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## Abstract

Title of Thesis: The Trade Model of a Dynamic World Input-Output Forecasting System

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Thesis directed by: Professor Clopper Almon, Department of Economics University of Maryland

The primary purpose of this study is to build a model of international trade with sufficient commodity detail so that a system of national input-output models, to be built later, may be joined to produce annual forecasts of trade among them which are consistent from country to country. The model assumes that the national models will produce forecasts of imports and domestic prices by product. The trade model will use these data to produce forecasts of exports and world prices as seen by each country for use in the national models.

The analysis involves forecasting of trade shares. Trade shares are, for a country importing a certain product, the proportions imported from each source country. The trade shares are not constant or even relatively constant over time. In fact, they have been very unstable. The analysis further shows that the shares are price elastic. Estimates of this price elasticity have been derived. The analysis is detailed enough so that the effect of a price change in Canada for Butter and eggs can be seen in the American exports of Butter and eggs to the United Kingdom. The technique employed insures that throughout the historical and any forecast period for an importer the sum of the shares over all sources is unity.

Since forecasting of exports is the primary purpose of the model aggregate statistics on the price responsiveness of the shares by country have been obtained. The American and French trade shares, while price elastic, are somewhat less elastic than those of Germany, Italy, Canada and the United Kingdom. Japan's price responsiveness is higher still.

Chapter I gives a brief introduction to the world trade modeling now being undertaken at the University of Maryland and an example of the results available from the analysis. Chapter II describes the structure and techniques used in estimating the model. Chapter III describes several other models of world trade which use trade shares. Chapter IV examines the parameter estimates and their implications. Chapter V examines the fit of the equations. A final chapter examines prospects for future work.

# THE TRADE MODEL OF A DYNAMIC WORLD INPUT-OUTPUT FORECASTING SYSTEM

by

Douglas Eugene Nyhus

Thesis submitted to the Faculty of the Graduate School
of the University of Maryland in partial fulfillment
of the requirements for the degree of
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# Chapter I

## Introduction

### Introduction

This study reports an econometric model of world trade for 119 categories of merchandise trade. The model focuses on forecasting exports by commodity for the United States and eight of its major trading partners. It takes the total imports of each of the commodities by each country and domestic prices of each country as given and forecasts how much of those imports will be supplied by each other country. It uses pooled time series and cross country data on annual observations for the 1962-72 period.

### Purpose of the Study

The primary purpose of the study is to produce a model of international trade which will tie together a system of national input-output forecasting models to produce annual forecasts of trade among the nine countries and the rest of the world.

The model of international trade will be constructed well in advance of several of the national models to which it will be linked. This fact will not, however, preclude its use in analyzing and simulating various economic phenonema. Specifically, the price responsiveness of exports can be examined for each country by commodity. In addition, the degree to which different countries compete in the same market can be seen. Table 1-1 is an example of the results. The commodity is

Dairy products. The table shows the effect when one country reduces its price ten percent and no others alter their prices. The analysis in the table further assumes that, to keep the example clear and simple, no country alters its total imports but only changes the sources of supply based on the new prices which it sees abroad. In reading the first row of numbers on the table, we see that if Canada reduces its price it will gain $8.6 million U.S. dollars. The gain, reading across the row, will be at the expense of Belgium-Luxembourg which will lose $3.2 million, Germany who will lose $.3 million, and so on. The next row shows that if the U.S. reduces its price ten percent it would gain $21.2 million with the Rest of the World being the big loser with a loss of $9.9 million. The table reads similarly for each of the countries named in the table. Tables similar to this one for dairy products were derived for each of the 119 categores of merchandise trade.

The Setting of the Model

The Interindustry Forecasting group at the University of Maryland has built a large-scale, input-output system for the United States and is now working on similar models for other countries. The candidates for national models included all the major trading partners of the U.S. (except for Mexico): Japan, Canada, the United Kingdom, the Netherlands, Germany, Belgium-Luxembourg, France and Italy. A small model will be built for the rest of the world.

The central position of the trade model in this international system is illustrated by Figure 1-1, which suggests a solar system with the trade model as the sun and the country models as the planets.

TABLE I-1

THE EFFECTS OF TEN PERCENT PRICE CHANGE BY COUNTRY FOR DAIRY PRODUCTS

(All Figures are in Millions of U.S. Dollars)

| Price Changer / Effects in | Canada | United States | Japan | Belgium-Luxembourg | France | Germany | Italy | Nether-lands | United Kingdom | Others |
|---|---|---|---|---|---|---|---|---|---|---|
| Canada | 8.6 | -2.5 | .0 | -3.2 | -1.4 | -.3 | -.0 | -.0 | -.0 | -1.2 |
| United States | -2.5 | 21.2 | -.0 | -2.4 | -3.7 | -2.1 | -.1 | -.6 | -.1 | -9.9 |
| Japan | .0 | -.0 | 7.3 | -2.5 | -1.6 | -1.3 | -.1 | -1.4 | -.2 | -.3 |
| Belgium-Luxembourg | -3.4 | -2.6 | -2.3 | 91.0 | -37.8 | -16.9 | -3.1 | -18.4 | -3.0 | -3.7 |
| France | -1.3 | -2.1 | -1.4 | -32.0 | 130.8 | -62.0 | -1.7 | -23.2 | -2.2 | -5.1 |
| Germany | -.4 | -1.2 | -1.3 | -17.8 | -72.0 | 115.4 | -.9 | -17.2 | -2.7 | -2.0 |
| Italy | -.0 | -.1 | -.0 | -3.5 | -1.7 | -1.0 | 11.3 | -.6 | -.1 | -4.2 |
| Netherlands | -.0 | -.4 | -1.2 | -15.2 | -22.4 | -14.2 | -.6 | 58.8 | -1.6 | -3.2 |
| United Kingdom | -.0 | -.0 | -.2 | -2.6 | -2.2 | -2.6 | -.1 | -1.6 | 9.9 | -.4 |
| Others | -.8 | -5.2 | -.2 | -3.1 | -4.4 | -1.6 | -3.8 | -2.9 | -.4 | 22.4 |

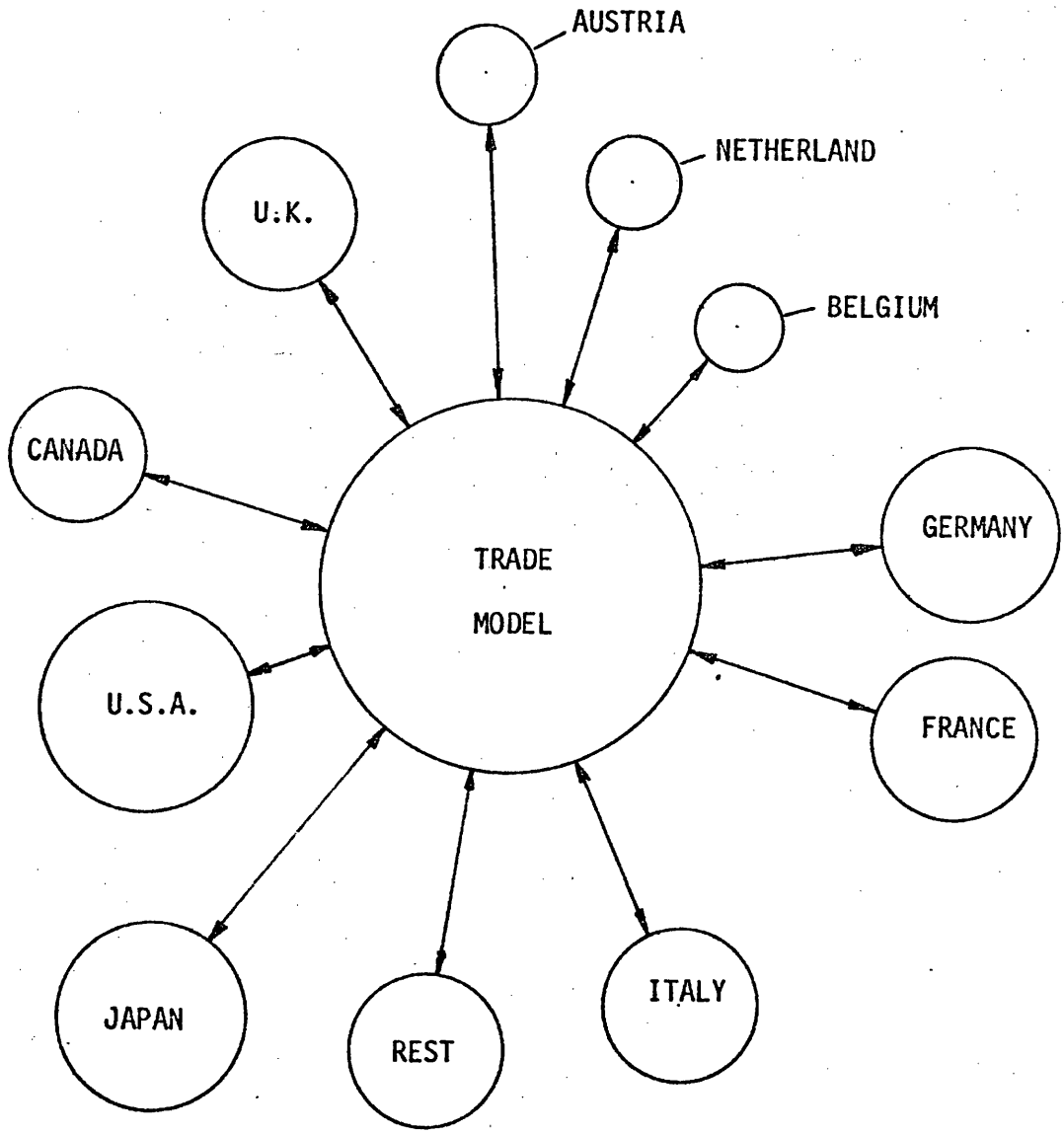


Figure I-1 Trade Model with Planet Country Models

The sun "draws" imports and absolute domestic prices to itself and "radiates" exports and world prices back in return. An iterative solution process will be used, for market clearing world prices and exports are determined simultaneously.

An example will probably help in understanding how the models will work. Suppose personal income in Germany should drop sharply. In the German model demand for imports would fall for two reasons: (1) domestic output would fall; and (2) Germany's domestic prices might fall slightly and thereby make foreign goods relatively more expensive. In the trade model the lower German import demands would lower the export demands for those countries from whom Germany imports goods. The lower German domestic price would, at least in this stage, increase German exports. On returning to the German model, the higher foreign demands would mitigate the recession and so stimulate import demands slightly. German prices would slow their decline. The first effect on another country, say the Netherlands, would be a reduced demand for her exports and a slightly lower world price. Imports of the Netherlands would be under two opposite forces: a world price decrease would push them up, but the fall in exports would pull them down through lower domestic outputs. The direction of change of the Netherland's imports would be uncertain but the effect on her domestic economy would not. In addition, the lower output for the Netherlands would generate less inflationary pressures. When we return to the trade model, after the first effects of Germany's recession have had their impact on the Netherlands, German imports will go slightly. It might be assumed that global imports would rise slightly and hence

total exports might rise. The interaction between the national models and the trade model would continue until an equiliborium solution is found.

Plan of the Report

Chapter II will go relatively quickly through the exposition of the trade model. In order that the ideas, constraints, and objectives of the model will remain clear, there will be little mention of the literature at that point. Once the model is firmly in hand, Chapter III will briefly review what previous authors have done in trade modeling and the relationship of their work to the present one. Chapter IV will discuss the empirical results in great detail. Chapter V will analyze the fit of the equations. Chapter VI will suggest possible improvements to the model and extensions of it.

# Chapter II

## The Trade Model

This chapter reports on the econometric analysis of the international model for 119 categories of merchandise trade. Since individual country models are capable of producing satisfactory import forecasts, this model focuses on forecasting exports for all of the nine countries. With the imports and domestic prices supplied by the individual country models, exports of each country and the rest of the world are determined. The analysis uses OECD data of international trade by commodity of origin and destination. Time series and cross-country observations for eleven years from 1962-72 were employed.[1]

The basic objective of the analysis is to produce annual forecasts of each of the 119 commodities of exports from each of the nine to each of the other eight and to the rest of the world. These forecasts must be mutually consistent, internally as well as externally, for all countries alike. The model shows the price responsiveness of exports for each country.

The use of domestic prices in the formulation of the price term means that we are ignoring the impact of tariffs on the prices paid for imported goods. The mere existence of tariffs does not, necessarily, imply any trade diversion among suppliers. This is true if the tariff

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[1] A data appendix explains the sources and methods used to acquire the data.

is of the kind used by the United States and Canada--a most-favored-nation tariff. For this kind of tariff there are no trade diverting effects since the tariff is uniform from country to country. The level of the tariff may vary and again no bias results in the proportions of a product imported from various sources. The effect of a change in a most-favored-nation tariff will be to affect the level of imports rather than their composition by origin.

A more complicated tariff consisting of different rates for different sources may not, necessarily, imply any continuing trade diversion either. If the differential tariff, such as that used by the European Economic Community (EEC), has been in effect for a period long enough so that all its trade diverting effects have been felt, then its mere continuance will not bias the estimations of the share equation price parameters. The differential tariff may even be altered and yet have no additional trade diverting effects. Suppose Germany has a 10% ad valorem tariff on United States steel and a 5% ad valorem tariff on British steel. If Germany alters her tariff so that the rate is 8% on American steel and 3% on the British product no trade diverting effects will ensue. The reader should note that here we require the tariff changes to be linear (the same reductions in the ad valoreum rates) if the tariff change is to have no trade diverting effects.

It is my argument here that the differential tariffs within the EEC have undergone linear cuts during the estimation period of 1962 to 1972.

The formation of the EEC in 1958 began the process of tariff

reduction within the six member countries consisting of Belgium-Luxembourg, the Netherlands, France, Germany, and Italy. In 1962 the tariff levels for intra-EEC trade had been reduced 50%.[2] Using data from the EEC on average levels of custom duties in the EEC in 1958,[3] the average level of intra-EEC tariff was 6.2% in 1962. Tariffs were completely eleminated in 1968 for intra-EEC trade. The linear reduction for the period 1962 to 1972 was thus 6.2%.

The formation of the EEC had another tariff effect, however; that was to erect a tariff wall around the EEC member countries. The focus of the "Kennedy Round" of tariff reductions was to reduce that wall along with the tariff walls of the United States, Britain, and Japan. Ernest Preeg,[4] has calculated that the average ad valorem tariff imposed by the EEC before the "Kennedy Round" cuts to be about 12.8% and after the cuts to be 8.1%. The EEC, itself,[5] estimates that its tariff in 1972 is about 6.0%. Thus, the linear reduction in the EEC wall was of the order of 4.7% to 6.8%. Comparing the intra-EEC linear reductions to the EEC wall reductions we see they are of nearly equal magnitude. Thus, I argue that, on balance, the effect of the formation and implementation of the EEC and Kennedy Round tariff reductions has been nearly neutral with respect to trade shares. That is, in spite of

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[2] Commission of the European Communities, Information Memo P-41, June 1968.

[3] ibid., p. 2.

[4] Preeg, Ernest H., Traders and Diplomats, The Brookings Institution, 1970, Chapter 13.

[5] Commission of the European Communities, European Community Background Information, No. 3, February 15, 1972, p. 2.

the fact that either of the two tariff actions would, by itself, generate trade diversion, taken together their separate effects are greatly reduced.

To determine whether tariffs have had a significant effect on the trading patterns during the period 1962 to 1972, one would need to include the tariff rates by commodity, by country for each source annually and then modify the prices accordingly. The reader will note, however, that up to this point I have ignored all the problems inherent in computing tariffs when more than one good is in a trade sector. Ernest Preeg offers a good discussion of the many problems involved in such calculations.[6] For the current study, the effects of tariffs and their change have been ignored.

The basic point of reference for the analysis is a trade share matrix M. M is square and has as many rows or columns as there are countries in the model. The $i^{th}$ row of M expresses the exports of country i to each of the other countries. The diagonal elements are all zero, except for our tenth country, a region, called the "rest of the world" (or more simply "Others") where the remaining countries are aggregated together into one region to obtain intraregional flows. Thus, the total imports of country j are given by the column sum $M_{\cdot j} = \Sigma M_{ij}$, and total exports of country i is the row sum $M_{i\cdot} = \Sigma M_{ij}$. The matrix of market shares $S_{ij}$ is thus obtained by dividing each column of M by its column sum. Hence, $S_{ij}$ is the proportion of goods

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[6] op.cit., Preeg, Appendix A, pp 273-281.

from country i in country j's imports.

Viewed from the market place, two overall constraints on any forecast of shares must be satisfied. The first is that in any forecast period each $S_{ij}$ must be non-negative and less than on equal to unity. The second is that the sum of shares from all sources must be unity: $\Sigma_i S_{ijt} = 1$ for all j and t.

As an example of an M matrix, Table II-1 shows the international flows of petroleum products (not crude petroleum) for the calendar year 1972. Each column shows the imports, in thousands of United States dollars, of the country whose name appears at the top of the column from each country named down the side. The bottom row shows total imports of each country (the $M_{.j}$) and the column on the far right shows total exports of each country (the $M_{i.}$). Table II-2 shows the S matrix corresponding to the M-matrix of Table II-1.

Predicting the S matrix is the main burden of this work. The basic equation we shall use for doing so is:

$$(1)\quad S_{ijt} = S_{ijo} P_{ijt}^{b_{ij}}$$

where

$P_{ijt}$ = the effective price of the good in question in country i, $p_{eit}$, relative to the world price as seen from country j, $p_{wjt}$. ($P_{ijt} = p_{eit}/p_{wjt}$).

To insure that global exports equal global imports, the world price, as seen by country j, $p_{wjt}$ is defined implicitly by the following equation:

TABLE II-I

BILATERIAL TRADE FLOWS FOR PETROLEUM PRODUCTS
IN THOUSANDS OF U.S. DOLLARS
FOR THE YEAR 1972

| | CANADA | U.S.A. | JAPAN | BEL-LUX | FRANCE | GERMANY | ITALY | NETHER-LANDS | U.K. | OTHERS | TOTAL EXPORTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 0 | 136573 | 6 | 69 | 2 | 2 | 0 | 41 | 2605 | 6856 | 146154 |
| U.S.A. | 63724 | 0 | 51206 | 20219 | 12717 | 24799 | 17559 | 21946 | 22819 | 207712 | 442701 |
| JAPAN | 72 | 10094 | 0 | 16 | 42 | 145 | 9 | 3 | 8 | 37818 | 48207 |
| BELG.-LUX | 3112 | 23088 | 305 | 0 | 13817 | 75419 | 5514 | 48239 | 54004 | 205909 | 429407 |
| FRANCE | 73 | 7873 | 25 | 22648 | 0 | 118971 | 19517 | 21170 | 41619 | 191685 | 423581 |
| GERMANY | 1058 | 1030 | 888 | 20310 | 41794 | 0 | 12962 | 35678 | 20880 | 264743 | 399343 |
| ITALY | 2 | 100878 | 12 | 38534 | 97959 | 40331 | 0 | 73894 | 46492 | 391460 | 789562 |
| NETHERLANDS | 1503 | 14568 | 281 | 87140 | 27023 | 477489 | 4040 | 0 | 202829 | 371924 | 1186797 |
| U.K. | 7869 | 10550 | 1417 | 11372 | 4899 | 21730 | 5260 | 32714 | 0 | 392905 | 488716 |
| OTHERS | 114495 | 1420298 | 464996 | 26283 | 74825 | 177810 | 101415 | 74356 | 139348 | 611284 | 3205110 |
| TOTAL IMPORTS | 191908 | 1724952 | 519136 | 226591 | 273078 | 936696 | 166276 | 308041 | 530604 | 2682296 | |

TABLE II-2

SHARE MATRIX,(S) CORRESPONDING TO TABLE II-I

| | CANADA | U.S.A | JAPAN | BEL-LUX | FRANCE | GERMANY | ITALY | NETHERLANDS | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | .0000 | .0792 | .0000 | .0003 | .0000 | .0000 | .0000 | .0001 | .0049 | .0026 |
| U.S.A. | .3320 | .0000 | .0986 | .0892 | .0466 | .0265 | .1052 | .0712 | .0430 | .0774 |
| JAPAN | .0004 | .0058 | .0000 | .0001 | .0002 | .0002 | .0000 | .0000 | .0000 | .0141 |
| BEL-LUX | .0162 | .0134 | .0006 | .0000 | .0506 | .0805 | .0330 | .1566 | .1018 | .0768 |
| FRANCE | .0004 | .0046 | .0000 | .1000 | .0000 | .1270 | .1175 | .0687 | .0784 | .0714 |
| GERMANY | .0055 | .0006 | .0017 | .0896 | .1530 | .0000 | .0776 | .1158 | .0394 | .0987 |
| ITALY | .0000 | .0585 | .0000 | .1701 | .3587 | .0431 | .0000 | .2399 | .0876 | .1459 |
| NETHERLANDS | .0078 | .0084 | .0005 | .3846 | .0990 | .5098 | .0242 | .0000 | .3823 | .1387 |
| U.K. | .0410 | .0061 | .0027 | .0502 | .0180 | .0232 | .0315 | .1062 | .0000 | .1465 |
| OTHERS | .5967 | .8235 | .8959 | .1159 | .2739 | .1897 | .6070 | .2415 | .2626 | .2278 |

$$(2)\quad \sum_i S_{ijo} P_{ijt}^{b_{ij}} = \sum_i S_{ijo} (p_{eit}/p_{wjt})^{b_{ij}} \equiv 1$$

Table II-3 gives a list of the variables used with their definitions.

Equation (1) can also be written in terms of trade flows as:

$$(1')\quad M_{ijt} = S_{ijo} M_{.jt} P_{ijt}^{b_{ij}}$$

The equality of exports and imports can be seen easily by summing (1') over exporting countries i and using the world price defined by (2):

$$\sum_i M_{ijt} = \sum_i S_{ijo} M_{.jt} P_{ijt}^{b_{ij}}$$

$$= M_{.jt} \sum_i S_{ijo} P_{ijt}^{b_{ij}}$$

$$= M_{.jt}$$

This solution to the adding-up problem by the implicit definition of $p_{wjt}$ should be noted carefully. The whole method rests on it.

One further aspect of equation (1') should be noted. The value flow, $M_{ijt}$, has been deflated by the exporting country's domestic price index, so we are dealing with volume flow. Note also that total imports of country j have been expressed (in volume terms) as the sum of all volume exports to it. Therefore, the proper deflator for imports to j does not contain the domestic price index of j (except when $M_{ii} \neq 0$, i.e., for intraregional flows).

The problem now is to find a set of substitution paramenters (b's) and a series of world prices which are consistent with

TABLE II-3

DEFINITION OF VARIABLES USED
IN THE TRADE MODEL

Note: Except for the exchange rate, the variables are specific to one of the 119 commodities.

| Variable | Definition | Description |
|---|---|---|
| $M_{ijt}$ | $V_{ijt}/p_{it}$ | Deflated value of imports from country i to country j in year t. |
| | where | |
| | $V_{ijt}$ | Value flow of imports from country i to country j in year t |
| | $p_{it} = v_{it}DP_{it}$ | Internationally comparable price index of country i in year t |
| | $v_{it}$ | Index of trade conversion factors (exchange rates) of country i vis-a-vis the U.S. dollar, 1972=1.00 in year t |
| | $DP_{it}$ | Domestic price index of country i in year t |
| $S_{ijt}$ | $M_{ijt}/M_{.jt}$ | Proportion imported by country j coming from i (a zero subscript indicates a base year (1972) value) |
| $M_{.jt}$ | $\sum_{i} M_{ijt}$ | Total imports of country j |
| $P_{ijt}$ | $P_{eit}/P_{wjt}$ | Relative price of source country i to the world price as seen by j in year t |
| $P_{eit}$ | $\sum_{\tau=0}^{5} W_{\tau} p_{it}$ | Effective price of country in in year t |
| p | equation (2) | World price as seen by country j in year t |
| U | | Domestic use of good i in year t (used only in equation 22 which is outside the scope of this chapter) |
| b,w,g, | | Estimated parameters |

conditions (1) and (2). Inititally I had hoped that a simple iterative process could be applied to (1) and (2) until a joint solution was found. That is, I planned to assume that all b's were equal to -1 and to solve for world prices with (2), and then generate new b's using (1). With these b's, so ran the plan, I would recalculate world prices, and then re-estimate the b's, and so on. A nice simple process; but unfortunately, it does not converge, as I learned by trying it. A little consideration made it obvious that it could not converge, for suppose we start with a given set of b's and Canada's b comes out highest on the first solution. The Canadian price will then carry a heavy weight in the world price of the second iteration. On that iteration of (1), an even higher estimate of Canada's b will be required to get the necessary action from the relative price term, for the heavy weight of Canada's price has made the relative price term closer to one. Indeed, the limit of this iterative procedure is to have only one very large (negative) b, in this case for Canada, and the world price will thus equal Canada's domestic price.

After the failure of the simple iterative procedure, we had to turn to a more complex non-linear estimation method. The non-linearity arises, of course, because the b's enter (1) not only directly, in the exponents, but also indirectly through the definition of the world price.

The method of least squares requires that we determine the b's to minimize the sum of squares

$$\sum_i \sum_t r_{ijt}^2$$

where

$$r_{ijt} = M_{ijt} - S_{ijo} M._{jt} P_{ijt}^{b_{ij}}$$

We will approximate $r_{ijt}$ with the first term of the Taylor series expansion as a function of the b's, thus

$$(3)\quad r_{ijt} \tilde{\sim} \tilde{r}_{ijt} = M_{ijt} - S_{ijo} M._{jt} \left(\sum_k \partial / \partial b_{kj} \left(P_{ijt}^{b_{ij}}\right) \Delta b_{kj}\right)$$

With given initial values of the b's, we evaluate each $\partial / \partial b_{kj} (P_{ijt}^{b_{ij}})$ on the right and then determine, by regression, the $\Delta b_{kj}$ which minimize the sum of squares of the $\tilde{r}_{ijt}$. These $\Delta b_{kj}$'s added to the original b's, give new b's about which we again expand, estimate new b's by regression, and continue the process until the new b's imply nearly the same world price as did their immediately preceeding b's.

The calculation of the $\partial / \partial b_{kj} (P_{ijt}^{b_{ij}})$ in (3) is the tricky part of this process. (The reader not interested in the details will find the answer in equation (8) and may pick up the story at that point.) First of all, we have

$$(4)\quad \partial / \partial b_{kj} (P_{ijt}^{b_{ij}}) = \delta_{ik} P_{ijt}^{b_{ij}} \ln P_{ijt} + b_{ij} P_{ijt}^{b_{ij} - 1} \partial / \partial b_{kj} (P_{ijt})$$

where $\delta_{ik} = \begin{cases} 1 \text{ if } i = k \\ 0 \text{ if } i \neq k \end{cases}$

From the definition of $P_{ijt}$, $p_{eit}/p_{wjt}$, we find

$$(5)\quad \partial/\partial b_{kj}\ (P_{ijt}) = (p_{eit}/p_{wjt})\ (-1/p_{wjt})\ \partial/\partial b_{kj}\ (p_{wjt})$$

$$= -(P_{ijt}/p_{wjt})\ \partial/\partial b_{kj}\ (p_{wjt})$$

To obtain $\partial/\partial b_{kj}\ (p_{wjt})$ we recall that $p_{wjt}$ is defined so as to make (2) an identity. Therefore, the derivative of the left side of (2) with respect to $b_{kj}$ is zero:

$$(6)\quad \partial/\partial b_{kj}\ (2) = \sum_{\ell} S_{\ell jo}\ b_{\ell k}\ P_{\ell kt}^{b_{\ell k}-1}\ (p_{e\ell t}/p_{wjt})(-1/p_{wjt})\ \partial/\partial b_{kj}\ (p_{wjt})$$

$$+ S_{jko}\ P_{jkt}^{b_{jk}}\ \ln P_{jkt} = 0$$

Solving (6) for $\partial/\partial b_{kj}\ (p_{wjt})$ yields

$$(7)\quad \partial/\partial b_{kj}\ (p_{wjt}) = \frac{p_{wjt}\ S_{jko}\ P_{jkt}^{b_{jk}}\ \ln P_{jkt}}{\sum_{\ell} S_{\ell ko}\ b_{\ell j}\ P_{\ell jt}^{b_{\ell j}}}$$

Substituting (7) into (5), and (5) into (4), and (4) into (3) yields

$$(8)\quad \tilde{r}_{ijt} = M_{ijt} - S_{ijo}\ M_{\cdot jt}\cdot$$

$$\sum_{k} (\delta_{ik}\ P_{ijt}^{b_{ij}}\ \ln P_{ijt} + b_{ij}\ P_{ijt}^{b_{ij}-1}\ (-P_{ijt}/p_{wjt})\cdot$$

$$\frac{p_{wjt}\ S_{jko}\ P_{jk}^{b_{jk}}\ \ln P_{jkt}}{\sum_{\ell} S_{\ell jo}\ b_{\ell j}\ P_{\ell jt}^{b_{\ell j}}})\ \Delta b_{kj}$$

The iterative solution is started by assigning a value of -3 to all the b's. With this assumption we solve for the world prices in (2) and with them we return to (8) to get new b's. As mentioned already, this process is repeated until the newly calculated world price converges to the one of the previous iteration. The value of -3 was used by Armington[7] for a similar type of price parameter. The choice of -3 was, however, not critical. Beginning values of -1 and -4 were also tried. They yielded nearly the same b's; differences did appear in the second decimal place. One further restriction was imposed on the b's. They were constrained to be non-positive and greater than -10. If the b's found by regression led to a particular b being outside this interval, the b was moved only to the limit of this range. The procedure probably slowed the convergence a bit but it kept us from getting unrealistic estimates which would not be usable in forecasting.

One question still remains concerning equation (1). It concerns the long and short run price effects on the shares. The effect of a price reduction in a given period may not, in that period, produce many additional buyers. If the potential buyer has not dealt with the supplier before, new lines of communication need to be established. Professional trading companies facilitate the connection but cannot entirely eliminate the delay. In a world of generally rising prices, many price reductions are relative rather than absolute. So a buyer

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[7] Armington, P. S. "The Geographic Pattern of Trade and the Effects of Price Changes", International Monetary Fund Staff Papers, Vol. XVI (1969), p. 182.

must realize that while the old supplier raised his price ten percent, the potential new one has raised his only five percent and may now, in fact, be cheaper. In addition, the buyer must ask himself—will the new relative price relationship persist for long? How much will I lose in fixed costs by changing supplier? Will the cheaper supplier be able to supply the goods on schedule? These questions all tend to lengthen the period of adjustment between price changes and volume of trade changes. They lead us to define the effective price, which we have used thus far, as a weighted average of present and past domestic market prices:

$$(9)\quad P_{eit} = \sum_{\tau=0}^{5} W_\tau P_{it-\tau}$$

We will assume that these weights, the w's, will vary from commodity to commodity; but, for a given commodity, will be the same for each importing country. Intutitively, it would seem to be simpler to estimate a different lag distribution for each importer rather than constraining them all to be the same. Data limitations, however, are highly important. The estimation of a five-year lag with only eleven years of data would, I believe, severely reduce the available degrees of freedom. The constraint that all countries have the same lag distribution means that we have increased the data for the estimation of the lag tenfold without unduly limiting the explanatory power of prices. Further, we will say that these weights lie on a smooth curve, a polynomial. A polynomial of degree three was selected because it had enough ability to twist and turn to produce a varied adjustment pattern but not so much that the

patterns become jerky.

Factors other than prices can affect the coefficients of the share matrix. Changes in tastes, habits, subsidies and quotas may all be important, but they are, in most cases, difficult to quantify or to predict. If, however, we assume that these variables have trends, a time trend can be added to (1').

The addition of a time variable can be handled in three possible ways: (a) by using (1') in its current form multiplied by an exponential time trend; (b) changing (1') to a linear form and adding a time trend; or (c) by adding a linear time trend to the logarithmic form of (1'), which would make it non-linear in the b's.

The first form is

$$(10)\quad M_{ijt} = S_{ijo} M_{\cdot jt} P_{ijt}^{b_{ij}} e^{g_{ij}t}$$

where $P_{ijt} = p_{eit}/p_{wjt}$. This form has the property that both b's and g's can be estimated jointly, but it violates our adding up requirement.

That is

$$\sum_i M_{ijt} = M_{\cdot jt} \sum_i S_{ijo} P_{ijt}^{b_{ij}} e^{g_{ij}t} = M_{\cdot jt}$$

holds only if all $g_{ij} = o$ which implicitly states that we have no time trend. Clearly this form must be rejected.

The second form is

$$(11)\quad M_{ijt} = S_{ijo} M_{ijt} + S_{ijo} M_{ijt} b_{ij} (p_{eit} - p_{wjt}) + g_{ij}t$$

This equation can handle the adding up problem if we constrain the g's so that $\sum_i g_{ij}=0$ and, of course, have the world price suitably defined. However, its linear form implies that a given change in the price always generates the same change in share no matter how different the current share is from its base-year value. This property does not seem desirable for medium-term to long-term forecasting.

Consequently, one is left with the third form,

$$(12)\quad M_{ijt} = S_{ijo}\, M_{\cdot jt}\, P_{ijt}^{b_{ij}} + g_{ij}t$$

This form is not as formidable to estimate as it first appears. Equations (1) and (2) yield consistent estimates of the world prices and substitution parameters. The g's, therefore, can be estimated from residuals. That is

$$g_{ij}t = M_{ijt} - S_{ijo}\, M_{\cdot jt}\, P_{ijt}^{b_{ij}}$$

But, one might ask, why not estimate the g's jointly with the b's. The answer is twofold. First, we wish to make the prices do as much work as we can because we wish the change in the share matrix to be economically meaningful; second, we did try to estimate them jointly, resulting in unreasonable, erratic b's. So we were left with the result of estimating the g's from the residuals.

To insure that global imports equal global exports, the sum of the g's must be zero. But since each g is estimated independently, they will not automatically sum to zero and post-estimate adjustment is needed. Those with the best fits should, however, be adjusted proportionally less than those with poor fits. Fortunately, a set of

good weights is at hand: the standard errors of the g's. Therefore, each g was adjusted in proportion to its standard error until the zero sum was reached.

The linear trend variable, however, presents a problem. Even though we satisfy the adding up constraint by forcing the sum of the g's to zero, each g could, and with enough time would, make the bilateral flow negative or larger than the total import flow itself. A simple solution is to have time "slow down" in the forecast period. "Time", I felt should not go past the value, t*, which would make the time component of any country's share reduce that share by more than 90 percent of its initial size or increase the share by more than 90 percent of all other initial shares. That is, one finds the largest t* such that

$$(14)\quad g_{ij}t^* \leq .9(1-S_{ijo}) \text{ if } g_{ij} > o$$

or

$$(14')\quad -g_{ij}t^* \leq .9\, S_{ijo} \text{ if } g_{ij} < o$$

But one does not want time to charge up to t* too quickly. Rather, time should slow down gradually, decreasing its pace by the same percent each year. In the first year time steps forward by one unit, in the second year by (1-d) units, in the third year by (1-d) units. It therefore never goes beyond

$$(15)\quad \frac{1}{d} = \sum_{i=o}^{\infty} (1-d)^i$$

So we set $\frac{1}{d} = t^*$ or $d = \frac{1}{t^*}$. This slowing down of time appears

only in the forecast, not in the estimation period.

