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British Exports and Import Growth
Among Its Customers

This paper reflects the personal opinion of the author and must not be interpreted as representing the opinion of the Board of Governors.

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Introduction

It has been suggested that part of Britain's balance of payments difficulties--in those far-off days when Britain had a balance of payments problem--was attributable to slow growth in total merchandise imports of the countries to which the United Kingdom exported. This paper tests that hypothesis* by averaging rates of growth of the value of imports by the U.K.'s customers in 1961-67 and 1962-67, weighted by the value of British exports to these recipient units, and comparing the results to (1) similar averages for three other major exporters--Germany, Italy and Japan--which, unlike Britain, have achieved impressive records of rapid export growth; and (2) actual increases in various measures of world trade.

The averages for Britain were computed in several ways: (1) by individual country undifferentiated by commodity; (2) in much more aggregated form, by broad country-groups again undifferentiated by commodity; (3) by broad country-groups by commodity-groups--that is, where the average was for individual commodity-groups to individual country-groups, weighted by the corresponding value of British exports of those commodity-groups to those country-groups; and (4) by commodity-group, undifferentiated by recipient. This last average is not relevant to establishing whether Britain has been exporting disproportionately to countries with slow import growth; but it is useful in casting light on the related question of whether Britain has been exporting goods for which demand growth has been relatively sluggish.

*Generally referred to in the text as the slow import growth hypothesis.

On balance, the findings of this paper, as will be shown below, do not support the hypothesis that slow import growth among Britain's customers has handicapped British export growth; nor do the findings indicate that the commodity composition of British exports has been to its disadvantage.

The Computations:

1. Hypothetical Export Growth of U.K. Exports by Country or Country-Group Undifferentiated According to Commodity-Group.

The formulas used for determining how much British exports would have grown if they had depended only on the rate of growth of imports of the countries to which the United Kingdom exported are given below:

$$G_{t_o - t_1} = \frac{\sum_{i=1}^{n} \left[x_{t_o i} \quad \left(m_{t_1 i} / m_{t_o i} \right) \right]}{\sum_{i=1}^{n} x_{t_o i}}$$

$$G'_{t_o - t_1} = \frac{\sum_{i=1}^{n} \left[x_{t_1 i} \quad \left(m_{t_1 i} / m_{t_o i} \right) \right]}{\sum_{i=1}^{n} x_{t_1 i}}$$

where $G_{t_o-t_1}$ and $G'_{t_o-t_1}$ are the hypothetical growth rates for British exports with base-year and terminal-year weights, respectively;

$x_{t_o i}$ is the value of British exports to country i in the base year;

$x_{t_1 i}$ is the value of British exports to country i in the terminal year;

$m_{t_o i}$ is the value of the imports of country i in the base year;

$m_{t_1 i}$ is the value of the imports of country i in the terminal year.

This method of calculating a country's hypothetical export performance--at least with base-year weights--has been used many times in the past.[1/] The main purpose of the technique has generally been to determine the gain or loss of competitiveness of a country's exports, with the gain or loss conceived of and measured by the difference between hypothetical and actual export growth. What the first of the two formulas above yields--that is, the one using base-year weights--is the growth in exports from base to terminal year that would have occurred (we refer to this as "hypothetical growth") if the exporting country had exactly maintained its base-year market share in each country to which it exports.

1/ See, for example:

Edward E. Leamer and Robert M. Stern, "Constant-Market-Share-Analysis of Export Growth," unpublished discussion paper presented to Research Seminar in International Economics at University of Michigan, February 20, 1969.

P. R. Narvekar, "The Role of Competitiveness in Japan's Export Performance, 1954-58," IMF Staff Papers, (VIII:1) November 1960.

Anne Romanis, "Relative Growth of Exports of Manufactures of the United States and Other Industrial Countries," IMF Staff Papers, (VIII:2) May 1961.

