Sterling and inflation

An important factor behind the significant reduction in the rate of UK price inflation has been the rise in sterling. By mid-August, however, sterling had depreciated from its peak against the US dollar by over 25% and from its effective rate peak by over 10%.[1] *This note discusses the resulting upward pressure on UK prices. It disputes the view that sterling's movement against the dollar gives a better indication of the inflation effect than the movements in its effective exchange rate. The response of wages is very uncertain. This note suggests that, in the absence of any wage response, consumer prices could rise on account of depreciation by only one quarter of the fall in the effective rate after two years.*

The relevance of the effective rate

Sterling has depreciated heavily against the dollar but by comparatively little against currencies in the European Monetary System. It has been argued that the United Kingdom has thus had the worst of both worlds: the maximum inflation effect (because—so the argument runs— UK import prices, especially of primary products, are set in dollars) but with little gain in competitiveness (because the most important markets are in Europe). In particular, it has been suggested that the change in the effective rate understates the impact of recent exchange rate changes on UK import prices, and thus on UK inflation, because the dollar has a weight of only one quarter in the sterling effective rate index.

As presently constructed, the sterling effective exchange rate index is geared to the trade balance effects of exchange rate movements: given a particular set of exchange rate changes against sterling, the index shows that uniform movement in sterling against all the currencies in the basket which would have an equivalent impact on the trade balance.[2] Though in principle there is no reason why the effective exchange rate should be suitable as an index measuring the inflationary impact of exchange rate changes, the weight given to the dollar does not in fact appear to be too low for this purpose. Those who believe that the dollar should be given a greater weight than in the effective index have made the following points.

Weights reflecting the shares of countries in UK imports may be more appropriate for an index directed towards the price effects in this country of exchange rate changes.[3]
Table A shows weights based on shares in UK visible imports for the countries included in the effective rate index.[4] Except for the United States and Japan, the weights are broadly similar to those of the effective rate index (see the second column in the table); and in fact the US dollar has a considerably *smaller* weight in the 'import shares' index than in the effective index.

Table A
Exchange rate weights

	Import shares index(a)	Effective rate index(a)
Austria	0.81	1.00
Belgium	6.85	4.04
Canada	3.73	1.51
Denmark	2.91	1.09
France	10.29	10.39
West Germany	15.05	14.08
Italy	6.10	7.18
Japan	4.52	13.67
Netherlands	8.99	4.80
Norway	3.80	2.11
Sweden	3.90	3.73
Switzerland	6.90	3.00
United States	15.95	24.63
Australia	1.28	1.99
Finland	2.09	0.85
Ireland	4.71	4.05
Spain	2.12	1.86

(a) Based on share by value in 1980 (overseas trade statistics basis).

Chart A compares the indices derived using these two sets of weights. The 'import shares' index has recently fallen slightly less fast than the effective rate, so an index constructed in this way would attach less significance to recent exchange rate developments than the effective rate index (and, of course, still less than the sterling/dollar rate alone); this is mainly because of the lower weight given to the dollar in the 'import shares' index.

Effective rate weights understate the importance of the dollar, because some UK imports from countries other than the United States may also be invoiced in dollars.
The evidence on invoicing of UK imports is limited. The results of surveys of currency invoicing of UK imports conducted in 1978 and 1979 by the Department of Trade[5] suggest that roughly 40% of UK imports are invoiced in

(1) Quarterly averages of these rates are shown in Chart A. Sterling reached its recent peak against the US dollar ($2.4650) on 24 October 1980 and in effective terms (105.6) on 28 January 1981.

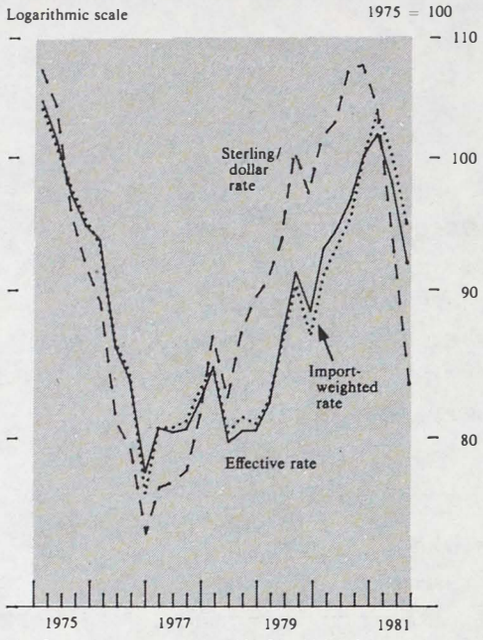
(2) Its construction and the weights used in its calculation were described in the March 1981 *Bulletin*, page 69. As Table A shows, the weight of the US dollar in the effective rate index is considerably greater than our bilateral trade with the United States would suggest. This largely reflects the importance, for the UK trade balance, of the United States as a competitor in third markets.