Now that all the parts have been explained we may ask, "How does the entire system operate?" To recapitulate, we have the following relationships:

$$(16)\quad p_{eit} = \sum_{\tau=o}^{5} W_\tau P_{it-\tau}$$

$$(17)\quad M_{ijt} = S_{ijo} M_{\cdot jt} P_{ijt}^{b_{ij}}$$

$$(18)\quad \sum_i S_{ijo} (p_{eit}/p_{wjt})^{b_{ij}} \equiv 1$$

$$(19)\quad g_{ij}t = M_{ijt} - S_{ijo} M_{\cdot jt} P_{ijt}^{b_{ij}}$$

$$(20)\quad \sum_i g_{ij} = o$$

$$(21)\quad M_{ijt} = S_{ijo} M_{\cdot jt} \prod_{\tau=o}^{5} \left( (P_i/p_{wj})_{t-\tau}^{b_{ij}} \right)^{w_\tau}$$

Beginning from given w's[8] amd b's, we first determine the effective price from (16) and then mutally determine the world price and substitution parameters in (17) and (18). We then estimate time trends from the residuals and constrain the sum of the g's to zero in (19) and (20). Finally, we estimate a distributed lag on prices in (20). Then we return to the top and, with the newly estimated w's and b's go

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[8]The initial w's were obtained from a study by Jung, R., and Rhomberg, R., "Price Competitiveness in Export Trade Among Industrial Countries", American Economic Review, Vol. 63 (May 1973), pp. 412-18.

through the entire process again. When the change from one set of w's to the next is small we stop. Actually, three complete iterations appeared sufficient. The distributed lags on prices stablized very quickly.

To remind the reader of the connection between the trade model and the country models, the import equation for country j of good i which is used in the country model is shown.

$$(22)\quad M_t = (a + bU_t)\ (p_{wj}/P)^n_t$$

where

$M_t$ = total imports of a good in year t

$U_t$ = domestic use of good (domestic use is output-exports +imports) in year t

$P_{wj}$ = world price of good i as seen by j as estimated in the trade model

$P$ = domestic price of good i in country j.

Thus, we see in (22) that the link from the trade model to the import equations of the country models has been made through the world price.

# Chapter III

## Other Related Work

The first of two sections in this chapter discusses other work in the general field of international trade model linking; the second, current trade models linking national models with special emphasis on those which use the trade shares approach.

### International Trade Model Linking

Rudolf Rhomberg succinctly states[1] the reasons for a world trade model and several approaches in modeling the linkages. He distinguishes direct from indirect linking. By "direct" linking, he means explicitly relating (by equations) the bilateral international trade flows between each of the countries in a system of national models. Direct linking then would require "such a high degree of detailed attention to external economic relations in each of these models that it would be difficult to preserve a reasonable balance between the domestic and foreign sectors of these models." The number of equations required for the countries involved in the study would certainly be prohibitively large.[2]

Indirect linkages refer, in Rhomberg's terms, to the use of a trade model. Clearly that approach is the substance of this study.

Rhomberg goes on to cover several approaches to model linkage. He

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[1]Rhomberg, R. R., "Possible Approaches to a Model of World Trade and Payments," IMF Staff Papers, vol 18 (1970), pp. 1-27.

[2]For example, if n countries are in a model with m sectors, there would be (n-1) (m) equations--nine hundred for a one hundred sector national model in the present INFORUM system of ten countries.

calls the three basic types the "consistency", "bilateral", and "structural" approaches. To Rhomberg "consistency" means that global imports equal global exports in each period of the model. (Allowances are made for CIF-FOB differences and some shipping time lags--~~ae~~.g. the time period a Japanese export to France may be reported as an export from Japan one period before it is reported as an import by France.) The simplest way to achieve "consistency" is to force one set of national import or export forecasts to equal the other and re-run each of the national models with the imposed consistent exports and imports as exogenous data. The consistency condition has been applied in Project LINK's "MINI-LINK."[3] The imports of each country in the model independently are estimated with different assumptions about world trade. Summing across countries they obtain world trade. A consistent pairing is then found between a set of import demands and world trade. The limitations to the simple way are that it yields, in general, little improvement in the forecasts and that it leaves no room for policy analysis. Still the "consistency" approach has much intuitive appeal. In summary, this approach may be regarded as a necessary but not a sufficient condition for a world trade model.

The "bilateral" approach means, to Rhomberg, essentially the direct linkage method of international trade modeling. Rhomberg points

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[3] Klein, L. R., and Van Peeterssen, A., "Forecasting World Trade Within Project LINK", in Ball, R. J. (ed.), The International Linkage of National Economic Models, North Holland, Amsterdam, 1972.

up a major problem in this type of linkage: it violates the specification of the desired model. The direct model is Keynesian in approach and yet an intertational trade model should be Walrasian in approach. This last point needs to be explained a bit more fully. Direct linkage ignores, or at least obscures, the competitive nature of several possible sources of supply for an import since there is no simple way to represent the competitive relationships in bilateral import functions. In addition, the imports from a particular source may be significantly affected by supply conditions in the source country. These supply conditions are a function of exports of other goods of the source country as well as exports of the good in question. Perhaps prices could be made to reflect all of these factors but the amount of effort needed to do so would be enormous--expecially when another approach could well lead to the same result much more easily. The bilateral approach does, however, have the desirable characteristic of directly relating the economies of different countries--something which the simple "consistency" approach does not really try to do. Estimation of bilateral flows has been done, for example, by Houthakker and Magee[4] where they estimated separate equations of United States imports from several countries. So, in summary, the "bilateral" approach has good intentions but lethal theoretical and practical problems.

The third approach suggested by Rhomberg is the "structural"

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[4]Houthakker, H.S., and Magee, S. P., "Income and Price Elasticities in World Trade", The Review of Economics and Statistics, Vol. LI, (May, 1969), pp. 111-125.

approach. It interposes a structure of international trade into the problems associated with the "bilateral" approach. As Rhomberg states, "The idea would be similar to that of using an input-output matrix with fixed coefficients in the analysis of problems that would actually require a full microeconomic supply-and-demand model of many producing and consuming sectors."[4] As Rhomberg further notes, however, the idea of fixed trade shares should be viewed only as a starting point.

Paul Armington, a colleague of Rhomberg's at the International Monetary Fund, has developed a theoretical framework for the "structural" approach emphasized by his fellow IMF staff members.[5] He assumes that goods are distinguished by kind and site of production (e.g. German autos, German chemicals, and Japanese chemicals are all different goods) and "buyers preferences for different products of a given kind are independent of their purchases of products of any other kind." After these two simple assumptions he makes three more assumptions—two of which seem reasonable and proper while the third does not. First, he assumes that market shares are unaffected by changes in the size of the market, all else remaining the same. For example, a 30% increase in French imports of sugar will not by itself change the proportions it buys from each of its suppliers. Note that here we are assuming that no supplier changes his price. The second assumption is that the elasticity of substitution between products in

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[4]Rhomberg, op.cit., p. 10.

[5]Armington, P. S., "A Theory of Demand for Products Distinguished by Place of Production," IMF Staff Papers, vol. XVI (1969), pp 159-177.

a market is constant over all price ratios. The third assumption is that this elasticity of substitution between any two products competing in the same market is the same as that for any other pair in that market. In the U.S. market for machine tools, for instance, the elasticity of substitution between French and German tools is the same as that between French and British tools. One of the hallmarks of Germany's export success has been her ability to retain her export markets in the face of the rapidly appreciating Deutsch Mark. Retaining this third restrictive assumption greatly reduces a trade model's flexibility of responee to various price changes by different countries. In fact, one of the major innovations of my own work was to drop this constricting assumption. Without that assumption, estimation becomes much more time consuming, but the variety of results obtained makes the trouble worthwhile. To Armington's credit, he does examine such a relaxation in a later paper.[6] In this paper, he imposes two widely different sets of substitution parameters while changing the price in one country the same amount for both cases. The results show that on the import side the effect of the substitution parameters is substantial; on the other hand, the changes in exports were much smaller. The effect of the trade structure appears to be strong since the different sets of substitution parameters led to few marked changes. Therefore, Armington concludes that the substitution parameters should be estimated from historical data but that the trade structure itself has probably more influence on

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[6] Armington, P. S., "The Geographic Pattern of Trade and the Effects of Price Changes," IMF Staff Papers, Vol. XVI (1969), pp 179-197.

exports. The French have also developed a system of models of individual countries into a world system.[7] The multinational avec operation integrees, pour la simulation economique, or MOISE, consists of 20 geographic zones (individual and groups of countries) and distinguishes 12 products. The zones are solved individually for each of their 12 outputs by an input-output matrix and forecast final demand. The national variables are then used in the international exchange model which yields variables which are used in the national models. An iterative process is followed between the national and international models until a convergence is found.

The factors affecting international trade flows are four in MOISE. The first is the growth of output which yields greater import demands. The second consists of supply constraints on the one hand and a drive for export markets on the other. The third factor relates relative prices, foreign and domestic taxes, and tariff barriers to international trade. The last factor involves the innovativeness and specialization in export intensive goods in the country.

Unfortunately Courier and Lafay, the authors of the model, did not include any statistical results of the model in their paper. Therefore, we cannot examine or compare their results with others or ours.

## A Brief Survey of the Current Trade Models

In this section, three models will be discussed. All use the

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[7] Courier, M. and Lafay, F., "Simulation Economique Multinationale," Statistique & Etudes Financiers, Paris, 1972, pp. 27-58.

shares approach. All have the common assumption that the elasticities of substitution are constant between all exporters to a given importer.

Grant Taplin has explained a model of world trade based upon the trade shares approach.[8] He tested seven types of equations for forecasting the shares. Dealing with total trade between pairs of OECD countries, he measured the root-mean-square-weighted-proportional error (RMSWPE) for each type.[9] Using 1963 as his base, he calculated the RMSWPE for the years 1964-1969 for each of his seven types of equations. The first type, constant shares, performed the worst. Errors beginning at 5.34 in 1964 grew steadily until they were 17.90 in 1969. As expected, the type with one of the lowest average RMSWPE over the period was one in which the previous period's share was used. This isn't surprising, but it does lead to the conlusion that the obvious choice of a base year

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[8] Taplin, G. B., "A Model of World Trade," The International Linkage of National Econometric Models, R. J. Ball (ed.), North Holland, Amsterdam, 1972.

[9] $$\text{RMSWPE} = \sum_{i=1}^{n} \frac{X_i}{X.} \left( \frac{X_i - \hat{X}_i}{X_i} \right)^2$$

where n = number of OECD countries

$X_i$ = actual total exports of country i,

$\hat{X}_i$ = forecasted total exports of country i, and

$$X. = \sum_{i=1}^{n} X_i$$

for beginning a forecast is the last year of known data. Other types involving linear changes to the shares did somewhat less well. A price adjustment formulation (with differing long and short effects) was the best performer:[10] a linear variant of it performed somewhat less well. As the reader will remember, the type of equation selected for this study is of this same general type.

Lee Samuelson of the staff of the Organization for Economic Cooperation and Development (OECD) has developed a comprehensive model of world trade.[11] His model is divided neatly into three blocks: (1) prices; (2) imports; and (3) exports. It is the third block which especially interests us here. The basic form of his equation is a first order (linear) approximation of the CES demand-system functions:

$$M_i = S_i M. \quad \frac{P_i}{\Sigma_k S_k P_k}^{b_i}$$

Further, he adds three additional variables in a linear fashion. The first is a measure of relative capacity utilization; the second, a measure of relative tightness in the entire economy; the third, a dummy

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[10]The structural equation was

$$S_t = a P_t^{\,b} S_{t-1}^{c}$$

where $S_t$ is the share in year t, $P_t$ is $\frac{P_i}{\sum_m W_m P_m}$, and a, b, and c, are parameters to be estimated.

[11]Samuelson, Lee, "A New Model of World Trade," OECD Economic Outlook, Occasional STudies, December 1973.

seasonal variable. For an aggregate model forecasting a country's total exports, the use of capacity utilization and total demand pressure seem appropriate, but in the case of a highly disaggregated model, such as the current study, such effects, by commodity, may be transmitted through the price term. The price equations in each of the national models (Samuelson does not have detailed national models) should incorporate such possible pressures in their price forecasting equations. However, Samuelson's addition of these variables presents an interesting idea which may be tested in further work. Regretably, the data requirements for such additional work place it outside the scope of the current study. To generate the proper variables, output measures would be necessary for all ten countries for all 119 commodities for the full-time period. The stage of Samuelson's model when the above cited paper was written precluded extensive simulation testing. The regression results for the equations estimated were, however, available Samuelson used a three period (one and one-half years) lag for his relative price term. An Almon lag was estimated and then normalized so that all weights were positive and their sum unity. The full price elasticity varied from -.31 for Austria to -2.06 for Ireland. The t-ratios appeared significant. The relative capacity utilization variable also proved generally helpful. The relative total domestic demand pressure variable appeared to be less helpful. It appeared in only eleven of the twenty equations. One can infer that the results in the other nine were either not significant or had the wrong sign. The $R^2$ for his equations were generally rather low. It varied from 0.12 for Spain to 0.78 for Germany; the average being 0.42.

Samuelson produces an interesting table where he displays "World Market Price Elasticities for Exporters." The elasticity estimates reflect the readjustment of a competitive exporter's price induced by the change of the export price of the country in question. The current period price elasticities vary little and range from -.56 for Belgium-Luxembourg to -.91 for Sweden while the long term price elasticities range from -1.04 for Japan to -1.51 for Switzerland. The figures result from two oft-opposing effects. The first is that price elasticities of those exporters whose primary exports are basic raw materials are probably low--hence, Canada and the U.S.A. have low final effect elasticities. Small countries may, on the other hand, have so many competitors for their non-distinguished line of exports that after the competitors adjust their prices, most of the would-be gain from the price decrease is lost. Examples here are Belgium-Luxembourg and the Netherlands. Switzerland, however, produces many specialized products not found elsewhere in the world, hence, her export price elasticity would be closer to that of a global import elasticity for that product. In summary, Samuelson's model is an informative and helpful piece of work. It could not, of course, be applied to the current study because of its aggregative nature.

The third example of the use of trade shares in producing export demands is present in B. G. Hickman and L. J. Lau's recent article in which they describe their trade model which will be used in Project LINK.[12] The purpose of Hickman and Lau's model is to accomplish, for

[12]Hickman, B. G., and Lau, L. J., "Elasticities of Substitution and Export Demands in a World Trade Model," European Economic Review (1973), pp. 347-380.

short run macroeconomic models that which we will do for medium term input-output models. As has already been noted concerning Samuelson's model, the short run nature of the model dictates much of its formulation.

With a careful and thorough theoretical development, the authors derive the linear approximation of the standard CES export demand function:

$$M_{ij} = S^{o}_{ij}\, M_{.j} - b_j\, M^{o}_{ij}\ (p^{x}_{ij} - p^{m}_{j}) + s_j\, M^{o}_{ij}\, r_{ij}t$$

where $M_{.j}$ = constant dollar quantity of imports from the $i^{th}$ country. The zero superscript refers to base year quantity;

$S_{ij}$ = base year $i^{th}$ country's share in $j^{th}$ country's imports;

$M_{ij}$ = constant dollar quantity of imports of the $j^{th}$ country;

$s_j$ = elasticity of substitution between any two countries in the $j^{th}$ market;

$p^{x}_{ij}$ = price index of exports of country i to country j;

$p^{m}_{j} = \sum_{i=1}^{n} S^{o}_{ij}\ P^{x}_{ij}$ price index of imports of country j;

$t$ = time trend, set at zero in base year;

$r_{ij}$ = trend coefficient.

The reader will notice a striking similarity between the above equation and equation (12) of Chapter II of this study. But there are some basic differences between the two equations. The obvious difference is that Hickman and Lau's equation is strictly linear, while in this study the equation is non-linear. In the realm of medium term forecasting, linear

equations, particularly those with significant time trends, will not tend to give the most reliable results. (It must also be remembered that Hickman and Lau's equation is only an approximation for the true equation.) For example, after 10 years and say 7 percent annual inflation the price terms will have values of about 2.00. In that case, a 5 percent decrease in an exporters price would have as much effect as a 10 percent decrease in the base year where prices were on the order of 1.0. This is not acceptable in a model that is expected to forecast that far ahead. In addition, the time trend term may force the bilateral flow to be larger than the total or in the opposite case negative. The prospect of that event occuring are very high (a certainty with enough time) for a model with many countries and several commodities forecasting several years ahead. The reader will remember that in the present study this problem is overcome by "slowing" time down. In fairness to Hickman and Lau, their model is for the short term (1-2 years) so that the above criticisms are not valid for their particular circumstances; they would apply, however, if we tried to use their type equation for medium term forecasting. A second major difference is that b, the elasticity of substitution is constrained to be the same between imports from any two countries for a particular market while in our equation the price parameters may vary widely over the source countries. Armington's pioneering article argued that site of production was a valid distinction among products: French chemicals and Japanese chemicals are really different products.[13] Constraining

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[13]Armington, P. S., op.cit., Vol. 17(1969), pp. 159-177.

the price parameters to be equal somewhat dims that product distinction.

The major finding of the Hickman and Lau study was that the addition of a time trend (to measure non-price effects such as changes in taste) greatly improved the fit of the equations and their forecasting ability. A table is presented which compares, among other things, the equation fits of the trend vs. non-trend equations. In 19 of 27 cases (there are 27 countries in their model and only one commodity), the trend equation had a lower standard error of estimate after adjustment for degrees of freedom. The improvements in fit using the trend equation were generally very apparent. The result seemed strong enough that I felt such a term should be included in my equations even though it increased the complexity of the model significantly.

# Chapter IV

## The Parameter Estimates

The parameter estimates, it will be recalled, include those on price (the b's), those on the distributed lag of the effective price (the w's), and those on time (the g's). But before proceeding further, I must forewarn the reader that he will not see all the results. All the estimated parameters are available from the author, but the reason for not showing them all is simple--there are just too many of them, 11,900 b's, 11,900 g's, and over 700 w's are estimated. To display them all would waste our space and probably help little in interpreting the results. Twelve sectors, about one-tenth of the total, have been selected for examination in greater detail. Even within the twelve, full detail can be shown only for the first.

The selection of which sectors to display was based on several considerations: (1) the results should be typical--not all good or all bad, (2) the results should illustrate the main points to be made, and (3) the selected sectors should represent various types of commodities such as agricultural goods, crude materials, energy related products, basic and light maufactured products, machinery and consumer oriented products. The twelve are: 2 - Dairy and eggs, 7 - Preserved fruits and vegetables, 15 - Crude rubber, 17 - Pulp and paper, 28 - Petroleum products, 38 - Manufactured rubber, 56 - Wire and tubes, 74 - Textile and leather machinery, 78 - Construction machinery, 81 - Pumps, 95 - Personal autos, 106 - Clothing.

The Price Parameters

The price parameters for Dairy and eggs are shown in Table IV-1. The columns represent importers and the rows exporters. Thus, the value -.72 in the Canada column is the price parameter for United States exports to Canada. At first glance this parameter could be interpreted as an elasticity. It is not, however, for when the United States lowers its price ten percent the world price as seen by Canada also falls. If, to take an extreme case, the world price, as seen by Canada, were completely determined by the American price, then any American price change would result in no movement in the ratio of the American prices to world price and, hence, to any change in the American share of Canadian imports. In the present case, the American change lowers the world price, as seen by Canada, only slightly so that the price parameter is fairly close to an elasticity. Therefore, since it is the interaction between the price parameters and the shares which determine the world price, the price elasticities associated with the price parameters cannot be discerned directly from Table IV-1.

To make the price parameters speak to us as clearly as possible, a simple calculation was performed. The first panel of Table IV-2 shows the trading structure for Dairy and eggs in 1972. Panels 2 - 11 assume the following: (a) all imports remain unchanged; (b) one, and only one, country reduces its price by ten percent and holds that price for five years. For panel 2 that country is Canada. The numbers in this second panel show the full price effect (effects of the time parameters are neglected). The world price as seen by each importer is

TABLE IV-1

PRICE PARAMETERS FOR DAIRY AND EGGS

| Exporter | Importer | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada | United States | Japan | Belgium-Luxembourg | France | Germany | Italy | Netherlands | United Kingdom | Others |
| Canada | 0.00 | .00 | -4.97 | .00 | .00 | .00 | .00 | .00 | -8.00 | .00 |
| United States | -.72 | .00 | -10.00 | -10.00 | .00 | -10.00 | -10.00 | -10.00 | -4.64 | -.04 |
| Japan | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | -4.27 |
| Belgium-Luxembourg | .00 | .00 | .00 | .00 | -5.46 | -2.08 | -4.11 | .00 | -10.00 | -10.00 |
| France | -.90 | -3.15 | .00 | -10.00 | .00 | -10.00 | -10.00 | .00 | -2.34 | -3.21 |
| Germany | .00 | .00 | .00 | -9.17 | -.01 | .00 | -3.99 | -10.00 | -5.09 | -6.70 |
| Italy | -.89 | -2.64 | .00 | -4.39 | -3.95 | .00 | .00 | -3.52 | -.21 | -1.05 |
| Netherlands | -.39 | -.42 | -3.01 | -2.41 | .00 | .00 | -1.34 | .00 | .00 | -1.89 |
| United Kingdom | .00 | -1.50 | -.21 | -4.40 | -1.18 | .00 | .00 | -2.25 | .00 | -1.56 |
| Others | -9.40 | -2.07 | -5.52 | .00 | .00 | .00 | .00 | .00 | .00 | -1.02 |

shown in the first line. For instance, the Canadian price reduction of ten percent causes the world price as seen by Japan to fall slightly to .997. As seen by Belgium, the world price falls not at all, for Canadian exports to Belgium are negligible. But for the United Kingdom, a major Canadian market, it falls to .957. The row for Canadian exports shows that they will rise $1.45 million to Japan and $7.19 million to the United Kingdom. (If the price parameters had been elasticities the resultant changes would have been $1.50 million and $15.3 million.) The United States, losing ground competitively, will see its exports drop $.20 million to Japan and $2.30 million to the United Kingdom. The sum of each column is zero, reflecting the fact that imports remain unchanged. Thus, we see that one effect of the Canadian price change is to reduce United States exports to the United Kingdom. Now what about the effect of a United States price change on Canadian exports to the United Kingdom? Panel 3, which displays the effects of a U.S. price reduction, shows this effect to be $2.3 millions. Thus, we see here that the cross-country effects can be very similar. They are not always so symmetrical, however. Take, for example, the two panels, 6 and 7, dealing with French and German price reductions. For the French reduction, shown in panel 6, the effect on German exports to Belgium is $11.9 million, however, for the German reduction, panel 7, the effect on French exports to Belgium is somewhat greater, $14.7 million.

The last panel in the table, labeled "Sector 2 Dairy and Eggs" is a summary of panels 2 to 11. The first column shows the 1972 exports of the price changing country. The second column shows

Table IV-2

Detailed Price Effects

Panel 1

FLOW MATRIX IN 72 FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| CANADA | .000 | 4.515 | 2.183 | .240 | .025 | .080 | .193 | .130 | 11.442 | 31.334 |
| U.S.A. | 11.342 | .000 | 7.334 | .682 | .180 | .517 | .934 | .573 | 12.367 | 109.446 |
| JAPAN | .000 | .013 | .000 | .000 | .000 | .058 | .000 | .004 | .003 | 13.317 |
| BELG-LUX | .016 | .436 | 1.277 | .000 | 20.302 | 57.330 | 10.049 | 22.022 | 8.848 | 76.661 |
| FRANCE | 2.698 | 11.589 | .784 | 43.257 | .000 | 120.398 | 160.553 | 16.761 | 14.355 | 149.654 |
| GERMANY | .775 | 2.451 | .163 | 26.783 | 11.138 | .000 | 149.510 | 76.956 | 1.635 | 57.982 |
| ITALY | 4.509 | 20.427 | .066 | 1.352 | 8.081 | 6.000 | .000 | .979 | 2.594 | 16.098 |
| NETHERLAND | 3.745 | 6.138 | 3.625 | 62.501 | 43.135 | 301.166 | 33.586 | .000 | 45.646 | 223.726 |
| U.K. | .712 | .858 | 2.896 | 1.973 | .478 | 1.132 | .698 | 3.825 | .000 | 43.056 |
| OTHERS | 13.543 | 73.015 | 78.478 | 18.914 | 20.272 | 45.891 | 59.180 | 5.628 | 524.261 | 82.111 |

Panel 2

CHANGE FLOW MATRIX FOR PRICE CHANGE IN CANADA FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | 1.000 | 1.000 | .997 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | .957 | 1.000 |
| CANADA | .000 | .000 | 1.450 | .000 | .000 | .000 | .000 | .000 | 7.196 | .000 |
| U.S.A. | .000 | .000 | -.204 | .000 | .000 | .000 | .000 | .000 | -2.300 | .000 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| BELG-LUX | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -3.171 | .000 |
| FRANCE | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.415 | .000 |
| GERMANY | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.331 | .000 |
| ITALY | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.023 | .000 |
| NETHERLAND | .000 | .000 | -.031 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| U.K. | .000 | .000 | -.002 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| OTHERS | .000 | .000 | -1.216 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |

Panel 3

CHANGE FLOW MATRIX FOR PRICE CHANGE IN U.S.A. FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | .994 | 1.000 | .978 | .999 | 1.000 | .999 | .999 | .999 | .973 | 1.000 |
| CANADA | .000 | .000 | -.228 | .000 | .000 | .000 | .000 | .000 | -2.226 | .000 |
| U.S.A. | .834 | .000 | 9.518 | 1.245 | .000 | .955 | 1.724 | 1.048 | 5.417 | .427 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.011 |
| BELG-LUX | .000 | .000 | .000 | .000 | .000 | -.086 | -.031 | .000 | -2.096 | -.143 |
| FRANCE | -.015 | .000 | .000 | -.639 | .000 | -.870 | -1.210 | .000 | -.879 | -.090 |
| GERMANY | .000 | .000 | .000 | -.363 | .000 | .000 | -.451 | -1.035 | -.210 | -.073 |
| ITALY | -.026 | .000 | .000 | -.009 | .000 | .000 | .000 | -.005 | -.014 | -.003 |
| NETHERLAND | -.009 | .000 | -.234 | -.224 | .000 | .000 | -.034 | .000 | .000 | -.079 |
| U.K. | .000 | .000 | -.014 | -.013 | .000 | .000 | .000 | -.012 | .000 | -.013 |
| OTHERS | -.784 | .000 | -9.044 | .000 | .000 | .000 | .000 | .000 | .000 | -.016 |

Table IV-2 (Cont'd)

Panel 4

CHANGE FLOW MATRIX FOR PRICE CHANGE IN JAPAN FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | .997 |
| CANADA | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| U.S.A. | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.013 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | 7.268 |
| BELG-LUX | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -2.485 |
| FRANCE | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.574 |
| GERMANY | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.265 |
| ITALY | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.056 |
| NETHERLAND | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.389 |
| U.K. | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.221 |
| OTHERS | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.276 |

Panel 5

CHANGE FLOW MATRIX FOR PRICE CHANGE IN BELG-LUX FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | 1.000 | 1.000 | 1.000 | 1.000 | .918 | .989 | .998 | 1.000 | .957 | .956 |
| CANADA | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -3.410 | .000 |
| U.S.A. | .000 | .000 | .000 | .000 | .000 | -.053 | -.022 | .000 | -2.294 | -.182 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -2.331 |
| BELG-LUX | .000 | .000 | .000 | .000 | 2.361 | 12.439 | 5.298 | .000 | 7.457 | 63.395 |
| FRANCE | .000 | .000 | .000 | .000 | .000 | -12.396 | -3.774 | .000 | -1.410 | -20.163 |
| GERMANY | .000 | .000 | .000 | .000 | -.007 | .000 | -1.413 | .000 | -.330 | -15.110 |
| ITALY | .000 | .000 | .000 | .000 | -2.312 | .000 | .000 | .000 | -.023 | -.746 |
| NETHERLAND | .000 | .000 | .000 | .000 | .000 | .000 | -.107 | .000 | .000 | -18.278 |
| U.K. | .000 | .000 | .000 | .000 | -.046 | .000 | .000 | .000 | .000 | -2.929 |
| OTHERS | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -3.702 |

Panel 6

CHANGE FLOW MATRIX FOR PRICE CHANGE IN FRANCE FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | .998 | .982 | 1.000 | .938 | 1.000 | .908 | .924 | 1.000 | .985 | .974 |
| CANADA | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.274 | .000 |
| U.S.A. | -.015 | .000 | .000 | -.323 | .000 | -.321 | -.512 | .000 | -.818 | -.105 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.400 |
| BELG-LUX | .000 | .000 | .000 | .000 | .000 | -10.448 | -2.803 | .000 | -1.214 | -17.574 |
| FRANCE | .263 | 3.675 | .000 | 22.024 | .000 | 10.741 | 47.337 | .000 | 3.387 | 43.381 |
| GERMANY | .000 | .000 | .000 | -11.916 | .000 | .000 | -40.658 | .000 | -.118 | -9.276 |
| ITALY | -.008 | -.946 | .000 | -.332 | .000 | .000 | .000 | .000 | -.008 | -.435 |
| NETHERLAND | -.003 | -.046 | .000 | -8.974 | .000 | .000 | -3.402 | .000 | .000 | -10.744 |
| U.K. | .000 | -.023 | .000 | -.485 | .000 | .000 | .000 | .000 | .000 | -1.716 |
| OTHERS | -.238 | -2.663 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -2.158 |

Table IV-2 (Cont'd)

Panel 7

CHANGE FLOW MATRIX FOR PRICE CHANGE IN GERMANY FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | 1.000 | 1.000 | 1.000 | .959 | 1.000 | 1.000 | .967 | .902 | .996 | .977 |
| CANADA | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.373 | .000 |
| U.S.A. | .000 | .000 | .000 | -.231 | .000 | .000 | -.269 | -.369 | -.235 | -.096 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.280 |
| BELG-LUX | .000 | .000 | .000 | .000 | -.008 | .000 | -1.310 | .000 | -.359 | -16.170 |
| FRANCE | .000 | .000 | .000 | -14.654 | .000 | .000 | -46.234 | .000 | -.138 | -10.955 |
| GERMANY | .000 | .000 | .000 | 21.374 | .008 | .000 | 49.292 | 1.457 | 1.102 | 42.193 |
| ITALY | .000 | .000 | .000 | -.225 | -.002 | .000 | .000 | -.299 | -.002 | -.396 |
| NETHERLAND | .000 | .000 | .000 | -5.940 | .000 | .000 | -1.498 | .000 | .000 | -9.796 |
| U.K. | .000 | .000 | .000 | -.328 | -.000 | .000 | .000 | -.795 | .000 | -1.564 |
| OTHERS | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.966 |

Panel 8

CHANGE FLOW MATRIX FOR PRICE CHANGE IN ITALY FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | .997 | .975 | 1.000 | .999 | .972 | 1.000 | 1.000 | .999 | 1.000 | .999 |
| CANADA | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.025 | .000 |
| U.S.A. | -.026 | .000 | .000 | -.006 | .000 | .000 | .000 | -.003 | -.016 | -.003 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.047 |
| BELG-LUX | .000 | .000 | .000 | .000 | -2.877 | .000 | .000 | .000 | -.024 | -.631 |
| FRANCE | -.008 | -.903 | .000 | -.404 | .000 | .000 | .000 | .000 | -.009 | -.396 |
| GERMANY | .000 | .000 | .000 | -.229 | -.002 | .000 | .000 | -.429 | -.002 | -.320 |
| ITALY | .431 | 4.783 | .000 | .787 | 2.893 | .000 | .000 | .437 | .056 | 1.871 |
| NETHERLAND | -.005 | -.066 | .000 | -.141 | .000 | .000 | .000 | .000 | .000 | -.349 |
| U.K. | .000 | -.033 | .000 | -.008 | -.016 | .000 | .000 | -.005 | .000 | -.056 |
| OTHERS | -.396 | -3.788 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.069 |

Panel 9

CHANGE FLOW MATRIX FOR PRICE CHANGE IN NETHERLAND FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | .999 | .999 | .997 | .978 | 1.000 | 1.000 | .998 | 1.000 | 1.000 | .978 |
| CANADA | .000 | .000 | -.028 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| U.S.A. | -.009 | .000 | -.185 | -.135 | .000 | .000 | -.021 | .000 | .000 | -.089 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.193 |
| BELG-LUX | .000 | .000 | .000 | .000 | .000 | .000 | -.092 | .000 | .000 | -15.134 |
| FRANCE | -.003 | -.041 | .000 | -8.569 | .000 | .000 | -3.560 | .000 | .000 | -10.197 |
| GERMANY | .000 | .000 | .000 | -4.908 | .000 | .000 | -1.332 | .000 | .000 | -7.938 |
| ITALY | -.004 | -.061 | .000 | -.125 | .000 | .000 | .000 | .000 | .000 | -.368 |
| NETHERLAND | .157 | .274 | 1.315 | 13.918 | .000 | .000 | 4.989 | .000 | .000 | 38.181 |
| U.K. | .000 | -.001 | -.002 | -.182 | .000 | .000 | .000 | .000 | .000 | -1.454 |
| OTHERS | -.141 | -.171 | -1.102 | .000 | .000 | .000 | .000 | .000 | .000 | -1.827 |

Table IV-2 (Cont'd)

Panel 10

CHANGE FLOW MATRIX FOR PRICE CHANGE IN U.K. FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | 1.000 | .999 | 1.000 | .999 | 1.000 | 1.000 | 1.000 | .999 | 1.000 | .997 |
| CANADA | .000 | .000 | -.001 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| U.S.A. | .000 | .000 | -.009 | -.009 | .000 | .000 | .000 | -.007 | .000 | -.014 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.191 |
| BELG-LUX | .000 | .000 | .000 | .000 | -.049 | .000 | .000 | .000 | .000 | -2.554 |
| FRANCE | .000 | -.023 | .000 | -.588 | .000 | .000 | .000 | .000 | .000 | -1.619 |
| GERMANY | .000 | .000 | .000 | -.334 | -.000 | .000 | .000 | -1.001 | .000 | -1.301 |
| ITALY | .000 | -.035 | .000 | -.008 | -.014 | .000 | .000 | -.005 | .000 | -.057 |
| NETHERLAND | .000 | -.002 | -.001 | -.206 | .000 | .000 | .000 | .000 | .000 | -1.428 |
| U.K. | .000 | .146 | .066 | 1.143 | .063 | .000 | .000 | 1.010 | .000 | 7.434 |
| OTHERS | .000 | -.097 | -.054 | .000 | .000 | .000 | .000 | .000 | .000 | -.284 |

Panel 11

CHANGE FLOW MATRIX FOR PRICE CHANGE IN OTHERS FOR DAIRY AND EGGS

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAND | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|
| WORLD PRICE | .910 | .934 | .912 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | .996 |
| CANADA | .000 | .000 | -.799 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| U.S.A. | -.743 | .000 | -4.404 | .000 | .000 | .000 | .000 | .000 | .000 | -.017 |
| JAPAN | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.232 |
| BELG-LUX | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -3.099 |
| FRANCE | -.219 | -2.238 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.968 |
| GERMANY | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -1.590 |
| ITALY | -.365 | -3.363 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | -.070 |
| NETHERLAND | -.137 | -.173 | -.875 | .000 | .000 | .000 | .000 | .000 | .000 | -1.738 |
| U.K. | .000 | -.083 | -.056 | .000 | .000 | .000 | .000 | .000 | .000 | -.277 |
| OTHERS | 1.462 | 5.856 | 6.131 | .000 | .000 | .000 | .000 | .000 | .000 | 8.960 |

SECTOR 2 DAIRY AND EGGS

Panel 12

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 50.142 | 17.2 | 8.647 | -2.505 | .000 | -3.171 | -1.415 | -.331 | -.023 | -.031 | -.002 | -1.216 |
| U.S.A. | 143.375 | 14.8 | -2.453 | 21.169 | -.011 | -2.357 | -3.704 | -2.132 | -.056 | -.581 | -.051 | -9.844 |
| JAPAN | 13.395 | 54.3 | .000 | -.013 | 7.268 | -2.485 | -1.574 | -1.265 | -.056 | -1.389 | -.221 | -.276 |
| BELG-LUX | 196.941 | 46.2 | -3.410 | -2.551 | -2.331 | 90.950 | -37.743 | -16.859 | -3.081 | -18.386 | -2.974 | -3.702 |
| FRANCE | 520.049 | 25.2 | -1.274 | -2.095 | -1.400 | -32.038 | 130.808 | -61.968 | -1.729 | -23.168 | -2.224 | -5.059 |
| GERMANY | 327.393 | 35.3 | -.373 | -1.200 | -1.280 | -17.646 | -71.982 | 115.427 | -.924 | -17.233 | -2.687 | -1.966 |
| ITALY | 60.106 | 18.7 | -.025 | -.054 | -.047 | -3.532 | -1.719 | -.983 | 11.259 | -.561 | -.117 | -4.253 |
| NETHERLAND | 723.268 | 8.1 | -.028 | -.439 | -1.193 | -15.226 | -22.370 | -14.178 | -.559 | 58.834 | -1.639 | -3.241 |
| U.K. | 55.628 | 17.7 | -.001 | -.040 | -.191 | -2.603 | -2.230 | -2.635 | -.119 | -1.638 | 9.863 | -.435 |
| OTHERS | 921.293 | 2.4 | -.799 | -5.163 | -.232 | -3.099 | -4.425 | -1.580 | -3.798 | -2.922 | -.416 | 22.409 |

percent gain in total exports that the price-changer reaps by the ten percent price change. The rest of the row for Canada, for example, is the sum of the rows for panel 2. Thus, the gain of $8.647 million is the sum of the $1.45 million to Japan and the $7.19 million to the United Kingdom. The United States' loss of $2.505 million is the sum of losses of -.204 in exports to Japan and of -2.300 in exports to the United Kingdom. The percent change column in this summary table provides elasticities. The Canadian gain of $8.647 million means a 17.2 percent gain from the ten percent price reduction. This, of course, translates itself into an export share elasticity of 1.72. We have thus derived another important fact which the price parameters embody.

