Constant-Market-Share Analysis
of Export Growth

A country's exports may fail to grow as rapidly as the world average for three reasons: (1) Exports may be concentrated in commodities for which demand is growing relatively slowly; (2) exports may be going primarily to relatively stagnant regions; or (3) the country in question may have been unable or unwilling to compete effectively with other sources of supply. In this chapter we shall discuss a method of analysis designed to disentangle these effects.[1]

At the heart of the method of analysis is the assumption that a country's share in world markets should remain unchanged over time. The difference between the export growth implied by this constant-share norm and the actual export performance is attributed to the effect of competitiveness, and the actual growth in exports is divided into competitiveness, commodity-composition and market-distribution effects. This will be made clearer in the discussion below.

THEORY AND MEASUREMENT

Demand for exports in a given market from two competing sources of supply may be described by the following relationship:

$$\frac{q_1}{q_2} = f\left(\frac{p_1}{p_2}\right) \tag{7.1}$$

where q_i and p_i are the quantity sold and price of the commodity from the ith supply source. This relationship will be recognized as the basic form of

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[1] This type of analysis was applied initially in the foreign-trade context by Tyszynski [26] in studying changes in the market shares of countries exporting manufactured goods from 1899–1950. For an earlier application in the study of industrial location, see Creamer [7].

the elasticity of substitution, which we treated at length and with some skepticism in Chapter 3. The various assumptions implicit in Equation (7.1) are unimportant, however, for present purposes.

Relationship (7.1) may be altered by multiplying by p_1/p_2 to obtain

$$\frac{p_1 q_1}{p_2 q_2} = \frac{p_1}{p_2} \times f\left(\frac{p_1}{p_2}\right) \qquad (7.2)$$

This implies

$$\frac{p_1 q_1}{p_1 q_1 + p_2 q_2} = \left(1 + \frac{p_2 q_2}{p_1 q_1}\right)^{-1}$$

$$= \left\{1 + \left[\frac{p_1 f(p_1/p_2)}{p_2}\right]^{-1}\right\}^{-1} \qquad (7.3)$$

$$= g\left(\frac{p_1}{p_2}\right)$$

which indicates that Country 1's share of the market in question will remain constant except as p_1/p_2 varies. This establishes the validity of the constant-share norm and suggests that the difference between export growth implied by the constant-share norm and actual export growth may be attributed to price changes. For want of a better term, the discrepancy between the constant-share norm and actual performance has been labeled the "competitiveness effect." Thus when a country fails to maintain its share in world markets, the competitiveness term will be negative and will indicate price increases for the country in question somewhat greater than its competitors.[2]

The constant-share norm will allow us to make several interesting calculations. Toward that end we will need the following definitions:

$V_i.$ = value of A's exports of Commodity i in Period 1.
$V'_i.$ = value of A's exports of Commodity i in Period 2.
$V_{.j}$ = value of A's exports to Country j in Period 1.

[2] Richardson [20] has pointed out, however, that this statement requires the additional assumption that the elasticity of substitution exceeds one in absolute value, a fact that is likely for reasonably fine categories of data.

The term competitiveness is perhaps misleading in this context since it brings with it an unwarranted emotional reaction. To be competitive is ordinarily a desirable thing. This is not necessarily the case in the present analysis as there are many economic reasons why a country might undergo a reduction in its share of a market and therefore incur the "uncompetitive" label. For instance, a small country might be exporting commodities to regions with very fast-growing demands and might not have the domestic capacity to maintain its market shares. Accordingly, the country ought to raise its asking price and be subjected to a reduction in its market share. Another country exporting to more stagnant regions would have little trouble maintaining its share and may have a positive competitiveness effect. Clearly, the first country is not less competitive than the second under the ordinary definition of the word. However, in terms of the present analysis, the first country would be designated less competitive. We shall return later in the chapter to a discussion of the determinants of the competitiveness effect.

$V'_{.j}$ = value of A's exports to Country j in Period 2.
V_{ij} = value of A's exports of Commodity i to Country j in Period 1.
r = percentage increase in total world exports from Period 1 to Period 2.
r_i = percentage increase in world exports of Commodity i from Period 1 to Period 2.
r_{ij} = percentage increase in world exports of Commodity i to Country j from Period 1 to Period 2.