(3) This assumes that exporters price in their own currencies without reference to exchange rates.

(4) The only sizable omission in terms of import share is Saudi Arabia, though several countries have a larger import share than Austria (the country with the lowest weight in the index).

(5) The most recent of these, carried out on imports in October 1979, was reported in *British Business*, 13 February 1981, page 318.

Chart A
Exchange rate indices[a]



(a) Quarterly averages except 1981 Q3 which is July and August.

sterling, 30% in dollars and 30% in other currencies. The share of imports invoiced in dollars is therefore only slightly greater than the weight of the dollar in the effective rate index. Furthermore, the currency of invoice is probably only of short-run importance. Over time, prices quoted in dollars will adjust in response to movements in exchange rates: for example, quoted dollar prices may tend to fall following a general strengthening of the dollar, because third countries will still be able to maintain their previous receipts in terms of their own currencies even if they quote lower dollar prices; in addition, demand may weaken if dollar prices are not reduced. Thus the invoicing evidence does not suggest that changes in the sterling/dollar exchange rate should be given any more significance in considering its impact on UK domestic prices than is already reflected in sterling's effective rate.

Primary product prices are particularly important to the United Kingdom, because of their impact on the prices of domestically produced goods.

The importance of the United States in the production, consumption and marketing of many internationally traded commodities has made the dollar an obvious numeraire for a large proportion of trading on commodity markets—though in so far as it affects UK import prices this will be reflected in the invoicing data discussed above. *But the US dollar prices have also become accepted in some quarters as providing a 'true' measure of primary product prices,* in the sense that fluctuations in dollar exchange rates are transmitted—with due allowance for invoicing lags—into the prices paid in local currencies by other countries. Again, this could mean that the effective rate gives insufficient weight to the dollar, and that the price implications of the recent strength of the dollar are understated by the sterling effective rate index.

Although a full analysis of the interaction between primary product prices and flexible exchange rates is beyond the scope of this note, an examination of the correlation between aggregate primary product price indices denominated in different currencies and the relevant exchange rates may provide some insight.[1] For this purpose the dollar and the SDR[2] have been used; if, for example, a basket of currencies, such as the SDR, is less likely to distort 'true' commodity prices (in other words, if SDR-denominated prices reflect underlying market conditions better than dollar-denominated prices) then movements in the SDR/dollar exchange rate will be more closely related to movements in the dollar-denominated series than to those expressed in SDRs.

The results obtained from relating changes in aggregate primary product price indices (denominated alternatively in dollars and SDRs) to changes in the SDR/dollar exchange rate are given in Table B. The indices for metal ores and agricultural raw materials appear to be less sensitive to exchange rate movements when expressed in dollars—perhaps reflecting the high proportion of dollar-denominated producer pricing—but this result is reversed in favour of the SDR once metals and food are included.

Table B
Correlation of monthly percentage changes in the SDR/dollar exchange rate and commodity price indices (1976–80)

	Denominated in:	
	Dollars	SDRs
Metal ores	−0.185	+0.338(a)
Metals	−0.377(a)	+0.215
Agricultural non-foods	−0.276(a)	+0.316(a)
Foods	−0.601(a)	+0.025
All items	−0.632(a)	+0.224

(a) Significant at the 95% level.

The results for the foods index are particularly striking, reflecting the importance of products covered by the Common Agricultural Policy (CAP) of the European Community in UK imports. The 'all items' dollar index shows a strong tendency to move inversely with changes in the international value of the dollar, while the corresponding SDR index is not significantly correlated with the SDR/dollar rate. In addition, the SDR series are generally more stable: their coefficients of variation are smaller than for the dollar indices, even after allowance for trends in the series, and they are not sensitive to exchange rate fluctuations.

This suggests that the sterling price paid by British industry for raw materials depends upon sterling's rate against currencies in general, and not just against the dollar. Indeed, the results obtained from relating percentage

(1) These indices comprise market price quotes, so trade invoicing considerations and contractual lags are not relevant here. The individual prices are, however, weighted according to the importance of the primary products in UK imports because the argument is being examined in the UK context.