In Table IV-2, we saw the derivation of the estimates of the price elasticities by exporter which are given in the last panel of that table. Table IV-3 shows similar summaries of the price parameters for the twelve selected sectors. To show the equivalent of Table IV-2 for each of the 119 sectors would require 476 pages of computer output and even just to give them for the twelve sectors would require 44 more pages. Such a listing would aid little in a general understanding of the results, so let us instead study Table IV-3, realizing, of course, that we are dealing with summaries of still more detailed data.

The first item we wish to examine from Table IV-3 is the relationship between size of exporter and the price elasticity. This can be done by examining the two columns "1972 exports" and "% change" for each of the twelve. The relationship is readily apparent. The larger the relative size of the exporter in world trade, the smaller the export share price elasticity. Of course, this "law" is only a tendency

Table IV-3

Summary Tables of Detailed Price Effects

SECTOR 2 DAIRY AND EGGS

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 50.142 | 17.2 | 8.647 | -2.505 | .000 | -3.171 | -1.415 | -.331 | -.023 | -.031 | -.002 | -1.216 |
| U.S.A. | 143.375 | 14.8 | -2.453 | 21.169 | -.011 | -2.357 | -3.704 | -2.132 | -.056 | -.581 | -.051 | -9.844 |
| JAPAN | 13.395 | 54.3 | .000 | -.013 | 7.268 | -2.485 | -1.574 | -1.265 | -.056 | -1.389 | -.221 | -.276 |
| BELG-LUX | 196.941 | 46.2 | -3.410 | -2.551 | -2.331 | 90.950 | -37.743 | -16.859 | -3.081 | -18.386 | -2.974 | -3.702 |
| FRANCE | 520.049 | 25.2 | -1.274 | -2.095 | -1.400 | -32.038 | 130.808 | -61.968 | -1.729 | -23.168 | -2.224 | -5.059 |
| GERMANY | 327.393 | 35.3 | -.373 | -1.200 | -1.280 | -17.846 | -71.982 | 115.427 | -.924 | -17.233 | -2.687 | -1.966 |
| ITALY | 60.106 | 18.7 | -.025 | -.054 | -.047 | -3.532 | -1.719 | -.983 | 11.259 | -.561 | -.117 | -4.253 |
| NETHERLAND | 723.268 | 8.1 | -.028 | -.439 | -1.193 | -15.226 | -22.370 | -14.178 | -.559 | 58.834 | -1.639 | -3.241 |
| U.K. | 55.628 | 17.7 | -.001 | -.040 | -.191 | -2.603 | -2.230 | -2.635 | -.119 | -1.638 | 9.863 | -.435 |
| OTHERS | 921.293 | 2.4 | -.799 | -5.163 | -.232 | -3.099 | -4.425 | -1.580 | -3.798 | -2.922 | -.416 | 22.409 |

SECTOR 7 PRESERVED FRUITS AND VEGETABLE

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 23.559 | 32.4 | 7.631 | -.000 | -.050 | -.007 | -.629 | -.063 | -.068 | -.631 | -.002 | -6.194 |
| U.S.A. | 246.383 | 3.3 | -.000 | 8.071 | -.017 | -.000 | -4.213 | -.000 | -.041 | -3.801 | -.000 | -.000 |
| JAPAN | 55.454 | 15.1 | -.045 | -.013 | 8.382 | -.064 | -.420 | -.324 | -.049 | -.369 | -.019 | -7.096 |
| BELG-LUX | 65.417 | 12.7 | -.007 | -.000 | -.068 | 8.280 | -.961 | -3.916 | -.308 | -.121 | -.157 | -2.762 |
| FRANCE | 158.907 | 70.3 | -.449 | -3.250 | -.542 | -1.198 | 111.735 | -3.197 | -3.257 | -31.458 | -.182 | -68.222 |
| GERMANY | 58.180 | 90.2 | -.096 | -.000 | -.408 | -3.445 | -2.189 | 52.496 | -1.172 | -.986 | -.482 | -43.749 |
| ITALY | 199.997 | 7.7 | -.042 | -.028 | -.048 | -.263 | -2.433 | -.956 | 15.465 | -2.459 | -.029 | -9.265 |
| NETHERLAND | 137.947 | 83.8 | -.446 | -3.014 | -.478 | -.151 | -31.286 | -1.061 | -3.337 | 115.662 | -.000 | -75.950 |
| U.K. | 32.886 | 14.6 | -.002 | -.000 | -.022 | -.185 | -.184 | -.596 | -.038 | -.000 | 4.803 | -3.783 |
| OTHERS | 1255.947 | 11.4 | -4.527 | -.000 | -6.369 | -1.883 | -48.009 | -19.592 | -9.438 | -51.424 | -2.364 | 143.506 |

SECTOR 15 RUBBER(INCL. SYNTH)--CRUDE

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 64.608 | 11.4 | 7.390 | -1.428 | -.030 | -.000 | -3.062 | -.845 | -.173 | -.213 | -1.322 | -.351 |
| U.S.A. | 174.999 | 7.6 | -1.087 | 15.348 | -.045 | -.030 | -4.497 | -1.142 | -.628 | -.580 | -2.667 | -2.675 |
| JAPAN | 88.538 | .5 | -.019 | -.046 | .403 | -.002 | -.066 | -.069 | -.004 | -.108 | -.086 | -.012 |
| BELG-LUX | 2.870 | 4.8 | .000 | -.031 | -.002 | .137 | .000 | -.019 | -.005 | -.027 | -.042 | -.014 |
| FRANCE | 109.381 | 14.2 | -2.718 | -4.280 | -.065 | -.000 | 15.519 | -1.638 | -.900 | -3.070 | -2.354 | -.534 |
| GERMANY | 75.220 | 13.6 | -.914 | -1.168 | -.069 | -.018 | -1.700 | 10.195 | -.153 | -4.341 | -1.329 | -.615 |
| ITALY | 26.010 | 11.3 | -.164 | -.665 | -.004 | -.005 | -.989 | -.147 | 2.940 | -.464 | -.433 | -.078 |
| NETHERLAND | 83.429 | 16.7 | -.122 | -.560 | -.108 | -.026 | -3.043 | -4.348 | -.479 | 13.935 | -2.766 | -2.495 |
| U.K. | 70.635 | 16.6 | -1.400 | -2.731 | -.087 | -.040 | -2.485 | -1.293 | -.430 | -2.771 | 11.715 | -.503 |
| OTHERS | 683.514 | 1.0 | -.284 | -2.376 | -.012 | -.013 | -.495 | -.587 | -.078 | -2.370 | -.485 | 6.671 |

SECTOR 17 PULP AND PAPER

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 833.419 | 2.1 | 17.739 | -2.091 | -.000 | -7.729 | -.989 | -.659 | -.000 | -5.023 | -1.317 | -.000 |
| U.S.A. | 392.220 | 1.7 | -2.464 | 6.554 | -.000 | .000 | -.576 | -1.232 | -.000 | -.066 | -.271 | -1.992 |
| JAPAN | 7.493 | -.0 | -.000 | .000 | -.000 | .000 | -.000 | -.000 | -.000 | .000 | .000 | -.000 |
| BELG-LUX | 31.982 | 60.6 | -16.852 | .000 | -.000 | 19.370 | -.202 | -.000 | -.000 | -2.195 | -.138 | -.000 |
| FRANCE | 33.598 | 7.5 | -1.285 | -.939 | -.000 | -.140 | 2.517 | -.053 | -.000 | -.094 | -.014 | -.000 |
| GERMANY | 26.591 | 11.0 | -.897 | -1.910 | -.000 | .000 | -.052 | 2.912 | -.000 | -.024 | -.038 | -.000 |
| ITALY | .567 | -.0 | -.000 | .000 | -.000 | .000 | -.000 | -.000 | -.000 | .000 | .000 | -.000 |
| NETHERLAND | 16.314 | 71.8 | -8.263 | -.103 | -.000 | -3.178 | -.107 | -.034 | -.000 | 11.712 | -.052 | -.000 |
| U.K. | 4.950 | 79.8 | -3.235 | -.518 | -.000 | -.127 | -.016 | -.042 | -.000 | -.050 | 3.953 | -.000 |
| OTHERS | 1092.231 | .2 | -.000 | -2.299 | -.000 | .000 | -.000 | -.000 | -.000 | .000 | .000 | 2.298 |

Table IV-3 (Cont'd)

SECTOR 28 PETROLEUM PRODUCTS

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 146.154 | 148.6 | 217.222 | -.000 | -1.032 | -.000 | -.367 | -.137 | -14.203 | -6.594 | -.416 | -194.523 |
| U.S.A. | 442.701 | 7.4 | -.000 | 32.799 | -.000 | -1.466 | -6.190 | -.000 | -18.814 | -1.941 | -1.426 | -2.989 |
| JAPAN | 48.207 | 25.3 | -1.006 | -.000 | 12.217 | -.000 | -.020 | -.008 | -.743 | .000 | -.000 | -10.462 |
| BELG-LUX | 429.407 | 1.4 | -.000 | -1.053 | -.000 | 5.928 | -.000 | -.000 | -3.623 | .000 | -.165 | -1.088 |
| FRANCE | 423.581 | 3.0 | -.273 | -6.388 | -.015 | -.000 | 12.598 | -.104 | -.228 | -2.344 | -.354 | -2.904 |
| GERMANY | 399.343 | 4.0 | -.157 | -.000 | -.009 | -.000 | -.132 | 15.964 | -.444 | -10.498 | -.212 | -4.530 |
| ITALY | 789.562 | 38.1 | -14.421 | -11.523 | -.786 | -3.705 | -.304 | -.368 | 300.449 | -40.667 | -6.914 | -221.995 |
| NETHERLAND | 1186.797 | 26.9 | -3.747 | -3.174 | -.000 | -.000 | -3.011 | -7.236 | -38.894 | 318.878 | -31.720 | -231.391 |
| U.K. | 488.716 | 17.2 | -.273 | -1.138 | -.000 | -.164 | -.315 | -.178 | -9.153 | -51.790 | 84.262 | -21.412 |
| OTHERS | 3295.110 | 15.4 | -87.474 | -2.171 | -5.185 | -.735 | -2.221 | -2.170 | -145.469 | -228.143 | -20.900 | 494.103 |

SECTOR 38 RUBBER MANUFACTURES

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 39.057 | 24.5 | 9.588 | -.000 | -.134 | -.740 | -1.573 | -1.114 | -2.399 | -.118 | -.000 | -3.523 |
| U.S.A. | 230.728 | 8.2 | -.000 | 18.916 | -.050 | -1.243 | -.000 | -7.883 | -.925 | -.373 | -6.907 | -1.546 |
| JAPAN | 304.843 | 4.8 | -.125 | -.037 | 14.506 | -1.280 | -.979 | -.273 | -.016 | -.708 | -.054 | -11.130 |
| BELG-LUX | 112.573 | 28.2 | -1.066 | -.916 | -1.393 | 31.726 | -3.398 | -5.612 | -3.129 | -1.821 | -1.749 | -12.729 |
| FRANCE | 421.781 | 5.4 | -1.503 | -.000 | -.860 | -2.750 | 22.866 | -1.629 | -3.572 | -3.592 | -.000 | -8.994 |
| GERMANY | 389.987 | 9.4 | -1.075 | -5.386 | -.259 | -5.018 | -1.641 | 36.734 | -7.172 | -.138 | -9.309 | -6.770 |
| ITALY | 241.246 | 10.5 | -2.371 | -.617 | -.016 | -2.251 | -3.725 | -7.397 | 25.352 | -.274 | -1.572 | -7.133 |
| NETHERLAND | 104.551 | 9.4 | -.115 | -.880 | -.608 | -1.800 | -3.802 | -.146 | -.269 | 9.781 | -.123 | -2.047 |
| U.K. | 241.000 | 11.1 | -.000 | -7.860 | -.057 | -2.113 | -.000 | -13.562 | -2.042 | -.084 | 26.758 | -1.070 |
| OTHERS | 370.348 | 13.7 | -3.313 | -1.548 | -10.817 | -9.517 | -9.005 | -6.799 | -6.919 | -1.957 | -.857 | 50.645 |

SECTOR 56 WIRE AND TUBES

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 48.759 | 14.7 | 7.165 | -.407 | -3.245 | -.069 | -.143 | -2.558 | -.405 | -.211 | -.008 | -.128 |
| U.S.A. | 263.837 | 32.6 | -.307 | 85.969 | -47.625 | -1.290 | -4.975 | -7.843 | -2.198 | -3.179 | -16.724 | -1.849 |
| JAPAN | 816.048 | 23.4 | -2.574 | -41.075 | 190.859 | -3.116 | -22.610 | -38.405 | -4.728 | -5.414 | -65.889 | -7.184 |
| BELG-LUX | 210.398 | 10.2 | -.062 | -1.166 | -3.660 | 21.460 | -.662 | -10.934 | -1.584 | -1.326 | -.500 | -1.606 |
| FRANCE | 307.048 | 17.3 | -.133 | -5.007 | -23.898 | -.640 | 53.117 | -14.047 | -.014 | -.505 | -7.917 | -1.084 |
| GERMANY | 904.859 | 9.8 | -2.634 | -5.928 | -34.084 | -9.464 | -11.885 | 89.113 | -8.286 | -6.035 | -6.821 | -4.112 |
| ITALY | 229.148 | 13.4 | -.383 | -1.574 | -4.465 | -1.701 | -.016 | -10.150 | 30.739 | -7.293 | -.621 | -4.558 |
| NETHERLAND | 112.730 | 29.0 | -.119 | -2.061 | -4.150 | -1.660 | -.398 | -9.156 | -7.198 | 32.711 | -.479 | -7.532 |
| U.K. | 222.821 | 56.3 | -.006 | -18.422 | -87.628 | -.472 | -9.275 | -8.384 | -.595 | -.527 | 125.531 | -.390 |
| OTHERS | 390.006 | 6.6 | -.072 | -1.149 | -5.443 | -1.645 | -1.035 | -4.433 | -4.218 | -7.276 | -.353 | 25.585 |

SECTOR 74 TEXTILE AND LEATHER MACHINERY

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 31.892 | 4.8 | 1.543 | -.063 | -.252 | -.000 | -.053 | -.529 | -.201 | -.276 | -.000 | -.241 |
| U.S.A. | 272.503 | 13.6 | -.057 | 37.115 | -12.295 | -.065 | -1.095 | -2.395 | -1.350 | -5.488 | -5.478 | -8.917 |
| JAPAN | 425.730 | 14.0 | -.219 | -12.778 | 59.462 | -.790 | -2.833 | -7.586 | -5.218 | -12.798 | -3.080 | -14.284 |
| BELG-LUX | 79.413 | 4.6 | -.000 | -.069 | -.611 | 3.615 | -.000 | -1.482 | -.184 | -.181 | -.122 | -.969 |
| FRANCE | 203.077 | 5.5 | -.043 | -1.047 | -2.681 | -.000 | 11.213 | -.584 | -2.579 | -2.619 | -.045 | -1.639 |
| GERMANY | 1296.154 | 2.2 | -.302 | -2.014 | -4.981 | -1.387 | -.616 | 28.655 | -2.092 | -2.509 | -.000 | -14.780 |
| ITALY | 306.118 | 6.0 | -.154 | -1.318 | -4.947 | -.172 | -2.497 | -2.277 | 18.456 | -4.874 | -.058 | -2.209 |
| NETHERLAND | 67.167 | 69.8 | -.252 | -7.214 | -16.672 | -.226 | -3.232 | -3.229 | -6.312 | 46.910 | -.689 | -9.190 |
| U.K. | 423.785 | 2.7 | -.000 | -6.020 | -2.836 | -.110 | -.049 | -.000 | -.059 | -.385 | 11.275 | -1.829 |
| OTHERS | 463.685 | 10.6 | -.204 | -8.160 | -11.530 | -.945 | -1.719 | -15.702 | -2.272 | -6.777 | -1.933 | 49.194 |

Table IV-3 (Cont'd)

SECTOR 78 CONSTRUCTION MACHINES

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 44.750 | 29.5 | 13.200 | -.000 | -5.276 | -.369 | -4.679 | -.000 | -.000 | -.141 | -2.523 | -.222 |
| U.S.A. | 858.680 | 6.5 | -.000 | 56.014 | -17.069 | -17.630 | -15.262 | -.351 | -1.173 | -.162 | -.904 | -3.496 |
| JAPAN | 129.871 | 58.6 | -7.954 | -22.432 | 76.112 | -26.372 | -11.170 | -1.809 | -.290 | -.456 | -1.268 | -4.393 |
| BELG-LUX | 106.712 | 70.1 | -.745 | -21.957 | -28.910 | 74.839 | -10.190 | -4.312 | -2.867 | -.351 | -.228 | -5.344 |
| FRANCE | 249.174 | 19.5 | -5.657 | -19.502 | -9.303 | -7.994 | 48.468 | -1.428 | -.533 | -.108 | -1.654 | -2.365 |
| GERMANY | 341.735 | 2.3 | -.000 | -.339 | -1.244 | -3.708 | -1.456 | 7.768 | -.167 | -.003 | -.726 | -.129 |
| ITALY | 127.853 | 5.1 | -.000 | -1.398 | -.260 | -3.462 | -.658 | -.216 | 6.471 | -.000 | -.050 | -.432 |
| NETHERLAND | 22.455 | 6.4 | -.288 | -.165 | -.460 | -.306 | -.134 | -.004 | -.000 | 1.446 | -.045 | -.046 |
| U.K. | 261.969 | 3.5 | -3.916 | -1.125 | -1.346 | -.175 | -1.810 | -.760 | -.034 | -.036 | 9.235 | -.044 |
| OTHERS | 123.943 | 11.9 | -.193 | -3.339 | -3.961 | -4.598 | -2.185 | -.138 | -.355 | -.045 | -.030 | 14.807 |

SECTOR 81 PUMPS

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 20.878 | 15.0 | 3.138 | -1.376 | -.363 | -.000 | -.173 | -.368 | -.000 | -.056 | -.168 | -.636 |
| U.S.A. | 676.841 | 22.8 | -1.106 | 154.643 | -25.076 | -1.015 | -21.118 | -45.003 | -2.522 | -7.389 | -13.060 | -38.512 |
| JAPAN | 162.849 | 40.2 | -.330 | -28.974 | 65.462 | -.133 | -4.423 | -10.843 | -2.467 | -2.133 | -4.339 | -11.838 |
| BELG-LUX | 75.524 | 8.0 | -.000 | -1.938 | -.112 | 6.007 | -.078 | -2.088 | -.620 | -.000 | -.590 | -.596 |
| FRANCE | 233.645 | 21.4 | -.147 | -22.906 | -3.846 | -.077 | 49.917 | -9.723 | -.218 | -1.950 | -5.408 | -5.707 |
| GERMANY | 688.086 | 15.6 | -.308 | -41.929 | -9.167 | -2.644 | -9.093 | 107.162 | -12.920 | -5.387 | -10.626 | -15.861 |
| ITALY | 223.305 | 13.6 | -.000 | -3.409 | -2.424 | -.690 | -.284 | -15.055 | 30.319 | -3.604 | -3.573 | -1.305 |
| NETHERLAND | 104.642 | 27.5 | -.049 | -8.670 | -2.223 | -.000 | -1.977 | -6.608 | -5.422 | 28.795 | -1.837 | -2.030 |
| U.K. | 289.205 | 16.2 | -.140 | -12.601 | -3.775 | -.636 | -5.869 | -11.701 | -3.523 | -1.566 | 46.827 | -7.065 |
| OTHERS | 358.260 | 26.4 | -.598 | -45.909 | -12.317 | -.593 | -6.402 | -17.884 | -1.185 | -2.162 | -7.690 | 94.697 |

SECTOR 95 PERSONAL AUTOS

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 2192.129 | 43.2 | 947.948 | -.691 | -434.528 | -.000 | -15.444 | -369.665 | -.212 | -.000 | -63.871 | -63.661 |
| U.S.A. | 1323.396 | 38.6 | -1.025 | 510.564 | -229.350 | -.753 | -10.210 | -119.499 | -31.937 | -.000 | -80.955 | -36.943 |
| JAPAN | 2235.765 | 89.3 | -511.961 | -281.993 | 1996.759 | -25.870 | -28.320 | -681.920 | -96.756 | -.081 | -211.175 | -159.199 |
| BELG-LUX | 1257.558 | 10.6 | -.000 | -.665 | -24.705 | 132.697 | -.109 | -52.585 | -20.686 | -2.419 | -21.204 | -10.407 |
| FRANCE | 1994.373 | 8.4 | -26.870 | -19.963 | -36.095 | -.104 | 168.396 | -69.455 | -.321 | -.000 | -11.097 | -4.819 |
| GERMANY | 4150.724 | 39.6 | -396.202 | -137.163 | -598.336 | -49.674 | -55.643 | 1641.812 | -79.475 | -.348 | -178.866 | -146.638 |
| ITALY | 980.403 | 30.2 | -.229 | -27.318 | -82.944 | -22.174 | -.333 | -93.610 | 296.082 | -.000 | -26.946 | -43.087 |
| NETHERLAND | 113.626 | 5.0 | -.000 | -.000 | -.063 | -3.549 | -.000 | -.472 | -.000 | 5.669 | -1.467 | -.159 |
| U.K. | 830.189 | 102.6 | -104.543 | -97.549 | -250.530 | -30.713 | -11.998 | -240.170 | -42.374 | -1.374 | 852.050 | -73.073 |
| OTHERS | 633.520 | 115.8 | -104.482 | -36.166 | -212.890 | -14.501 | -4.935 | -212.504 | -65.928 | -.199 | -82.585 | 733.905 |

SECTOR 106 CLOTHING

| PRICE CHANGER | 1972 EXPORTS(US$) | %CHANGE | TRADE EFFECTS (FLOWS) CANADA | U.S.A. | JAPAN | BELG-L | FRANCE | GERMAN | ITALY | NETHER | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CANADA | 96.934 | 23.0 | 22.297 | -.000 | -.477 | -.313 | -.886 | -.343 | -3.973 | -.462 | -.224 | -15.684 |
| U.S.A. | 240.488 | -.0 | -.000 | -.000 | -.000 | -.000 | -.000 | -.000 | -.000 | -.000 | -.000 | -.000 |
| JAPAN | 429.299 | 57.1 | -.502 | -.000 | 245.208 | -1.272 | -2.464 | -2.027 | -29.606 | -2.388 | -3.390 | -203.746 |
| BELG-LUX | 445.239 | 14.7 | -.217 | -.000 | -.982 | 65.448 | -2.260 | -2.635 | -18.963 | -1.894 | -.253 | -38.325 |
| FRANCE | 791.484 | 17.0 | -.596 | -.000 | -1.707 | -2.283 | 134.550 | -7.172 | -26.244 | -23.050 | -.602 | -73.025 |
| GERMANY | 656.445 | 18.3 | -.283 | -.000 | -2.893 | -3.032 | -8.884 | 120.182 | -37.409 | -2.860 | -.000 | -64.999 |
| ITALY | 1222.113 | 60.9 | -2.947 | -.000 | -33.102 | -19.997 | -28.537 | -30.058 | 744.219 | -23.564 | -10.827 | -595.518 |
| NETHERLAND | 306.934 | 38.1 | -.342 | -.000 | -2.131 | -2.656 | -23.793 | -3.144 | -25.265 | 117.051 | -.759 | -59.765 |
| U.K. | 360.851 | 12.8 | -.212 | -.000 | -2.752 | -.253 | -.582 | -.000 | -7.921 | -.704 | 46.281 | -33.866 |
| OTHERS | 3845.982 | 20.4 | -8.297 | -.000 | -142.420 | -36.763 | -78.508 | -41.361 | -397.612 | -49.883 | -31.850 | 786.246 |

but it is rather logical. Suppose, for example, that the United States accounted for 90% of the world exports of a product. For the United States to gain another 9 percentage points from the ten percent price cut, as an elasticity of 1.0 would require, the price change would have to result in near extinction of all other exporters of the product. On the other hand, if the United States accounted for only one percent of world trade, a doubling of that percentage would hardly affect any other exporters. Note, of course, that imports of each country are assumed to remain unchanged. The chief effect, of course, of the large exporter's price change is to affect the volume of imports. Therefore, these share elasticities are comparable to the usual price elasticities only for the case of the small exporter.

To continue our discussion of price elasticities--we will discuss the other parts of Table IV-3 later--we need to turn to Table IV-4. This table lists all the share price elasticities by country and commodity. Near the bottom of the table are shown the averages of the share elasticities weighted by 1972 exports. Two points need to be said about these averages. The region "Others" had the lowest elasticity, 1.14, just above the 1.00 needed to make devaluation increase exports. Next lowest is the United States with 1.44, then follows France with 1.60, Germany at 2.01, Canada with 2.04, the United Kingdom's 2.14, Belgium's 2.46, Italy at 2.90 up to Japan with 3.62. These results show the fact that "Others" and the United States are relatively large exporters in world trade ("Others" has just slightly less than one-third of world trade in 1972 and the United States about one-seventh) and both are not in sharp competition with the European

Table IV-4

SUMMARY OF EXPORT PRICE ELASTICITIES

| | SECTOR | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAN | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MEAT AND LIVE ANIMA | 1.01 | 1.83 | 2.49 | 3.24 | 3.16 | 3.66 | 1.03 | 1.72 | 3.37 | .54 |
| 2 | DAIRY AND EGGS | 1.72 | 1.48 | 5.43 | 4.62 | 2.52 | 3.53 | 1.87 | .81 | 1.77 | .24 |
| 3 | FISH | 2.75 | 2.23 | 1.45 | 3.17 | 2.87 | 2.03 | 2.14 | 2.05 | 4.44 | .71 |
| 4 | GRAINS UNMILLED | 1.56 | .45 | 1.39 | 1.43 | .97 | 11.16 | 10.22 | 2.77 | 5.41 | .66 |
| 5 | GRAINS MILLED | .95 | .08 | -.00 | .08 | 2.92 | 1.16 | 4.34 | 2.33 | 1.91 | 2.14 |
| 6 | FRESH FRUITS AND VE | .07 | 1.71 | 1.49 | 2.79 | 5.18 | 6.16 | 1.62 | 1.96 | 6.24 | .53 |
| 7 | PRESERVED FRUITS AN | 3.24 | .33 | 1.51 | 1.27 | 7.03 | 9.02 | .77 | 8.38 | 1.46 | 1.14 |
| 8 | SUGAR | .10 | 2.57 | .35 | 1.30 | .70 | 8.99 | 7.59 | 6.35 | .27 | .48 |
| 9 | COFFEE,TEA,COCOA,ET | 1.29 | 1.29 | 1.88 | .11 | 1.31 | .11 | 1.89 | 1.48 | 1.04 | .10 |
| 10 | FEED STUFFS | 2.53 | 1.71 | 1.12 | .81 | 3.77 | 7.93 | 7.57 | -.00 | 4.84 | 1.63 |
| 11 | FATS AND OILS | 1.92 | .29 | 1.91 | 4.06 | .31 | .84 | 9.31 | .88 | .95 | .21 |
| 12 | BEVERAGES | .01 | 4.06 | -.00 | 5.05 | .13 | 4.76 | .29 | 3.14 | .40 | 1.21 |
| 13 | TOBACCO AND TOBACCO | 1.57 | 1.05 | 2.44 | 2.28 | 2.13 | 6.49 | 3.78 | .16 | .54 | 1.06 |
| 14 | HIDES,LEATHER,FURS | 2.37 | 1.04 | -.00 | 1.42 | 1.84 | 1.52 | 3.33 | 2.31 | .67 | .30 |
| 15 | RUBBER(INCL. SYNTH) | 1.14 | .76 | .05 | .48 | 1.42 | 1.36 | 1.13 | 1.67 | 1.66 | .10 |
| 16 | CRUDE WOOD | 1.24 | 1.11 | 7.06 | 1.45 | 2.44 | 2.50 | 16.63 | 3.60 | 10.71 | .26 |
| 17 | PULP AND PAPER | .21 | .17 | -.00 | 6.06 | .75 | 1.10 | -.00 | 7.18 | 7.98 | .02 |
| 18 | SILK, OTH. NON MANM | -.00 | 1.35 | 2.79 | .82 | 2.52 | 3.31 | 2.40 | 5.58 | 1.03 | .91 |
| 19 | WOOL | 2.70 | 3.47 | 3.32 | 2.30 | .59 | 5.08 | 2.79 | .26 | 1.95 | .18 |
| 20 | COTTON | -.00 | .02 | 3.97 | 1.36 | 5.52 | .64 | 2.58 | -.00 | 1.53 | .03 |
| 21 | CRUDE FERTILIZERS | .00 | .79 | -.00 | -.00 | 6.53 | 9.68 | -.00 | .04 | -.00 | .25 |
| 22 | MARBLE,SAND, AND OT | 2.04 | 1.93 | 13.05 | 1.32 | 3.06 | .87 | 1.68 | 5.72 | 2.43 | 1.69 |
| 23 | IRON ORE AND SCRAP | 3.97 | 6.70 | 8.34 | .21 | 7.33 | 2.17 | 6.70 | 4.02 | 3.47 | .96 |
| 24 | NONFERROUS ORES AND | .97 | .91 | -.00 | 1.46 | .18 | 1.47 | 2.90 | 1.66 | 2.01 | .37 |
| 25 | VEGETABLE MATERIALS | 1.13 | 1.53 | 4.39 | 1.31 | .43 | .94 | .20 | .14 | 1.24 | .29 |
| 26 | COAL, COKE | 6.00 | 1.05 | 16.61 | 4.86 | .51 | .57 | -.00 | 6.27 | 11.55 | 1.00 |
| 27 | CRUDE PERTOLEUM | -.00 | 2.31 | 18.05 | -.00 | -.00 | .00 | -.00 | .13 | 13.81 | .02 |
| 28 | PETROLEUM PRODUCTS | 14.86 | .74 | 2.53 | .14 | .30 | .40 | 3.79 | 2.69 | 1.72 | 1.54 |
| 29 | GAS, NATURAL AND SY | .26 | .48 | 14.02 | 5.79 | 4.66 | 4.78 | 7.51 | .31 | 6.92 | .81 |
| 30 | ELECTRICAL ENERGY | -.00 | .00 | .00 | -.00 | 3.27 | .00 | .00 | 3.90 | -.00 | 1.86 |
| 31 | CHEMICAL ELEMENTS | 6.14 | 1.90 | 1.94 | -.00 | .79 | 1.25 | 6.85 | .90 | .46 | .76 |
| 32 | DYEING,TANNING, AND | 1.21 | 7.64 | .13 | 1.74 | .10 | 2.30 | 4.36 | 1.85 | 1.16 | 4.52 |
| 33 | MEDICINAL CHEMICALS | 2.63 | .77 | .82 | 6.82 | .19 | 4.17 | 3.41 | 6.87 | .28 | 4.04 |
| 34 | PERFUME MAT. AND OT | 2.85 | .47 | 7.26 | 7.23 | 1.83 | 1.72 | 4.82 | 2.37 | .87 | 2.45 |
| 35 | MANUFACTURED FERTIL | .00 | 2.09 | 10.83 | 3.51 | 1.49 | 6.07 | 10.73 | 5.21 | 4.62 | 1.68 |
| 36 | EXPOLSIVES | 5.27 | 3.81 | 12.48 | 9.85 | 3.22 | 3.44 | 1.70 | .98 | -.00 | 5.14 |
| 37 | PLASTIC MATERIALS | 1.51 | .01 | .49 | .13 | 2.64 | 1.46 | .33 | 3.11 | .06 | 1.64 |
| 38 | RUBBER MANUFACTURES | 2.45 | .82 | .48 | 2.82 | .54 | .94 | 1.05 | .94 | 1.11 | 1.37 |
| 39 | VENEERS, PLAYWOOD | 2.11 | 2.35 | 4.00 | .16 | 2.36 | -.00 | 4.04 | 1.60 | .87 | 1.21 |
| 40 | NEWSPRINT | .44 | 4.81 | -.00 | 8.75 | 2.89 | 4.12 | 4.73 | 5.54 | -.00 | 1.27 |
| 41 | KRAFTPAPER | 4.45 | 2.83 | -.00 | 5.29 | 5.50 | 3.47 | 16.56 | 8.04 | 3.58 | 1.92 |
| 42 | FIBREBOARD | 5.39 | 1.28 | 8.76 | 5.79 | .20 | 1.94 | 3.87 | 2.25 | 4.31 | .70 |
| 43 | OTHER PAPER AND PAP | .81 | .05 | .88 | 7.09 | .53 | 4.20 | 9.71 | .49 | .20 | 3.03 |
| 44 | ART. OF PAPER AND P | 6.48 | .02 | .97 | 5.32 | 1.55 | 1.89 | 4.56 | 3.08 | .91 | 3.83 |
| 45 | YARNS AND THREADS | 5.22 | 1.50 | 3.63 | 2.32 | 1.75 | 2.62 | 3.05 | 2.85 | 8.98 | 2.86 |
| 46 | COTTON FABRICS | 9.27 | 2.44 | 6.21 | 6.22 | 1.72 | 2.50 | 1.13 | 5.21 | 5.80 | 2.74 |
| 47 | OTH TEXT FAB EXC FL | 6.09 | 1.06 | .63 | 2.52 | 1.80 | 2.44 | 2.00 | 2.15 | -.00 | 1.94 |
| 48 | FLOOR COVERINGS | 8.12 | 1.22 | 7.18 | 2.27 | 3.00 | 2.93 | 6.19 | 1.89 | 2.70 | 2.10 |
| 49 | STONE AND BRICKS | 1.51 | -.00 | 1.81 | 2.12 | .43 | 1.39 | 3.05 | 5.44 | -.00 | 2.95 |
| 50 | GLASS | .93 | .70 | 4.86 | 2.16 | 2.28 | 2.21 | 3.10 | 2.87 | .91 | 2.83 |
| 51 | POTTERY, PERALS, PR | 1.72 | 1.72 | 2.00 | .87 | 1.02 | 5.08 | 1.48 | 12.53 | 1.05 | .30 |
| 52 | PIG IRON | 3.26 | 7.58 | 5.49 | 3.29 | 2.16 | .11 | 4.99 | 5.07 | 1.66 | .49 |
| 53 | IRON AND STEEL INGO | 4.13 | 8.76 | 3.17 | 2.10 | 1.84 | 3.07 | 9.79 | 9.58 | 3.59 | .52 |
| 54 | UNIVERALS AND PLATE | .35 | 12.52 | 3.24 | 1.71 | 2.42 | 6.28 | 4.53 | 4.02 | 12.53 | .34 |
| 55 | HOOPS AND RAIL TRAC | 10.39 | .84 | 2.63 | 1.07 | .29 | 1.07 | 3.30 | .64 | 4.40 | .74 |
| 56 | WIRE AND TUBES | 1.47 | 3.26 | 2.34 | 1.02 | 1.73 | .98 | 1.34 | 2.90 | 5.63 | .66 |
| 57 | IRON AND STEEL CAST | 1.39 | 1.45 | 10.48 | 1.40 | 7.96 | 1.94 | 2.96 | 6.87 | .75 | 2.29 |
| 58 | COPPER | 1.80 | 3.24 | 7.48 | 2.54 | 7.37 | 2.08 | 3.15 | 4.50 | .91 | .94 |
| 59 | ALUMINUM | 1.81 | 2.48 | 2.32 | 1.08 | 1.84 | 1.36 | 1.07 | 6.12 | 1.94 | 1.32 |
| 60 | LEAD AND ZINC | 1.42 | 1.51 | 6.19 | 1.20 | 5.80 | 4.79 | 2.50 | 3.30 | 2.84 | .29 |