The alternative calculation of hypothetical growth, through application of terminal-year weights, in effect provides an indication of how the exports of a country would grow in the future if the import growth of its customers remained the same as in the preceding interval from base to terminal year and if the exporting country maintained its terminal-year market shares in each country in the future. The indices using terminal-year weights are mainly useful in giving some indication of the relationship of the growth of British exports to the import growth of its customers during the 1961-67 and 1962-67 periods.

The choice of the 1961-67 and 1962-67 intervals was largely arbitrary. We chose 1967 as the terminal year because it was the latest year for which relatively complete data were available. The selection of 1961 and 1962 as base years was based partly on data availability considerations and partly on the assumption that a five or six-year interval was large enough to minimize distortions of import growth trends caused by random or cyclical factors--but sufficiently short to avoid lack of relevance.

Two base years were chosen as a consistency check, to see if the relationship of British hypothetical export growth to the variables with which it was being compared was significantly affected by the choice of base year.

a. Averages according to individual countries

The initial computation for the United Kingdom consisted of taking a weighted average of import growth of 64 countries accounting for 89.8 per cent of British exports in 1961, 90.9 per cent in 1962 and 92.3 per cent in 1967. The results show a hypothetical increase in British exports in 1961-67 of 57.2 per cent when base year weights are used and 66.3 per cent when terminal year weights are applied. For 1962-67, the hypothetical increases are 49.4 per cent and 54.1 per cent for base and terminal year weights, respectively. (See Table 1.)

Table 1. Hypothetical Export Growth of Selected Countries and Actual Growth of World Exports
(1961 or 1962=100)

	Base-Year Weights		Terminal-Year Weights	
	1967/61	1967/62	1967/61	1967/62
Hypothetical growth				
United Kingdom	157.2	149.4	166.3	154.1
Germany	160.9	150.0	166.1	151.9
Italy	161.3	149.9	171.6	155.7
Japan	168.2	157.7	180.2	164.7
Actual growth[a/]				
World exports[b/]	162.7	153.6		
U.K. exports	131.6	128.1		

a/ All figures for world exports exclude the United Kingdom.
b/ U.N., Monthly Bulletin of Statistics.

The actual increases in British exports in 1961-67 and 1962-67 were 31.6 and 28.1 per cent, respectively. Thus something other than growth of Britain's export markets explains Britain's poor trade performance

during the period covered. On the other hand, the table also shows that hypothetical growth with base-year weights was somewhat below the growth of world trade--about 63 per cent in 1961-67 and 54 per cent in 1962-67[1/]--implying that Britain's markets did expand a little slower than other markets.

However, hypothetical export growth as calculated with terminal-year weights indicates that if Britain were to maintain its 1967 market shares in the future, its exports would increase at roughly the same rate as world trade, assuming world trade continued to increase at the same rate as in 1961-67 or 1962-67. That hypothetical British export growth was greater with terminal year than base year weights does indicate that, as one might expect, there was a positive

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1/ These figures imply that British exports might have been about £140 to £180 million higher in 1967 than they actually were if hypothetical British export growth had equaled actual growth in world trade. This estimate is arrived at as follows:

For 1961-67 multiply the ratio of the index number for world trade to the index number for hypothetical British export growth by the index number for the actual increase in British exports:

162.7/157.2 X 131.6 = 136.2

Next multiply the actual value of British exports in 1961 by 1.362:

1.362 X £3,955 billion = £5,386 billion

£5,386 billion exceeds by £181 million the actual total for British exports in 1967 of £5,205 billion.

The corresponding calculation for 1962-67 yields a total of £5,349 billion, £144 million above the actual value of British exports in 1967.

correlation between the actual growth of British exports to individual countries and the rate of growth of imports by those countries--the faster the rate at which a country's imports grew, the greater the rate of increase in British exports to that country.

