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II: NEW MEASURES OF PRICE COMPETITIVENESS FOR NONFERROUS METALS

Seven metals—copper, aluminum, nickel, silver, zinc, tin, and lead—accounted for over 90 per cent of the nonferrous metal exports of the advanced countries in 1963; copper and aluminum each constituted about one-third of the nonferrous exports, and nickel one-eighth (see Table 1).[1] Over two-thirds of the exports consisted of "unwrought" forms such as ingots, billets, anodes, cathodes, and pellets; and the rest consisted of "worked" metals, which are rolled, extruded, drawn, or forged into plates and sheets, foil, tubes, pipes, and fittings.[2] These proportions, however, understate the importance to the economies of the advanced countries of exports of worked metals relative to exports

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[1] The precise coverage corresponds to Division 68 in the *Standard International Trade Classification, Revised*, Statistical Papers, Series M, No. 34, United Nations, New York, 1961. The major groups within this division and the weights assigned to them in this study are as follows:

	Group	Weight (per cent)
681	Silver & platinum	8.3
682	Copper	34.2
683	Nickel	12.0
684	Aluminum	31.4
685	Lead	2.2
686	Zinc	4.4
687	Tin	2.5
689	Miscellaneous	5.0
		100.0

Group 688, uranium and thorium, which accounted for a little under 1 per cent of nonferrous trade in 1963, has been omitted. Groups 681–687 are subdivided into subgroups for "unwrought" and "worked" metals. (See text and footnote 2.) Ores are excluded since they are not regarded as manufactured products (they are in SITC Division 28). Gold is excluded from the trade classification and from our study since gold transactions predominantly involve monetary settlements rather than ordinary merchandise transactions.

[2] We will use the terms "unwrought" and "worked" in this report even though they do not appear to be widely used in the nonferrous metal trades of the U.S. They are the terms used in the SITC which we are following in this study, and the terms that are in use, such as "ingot," "semis," and "fabricated," would not correctly convey the precise coverage of the SITC categories.

TABLE 1

Exports of Nonferrous Metals, OECD Countries, 1963

(million dollars)

Destination	Total OECD[a]	Origin							
		U.S.	U.K.	EEC	Germany	France	Belgium, Luxem.	Canada	Japan
Total, all groups and destinations	2,730	454	348	837	256	145	357	708	43
United States	587	–	38	98	35	21	36	372	15
OECD-Europe	1,540	263	191	604	163	95	286	247	4
U.K.	314	69	–	28	9	3	12	173	1
EEC	897	173	135	426	79	77	227	43	2
Germany	329	66	41	123	–	20	78	22	b
France	189	40	25	108	21	–	80	6	1
Belgium, Luxem.	100	6	21	65	17	41	–	3	–
Canada	83	59	21	2	1	b	1	–	b
Japan	47	18	9	7	2	1	4	12	–
Latin America	83	33	5	16	7	4	3	23	1
Asia (excl. Japan)	170	65	26	25	10	4	5	31	18
Other	217	16	59	86	38	20	22	23	2

(continued)

TABLE 1 (contd.)

SITC Group	Total OECD[a]	U.S.	U.K.	EEC	Origin Germany	France	Belgium, Luxem.	Canada	Japan
SITC Group									
681 Silver	226	44	79	65	39	6	15	29	b
682 Copper	933	213	104	373	120	27	207	155	15
683 Nickel	327	22	60	25	11	12	b	174	b
684 Aluminum	857	125	52	214	60	85	46	281	17
685 Lead	60	1	10	28	6	5	14	15	b
686 Zinc	120	11	4	51	8	4	32	39	1
687 Tin	67	5	27	33	4	b	17	–	b
688 Uranium	1	b	b	b	b	b	b	–	–
689 Misc.	137	33	12	48	8	5	26	15	9

NOTES TO TABLE 1

Source: *Commodity Trade Statistics,* United Nations, New York, 1963; *Trade by Commodities,* OECD Statistical Bulletins, Series C, 1963; Vol. 1 and Supplement; *1963 World Trade Annual,* United Nations, New York, 1964.

The Japanese figures are all from the *1963 World Trade Annual.* The three-digit group totals for other countries were taken from the *Trade by Commodities,* Supplement, except SITC groups 681 and 682 for the U. S. and 689 for Canada.