It follows from the above definitions that for Period 1

$$\sum_j V_{ij} = V_i. \qquad \sum_i V_{ij} = V_{.j} \qquad (7.4)$$

and similarly for Period 2. In addition, the value of Country A's exports in Period 1 is given by

$$\sum_i \sum_j V_{ij} = \sum_i V_i. = \sum_j V_{.j} = V_{..} \qquad (7.5)$$

The application of the constant-share norm will depend on the nature of the market that we have in mind when writing (7.1). At the first level of analysis, we may view exports as being completely undifferentiated as to commodity and region of destination. That is to say, exports may be viewed as a single good destined for a single market. If A maintained its share in this market, then exports would increase by $rV_{..}$, and we may write the following identity

$$V'_{..} - V_{..} \equiv rV_{..} + (V'_{..} - V_{..} - rV_{..}) \qquad (7.6)$$

We will refer to Equation (7.6) as a "one-level" analysis. It divides the growth in A's exports into a part associated with the general increase in world exports and an unexplained residual, the competitiveness effect.

We may instead argue that exports are in fact quite a diverse set of commodities and that when we write Equation (7.1), what we have in mind is the world market for a particular commodity class. For the ith commodity we may write an expression analogous to (7.6)

$$V'_i. - V_i. \equiv r_i V_i. + (V'_i. - V_i. - r_i V_i.) \qquad (7.7)$$

which may be aggregated to

$$V'_{..} - V_{..} \equiv \sum_i r_i V_i. + \sum_i (V'_i. - V_i. - r_i V_i.)$$

$$\equiv (rV_{..}) + \sum_i (r_i - r)V_i. + \sum_i (V'_i. - V_i. - r_i V_i.) \qquad (7.8)$$
$$\quad (1) \qquad\qquad (2) \qquad\qquad\qquad (3)$$

This equation represents a "two-level" analysis, in which the growth of A's exports is broken into parts attributed to: (1) the general rise in world exports; (2) the commodity composition of A's exports in Period 1; and (3) an unexplained residual indicating the difference between A's actual export

increase and the hypothetical increase if A had maintained its share of the exports of each commodity group.

The commodity-composition effect in identity (7.8) requires further comment. It has been defined by

$$\sum_i (r_i - r)V_i. \tag{7.9}$$

and is meant to indicate the extent to which A's exports are concentrated in commodity classes with growth rates more favorable than the world average. Thus, if world exports of Commodity i increased by more than the world average for all commodities, $(r_i - r)$ is positive. This positive number will receive a heavy weight when added to the other terms if $V_i.$ is relatively large. Accordingly the sum indicated by (7.9) would be positive if A had concentrated on the export of commodities whose markets were growing relatively fast and would be negative if A had concentrated in slowly growing commodity markets.

Finally, we may observe that exports are differentiated by destination as well as by commodity type. We have as yet made no allowance for the fact that some countries have easy access to rapidly growing regions while others are surrounded by relatively slow-growing neighbors. The appropriate norm in this case is a constant share of exports of a particular commodity class to a particular region. The identity analogous to (7.6) and (7.7) is

$$V'_{ij} - V_{ij} \equiv r_{ij}V_{ij} + (V'_{ij} - V_{ij} - r_{ij}V_{ij}) \tag{7.10}$$

which when aggregated yields

$$
\begin{aligned}
V'_.. - V_.. &\equiv \sum_i \sum_j r_{ij}V_{ij} + \sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij}V_{ij}) \\
&\equiv rV_.. + \sum_i (r_i - r)V_i. + \sum_i \sum_j (r_{ij} - r_i)V_{ij}
\end{aligned}
$$
$$
\qquad\quad (1) \qquad\qquad (2) \qquad\qquad\qquad (3) \tag{7.11}
$$
$$
+ \sum_i \sum_j (V'_{ij} - V_{ij} - r_{ij}V_{ij})
$$
$$
(4)
$$

Identity (7.11) represents a "three-level" analysis in which the increase in A's exports is broken down into parts attributed to: (1) the general rise in world exports; (2) the commodity composition of A's exports; (3) the market distribution of A's exports; and (4) a residual reflecting the difference between the actual export growth and the growth that would have occurred if A had maintained its share of the exports of each commodity to each country.

