running a current account deficit, financed by reducing overseas assets (or incurring liabilities to overseas). The effect on RNDI of a change in the terms of trade can be defined as the reduction in real domestic absorption which would be required (or, in the case of a terms of trade improvement, the increase made possible) if the current balance were to be left unchanged.

Although the UK economy may not be so small or so open as that in the above illustration, changes in the terms of trade have in some years had a significant influence on the development of RNDI (Chart 3), on occasions (for example 1974–75) larger than the effect of changes in real domestic output (Table C). However, although the terms of trade adjustment may be substantial in particular years or over short runs of years, the

Chart 3
Contribution of terms of trade effect to annual changes in RNDI

Percentage changes on a year earlier

RNDI excluding terms of trade effect
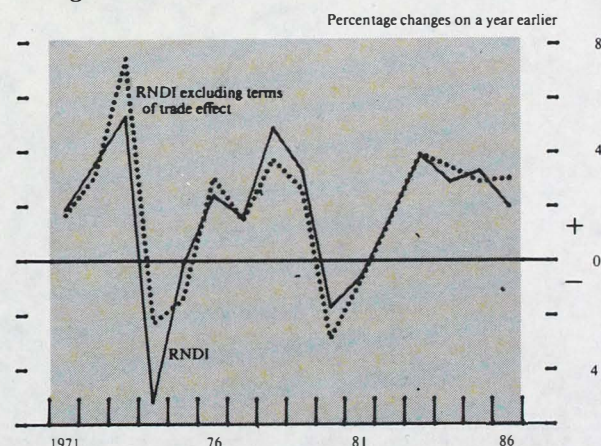
RNDI

(1) There are a number of possible methods of calculating RNDI and, in particular, the terms of trade component. See 'Measuring changes in the nation's real income', J Hibbert, *Economic Trends*, January 1985. The present article follows the definition of RNDI used by the CSO for the published national accounts.

Table C
Contributions to movements in RNDI[a]
Percentages of preceding year's RNDI

	Growth in domestic output	Terms of trade effect
1971	1.8	0.2
1972	3.3	0.5
1973	7.2	−2.1
1974	−1.9	−2.9
1975	−0.9	1.3
1976	2.7	−0.7
1977	2.4	0.1
1978	3.5	1.0
1979	2.7	0.6
1980	−2.4	1.2
1981	−1.3	0.2
1982	1.4	0.1
1983	3.4	−0.1
1984	3.0	−0.6
1985	3.5	0.4
1986	2.6	−1.1

(a) Contributions from changes in net property income or transfers not shown.

cumulative effect over the full period examined here has not been so great, because of offsetting positive and negative effects.

Exposition of the terms of trade effect on RNDI may be assisted by the sort of disaggregation given in Table D. The level of disaggregation is somewhat arbitrary (but is also constrained by the availability of data).[1] The table shows the contribution of relative price movements between broad categories—namely goods/services and oil/non-oil goods—as well as that of the relative movement of import and export prices within those categories. The terms of trade made their largest unfavourable contribution to RNDI in 1973–74 when the effects of the non-oil

Table D
Contribution of terms of trade to changes in RNDI
Percentages of preceding year's RNDI

	Overall terms of trade effect	of which: Price of goods relative to services	Terms of trade in: Services	Terms of trade in: Goods	of which: Price of oil relative to non-oil goods	of which: Terms of trade in: Oil	of which: Terms of trade in: Non-oil goods	Memorandum: Percentage change in price of non-oil commodities relative to manufactures
1971	0.2	—	−0.1	0.3	—	−0.1	0.4	−4.8
1972	0.5	0.1	0.1	0.2	—	0.1	0.1	2.1
1973	−2.1	—	−0.2	−1.9	−0.2	0.1	−1.9	29.8
1974	−2.9	−0.2	−0.3	−2.4	−1.2	−0.4	−0.8	3.6
1975	1.3	—	0.1	1.2	−0.1	—	1.3	−22.8
1976	−0.7	0.1	−0.2	−0.6	−0.2	—	−0.3	6.4
1977	0.1	—	—	0.2	—	0.2	—	3.0
1978	1.0	—	0.2	0.8	—	0.1	0.7	−10.1
1979	0.6	—	0.4	0.2	−0.5	0.1	0.6	3.1
1980	1.2	−0.1	0.4	0.9	−0.1	—	0.9	0.6
1981	0.2	—	—	0.2	0.2	−0.1	0.1	−5.1
1982	0.1	—	—	—	0.2	−0.2	0.1	−5.4
1983	−0.1	0.1	−0.2	0.1	0.1	—	—	1.1
1984	−0.6	—	−0.1	−0.5	0.1	−0.3	−0.3	2.5
1985	0.4	—	0.1	0.3	—	—	0.3	−11.1
1986	−1.1	0.1	—	−1.2	−1.5	0.4	−0.1	−13.6