The same weighted averages were calculated for Germany, Italy, and Japan, three countries whose export performance in the period covered was in excess of the growth in world trade. (The percentage increases in exports for Germany in 1961-67 and 1962-67 were 71.4 and 63.9 per cent, respectively; for Italy, 108.0 and 86.4 per cent; and for Japan, 146.5 and 112.4 per cent.) Interestingly, hypothetical export growth for Germany and Italy did not substantially differ from that for Britain, as is evident in Table 1. Only in the case of Japan was hypothetical growth markedly higher.1/

b. Averages according to broad country groups

In addition to the results calculated from data for individual countries, weighted averages for the United Kingdom were also computed on a much more aggregated basis. Specifically, a measure of hypothetical export growth of the U.K. to (1) EFTA, (2) EEC, (3) the rest of Europe,

1/ The weighted averages for Germany were computed from import growth data for 93 countries which bought 97.8 per cent of Germany's exports in 1961, 99.4 per cent in 1962, and 98.7 per cent in 1967. The averages for Italy were compiled from 60 countries accounting for 92.9 per cent of Italy's exports in 1961, 93.4 per cent in 1962, and 93.4 per cent in 1967. Import growth in 99 countries was used to calculate the averages for Japan. These countries accounted for 96.9 per cent of Japanese exports in 1961, 97.2 per cent in 1962, and 96.9 per cent in 1967.

(4) Australia, New Zealand, and South Africa, (5) Canada, (6) the United States, (7) Latin America, (8) the Soviet Union and Eastern Europe, and (9) the rest of the world was computed. The purpose was to ascertain the extent to which a drastic change in the degree of aggregation affected the results. As Table 2 shows, hypothetical British export growth was higher where base year weights were used,

Table 2. Hypothetical British Export Growth, by Nine Country-Groups[a/] (1961 or 1962=100)

Base-Year Weights		Terminal-Year Weights	
1967/61	1967/62	1967/61	1967/62
162.8	154.9	164.7	155.3

a/ (1) United States, (2) Canada, (3) EEC, (4) EFTA, (5) Rest of Western Europe, (6) Australia, New Zealand and South Africa, (7) Latin America, (8) Soviet Union and Eastern Europe, and (9) the rest of the world.

though about the same in the case of terminal year weights. Two other points about the results for the nine-country group breakdown are worth noting: First, the indices with terminal-year weights were only very slightly higher than the corresponding indices using base-year weights, and second, hypothetical British export growth was about the same in all four cases as the actual increase in world trade. The latter result is probably a consequence of the greater degree of aggregation. Note that the average--unweighted--rate of import growth for the nine country-groups was 163.3 for 1961-67 and 153.7 for 1962-67, both virtually the same as the corresponding increases in world trade. The standard deviations for the two averages were 16.8 and 12.5. On the other hand, unweighted average import growth

for the 64 countries was 149.6 for 1961-67 and 139.7 for 1962-67, considerably below the increase in world trade in these two periods. The standard deviations, furthermore, were much larger--44.0 and 33.3

The choice of the nine regions was largely dictated by data considerations. In making use of a combination of commodity and area import growth--see the next section--we found that statistics on imports of specific commodity groups were readily available only for the first eight of the nine areas and countries listed in the preceding paragraph. As a matter of convenience, we decided to use these same nine groupings in our alternative reckoning of hypothetical U.K. export growth by recipient unit undifferentiated by commodity group.

2. Hypothetical Growth of U.K. Exports by Country Group and by Commodity Group:

The work in the preceding section ignored the commodity breakdown of imports of Britain's customers. On the assumption that a more accurate picture of British export potential, or hypothetical export growth, would be obtained by taking into account not only where but what Britain exported, hypothetical British export growth was also computed according to the following formula:

$$G_{t_o-t_1} = \frac{\sum_{j=1}^{n} \sum_{i=1}^{n} \left[x_{t_o ij} \left(m_{t_1 ij} / m_{t_o ij} \right) \right]}{\sum_{j=1}^{n} \sum_{i=1}^{n} x_{t_o ij}}$$

$$G'_{t_o-t_1} = \frac{\sum_{j=1}^{n} \sum_{i=1}^{n} \left[x_{t_1 ij} \left(m_{t_1 ij} / m_{t_o ij} \right) \right]}{\sum_{j=1}^{n} \sum_{i=1}^{n} x_{t_1 ij}}$$

where $G_{t_o-t_1}$ and $G'_{t_o-t_1}$ are the hypothetical growth rates for British exports with base-year and terminal-year weights, respectively:

