

Revisions to the calculation of effective exchange rates

This note describes new statistics recently published by the International Monetary Fund (IMF) and the consequent proposed changes in the way the Bank of England calculates indices of effective exchange rates. The new indices are to be published from 30 December 1988; the old indices will also be published for the last time on that day.

An effective exchange rate is a measure of the value of a currency against a 'basket' of other currencies, relative to a base date. It is calculated as a weighted geometric average of exchange rates, expressed in the form of an index.

The effective exchange rate indices for sterling and other currencies currently published by the Bank are based on the IMF's Multilateral Exchange Rate Model (MERM).⁽¹⁾ The weights were designed such that, in the case of sterling for example, according to the MERM, any combination of changes in other currencies against sterling which resulted in a 1% change in the index would have the same effect on the United Kingdom's visible trade balance as a 1% change in sterling against all other currencies. The current weights were introduced in 1981⁽²⁾ and take account of the direction and size of trade flows in 1977.

Beginning with the July 1988 edition of its publication *International Financial Statistics*, the IMF started publishing new monthly nominal effective exchange rate indices for sixteen industrialised countries.⁽³⁾ Since the MERM is unlikely to be re-estimated in the near future, and its weights are becoming increasingly outdated, it is intended to make the new published index the United Kingdom's 'official' exchange rate index (ERI) as from 3 January 1989. The weights for the new effective exchange rate have been derived from disaggregated trade flows in manufactured goods in 1980, rather than trade in all goods in 1977 as in the MERM-based index; it is hoped that the IMF will be able to update the weights in the new indices in due course. The weights are designed to measure the impact of real exchange rate changes on the real manufacturing balance and for any individual country represent the relative importance of each of the other countries as a competitor to the manufacturing sector of that country. The weight for each country is

derived from three components: by way of example, the weight of the US dollar in the sterling index takes account of (i) US competition in the UK domestic market (ie import competitiveness), (ii) UK competition in the US domestic market (ie bilateral export competitiveness) and (iii) competition between US and UK manufactured goods in third country markets (ie the markets of the other fifteen industrialised countries, and those in other areas of the world). These components are weighted together differently in the calculation of each country's index, according to the degree of competition in each market.⁽⁴⁾

For the United Kingdom, manufacturing trade represents over three quarters of all visible trade and the sixteen countries account for a similar proportion of our overseas markets. The most significant changes in the weights of the sterling ERI are the fall in the weight of the US dollar from approximately 24.6% to 20.4%, and the rise in the weight of the currencies of members of the European Community included in the calculations from 47.5% to 55.6% (within this the weight for the deutschemark has increased from 14.1% to 20%). This continues a trend apparent at the time of the last revision in 1981, when the weight of the US dollar declined from 32.8% to 24.6%. Australia, which in the old index had a weight of 2%, is no longer included in the calculation. The matrix of weights is shown in Table A.

The base date for the new sterling exchange rate index will be 1985 = 100. A change in the base date only influences the scale of the index and not percentage changes between different points; neither does it require any alteration to the weights used in the calculation. The new exchange rate index for sterling is shown in Table B and the chart alongside the old index, which for ease of comparison has been rescaled to 1985 = 100.

(1) See 'A Multilateral Exchange Rate Model' by J R Artus and R R Rhomberg, *IMF Staff Papers*, Vol 20, November 1973, page 591. The model was subsequently developed by the IMF's Research Department; see 'A Revised Version of the Multilateral Exchange Rate Model' by J R Artus and A K McGuirk, *IMF Staff Papers*, Vol 28, June 1981, page 275.

(2) See 'Revisions to the calculation of effective exchange rates' in the March 1981 *Bulletin*, page 69.

(3) The countries are the MERM eighteen countries excluding Australia and Ireland, although exchange rates against the Irish punt are included in the Calculations of other countries' indices. See *International Financial Statistics*, July 1988, page 7.

(4) For details of how these weights are derived see 'Measuring Price Competitiveness for Industrial Country Trade in Manufactures' by A K McGuirk, *IMF Working Paper*, April 1986.

Table A
Weights derived from trade in manufactures^(a)