The market distribution term in identity (7.11) may be interpreted in the same manner as the commodity-composition effect. It is defined by

$$\sum_i \sum_j (r_{ij} - r_i)V_{ij} \tag{7.12}$$

and is seen to be positive if A had concentrated its exports in markets that were experiencing relatively rapid growth. The term would be negative if A had concentrated in more stagnant regions.[3]

The interpretation of the competitiveness residual is not as straightforward as the other terms. A negative residual reflects a failure to maintain market shares. If export demand is described by relationship (7.1), then this residual is necessarily associated with a rise in relative prices, p_1/p_2. However, relationship (7.1) ignores the many other influences that will affect the saleability of a country's exports in foreign markets. In addition to: (1) the differential rates of export price inflation, the general competitiveness residual may reflect: (2) differential rates of quality improvement and the development of new exports; (3) differential rates of improvement in the efficiency of marketing or in the terms of financing the sale of export goods; and (4) differential changes in the ability for prompt fulfillment of export orders.[4]

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[3] It should be mentioned that it is arbitrary whether one allows first for the effect of the commodity composition and then the market distribution, or vice versa. Had we allowed for the market distribution first, the center two terms in identity (7.11) would have been

$$
\begin{array}{cc}
\text{(Market Effect)} & \text{(Commodity Effect)} \\
\sum_j (r_j - r)V_{.j} + & \sum_i \sum_j (r_{ij} - r_j)V_{ij}
\end{array}
$$

Although the sum of the above terms is equal to the center terms in identity (7.11), the values which we would attribute to the commodity and market distributions will not be the same. That is,

Commodity Effect

$$\sum_i (r_i - r)V_i. \neq \sum_i \sum_j (r_{ij} - r_j)V_{ij}$$

Market Effect

$$\sum_i \sum_j (r_{ij} - r_j)V_{ij} \neq \sum_j (r_j - r)V_{.j}$$

According to Richardson's calculations [20], the effects may vary substantially, depending on which one is calculated first.

It should also be noted that other ways of expressing Equation (7.11) are possible. For instance, we might normalize by dividing by $V_..$.

$$\frac{V'_.. - V_..}{V_..} = r + \frac{\sum_i (r_i - r)V_i.}{V_..} + \frac{\left[\sum_i \sum_j (r_{ij} - r_i)V_{ij}\right]}{V_..} + \frac{\left[\sum_i \sum_j (V'_{ij} - V_{ij}) - r_{ij}V_{ij}\right]}{V_..}$$

This explains the percentage increase in exports, not the levels as we have done in the text. Tyszynski [26] actually used

$$\frac{V'_.}{V'_w} - \frac{V_.}{V_w} = \left(\frac{(r_i + 1)V_i.}{V'_w} - \frac{V_..}{V_w}\right) + \left(\frac{V'_.}{V'_w} - \frac{(r_i + 1)V_i.}{V'_w}\right)$$

where V_w is the total value of world trade. In this form the change in a country's share of world trade is set equal to the change that would have occurred if its share in each commodity class had been maintained, plus the competitiveness residual.

[4] See Fleming and Tsiang [9, pp. 219–22] for a more extended discussion of these factors.

It should be stressed that the factors just mentioned that bear upon the saleability of a country's exports are meant to describe the demand side of the phenomenon under study. The actual value taken on by the residual will of course result from the interaction of both demand and supply. As with the time-series analysis of demand, it may prove to be difficult to identify the separate influences of demand and supply. We may nonetheless list some supply factors that may affect one country's export-supply price vis-à-vis its competitors in world trade. These are: (1) differential rates of monetary inflation; (2) differential growth rates of available productive factors and the responsiveness of export supply to the domestic supply of these factors; (3) differential rates of productivity increases; and (4) the extent to which the country is concentrated in exports to very rapidly growing markets.[5]

The interpretation of the competitiveness residual is therefore clearly complicated by the nature of the general-equilibrium system that lies behind it. It is further complicated by the necessarily arbitrary selections of a base period and the level of disaggregation of the commodity and market groups. This also complicates the interpretation of the market and commodity effects. The analysis is thus quite inflexible in the sense that its implications may apply only to the specified time period with the particular breakdown of commodities and market groups. Possibly different conclusions will emerge on the relative importance of the various factors isolated if another choice of time period and level of aggregation is made.[6]

THE CHOICE OF "STANDARD"

We have indicated that the appropriate level of analysis and the extent of disaggregation by commodity and region depend on the market for which the elasticity-of-substitution relationship (7.1) is thought to hold. We have, however, taken for granted that the competing exports, q_2 in (7.1), are the

[5] See Ooms [18] for a mathematical model that indicates these points.