(1) The method of calculation is given in the appendix. Data limitations preclude the identification of the impact of changes in the price of manufactured goods relative to non-oil commodities, which might also be of particular interest. As an indication of the periods when such changes are likely to have been important for the United Kingdom, movements in the world price of non-oil commodities relative to the export price of manufactures of OECD countries, all expressed in common currency, are shown as a memorandum item in Table D.

(2) This improvement appears to have reflected the divergent responses of the price of North Sea crude oil and that of refined oil products (the latter forming a considerably larger proportion of imports) to the fall and subsequent partial recovery of the world oil price.

commodity price boom and then the first oil shock were compounded by sterling's depreciation. The subsequent fall in non-oil commodity prices, and an acceleration of UK inflation relative to that of its trading partners (albeit implying a decline in competitiveness), only partly reversed earlier losses, and RNDI was subsequently further affected adversely by sterling's fall up to end-1976. Between 1977 and 1981, RNDI was boosted by a steady improvement in the terms of trade as the real exchange rate rose and growing North Sea oil production provided a cushion against sharply higher oil prices. Since 1981, movements in the non-oil terms of trade have been small despite sterling's depreciation. The main recent terms of trade contribution to RNDI has come from the sharp fall in oil prices in 1986, directly reducing RNDI by about $1\frac{1}{2}\%$, although the effect was partly offset by an improvement in the terms of trade in oil itself.[2]

Recent stability of the terms of trade in manufactures

Sterling's depreciation since the early 1980s has more than offset a rise, on balance, in UK costs relative to those of competitors. Nevertheless, the terms of trade in manufactures have remained broadly stable (Chart 1), a development which runs counter to some established views of the determination of trade prices.

It is typically maintained that world prices have a greater influence on UK import prices than on UK export prices (after allowance for movements in the exchange rate), whereas domestic cost developments exert a bigger impact on export prices than on import prices. In these circumstances, if sterling depreciated, import prices would rise faster than export prices and the UK terms of trade in manufactures would deteriorate; or, if cost inflation were faster in the United Kingdom than

Chart 4
Relative unit labour costs[a]

1980 = 100

Effective exchange rate

Common currency

Local currency
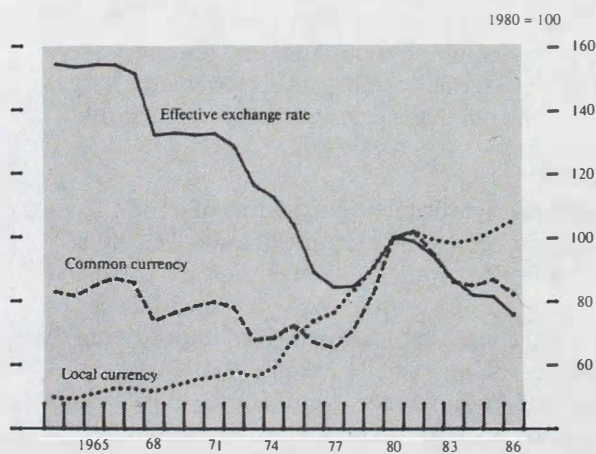
(a) Ratio of UK to overseas unit labour costs, non-normalised.

