INTERNATIONAL MONETARY FUND

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To: Members of the Executive Board

From: The Secretary

Subject: Europe's Terms of Trade

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INTERNATIONAL MONETARY FUND

Research Department

Europe's Terms of Trade

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Summary

In the eighteen months ended December 1947, wholesale prices in the
United States increased more than 40 per cent and the export price index
increased 30 per cent. As a result, essential imports from the United
States became a greater burden on the foreign exchange resources of Europe.
It is commonly believed:

(a)   that as a consequence of this the terms of trade of European
countries worsened;
(b)   that the terms of trade of these countries are now particularly
unfavorable; and
(c)   that with a return of more "normal" conditions a considerable im-
provement in the terms of trade may be expected.

It is the purpose of this note to show that the facts do not support
(a) or (b) and that no statistical evidence from the past would justify the
expectation of a considerable improvement of the terms of trade of Europe.

1.   Computation of Terms of Trade

A preliminary remark on the accuracy of indices of terms of trade is
required.   An index of the terms of trade is derived by taking the ratio
of an export price index to an import price index.   These two indices re-
present weighted averages of the movement of prices of a large number of
individual commodities.   The measurement of these individual price move-
ments is always subject to some degree of errors.   Especially at present,
when prices of individual commodities have risen at widely different rates
since the beginning of the war, any weighted average of these prices is
rather sensitive to the weighting system which happens to be used.   Thus,
the two indices have a margin of error and arbitrariness which may well
be as large as 5 or 10 per cent.   In an index of the terms of trade these
margins of error may be compounded; it may, therefore, well have a margin
of error of 10 per cent or more.   Thus if the export price index of a

country stands at 210 and its import price index at 200, one would indicate
the terms of trade as 105. But if the export index may, in fact, lie be-
tween 200 and 220 and the import index between 190 and 210, the outside
values for the terms of trade would be 95 (i.e. 200/210) and 116 (i.e.
220/190).

For most countries, only one set of figures exists from which to compute
the terms of trade for that country; it is only when various import and
export price indices exist that the lack of precision of the terms of trade
figures becomes strikingly apparent. This is the situation in the United
Kingdom, for which there are three sets of import and export price indices.
Because of the peculiarities presented by these indices they are discussed
separately in an Annex to this note.

2. Export and Import Price Indices

Table 1 provides export and import price indices and terms of trade
for six European countries for which relatively satisfactory data are avail-
able.

Table.1. Export and Import Price Indices and Terms of Trade

(1937=100)

Country	January 1946			January 1947			December 1947		
	Export Prices	Import Prices	Terms of Trade	Export Prices	Import Prices	Terms of Trade	Export Prices	Import Prices	Terms of Trade
Belgium				389*	299*	130*	434*	331*	131*
Denmark	172	170	101	201	198	102	289	223	129
Norway	227	213	107	222	252	88	278	284	98
Sweden	150	204	74	155	208	74	204	220	93
Switzerland	253*	241*	105*	258	242	107	275	255	108
United Kingdom1/									
A	192	185	104	215	208	103	248	244	102
B	189*	186*	102*	215*	229*	94*	237*	251*	94*
C	198*	197*	101*	225*	236*	95*	259*	270*	96*

* Figures refer to calendar quarter beginning or ending in month indicated.
1/ United ingdom: A. "Price Index"   )
              B. "Unit value index", current weights.)See Annex.
              C. "Unit value index" 1938 weights,   )
Source: International Financial Statistics, or derived from data in I.F.S.;
        for U.K., series B & C: London & Cambridge Economic Service, Vol. XXVI,
        Bull. I, February 1948, page 21.

If one concentrates first on the comparison between January and December
1947 it will be seen that for three countries (Belgium, Switzerland and the
United Kingdom) there is no significant change in the terms of trade; for the
three others, there is a notable improvement (27 per cent for Denmark, 11
per cent for Norway and 26 per cent for Sweden). During the year 1946,. there
was little change in the terms of trade for Denmark, Sweden, Switzerland;
for the United Kingdom there may have been a moderate fall of from 1 per cent
to 8 per cent, depending on the index used. A large fall is shown for Norway
only.

Speaking generally the rise in import prices during these two years
was offset by an increase in export prices, reflecting in part the intensive
demand for exports and in part also inflationary pressure in these countries.

The same table also shows that at the end of 1947 the terms of trade
for two countries, the United Kingdom and Norway, were roughly at the 1937
level, for Switzerland, Denmark and Belgium they were more favorable, where-
as for Sweden they were less favorable. A different result is, of course,
obtained if another year, e.g. 1936 or 1938, is taken as a base year.
Figures based on alternative base years are shown below.