[6] The choice of a level of aggregation is not quite as arbitrary as the choice of base period is. We have pointed out that each "level" of analysis is based on a different view of export competition. The choice of a "level" of analysis as well as the degree of disaggregation within that "level" thus depends on whether the elasticity-of-substitution relationship is applicable to the particular submarket.

Richardson's calculations [20] suggest that quite different results may emerge when final–rather than initial–year weights are used and when disaggregation of both markets and especially commodities is introduced. His work also contains an extensive theoretical analysis of the underpinnings of the constant-market-share method. His conclusions regarding the method are on the whole rather negative in view of its comparatively weak theoretical foundation and the sensitivity of the empirical results to the different computing and data variations we have noted.

world total, and we have used world growth rates as a standard with which to judge export performance of a particular country. For much the same reason that the elasticity of substitution may not hold for various levels of aggregation, it may also not hold for one country vis-à-vis the rest of the world. Competition may be rather minor between various countries and regions and an appropriate choice of competing exports may be quite restricted. This suggests that the world standard may not provide an appropriate constant-shares norm. This leads to rather difficult problems in the selection of a more restricted standard. Apart from the theoretical question of the adequacy of the elasticity-of-substitution function vis-à-vis certain competitors, there also arise questions as to just what it does mean to establish such norms and what interpretations of the results are meaningful.

FURTHER IMPLICATIONS

Despite the foregoing reservations, the constant-market-share analysis poses an interesting and important question. This concerns the extent to which a country's exports are concentrated in commodities and markets that can be considered to be relatively slowly or rapidly expanding, and what the nature of the actual expansion of exports has been in the particular context. Presumably a country will prefer to be concentrated in commodities and markets that are rapidly expanding. For policymakers, this analysis may point the way to a preferred distribution of exports. The less developed countries in particular may be able to find support in terms of negative commodity and regional effects for their complaint about the slow expansion of their export markets.

Studies that have used this method have been retrospective in character. There is no reason, however, why the method could not be used for export projections. We could thus determine by how much a country's exports might increase or decrease due to currently existing favorable commodity or market distributions on the assumption of a continuation of the most recent trends in these markets. This of course assumes away the competitiveness effect, which may in fact be quite important in determining exports.

It may also be mentioned that this method should not be construed as a replacement for traditional least squares demand analysis. It has no probability basis and therefore cannot be used to make valid probability statements about demand parameters or about future events. The method may, however, be useful in conjunction with traditional analysis insofar as traditional least squares can be brought to bear on the analysis of the compet-

itive residuals.[7] We may in the process be able to separate the demand influences from the supply influences, and determine the extent to which the residual depends on price or nonprice factors. In addition, such an analysis would provide a means with which to forecast the residuals and consequently allow us to make probability statements about future values of exports.

The competitiveness residual for any particular market is given by

$$V' - V\left(\frac{V' + V'_w}{V + V_w}\right) \tag{7.13}$$

where V, V_w, V', V'_w represent the value of exports to the market by country A and by the rest of the world in Periods 1 and 2.[8] If we divide this by $V' + V'_w$ and employ Equation (7.3), we obtain

$$\frac{V'}{V' + V'_w} - \frac{V}{V + V_w} = g\left(\frac{p'}{p'_w}\right) - g\left(\frac{p}{p_w}\right) \tag{7.14}$$

which relates a value easily calculated from the competitiveness residual to the relative price terms in each period. Accordingly, if we regress this value on the relative prices, we shall obtain an estimate of the function g. In addition to the relative price variables, we should include any of the demand factors discussed earlier that are likely to influence the saleability of exports. We would then be able to assess the relative importance of the price and nonprice factors. Unfortunately, however, data on these nonprice factors may be lacking. Furthermore, we have only one residual (one data point) for each market. Extra data points may of course be obtained by repeating the analysis over time. This amounts roughly to estimating the elasticity of substitution for the particular market. Alternatively one can assume that the function g in (7.14) is the same for all markets and a cross-section regression may be used.[9]