All other figures are from *Trade by Commodities,* Vol. I, except where U. S. and Canadian export data were missing. Missing U. S. exports estimated to be worth $44,368,000 ($39,779,000 for SITC group 681.1, silver unwrought or partly worked, and $4,589,000 for SITC subgroup 682.23, copper foil) were calculated from data on imports from the U. S. from the *1963 World Trade Annual* and *Commodity Trade Statistics.*

The same procedure was followed to estimate missing Canadian export data for SITC group 689 (miscellaneous metals, not elsewhere specified) of $204,000.

These figures were added to U. S. and Canadian exports by destination and by three-digit group, and are also included in the grand total.

U. S. export figures in this and succeeding tables are from unpublished tabulations of the U. S. Department of Commerce and are a corrected version of the figures published by the OECD and the U. N.

aIncludes eighteen European countries, U. S., Canada, and Japan.
bLess than $500,000.

of unwrought metals. The reason is that value added within a developed exporting country represents a much higher fraction of the export proceeds from worked metals than from unwrought metals, for which the value added is mainly in the smelting and refining processes.[3] We have not tried to adjust our weights to a value-added basis, particularly since the problem is negligible in other parts of our study. In any event, the price movements of worked metals are often closely related to those of unwrought metals.

International Price Indexes

The international price indexes for nonferrous metals have been derived for each country or area by applying these 1963 trade weights

[3] Conceptually, the prices for processing ores into metals would be more appropriate measures for our purposes than the prices of the metals, but these could not have been obtained without a much more intensive field effort. and perhaps not even then.

to its export prices (or to its domestic prices where exports were nil or negligible) and are shown in Table 2.

TABLE 2

International Price Indexes,
Nonferrous Metals, 1953-64
(1962 for each country = 100)

	1953	1957	1961	1962	1963	1964
U.S.	97	101	101	100	100	108
U.K.	97	102	101	100	102	115
EEC	102	103	101	100	101	117
Germany	102	106	101	100	99	116

Note: These indexes were built up from separate indexes for the three-digit groups of metals (see Table 1), and the latter were in turn based on their four-digit components. For important metals like copper and aluminum, weighting was carried down to the five-digit level. For separate indexes for some of the three- and four-digit classifications and for information on sources, see the following sections of this report.

It may be seen that the prices of nonferrous metals relevant to international trade have usually moved in the same direction in the different countries, but often in different degrees. The main changes over time were price increases between 1953 and 1957 and again, larger ones this time, between 1963 and 1964.[4] The U.K. and German indexes reflect greater price variability over time than the U.S. index does. The smaller U.S. price increases in the face of booming metal markets in 1964 are the clearest indication of this difference.

The temporal variability of prices was also great for Belgium, the most important nonferrous exporter in the Common Market.[5] However, this variability cannot be seen in the EEC index because the fluctuations were damped when Belgian price changes were averaged

[4] Price changes within the period 1953 to 1961 were larger than is suggested by our reference years. See, for example, our discussion of copper prices in Section III.

[5] Although Belgium is a more important factor in nonferrous metals than any of the other EEC countries, the data are more adequate for the larger EEC countries, particularly Germany, because the effort made to collect prices was in accordance with the relative importance of the various countries in aggregate exports of metals, metal products, and machinery.

with those of other member countries to calculate the EEC index as
a whole.

Indexes of Price Competitiveness

The indexes of price competitiveness for nonferrous metals—that is,
the ratios of the international price indexes of the U.K., Germany,
and the EEC to those of the U.S.—are given in Table 3. The indexes
show that the price competitiveness of the U.S. in nonferrous metals
was about the same relative to the U.K. every year until the last two,

TABLE 3

Indexes of U.S. Price Competitiveness,
Nonferrous Metals, 1953-64
(1962 = 100)

	1953	1957	1961	1962	1963	1964
Relative to U. K.	100	101	100	100	102	107
Relative to EEC	105	102	100	100	101	109
Relative to Germany	106	105	100	100	99	108

Source: Derived from Table 2.