Based on 1980 trade flows

	Austria	Belgium	Canada	Denmark	France	West Germany	Italy	Japan	Netherlands
Austria	—	0.0278	0.0067	0.0106	0.0728	0.4342	0.1090	0.0508	0.0309
Belgium	0.0113	—	0.0082	0.0077	0.2072	0.2755	0.0728	0.0442	0.0947
Canada	0.0033	0.0099	—	0.0020	0.0273	0.0405	0.0163	0.0743	0.0092
Denmark	0.0185	0.0327	0.0069	—	0.0707	0.2466	0.0524	0.0510	0.0449
France	0.0133	0.0931	0.0101	0.0074	—	0.2742	0.1470	0.0645	0.0501
West Germany	0.0500	0.0779	0.0094	0.0164	0.1725	—	0.1227	0.0845	0.0773
Italy	0.0282	0.0462	0.0085	0.0078	0.2077	0.2755	—	0.0639	0.0387
Japan	0.0109	0.0233	0.0324	0.0063	0.0758	0.1578	0.0531	—	0.0231
Netherlands	0.0142	0.1072	0.0086	0.0119	0.1263	0.3096	0.0690	0.0497	—
Norway	0.0178	0.0338	0.0141	0.0590	0.0666	0.1593	0.0377	0.0747	0.0481
Sweden	0.0207	0.0325	0.0139	0.0547	0.0829	0.2226	0.0546	0.0707	0.0387
Switzerland	0.0384	0.0457	0.0069	0.0094	0.1159	0.2874	0.0957	0.0662	0.0304
United Kingdom	0.0124	0.0525	0.0190	0.0145	0.1175	0.2001	0.0766	0.0883	0.0500
United States	0.0073	0.0283	0.1873	0.0065	0.0831	0.1450	0.0560	0.2586	0.0275
Finland	0.0311	0.0266	0.0206	0.0374	0.0718	0.1983	0.0481	0.0549	0.0387
Republic of Ireland	0.0087	0.0318	0.0157	0.0108	0.0752	0.1525	0.0509	0.0391	0.0363
Spain	0.0111	0.0375	0.0118	0.0067	0.2126	0.1923	0.1256	0.0839	0.0351

	Norway	Sweden	Switzerland	United Kingdom	United States	Finland	Republic of Ireland	Spain
Austria	0.0085	0.0296	0.0724	0.0582	0.0584	0.0165	0.0026	0.0110
Belgium	0.0066	0.0190	0.0351	0.1007	0.0924	0.0058	0.0038	0.0152
Canada	0.0033	0.0098	0.0064	0.0442	0.7400	0.0054	0.0023	0.0058
Denmark	0.0488	0.1363	0.0309	0.1181	0.0906	0.0345	0.0056	0.0115
France	0.0058	0.0218	0.0400	0.1012	0.1217	0.0070	0.0041	0.0386
West Germany	0.0087	0.0368	0.0624	0.1085	0.1336	0.0121	0.0052	0.0220
Italy	0.0046	0.0203	0.0467	0.0933	0.1159	0.0066	0.0039	0.0322
Japan	0.0076	0.0218	0.0269	0.0894	0.4449	0.0063	0.0025	0.0179
Netherlands	0.0106	0.0256	0.0265	0.1086	0.1017	0.0095	0.0049	0.0161
Norway	—	0.1765	0.0232	0.1300	0.0981	0.0445	0.0034	0.0133
Sweden	0.0586	—	0.0280	0.1243	0.1148	0.0663	0.0036	0.0130
Switzerland	0.0058	0.0213	—	0.1368	0.1173	0.0069	0.0027	0.0132
United Kingdom	0.0131	0.0379	0.0548	—	0.2044	0.0145	0.0242	0.0202
United States	0.0058	0.0206	0.0276	0.1202	—	0.0054	0.0049	0.0155
Finland	0.0398	0.1788	0.0245	0.1283	0.0818	—	0.0036	0.0159
Republic of Ireland	0.0055	0.0175	0.0175	0.3853	0.1339	0.0065	—	0.0128
Spain	0.0064	0.0188	0.0251	0.0958	0.1251	0.0085	0.0038	—

(a) The weights relating to the effective exchange rates of the countries in the left-hand column are obtained by reading across the appropriate rows. The weights for an individual currency do not necessarily sum exactly to unity. This is due to rounding, as the weights are quoted to four decimal places only.

Sterling effective exchange rate

— New effective exchange rate
- - - Old effective exchange rate

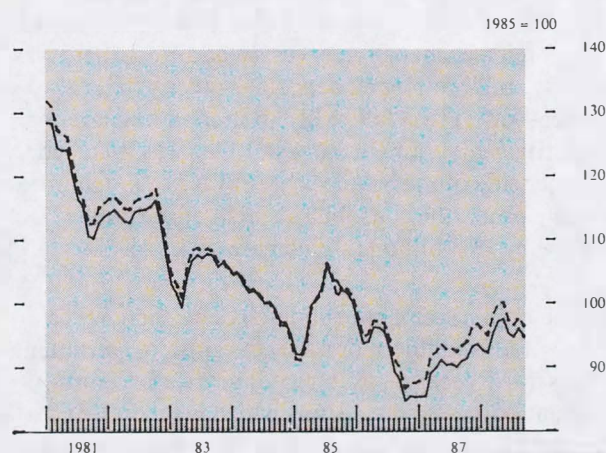


Table B
'New' and 'old' indices of the sterling ERI

1985 = 100
Quarterly averages

		New	Old ^(a)
1985	Q1	92.9	92.1
	Q2	101.0	100.8
	Q3	104.6	104.9
	Q4	101.4	102.1
1986	Q1	95.0	96.1
	Q2	96.1	97.3
	Q3	90.2	92.0
	Q4	85.1	87.2
1987	Q1	86.7	89.3
	Q2	90.5	93.0
	Q3	90.5	92.9
	Q4	92.7	95.7
1988	Q1	93.5	96.4
	Q2	96.6	99.2
	Q3	95.2	97.0

(a) For comparison the old index has been rescaled to 1985 = 100.