Table IV-4 (Cont'd)

SUMMARY OF EXPORT PRICE ELASTICITIES

| | SECTOR | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLAN | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | OTHER NONFERROUS | 1.44 | 2.72 | 9.05 | 2.57 | 1.93 | 1.72 | 3.36 | .84 | .16 | .56 |
| 62 | FINISHED STRUCTURAL | 8.05 | .30 | 4.75 | 3.08 | 1.78 | 1.22 | 2.07 | 1.24 | .60 | 6.08 |
| 63 | METAL CONTAINERS | 1.63 | 8.11 | 6.92 | 6.66 | .82 | 4.34 | .53 | 4.05 | .95 | 6.53 |
| 64 | WIRE PRODUCTS | 1.45 | 6.52 | 2.63 | 1.01 | 1.00 | 2.48 | 6.50 | 6.79 | -.00 | 6.19 |
| 65 | HARDWARE | .68 | 2.72 | 2.62 | 2.23 | .63 | -.00 | 2.55 | 1.19 | 3.18 | .13 |
| 66 | BOILERS AND TURBINE | 11.49 | .75 | 4.32 | 8.19 | .57 | 2.37 | .88 | .55 | 1.46 | 1.23 |
| 67 | AIRCRAFT ENGINES | 2.23 | .91 | -.00 | 6.35 | 3.13 | 3.58 | 1.60 | 4.33 | .45 | 3.25 |
| 68 | INTERNAL COMBUSTION | .22 | 1.92 | 7.27 | 6.90 | .37 | 1.26 | .51 | .41 | 2.84 | 2.01 |
| 69 | OTHER POWER MACHINE | 5.04 | .56 | 5.87 | 2.89 | 3.76 | 1.95 | .74 | .43 | 1.49 | 1.09 |
| 70 | AGRICULTURAL MACHIN | .59 | 2.54 | 12.93 | 7.76 | .14 | 1.29 | .03 | 12.11 | .26 | 9.09 |
| 71 | OFFICE MACHINES | -.00 | 1.73 | 6.61 | 13.17 | 2.44 | .27 | 12.14 | .97 | 1.42 | 2.20 |
| 72 | COMPUTER AND RELATE | .68 | .71 | 7.13 | 2.29 | .38 | 1.59 | 7.00 | 7.72 | .06 | 5.45 |
| 73 | METAL WORKING MACHI | 5.90 | 3.49 | 6.58 | 2.51 | .71 | .61 | 1.73 | 2.22 | .35 | 2.81 |
| 74 | TEXTILE AND LEATHER | .48 | 1.36 | 1.40 | .46 | .55 | .22 | .60 | 6.98 | .27 | 1.06 |
| 75 | PAPER MILL MACHINES | -.00 | .04 | .48 | .75 | .50 | .58 | 3.37 | 4.35 | 2.02 | 2.02 |
| 76 | PRINTING MACHINES | 3.85 | .83 | 6.62 | 8.25 | 2.30 | .97 | 3.65 | 8.44 | 1.17 | 1.09 |
| 77 | FOOD PROCESSING MAC | -.00 | 1.39 | 6.90 | 2.29 | .47 | 1.19 | 1.99 | 1.59 | .11 | 3.20 |
| 78 | CONSTRUCTION MACHI | 2.95 | .65 | 5.86 | 7.01 | 1.95 | .23 | .51 | .64 | .35 | 1.19 |
| 79 | MINERAL CRUSHING MA | 5.14 | 1.97 | 5.32 | 7.38 | .58 | .43 | .34 | 3.50 | .62 | 3.62 |
| 80 | HEATING AND COOLING | 1.71 | 1.59 | 4.63 | 1.78 | 1.99 | 1.17 | .16 | 1.42 | .99 | 1.39 |
| 81 | PUMPS | 1.50 | 2.28 | 4.02 | .80 | 2.14 | 1.56 | 1.36 | 2.75 | 1.62 | 2.64 |
| 82 | MECHANICAL HANDLING | 5.40 | 2.99 | 8.73 | 5.07 | 5.89 | 1.67 | .27 | 1.46 | .46 | 2.00 |
| 83 | ALL OTHER NON-ELECT | 1.46 | 2.41 | 4.51 | 3.53 | .05 | 1.14 | .75 | .96 | .09 | 4.77 |
| 84 | ELECTRIC POWER MACH | 6.27 | 2.23 | 3.98 | .64 | .34 | 1.26 | 3.01 | 1.49 | .31 | 3.56 |
| 85 | EQUIP OFR DISTRIBUT | 4.77 | .67 | 2.82 | 1.34 | .43 | .08 | 1.86 | 4.52 | 3.85 | 1.43 |
| 86 | TELEVISION SETS AND | 2.68 | -.00 | 3.31 | 1.10 | 1.21 | 1.57 | .99 | 3.20 | .99 | 6.50 |
| 87 | APPLIANCES, DOMESTI | 6.91 | 1.28 | 3.30 | 9.12 | 1.97 | .37 | .97 | 2.70 | 1.92 | 3.46 |
| 88 | MEDICAL ELECTRICAL | 4.79 | 2.75 | 5.67 | 4.91 | 1.15 | 1.83 | 4.13 | -.00 | 2.01 | 2.59 |
| 89 | BATTERIES | .60 | .89 | .57 | 2.21 | 1.22 | 1.81 | 4.59 | 5.18 | 4.79 | 2.79 |
| 90 | LAMPS | 9.72 | 7.04 | 1.63 | 1.33 | 3.11 | 2.22 | 1.44 | 2.51 | 2.31 | 5.44 |
| 91 | TRANSISTORS | .35 | 1.45 | 6.39 | 1.12 | 3.38 | .72 | 2.47 | 4.12 | 3.97 | 1.24 |
| 92 | ELECTRICAL MEASURIN | 1.95 | 2.86 | 4.52 | 8.32 | 4.56 | 1.34 | 3.63 | 2.27 | 1.93 | 5.12 |
| 93 | OTHER ELECTRIAL MA | 5.39 | 4.62 | 4.09 | 6.94 | 3.03 | 2.61 | 1.23 | 5.49 | 6.80 | 7.15 |
| 94 | RAILWAY VEHICLES | 2.61 | .10 | 2.26 | 10.13 | 2.93 | 3.35 | .57 | 8.95 | 7.93 | 8.30 |
| 95 | PERSONAL AUTOS | 4.32 | 3.86 | 8.93 | 1.06 | .84 | 3.96 | 3.02 | .50 | 10.26 | 11.58 |
| 96 | BUSSES AND TRUCKS | 3.40 | 3.34 | 7.30 | 3.31 | .48 | 1.16 | 7.51 | 3.86 | 3.18 | .86 |
| 97 | AUTO BODIES AND CHA | 1.35 | .51 | 7.61 | 5.13 | .11 | 3.18 | 3.51 | 6.65 | 4.02 | 10.15 |
| 98 | MOTOR CYCLES | .00 | 3.01 | 1.05 | 9.04 | 3.63 | 3.53 | 9.98 | 13.95 | 12.48 | 1.72 |
| 99 | ROAD VEHICLES | 13.75 | 2.69 | 4.87 | 1.43 | .42 | 4.02 | 4.52 | 3.41 | 4.86 | 4.73 |
| 100 | AIRCRAFT AND PARTS | .69 | .31 | 1.13 | 7.59 | 1.44 | 5.17 | 8.13 | 3.83 | 1.48 | 7.53 |
| 101 | WARSHIPS | 1.13 | 9.86 | .00 | .00 | .00 | .00 | 15.15 | .00 | .00 | -.00 |
| 102 | SHIPS AND BOATS | .00 | 1.03 | 1.57 | 1.81 | 2.01 | 2.40 | .25 | 3.45 | 2.80 | 3.36 |
| 103 | SANITARY,PLUMBING,H | -.00 | .71 | 6.25 | 1.74 | .29 | 2.01 | -.00 | 3.32 | 5.29 | 2.27 |
| 104 | FURNITURE | 4.35 | 2.20 | 2.48 | 3.93 | 2.31 | 1.03 | .58 | .09 | .22 | 1.97 |
| 105 | TRAVEL GOODS, HADNB | 8.98 | 4.29 | .83 | 2.58 | 3.23 | 8.77 | 4.93 | 8.97 | -.00 | 3.26 |
| 106 | CLOTHING | 2.30 | -.00 | 5.71 | 1.47 | 1.70 | 1.83 | 6.09 | 3.81 | 1.28 | 2.04 |
| 107 | FOOTWEAR | .81 | .32 | 13.11 | .49 | 1.68 | 4.73 | .92 | 7.08 | .01 | 1.79 |
| 108 | SCIENTIFIC,MEDICAL | 7.76 | .11 | 3.24 | 12.50 | .13 | 1.76 | 2.45 | 2.15 | 1.64 | 2.99 |
| 109 | PHOTOGRAPIC SUPPLIE | 1.21 | 1.17 | 2.75 | 4.07 | 2.33 | 4.21 | 5.47 | .76 | 2.37 | 3.64 |
| 110 | WATCHES AND CLOCKS | 4.39 | .20 | 2.45 | 5.71 | .81 | 3.59 | 1.56 | 5.28 | .77 | .10 |
| 111 | MUSICAL INSTRUMENTS | 1.54 | 1.02 | 3.95 | 6.50 | 6.04 | 7.50 | 3.26 | 9.86 | 1.35 | 4.48 |
| 112 | PHONOGRAPHS AND REC | -.00 | 1.57 | .77 | 7.68 | 3.42 | .13 | 2.34 | -.00 | 1.59 | 2.86 |
| 113 | PRINT MATTER | 4.90 | .62 | .78 | 3.19 | .86 | .79 | 3.18 | 2.72 | 1.14 | 2.12 |
| 114 | ART | 3.38 | 1.07 | 5.89 | 4.91 | 1.90 | .58 | 1.23 | 2.06 | .92 | 1.87 |
| 115 | TOYS AND CARRIAGES, | 6.61 | 2.03 | 5.74 | 2.53 | .49 | 4.43 | 1.97 | 5.86 | 1.79 | 4.17 |
| 116 | OFFICE SUPPLIES | .00 | .01 | -.00 | -.00 | .80 | 5.27 | 5.36 | 4.58 | .59 | 2.16 |
| 117 | JEWELLERY | -.00 | 4.94 | .36 | 6.56 | 3.01 | .88 | 3.11 | 7.05 | 1.98 | 4.25 |
| 118 | MANUFACTURES,NES | 5.62 | .51 | 3.16 | 2.82 | .39 | .27 | 6.16 | .62 | 1.59 | 1.28 |
| 119 | COMMERICAL AND TRAN | 14.18 | .62 | .07 | 3.87 | 14.58 | .66 | 7.44 | 7.70 | .88 | .73 |
| 1972 | WGT AVERAGES | 2.04 | 1.44 | 3.62 | 2.46 | 1.60 | 2.01 | 2.90 | 2.63 | 2.14 | 1.14 |

countries for many of their large exports. Another interesting division occurs within Europe. France, Germany and the United Kingdom have lower elasticities than do the low countries and Italy. Differences in size may account for part of the difference but I believe not all of it. For example, Japan is the fourth largest exporter and yet it has, by a substantial margin, the highest elasticity. The reasons for the different elasticities are probably different for each country.

Table IV-5 gives the elasticities by country by major SITC (one digit). Keeping in mind that the elasticities presented here are based on shares, we can nevertheless compare them to aggregate studies done elsewhere by looking at the relative relationships between groupings. For example, M. E. Kreinin,[1] and R. J. Ball and K. Marwah[2] both found a lower price elasticity for United States imports of semi-manufactures than that of manufactures. From these studies we might infer that export price elasticities for crude materials could be expected to be lower than those for manufactures. As Table IV-5 shows, their relationship holds for all countries except France. The overwhelming result then is that manufactures have higher elasticities than do crude materials. The fact that nine of the ten countries in model display such a result is evidence that the large-share low elasticity phenomenon does not apply in this case. Many studies have been done

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[1]Kreinin, Mordechai E., "Price Elasticities in International Trade," Review of Economics and Statistics, Vol. 49 (November 1967) p. 514.

[2]Ball, R. J. and Marwah, R., "The U.S. Demand for Imports 1948-1958," Review of Economics and Statistics, Vol. 44 (November 1962, pp. 395, 401.

TABLE IV-5

EXPORT PRICE ELASTICITIES BY ONE-DIGIT SITC

| | Canada | U.S.A. | Japan | Belgium-Luxembourg | France | Germany | Italy | Netherlands | United Kingdom | Others | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Agriculture | 1.69 | .68 | 1.48 | 2.61 | 2.32 | 4.09 | 2.49 | 1.88 | 2.42 | .53 | 1.11 |
| Beverages and tobacco | .33 | 1.15 | 1.01 | 3.43 | .19 | 5.22 | .50 | 1.23 | .42 | 1.12 | .93 |
| Crude materials | 1.30 | 1.34 | 2.51 | 1.58 | 2.44 | 2.03 | 2.39 | 2.00 | 1.48 | .43 | .97 |
| Coal and petroleum products | 1.75 | .93 | 7.58 | .52 | .86 | .56 | 3.73 | 1.93 | 3.69 | .26 | .65 |
| Chemicals | 2.89 | 1.48 | 2.08 | 2.17 | 1.36 | 1.96 | 3.98 | 2.95 | .55 | 2.08 | 1.96 |
| Manufactured goods | 1.53 | 2.54 | 2.74 | 2.18 | 1.75 | 2.28 | 3.26 | 3.66 | 2.62 | 1.30 | 2.14 |
| Machinery | 2.71 | 1.65 | 4.61 | 2.88 | 1.32 | 1.86 | 2.39 | 3.17 | 2.54 | 4.33 | 2.60 |
| Miscellaneous goods | 3.67 | .96 | 3.38 | 3.43 | 1.48 | 2.04 | 3.27 | 2.00 | 1.52 | 2.19 | 2.26 |
| | 2.04 | 1.44 | 3.62 | 2.46 | 1.60 | 2.01 | 2.90 | 2.63 | 2.14 | 1.14 | 1.86 |

separating imports by broad groups and estimating elasticities, but relatively little has been done in the same manner for exports. Taplin[3] does, however, present some market share elasticities from his model. He finds that manufactured goods have a substantially higher elasticities than do crude materials (2.5 vs .3). The corresponding figures from the present study are 2.14 and .97.

As the last column of Table IV-5 shows, as goods become more processed they become more price elastic. Fuels show the lowest average elasticities. Somewhat above them lie Crude materials and Beverages and tobacco. These three groups still have, however, an elasticity under 1.0. Agricultural products are just above the Crude materials. Chemicals and Manufactured goods have elasticities about twice that of the basic commodities. Machinery appears to be significantly more price elastic than any of the others. High individual country elasticities for low average groups can best be explained by remembering the small-share high-elasticity phenomenon observed in Table IV-2.

Up to this point we have only skirted two other important factors revealed in Table IV-2. The first of these is the symmetry of the "Trade Effects" portion of the table. Returning to the top of the table to look at Dairy and eggs, we see that if Canada lowers its price ten percent, the U.S. loses $2.505 million and, if the U.S. lowers its price, Canada loses $2,453 million. The reactions are not all so symmetrical as in this one example (U.S.A.-Others and Others-U.S.A.),

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[3] op.cit., Taplin, p. 193.

but the symmetry is still very strong. The symmetry feature leads us to expect that if the biggest loser when Canada lowers its price is Belgium, then the biggest effect on Canada will probably come if Belgium lowers its price. Hence, rival pairs of countries appear.

Who are the rivals? To answer this question, it is probably best to put the reactions in relative terms to abstract from size of country. If we do not, we would find that Others, the U.S., and Germany would be paired most often.[4] A good relative measure to use is the percent changed. Table IV-6 gives this reaction table. The table shows that, for Canada, Japan is the most affected in 37 sectors. This fact is denoted by the star after the "37" under Japan. Similarly, for Japan, Canada is affected the greatest number of times (25). The Japan-Canada pairing clearly reveals that they compete keenly for the large United States market. France and Germany might be expected to be trade rivals based on a long political and social rivalry. Similarly, one might expect that Belgium would rival the Netherlands. That, however, does not turn out to be the case. Instead, the pairings here show that for Belgium the rival is Germany and vice versa; for France, the Netherlands, and the rival for the Netherlands is Belgium. In fact, a French price change affects German exports most for only eleven products but affects the Netherlands most for twenty-five. Likewise, a German price change affects France the most for only ten products but

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[4] In fact, under such comparison Others was paired 409 times out of a possible 1,071 times, the U.S. 133 times, and Germany 184 times, while Belgium-Luxembourg only 35 times.

TABLE IV-6

Maximum Effect Table

| Price Changer | Countries Most Effected | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Canada | United States | Japan | Belgium-Luxembourg | France | Germany | Italy | Nether-lands | United Kingdom | Others |
| Canada | 0 | 7 | 37* | 6 | 4 | 6 | 12 | 9 | 6 | 28 |
| United States | 5 | 0 | 23* | 9 | 6 | 12 | 19 | 15 | 14 | 16 |
| Japan | 25* | 12 | 0 | 9 | 3 | 9 | 15 | 8 | 15 | 22 |
| Belgium-Luxembourg | 6 | 5 | 14 | 0 | 5 | 24* | 23 | 19 | 3 | 19 |
| France | 9 | 5 | 21 | 7 | 0 | 11 | 11 | 25* | 6 | 24 |
| Germany | 7 | 7 | 20 | 36* | 10 | 0 | 9 | 15 | 6 | 9 |
| Italy | 9 | 9 | 10 | 18 | 10 | 9 | 0 | 23 | 6 | 24* |
| Netherlands | 5 | 6 | 12 | 19* | 14 | 14 | 18 | 0 | 9 | 19* |
| United Kingdom | 7 | 16 | 24* | 12 | 9 | 13 | 12 | 13 | 0 | 14 |
| Others | 23 | 7 | 29* | 12 | 6 | 6 | 16 | 14 | 6 | 0 |

Belgium for thirty-four. This result does not mean, however, that France and Germany are not trading rivals but rather that each has a greater rival. Viewed from the affected country side (i.e., the column in the table), we see Canada most affected by Japan, the United States by the United Kingdom, and so on. To get a clearer picture of these data, Table IV-7 gives a list of the country most affected by a price change of the given country and the country most affecting the given country. The absence of the U.S. and Italy from the table merely means that neither of these countries could be considered primary trade rivals of any of the others.

Distributed Lags of Prices

While still maintaining our focus on prices, we now turn our attention from the level of their effects to the time path the prices effects follows to reach that level. Since the path of the effect is constrained to be the same for all countries for a given product with different lags for different products, we need to look at product-to product differences.

The plots of the cumulative effect of the twelve selected sectors is shown in Figure IV-1. In the first plot, for Dairy and eggs, on the upper left of Figure IV-1, for example, we observe the proportion of the total effect that occurs in the current year is about 50%, the amount in the current and first year after the price change is about 80% and so on. After inspection of just these twelve lags, we can realize that the lags were substantial. Prices have substantial effects on trade even after three years. To save space, Table IV-8 displays

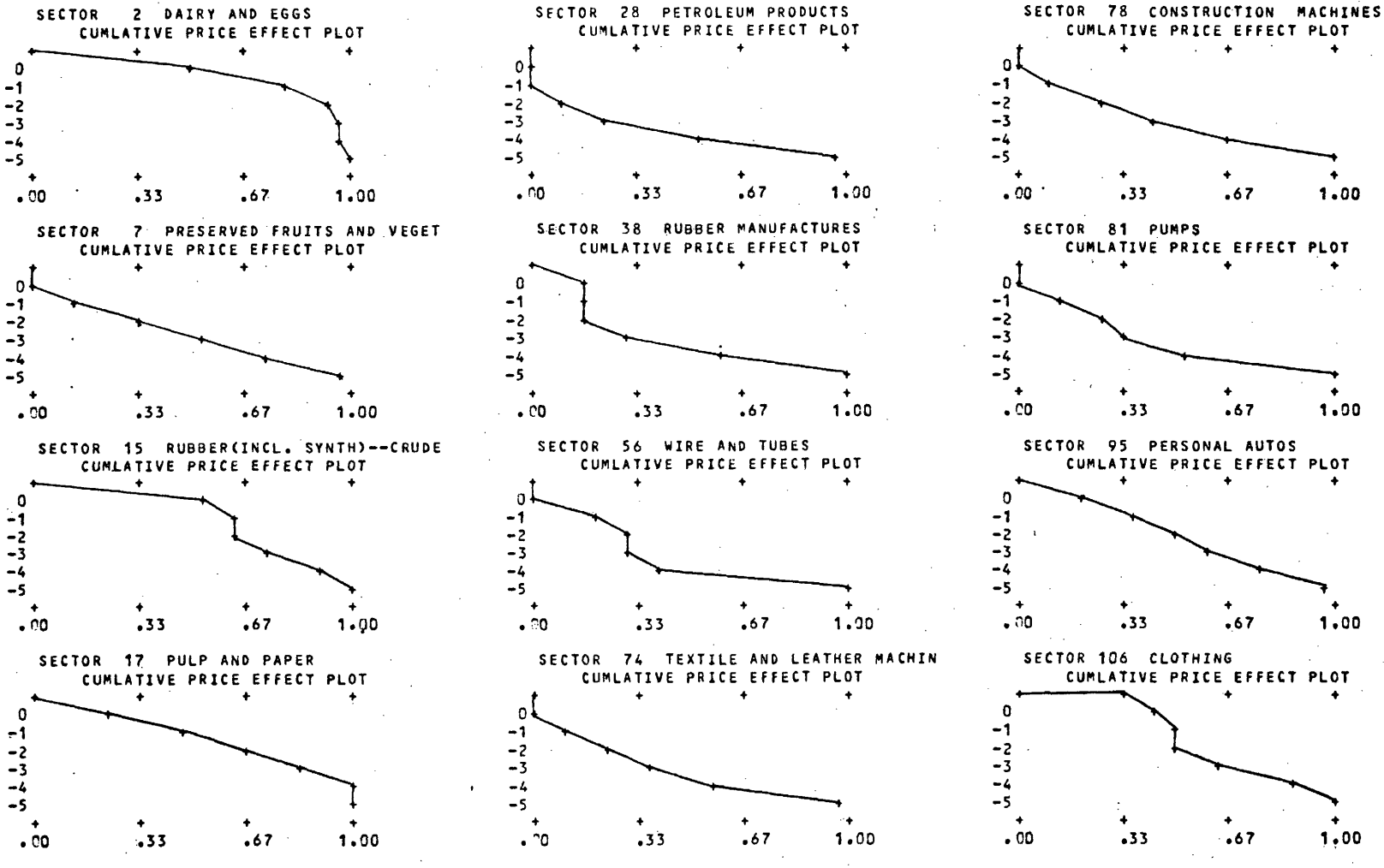
TABLE IV-7

TRADE RIVALS

| Given Country | Most Affecting | Most Affected By |
|---|---|---|
| Canada | Japan | Japan |
| U.S.A | Japan | United Kingdom |
| Japan | Canada | Canada |
| Belgium-Luxembourg | Germany | Germany |
| France | Netherlands | Netherlands |
| Germany | Belgium-Luxembourg | Belgium-Luxembourg |
| Italy | Others | Belgium-Luxembourg |
| Netherlands | Belgium-Luxembourg/Others | France |
| United Kingdom | Japan | Japan |
| Others | Japan | Canada |

Figure IV-1

Time Path of Price Effect



the lag weights and their accumulated effect for each of the 119 products. Here, again, inspection shows that the lags are substantial.

Comparison of lags for different commodities, as in Figure IV-2, shows up some interesting contrasts not easily observable in Figure IV-1 or Table IV-8. Panels (a) - (c) of Figure IV-2 illustrate the differences in the distributed lags for products in different stages of manufacture. Panel (a) shows the relationship between Crude rubber (15) and Rubber manufactures (38). The price effect for Crude rubber occurs much faster than does that for the manufactured product. In fact, after two years, two-thirds of the total effect has occurred for Crude rubber while only about one-sixth of the total effect has occurred for Rubber manufactures. Panel (b) shows a similar relationship between Unmilled grains (4) and Milled grains (5). The distributed lag for the Unmilled grains showed that they respond much more quickly to price changes than do the Milled grains. The fast price response of crude materials relative to manufactured goods probably stems from their greater homogeneity. Such comparisons, however, are not easily found. Panel (c) shows the reverse relation between the distributed lags for Cotton (20) and Cotton fabrics (46). Cotton fabrics is seen to move more rapidly in the first year, but Cotton catches up after two years. The price change then takes effect at about the same rate. Of course, cotton fabric could itself be a product in a low stage of manufacture when compared to Clothing. In any case, the effect demonstrated in panels (a) and (b) is not universal.

Panels (d) - (f) illustrate the point that consumer products tend to have a faster price responsiveness than do producer items. Panel (d)

Table IV-8

Distributed Lags on Prices

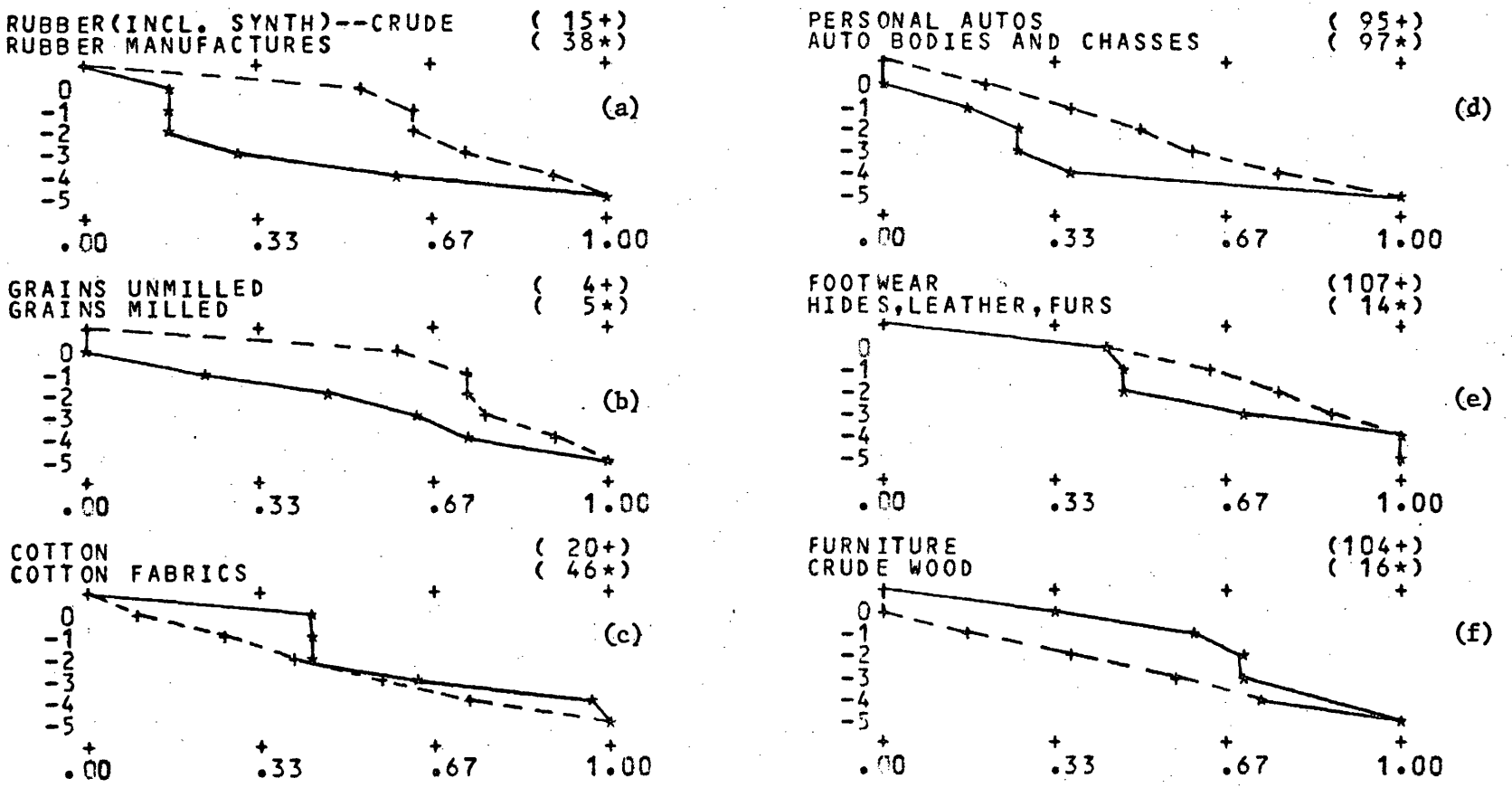
| | SECTOR | INCREMENTAL EFFECT AFTER X YEARS | | | | | | CUMLATIVE EFFECT AFTER X YEARS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | 0 | 1 | 2 | 3 | 4 | 5 |
| 1 | MEAT AND LIVE ANIMALS | .608 | .261 | .072 | .000 | .007 | .052 | .608 | .870 | .941 | .941 | .948 | 1.000 |
| 2 | DAIRY AND EGGS | .532 | .289 | .124 | .031 | .000 | .024 | .532 | .821 | .945 | .976 | .976 | 1.000 |
| 3 | FISH | .281 | .000 | .028 | .188 | .304 | .200 | .281 | .281 | .309 | .496 | .800 | 1.000 |
| 4 | GRAINS UNMILLED | .603 | .135 | .000 | .048 | .127 | .087 | .603 | .738 | .738 | .785 | .913 | 1.000 |
| 5 | GRAINS MILLED | .000 | .241 | .243 | .150 | .108 | .259 | .000 | .241 | .483 | .634 | .741 | 1.000 |
| 6 | FRESH FRUITS AND VEGETABLES | .129 | .000 | .031 | .152 | .296 | .392 | .129 | .129 | .160 | .312 | .608 | 1.000 |
| 7 | PRESERVED FRUITS ANd VEGETABLE | .000 | .155 | .201 | .195 | .194 | .255 | .000 | .155 | .356 | .551 | .745 | 1.000 |
| 8 | SUGAR | .194 | .000 | .098 | .281 | .345 | .083 | .194 | .194 | .291 | .572 | .917 | 1.000 |
| 9 | COFFEE,TEA,COCOA,ETC | .125 | .000 | .057 | .194 | .313 | .311 | .125 | .125 | .181 | .376 | .689 | 1.000 |
| 10 | FEED STUFFS | .000 | .100 | .184 | .239 | .256 | .221 | .000 | .100 | .283 | .523 | .779 | 1.000 |
| 11 | FATS AND OILS | .453 | .287 | .129 | .020 | .000 | .110 | .453 | .741 | .870 | .890 | .890 | 1.000 |
| 12 | BEVERAGES | .000 | .133 | .173 | .177 | .204 | .312 | .000 | .133 | .306 | .483 | .688 | 1.000 |
| 13 | TOBACCO AND TOBACCO PRODUCTS | .000 | .177 | .193 | .152 | .159 | .318 | .000 | .177 | .370 | .522 | .682 | 1.000 |
| 14 | HIDES,LEATHER,FURS | .455 | .016 | .026 | .210 | .293 | .000 | .455 | .470 | .496 | .707 | 1.000 | 1.000 |
| 15 | RUBBER(INCL. SYNTH)--CRUDE | .555 | .090 | .000 | .094 | .183 | .078 | .555 | .645 | .645 | .739 | .922 | 1.000 |
| 16 | CRUDE WOOD | .358 | .256 | .108 | .000 | .021 | .257 | .358 | .614 | .722 | .722 | .743 | 1.000 |
| 17 | PULP AND PAPER | .265 | .205 | .196 | .191 | .142 | .000 | .265 | .470 | .667 | .858 | 1.000 | 1.000 |
| 18 | SILK, OTH. NON MANMADE FIBERS | .417 | .055 | .000 | .105 | .222 | .202 | .417 | .471 | .471 | .577 | .798 | 1.000 |
| 19 | WOOL | .344 | .179 | .152 | .173 | .152 | .000 | .344 | .523 | .675 | .848 | 1.000 | 1.000 |
| 20 | COTTON | .125 | .142 | .146 | .154 | .183 | .250 | .125 | .266 | .412 | .566 | .750 | 1.000 |
| 21 | CRUDE FERTILIZERS | .406 | .052 | .000 | .106 | .224 | .212 | .406 | .458 | .458 | .563 | .788 | 1.000 |
| 22 | MARBLE,SAND, AND OTH.CRUDE MIN | .224 | .190 | .206 | .215 | .165 | .000 | .224 | .414 | .620 | .835 | 1.000 | 1.000 |
| 23 | IRON ORE AND SCRAP | .000 | .172 | .201 | .173 | .171 | .282 | .000 | .172 | .374 | .546 | .718 | 1.000 |
| 24 | *NONFERROUS ORES AND SCRAP* | .240 | .020 | .000 | .104 | .256 | .380 | .240 | .260 | .260 | .364 | .620 | 1.000 |
| 25 | VEGETABLE MATERIALS,NES | .483 | .214 | .057 | .006 | .052 | .188 | .483 | .696 | .754 | .760 | .812 | 1.000 |
| 26 | COAL, COKE | .210 | .310 | .199 | .041 | .000 | .240 | .210 | .520 | .719 | .760 | .760 | 1.000 |
| 27 | CRUDE PERTOLEUM | .125 | .191 | .246 | .255 | .184 | .000 | .125 | .315 | .561 | .816 | 1.000 | 1.000 |
| 28 | PETROLEUM PRODUCTS | .000 | .025 | .075 | .157 | .282 | .460 | .000 | .025 | .100 | .258 | .540 | 1.000 |
| 29 | GAS, NATURAL AND SYNTHETIC | .287 | .161 | .166 | .205 | .182 | .000 | .287 | .448 | .614 | .818 | 1.000 | 1.000 |
| 30 | ELECTRICAL ENERGY | .202 | .247 | .243 | .196 | .113 | .000 | .202 | .449 | .691 | .887 | 1.000 | 1.000 |
| 31 | CHEMICAL ELEMENTS | .178 | .000 | .079 | .246 | .331 | .165 | .178 | .178 | .257 | .503 | .835 | 1.000 |
| 32 | DYEING,TANNING, AND COAL CHEM | .472 | .001 | .000 | .191 | .297 | .039 | .472 | .473 | .473 | .664 | .961 | 1.000 |
| 33 | MEDICINAL CHEMICALS | .000 | .122 | .069 | .020 | .150 | .638 | .000 | .122 | .191 | .211 | .361 | 1.000 |
| 34 | PERFUME MAT. AND OTH. CHEM.NES | .187 | .144 | .149 | .174 | .187 | .159 | .187 | .331 | .480 | .654 | .841 | 1.000 |
| 35 | MANUFACTURED FERTILIZERS | .587 | .230 | .050 | .000 | .033 | .100 | .587 | .817 | .867 | .867 | .900 | 1.000 |
| 36 | EXPOLSIVES | .225 | .139 | .180 | .240 | .216 | .000 | .225 | .364 | .544 | .784 | 1.000 | 1.000 |
| 37 | PLASTIC MATERIALS | .286 | .000 | .040 | .210 | .313 | .151 | .286 | .286 | .326 | .536 | .849 | 1.000 |
| 38 | RUBBER MANUFACTURES | .167 | .000 | .017 | .140 | .289 | .387 | .167 | .167 | .184 | .324 | .613 | 1.000 |
| 39 | VENEERS, PLAYWOOD | .122 | .000 | .080 | .232 | .326 | .239 | .122 | .122 | .202 | .434 | .762 | 1.000 |
| 40 | NEWSPRINT | .067 | .276 | .312 | .235 | .110 | .000 | .067 | .343 | .655 | .890 | 1.000 | 1.000 |
| 41 | KRAFTPAPER | .000 | .144 | .133 | .096 | .163 | .463 | .000 | .144 | .277 | .374 | .537 | 1.000 |
| 42 | FIBREBOARD | .253 | .226 | .151 | .085 | .083 | .202 | .253 | .479 | .630 | .715 | .798 | 1.000 |
| 43 | OTHER PAPER AND PAPERBOARD | .000 | .242 | .234 | .134 | .100 | .291 | .000 | .242 | .476 | .610 | .709 | 1.000 |
| 44 | ART. OF PAPER AND PAPERBOARD | .353 | .292 | .205 | .113 | .037 | .000 | .353 | .645 | .850 | .963 | 1.000 | 1.000 |
| 45 | YARNS AND THREADS | .657 | .144 | .000 | .050 | .118 | .031 | .657 | .801 | .801 | .851 | .969 | 1.000 |
| 46 | COTTON FABRICS | .449 | .000 | .010 | .204 | .304 | .033 | .449 | .449 | .460 | .663 | .967 | 1.000 |
| 47 | OTH TEXT FAB EXC FLOOR COVERNG | .217 | .000 | .015 | .150 | .291 | .327 | .217 | .217 | .232 | .381 | .673 | 1.000 |
| 48 | FLOOR COVERINGS | .359 | .137 | .125 | .188 | .191 | .000 | .359 | .496 | .621 | .809 | 1.000 | 1.000 |
| 49 | STONE AND BRICKS | .217 | .131 | .047 | .029 | .139 | .437 | .217 | .348 | .395 | .424 | .563 | 1.000 |
| 50 | GLASS | .320 | .126 | .135 | .209 | .210 | .000 | .320 | .447 | .582 | .790 | 1.000 | 1.000 |
| 51 | POTTERY, PERALS, PRECIOUS GEMS | .000 | .001 | .004 | .071 | .267 | .656 | .000 | .001 | .005 | .076 | .344 | 1.000 |
| 52 | PIG IRON | .220 | .036 | .048 | .157 | .265 | .273 | .220 | .256 | .304 | .462 | .727 | 1.000 |
| 53 | IRON AND STEEL INGOTS AND BARS | .346 | .064 | .000 | .074 | .205 | .311 | .346 | .410 | .410 | .484 | .689 | 1.000 |
| 54 | UNIVERALS AND PLATES | .381 | .121 | .000 | .007 | .131 | .361 | .381 | .502 | .502 | .509 | .639 | 1.000 |
| 55 | HOOPS AND RAIL TRACK | .023 | .142 | .070 | .000 | .125 | .639 | .023 | .165 | .235 | .235 | .361 | 1.000 |
| 56 | WIRE AND TUBES | .012 | .196 | .115 | .000 | .083 | .594 | .012 | .208 | .323 | .323 | .406 | 1.000 |
| 57 | IRON AND STEEL CASTINGS | .000 | .112 | .092 | .070 | .178 | .549 | .000 | .112 | .204 | .273 | .451 | 1.000 |
| 58 | COPPER | .168 | .190 | .085 | .000 | .081 | .476 | .168 | .357 | .442 | .442 | .524 | 1.000 |
| 59 | ALUMINUM | .259 | .240 | .216 | .176 | .108 | .000 | .259 | .499 | .715 | .892 | 1.000 | 1.000 |
| 60 | LEAD AND ZINC | .295 | .287 | .144 | .003 | .000 | .272 | .295 | .582 | .725 | .728 | .728 | 1.000 |