when it improved. In 1964 U.K. prices had risen 7 per cent more
from the 1962 base than U.S. prices had. U.S. price competitiveness
vis à vis Germany and the Common Market as a whole was lower
in 1961–63 than in earlier years, but there was a sharp improvement
in 1964. For nonferrous metals, it was possible to obtain both time-to-
time and place-to-place price comparisons. Both international price
indexes and place-to-place price indexes were, therefore, constructed
at each three- or four-digit level. However, some of the time-to-time
links were made on the basis of changes in the place-to-place price
comparisons in cases where the data on these were more abundant
or more reliable. Some of the place-to-place indexes, on the other hand,
were derived by adjusting the place-to-place relative for one date to
a different date on the basis of the time-to-time price movements in
the two countries involved. Because of this interdependence, the time-
to-time and place-to-place indexes do not produce independent esti-
mates of changes in price competitiveness. For nonferrous metals,
heavier reliance has been placed on the time-to-time indexes, and the

indexes of price competitiveness shown above have been derived from the final international price indexes.

Comparisons of Price Levels

European price levels were almost always somewhat below those of the United States, as can be seen in Table 4. The differences in 1964 can probably be considered negligible, given the possible margins of error in these calculations, but the earlier price differences do appear to have been significant, particularly in 1961–63.

TABLE 4

Price Levels, Nonferrous Metals, 1953-64
(U. S. for each year = 100)

	1953	1957	1961	1962	1963	1964
U.S.	100	100	100	100	100	100
U.K.	92	93	93	93	94	98
EEC	95	93	91	91	92	98
Germany	98	99	94	94	93	100

Note: The place-to-place comparisons of the international prices of nonferrous metals (mainly export prices, but domestic prices for metals not exported by a particular country) were built up from five-, four-, or three-digit categories in a manner analogous to that used for the time-to-time indexes of international prices. For sources, see tables and text discussions on individual commodities in Section III.

It should be pointed out that these price differences do not necessarily indicate that the United States was able to export at prices 8 or 10 per cent above those prevailing in Europe. There were cases in which the U.S. did sell at prices above those in Europe, as will be pointed out later for specific commodities. However, some of the data reflect unsuccessful bidding by U.S. companies, especially on certain fabricated or semifabricated products which the United States did not export to any substantial degree.

Comparisons with Wholesale Price and Unit Value Data

In Table 5, the NBER indexes of international prices are presented as percentage changes for individual periods in order to facilitate comparison with wholesale price series and, in the case of the U.S.,

TABLE 5

*International Prices, Domestic Prices, and Unit Values of
Nonferrous Metals: Comparisons for Individual Periods*

	1957/53	1961/57	1962/61	1963/62	1964/63
NBER International Price Indexes					
U.S.	104	100	99	100	108
U.K.	105	99	99	102	113
EEC	101	98	99	101	116
Germany	104	95	99	99	117
Wholesale Price Indexes[a]					
U.S.	111	103	99	99	106
U.K.	110	101	99	103	112
EEC	100	88	98	101	107
Germany	96	105	95	100	111
Wholesale Price Indexes[b]					
U.S.	113	106	97	98	105
U.K.	113	108	98	100	114
Japan	99	102	98	99	105
EEC	103	84	98	100	105
Germany	97	105	96	99	109
U.S. Export Unit Value Indexes					
Total	122	90	101	98	102
Copper	111	96	103	101	104
Aluminum	134	84	99	94	100

Note: The NBER series are derived from Table 2 and the unit value
series are described in the text. The number of wholesale price series
available for the individual areas increased over time. The numbers
were as follows:

	Official Price Series		Official and Trade Journal Price Series	
	Min.	Max.	Min.	Max.
U.S.	15	27	29	42
U.K.	9	9	37	37
EEC	12	13	22	30
Germany	4	4	5	5
Japan	12	16	—	—

The various series for each country were aggregated into indexes for SITC 68 by using 1963 trade weights. When more than one series was available within a group, the four- or five-digit weights were applied, as the situation required. Indexes for various EEC countries within a given category were combined in accordance with each country's importance in EEC exports of that category. The changes in wholesale prices between 1957 and 1961 were adjusted to take account of a 29 per cent depreciation of the French franc and a 5 per cent appreciation of the German mark and Dutch guilder.

ªOfficial series and trade journal prices.

ᵇOfficial series only.

with export unit value series also. To minimize gaps in coverage, official wholesale price series were supplemented by price series from trade journals. Both the wholesale prices and the export unit values are weighted by the same world trade weights used in making the NBER indexes. It is to be expected that the wholesale prices will show more country-to-country differences in the direction and amount of movement than the export prices of each country since the latter refer more nearly to a common market than the former. The two sets of wholesale price indexes in Table 5 conform to these expectations; the four international price index series are more alike than either set of the corresponding four wholesale price indexes except when export prices responded differentially to boom conditions in 1964.