Table 2. Terms of Trade, December 1947,
Calculated on Different Base Years

Country	Base Year		
	1936=100	1937=100	1938=100
Belgium	135	139	130
Denmark	114	129	113
Norway	96	98	99
Sweden	104	93	96
Switzerland	.	.	108
United Kingdom A	99	102	95
B	91	94	88
C	93	96	90

For Belgium, Denmark and the United Kingdom, the terms of trade in
1937 were less favorable than in 1936 or 1938; hence, computed on a 1937
basis, the present terms of trade compare more favorably with 1937 than with
1936 or 1938. These differences reflect the shortlived boom in pri-
mary products in 1937 which was not accompanied by a corresponding increase
in the prices of manufactures or of the export products of Denmark. For
Sweden, whose exports consist to a considerable extent of primary products,
1937 was a year of favorable terms of trade, and hence present terms of

trade look relatively more unfavorable if the year 1937 is taken as a standard of reference than if 1936 or 1938 is used.

Any year can be used as base year to present an index number. The arbitrariness of the choice is generally realized when price indices are used; attention is concentrated on the movement, rather than on the absolute level which the index number has attained. It is, however, unfortunately common to denote terms of trade figures in excess of 100 as "favorable" and below 100 as "unfavorable", without explicit reference to the base year. The computation of most British price indices on 1938 as a base year, in particular, appears to have led to the belief that the present terms of trade in the United Kingdom are unfavorable. In fact, using the figures quoted above, they are unfavorable compared to 1938, but they can hardly be called unfavorable compared to 1937. Clearly, one has to guard against drawing conclusions which are influenced by the arbitrarily selected base year on which the figures happen to be presented. In particular, one cannot jump from the observation that the terms of trade are "unfavorable" to the conclusion that there is a tendency for them to improve. At present, practically all price indices are based on some year or years in the 'thirties. But the terms of trade of the industrial countries in Europe cannot be considered to have been "normal" at any time in the 'thirties.

3. Terms of Trade Prior to the War

Table 3 shows, for the interwar period, the terms of trade of the United Kingdom, and of manufactured versus primary products generally in world trade. The two series move, on the whole, parallel, with only minor differences. After World War I, in 1919 and 1920, the British terms of trade were more favorable than they had been in 1913, in a period when there was, as there is today, a great shortage of food and raw materials. In 1921, they improved further as a consequence of the slump in that year. But after the recovery from that depression, the terms of trade worsened to about 17 per cent above 1913 in the late 'twenties. For other industrial countries, the terms of trade in the late 'twenties were, on the whole, somewhat less favorable, as the price indices derived from world trade indicate, the index standing at 112 for the average 1925-1929. After 1929, the terms of trade improved sharply, with 1933 as the most favorable year (145 for the United Kingdom, 154 for all industrial countries). Even though the primary producing countries regained some of the lost ground in the later 'thirties, the terms of trade never reached the position of the late 'twenties, not even in 1937.

Table 3. Terms of Trade for Industrial Countries
in the Interwar Period

(1913=100)

	United Kingdom[1]/	General[2]/
1919	120	.
1920	128	.
1921	146	145
1922	134	133
1923	128	120
1924	123	112
1925	119	111
1926	123	113
1927	118	110
1928	117	112
1929	117	116
1930	129	130
1931	143	146
1932	142	153
1933	145	154
1934	142	143
1935	137	140
1936	134	134
1937	126	127
1938	137	137

[1]/ Prices of U.K. exports over prices of U.K.
Imports.

[2]/ Prices of manufactured products over prices
of primary products in world trade.

Source: For U.K.: Schlote, Entwicklung des Eng-
lischen Aussenhandels, page 179; and
League of Nations, Review of World Trade,
1938. The index is a unit value index with
current weights.
For General: League of Nations, Industrial-
ization and Foreign Trade, page 157.

A brief digression into the century before 1913 may be appropriate.
Table 4 shows the series given in Table 3 for the nineteenth and early
twentieth century. Never, apparently, since the Napoleonic Wars, did
Britain enjoy such favorable terms of trade as in the 1930's; and the same
applies to the other industrial countries, as far as the record goes. Even
the terms of the late 1920's were unusually favorable by pre-1913 standards.

Table 4.   Terms of Trade for Industrial Countries before 1913

(1913=100)

	United Kingdom[1]	General[2]
1801-1810	151	.
1811-1820	124	.
1821-1830	121	.
1831-1840	101	.
1841-1850	91	.
1851-1860	83	.
1861-1870	85	.
1871-1875	94	.
1876-1880	84	93
1881-1885	82	95
1886-1890	87	100
1891-1895	93	103
1896-1900	97	116
1901-1905	99	104
1906-1910	98	103
1911-1913	98	100

[1]   Prices of U.K. exports over prices of U.K.
      imports.
[2]   Prices of manufactured products over prices
      of primary products in world trade.