Table IV-8 (Cont'd)

| | SECTOR | INCREMENTAL EFFECT AFTER X YEARS | | | | | | CUMLATIVE EFFECT AFTER X YEARS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | 0 | 1 | 2 | 3 | 4 | 5 |
| 61 | OTHER NONFERROUS | .226 | .206 | .213 | .207 | .149 | .000 | .226 | .431 | .644 | .851 | 1.000 | 1.000 |
| 62 | FINISHED STRUCTURAL PARTS | .213 | .185 | .207 | .222 | .172 | .000 | .213 | .399 | .606 | .828 | 1.000 | 1.000 |
| 63 | METAL CONTAINERS | .304 | .171 | .164 | .193 | .168 | .000 | .304 | .475 | .639 | .832 | 1.000 | 1.000 |
| 64 | WIRE PRODUCTS | .155 | .268 | .272 | .204 | .101 | .000 | .155 | .423 | .695 | .899 | 1.000 | 1.000 |
| 65 | HARDWARE | .034 | .146 | .259 | .314 | .248 | .000 | .034 | .180 | .439 | .752 | 1.000 | 1.000 |
| 66 | BOILERS AND TURBINES | .057 | .180 | .095 | .000 | .094 | .574 | .057 | .237 | .332 | .332 | .426 | 1.000 |
| 67 | AIRCRAFT ENGINES | .535 | .084 | .000 | .097 | .190 | .094 | .535 | .619 | .619 | .716 | .906 | 1.000 |
| 68 | INTERNAL COMBUSTION ENGINES | .000 | .179 | .229 | .210 | .181 | .202 | .000 | .179 | .407 | .617 | .798 | 1.000 |
| 69 | OTHER POWER MACHINERY | .280 | .150 | .035 | .000 | .109 | .426 | .280 | .430 | .465 | .465 | .574 | 1.000 |
| 70 | AGRICULTURAL MACHINERY | .000 | .108 | .098 | .087 | .189 | .519 | .000 | .108 | .206 | .293 | .481 | 1.000 |
| 71 | OFFICE MACHINES | .000 | .176 | .208 | .178 | .170 | .268 | .000 | .176 | .384 | .562 | .732 | 1.000 |
| 72 | COMPUTER AND RELATED EQUIPMENT | .147 | .183 | .233 | .250 | .188 | .000 | .147 | .329 | .562 | .812 | 1.000 | 1.000 |
| 73 | METAL WORKING MACHINERY | .531 | .125 | .000 | .041 | .135 | .167 | .531 | .656 | .656 | .698 | .833 | 1.000 |
| 74 | TEXTILE AND LEATHER MACHINERY | .000 | .121 | .136 | .132 | .196 | .415 | .000 | .121 | .257 | .389 | .585 | 1.000 |
| 75 | PAPER MILL MACHINES | .267 | .001 | .000 | .136 | .283 | .313 | .267 | .269 | .269 | .405 | .687 | 1.000 |
| 76 | PRINTING MACHINES | .539 | .119 | .000 | .052 | .144 | .146 | .539 | .658 | .658 | .709 | .854 | 1.000 |
| 77 | FOOD PROCESSING MACHINES | .424 | .132 | .012 | .023 | .126 | .282 | .424 | .556 | .568 | .591 | .718 | 1.000 |
| 78 | CONSTRUCTION MACHINES | .000 | .120 | .160 | .174 | .214 | .332 | .000 | .120 | .280 | .454 | .668 | 1.000 |
| 79 | MINERAL CRUSHING MACHINES | .351 | .195 | .060 | .000 | .070 | .324 | .351 | .546 | .606 | .606 | .676 | 1.000 |
| 80 | HEATING AND COOLING EQUIPMENT | .630 | .135 | .000 | .055 | .128 | .052 | .630 | .765 | .765 | .819 | .948 | 1.000 |
| 81 | PUMPS | .000 | .138 | .129 | .098 | .168 | .466 | .000 | .138 | .268 | .365 | .534 | 1.000 |
| 82 | MECHANICAL HANDLING EQUIPMENT | .000 | .065 | .040 | .046 | .206 | .643 | .000 | .065 | .105 | .151 | .357 | 1.000 |
| 83 | ALL OTHER NON-ELECTRICAL,NES | .058 | .036 | .000 | .034 | .222 | .649 | .058 | .094 | .094 | .128 | .351 | 1.000 |
| 84 | ELECTRIC POWER MACHINES | .154 | .133 | .041 | .000 | .128 | .544 | .154 | .286 | .328 | .328 | .455 | 1.000 |
| 85 | EQUIP OFR DISTRIBUTING ELECT. | .000 | .077 | .084 | .105 | .220 | .513 | .000 | .077 | .161 | .266 | .486 | 1.000 |
| 86 | TELEVISION SETS AND RADIOS,ETC | .285 | .136 | .154 | .218 | .207 | .000 | .285 | .421 | .575 | .793 | 1.000 | 1.000 |
| 87 | APPLIANCES, DOMESTIC | .222 | .333 | .245 | .089 | .000 | .111 | .222 | .556 | .800 | .889 | .889 | 1.000 |
| 88 | MEDICAL ELECTRICAL APPLIANCES | .000 | .148 | .105 | .044 | .139 | .564 | .000 | .148 | .253 | .297 | .436 | 1.000 |
| 89 | BATTERIES | .633 | .187 | .041 | .053 | .086 | .000 | .633 | .820 | .860 | .914 | 1.000 | 1.000 |
| 90 | LAMPS | .242 | .144 | .036 | .000 | .115 | .463 | .242 | .386 | .422 | .422 | .537 | 1.000 |
| 91 | TRANSISTORS | .170 | .162 | .063 | .000 | .103 | .502 | .170 | .332 | .395 | .395 | .498 | 1.000 |
| 92 | ELECTRICAL MEASURING INSTRUMEN | .179 | .146 | .048 | .000 | .116 | .511 | .179 | .325 | .373 | .373 | .489 | 1.000 |
| 93 | OTHER ELECTRIAL MACH.,NEW | .159 | .233 | .121 | .000 | .047 | .440 | .159 | .392 | .512 | .512 | .560 | 1.000 |
| 94 | RAILWAY VEHICLES | .342 | .201 | .066 | .000 | .066 | .326 | .342 | .543 | .609 | .609 | .674 | 1.000 |
| 95 | PERSONAL AUTOS | .221 | .159 | .123 | .120 | .152 | .225 | .221 | .380 | .503 | .623 | .775 | 1.000 |
| 96 | BUSSES AND TRUCKS | .000 | .192 | .133 | .032 | .099 | .543 | .000 | .192 | .325 | .358 | .457 | 1.000 |
| 97 | AUTO BODIES AND CHASSES | .000 | .172 | .104 | .011 | .107 | .607 | .000 | .172 | .275 | .286 | .393 | 1.000 |
| 98 | MOTOR CYCLES | .259 | .212 | .203 | .191 | .136 | .000 | .259 | .470 | .673 | .864 | 1.000 | 1.000 |
| 99 | ROAD VEHICLES | .097 | .213 | .115 | .000 | .066 | .510 | .097 | .310 | .424 | .424 | .490 | 1.000 |
| 100 | AIRCRAFT AND PARTS | .217 | .231 | .110 | .000 | .046 | .395 | .217 | .449 | .559 | .559 | .605 | 1.000 |
| 101 | WARSHIPS | .000 | .081 | .121 | .161 | .240 | .398 | .000 | .081 | .201 | .362 | .602 | 1.000 |
| 102 | SHIPS AND BOATS | .127 | .245 | .272 | .227 | .130 | .000 | .127 | .371 | .643 | .870 | 1.000 | 1.000 |
| 103 | SANITARY,PLUMBING,HEAT. FIXTUR | .222 | .153 | .198 | .235 | .203 | .000 | .222 | .375 | .563 | .797 | 1.000 | 1.000 |
| 104 | FURNITURE | .000 | .172 | .211 | .188 | .178 | .251 | .000 | .172 | .383 | .571 | .749 | 1.000 |
| 105 | TRAVEL GOODS, HADNBAGS | .205 | .000 | .071 | .240 | .328 | .156 | .205 | .205 | .276 | .516 | .844 | 1.000 |
| 106 | CLOTHING | .464 | .041 | .000 | .136 | .243 | .116 | .464 | .506 | .506 | .641 | .884 | 1.000 |
| 107 | FOOTWEAR | .464 | .195 | .112 | .117 | .112 | .000 | .464 | .658 | .770 | .888 | 1.000 | 1.000 |
| 108 | SCIENTIFIC,MEDICAL INSTRUMENTS | .357 | .050 | .000 | .096 | .224 | .274 | .357 | .406 | .406 | .502 | .726 | 1.000 |
| 109 | PHOTOGRAPIC SUPPLIES | .299 | .000 | .065 | .255 | .330 | .051 | .299 | .299 | .364 | .619 | .949 | 1.000 |
| 110 | WATCHES AND CLOCKS | .343 | .075 | .000 | .058 | .189 | .335 | .343 | .418 | .418 | .476 | .665 | 1.000 |
| 111 | MUSICAL INSTRUMENTS | .352 | .015 | .000 | .141 | .271 | .221 | .352 | .367 | .367 | .508 | .779 | 1.000 |
| 112 | PHONOGRAPHS AND RECORDS | .000 | .094 | .111 | .127 | .216 | .452 | .000 | .094 | .205 | .332 | .548 | 1.000 |
| 113 | PRINT MATTER | .118 | .000 | .105 | .273 | .345 | .159 | .118 | .118 | .223 | .496 | .841 | 1.000 |
| 114 | ART | .139 | .000 | .138 | .334 | .368 | .020 | .139 | .139 | .277 | .612 | .980 | 1.000 |
| 115 | TOYS AND CARRIAGES, GAMES | .312 | .069 | .000 | .058 | .196 | .366 | .312 | .380 | .380 | .439 | .634 | 1.000 |
| 116 | OFFICE SUPPLIES | .445 | .230 | .137 | .107 | .081 | .000 | .445 | .675 | .812 | .919 | 1.000 | 1.000 |
| 117 | JEWELLERY | .000 | .135 | .127 | .099 | .172 | .468 | .000 | .135 | .262 | .360 | .532 | 1.000 |
| 118 | MANUFACTURES,NES | .196 | .000 | .076 | .245 | .330 | .153 | .196 | .196 | .272 | .517 | .847 | 1.000 |
| 119 | COMMERICAL AND TRANSACT.,NSK | .248 | .047 | .124 | .277 | .303 | .000 | .248 | .295 | .420 | .697 | 1.000 | 1.000 |

Figure IV-2

Comparison of Time Paths on Price



shows the distributed lags for Personal autos (95) and Auto bodies and chassis (97). The consumer item, Personal autos, has a steadily increasing price effect with time but the producer items, Auto bodies and chassis, responds to price slowly at first and only after four years does a price change begin to show a significant effect. Panel (e) shows the relationship between Leather, a producer good, and Shoes, a consumer item. Both products show a healthy response in the year of the price change but then Leather seems to catch its breath while Shoes go stepping rapidly forward. Leather catches up after four years, and at that time the price response appears to be complete.

This fast-consumer thesis also has exceptions, as Panel (f) shows. Crude wood (16) responds much more quickly than does Furniture (104). Perhaps this panel is more illustrative of the point made in Panels (a) and (b). In any case, we can see that is often difficult to classify a pair of products so that they fit clearly into one or another type of response.

The Time Parameters (g)

As with the price parameters, there are 11,000 time parameters, and we find it more helpful to look at their effects rather than to display the coefficients themselves.[5]

From the discussion in Chapter II, we recall that we might have to

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[5]An examination of the importance of time vs. the importance of prices will be discussed in Chapter V which deals with the fit of the equations.

slow time down in the forecast period. The reason, of course, was to prevent any single share from becoming negative or greater than unity, for any time trend would eventually force one or the other to occur. To simplify forecasting computations, if after twenty years the time parameter would reduce no share by ninety percent of its initial value nor increase the share by more than ninety percent of all other shares, then time would not slow down. That is, t*, the maximum value to which time could move would have no limit. If t* was found to be less than twenty years then the rate of "slow down" for time was calculated. Table IV-9 shows the amount of slowdown required by country. For the importer Canada, no limit was set for t* in 59 percent of the 119 products; for 19 percent the limit was from 10-20 years. For all countries, t* was greater than ten years in over two-thirds of the cases and less than two years for only five percent of the products. These data indicate that the slowdown in time may have effects in a few isolated cases[6] but that the restraint on time will not be strong and pervasive.

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[6]Detailed examination shows that most drastic slowdowns in time, with t* less than two years, occur in Agricultural goods, Fuels and Crude materials.

TABLE IV-9

Distribution of Values of t* by Country

| Country / t* in years | Less than 2 | 2-5 | Percent 5-10 | 10-20 | No Limit |
|---|---|---|---|---|---|
| Canada | 02 | 04 | 16 | 19 | 59 |
| United States | 08 | 13 | 18 | 24 | 37 |
| Japan | 04 | 09 | 16 | 23 | 48 |
| Belgium-Luxembourg | 03 | 12 | 18 | 19 | 48 |
| France | 05 | 08 | 13 | 26 | 48 |
| Germany | 07 | 08 | 20 | 26 | 39 |
| Italy | 09 | 09 | 21 | 29 | 31 |
| Netherlands | 05 | 16 | 13 | 29 | 36 |
| United Kingdom | 03 | 14 | 21 | 25 | 37 |
| Others | 04 | 08 | 13 | 30 | 45 |
| TOTAL | 05 | 10 | 17 | 25 | 43 |

# Chapter V

## The Fit of the Equations

How well did our equations fit the data? How much did the rather elaborate consideration of prices improve on a simpler scheme, say the assumption of constant shares? This chapter will answer these questions.

Since the equations were estimated as shares of origin countries in a given total of imports by destination country, the fit measure for the equation viewed by importer will be based on the shares themselves. On the other hand, the model was developed to forecast exports. Hence, the fits viewed by exporter will be based on the exports of each country by commodity.

### Equation Fit by Importer

The equation used to estimate the shares was based on a Taylor series approximation. Since the last equation estimated yielded changes in the price parameters which did not change the computed world price, we could reasonably expect the $R^2$ of that last estimated equation to be close to zero. In addition, the time parameters were estimated from the residuals, and so the statistical fit from that equation would be inappropriate to use when discussing the fit on all the shares jointly for a given importer of a given commodity. Now $R^2$'s could, of course, be computed for how the whole equation works, but as long as a special computation had to be made, it seemed preferable to choose the following measure which seems a little clearer. Let us call this measure EITS, meaning Error in the share. We define EITS for a given

importer j in year t by

$$EITS_{jt} = \left( \sum_{i=1}^{n} | S_{ijt} - \hat{S}_{ijt} | \right) / 2$$

where,

$\hat{S}_{ijt}$ is the estimated share of imports to j coming from i in year t,

$S_{ijt}$ is the actual share,

and

n is the number of source countries in the model.

The division by two occurs because the constraint that the sum of all shares is unity implies that an error in one share by necessity generates an equal and opposite error in the other shares. So, while we cannot point a finger at the share with the matching error, we do know that we will count each error twice. EITS was computed using both the equation forecast share and a constant 1972 share.

Table V-1 shows EITS using the equation on the left side and using the constant share on the right as the predicted share for each of the twelve commodities by country by year. In addition, the average EITS's are displayed for each country by product. Let us examine Table V-1 beginning with the right hand side, which uses the constant share as the predicted share for the first product, Dairy and eggs. First look up and down each column. Even a quick scan will demonstrate that EITS gets larger the further the year in question is from the base year. Thus, we see one of the major findings of this study: constant shares are not a good assumption when dealing with trade flows. EITS is rather low at first but it seems to grow rather steadily as we get

Table V-1

Errors in the Shares

EQUATION 2 DAIRY AND EGGS CONSTANT

| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | .117 | .052 | .198 | .095 | .194 | .133 | .253 | .252 | .025 | .056 | .149 | .301 | .610 | .299 | .208 | .209 | .632 | .592 | .050 | .265 |
| 1963 | .080 | .040 | .243 | .164 | .178 | .098 | .133 | .275 | .024 | .032 | .253 | .286 | .640 | .287 | .194 | .173 | .513 | .704 | .033 | .291 |
| 1964 | .065 | .055 | .200 | .131 | .187 | .044 | .193 | .542 | .029 | .052 | .187 | .256 | .603 | .285 | .305 | .156 | .434 | .771 | .034 | .257 |
| 1965 | .030 | .068 | .119 | .091 | .225 | .036 | .105 | .380 | .019 | .066 | .173 | .205 | .532 | .277 | .344 | .155 | .370 | .597 | .047 | .207 |
| 1966 | .158 | .048 | .159 | .110 | .156 | .047 | .123 | .328 | .020 | .053 | .227 | .098 | .290 | .218 | .318 | .136 | .255 | .463 | .052 | .127 |
| 1967 | .048 | .058 | .171 | .117 | .130 | .054 | .092 | .237 | .022 | .044 | .104 | .069 | .152 | .150 | .286 | .136 | .133 | .273 | .038 | .127 |
| 1968 | .049 | .080 | .122 | .093 | .120 | .037 | .104 | .190 | .033 | .073 | .082 | .114 | .138 | .118 | .266 | .101 | .127 | .234 | .055 | .137 |
| 1969 | .100 | .040 | .089 | .072 | .139 | .077 | .129 | .374 | .060 | .068 | .075 | .045 | .093 | .068 | .218 | .104 | .142 | .399 | .074 | .123 |
| 1970 | .092 | .110 | .172 | .082 | .122 | .080 | .057 | .299 | .031 | .044 | .086 | .112 | .179 | .140 | .152 | .074 | .121 | .319 | .042 | .108 |
| 1971 | .097 | .039 | .103 | .071 | .047 | .020 | .041 | .121 | .090 | .089 | .090 | .044 | .091 | .067 | .046 | .013 | .090 | .128 | .085 | .099 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .076 | .054 | .143 | .093 | .136 | .057 | .112 | .273 | .032 | .053 | .130 | .139 | .303 | .174 | .212 | .114 | .256 | .407 | .046 | .158 |

EQUATION 7 PRESERVED FRUITS AND VEGETABLE CONSTANT

| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | .030 | .068 | .087 | .066 | .042 | .062 | .077 | .050 | .053 | .064 | .214 | .262 | .200 | .318 | .156 | .275 | .175 | .265 | .142 | .303 |
| 1963 | .035 | .033 | .006 | .074 | .046 | .049 | .046 | .047 | .020 | .030 | .168 | .235 | .093 | .297 | .166 | .271 | .201 | .241 | .094 | .273 |
| 1964 | .030 | .051 | .006 | .043 | .051 | .030 | .043 | .032 | .020 | .029 | .108 | .278 | .071 | .277 | .165 | .280 | .182 | .208 | .070 | .234 |
| 1965 | .014 | .058 | .034 | .030 | .033 | .064 | .069 | .043 | .040 | .018 | .107 | .244 | .033 | .238 | .144 | .257 | .182 | .191 | .041 | .216 |
| 1966 | .014 | .017 | .022 | .057 | .012 | .060 | .051 | .045 | .030 | .035 | .093 | .133 | .026 | .196 | .119 | .217 | .110 | .148 | .040 | .178 |
| 1967 | .031 | .036 | .018 | .049 | .052 | .065 | .028 | .027 | .030 | .045 | .073 | .126 | .025 | .177 | .115 | .190 | .078 | .078 | .064 | .176 |
| 1968 | .036 | .010 | .032 | .075 | .024 | .060 | .115 | .052 | .023 | .055 | .052 | .072 | .012 | .135 | .086 | .151 | .119 | .056 | .031 | .150 |
| 1969 | .024 | .030 | .024 | .046 | .052 | .022 | .050 | .036 | .023 | .043 | .042 | .071 | .039 | .068 | .032 | .098 | .062 | .056 | .030 | .115 |
| 1970 | .048 | .028 | .019 | .021 | .052 | .044 | .043 | .026 | .011 | .052 | .075 | .062 | .030 | .073 | .031 | .054 | .040 | .032 | .022 | .091 |
| 1971 | .010 | .030 | .018 | .048 | .012 | .052 | .025 | .020 | .025 | .035 | .025 | .042 | .023 | .035 | .015 | .028 | .025 | .026 | .021 | .058 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .025 | .033 | .024 | .046 | .034 | .046 | .050 | .034 | .025 | .037 | .087 | .139 | .050 | .165 | .093 | .166 | .107 | .118 | .051 | .163 |

EQUATION 15 RUBBER(INCL. SYNTH)--CRUDE CONSTANT

| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | .034 | .019 | .012 | .071 | .056 | .076 | .139 | .137 | .071 | .166 | .116 | .140 | .213 | .352 | .279 | .301 | .329 | .382 | .241 | .374 |
| 1963 | .048 | .008 | .019 | .157 | .090 | .121 | .174 | .150 | .057 | .142 | .113 | .111 | .199 | .348 | .203 | .260 | .255 | .373 | .234 | .310 |
| 1964 | .051 | .014 | .003 | .176 | .043 | .071 | .156 | .057 | .040 | .152 | .112 | .108 | .192 | .358 | .217 | .262 | .214 | .345 | .231 | .317 |
| 1965 | .053 | .032 | .047 | .198 | .034 | .071 | .167 | .080 | .024 | .128 | .104 | .065 | .130 | .299 | .208 | .224 | .160 | .339 | .215 | .242 |
| 1966 | .031 | .059 | .015 | .135 | .067 | .053 | .101 | .077 | .061 | .085 | .068 | .031 | .133 | .260 | .189 | .217 | .163 | .279 | .197 | .226 |
| 1967 | .062 | .021 | .039 | .099 | .070 | .059 | .035 | .104 | .061 | .054 | .091 | .076 | .136 | .229 | .151 | .183 | .149 | .300 | .182 | .176 |
| 1968 | .040 | .016 | .087 | .128 | .102 | .046 | .052 | .131 | .066 | .053 | .068 | .052 | .155 | .179 | .146 | .147 | .155 | .209 | .163 | .145 |
| 1969 | .048 | .025 | .075 | .149 | .065 | .085 | .082 | .059 | .085 | .041 | .068 | .045 | .041 | .207 | .090 | .109 | .119 | .170 | .143 | .121 |
| 1970 | .050 | .044 | .038 | .144 | .066 | .055 | .037 | .052 | .032 | .149 | .062 | .053 | .034 | .173 | .089 | .109 | .091 | .148 | .058 | .210 |
| 1971 | .010 | .030 | .011 | .063 | .055 | .105 | .041 | .055 | .053 | .045 | .014 | .027 | .008 | .089 | .067 | .123 | .051 | .064 | .049 | .046 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .039 | .024 | .031 | .120 | .059 | .067 | .089 | .082 | .050 | .092 | .074 | .064 | .113 | .227 | .149 | .176 | .153 | .237 | .156 | .197 |

EQUATION 17 PULP AND PAPER CONSTANT

| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | .050 | .003 | .092 | .145 | .070 | .071 | .088 | .114 | .077 | .092 | .027 | .083 | .306 | .318 | .111 | .159 | .154 | .219 | .055 | .041 |
| 1963 | .018 | .036 | .052 | .080 | .026 | .039 | .038 | .041 | .043 | .038 | .046 | .043 | .161 | .309 | .107 | .152 | .156 | .227 | .063 | .067 |
| 1964 | .042 | .026 | .036 | .076 | .016 | .016 | .039 | .040 | .025 | .038 | .011 | .039 | .132 | .290 | .105 | .137 | .133 | .204 | .067 | .066 |
| 1965 | .006 | .014 | .015 | .038 | .021 | .047 | .028 | .060 | .031 | .048 | .042 | .065 | .081 | .308 | .109 | .133 | .133 | .190 | .092 | .091 |
| 1966 | .019 | .031 | .053 | .086 | .049 | .046 | .053 | .078 | .058 | .057 | .064 | .072 | .095 | .277 | .114 | .122 | .133 | .186 | .109 | .093 |
| 1967 | .042 | .019 | .055 | .123 | .037 | .044 | .032 | .056 | .032 | .041 | .095 | .056 | .068 | .272 | .092 | .095 | .093 | .107 | .076 | .077 |
| 1968 | .071 | .018 | .081 | .155 | .028 | .024 | .044 | .063 | .039 | .066 | .107 | .045 | .060 | .266 | .068 | .059 | .086 | .076 | .073 | .092 |
| 1969 | .070 | .006 | .061 | .157 | .035 | .034 | .051 | .029 | .056 | .054 | .096 | .012 | .056 | .236 | .060 | .058 | .080 | .053 | .083 | .074 |
| 1970 | .090 | .007 | .068 | .182 | .037 | .039 | .061 | .038 | .042 | .093 | .076 | .006 | .054 | .230 | .049 | .045 | .061 | .023 | .045 | .099 |
| 1971 | .058 | .006 | .040 | .043 | .029 | .046 | .034 | .038 | .020 | .066 | .052 | .001 | .032 | .022 | .038 | .036 | .029 | .023 | .023 | .062 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .042 | .015 | .050 | .098 | .032 | .037 | .043 | .051 | .039 | .054 | .056 | .038 | .095 | .230 | .078 | .091 | .096 | .119 | .062 | .069 |

Table V-1 (Cont'd)

| | EQUATION 28 PETROLEUM PRODUCTS | | | | | | | | | | CONSTANT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
| 1962 | .038 | .023 | .028 | .296 | .155 | .168 | .063 | .097 | .037 | .058 | .072 | .147 | .276 | .232 | .296 | .415 | .213 | .194 | .367 | .096 |
| 1963 | .021 | .021 | .012 | .272 | .047 | .101 | .064 | .114 | .062 | .045 | .049 | .148 | .254 | .232 | .375 | .358 | .178 | .174 | .385 | .108 |
| 1964 | .033 | .024 | .017 | .192 | .061 | .052 | .058 | .089 | .058 | .043 | .047 | .152 | .211 | .177 | .315 | .284 | .230 | .167 | .353 | .090 |
| 1965 | .018 | .024 | .032 | .120 | .083 | .120 | .049 | .051 | .052 | .034 | .027 | .150 | .121 | .207 | .324 | .237 | .136 | .111 | .257 | .081 |
| 1966 | .047 | .022 | .012 | .223 | .059 | .168 | .069 | .043 | .067 | .028 | .052 | .134 | .124 | .267 | .262 | .311 | .112 | .080 | .261 | .089 |
| 1967 | .034 | .028 | .043 | .255 | .044 | .148 | .049 | .092 | .053 | .031 | .034 | .118 | .138 | .295 | .229 | .273 | .086 | .125 | .278 | .077 |
| 1968 | .061 | .035 | .044 | .233 | .061 | .134 | .083 | .085 | .068 | .038 | .070 | .086 | .105 | .283 | .196 | .250 | .127 | .068 | .235 | .078 |
| 1969 | .054 | .051 | .043 | .144 | .118 | .104 | .143 | .077 | .057 | .048 | .062 | .060 | .092 | .158 | .115 | .131 | .165 | .086 | .171 | .055 |
| 1970 | .081 | .050 | .050 | .122 | .153 | .063 | .115 | .081 | .060 | .047 | .086 | .061 | .073 | .132 | .100 | .057 | .150 | .096 | .132 | .041 |
| 1971 | .064 | .051 | .012 | .079 | .066 | .064 | .072 | .092 | .082 | .048 | .066 | .048 | .024 | .092 | .055 | .040 | .079 | .102 | .130 | .048 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .041 | .030 | .027 | .176 | .077 | .102 | .069 | .075 | .054 | .038 | .051 | .100 | .129 | .189 | .206 | .214 | .134 | .109 | .233 | .069 |

| | EQUATION 38 RUBBER MANUFACTURES | | | | | | | | | | CONSTANT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
| 1962 | .054 | .064 | .171 | .148 | .142 | .114 | .122 | .098 | .156 | .056 | .146 | .217 | .365 | .289 | .238 | .181 | .208 | .173 | .267 | .165 |
| 1963 | .065 | .106 | .163 | .087 | .071 | .108 | .082 | .038 | .061 | .026 | .120 | .202 | .397 | .299 | .244 | .193 | .195 | .152 | .239 | .120 |
| 1964 | .022 | .073 | .082 | .051 | .063 | .053 | .068 | .042 | .093 | .028 | .131 | .131 | .315 | .242 | .220 | .142 | .179 | .161 | .284 | .096 |
| 1965 | .020 | .105 | .114 | .023 | .066 | .044 | .070 | .040 | .089 | .042 | .104 | .123 | .253 | .169 | .180 | .135 | .107 | .129 | .245 | .101 |
| 1966 | .027 | .079 | .145 | .042 | .056 | .035 | .045 | .021 | .091 | .013 | .076 | .123 | .156 | .136 | .211 | .116 | .090 | .106 | .202 | .072 |
| 1967 | .028 | .103 | .184 | .056 | .047 | .052 | .027 | .056 | .064 | .037 | .050 | .149 | .160 | .118 | .150 | .092 | .079 | .083 | .119 | .055 |
| 1968 | .059 | .083 | .134 | .058 | .026 | .050 | .076 | .033 | .089 | .047 | .086 | .085 | .119 | .102 | .055 | .092 | .119 | .074 | .095 | .074 |
| 1969 | .042 | .051 | .147 | .100 | .052 | .085 | .098 | .061 | .068 | .064 | .071 | .064 | .162 | .125 | .099 | .137 | .125 | .104 | .083 | .104 |
| 1970 | .042 | .057 | .164 | .041 | .018 | .066 | .056 | .039 | .099 | .037 | .041 | .066 | .125 | .059 | .068 | .101 | .070 | .067 | .080 | .062 |
| 1971 | .045 | .079 | .111 | .031 | .047 | .023 | .050 | .045 | .075 | .028 | .044 | .096 | .085 | .040 | .071 | .027 | .051 | .055 | .070 | .038 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .037 | .073 | .129 | .058 | .054 | .057 | .063 | .043 | .080 | .034 | .079 | .114 | .194 | .143 | .140 | .111 | .111 | .100 | .153 | .081 |

| | EQUATION 56 WIRE AND TUBES | | | | | | | | | | CONSTANT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
| 1962 | .028 | .124 | .246 | .080 | .067 | .056 | .093 | .095 | .398 | .076 | .218 | .308 | .343 | .225 | .331 | .212 | .235 | .184 | .279 | .210 |
| 1963 | .036 | .105 | .173 | .086 | .067 | .048 | .092 | .091 | .367 | .043 | .195 | .229 | .201 | .243 | .282 | .210 | .200 | .157 | .272 | .172 |
| 1964 | .062 | .077 | .088 | .098 | .037 | .056 | .056 | .050 | .255 | .036 | .123 | .148 | .227 | .193 | .271 | .202 | .214 | .115 | .312 | .135 |
| 1965 | .041 | .104 | .115 | .082 | .096 | .095 | .199 | .050 | .190 | .055 | .139 | .140 | .135 | .156 | .188 | .157 | .160 | .075 | .320 | .122 |
| 1966 | .031 | .061 | .060 | .069 | .072 | .040 | .064 | .034 | .095 | .038 | .136 | .079 | .062 | .156 | .169 | .135 | .175 | .077 | .255 | .102 |
| 1967 | .037 | .047 | .142 | .131 | .048 | .029 | .054 | .054 | .244 | .038 | .080 | .072 | .208 | .146 | .182 | .144 | .164 | .053 | .341 | .098 |
| 1968 | .039 | .112 | .252 | .047 | .069 | .056 | .072 | .049 | .306 | .039 | .101 | .137 | .307 | .163 | .175 | .102 | .180 | .037 | .333 | .066 |
| 1969 | .079 | .066 | .130 | .053 | .060 | .095 | .067 | .031 | .288 | .033 | .123 | .092 | .190 | .143 | .168 | .094 | .191 | .031 | .319 | .061 |
| 1970 | .027 | .091 | .104 | .040 | .050 | .125 | .085 | .062 | .163 | .068 | .048 | .092 | .141 | .112 | .115 | .146 | .130 | .071 | .187 | .081 |
| 1971 | .128 | .089 | .148 | .058 | .048 | .060 | .094 | .032 | .155 | .075 | .090 | .081 | .157 | .070 | .031 | .069 | .119 | .029 | .172 | .048 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .046 | .080 | .133 | .068 | .056 | .060 | .080 | .050 | .224 | .046 | .114 | .125 | .179 | .146 | .174 | .134 | .161 | .075 | .254 | .100 |

| | EQUATION 74 TEXTILE AND LEATHER MACHINERY | | | | | | | | | | CONSTANT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
| 1962 | .104 | .179 | .158 | .054 | .075 | .090 | .102 | .072 | .111 | .024 | .293 | .212 | .289 | .087 | .087 | .160 | .106 | .083 | .145 | .151 |
| 1963 | .093 | .158 | .119 | .030 | .040 | .085 | .087 | .042 | .084 | .043 | .256 | .192 | .267 | .096 | .096 | .176 | .103 | .089 | .120 | .139 |
| 1964 | .091 | .091 | .125 | .055 | .025 | .055 | .075 | .046 | .038 | .041 | .280 | .177 | .210 | .127 | .103 | .129 | .096 | .050 | .135 | .102 |
| 1965 | .045 | .063 | .118 | .067 | .033 | .048 | .058 | .047 | .025 | .034 | .223 | .140 | .171 | .101 | .066 | .126 | .135 | .067 | .125 | .093 |
| 1966 | .059 | .061 | .138 | .040 | .046 | .046 | .085 | .037 | .033 | .036 | .221 | .112 | .253 | .110 | .102 | .090 | .155 | .055 | .109 | .105 |
| 1967 | .041 | .086 | .114 | .064 | .050 | .054 | .083 | .037 | .027 | .034 | .175 | .132 | .216 | .089 | .098 | .074 | .139 | .052 | .084 | .073 |
| 1968 | .057 | .130 | .103 | .098 | .052 | .062 | .071 | .076 | .052 | .047 | .102 | .159 | .118 | .108 | .069 | .061 | .111 | .086 | .091 | .059 |
| 1969 | .082 | .086 | .117 | .056 | .047 | .067 | .053 | .049 | .069 | .032 | .075 | .113 | .112 | .078 | .074 | .059 | .088 | .057 | .075 | .041 |
| 1970 | .064 | .066 | .118 | .094 | .050 | .101 | .064 | .055 | .050 | .039 | .092 | .081 | .131 | .088 | .070 | .105 | .089 | .061 | .061 | .052 |
| 1971 | .069 | .092 | .054 | .078 | .040 | .040 | .071 | .057 | .047 | .051 | .064 | .098 | .054 | .077 | .050 | .047 | .077 | .060 | .040 | .057 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .064 | .092 | .106 | .058 | .042 | .059 | .068 | .047 | .049 | .035 | .162 | .129 | .166 | .087 | .074 | .093 | .100 | .060 | .090 | .079 |