$x_{t_o ij}$ is the value of British exports of commodity-group i to country, or country-group, j in the base year;

$x_{t_o ij}$ is the value of British exports of commodity-group i to country, or country-group, j in the terminal year;

$m_{t_o ij}$ is the value of the imports of commodity-group i by country, or country-group, j in the base-year;

$m_{t_1 ij}$ is the value of the imports of commodity-group i by country, or country-group, j in the terminal-year.

This formula yields an average of the import growth of individual countries or country-groups broken down according to commodity-group imported, weighted by the value of British exports of the commodity-group to the given country or country-group.

The country-groups used were listed on page 6. The commodity-groups chosen were (1) all non-manufactures; (2) chemicals; (3) textiles; (4) metals; (5) other basic materials--that is, basic materials minus textiles and metals--plus miscellaneous manufactures; and (6) machinery, a category which includes transportation equipment.

As the results in Table 3 show, hypothetical British export growth was greater than the actual increase in world trade.

The very high degree of aggregation with respect to commodity-groups--there were only six--was again dictated by data problems. Specifically, attempts to gather import statistics on a more disaggregated

Table 3. Hypothetical British Export Growth, by Commodity-Groups and Country-Groups[a/]
(1961 or 1962=100)

	Base-Year Weights		Terminal-Year Weights	
	1967/61	1967/62	1967/61	1967/62
Hypothetical growth				
All exports	173.0	163.3	182.4	168.1
Excluding non-manufactures	178.4	167.9	189.2	173.2
Actual growth[b/]				
Total world exports[c/]	162.7	153.6		
World exports of manufactures[c/]	183.5	169.3		

a/ Country groups are the same as those listed in Table 2. Commodity groups are (1) Non-manufactures, (2) Chemicals, (3) Textiles, (4) Metals, (5) Other basic materials plus miscellaneous manufactures, and (6) machinery.
b/ Excludes the United Kingdom.
c/ U.N., Monthly Bulletin of Statistics.

basis from a variety of sources produced inconsistent results and it was thus decided to draw exclusively on the U.N. Monthly Bulletin of Statistics from which import data for six commodity groups could be put together for each of the seven country-groups.

As the results in Table 3 show, hypothetical British export growth was greater than the actual increase in world trade for both 1961-67 and 1962-67 and for base-year as well as terminal-year weights. The smallest margin by which any one of the hypothetical growth indices exceeds its counterpart for actual growth of world trade is about ten index number points.

In the case of exports of manufactured goods alone, hypothetical British export growth is slightly lower, where base-year weights are used, than actual growth of world exports of manufactures (exclusive of those to the United Kingdom). However, the difference is not very marked--about five points for 1961-67, less than two for 1962-67.

All in all, the findings summarized in Table 3 either contradict or do little to substantiate the slow import growth hypothesis. Particular attention should be paid to the results in Table 3, since, as we already noted, the indices based on disaggregation by both country-groups and commodity-groups represent probably the most meaningful measure of hypothetical British export growth.

3. Hypothetical Growth of U.K. Exports by Commodity-Group Undifferentiated According to Recipient Unit:

Largely for the sake of symmetry, hypothetical British export growth was calculated on the basis of growth in world imports by commodity-groups undifferentiated according to recipient unit. Where base-year weights were used, the indices only slightly differ from their counterparts where disaggregation was by commodity by country-group. (See Tables 3 and 4.) However, oddly, the indices for commodity groups undifferentiated according to country-group rise very little when terminal-year weights are used, with the result that the commodity-group indices are substantially lower than those employing the commodity-group by

country-group form of disaggregation.[1/] All of the indices compiled from commodity-group data undifferentiated according to country-group, however, are greater than the actual increases in total world trade.