The figures also suggest that, in periods of price instability, the wholesale price indexes are not reliable indicators of international price competitiveness. In any event, there are larger differences between the wholesale and NBER indexes for 1957/1953, 1961/1957, and 1964/1963 (all intervals of relatively large price changes) than for 1962/1961 and 1963/1962 (intervals of relative price stability). The largest discrepancy between the two sets of data is for the change between 1953 and 1957 in U.S. price competitiveness relative to Germany; according to the wholesale indexes, the U.S. position deteriorated by 14 per cent,[6] while the NBER indexes indicate no change.[7] The error in this case probably lies with the German wholesale price index, for which only five series were available.

[6] $(96 \div 111) \times 100 = 86.$

[7] The international price index rose by 4 per cent between 1953 and 1957 in both countries.

That narrow commodity coverage may be responsible for other dif-ferences between the two sets of indexes is suggested by the closer conformance to the NBER indexes of the wholesale price indexes when supplemented with trade journal prices. However, while many of the discrepancies between the NBER and wholesale price series may be explicable in these terms, it should not be forgotten that the wholesale price data are based on formally quoted prices which may differ from actual transactions prices, particularly when prices are changing. Indeed, sometimes, it has been alleged, a published price has been maintained at one level by the firms reporting the price to the trade journal or other publisher while different prices are in effect for selling.[8] In addition, as will be indicated in the discussions of particular metal markets, actual transactions prices sometimes differ for domestic sales and exports.

We have included a series on Japanese wholesale prices of non-ferrous metals, although we were unable to gather enough primary data to construct our own indexes for Japan. The Japanese wholesale price indexes show less variation in these years than any other price series in the table. In view of the great dependence of Japan upon foreign supplies for many nonferrous metals, it would be surprising if the Japanese index of international prices for nonferrous metals—if it could have been constructed—would have shown such stability relative to the U.S. and Europe.

The NBER international price index for U.S. nonferrous metals has also been compared in Table 5 with an index of U.S. export unit values weighted by foreign trade weights. The unit value index is based on eight series of export unit values chosen to conform to those used by the Department of Commerce in its official unit value indexes. Four of the series are unit values for copper, three for aluminum, and one is for pipe fittings of copper or other nonferrous alloys. The Commerce Department does not publish a separate index

[8] "Perhaps the most insidious evil of all inherent in current trends in pricing practice is the way in which, in certain markets, a price can be kept running on a certain basis—of historical validity—while the trade contrives to effect much of its business at lower prices, the effect of which is, however, not allowed to reflect back on the published price, because the basis on which it is concluded is different from the basis on which the published price is fixed." *Metal Bulletin* (London), October 6, 1961, p. 12. See also *E & MJ Metal and Mineral Markets*, June 24, 1963; *Metal Bulletin*, July 19, 1963, p. 21; and *Engineering and Mining Journal*, February 1965, p. 94.

for nonferrous metals and it uses shifting domestic weights rather than the fixed world weights we have used.

There are sometimes wide discrepancies between the unit value index and the NBER international price index, which seem to us to cast serious doubt upon the reliability of unit value indexes—even when the underlying series are carefully selected—even in so relatively simple a product area as nonferrous metals.[9]

The large differences between the U.S. export unit value index and the NBER international price index are not due primarily to the fact that the unit value index covers only copper and aluminum. The differences between the separate unit value indexes for those two metals and the corresponding international price indexes of Tables 9 and 11 are as great as those for nonferrous metals as a group, and the discrepancy between the two total indexes is almost an average of those for the two main components. There could, of course, be differences in coverage within the individual metals, but these are not likely to be important, since the unit value data cover both unwrought and worked metals in both groups. The main differences are probably attributable to the fact that the commodity composition of the trade classifications used for computing unit value indexes may change markedly, particularly when there are significant changes in demand and supply relationships that cause prices to move.

[9] Part of the smaller range of price movements in the NBER international price indexes may be attributed to the inclusion of a much larger number of series. However, it would probably be difficult to increase substantially the number of unit value series included in the calculations because most of the available series are characterized by erratic fluctuations owing to large variability in the product mix of the trade classification to which they refer.