Table V-1 (Cont'd)

EQUATION 78 CONSTRUCTION MACHINES CONSTANT

| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | .040 | .190 | .117 | .115 | .079 | .137 | .197 | .112 | .174 | .061 | .103 | .415 | .121 | .215 | .201 | .306 | .326 | .200 | .311 | .237 |
| 1963 | .015 | .124 | .062 | .053 | .058 | .110 | .159 | .056 | .110 | .046 | .103 | .404 | .095 | .188 | .214 | .304 | .256 | .175 | .307 | .186 |
| 1964 | .018 | .241 | .182 | .123 | .082 | .113 | .139 | .124 | .117 | .038 | .087 | .357 | .240 | .183 | .172 | .278 | .219 | .193 | .349 | .164 |
| 1965 | .020 | .108 | .028 | .088 | .091 | .129 | .126 | .089 | .060 | .031 | .082 | .371 | .092 | .085 | .192 | .261 | .204 | .142 | .289 | .124 |
| 1966 | .058 | .103 | .201 | .089 | .074 | .078 | .149 | .062 | .118 | .064 | .060 | .401 | .188 | .137 | .147 | .235 | .178 | .141 | .228 | .126 |
| 1967 | .038 | .130 | .091 | .082 | .057 | .101 | .176 | .095 | .104 | .053 | .064 | .296 | .094 | .102 | .111 | .162 | .220 | .129 | .169 | .121 |
| 1968 | .025 | .095 | .058 | .145 | .087 | .097 | .125 | .082 | .130 | .060 | .053 | .216 | .079 | .157 | .087 | .115 | .148 | .122 | .135 | .108 |
| 1969 | .049 | .097 | .051 | .066 | .041 | .089 | .082 | .099 | .134 | .060 | .038 | .208 | .098 | .079 | .041 | .087 | .097 | .118 | .112 | .061 |
| 1970 | .026 | .062 | .116 | .037 | .054 | .082 | .049 | .079 | .052 | .049 | .036 | .146 | .152 | .052 | .058 | .072 | .075 | .094 | .104 | .054 |
| 1971 | .021 | .166 | .149 | .062 | .048 | .042 | .031 | .062 | .059 | .045 | .011 | .188 | .156 | .074 | .044 | .028 | .043 | .069 | .102 | .038 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .028 | .120 | .096 | .078 | .061 | .089 | .112 | .078 | .096 | .046 | .058 | .273 | .119 | .116 | .115 | .168 | .161 | .126 | .192 | .111 |

EQUATION 81 PUMPS CONSTANT

| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET° | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | .046 | .236 | .113 | .012 | .075 | .036 | .052 | .058 | .145 | .023 | .097 | .246 | .205 | .179 | .113 | .170 | .102 | .195 | .211 | .120 |
| 1963 | .017 | .177 | .083 | .027 | .051 | .062 | .037 | .022 | .090 | .028 | .058 | .263 | .093 | .177 | .109 | .138 | .123 | .184 | .157 | .125 |
| 1964 | .027 | .137 | .091 | .050 | .010 | .061 | .043 | .026 | .075 | .042 | .057 | .271 | .186 | .126 | .077 | .140 | .113 | .173 | .159 | .121 |
| 1965 | .014 | .045 | .077 | .039 | .046 | .028 | .027 | .036 | .076 | .024 | .037 | .301 | .048 | .101 | .062 | .077 | .123 | .134 | .142 | .095 |
| 1966 | .009 | .121 | .053 | .041 | .038 | .038 | .057 | .029 | .053 | .030 | .029 | .294 | .068 | .110 | .074 | .029 | .063 | .124 | .114 | .084 |
| 1967 | .021 | .140 | .038 | .035 | .034 | .061 | .029 | .054 | .038 | .017 | .031 | .252 | .042 | .082 | .075 | .034 | .080 | .115 | .068 | .072 |
| 1968 | .017 | .110 | .038 | .042 | .039 | .042 | .037 | .042 | .045 | .030 | .026 | .232 | .041 | .100 | .092 | .049 | .082 | .111 | .083 | .065 |
| 1969 | .012 | .154 | .032 | .042 | .038 | .053 | .042 | .026 | .048 | .034 | .017 | .224 | .050 | .105 | .083 | .074 | .105 | .093 | .081 | .059 |
| 1970 | .020 | .110 | .020 | .040 | .016 | .037 | .055 | .041 | .029 | .014 | .015 | .155 | .036 | .047 | .050 | .031 | .062 | .088 | .060 | .035 |
| 1971 | .015 | .078 | .039 | .028 | .042 | .029 | .037 | .027 | .047 | .018 | .015 | .081 | .049 | .047 | .054 | .026 | .042 | .047 | .061 | .022 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .018 | .119 | .053 | .032 | .035 | .041 | .038 | .033 | .059 | .024 | .035 | .211 | .074 | .098 | .072 | .070 | .081 | .115 | .103 | .072 |

EQUATION 95 PERSONAL AUTOS CONSTANT

| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | .052 | .083 | .199 | .088 | .123 | .161 | .173 | .197 | .198 | .103 | .554 | .619 | .225 | .199 | .302 | .323 | .232 | .265 | .293 | .238 |
| 1963 | .169 | .070 | .044 | .046 | .046 | .170 | .069 | .055 | .092 | .037 | .566 | .619 | .209 | .205 | .293 | .294 | .195 | .268 | .258 | .265 |
| 1964 | .133 | .133 | .033 | .030 | .106 | .056 | .056 | .085 | .042 | .035 | .539 | .604 | .162 | .165 | .341 | .164 | .264 | .275 | .303 | .265 |
| 1965 | .126 | .150 | .034 | .059 | .064 | .113 | .062 | .049 | .103 | .052 | .345 | .526 | .158 | .175 | .253 | .117 | .226 | .238 | .298 | .245 |
| 1966 | .029 | .105 | .093 | .047 | .073 | .105 | .067 | .053 | .082 | .043 | .149 | .351 | .164 | .142 | .231 | .140 | .224 | .203 | .238 | .219 |
| 1967 | .078 | .075 | .069 | .045 | .090 | .076 | .078 | .051 | .061 | .019 | .151 | .194 | .121 | .111 | .199 | .102 | .183 | .191 | .204 | .159 |
| 1968 | .038 | .043 | .075 | .046 | .106 | .074 | .081 | .084 | .095 | .041 | .130 | .151 | .132 | .075 | .147 | .138 | .152 | .186 | .200 | .160 |
| 1969 | .035 | .104 | .049 | .024 | .072 | .075 | .116 | .047 | .108 | .050 | .097 | .140 | .091 | .041 | .089 | .101 | .143 | .138 | .213 | .145 |
| 1970 | .023 | .072 | .075 | .056 | .060 | .044 | .090 | .056 | .101 | .061 | .057 | .090 | .101 | .056 | .105 | .065 | .097 | .109 | .156 | .076 |
| 1971 | .014 | .048 | .079 | .036 | .052 | .103 | .032 | .062 | .085 | .039 | .037 | .030 | .091 | .041 | .048 | .115 | .039 | .072 | .113 | .029 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .063 | .080 | .068 | .043 | .072 | .089 | .075 | .067 | .088 | .044 | .239 | .302 | .132 | .110 | .182 | .142 | .160 | .177 | .207 | .164 |

EQUATION 106 CLOTHING CONSTANT

| | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH | CAN | USA | JAP | B-L | FRA | GER | ITA | NET | UK | OTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1962 | .034 | .123 | .512 | .076 | .148 | .040 | .145 | .095 | .086 | .087 | .417 | .404 | .545 | .197 | .256 | .096 | .369 | .217 | .301 | .280 |
| 1963 | .048 | .054 | .246 | .054 | .072 | .041 | .088 | .064 | .016 | .048 | .356 | .410 | .614 | .189 | .233 | .080 | .305 | .186 | .185 | .260 |
| 1964 | .031 | .026 | .104 | .068 | .062 | .049 | .082 | .033 | .027 | .037 | .332 | .383 | .442 | .196 | .220 | .088 | .295 | .153 | .158 | .240 |
| 1965 | .040 | .024 | .054 | .050 | .084 | .024 | .100 | .024 | .022 | .041 | .319 | .356 | .324 | .160 | .207 | .079 | .300 | .138 | .166 | .239 |
| 1966 | .061 | .070 | .061 | .033 | .052 | .011 | .133 | .033 | .021 | .058 | .298 | .353 | .252 | .135 | .206 | .074 | .290 | .128 | .151 | .220 |
| 1967 | .020 | .038 | .055 | .056 | .053 | .031 | .072 | .038 | .018 | .041 | .209 | .287 | .183 | .138 | .190 | .092 | .178 | .124 | .117 | .174 |
| 1968 | .042 | .048 | .027 | .079 | .085 | .041 | .106 | .054 | .029 | .045 | .155 | .242 | .072 | .136 | .205 | .093 | .154 | .112 | .070 | .160 |
| 1969 | .034 | .056 | .037 | .094 | .093 | .053 | .111 | .042 | .040 | .040 | .155 | .210 | .063 | .144 | .162 | .096 | .139 | .087 | .047 | .107 |
| 1970 | .026 | .038 | .027 | .062 | .072 | .055 | .066 | .041 | .012 | .037 | .128 | .153 | .035 | .106 | .131 | .090 | .112 | .072 | .039 | .079 |
| 1971 | .015 | .013 | .045 | .051 | .055 | .018 | .044 | .019 | .019 | .019 | .071 | .071 | .039 | .036 | .099 | .048 | .082 | .037 | .011 | .044 |
| 1972 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| AVE | .032 | .044 | .106 | .057 | .071 | .033 | .086 | .040 | .026 | .041 | .222 | .261 | .233 | .131 | .173 | .076 | .202 | .114 | .113 | .164 |

further from the base year. Even five years from the base year, constant shares lead to relatively high values of EITS. Now let us look at the left hand side of Table V-1, where the predicted share used in calculating EITS was the equation share. Again, scan the columns. Again we see that the EITS for 1962 to 1964 or so are generally much higher than those of say, 1969 to 1971. But notice that the trend is not nearly so great as that observed for the constant share prediction. In fact, sometimes the later years produced higher values of EITS than did those early years which were far from the base year.

Now let us compare the average EITS under the equation and constant share predictions. One point that must be made is that we should not always expect the equation EITS to be smaller of the two. Why? The method of least squares was used in the regression which produced the parameters; therefore, EITS was not the value minimized. EITS is a linear error measure, so large errors are not weighted as heavily as they are under least squares. Therefore we could expect a few, though surely not many, cases where the equation EITS were larger than the constant share EITS.

Table V-2 displays the ratio of the equation EITS to the constant share EITS for each of the 119 commodities. From this ratio we can get an indication of the degree of improvement which was obtained by the equation. The improvements were rather general. It is, however, difficult to get a distinct feeling of the improvement generated in this table. Figure V-1 shows a histogram of the improvement. The height shows the percentage of sectors showing the amount of improvement on the horizontal axis. The model ratio appears to be in the range of .5

Table V-2

RATIO OF EQUATION TO CONSTANT SHARE EITS

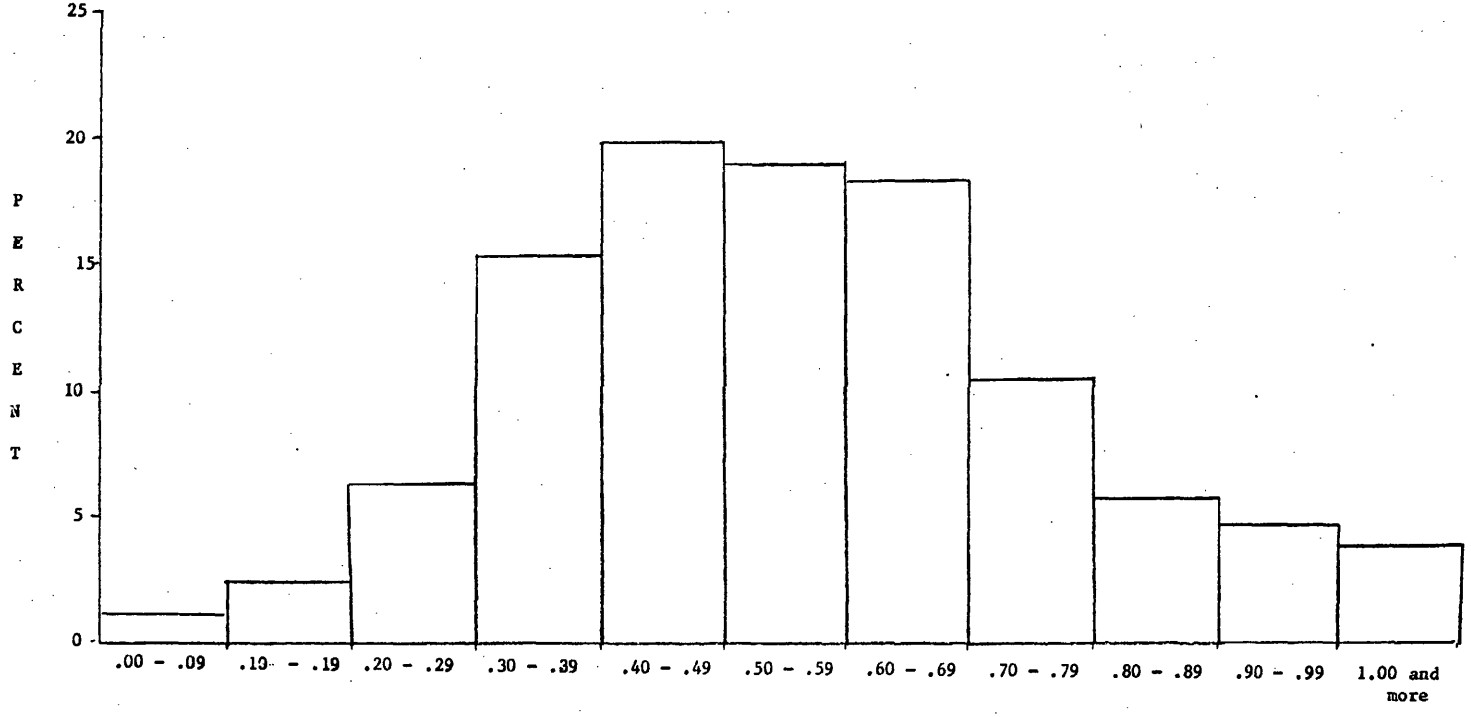
| SECTOR | TITLE | CANADA | U.S.A. | JAPAN | BEL-LUX | FRANCE | GERMANY | ITALY | NETHERLAN | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MEAT AND LIVE ANIMALS | .715 | .880 | .581 | .518 | .611 | .402 | .204 | .420 | .376 | .708 |
| 2 | DAIRY AND EGGS | .586 | .384 | .474 | .538 | .642 | .499 | .436 | .670 | .696 | .332 |
| 3 | FISH | .414 | .245 | .456 | .283 | .538 | .563 | .463 | .351 | .268 | .193 |
| 4 | GRAINS UNMILLED | 1.000 | .853 | .625 | .318 | .587 | .510 | .491 | .312 | .698 | .908 |
| 5 | GRAINS MILLED | .589 | .539 | .485 | .397 | .409 | .537 | .675 | .596 | .445 | .453 |
| 6 | FRESH FRUITS AND VEGETAB | .864 | .744 | .719 | .571 | .743 | .420 | .762 | .480 | .606 | .494 |
| 7 | PRESERVED FRUITS AND VEG | .285 | .237 | .481 | .279 | .365 | .279 | .466 | .291 | .494 | .226 |
| 8 | SUGAR | .888 | .817 | .822 | .644 | .370 | .504 | .664 | .546 | .607 | .568 |
| 9 | COFFEE,TEA,COCOA,ETC | .446 | .346 | .462 | .394 | .254 | .341 | .330 | .488 | .637 | .511 |
| 10 | FEED STUFFS | .540 | .906 | .833 | .476 | .328 | .386 | .830 | .398 | .496 | .359 |
| 11 | FATS AND OILS | .906 | 1.082 | .922 | .507 | .621 | .877 | .644 | .795 | .853 | 1.402 |
| 12 | BEVERAGES | .600 | .536 | .953 | .441 | .223 | .493 | .797 | .590 | .344 | .560 |
| 13 | TOBACCO AND TOBACCO PROD | .538 | .794 | .759 | .608 | .368 | .458 | .560 | .337 | .485 | .449 |
| 14 | HIDES,LEATHER,FURS | .395 | .510 | .710 | .471 | .479 | .447 | .456 | .492 | .503 | .449 |
| 15 | RUBBER(INCL. SYNTH)--CRU | .522 | .380 | .279 | .529 | .395 | .383 | .583 | .345 | .320 | .469 |
| 16 | CRUDE WOOD | .960 | .303 | .367 | .387 | .353 | .793 | .573 | .676 | .248 | .312 |
| 17 | PULP AND PAPER | .754 | .393 | .529 | .429 | .408 | .410 | .443 | .426 | .619 | .777 |
| 18 | SILK, OTH. NON MANMADE F | .409 | .638 | .473 | .407 | .678 | .419 | .535 | .489 | .388 | .620 |
| 19 | WOOL | .387 | .538 | .656 | .533 | .470 | .247 | .572 | .373 | .444 | .422 |
| 20 | COTTON | 1.019 | 1.000 | 3.371 | .570 | .680 | .936 | 1.827 | .857 | .561 | .886 |
| 21 | CRUDE FERTILIZERS | 1.000 | .234 | .686 | .313 | .205 | .305 | .857 | .744 | .431 | .284 |
| 22 | MARBLE,SAND, AND OTH.CRU | .610 | .657 | .554 | .435 | .554 | .582 | .357 | .750 | .551 | .436 |
| 23 | IRON ORE AND SCRAP | .911 | .856 | .360 | .407 | .400 | .480 | .593 | .846 | .918 | .639 |
| 24 | NONFERROUS ORES AND SCRA | .902 | .902 | .695 | .622 | .751 | .901 | .748 | .586 | .616 | .836 |
| 25 | VEGETABLE MATERIALS,NES | .630 | .433 | .480 | .257 | .591 | .523 | .699 | .737 | .640 | .429 |
| 26 | COAL, COKE | .153 | .540 | .505 | .501 | .388 | .275 | .439 | .633 | .343 | .425 |
| 27 | CRUDE PERTOLEUM | 1.000 | .207 | .365 | .381 | .495 | .397 | .323 | .700 | .431 | .293 |
| 28 | PETROLEUM PRODUCTS | .796 | .298 | .206 | .932 | .373 | .477 | .517 | .682 | .233 | .550 |
| 29 | GAS, NATURAL AND SYNTHET | 1.000 | .276 | .450 | .260 | .346 | .922 | .355 | .892 | .640 | .335 |
| 30 | ELECTRICAL ENERGY | .000 | 9.000 | .000 | 1.000 | 1.000 | 1.246 | .000 | .000 | .393 | .664 |
| 31 | CHEMICAL ELEMENTS | .504 | .499 | .567 | .685 | .482 | .553 | .415 | .734 | .515 | .471 |
| 32 | DYEING,TANNING, AND COAL | .306 | .362 | .464 | .443 | .369 | .505 | .331 | .589 | .507 | .311 |
| 33 | MEDICINAL CHEMICALS | .749 | .877 | .505 | .468 | .821 | .561 | .518 | .655 | .799 | .428 |
| 34 | PERFUME MAT. AND OTH. CH | .639 | .818 | .686 | .525 | .631 | .526 | .458 | .610 | .583 | .791 |
| 35 | MANUFACTURED FERTILIZERS | .852 | .561 | .485 | .636 | .425 | .420 | .381 | .804 | .313 | .452 |
| 36 | EXPOLSIVES | .954 | .734 | .985 | .725 | .698 | .803 | .812 | .659 | .634 | .508 |
| 37 | PLASTIC MATERIALS | .738 | .729 | .606 | .659 | .303 | .488 | .289 | .561 | .548 | .336 |
| 38 | RUBBER MANUFACTURES | .467 | .636 | .662 | .403 | .384 | .518 | .568 | .428 | .526 | .426 |
| 39 | VENEERS, PLAYWOOD | .295 | .165 | .666 | .552 | .794 | .724 | .631 | .700 | .335 | .258 |
| 40 | NEWSPRINT | 1.000 | .735 | 1.010 | .346 | .610 | .719 | 1.000 | .599 | .488 | .792 |
| 41 | KRAFTPAPER | 1.000 | .381 | .898 | .308 | .222 | .325 | .228 | .459 | .997 | .767 |
| 42 | FIBREBOARD | .668 | .443 | 1.000 | .441 | .402 | .533 | .819 | .696 | .994 | .506 |
| 43 | OTHER PAPER AND PAPERBOA | .485 | .362 | .421 | .337 | .308 | .437 | .389 | .303 | .523 | .326 |
| 44 | ART. OF PAPER AND PAPERB | .745 | .555 | .633 | .473 | .463 | .360 | .368 | .444 | .411 | .264 |
| 45 | YARNS AND THREADS | .569 | .755 | .797 | .364 | .458 | .544 | .819 | .469 | .446 | .703 |
| 46 | COTTON FABRICS | .273 | .350 | .732 | .323 | .540 | .302 | .674 | .330 | .578 | .217 |
| 47 | OTH TEXT FAB EXC FLOOR C | .413 | .450 | .339 | .309 | .386 | .323 | .566 | .219 | .313 | .303 |
| 48 | FLOOR COVERINGS | .350 | .321 | .500 | .766 | .550 | .433 | .857 | .638 | .538 | .385 |
| 49 | STONE AND BRICKS | .395 | .481 | .388 | .333 | .411 | .371 | .471 | .540 | .510 | .359 |
| 50 | GLASS | .284 | .268 | .735 | .519 | .563 | .358 | .527 | .418 | .377 | .332 |
| 51 | POTTERY, PERALS, PRECIOU | .513 | .728 | 1.091 | .705 | .714 | .777 | .550 | .787 | .463 | .435 |
| 52 | PIG IRON | .900 | .366 | .907 | .842 | .808 | .601 | .692 | .624 | .722 | .616 |
| 53 | IRON AND STEEL INGOTS AN | .629 | .704 | .978 | .691 | .234 | .359 | .597 | .416 | .809 | .475 |
| 54 | UNIVERALS AND PLATES | .319 | .674 | 1.030 | .642 | .330 | .357 | .632 | .341 | .672 | .300 |
| 55 | HOOPS AND RAIL TRACK | .458 | .329 | .928 | .664 | .548 | .847 | .790 | .517 | .614 | .589 |
| 56 | WIRE AND TUBES | .406 | .636 | .739 | .462 | .322 | .450 | .495 | .660 | .882 | .459 |
| 57 | IRON AND STEEL CASTINGS | .929 | .265 | 1.000 | .855 | .624 | .681 | .602 | .729 | .731 | .473 |
| 58 | COPPER | .646 | .539 | .505 | .665 | .244 | .445 | .341 | .282 | .572 | .362 |
| 59 | ALUMINUM | .819 | .530 | .616 | .333 | .482 | .445 | .410 | .434 | .317 | .330 |
| 60 | LEAD AND ZINC | .415 | .626 | 1.700 | .736 | .273 | .638 | .419 | .454 | .439 | .398 |

Table V-2 (Cont'd)

| SECTOR | TITLE | CANADA | U.S.A. | JAPAN | BEL-LUX | FRANCE | GERMANY | ITALY | NETHERLAN | U.K. | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | OTHER NONFERROUS | .321 | .583 | .655 | .879 | .466 | .587 | .826 | .679 | .745 | .705 |
| 62 | FINISHED STRUCTURAL PART | .900 | .694 | .967 | .648 | .360 | .829 | 1.391 | .604 | .556 | .367 |
| 63 | METAL CONTAINERS | .368 | .911 | .801 | .679 | .448 | .646 | .792 | .651 | .648 | .357 |
| 64 | WIRE PRODUCTS | .694 | .361 | .986 | .603 | .489 | .754 | .340 | .589 | .646 | .475 |
| 65 | HARDWARE | .327 | .425 | .645 | .719 | .582 | .567 | .635 | .521 | .583 | .331 |
| 66 | BOILERS AND TURBINES | .781 | .975 | .985 | .643 | .745 | .833 | .968 | .731 | .626 | .483 |
| 67 | AIRCRAFT ENGINES | .264 | .493 | .377 | .637 | .810 | .718 | .745 | .459 | .454 | .655 |
| 68 | INTERNAL COMBUSTION ENGI | .846 | .512 | .762 | .779 | .602 | .645 | .499 | .437 | .449 | .479 |
| 69 | OTHER POWER MACHINERY | .808 | .855 | .952 | .625 | 1.079 | .726 | 1.261 | .914 | .554 | .694 |
| 70 | AGRICULTURAL MACHINERY | .500 | .393 | .738 | .573 | .527 | .552 | .486 | .794 | .552 | .441 |
| 71 | OFFICE MACHINES | .580 | .407 | .639 | .570 | .515 | .522 | .908 | .452 | 1.043 | .389 |
| 72 | COMPUTER AND RELATED EQU | 1.067 | 1.239 | .609 | .874 | .778 | .670 | .936 | .651 | .685 | .624 |
| 73 | METAL WORKING MACHINERY | .663 | .682 | .367 | .651 | .540 | .572 | .803 | .645 | .293 | .637 |
| 74 | TEXTILE AND LEATHER MACH | .396 | .716 | .640 | .662 | .561 | .631 | .681 | .784 | .544 | .437 |
| 75 | PAPER MILL MACHINES | .943 | .429 | 1.018 | .642 | .677 | .762 | .680 | .833 | .468 | .738 |
| 76 | PRINTING MACHINES | .729 | .682 | .759 | .477 | .519 | .637 | .481 | .360 | .374 | .369 |
| 77 | FOOD PROCESSING MACHINES | .630 | .720 | .915 | .408 | .395 | .587 | .633 | .623 | .657 | .690 |
| 78 | CONSTRUCTION MACHINES | .486 | .438 | .803 | .675 | .529 | .529 | .699 | .621 | .502 | .415 |
| 79 | MINERAL CRUSHING MACHINE | .678 | .557 | .541 | .629 | .377 | .870 | .676 | .875 | .510 | .584 |
| 80 | HEATING AND COOLING EQUI | .694 | .723 | .724 | .703 | .556 | .560 | .379 | .393 | .521 | .529 |
| 81 | PUMPS | .514 | .564 | .715 | .333 | .494 | .583 | .464 | .285 | .570 | .326 |
| 82 | MECHANICAL HANDLING EQUI | .452 | .547 | .480 | .469 | .438 | .488 | .480 | .349 | .533 | .263 |
| 83 | ALL OTHER NON-ELECTRICAL | .401 | .325 | .615 | .599 | .429 | .500 | .477 | .654 | .404 | .318 |
| 84 | ELECTRIC POWER MACHINES | .482 | .677 | .875 | .795 | .939 | .742 | .598 | .765 | .665 | .451 |
| 85 | EQUIP OFR DISTRIBUTING E | .669 | .745 | .799 | .761 | 1.078 | .573 | .706 | .668 | .538 | .431 |
| 86 | TELEVISION SETS AND RADI | .401 | .492 | .778 | .521 | .684 | .634 | .713 | .380 | .727 | .376 |
| 87 | APPLIANCES, DOMESTIC | .281 | .459 | .854 | .585 | .632 | .523 | .561 | .428 | .422 | .431 |
| 88 | MEDICAL ELECTRICAL APPLI | .582 | .733 | .656 | .534 | .673 | .776 | .455 | .561 | .723 | .383 |
| 89 | BATTERIES | .433 | .665 | .659 | .450 | .369 | .613 | .582 | .471 | .999 | .408 |
| 90 | LAMPS | .311 | .546 | 1.258 | .428 | .618 | .598 | .372 | .717 | .474 | .528 |
| 91 | TRANSISTORS | .479 | .287 | .537 | .689 | .716 | .579 | .801 | .461 | .932 | .141 |
| 92 | ELECTRICAL MEASURING INS | .337 | 1.209 | .397 | .623 | .549 | .867 | .679 | .747 | .596 | .356 |
| 93 | OTHER ELECTRIAL MACH.,N | .332 | .608 | .506 | .383 | .569 | .596 | .548 | .604 | .608 | .341 |
| 94 | RAILWAY VEHICLES | .656 | .696 | .824 | .253 | .545 | .624 | .716 | .475 | .608 | .458 |
| 95 | PERSONAL AUTOS | .265 | .266 | .516 | .394 | .395 | .627 | .469 | .380 | .424 | .266 |
| 96 | BUSSES AND TRUCKS | .325 | .591 | .448 | .687 | .658 | .951 | .489 | .670 | .869 | .379 |
| 97 | AUTO BODIES AND CHASSES | .391 | .326 | .965 | .906 | .611 | .696 | .419 | .761 | 1.158 | .473 |
| 98 | MOTOR CYCLES | .610 | .493 | 1.000 | .335 | .301 | .569 | .332 | .635 | .363 | .343 |
| 99 | ROAD VEHICLES | .404 | .423 | 1.115 | .648 | .709 | .664 | .805 | .522 | .779 | .413 |
| 100 | AIRCRAFT AND PARTS | .587 | .935 | .601 | .845 | .997 | .905 | .692 | .841 | .615 | .887 |
| 101 | WARSHIPS | 1.000 | .000 | .200 | 1.000 | .071 | .222 | .308 | 1.000 | .000 | .416 |
| 102 | SHIPS AND BOATS | .764 | .921 | .437 | .683 | .765 | 1.086 | .666 | .866 | .819 | .511 |
| 103 | SANITARY,PLUMBING,HEAT. | .319 | .585 | .330 | .521 | .652 | .339 | .713 | .578 | .383 | .382 |
| 104 | FURNITURE | .262 | .482 | .552 | .939 | .637 | .476 | .552 | .909 | .590 | .264 |
| 105 | TRAVEL GOODS, HADNBAGS | .318 | .418 | .566 | .582 | .520 | .548 | .565 | .533 | .333 | .288 |
| 106 | CLOTHING | .144 | .171 | .455 | .433 | .407 | .434 | .426 | .353 | .233 | .251 |
| 107 | FOOTWEAR | .210 | .196 | .287 | .391 | .501 | .579 | .569 | .284 | .647 | .231 |
| 108 | SCIENTIFIC,MEDICAL INSTR | .704 | .551 | .774 | .583 | .621 | .636 | .583 | .739 | .777 | .517 |
| 109 | PHOTOGRAPIC SUPPLIES | .562 | .376 | .756 | .662 | .513 | .471 | .406 | .313 | .567 | .407 |
| 110 | WATCHES AND CLOCKS | .532 | .389 | .467 | .340 | .551 | .278 | .356 | .341 | .462 | .180 |
| 111 | MUSICAL INSTRUMENTS | .427 | .267 | .522 | .555 | .290 | .354 | .406 | .447 | .392 | .205 |
| 112 | PHONOGRAPHS AND RECORDS | .586 | .583 | .415 | .571 | .822 | .659 | .644 | .557 | .781 | .656 |
| 113 | PRINT MATTER | .343 | .680 | .889 | .374 | .415 | .637 | .762 | .565 | .527 | .369 |
| 114 | ART | .731 | .303 | .867 | .578 | .607 | .670 | .488 | .341 | .574 | .403 |
| 115 | TOYS AND CARRIAGES, GAME | .385 | .266 | 1.049 | .385 | .450 | .785 | .456 | .565 | .762 | .281 |
| 116 | OFFICE SUPPLIES | .530 | .951 | 1.000 | .436 | .419 | .879 | .610 | .299 | .619 | .330 |
| 117 | JEWELLERY | .555 | .403 | .732 | .673 | .431 | .608 | .577 | .643 | .711 | .531 |
| 118 | MANUFACTURES,NES | .841 | .280 | .906 | .797 | .698 | .536 | .784 | .535 | .701 | 1.541 |
| 119 | COMMERICAL AND TRANSACT. | .429 | .421 | .490 | .623 | .498 | .558 | .458 | .408 | .494 | .604 |

Figure V-1

Distribution of the Ratio of Equation EITS to
Constant Share EITS for All Countries
and Commodities



to .59. This suggests that the equation removed a little less than half the error generated by the constant share equations. This histogram does show that there were few instances of near total improvement or of total lack of improvement. Further, the slight skewness of the histogram indicates that most fits were slightly better than the model one. Histograms for major SITC classifications are shown in Figure V-2. Comparing each of these with the total (Figure V-1), we observe that the improvement was better for Manufactured goods but somewhat worse for Chemicals than the average. Figure V-3 shows histograms corresponding to those in Figures V-1 and Figure V-2 for each of the countries in the model. The most striking feature displayed in these charts is the much greater improvement for "Others." The American and Canadian histograms are quite similar, the Japanese appears to be the worst of the lot. All the charts demonstrate a skewness to the left, except for the Belgium one, indicating that there exist data problems in a few sectors and that prices and trends are not the only important factors in bilateral trade flows.