Sources: See Table 3.

4. Conclusions

It would be rash to forecast on the basis of these figures. The terms of trade in the 1950's will not be determined by those of the 1850's, but by future conditions, specifically:

(a) in the short run: the supply and demand conditions of primary compared to industrial products. A slump like that of 1920/21 would no doubt improve Europe's terms of trade;

(b) in the somewhat longer run: the relative developments of productivity and hence of cost in the primary industries as compared with those in manufacturing industries.

Only an analysis of commodity market positions and production techniques could provide a basis for a forecast of the terms of trade in the years to come. But the figures given for the past do serve as a sign of caution. The terms of trade of the 'thirites were, in any case, unprecedented. This does not prove that they may not return in the 'fifties. But there is no statistical basis for expecting them to return nor for considering them as "normal".

Annex

Export and Import Price Indices for the U.K.

For a great many years, the United Kingdom has published indices of
the quantities of commodities exported and imported, recomputed at prices
of a certain base year, the base year being changed every few years. By
dividing a volume (quantum) index based on these figures into an index
number of the value of exports or imports, a unit value index (price index)
was obtained, the weights of which were the values of the current year.[1]
Since the data were made available with considerable breakdown it was
possible to recompute an average of the price ratios of the subgroups with
weights derived from any other year, e.g. the base year of the quantum
index. Indices B and C respectively, in Table 1 and Table 2 have been com-
puted in these ways. Index C is not official; it has been computed by the
London & Cambridge Economic Service. If the indices are compared as to
the accuracy with which each approaches its own objective, index B is
better than index C, since the reweighting of C had to be done on published
groups of commodities, not on the individual data.

There is also a "price index", (index A) which differs from the unit
value index with current weights (index B) only in these two respects:

(a) index A, though like index B based on "unit values", i.e. average
prices of certain categories of trade as indicated by trade statistics, is
based on narrower and therefore more homogenous commodity groups. There
is, therefore, less probability in index A than in index B that apparent
price changes reflect changes in quality. It may be that index B, though
less accurate on this account as a pure price index, is for this very reason
preferable to index A, since part of the difficulty of the United Kingdom
consists in having to import from more expensive sources of supply than
before the war. In 1946, index B was 3 per cent higher than A and in 1947
it was 6 per cent higher. It is by no means certain, however, that such a
relatively small difference need have been caused by this particular dif-
ference between the two indices.

(b) in index B the weights are derived from the actual trade in the
particular quarter or year for which the index is computed. In index A,
the weights are standardized for a whole year; in order to have "current"
weights available at the beginning of the year, estimated import and export
quantities for the year are used to construct price indices for each month
of the year.

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[1] If the subscript o indicates the base year and i the current year,
then the

$$\text{quantum index} = \frac{\sum p_o q_i}{\sum p_o q_o} ; \quad \text{the value index} = \frac{\sum p_i q_i}{\sum p_o q_o} ;$$

$$\text{hence price index} = \frac{\text{value index}}{\text{quantum index}} = \frac{\sum p_i q_i}{\sum p_o q_i}$$

Quarterly figures for the three indices are given below, with the base year on which they are originally published (1938-100):

Indices of the Prices in Foreign Trade for the United Kingdom

(1938=100)

		Exports			Imports		
		A	B	C	A	B	C
1946	I	190	186	194	199	196	207
	II	195	191	203	201	206	220
	III	199	197	206	206	210	226
	IV	207	204	213	217	228	241
1947	I	215	211	221	226	241	248
	II	224	221	234	240	265	267
	III	233	226	241	253	267	272
	IV	240	232	254	259	264	283

In the use of both indices, A and B, account has to be taken of the fact that neither is fully comparable for all dates. Index A has constant weights for all months of the year and is therefore comparable within a year, but not from year to year. Whether it can also be used for a comparison between years will have to be judged on the basis of the change between the December figure for one year and the January figure for the next year. Thus the export price index for December 1945 at 194 (1938=100) would not seem to be comparable with 188 for January 1946. Between 1946 and 1947, however, both the import and export price indices would seem comparable, the first one increasing by 3 points (about 1 1/2 per cent), and the other by 1 point (about 1/2 per cent). Annual figures of index B are not more comparable, inter se, than those of index A. In addition, successive quarterly figures of index B are not fully comparable as the composition of imports changes from quarter to quarter. Thus the fall of index B for imports by 2 per cent between the third and the fourth quarter of 1947 probably did not reflect a fall in the price of any commodity imported (index A increased by 4 per cent during the period) but rather a shift in the composition of imports in the direction of commodities which had risen less in price since 1938. This shift may well have been temporary, e.g. seasonal, and would, in that case be of no significance as an indication of the trend of import prices.