Table 4. Hypothetical British Export Growth, by Commodity-Groups (1961 or 1962=100)

	Base-Year Weights		Terminal-Year Weights	
	1967/61	1967/62	1967/61	1967/62
Hypothetical growth Six commodity-groups[a/]	173.1	160.0	174.5	160.8

a/ U.N., Monthly Bulletin of Statistics.

Summary Comments:

A number of limitations of the method--or of our application of it--employed to test the slow import growth hypothesis should be noted. First, the choice of periods--1961-67 and 1962-67--was largely arbitrary, though, for the most part, the results--for any given set of indices--for one period were consistent with the results for the other. (Consistency here means that, for a given set of indices, the slow import growth hypothesis is not contradicted by the results for one period but confirmed by those for the other.)

1/ It is interesting to note that where there was a high degree of aggregation--that is, where indices were compiled for country-groups undifferentiated by commodity-groups and for country-groups undifferentiated by commodity-groups--the margin by which the terminal-year weighted indices exceeded the base-year weighted indices was small. The spread was much larger for the relatively disaggregated indices, that is, the ones where the weighted averages were compiled according to commodity-group by country-group or according to a large number of individual countries undifferentiated by commodity-group.

Second, it would seem--intuitively, at any rate--that the degree of disaggregation in compiling weighted averages for the indices based on a commodity-group by country-group breakdown and on a breakdown by commodity-group alone was insufficient. (We say "intuitively" because of the absence of criteria for determining the optimal degree of disaggregation; this is another defect--an insoluble one--of the method.) Furthermore, the characteristics of the individual components themselves, not merely their number, are open to question. To cite the most obvious example, the "rest of the world" category in the country-group breakdown is simply a residual, with no homogeneous properties, accounting for 23.2 to 30.1 per cent of total British exports, depending on the year chosen. Such unsatisfactory aspects of the components reflect the large role played by data constraints in formulating the weighted averages.

Despite these flaws, though, some reassurance that the results may not have been too seriously affected by inadequate disaggregation is provided by the behavior of the indices based on a purely geographic breakdown. The difference between the indices compiled from import growth for a large number of individual countries and those compiled from data for the seven country-groups, it will be recalled, was relatively small.

Finally, mention should be made of the unavoidable index number problem arising from the choice of "weight-year." As we have indicated, base-year weights are the most appropriate in testing the

slow import growth hypothesis, but it should nevertheless be pointed out that the indices will differ, or are very likely to differ, according to weight-year. Thus, in this paper, terminal-year weighted indices were invariably higher--in some instances, much higher--than base-year weighted ones. The reasons for this, as already explained, are clear and make good sense. However, the differences between base-year and terminal-year weight indices point up the fact that--even if the choice of components were in some sense theoretically perfect--there would still be no index number providing the "true" measure of hypothetical export growth.

Turning to the indices themselves, the results of the various measures of hypothetical British export growth presented above do not unambiguously refute or confirm the slow import growth hypothesis. But, on balance, at least they cast serious doubt on its validity.

Some of the indices of hypothetical British export growth derived from import growth of recipient countries or country-groups undifferentiated according to commodity are not inconsistent with the hypothesis. However, as indicated in the text, hypothetical export growth is best measured by taking into account growth in imports of individual commodity-groups by individual recipient units. And, where reference is to trade in all commodities, the indices compiled on this basis are not consistent with the slow import growth hypothesis. In the case of the base-year weighted indices for trade in manufactures only, to be sure, hypothetical British export growth is below the growth in world trade, in accord with the slow import growth hypothesis. However, the margins of difference are small.