overseas, the terms of trade would improve, at least until any reaction by the exchange rate. This view of the determination of trade prices provides a reasonably satisfactory explanation of developments during the 1970s, when the pattern of movements in relative costs, expressed in common currency (Chart 4), was similar to that of the terms of trade in manufactures.
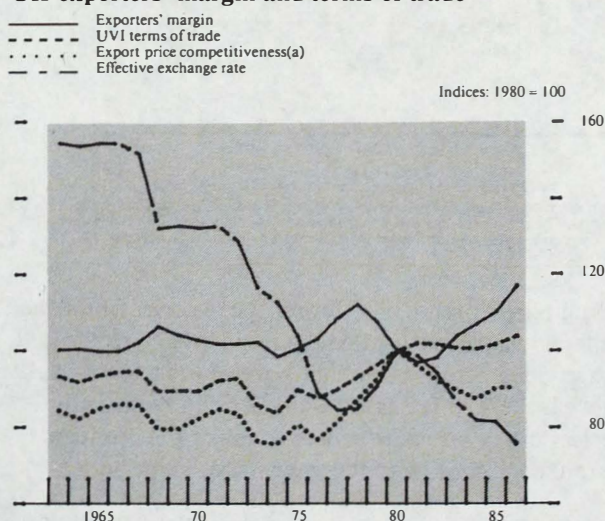
Since about 1980, however, the terms of trade in manufactures have been comparatively stable, while UK cost competitiveness has improved, mainly as a result of exchange rate depreciation. The departure from previous experience should not be overstated but it raises a question about the evolution of manufacturers' margins.

Manufacturers' margins

Exports and imports of manufactures may seldom be in direct competition. UK exporters set prices to compete with prices in overseas markets, while exporters to the United Kingdom are concerned with prices in the UK domestic market. Clearly, export and import prices may be influenced by common elements such as the exchange rate and prices of raw materials, but pricing strategy, including the manufacturers' assessment of market conditions and of profit potential, may largely be peculiar to individual products.

Both UK exporters and overseas exporters to the United Kingdom will be concerned with the price competitiveness of their product, which will influence demand.[1] In addition, they will be concerned with their profit margin per unit sold, and by adjusting prices (and hence margins) will select their preferred combination of profit margin and likely volume of sales.

Chart 5
UK exporters' margin and terms of trade

——— Exporters' margin
— — — UVI terms of trade
· · · · · Export price competitiveness(a)
— - — Effective exchange rate

Indices: 1980 = 100

(a) An increase in the index implies a loss of competitiveness from a UK perspective.

Any exchange rate movement implies a new mix. If, for example, sterling depreciates, the exporter may choose, at one extreme, to maintain an unchanged sterling price and aim for maximum stimulus to demand for his product. Conversely, he may choose to widen his margins by the full extent of the depreciation, in which case sales will benefit only to the extent of any 'supply-side' response.

Profit margins can be proxied by a simple ratio of indices of prices to costs, where the index for costs is a weighted average of unit labour costs and manufacturers' material and fuel input prices. This gives a measure of margins relative to a base year (1980) although it does not indicate the absolute size of the margin. While a reasonably satisfactory measure of the margins of UK exporters can be calculated in this way,[2] it is less easy to construct a similar index for margins of overseas producers exporting to the United Kingdom, because the composition of their input costs is not known with any precision. For present purposes, therefore, an index of these margins has been constructed on the assumption that overseas producers use the same input proportions and face the same world prices of material inputs as do UK exporters.