(2) The valuation of the SDR was described in the March 1981 *Bulletin*, page 66.

changes in industry's wholesale buying prices for raw materials (including oil) to exchange rate movements are consistent with the result that the importance of the sterling/dollar exchange rate in the determination of sterling commodity prices is in turn dependent upon the close association between this rate and sterling's effective rate. When the sterling/dollar rate was split into components reflecting separately the overall strength of the dollar and of sterling, then it was only the latter which shows any significant degree of association.[1]

The impact on prices and wages of a lower exchange rate

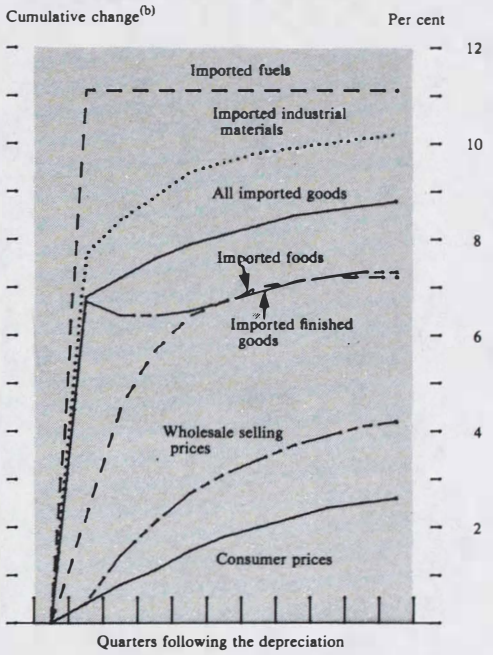
A lower sterling exchange rate against currencies in general will influence prices and wages in numerous interrelated ways, the full effect of which will only come through after some time. The immediate effect is most strongly felt on import prices. Within three months the sterling cost of imported industrial materials will probably be raised by nearly the full amount of the depreciation, as will the sterling cost of imported fuels and home-produced oil. Imported food prices will rise by rather less because, unless the 'green pound' is changed, the prices of foodstuffs covered by the CAP will be unaffected by a depreciation of sterling. Finished goods prices also rise by less than the full extent of the depreciation: these are influenced in part by UK domestic prices,[2] whose response to depreciation is much slower—though as it grows over time these import prices will continue to rise.

The increase in the sterling cost of imported raw materials will raise manfacturers' costs; thus wholesale prices will rise, possibly by more than the share of imported materials in costs would suggest, because international competitive restraints on output prices will have been eased by depreciation. The strength of this response may well be influenced by demand conditions. For example, the present weak state of demand at home and abroad may mean that companies may not be able to pass on automatically the higher cost of imported materials. In addition, some materials (such as oil) will have a greater influence on costs than their import weight suggests because a proportion of manufacturers' requirements is met by domestic production.

There are, however, further repercussions. The rise in wholesale selling prices will feed through to consumer prices, which will also be influenced directly by the rise in the price of imported consumer goods. Wages may also be affected. Employees may attempt to offset the erosion of real incomes brought about by the rise in consumer prices; in addition, employers may be more prepared to concede higher wages because domestic production will have become more profitable. How quickly and by how much wages increase are crucial to the longer-term price effects, because any rise in wages could influence wholesale and consumer prices and initiate a further rise in wages.[3]

In order to cut through the complexities it is helpful to consider the results of a simulated exchange rate depreciation using the Bank's short-term model. Chart B shows the simulated effects of a 10% sterling depreciation against all currencies which is not subsequently reversed,

Chart B
Price impact of 10% depreciation[a]



(a) From the Bank's short-term model, assuming no wage response. The exchange rate is assumed to remain 10% below the level it would otherwise have been.

(b) A 10% depreciation of sterling against the dollar is equivalent to an increase of 11.1% in units of sterling per dollar. As it is the latter rate which is relevant in this context, the 10% depreciation leads eventually to a rise slightly greater than 11% in some import prices.

and assumes that nominal wages are unaffected by the depreciation.[4] Wholesale and consumer price responses are relatively muted: after two years, consumer prices have risen by only one quarter of the fall in the exchange rate.

Any response of wages would tend to increase wholesale and consumer prices further—in the long run by the full extent of the depreciation if wages rose by a similar amount.[5] Present labour market conditions, and the low level of profitability in the manufacturing sector, may

(1) Correlations between monthly percentage changes in UK industry's wholesale buying prices for raw materials (denominated in sterling) and changes in various exchange rates between 1976–80 are:

Sterling/dollar rate	−0.556
Dollar effective rate	+0.120
Sterling effective rate	−0.629

(2) Recent Bank research suggests a figure of around 30%: see I D Bond, *The determination of UK manufactured import prices*, Bank of England Discussion Paper No. 16.

(3) For a more detailed exposition see R N Brown, C A Enoch and P D Mortimer-Lee, *The interrelationships between costs and prices in the United Kingdom*, Bank of England Discussion Paper No. 8.

(4) The 'green pound' is also assumed to be unaffected by the depreciation.

(5) If wages rise in line with consumer prices (but do not anticipate any price rise) consumer prices rise by one third of the exchange rate depreciation after two years.

moderate the wage response; in any circumstances, the final outcome will depend on the strength of monetary and fiscal policy. Because of the various lags noted above, not all the benefits of the appreciation in sterling over 1979 and 1980 will have come through to consumer prices yet; thus any upward pressure on consumer prices arising from the recent depreciation should for some time be at least partially offset by the delayed effects of the earlier appreciation.