The supply side of the phenomenon may also be analyzed by a regression of the change in relative prices on such variables as the differential rates of monetary inflation, the differential rates of growth of factors, and the differ-

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[7] It is interesting in this context that Junz and Rhomberg [12] have used the method to indicate the importance of the commodity and market effects in deciding on the level of aggregation to employ in regression analysis of factors determining market shares. They found the commodity effect to be negligible and thus adjusted the data only for the market effect. However, since they employed only three commodity classifications in their analysis, it is by no means clear that the commodity effect would have remained negligible if more disaggregated classifications had been used. In any event, as Kreinin [13, p. 511] and Magee [15, pp. 34–35] have pointed out, the real problem that Junz and Rhomberg wished to avoid was having to collect price data for the disaggregated commodity classes.

[8] That is, in terms of our previous notation

$$r = \frac{V' + V'_w}{V + V_w} - 1$$

[9] See, for example, Junz and Rhomberg [12] and Kreinin [13], who have regressed the residual on the change in relative prices. This is appropriate, however, only when the g function in Equation (7.14) is linear. The estimate thus obtained should not be labeled, as

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ential rates of productivity increase. The combination of the demand-side regression and the supply-side regression would allow us to explain and/or predict the value of the competitiveness residual.

CONCLUSION

The constant-share norm provides a useful tool for analyzing export performance by allowing achieved export growth to be separated into commodity, market-distribution, and competitiveness effects. While the competitiveness residual results from the complex interaction of demand and supply, the problem of identifying the separate influences of the demand and supply sides is essentially the same as the simultaneity problem of ordinary regression analysis discussed in Chapter 2. As we have seen, regression analysis may be applied to the residuals to attack this problem.

Quite apart from the competitiveness residual, the analysis provides useful information concerning the extent to which the country in question is exporting to markets with relatively unfavorable or favorable growth rates. This kind of information may be of interest to the authorities concerned with export policies.

A NUMERICAL ILLUSTRATION

A numerical illustration of the constant-market-share analysis is to be found in Table 7.1. The notation is essentially the same as we have been using. The data refer to total world exports (excluding Italy) and to Italian exports for 1955 and 1959. There are seven SITC commodity groups ($i = 1 \ldots 7$) and ten market groups ($j = 1 \ldots 10$) specified. All the relevant calculations are shown, except the cross classifications of world exports and Italian exports by market destination and commodity groups. The analysis of the change in Italian exports between 1955 and 1959 is indicated at the bottom of the table.

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by the aforementioned authors, an elasticity of substitution. But the estimate may be related to the elasticity of substitution e through Equations (7.14) and (7.3) as

$$e = \frac{\partial f/f}{\partial(p_1/p_2)/(p_1/p_2)} = e_g\left(\frac{1}{1 - g}\right) - 1$$

where

$$e_g = \frac{\partial g/g}{\partial(p_1/p_2)/(p_1/p_2)}$$

TABLE 7.1

Illustration of the Constant-Market-Share Analysis of Changes in Italian Exports, 1955–59 †

(Millions of Dollars)

Market	(1) Actual World Exports 1955	(2) Actual World Exports 1959	(3) Actual Italian Exports 1955 ($V_{i.}$)	(4) Actual Italian Exports 1959 ($V'_{.j}$)	(5) (2)÷(1)−1 (r_j)	(6) (5)×(3) ($r_j V_{.j}$)	(7) 0.239×(3) ($rV_{.j}$)	(8) ($\sum_i r_{ij}V_{ij}$)*
1. North America	15450	20520	176	380	0.328	58	42	60
2. Latin America	6920	7580	190	257	0.095	18	45	29
3. EEC	15334	19763	434	797	0.289	125	104	161
4. EFTA	15960	18330	432	648	0.148	64	103	76
5. Other W. Europe	3480	3810	181	192	0.095	17	43	21
6. Austr., N.Z. & So. Africa	3780	3660	46	55	−0.032	−1	11	−3
7. Japan	2120	3000	12	11	0.415	5	3	0
8. Other Asia & Africa	14000	17110	288	400	0.222	64	69	57
9. Eastern Europe	7360	11700	59	120	0.590	35	14	40
10. All Other	5660	6120	38	54	0.081	3	9	0
Total	90064	111593	1856	2914	0.239	388	443	441
			$\left(\sum_{i=1}^{7}\sum_{j=1}^{10} V_{ij}\right)$	$\left(\sum_{i=1}^{7}\sum_{j=1}^{10} V'_{ij}\right)$	(r)	$\left(\sum_{i=1}^{10} r_j V_{.j}\right)$	$\left(\sum_{j=1}^{10} rV_{.j}\right)$	$\left(\sum_{i=1}^{7}\sum_{j=1}^{10} r_{ij}V_{ij}\right)$