In our discussions of the time parameters in Chapter IV, as the reader may recall, we said that there would be a discussion of the relative contributions to the fit of the price and time parameters. Since the time parameters were estimated from the residuals, we would expect that the price parameters would have more explanatory power attributable to them than they would have had if they had been estimated simultaneously with the time parameters. Figure V-4 shows a histogram with the percent of commodities by country on the vertical axis having

Figure V-2

Distribution of Ratio of Equation EITS to Constant Share EITS by Commodity

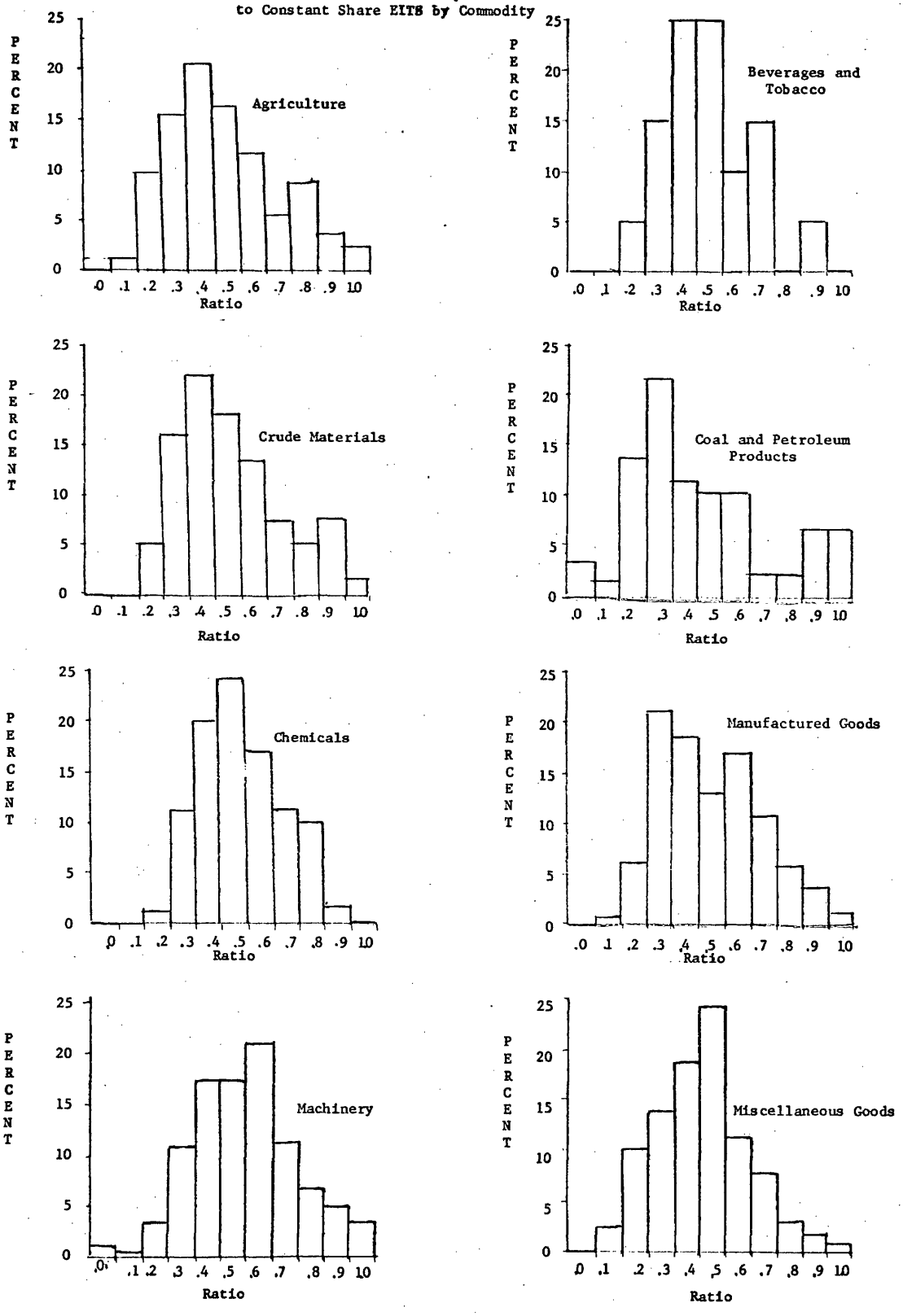


Figure V-3

Distribution of Ratio of Equation EITS
to Constant Share EITS by Country

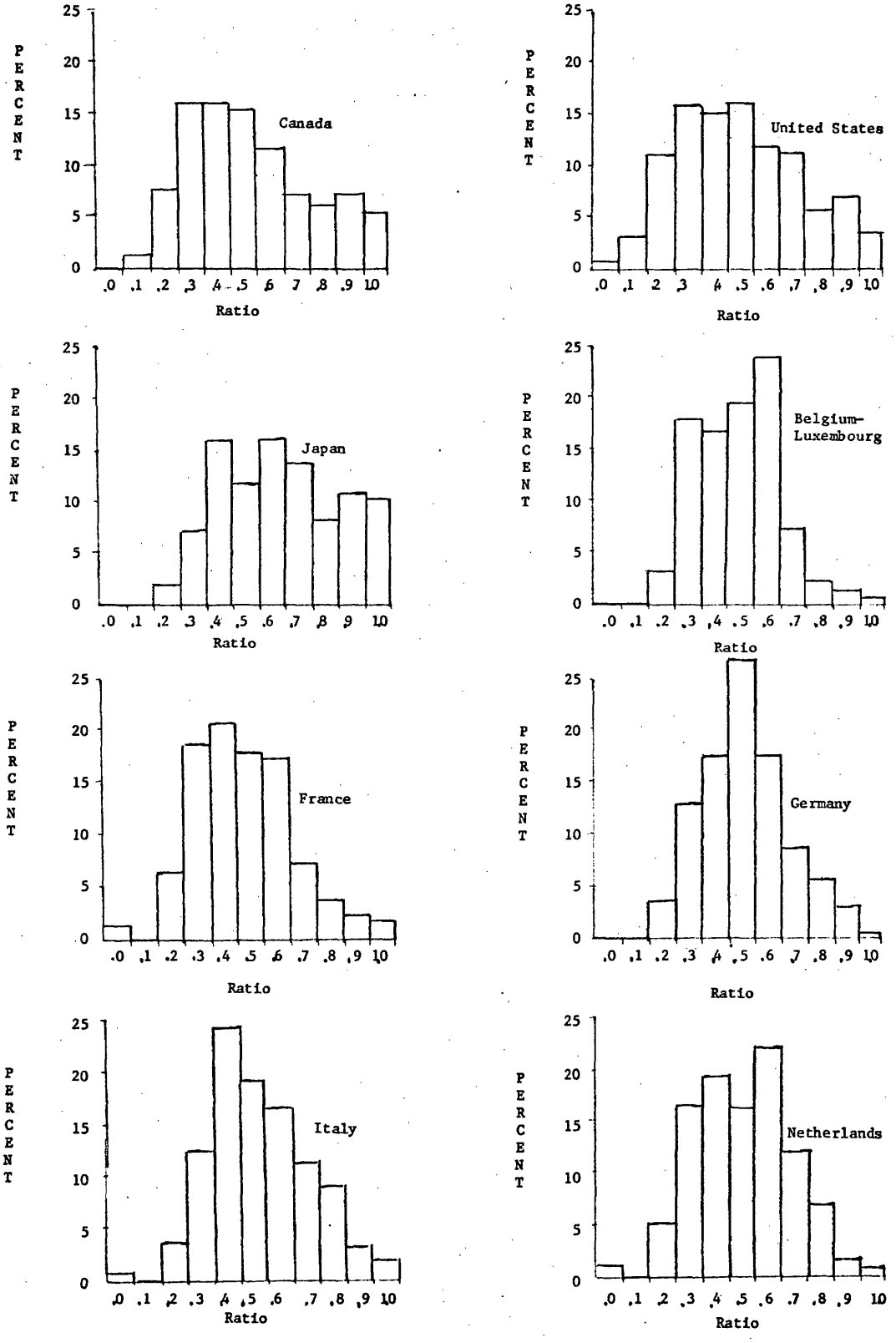
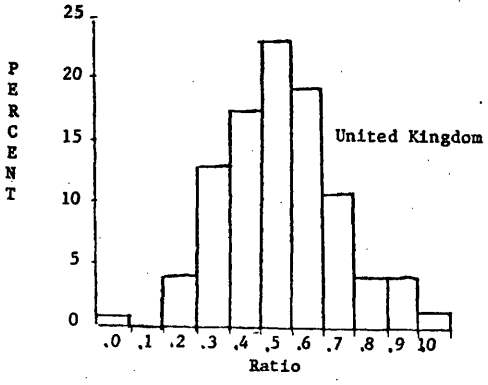
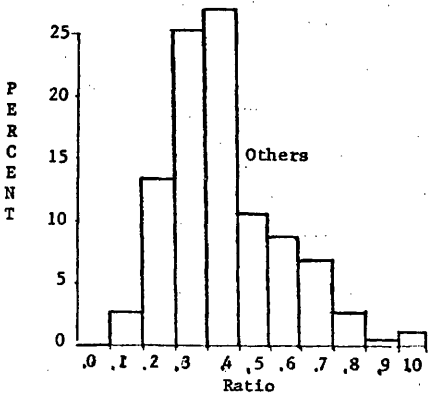


Figure V-3 (Cont'd)



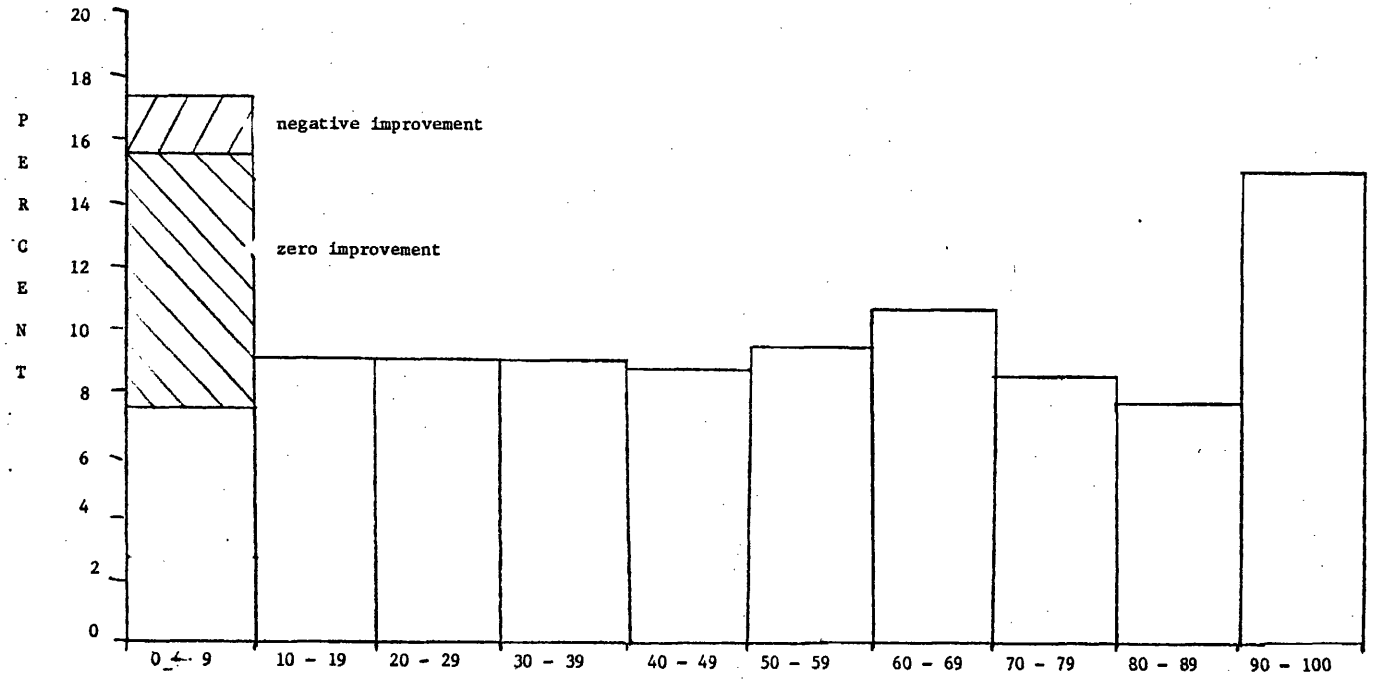
the percentage improvement attributable to price on the horizontal axis. Thus, about 17 percent of the commodities by countries (about 200 of the 1190 possible) had equations in which price contributed less than 10 percent of the total improvement. This relatively large percentage arose from the fact that in many cases prices failed to improve our error measure, EITS, at all. As we recall from our discussions of EITS, the failure to improve EITS with prices does not necessarily mean that prices played no part in the improvement. We can, I believe, safely assume however that prices probably did not help much in such cases. One further addition to this under-ten-percent group occurred in those instances in which the imports were either zero or very small (no imports of more than $250,000 from two or more countries). For these cases, prices were arbitrarily barred from having any effect and so, by necessity, the numbers were added to this group. At the other end of the scale stands the large percentage of commodities by countries (nearly 190 of the total) in which price contributed nearly all of the total improvement. The same reasons given for the failure of prices to improve EITS apply to the time parameters. The flat center section of the histogram in Figure V-4 means that, with the expected bias toward prices which surely exists, we must conclude that if prices and trends had been simultaneously estimated the price parameters would have contributed less to the fit than that observed here.

Equation Fits by Exporter

The model described and developed in Chapter II was designed to produce forecasts of exports. Therefore, no discussion of the fits

Figure V-4

Percentage of Total Improvement
Attributable to Price



would be complete without a report on the fit of the equations on export data. The statistic used to evaluate the fit on export data is AAPE, annual average percentage error. It is defined as follows:

$$AAPE = \left( \sum_{t=1}^{T} \left| \hat{E}_t - E_t \right| / E_t \right) / T$$

where

$\hat{E}$ is the predicted value of exports,

and

T is the number of years of historical data.

Table V-3 lists the AAPE's for each of the 119 commodities* for each of the ten countries. The column on the far right labeled "wt. ave." is the weighted average of the AAPE's of each country; the weights are the 1972 exports. On examining the table, we see rather large values. It would certainly seem that they could be easily improved upon. Closer examination, however, reveals that many of the large AAPE's are associated with relatively small export flows. For example, in Pulp and paper, Japan has an extraordinarily large AAPE of 347. Yet the exports associated with that value are only $7.5

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*Crude petroleum was omitted from the table because of a distortion in errors which is inherent in AAPE. The distortion occurs, as is the case for Netherlands exports of Crude petroleum, when exports are rising from near zero to significant levels in the data period. For instance, the actual exports of the Netherlands of Crude petroleum were $400 million in 1972 while in 1962 they were $4. million. If the 1962 predicted value were zero, then AAPE would be 100% but if the 1962 predicted value were $100 then the AAPE would be 2500. Similar distortions occurred elsewhere but in this instance the effects were noticeable in the totals because of the large value in 1972.

Table V-3

Average Absolute Percentage Errors by Country and Commodity

| | | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLA | U.K. | OTHERS | WT. AVE. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MEAT AND LIVE ANIMALS | 12.57 | 10.14 | 16.96 | 33.25 | 9.65 | 18.71 | 8.66 | 8.37 | 17.62 | 2.92 | 7.37 |
| 2 | DAIRY AND EGGS | 13.43 | 14.02 | 28.83 | 15.07 | 10.56 | 49.75 | 4.15 | 7.26 | 7.65 | 5.20 | 12.80 |
| 3 | FISH | 7.25 | 11.45 | 4.26 | 5.50 | 8.81 | 4.29 | 31.71 | 5.64 | 13.12 | 2.68 | 4.43 |
| 4 | GRAINS UNMILLED | 14.32 | 8.48 | 1603.00 | 24.16 | 18.03 | 54.95 | 40.21 | 38.91 | 135.29 | 12.73 | 14.37 |
| 5 | GRAINS MILLED | 12.23 | 6.62 | 42.10 | 12.69 | 10.49 | 8.73 | 16.57 | 5.53 | 4.60 | 6.47 | 9.62 |
| 6 | FRESH FRUITS AND VEGETABL | 7.75 | 4.24 | 19.91 | 13.04 | 9.72 | 11.44 | 8.53 | 9.13 | 15.33 | .83 | 3.94 |
| 7 | PRESERVED FRUITS AND VEGE | 13.03 | 9.66 | 9.09 | 13.76 | 11.97 | 29.96 | 6.37 | 10.33 | 7.95 | 2.96 | 6.45 |
| 8 | SUGAR | 26.60 | 25.94 | 29.60 | 959.61 | 16.97 | 33.47 | 1102.00 | 17.24 | 13.92 | 2.80 | 51.36 |
| 9 | COFFEE,TEA,COCOA,ETC | 20.20 | 24.33 | 16.97 | 12.51 | 27.21 | 25.51 | 15.86 | 9.75 | 25.36 | 1.20 | 3.44 |
| 10 | FEED STUFFS | 12.59 | 6.17 | 16.68 | 12.01 | 11.17 | 23.33 | 12.05 | 18.22 | 16.50 | 3.75 | 8.07 |
| 11 | FATS AND OILS | 22.26 | 7.17 | 16.98 | 14.34 | 26.03 | 13.81 | 411.56 | 13.39 | 11.37 | 9.70 | 15.13 |
| 12 | BEVERAGES | 4.06 | 9.34 | 15.45 | 14.40 | 3.79 | 4.65 | 18.50 | 12.35 | 5.97 | 7.71 | 7.35 |
| 13 | TOBACCO AND TOBACCO PRODU | 8.66 | 3.83 | 18.82 | 8.20 | 8.81 | 28.80 | 23.45 | 18.53 | 8.50 | 5.55 | 6.79 |
| 14 | HIDES,LEATHER,FURS | 9.62 | 10.69 | 38.24 | 5.20 | 6.41 | 2.72 | 9.70 | 12.17 | 13.74 | 5.44 | 7.97 |
| 15 | RUBBER(INCL. SYNTH)--CRUD | 16.94 | 13.12 | 54.56 | 45.10 | 25.39 | 8.23 | 28.85 | 32.49 | 17.92 | 3.11 | 13.49 |
| 16 | CRUDE WOOD | 2.17 | 6.57 | 14.04 | 10.68 | 8.84 | 12.50 | 13.37 | 7.71 | 41.49 | 1.67 | 2.81 |
| 17 | PULP AND PAPER | 5.32 | 7.33 | 347.70 | 37.19 | 10.36 | 17.59 | 30.01 | 7.62 | 16.95 | 4.36 | 6.93 |
| 18 | SILK, OTH. NON MANMADE FI | 144.13 | 6.55 | 15.55 | 6.84 | 8.29 | 10.36 | 10.66 | 7.09 | 13.14 | 7.31 | 10.40 |
| 19 | WOOL | 14.90 | 42.27 | 18.08 | 12.91 | 16.23 | 17.84 | 10.19 | 12.05 | 6.67 | 2.86 | 6.17 |
| 20 | COTTON | 20.04 | 14.70 | 16.62 | 12.99 | 34.15 | 10.16 | 33.58 | 48.36 | 24.69 | 2.50 | 5.96 |
| 21 | CRUDE FERTILIZERS | 36.36 | 25.09 | 112.65 | 45.58 | 29.98 | 37.57 | 161.84 | 285.83 | 62.88 | 4.05 | 32.83 |
| 22 | MARBLE,SAND, AND OTH.CRUD | 3.35 | 8.07 | 11.68 | 12.67 | 8.12 | 2.98 | 3.59 | 7.37 | 3.29 | 1.79 | 4.31 |
| 23 | IRON ORE AND SCRAP | 6.57 | 13.15 | 320.67 | 25.64 | 7.25 | 10.09 | 29.54 | 18.48 | 52.65 | 3.83 | 6.99 |
| 24 | NONFERROUS ORES AND SCRAP | 13.44 | 23.07 | 102.30 | 15.84 | 14.59 | 13.09 | 27.53 | 27.86 | 17.01 | 10.77 | 13.00 |
| 25 | VEGETABLE MATERIALS,NES | 14.31 | 7.34 | 12.52 | 11.53 | 2.58 | 10.81 | 5.61 | 4.49 | 20.95 | 11.46 | 8.31 |
| 26 | COAL, COKE | 31.61 | 4.15 | 45.82 | 8.42 | 17.10 | 5.22 | 24.97 | 14.11 | 12.02 | 4.93 | 6.67 |
| 28 | PETROLEUM PRODUCTS | 81.29 | 10.51 | 17.85 | 16.07 | 9.43 | 7.68 | 11.92 | 12.13 | 7.02 | 3.20 | 9.11 |
| 29 | GAS, NATURAL AND SYNTHETI | 2.01 | 30.66 | 34.23 | 15.22 | 9.67 | 33.60 | 24.56 | 43.61 | 65.07 | 6.53 | 19.73 |
| 30 | ELECTRICAL ENERGY | .00 | .00 | .00 | 18.16 | 18.77 | .00 | .00 | 35.15 | 80.65 | 12.00 | 17.10 |
| 31 | CHEMICAL ELEMENTS | 12.33 | 9.73 | 16.87 | 38.70 | 14.54 | 8.08 | 6.83 | 10.95 | 12.42 | 4.91 | 11.46 |
| 32 | DYEING,TANNING, AND COAL | 17.48 | 12.29 | 40.34 | 16.10 | 12.93 | 3.54 | 11.80 | 6.21 | 10.84 | 2.87 | 8.42 |
| 33 | MEDICINAL CHEMICALS | 6.89 | 11.23 | 5.89 | 19.74 | 7.30 | 7.02 | 5.35 | 31.73 | 5.03 | 7.86 | 10.65 |
| 34 | PERFUME MAT. AND OTH. CHE | 38.06 | 19.64 | 24.53 | 21.55 | 17.21 | 12.82 | 18.75 | 16.26 | 16.38 | 49.93 | 22.10 |
| 35 | MANUFACTURED FERTILIZERS | 11.74 | 12.34 | 18.53 | 8.93 | 17.28 | 10.45 | 22.52 | 44.11 | 25.49 | 7.38 | 16.61 |
| 36 | EXPOLSIVES | 34.00 | 9.43 | 16.94 | 12.88 | 4.90 | 20.95 | 27.07 | 34.19 | 16.22 | 9.19 | 15.49 |
| 37 | PLASTIC MATERIALS | 18.37 | 9.50 | 25.86 | 32.08 | 6.64 | 3.76 | 9.95 | 15.21 | 11.11 | 6.29 | 11.69 |
| 38 | RUBBER MANUFACTURES | 17.19 | 9.60 | 8.67 | 11.92 | 3.67 | 4.13 | 7.23 | 5.71 | 6.74 | 10.53 | 7.29 |
| 39 | VENEERS, PLAYWOOD | 10.08 | 9.91 | 7.36 | 12.27 | 9.43 | 7.69 | 13.19 | 9.10 | 11.41 | 4.86 | 7.25 |
| 40 | NEWSPRINT | .87 | 16.47 | 128.62 | 34.52 | 33.69 | 43.57 | 157.42 | 11.30 | 74.98 | 4.38 | 3.13 |
| 41 | KRAFTPAPER | 48.80 | 88.46 | 40.00 | 13.90 | 36.37 | 16.15 | 61.62 | 69.25 | 21.88 | 8.51 | 41.69 |
| 42 | FIBREBOARD | 8.64 | 5.93 | 23.75 | 11.20 | 13.28 | 4.07 | 42.12 | 8.11 | 10.52 | .94 | 3.92 |
| 43 | OTHER PAPER AND PAPERBOAR | 7.94 | 8.64 | 7.01 | 11.97 | 10.01 | 4.70 | 21.72 | 7.98 | 6.69 | 4.37 | 7.42 |
| 44 | ART. OF PAPER AND PAPERBO | 12.20 | 7.16 | 17.71 | 11.92 | 3.24 | 3.13 | 9.02 | 3.33 | 9.61 | 11.61 | 7.81 |
| 45 | YARNS AND THREADS | 27.66 | 40.65 | 21.68 | 13.67 | 28.32 | 21.95 | 16.48 | 14.12 | 36.87 | 12.72 | 20.83 |
| 46 | COTTON FABRICS | 14.19 | 6.22 | 4.93 | 9.00 | 3.74 | 4.60 | 11.12 | 6.97 | 9.02 | 5.11 | 5.90 |
| 47 | OTH TEXT FAB EXC FLOOR CO | 15.25 | 10.92 | 3.96 | 2.85 | 5.60 | 6.38 | 5.15 | 3.66 | 11.15 | 5.93 | 5.90 |
| 48 | FLOOR COVERINGS | 57.95 | 25.66 | 10.77 | 7.39 | 22.94 | 6.75 | 14.00 | 10.12 | 12.97 | 4.65 | 8.71 |
| 49 | STONE AND BRICKS | 14.16 | 10.06 | 6.14 | 7.39 | 3.79 | 2.69 | 34.73 | 28.88 | 8.27 | 5.83 | 12.54 |
| 50 | GLASS | 126.47 | 5.72 | 6.84 | 3.11 | 5.17 | 3.12 | 15.17 | 8.17 | 4.47 | 3.84 | 6.76 |
| 51 | POTTERY, PERALS, PRECIOUS | 22.10 | 224.38 | 15.71 | 13.33 | 20.60 | 13.96 | 19.03 | 24.65 | 117.01 | 3.37 | 43.76 |
| 52 | PIG IRON | 17.04 | 15.45 | 115.37 | 18.13 | 7.17 | 12.77 | 18.58 | 235.44 | 22.00 | 3.85 | 14.40 |
| 53 | IRON AND STEEL INGOTS AND | 16.18 | 25.00 | 13.59 | 5.85 | 4.36 | 7.08 | 29.93 | 25.29 | 6.32 | 11.99 | 11.06 |
| 54 | UNIVERALS AND PLATES | 15.57 | 19.75 | 5.48 | 3.30 | 4.36 | 4.74 | 18.71 | 4.85 | 9.59 | 11.64 | 6.98 |
| 55 | HOOPS AND RAIL TRACK | 19.56 | 24.48 | 23.70 | 5.61 | 12.67 | 8.06 | 19.77 | 7.60 | 12.43 | 10.17 | 12.92 |
| 56 | WIRE AND TUBES | 37.22 | 5.17 | 11.12 | 8.59 | 5.79 | 6.01 | 12.08 | 11.78 | 10.91 | 10.89 | 9.14 |
| 57 | IRON AND STEEL CASTINGS | 6.06 | 5.82 | 162.74 | 19.55 | 7.31 | 14.27 | 150.68 | 32.38 | 55.36 | 26.04 | 39.20 |
| 58 | COPPER | 12.32 | 18.39 | 17.81 | 5.06 | 12.32 | 8.63 | 39.21 | 17.78 | 11.77 | 5.05 | 8.20 |
| 59 | ALUMINUM | 10.77 | 15.92 | 17.39 | 6.55 | 10.26 | 18.68 | 39.07 | 11.18 | 22.09 | 7.40 | 11.96 |
| 60 | LEAD AND ZINC | 9.53 | 25.46 | 165.93 | 10.83 | 34.53 | 22.90 | 26.76 | 15.12 | 20.79 | 9.40 | 20.99 |
| 61 | OTHER NONFERROUS | 11.21 | 8.61 | 5.22 | 12.94 | 11.77 | 10.52 | 20.33 | 28.56 | 13.38 | 3.40 | 8.03 |

Table V-3 (Cont'd)

| | | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLA | U.K. | OTHERS | WT. AVE. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62 | FINISHED STRUCTURAL PARTS | 10.98 | 20.21 | 26.24 | 9.13 | 9.73 | 7.52 | 12.35 | 35.41 | 6.48 | 37.81 | 17.86 |
| 63 | METAL CONTAINERS | 12.94 | 8.06 | 34.28 | 8.82 | 9.46 | 7.46 | 12.41 | 8.13 | 6.13 | 12.86 | 11.80 |
| 64 | WIRE PRODUCTS | 42.46 | 12.68 | 11.74 | 4.39 | 21.81 | 6.14 | 26.10 | 11.05 | 8.28 | 9.03 | 10.56 |
| 65 | HARDWARE | 22.06 | 4.72 | 8.17 | 5.08 | 5.15 | 3.80 | 7.58 | 5.31 | 9.35 | 14.15 | 7.85 |
| 66 | BOILERS AND TURBINES | 39.03 | 10.29 | 33.45 | 27.68 | 21.09 | 6.82 | 14.73 | 32.75 | 7.74 | 10.37 | 14.66 |
| 67 | AIRCRAFT ENGINES | 26.69 | 96.33 | 75.09 | 22.05 | 28.55 | 12.79 | 61.07 | 15.69 | 21.05 | 16.69 | 50.06 |
| 68 | INTERNAL COMBUSTION ENGIN | 20.16 | 2.94 | 38.99 | 14.52 | 8.74 | 4.11 | 5.59 | 11.55 | 9.64 | 11.83 | 10.76 |
| 69 | OTHER POWER MACHINERY | 26.89 | 24.52 | 41.54 | 47.64 | 29.40 | 10.95 | 11.85 | 164.47 | 23.01 | 11.26 | 31.16 |
| 70 | AGRICULTURAL MACHINERY | 5.15 | 5.00 | 36.44 | 16.77 | 6.90 | 6.14 | 21.45 | 11.82 | 6.22 | 11.04 | 9.03 |
| 71 | OFFICE MACHINES | 28.64 | 6.37 | 46.03 | 21.20 | 27.72 | 14.62 | 17.96 | 15.12 | 19.68 | 12.95 | 16.43 |
| 72 | COMPUTER AND RELATED EQUI | 13.30 | 32.04 | 42.97 | 210.26 | 19.99 | 44.63 | 56.15 | 32.20 | 31.48 | 15.03 | 36.63 |
| 73 | METAL WORKING MACHINERY | 36.25 | 12.21 | 44.46 | 12.38 | 8.16 | 3.99 | 7.19 | 6.56 | 9.35 | 7.19 | 9.99 |
| 74 | TEXTILE AND LEATHER MACHI | 13.12 | 11.94 | 8.53 | 9.81 | 15.14 | 2.54 | 9.40 | 20.89 | 8.79 | 8.01 | 7.33 |
| 75 | PAPER MILL MACHINES | 14.31 | 8.12 | 36.10 | 17.13 | 20.64 | 6.90 | 9.65 | 10.53 | 18.78 | 8.45 | 11.04 |
| 76 | PRINTING MACHINES | 13.76 | 3.87 | 20.12 | 9.48 | 14.65 | 1.52 | 7.28 | 9.95 | 7.55 | 3.65 | 4.72 |
| 77 | FOOD PROCESSING MACHINES | 21.05 | 7.24 | 18.88 | 21.68 | 11.59 | 3.35 | 5.41 | 11.24 | 6.69 | 4.11 | 6.68 |
| 78 | CONSTRUCTION MACHINES | 29.95 | 8.05 | 36.60 | 77.73 | 14.48 | 9.60 | 20.55 | 11.07 | 10.56 | 5.33 | 15.21 |
| 79 | MINERAL CRUSHING MACHINES | 12.49 | 11.17 | 28.72 | 14.30 | 16.07 | 5.72 | 11.86 | 7.84 | 6.61 | 10.19 | 9.84 |
| 80 | HEATING AND COOLING EQUIP | 13.83 | 7.02 | 58.15 | 14.58 | 13.52 | 4.03 | 8.82 | 10.20 | 13.71 | 7.86 | 12.37 |
| 81 | PUMPS | 21.66 | 3.21 | 28.29 | 8.92 | 6.86 | 2.32 | 5.76 | 3.89 | 6.34 | 4.16 | 5.69 |
| 82 | MECHANICAL HANDLING EQUIP | 18.31 | 5.98 | 19.64 | 14.81 | 14.22 | 2.74 | 23.33 | 7.11 | 9.09 | 14.22 | 10.14 |
| 83 | ALL OTHER NON-ELECTRICAL, | 4.49 | 3.62 | 8.00 | 8.63 | 6.77 | 3.35 | 11.23 | 5.40 | 6.87 | 5.83 | 5.57 |
| 84 | ELECTRIC POWER MACHINES | 20.76 | 7.45 | 11.56 | 6.19 | 14.51 | 10.66 | 7.23 | 4.94 | 6.54 | 8.84 | 9.44 |
| 85 | EQUIP OFR DISTRIBUTING EL | 14.00 | 4.48 | 9.47 | 7.15 | 13.69 | 5.73 | 3.25 | 11.50 | 11.61 | 15.68 | 9.14 |
| 86 | TELEVISION SETS AND RADIO | 26.70 | 11.62 | 3.19 | 10.68 | 9.47 | 6.06 | 15.34 | 10.53 | 17.74 | 58.91 | 17.58 |
| 87 | APPLIANCES, DOMESTIC | 22.38 | 11.13 | 26.23 | 11.68 | 6.56 | 4.84 | 22.24 | 9.45 | 12.77 | 14.93 | 14.28 |
| 88 | MEDICAL ELECTRICAL APPLIA | 18.28 | 5.74 | 16.18 | 25.70 | 18.01 | 3.43 | 18.06 | 5.81 | 20.59 | 7.37 | 8.48 |
| 89 | BATTERIES | 30.69 | 9.98 | 9.28 | 36.82 | 10.34 | 4.03 | 37.83 | 15.09 | 8.92 | 10.77 | 12.54 |
| 90 | LAMPS | 16.21 | 6.84 | 10.92 | 6.36 | 12.16 | 3.61 | 15.07 | 2.72 | 5.64 | 23.28 | 8.09 |
| 91 | TRANSISTORS | 14.67 | 7.07 | 27.66 | 32.31 | 6.62 | 5.88 | 13.81 | 2.57 | 7.83 | 15.99 | 10.95 |
| 92 | ELECTRICAL MEASURING INST | 84.18 | 4.38 | 9.12 | 7.74 | 29.41 | 5.54 | 21.03 | 12.34 | 10.31 | 9.88 | 13.70 |
| 93 | OTHER ELECTRIAL MACH.,NE | 10.34 | 5.76 | 4.68 | 18.83 | 16.19 | 4.59 | 10.64 | 13.53 | 6.44 | 15.15 | 8.41 |
| 94 | RAILWAY VEHICLES | 74.53 | 13.39 | 24.17 | 17.37 | 38.64 | 10.91 | 21.83 | 25.12 | 16.28 | 17.52 | 26.42 |
| 95 | PERSONAL AUTOS | 18.77 | 5.75 | 47.09 | 17.54 | 11.70 | 8.66 | 7.86 | 15.18 | 9.85 | 9.40 | 16.48 |
| 96 | BUSSES AND TRUCKS | 74.73 | 9.77 | 16.97 | 19.90 | 9.15 | 6.34 | 8.65 | 16.83 | 15.39 | 27.33 | 23.42 |
| 97 | AUTO BODIES AND CHASSES | 17.10 | 3.54 | 14.01 | 26.98 | 12.36 | 4.99 | 8.42 | 12.33 | 7.25 | 28.26 | 9.36 |
| 98 | MOTOR CYCLES | .00 | 17.94 | 9.28 | 16.89 | 14.82 | 19.97 | 12.18 | 15.54 | 22.15 | 13.26 | 10.99 |
| 99 | ROAD VEHICLES | 31.44 | 7.47 | 8.06 | 7.06 | 16.35 | 10.54 | 17.47 | 13.70 | 13.27 | 17.32 | 12.69 |
| 100 | AIRCRAFT AND PARTS | 17.88 | 5.00 | 95.07 | 39.26 | 17.12 | 35.18 | 18.76 | 24.64 | 24.58 | 12.76 | 11.72 |
| 101 | WARSHIPS | 12.13 | 73.06 | 27.27 | 9.09 | .00 | .00 | 89.12 | 27.27 | .00 | 63.64 | 23.02 |
| 102 | SHIPS AND BOATS | 72.73 | 28.47 | 14.90 | 68.02 | 20.32 | 13.64 | 51.52 | 13.14 | 26.28 | 9.19 | 17.58 |
| 103 | SANITARY,PLUMBING,HEAT. F | 12.99 | 9.93 | 10.73 | 13.66 | 19.74 | 7.39 | 36.08 | 6.58 | 6.90 | 2.99 | 11.94 |
| 104 | FURNITURE | 19.55 | 16.58 | 4.96 | 5.73 | 6.36 | 9.00 | 14.07 | 8.69 | 12.69 | 5.80 | 8.62 |
| 105 | TRAVEL GOODS, HADNBAGS | 186.57 | 17.18 | 7.95 | 28.15 | 3.97 | 9.81 | 9.19 | 14.35 | 17.21 | 16.55 | 13.71 |
| 106 | CLOTHING | 23.39 | 12.82 | 5.79 | 9.06 | 8.45 | 1.59 | 11.33 | 6.03 | 8.03 | 10.42 | 9.32 |
| 107 | FOOTWEAR | 14.20 | 18.03 | 15.96 | 21.17 | 6.26 | 4.07 | 4.57 | 21.07 | 12.86 | 11.92 | 8.56 |
| 108 | SCIENTIFIC,MEDICAL INSTRU | 209.81 | 5.62 | 8.89 | 13.43 | 6.32 | 2.93 | 7.27 | 53.02 | 6.32 | 5.70 | 10.83 |
| 109 | PHOTOGRAPIC SUPPLIES | 16.54 | 3.69 | 5.20 | 11.97 | 6.83 | 6.66 | 6.64 | 103.19 | 6.40 | 5.59 | 14.54 |
| 110 | WATCHES AND CLOCKS | 28.29 | 12.41 | 29.97 | 20.94 | 8.23 | 4.28 | 23.87 | 9.55 | 3.63 | 5.78 | 11.90 |
| 111 | MUSICAL INSTRUMENTS | 17.46 | 6.82 | 29.74 | 49.41 | 10.62 | 3.18 | 9.74 | 8.78 | 11.76 | 5.42 | 15.63 |
| 112 | PHONOGRAPHS AND RECORDS | 42.90 | 19.92 | 20.71 | 9.31 | 7.18 | 12.88 | 8.07 | 29.71 | 16.81 | 4.98 | 17.21 |
| 113 | PRINT MATTER | 15.12 | 5.48 | 12.96 | 8.03 | 3.01 | 5.58 | 7.98 | 2.26 | 4.08 | 9.10 | 6.07 |
| 114 | ART | 12.17 | 4.52 | 9.72 | 3.89 | 6.86 | 7.84 | 4.40 | 5.22 | 9.51 | 6.82 | 6.88 |
| 115 | TOYS AND CARRIAGES, GAMES | 21.93 | 10.95 | 12.86 | 37.82 | 7.59 | 3.23 | 10.93 | 19.24 | 11.68 | 16.73 | 13.38 |
| 116 | OFFICE SUPPLIES | .00 | 13.84 | 22.10 | 73.83 | 31.64 | 17.66 | 21.54 | 22.08 | 5.13 | 17.93 | 16.81 |
| 117 | JEWELLERY | 12.37 | 9.77 | 14.30 | 11.30 | 13.79 | 12.92 | 5.57 | 58.67 | 10.41 | 22.86 | 12.66 |
| 118 | MANUFACTURES,NES | 60.68 | 61.01 | 12.37 | 10.87 | 10.43 | 14.24 | 12.39 | 16.53 | 16.65 | 4.53 | 13.95 |
| 119 | COMMERICAL AND TRANSACT., | 17.53 | 9.55 | 163.00 | 9.16 | 30.37 | 26.40 | 28.51 | 21.66 | 14.62 | 3.50 | 17.05 |
| WT. AVE. OF LISTED SECTORS | | 16.910 | 10.655 | 18.978 | 21.984 | 11.603 | 8.242 | 16.103 | 16.341 | 17.248 | 7.016 | 12.047 |