Chart 5 shows movements in the exchange rate, exporters' margins, export price competitiveness (defined as the ratio, in common currency, of UK export prices to overseas wholesale prices) and the UVI terms of trade in manufactures since 1963. Exporters' margins have tended to move in the opposite direction to that of the exchange rate (as would be expected): in the period 1976–81 when the terms of trade strengthened, margins first rose (1976–78) and then fell as the exchange rate appreciated. Despite the fall in margins between 1978 and 1981, export price competitiveness deteriorated, largely reflecting the rapid deterioration in common currency relative unit labour costs (Chart 4). In contrast, the years since 1981 have seen a substantial recovery in exporters' margins.[3] Such has been the growth in margins, and prices, that export price competitiveness has not improved as much (and so the manufacturing terms of trade have not fallen as much) as might have been expected given the extent of the exchange rate depreciation. Despite the fact that the exchange rate fell faster between 1974 and 1978 than between 1982 and 1986, the increase in exporters' margins has been greater in the later period. There thus appears to have been a change in exporters' pricing behaviour. The opportunity provided by sterling's depreciation between 1982 and 1986 appears to have been used mainly to increase profit margins rather than improve price competitiveness. Although a higher profit margin must imply worse price competitiveness than otherwise (for a given level of costs), it need not necessarily imply a lower market share. The level of profitability will clearly influence the willingness of manufacturers to supply. As a supply side influence, the widening in profit margins
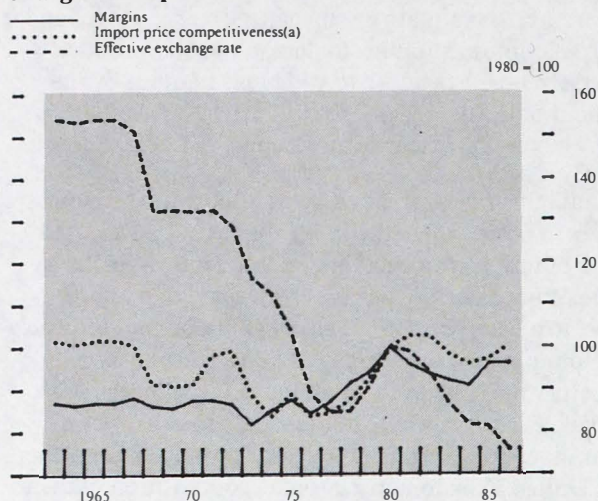
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(1) Non-oil competitiveness effects such as perceived reliability, quality and product status will also be important.
(2) The UK exporters' margin has been calculated as the ratio of the export UVI of manufactures (adjusted for the influence of taxes) to an index of costs. The latter is a weighted average of ⅔ unit labour costs (non-normalised) and ⅓ fuel and material costs. This is in turn a weighted average of various import prices, with the weights determined empirically. The weights for unit labour costs and input costs are based on the cost structure suggested by the 1979 input-output tables.
(3) Over this period there will presumably have been a tendency for less profitable companies to cease trading. Some increase in average margins might thus be expected.

Chart 6
Margin on exports to the United Kingdom

——— Margins
········· Import price competitiveness(a)
– – – – Effective exchange rate

1980 = 100

(a) An increase in the index implies a loss of competitiveness from a UK perspective.

is likely to have been one of the factors behind the improvement in UK net export volumes in late 1986 and early 1987.

The behaviour of margins on exports to the United Kingdom over this period is shown in Chart 6 along with a measure of import price competitiveness (defined as the ratio, in common currency, of UK domestic wholesale prices to UK import prices) and the exchange rate. As suggested above, this index of margins may be far from ideal. With this qualification, the general impression is of no significant departure from the patterns of earlier periods. Although sterling's depreciation since 1981 does not on balance seem to have been accompanied by a reduction in the margin on exports to the United Kingdom, the same was true of the period between 1974 and 1978. This suggests that the strength of domestic demand is likely to have been an important factor.