TABLE 7.1 (Continued)

Commodity	(1) Actual World Exports 1955	(2) Actual World Exports 1959	(3) Actual Italian Exports 1955 ($V_{i.}$)	(4) Actual Italian Exports 1959 ($V'_{i.}$)	(5) (r_i)	(6) ($r_i V_{i.}$)	(7) ($rV_{i.}$)	(8) ($\sum_j r_{ij}V_{ij}$)
1. SITC 0 & 1	17779	20769	412	536	0.168	69	98	75
2. SITC 2 & 4	16529	17994	130	140	0.089	12	31	3
3. SITC 3	9728	11445	166	214	0.177	29	40	18
4. SITC 5	4569	6389	127	208	0.398	51	50	51
5. SITC 7	16821	23981	371	758	0.426	158	89	156
6. SITC 6 & 8	23349	29498	650	1058	0.263	171	155	138
7. SITC 9	1289	1517			0.177			
Total	90064	111593	1856	2914	0.239	490	443	441
			$\left(\sum_{i=1}^{7}\sum_{j=1}^{10} V_{ij}\right)$	$\left(\sum_{i=1}^{7}\sum_{j=1}^{10} V'_{ij}\right)$	(r)	$\left(\sum_{i=1}^{7} r_i V_{i.}\right)$	$\left(\sum_{i=1}^{7} rV_{i.}\right)$	$\left(\sum_{i=1}^{7}\sum_{j=1}^{10} r_{ij}V_{ij}\right)$

Analysis

Italian exports in 1959   2914

Italian exports in 1955   1856

Change in exports   1058   100.0%

1. Due to increase in world trade: $\sum_{i=1}^{7} rV_{i.}$ 443   41.9

2. Due to commodity composition: $\sum_{i=1}^{7} r_i V_{i.} - \sum_{i=1}^{7} rV_{i.}$ 47**   4.4

3. Due to market distribution: $\sum_{i=1}^{7}\sum_{j=1}^{10} r_{ij}V_{ij} - \sum_{i=1}^{7} r_i V_{i.}$ −49**   −4.6

4. Due to increased competitiveness: $\sum_{i=1}^{7}\sum_{j=1}^{10} V'_{ij} - \sum_{i=1}^{7}\sum_{j=1}^{10} V_{ij} - \sum_{i=1}^{7}\sum_{j=1}^{10} r_{ij}V_{ij}$ 617   58.3

* r_{ij} was first computed from the cross classification of actual world exports by market destination and commodity groups and then multiplied by V_{ij}, the cross classification of actual Italian exports by market destination and commodity groups for 1955.

† Based on R. M. Stern, *Foreign Trade and Economic Growth in Italy* (New York: Frederick A. Praeger, 1967), pp. 33–42 and 161–63.

** If the order of these two influences is reversed, the effect of market distribution is then: $\sum_{i=1}^{10} r_j V_{.j} - \sum_{j=1}^{10} rV_{.j} = -5$ and the effect of commodity composition becomes 53.

REFERENCES

1. Armington, P. S., "A Theory of Demand for Products Distinguished by Place of Production," International Monetary Fund, *Staff Papers*, XVI (March 1969), 159–76.

2. Armington, P. S., "The Geographic Pattern of Trade and the Effects of Price Changes," International Monetary Fund, *Staff Papers*, XVI (July 1969), 179–201.

