

# Revision to the calculation of effective exchange rates

*This note describes some changes in the way in which the Bank of England calculates indices of effective exchange rates. The new indices were first published by the Bank on 2 February 1981; the old indices ceased to be published on 6 February 1981.*

An effective exchange rate index is a measure of the overall value of a currency against a number of other currencies, relative to a certain base date. The measure depends upon which other currencies are included in the calculation and the relative importance (weight) attached to each of them. Various effective exchange rate indices can therefore be calculated for any one currency. Also, the base date against which exchange rates are compared can be varied, although the adoption of a different date will influence only the scale of the index at any point, and not percentage changes in it between different dates.

The effective exchange rate indices for sterling and certain other currencies published by the Bank are based on the Multilateral Exchange Rate Model (MERM) of the International Monetary Fund (IMF).<sup>(1)</sup> The weights derived from the MERM are such that any combination of changes in other currencies against sterling which would have the same effect on the UK trade balance as a one per cent change in sterling against each of the other currencies is reflected as a one per cent change in the index. For example, the US dollar has a weight of approximately one quarter in the present calculation of the sterling effective rate: thus a one per cent depreciation of the US dollar is considered to have the same impact on the UK trade balance as a uniform appreciation of sterling of some one quarter of one per cent against all currencies in the basket.

From Monday, 2 February 1981 the calculation of the effective exchange rate indices published by the Bank was changed in three respects:

- The currencies of Hong Kong, Taiwan and Yugoslavia were no longer included in the calculation.

- The weights were revised by reference to 1977 rather than 1972 trade flows.
- The indices were based on average daily closing exchange rates in London<sup>(2)</sup> for 1975 = 100, rather than on the middle rates reported to the IMF following the Smithsonian agreement in December 1971.

The most significant change is the revision to the weights. As was noted at the time of the previous revision to the effective exchange rate calculation,<sup>(3)</sup> it has been the intention to change them whenever new weights based on more recent trade data become available. The IMF has recently updated the MERM using 1977 trade flows, and the new weights are shown in Table A. For the United Kingdom the most significant change is the fall in the weight of the US dollar from approximately one third to one quarter. This fall of eight percentage points is balanced by increases in the weights of the Irish pound (three points), the yen and the guilder (two points each), and the lira (one and a half points). Other changes are relatively small, being generally less than one point. (The omission of the three countries is not important for the sterling effective index because their combined weight was only some one and three quarter percentage points.)

The new effective exchange rate index for sterling since 1975 is shown in Table B alongside the old index, which has been rescaled onto the same base.<sup>(4)</sup> Over the period shown, there is very little difference between the two series. This means that changes in the weights have had largely offsetting effects on the quarterly average effective exchange rate for sterling over this period, although this is not the case for the effective rates of some other currencies.

(1) See 'A Multilateral Exchange Rate Model' by J R Artus and R R Rhomberg, *IMF Staff Papers*, vol. 20 no. 3, November 1973, page 591. The model has subsequently been further developed in the IMF's Research Department.

(2) Except for the Finnish markka, for which the Bank of Finland's trading rate in Helsinki is used.

(3) See the March 1977 issue of the Treasury's *Economic Progress Report*.

(4) Before 1975 the new index can be roughly approximated by dividing the old index by 77.2 (the old index averaged 77.2 in 1975).