Overall, there does not seem to have been a change in the pricing behaviour of foreign suppliers and it appears that the exchange rate has had a greater impact on UK exporters' margins. However, this apparent divergence may in part be attributable to divergent movements of component exchange rates within the overall effective measure. Thus, the mix of countries supplying UK imports of manufactures is rather different from that of countries against which UK exports compete. In particular, Germany and Japan are more important as competitors to UK exports than as sources of imports. Further, the United Kingdom imports a substantial proportion of manufactures from smaller OECD countries which are not significant competitors in UK export markets. Such differences, coupled with divergent movements in bilateral exchange rates, suggest that, since about 1980, an 'effective' exchange rate for sterling weighted only according to import sources would probably have depreciated less than one weighted by
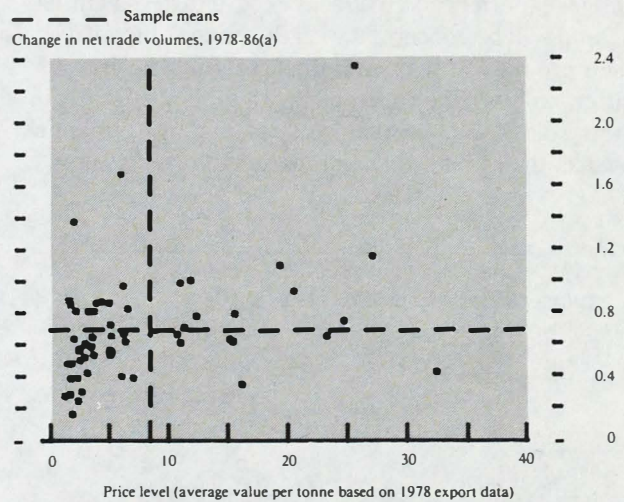
reference to competition in exports. This would in turn suggest that, other things being equal, export prices would be stronger than sterling import prices, which would help explain the stability of the terms of trade since 1981, in a period when the overall effective exchange rate (which is based on a combination of export and import weights) was depreciating.

Trading-up and the terms of trade

It was suggested earlier in the article that changes in composition associated with trading-up might be tending to raise the average price of UK manufactured goods. Other things being equal, the average value of exports would then tend to rise relative to that of imports. The AVI terms of trade, which reflect such changes in composition, would be stronger than the UVI terms of trade. However, the lower part of Chart 1 suggests that the evidence relating to such a hypothesis is, at least at the aggregate level, inconclusive.

The experience at such an aggregated level of trade may, however, conceal significant shifts in trading patterns. Chart 7 shows movements, between 1978 and 1986, in UK net trade volumes (as measured by weight) at the

Chart 7
Trade performance and price level of finished manufactures

– – – Sample means
Change in net trade volumes, 1978-86(a)

Price level (average value per tonne based on 1978 export data)

(a) Net trade volume is given by the ratio of the weight of exports to the weight of imports. The change is measured by the ratio of these net trade volumes between the years concerned; a value greater than 1 implies an increase in net trade volume.

three digit level of the SITC for most categories of finished manufactures, plotted against the respective 'price' (average value per unit of weight) of exports of each category in 1978.[1] The latter is taken as an admittedly imperfect proxy for value added, enabling the products to be ranked according to the intensity of value added.

This type of presentation may shed some light on the contention that the United Kingdom has been 'trading up'—that is, continuously shifting to the production of more sophisticated products where value added can be

(1) 1978 is the earliest year for which data based on the current SITC are available. The sample excludes items normally classified as erratics and others where volume data are not available or where growth (or decline) over the period was proportionately large around a very small base. Semi-manufactures are excluded because of the extremely wide range of average values per unit of weight.

expected, on balance, to be relatively high. Reported shifts up-market in such sectors as textiles and motor cars are examples. (And although the focus here is on finished manufactures, the same trait may be apparent in other categories, such as chemicals, where UK production may have become more specialised.) If trading-up had been taking place, a positive relationship might be expected between the price level per unit and the change in net export volume, although it should be noted that this is neither a perfect nor the only means by which trading-up might be explored. Such a relationship is broadly apparent in Chart 7, but there are clearly many exceptions (those falling in the north-west and south-east quadrants as defined by the broken lines which delineate average experience—an attempt to correct for other, more general factors which will also have influenced trade volumes and prices over this period). The absence of a firm relationship may partly reflect the inadequacy of the proxies for

Chart 8

Trade performance in manufactures: changes in net trade volumes[a] and terms of trade[b]

– – – Weighted averages

1986 on 1981
Change in net trade volumes

1981 on 1978
Change in net trade volumes

Change in terms of trade

(a) As defined in Chart 7.
(b) The terms of trade are given by the ratio of the average values per tonne for exports and imports. The change is measured by the ratio of the terms of trade between the years concerned and so a value greater than 1 implies an increase.

quantity and value added. In the field of information technology, for example, the emphasis has been on miniaturisation, so that weight is a highly misleading measure of the number of units traded.