3. Awad, F. H., "The Structure of World Export Trade, 1926–1953," *Yorkshire Bulletin*, II (July 1959), 19–37.

4. Balassa, B., "Recent Developments in the Competitiveness of American Industry and Prospects for the Future," in U.S. Congress, Joint Economic Committee, *Factors Affecting the United States Balance of Payments*. Washinton: U.S. Government Printing Office, 1962, pp. 27–54.

5. Baldwin, R. E., "The Commodity Composition of Trade: Selected Industrial Countries, 1900–1954," *Review of Economics and Statistics*, XL (February 1958, Supplement), 50–71.

6. Baldwin, R. E., "Implication of Structural Changes in Commodity Trade," in U.S. Congress, Joint Economic Committee, *Factors Affecting the United States Balance of Payments*. Washington: U.S. Government Printing Office, 1962, pp. 57–72.

7. Creamer, D., "Shifts of Manufacturing Industries," in *Industrial Location and Natural Resources*. Washington: U.S. National Resources Planning Board, 1943.

8. DeVries, B. A., *The Export Experience of Developing Countries*. World Bank Staff Occasional Papers, No. 3. Baltimore: Johns Hopkins Press, 1967, pp. 18–31.

9. Fleming, J. M. and S. C. Tsiang, "Changes in Competitive Strength and Export Shares of Major Industrial Countries," International Monetary Fund, *Staff Papers*, V (August 1958), 218–48.

10. Haberler, G., "Introduction" to the Papers and Abstracts of Papers at a Universities–National Bureau Committee for Economic Research Conference on Problems in International Economics, *Review of Economics and Statistics*, XL (February 1958, Supplement), 3–9.

11. Houston, D. B., "The Shift and Share Analysis of Regional Growth: A Critique," *Southern Economic Journal*, 33 (April 1967), 577–81.

12. Junz, H. B. and R. R. Rhomberg, "Prices and Export Performance of Industrial Countries, 1953–63," International Monetary Fund, *Staff Papers*, XII (July 1965), 224–69.

13. Kreinin, M. E., "Price Elasticities in International Trade," *Review of Economics and Statistics*, XLIX (November 1967), 510–16.

14. Lamfalussy, A., *The United Kingdom and the Six*. Homewood: Richard D. Irwin, Inc., for the Yale University Growth Center, 1963, esp. pp. 47–58 and pp. 137–40.

15. Magee, S., "Theoretical and Empirical Studies of Competition in International Trade: A Review," an unpublished study for the Council of Economic Advisers (1968).

16. Maizels, A., *Industrial Growth and World Trade*. Cambridge: Cambridge University Press, 1963.

17. Narvekar, P. R., "The Role of Competitiveness in Japan's Export Performance, 1954–58," International Monetary Fund, *Staff Papers*, VIII (November 1960), 85–100.

18. Ooms, V. D., "Models of Comparative Export Performance," *Yale Economic Essays*, 7 (Spring 1967), 103–41.

19. Organization for Economic Co-operation and Development, F. G. Adams, et al., *An Econometric Analysis of International Trade*. Paris: OECD, 1969.

20. Richardson, J. D., *Constant-Market-Shares Analysis of Export Growth*. Doctoral dissertation, University of Michigan, 1970.

21. Romanis, A., "Relative Growth of Exports of Manufactures of United States and Other Industrial Countries," International Monetary Fund, *Staff Papers*, VIII (May 1961), 241–73.

22. Spiegelglas, S., "World Exports of Manufactures, 1956 vs. 1937," *The Manchester School*, XXVII (May 1959), 111–39.

23. Stern, R. M., *Foreign Trade and Economic Growth in Italy*. New York: Frederick A. Praeger, 1967, Chap. 2.

24. Svennilson, I., *Growth and Stagnation in the European Economy*. Geneva: United Nations, 1954.

25. Tims, W. and F. M. Meyer Zu Schloctern, "Foreign Demand and the Development of Dutch Exports," *Cahiers Economiques de Bruxelles*, No. 15 (1962).

26. Tyszynski, H., "World Trade in Manufactured Commodities, 1899–1950," *The Manchester School*, XIX (September 1951), 272–304.

27. Wells, S. J., *British Export Performance: A Comparative Study*. Cambridge: Cambridge University Press, 1964, esp. pp. 5–9.