**Table A**  
Weights derived from the Multilateral Exchange Rate Model<sup>(a)</sup>

Based on 1977 trade flows

	Austria	Belgium	Canada	Denmark	France	West Germany	Italy	Japan	Netherlands
Austria	—	0.0220	0.0443	0.0177	0.0871	0.1644	0.0806	0.1264	0.0304
Belgium	0.0153	—	0.0123	0.0141	0.1879	0.2319	0.0926	0.0723	0.0933
Canada	0.0085	0.0104	—	0.0077	0.0465	0.0503	0.0384	0.0711	0.0145
Denmark	0.0104	0.0180	0.0451	—	0.0834	0.1121	0.1045	0.0872	0.0349
France	0.0143	0.0493	0.0303	0.0117	—	0.2005	0.1568	0.1089	0.0417
West Germany	0.0397	0.0485	0.0171	0.0164	0.1664	—	0.1246	0.1255	0.0608
Italy	0.0162	0.0303	0.0214	0.0097	0.1796	0.2283	—	0.1138	0.0372
Japan	0.0077	0.0194	0.0348	0.0110	0.0811	0.1318	0.0448	—	0.0263
Netherlands	0.0138	0.0642	0.0314	0.0196	0.1391	0.2021	0.1207	0.0684	—
Norway	0.0115	0.0197	0.0368	0.0233	0.0815	0.1224	0.0702	0.1247	0.0303
Sweden	0.0172	0.0223	0.0455	0.0419	0.0879	0.1146	0.0697	0.1055	0.0270
Switzerland	0.0380	0.0222	0.0368	0.0119	0.1108	0.1427	0.0958	0.1460	0.0287
United Kingdom	0.0100	0.0404	0.0151	0.0109	0.1039	0.1408	0.0718	0.1367	0.0480
United States	0.0113	0.0244	0.2028	0.0140	0.1011	0.1302	0.0747	0.2125	0.0324
Australia	0.0145	0.0203	0.0943	0.0152	0.0884	0.0709	0.0590	0.1051	0.0265
Finland	0.0186	0.0191	0.0468	0.0140	0.0690	0.1344	0.0498	0.1528	0.0151
Republic of Ireland	0.0067	0.0374	0.0542	0.0224	0.1090	0.1187	0.0671	0.0554	0.0588
Spain	0.0078	0.0258	0.0435	0.0158	0.1745	0.1207	0.0898	0.0863	0.0421
	Norway	Sweden	Switzerland	United Kingdom	United States	Australia	Finland	Republic of Ireland	Spain
Austria	0.0162	0.0392	0.0251	0.0400	0.2398	0.0277	0.0167	0.0036	0.0188
Belgium	0.0126	0.0245	0.0195	0.0211	0.1624	0.0130	0.0094	0.0018	0.0160
Canada	0.0056	0.0164	0.0081	0.0195	0.6420	0.0367	0.0093	0.0030	0.0122
Denmark	0.0427	0.0744	0.0113	0.0712	0.2398	0.0286	0.0095	0.0065	0.0203
France	0.0138	0.0232	0.0234	0.0414	0.2267	0.0156	0.0090	0.0045	0.0287
West Germany	0.0161	0.0399	0.0353	0.0477	0.2164	0.0091	0.0123	0.0037	0.0205
Italy	0.0084	0.0212	0.0275	0.0506	0.2071	0.0109	0.0075	0.0039	0.0263
Japan	0.0169	0.0219	0.0142	0.0415	0.4974	0.0234	0.0087	0.0032	0.0158
Netherlands	0.0115	0.0218	0.0143	0.0321	0.1934	0.0307	0.0052	0.0053	0.0264
Norway	—	0.0563	0.0119	0.0791	0.2611	0.0265	0.0238	0.0045	0.0164
Sweden	0.0792	—	0.0155	0.0409	0.2341	0.0294	0.0483	0.0050	0.0161
Switzerland	0.0158	0.0327	—	0.0042	0.2569	0.0234	0.0128	0.0026	0.0268
United Kingdom	0.0211	0.0373	0.0300	—	0.2463	0.0199	0.0085	0.0405	0.0186
United States	0.0121	0.0273	0.0169	0.0506	—	0.0486	0.0111	0.0058	0.0244
Australia	0.0112	0.0209	0.0117	0.0199	0.4019	—	0.0117	0.0039	0.0248
Finland	0.0346	0.0930	0.0138	0.0308	0.2676	0.0264	—	0.0041	0.0102
Republic of Ireland	0.0092	0.0154	0.0095	0.1194	0.2576	0.0335	0.0004	—	0.0253
Spain	0.0085	0.0148	0.0102	0.0445	0.2736	0.0287	0.0081	0.0051	—

(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.

**Table B**  
'New' and 'old' indices of the sterling effective exchange rate

1975 = 100

Quarterly averages

		New	Old <sup>(a)</sup>
1975	Q1	105.1	105.8
	Q2	101.8	102.3
	Q3	97.5	97.4
	Q4	95.1	94.5
1976	Q1	94.0	93.3
	Q2	86.3	85.2
	Q3	84.1	83.0
	Q4	78.1	77.2
1977	Q1	80.9	80.0
	Q2	80.6	79.8
	Q3	80.8	80.0
	Q4	82.6	82.0
1978	Q1	84.8	84.6
	Q2	79.9	79.7
	Q3	80.6	80.8
	Q4	80.6	81.1
1979	Q1	82.4	82.9
	Q2	87.0	87.2
	Q3	91.3	92.0
	Q4	88.5	89.0
1980	Q1	93.0	93.4
	Q2	94.5	95.0
	Q3	96.7	97.6
	Q4	100.2	100.6

(a) In order to assist comparison the old index has been rescaled to 1975 = 100.