A further limitation of the analysis illustrated in Chart 7 is that it is based only on 1978 price levels, without regard to price movements over time, and does not therefore indicate what contribution any trading-up may have made to movements in the terms of trade. With this in mind, Chart 8 offers an alternative presentation, plotting the same measure of trade performance against the change in the terms of trade in each category. Disaggregated data covering both semi and finished manufactures is used. The relationship is explored both for the period 1978 to 1981 when the overall terms of trade were rising, and for 1981 to 1986 when the terms of trade were more stable. Although there are again a considerable number of exceptions (those in the north-east and south-west quadrants), the evidence does suggest that there is a negative relationship between net trade performance and changes in the terms of trade: categories with an above average increase in the terms of trade tend to be those with worse than average trade performance, and this is true in both periods. The evidence therefore tends to reject the hypothesis that the buoyancy of the terms of trade was due to trading-up. Rather it suggests that the influence of changes in price competitiveness associated with the changes in the terms of trade has dominated any influence from a change by manufacturers in the goods which they supply.

Conclusion

This article has surveyed developments in the UK terms of trade. Swings in the terms of trade have on occasions been important influences on the current account and on real national disposable income. The latter is perhaps a better indicator of welfare than is gross domestic product, and in some years the difference in the growth rates between these two aggregates has been marked.

There are some indications that the pricing behaviour of UK exporters may have altered recently, with a strong growth in margins. This has, of course, been facilitated by some depreciation of sterling, but more of the benefit may have been taken in margins, rather than in price competitiveness, than in earlier episodes. Though tentative, this, when examined in conjunction with trade performance, seems indicative of improved supply-side responses.

Disaggregated data suggest that price competitiveness is nevertheless important. These data also provide some confirmation—again very tentative—of the process of trading-up.
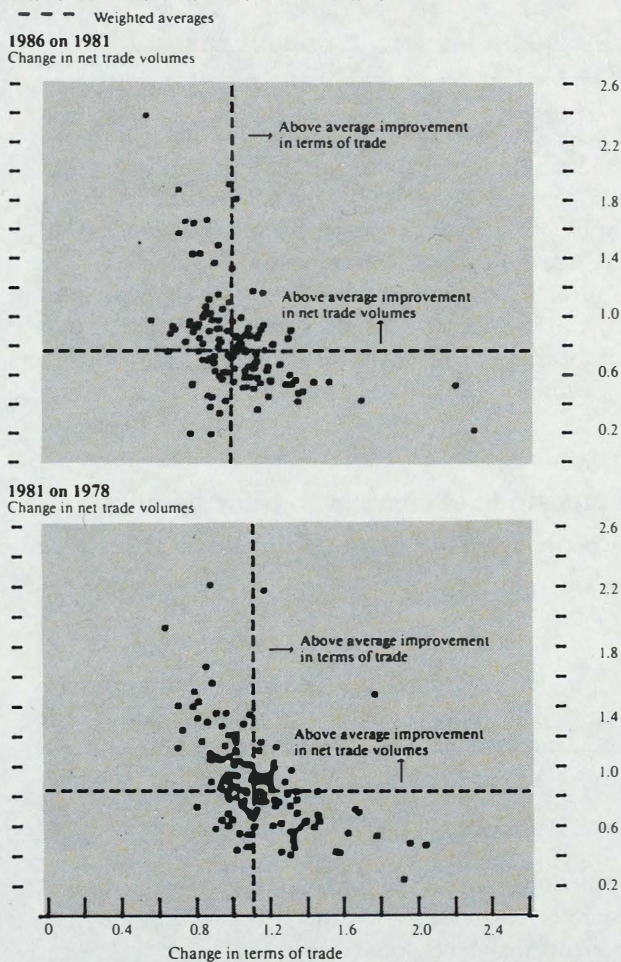
Appendix

Measurement of trade prices

When a price index is constructed for a group of goods, it is necessary to use some weighting system to combine the prices of the individual goods within the group. A unit value index (UVI) is constructed from information at a disaggregated level, the 'price' for each good usually being the ratio of value to quantity. These prices are weighted together to form an index, with the weight of each good being its share of the total value of trade in the base year—a base-weighted (Laspeyres) index. In contrast, an average value index (AVI) is the ratio of the current value of goods in the group to the value of the same volume at base-year prices. The resulting index is therefore a current-weighted (Paasche) index, in that it reflects the current importance by volume of the goods that make up the index. An AVI can be obtained directly at any level of aggregation for which value and volume data are available, whereas an aggregate UVI is obtained by weighting disaggregated UVIs by the pattern of trade in the base year.

Differential movements between AVIs and UVIs may occur because of changes in composition. These may arise because of changing incomes or tastes, trade restrictions, the discovery or exhaustion of natural resources, etc. Moreover, they will reflect changes in relative prices. Other things being equal, consumers will tend to substitute goods whose prices are rising relatively slowly for those whose prices are increasing more rapidly, in which case the AVI will tend to rise more slowly than the UVI, although the reverse will hold if the comparison relates to a period prior to the base year for the UVI weighting.

Chart 9, which shows movements in the UVI and AVI for imports of goods (less erratic items) from 1973 to 1986, broadly confirms such behaviour. A faster growth of the UVI since 1980 is evident, although a sharp increase in the AVI in the first quarter of 1986 considerably narrows the differential. In the period 1978–80 the UVI, based on 1980 weights (the official 1980-based index is available recalculated back to 1978), rises more slowly than the AVI. For the years before 1978 the UVI, though rescaled for continuity, is based on 1975 weights. Consistently, the UVI outpaces the AVI in the second part of this earlier period, but there appears to be little difference in the first part.

A similar relative pattern is found for the two export indices (not shown); the faster growth of the UVI is accentuated since 1980 by oil developments—a distinctive combination, on balance, of higher volume and

Chart 9
Import prices: AVI vs UVI, total visible trade excluding erratic items
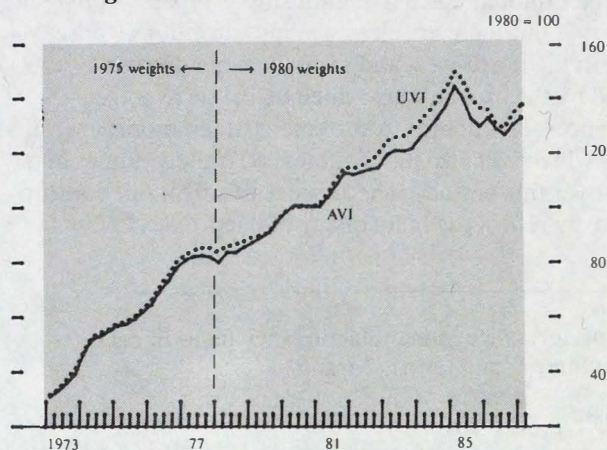
lower price. At lower levels of aggregation the pattern is also evident, for both exports and imports, although the contrast between AVI and UVI tends to be weaker in categories which are more narrowly defined (eg fuels) or those where there may be fewer possibilities for substitution (eg basic materials). There are short periods during which the series for food, drink and tobacco do not conform to the pattern. This may reflect the influence of the Common Agricultural Policy on the pattern of UK trade.

Decomposition of changes in trade balance

In any period the trade balance (BAL) can be represented as

$$BAL = P_x \cdot x - P_m \cdot m$$

where x and m are, respectively, export and import volumes and P_x and P_m are the corresponding AVIs. The change in the trade balance (ΔBAL) can be broken down into price (ΔP) and volume (ΔV) components:

$$\Delta BAL = \Delta P + \Delta V$$

Using the subscripts 1 and 0 to denote the current and previous periods respectively, the price and volume components may be expressed as either

$$\Delta P = \Delta P_x \cdot x_0 - \Delta P_m \cdot m_0$$
$$\Delta V = P_{x1} \cdot \Delta x - P_{m1} \cdot \Delta m$$

or

$$\Delta P = \Delta P_x \cdot x_1 - \Delta P_m \cdot m_1$$
$$\Delta V = P_{x0} \cdot \Delta x - P_{m0} \cdot \Delta m$$

In other words, either the price effect is calculated on the basis of previous period volumes and the volume effect on the basis of current prices, or vice versa. In Table B the first method has been used, but the second method would give similar results for the year-to-year movements.

Further decomposition of price component

For the purposes of Table B, the chosen formula for the price component of the change in the trade balance, namely

$$\Delta P = \Delta P_x \cdot x_o - \Delta P_m \cdot m_o$$

may be split into a general inflation effect,

$$\Delta P_m \cdot (x_o - m_o)$$

and a terms of trade effect,

$$(\Delta P_x - \Delta P_m) \cdot x_o$$

In this representation, the inflation effect is given by applying the change in import prices to the volume imbalance, and the terms of trade effect by applying the change in relative trade prices to the export volume. Alternatively the inflation effect could be calculated by reference to export prices or, indeed, to a more general price index such as the GDP deflator, with associated adjustments to the measure of the terms of trade effect; the choice of price deflator is somewhat arbitrary.

Terms of trade effect on RNDI

In the UK national accounts the terms of trade component (TT) of RNDI is defined as the amount by which the purchasing power of exports in terms of imports exceeds the instrinsic export volume (export value deflated by export price). Thus, continuing with the earlier notation and denoting the value of exports by X:

$$TT = X/P_m - X/P_x$$
$$= x \cdot (P_x/P_m - 1)$$

Clearly, TT is zero in the base year for the indices — presently 1980. The terms of trade contribution to the *change* in RNDI in any period not commencing in the base year is influenced by factors other than merely changes in the ratio of export to import prices, since it can be shown that

$$\Delta TT = x_o \cdot \Delta (P_x/P_m) + \Delta x \cdot (P_x/P_m - 1)$$

Thus, if the terms of trade stand significantly away from unity, the calculated contribution of the terms of trade to RNDI may alter between years as a result of changes in export volume, regardless of whether the terms of trade index has itself moved. In practice, the influence of changes in the terms of trade has completely overshadowed any 'export volume' effect.

Disaggregation by categories of trade

Using subscripts a and b to denote different categories of trade, separate terms of trade contributions to RNDI from within each category can be defined as follows:

$$TT_a = x_a \cdot (P_{xa}/P_{ma} - 1)$$

$$TT_b = x_b \cdot (P_{xb}/P_{mb} - 1)$$

However, these two terms do not sum to the overall terms-of-trade effect, TT. The residual can readily be derived as

$$TT - TT_a - TT_b = X/P_m - X_a/P_{ma} - X_b/P_{mb}$$
$$= X_a \cdot (1/P_m - 1/P_{ma}) + X_b \cdot (1/P_m - 1/P_{mb})$$

This expression may be regarded as the 'between-category' effect, reflecting the consequences of relative price movements between the different categories of trade rather than movements in export prices relative to import prices within particular categories.

Since the aggregate AVI, P_m, is a weighted average of the individual category AVIs, P_{ma} and P_{mb}, it is possible to analyse the components of this expression further. After some manipulation, it can be shown that

$$X_a \cdot (1/P_m - 1/P_{ma}) = (1 - W_a) \cdot (1 - P_{mb}/P_{ma}) \cdot X_a/P_m$$

where $W_a = m_a/m$, the weight of the individual AVI for category a in the aggregate AVI.

A similar form of expression results for $X_b \cdot (1/P_m - 1/P_{mb})$. In other words, the between-category effect depends on the ratio of the individual category import AVIs and the composition of import volumes.[1] For a given composition of import volumes, the larger the difference between P_{ma} and P_{mb}, the larger the between-category effect.

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(1) The expression for the between-category effect clearly depends on the chosen definition of the terms of trade effect on RNDI. Had a different definition been chosen (alternatives are discussed in the paper by Hibbert referred to on page 373), the resulting expression for the between-category effect might have been rather different.