million in 1972 on 0.3 percent of world exports. Similarly, Belgium's AAPE for Crude rubber is associated with a flow of only $2.9 million. Since these flows are small, the equation estimating the import shares will give them little weight in its calculations and hence we might readily expect AAPE's for these small flows to be relatively large.

Unfortunately, however, not all large AAPE's are for small flows. An example of this is for United States exports of Aircraft engines (67). However, the large AAPE's seen in this first panel of Table V-3 can be compared to constant share AAPE's. This comparison is shown in Table V-4. The ratio of the equation AAPE to the constant share AAPE is shown for all commodities by country. Again, as in Table V-3 weighted averages by commodities (the far-right column) and by country (the botton row) are shown too. Looking at the weighted averages by commodities, we see that while the weighted average AAPE's shown in the Table V-3 are large the constant share AAPE must have been, on average, nearly twice as large. Thus we see here, as we observed when looking at importers, that the constant shares forecast rather poorly. Furthermore, cells with large AAPE's are usually associated with small flows.

The bottom lines of Tables V-3 and V-4 show the weighted average of all sectors for the equation AAPE and the ratio of the equation AAPE to the constant share weighted average AAPE. The equation AAPE shows two groups of countries categorized by the size of their AAPE. One group, which consists of large exporters, includes the United States, France, Germany, and the region "Others". The lower value of their AAPE's stems directly from the estimation technique employed. The

Table V-4

Ratio of Equation to Constant Share AAPE

| | | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLA | U.K. | OTHERS | WT. AVE. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MEAT AND LIVE ANIMALS | .844 | .517 | .359 | .295 | .231 | .280 | 1.080 | .620 | .380 | .415 | .432 |
| 2 | DAIRY AND EGGS | .941 | .446 | .422 | .247 | .351 | .307 | .167 | .854 | .211 | .588 | .541 |
| 3 | FISH | .280 | .455 | .112 | .403 | .200 | .336 | .235 | .538 | .201 | .083 | .155 |
| 4 | GRAINS UNMILLED | .857 | 1.259 | .420 | .144 | .283 | .399 | .856 | .338 | 1.610 | .836 | .901 |
| 5 | GRAINS MILLED | .655 | .473 | .451 | .345 | .322 | .675 | .293 | .357 | .592 | 1.174 | .535 |
| 6 | FRESH FRUITS AND VEGETABL | .996 | .867 | .501 | .899 | .236 | .469 | .415 | .521 | .278 | .954 | .790 |
| 7 | PRESERVED FRUITS AND VEGE | .740 | .375 | .219 | .670 | .368 | .250 | .978 | .240 | 1.064 | .382 | .440 |
| 8 | SUGAR | 1.137 | .633 | 1.044 | 8.768 | .829 | .181 | 16.029 | .122 | 1.252 | .611 | 1.048 |
| 9 | COFFEE,TEA,COCOA,ETC | .331 | 1.156 | .907 | .302 | .414 | .180 | .617 | .344 | .376 | .391 | .393 |
| 10 | FEED STUFFS | .920 | .613 | .989 | .570 | .776 | .453 | .962 | .551 | .331 | .349 | .493 |
| 11 | FATS AND OILS | .896 | .895 | .665 | .547 | .573 | .342 | 4.912 | .382 | .577 | .678 | .784 |
| 12 | BEVERAGES | 1.020 | .417 | .508 | .475 | 1.013 | .289 | .159 | 1.790 | .917 | .315 | .738 |
| 13 | TOBACCO AND TOBACCO PRODU | .856 | .293 | .604 | .783 | .176 | .886 | .794 | .339 | .403 | .374 | .376 |
| 14 | HIDES,LEATHER,FURS | .395 | .721 | .513 | .501 | .311 | .283 | .928 | .532 | .838 | .420 | .511 |
| 15 | RUBBER(INCL. SYNTH)--CRUD | .542 | .422 | .293 | 1.184 | .115 | .237 | .649 | 1.132 | .156 | 1.388 | .899 |
| 16 | CRUDE WOOD | .291 | .851 | .283 | .539 | .696 | .502 | .364 | .297 | .548 | .645 | .592 |
| 17 | PULP AND PAPER | .316 | 1.014 | .522 | .300 | .891 | 1.117 | .649 | .464 | .455 | .418 | .492 |
| 18 | SILK, OTH. NON MANMADE FI | .395 | .270 | .593 | .377 | 1.273 | .871 | .714 | .233 | .607 | .832 | .699 |
| 19 | WOOL | .297 | .213 | .378 | .369 | .551 | .517 | .953 | 1.167 | .365 | 1.336 | 1.116 |
| 20 | COTTON | 1.300 | 1.607 | .271 | .945 | .262 | .995 | .671 | 1.083 | 1.133 | .755 | .968 |
| 21 | CRUDE FERTILIZERS | 1.000 | 1.497 | 1.000 | 1.070 | .628 | .713 | 1.000 | .439 | 1.000 | .378 | .638 |
| 22 | MARBLE,SAND, AND OTH.CRUD | .815 | .830 | .225 | .574 | .835 | .627 | .344 | .174 | .099 | .785 | .685 |
| 23 | IRON ORE AND SCRAP | .778 | .370 | 3.108 | .480 | .390 | .533 | .854 | .504 | 1.053 | .277 | .367 |
| 24 | NONFERROUS ORES AND SCRAP | .618 | .945 | .659 | .510 | .995 | .752 | 1.023 | .293 | .648 | .946 | .835 |
| 25 | VEGETABLE MATERIALS,NES | .568 | .339 | .553 | 1.064 | .822 | .459 | .766 | .589 | .658 | .393 | .536 |
| 26 | COAL, COKE | .251 | .316 | .158 | .274 | .464 | .581 | .221 | .408 | .261 | .220 | .350 |
| 28 | PETROLEUM PRODUCTS | .279 | .409 | 1.049 | .360 | 1.010 | .864 | .502 | .279 | .788 | .299 | .433 |
| 29 | GAS, NATURAL AND SYNTHETI | .756 | 2.348 | .667 | .667 | .184 | .778 | 1.070 | .711 | .419 | .336 | .758 |
| 30 | ELECTRICAL ENERGY | .000 | .000 | .000 | 2.278 | .656 | .000 | .000 | .865 | 1.193 | .861 | .770 |
| 31 | CHEMICAL ELEMENTS | .566 | .701 | .606 | .670 | .855 | .486 | .248 | 1.460 | .854 | .722 | .713 |
| 32 | DYEING,TANNING, AND COAL | .923 | .385 | .474 | .587 | .521 | .205 | .410 | .625 | .534 | .444 | .390 |
| 33 | MEDICINAL CHEMICALS | 1.113 | .592 | .657 | .411 | 1.001 | .549 | .345 | .464 | .875 | 1.314 | .764 |
| 34 | PERFUME MAT. AND OTH. CHE | .778 | .796 | .288 | .232 | .272 | .572 | .401 | .552 | .993 | 2.856 | .933 |
| 35 | MANUFACTURED FERTILIZERS | .487 | .376 | .534 | .340 | .506 | .320 | .695 | .372 | .700 | .271 | .390 |
| 36 | EXPOLSIVES | .751 | .427 | .417 | .575 | .504 | .475 | .686 | .926 | .772 | .342 | .509 |
| 37 | PLASTIC MATERIALS | .867 | .680 | .748 | .683 | .920 | .295 | .933 | .396 | .713 | .184 | .558 |
| 38 | RUBBER MANUFACTURES | .648 | .461 | .814 | .163 | 1.676 | .652 | .658 | .504 | .650 | .252 | .741 |
| 39 | VENEERS, PLAYWOOD | .477 | .510 | .170 | .925 | .683 | .692 | .915 | .822 | .664 | .143 | .365 |
| 40 | NEWSPRINT | .407 | 1.115 | .600 | .738 | .738 | .425 | 1.731 | .590 | 1.000 | .340 | .405 |
| 41 | KRAFTPAPER | .370 | .484 | 1.019 | .339 | .501 | .765 | .220 | .265 | .604 | .536 | .505 |
| 42 | FIBREBOARD | .245 | .918 | .102 | .261 | .719 | 1.245 | .932 | .654 | .271 | .230 | .371 |
| 43 | OTHER PAPER AND PAPERBOAR | .768 | .473 | .352 | .336 | 1.155 | .134 | .290 | .947 | .811 | 2.276 | 1.070 |
| 44 | ART. OF PAPER AND PAPERBO | 1.516 | .511 | 1.062 | .793 | .167 | .289 | .308 | .561 | .443 | .218 | .437 |
| 45 | YARNS AND THREADS | .217 | .522 | .099 | .252 | .405 | .113 | .176 | .122 | 2.094 | .093 | .346 |
| 46 | COTTON FABRICS | .384 | .280 | .181 | .345 | .443 | .327 | .542 | .292 | .402 | .165 | .265 |
| 47 | OTH TEXT FAB EXC FLOOR CO | .206 | .498 | .736 | .433 | .519 | .521 | .762 | .283 | .508 | .486 | .554 |
| 48 | FLOOR COVERINGS | .467 | .458 | .281 | .732 | .537 | .691 | .414 | 1.062 | .815 | .222 | .524 |
| 49 | STONE AND BRICKS | .438 | .463 | .683 | .587 | .824 | .543 | .509 | .415 | .482 | .983 | .629 |
| 50 | GLASS | .386 | .630 | .478 | .199 | .606 | .294 | .580 | .768 | .685 | .086 | .413 |
| 51 | POTTERY, PERALS, PRECIOUS | 1.233 | .873 | .591 | 1.143 | 1.179 | .452 | .565 | .706 | .823 | .957 | .907 |
| 52 | PIG IRON | .897 | .704 | .581 | .761 | .558 | .485 | .334 | .646 | .604 | .781 | .711 |
| 53 | IRON AND STEEL INGOTS AND | .919 | .659 | .427 | .552 | .246 | .352 | .322 | .278 | 1.031 | .718 | .503 |
| 54 | UNIVERALS AND PLATES | .763 | .454 | .124 | .218 | .270 | .377 | .729 | .252 | .326 | .750 | .322 |
| 55 | HOOPS AND RAIL TRACK | .401 | 1.112 | .347 | .593 | .661 | .912 | .594 | 1.012 | .456 | .954 | .735 |
| 56 | WIRE AND TUBES | .692 | .335 | .276 | 1.013 | .824 | .773 | .980 | .896 | .443 | .645 | .624 |
| 57 | IRON AND STEEL CASTINGS | .276 | .421 | 2.638 | 1.017 | .263 | 1.199 | .442 | .384 | 1.069 | .587 | .612 |
| 58 | COPPER | .578 | .484 | .145 | .154 | .339 | .628 | .665 | .212 | .815 | .418 | .434 |
| 59 | ALUMINUM | .501 | .528 | .922 | .220 | .712 | .461 | .673 | .055 | 1.002 | .244 | .410 |
| 60 | LEAD AND ZINC | .824 | .561 | .266 | .409 | .400 | .216 | 1.005 | .210 | .413 | 1.001 | .695 |
| 61 | OTHER NONFERROUS | .939 | .835 | .064 | .399 | .688 | .529 | .609 | .969 | .943 | .438 | .630 |

Table V-4 (Cont'd)

| | CANADA | U.S.A. | JAPAN | BELG-LUX | FRANCE | GERMANY | ITALY | NETHERLA | U.K. | OTHERS | WT. AVE. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 62 FINISHED STRUCTURAL PARTS | .546 | .553 | .295 | 1.357 | .630 | .791 | .709 | .692 | .961 | .528 | .690 |
| 63 METAL CONTAINERS | .986 | .372 | .222 | .974 | .749 | .389 | .952 | .396 | .872 | .323 | .571 |
| 64 WIRE PRODUCTS | 1.747 | .600 | .261 | .497 | .761 | .443 | 1.161 | .767 | .737 | .163 | .524 |
| 65 HARDWARE | .544 | .425 | .492 | .680 | .885 | .543 | .269 | .569 | .460 | .475 | .511 |
| 66 BOILERS AND TURBINES | .467 | .937 | .217 | .803 | 1.127 | .359 | .549 | .569 | .928 | 1.024 | .717 |
| 67 AIRCRAFT ENGINES | .716 | .531 | 1.532 | .534 | .868 | .374 | 1.018 | .845 | 1.358 | 1.335 | .893 |
| 68 INTERNAL COMBUSTION ENGIN | 1.251 | .434 | .311 | .429 | .566 | 1.043 | 1.011 | .891 | .562 | .645 | .725 |
| 69 OTHER POWER MACHINERY | .623 | .915 | .402 | 1.101 | .577 | .420 | .595 | .682 | .932 | .841 | .672 |
| 70 AGRICULTURAL MACHINERY | .447 | .469 | .133 | .656 | .458 | 1.223 | .520 | .266 | .538 | .210 | .562 |
| 71 OFFICE MACHINES | .838 | .330 | .096 | .211 | 1.348 | .839 | .451 | 1.337 | .700 | 1.162 | .583 |
| 72 COMPUTER AND RELATED EQUI | .603 | .768 | .312 | .630 | .642 | .567 | .951 | .442 | .686 | .564 | .635 |
| 73 METAL WORKING MACHINERY | .551 | .629 | .320 | .732 | .409 | .459 | .297 | .714 | 1.454 | .257 | .531 |
| 74 TEXTILE AND LEATHER MACHI | 1.191 | .549 | .660 | .913 | .541 | .502 | .845 | .412 | .547 | .615 | .590 |
| 75 PAPER MILL MACHINES | .937 | .422 | 1.066 | .942 | 1.132 | .808 | .343 | .638 | .499 | .382 | .624 |
| 76 PRINTING MACHINES | .737 | .763 | .143 | .089 | .274 | .142 | .858 | .180 | .990 | .478 | .451 |
| 77 FOOD PROCESSING MACHINES | 1.072 | .910 | .235 | 1.030 | .955 | .364 | .857 | .393 | .787 | .142 | .563 |
| 78 CONSTRUCTION MACHINES | .757 | .716 | .356 | .310 | .278 | .946 | .375 | .815 | .521 | .516 | .612 |
| 79 MINERAL CRUSHING MACHINES | 1.120 | .442 | .338 | .257 | .714 | 1.051 | .862 | .841 | .716 | .394 | .734 |
| 80 HEATING AND COOLING EQUIP | .788 | .670 | .208 | .471 | .587 | .287 | .983 | .868 | .854 | .496 | .578 |
| 81 PUMPS | .838 | .514 | .183 | .885 | .320 | .182 | .502 | .373 | .628 | .547 | .420 |
| 82 MECHANICAL HANDLING EQUIP | .603 | .277 | .086 | .459 | .341 | .237 | .507 | .990 | 1.029 | .353 | .386 |
| 83 ALL OTHER NON-ELECTRICAL, | 1.268 | .411 | .093 | 1.155 | .620 | .375 | .482 | .468 | .531 | .362 | .444 |
| 84 ELECTRIC POWER MACHINES | 1.302 | .507 | .114 | .872 | .710 | .594 | .978 | .633 | .613 | .298 | .525 |
| 85 EQUIP OFR DISTRIBUTING EL | .826 | .987 | .202 | .626 | .572 | 1.023 | .673 | .664 | .407 | .616 | .712 |
| 86 TELEVISION SETS AND RADIO | 1.013 | .659 | .143 | 1.385 | .886 | 1.368 | 1.027 | .312 | .638 | .677 | .642 |
| 87 APPLIANCES, DOMESTIC | .588 | .498 | .322 | .780 | .377 | 1.105 | .884 | .677 | .547 | .364 | .693 |
| 88 MEDICAL ELECTRICAL APPLIA | .877 | .421 | .151 | .472 | .353 | .245 | 1.051 | .976 | .941 | 1.638 | .604 |
| 89 BATTERIES | .853 | 1.094 | .699 | .430 | .586 | .237 | .392 | .279 | .283 | .312 | .510 |
| 90 LAMPS | .330 | .492 | 2.137 | .782 | .449 | .793 | .872 | .683 | .580 | .446 | .789 |
| 91 TRANSISTORS | 1.024 | .311 | 1.549 | .939 | .436 | .593 | .896 | .073 | .384 | .764 | .575 |
| 92 ELECTRICAL MEASURING INST | 1.052 | .345 | .136 | 1.198 | .441 | .826 | .899 | .781 | .851 | .360 | .571 |
| 93 OTHER ELECTRIAL MACH.,NE | .944 | .375 | .069 | .887 | .396 | .499 | .724 | .849 | .298 | .368 | .421 |
| 94 RAILWAY VEHICLES | .590 | .842 | 1.068 | .797 | .169 | .342 | .820 | .480 | .602 | .707 | .577 |
| 95 PERSONAL AUTOS | .811 | .284 | .106 | .662 | .836 | .506 | .992 | .985 | .250 | .193 | .535 |
| 96 BUSSES AND TRUCKS | .565 | .363 | .148 | .838 | 1.066 | .792 | .466 | .416 | .769 | .392 | .537 |
| 97 AUTO BODIES AND CHASSES | .802 | .638 | .215 | .787 | .481 | .598 | .485 | .975 | .394 | .564 | .599 |
| 98 MOTOR CYCLES | .000 | .929 | .167 | .400 | .637 | .565 | .330 | .402 | .405 | .500 | .247 |
| 99 ROAD VEHICLES | .692 | .491 | .109 | .891 | 1.178 | .721 | .532 | .941 | .654 | .463 | .611 |
| 100 AIRCRAFT AND PARTS | .829 | .842 | .691 | 1.274 | .718 | .765 | 1.026 | .866 | 1.017 | .316 | .846 |
| 101 WARSHIPS | .598 | 1.125 | 1.000 | 1.000 | .000 | .000 | .815 | 1.000 | .000 | 1.788 | .674 |
| 102 SHIPS AND BOATS | 1.000 | .942 | .471 | .964 | .967 | .712 | .691 | .737 | .927 | .492 | .614 |
| 103 SANITARY,PLUMBING,HEAT. F | .921 | .499 | .662 | .745 | .783 | .563 | .592 | 1.412 | .422 | .204 | .558 |
| 104 FURNITURE | .406 | .560 | .679 | .385 | .322 | 1.027 | 1.045 | .560 | .611 | .395 | .639 |
| 105 TRAVEL GOODS, HADNBAGS | 1.034 | 2.100 | .595 | .849 | .148 | .289 | .420 | .737 | .610 | .249 | .414 |
| 106 CLOTHING | .785 | .592 | .112 | .687 | .860 | .406 | .470 | .340 | 1.325 | .215 | .417 |
| 107 FOOTWEAR | .608 | .482 | .243 | .579 | .398 | .274 | .910 | .475 | .837 | .157 | .523 |
| 108 SCIENTIFIC,MEDICAL INSTRU | 1.515 | .568 | .250 | .522 | .866 | .234 | .984 | .546 | .629 | .314 | .473 |
| 109 PHOTOGRAPIC SUPPLIES | .607 | .566 | .288 | .542 | .309 | .339 | .462 | .608 | 1.240 | .665 | .563 |
| 110 WATCHES AND CLOCKS | .709 | .997 | .146 | .735 | 1.198 | .161 | .582 | .373 | .468 | .641 | .496 |
| 111 MUSICAL INSTRUMENTS | .933 | 1.036 | .307 | .543 | .286 | .102 | .937 | .470 | .629 | .561 | .506 |
| 112 PHONOGRAPHS AND RECORDS | .972 | .719 | .685 | 1.206 | .292 | .771 | 1.048 | .891 | .860 | .546 | .734 |
| 113 PRINT MATTER | .475 | .409 | .899 | 1.062 | .456 | .768 | .731 | .469 | 1.071 | .376 | .644 |
| 114 ART | .759 | .879 | .668 | .448 | .312 | .613 | 1.215 | .866 | .612 | .195 | .550 |
| 115 TOYS AND CARRIAGES, GAMES | .701 | .716 | .475 | .973 | .976 | .128 | .580 | 1.132 | .655 | .331 | .516 |
| 116 OFFICE SUPPLIES | .000 | .601 | 1.037 | 1.000 | .850 | .388 | .363 | .365 | .308 | .259 | .462 |
| 117 JEWELLERY | .430 | .496 | .450 | .503 | 1.025 | .591 | .268 | .713 | .524 | .413 | .459 |
| 118 MANUFACTURES,NES | .420 | 1.983 | .335 | .448 | .362 | .438 | .871 | .402 | .388 | .139 | .440 |
| 119 COMMERICAL AND TRANSACT., | .498 | .715 | .554 | .738 | .428 | .510 | .879 | .634 | 1.137 | .467 | .622 |
| WT. AVE. OF LISTED SECTORS | .675 | .650 | .345 | .645 | .626 | .538 | .667 | .576 | .737 | .548 | .583 |

other group, composed of generally smaller exporters, has values of AAPE at least half again as large as the first group. In Table V-4, the ratio line shows that most improvements by country were of about the same relative magnitude. Only two real outliers can be observed. The improvement of Japan was far greater than any of the others and the improvement for the United Kingdom was somewhat less good. Since Table V-3 showed that the equation AAPE's for these two outliers were rather similar, we know that the constant share AAPE for Japan must be larger than that for the United Kingdom.

The evolution of errors can best be shown graphically. Figure V-5 shows the percentage error for six commodities and three countries for each commodity. One vertical set of three graphs is used for one commodity. The horizontal axis, time covers the period 1962 to 1972; the vertical axis, the error, goes from -30% to 30%. In each graph the solid line connecting the *'s shows the percentage error, denoted by an asterisk, (predicted minus actual divided by actual) for the equation's predictions; the dotted line connecting the +'s shows the constant share error; the dashed line and the # mark, the errors found when predicting the shares with linear unconstrained time trends. Further, an "A" on the graph means that an error was greater than $\pm$30%.

One of the main features that the plots depict is shown by the constant error line. A look at several of these line will reveal immediately that the errors are larger in the early years and get smaller wntil they are zero, by definition, in 1972. Another feature of these lines is that they often veer upward or downward with time.

Figure V-5

Evolution of Export Errors

Legend: Equation——— Constant····· Time — — — —

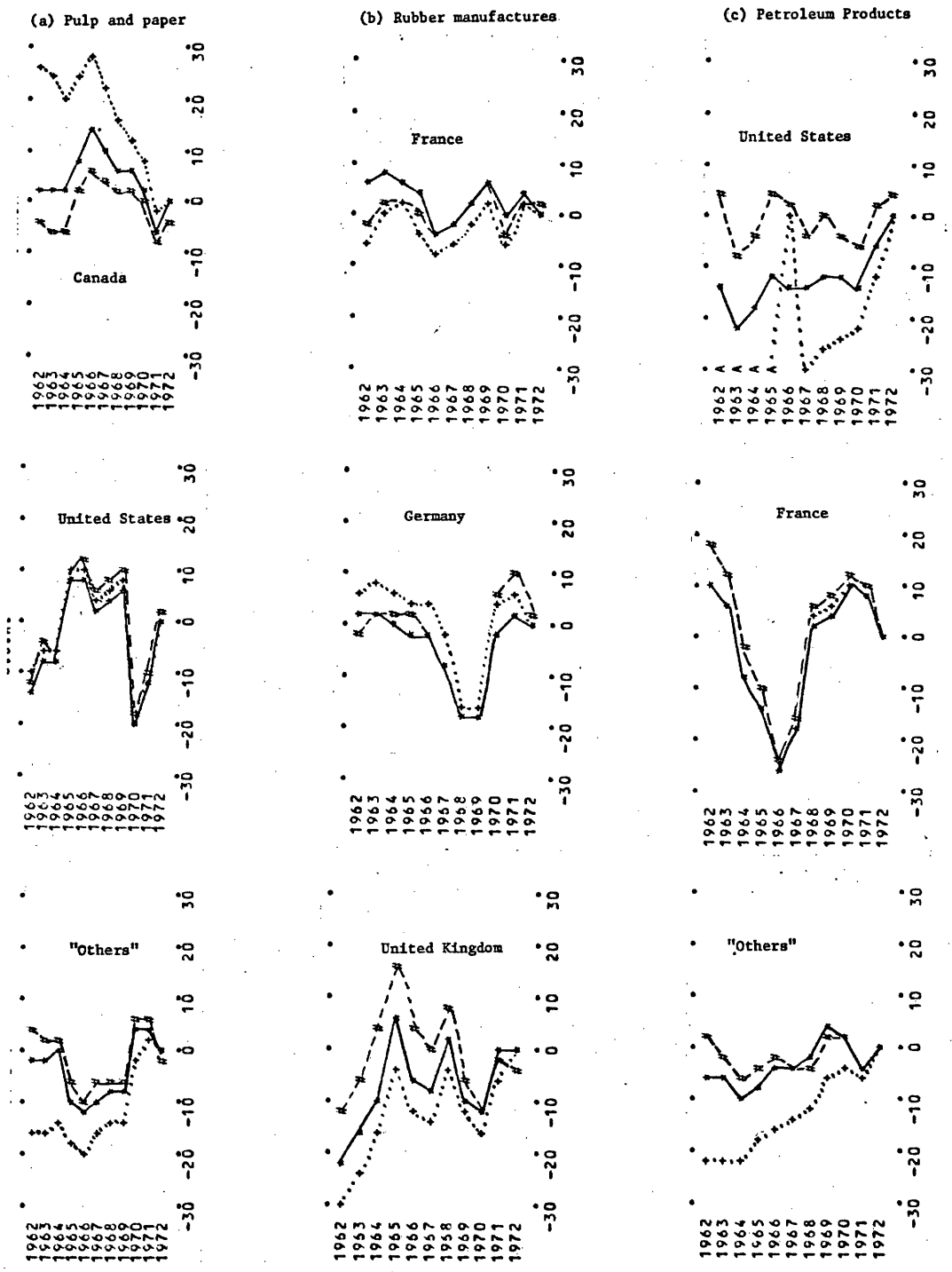
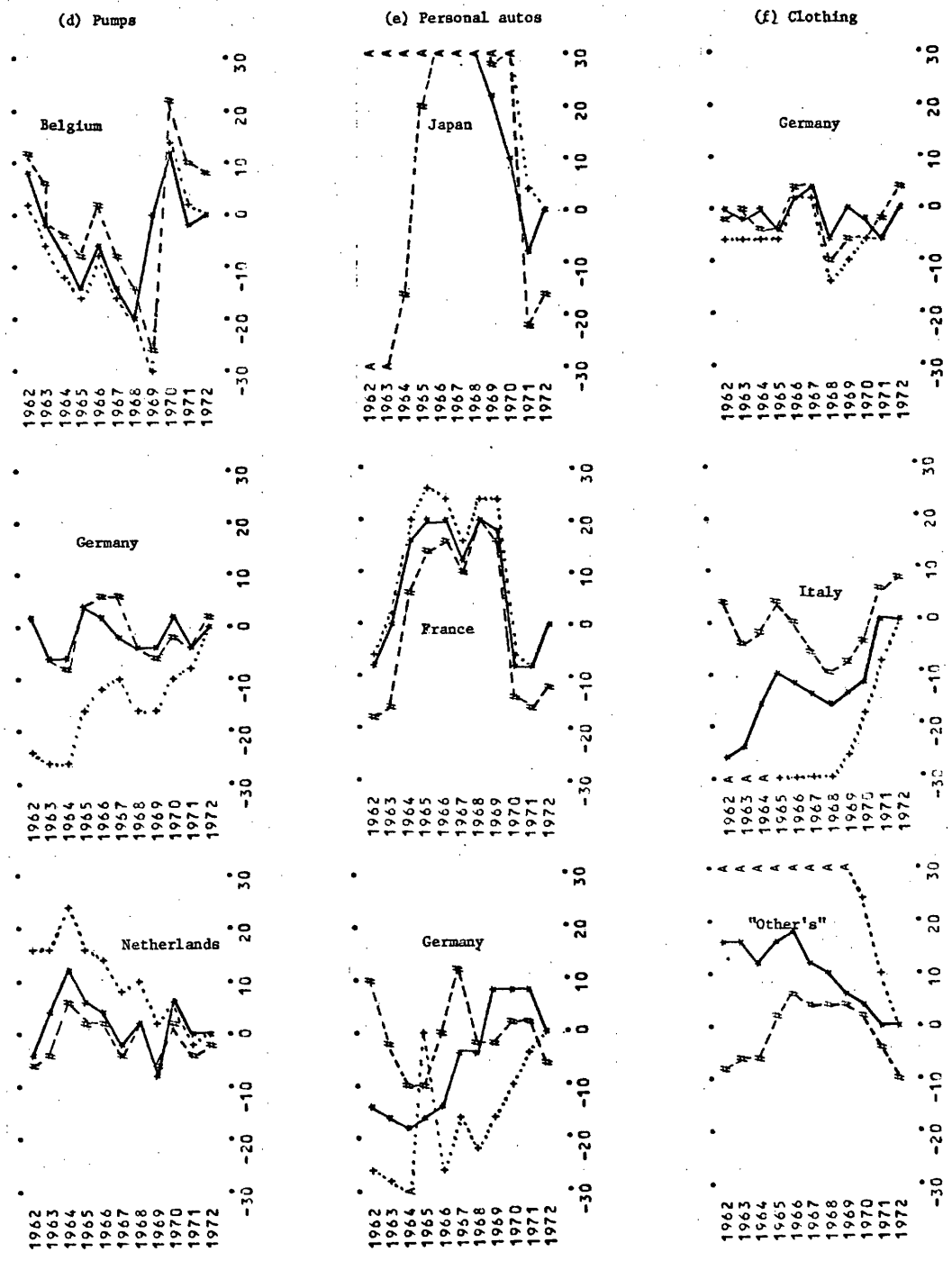


Figure V-5 (Cont'd)



The direction of the veer is important for it tells us whether the exporter's share has been rising or falling. A rising share through time will, of course, produce a relatively large share in 1972. Therefore, predictions based on the large 1972 share will be larger than the actual in earlier years. Therefore, the plot for such a circumstance will start with large positive errors in 1962 and gradually have smaller errors after that. The reverse is true for falling errors. Hence, rising average shares for an exporter can be seen as a falling error. Now for a few examples and further elaboration. Panel (a), the first vertical section of three plots, shows the errors for exports of Pulp and paper (17) for Canada, the United States, and "Others." The lines connecting the constant share error show: a fall for Canada, indicating Canada is growing relative to world trade; no trend for the United States, implying no trend relative to world exports; a rise for "Others," indicating that "Others" is losing ground, relatively, in world trade. Indeed, a calculation does show that in 1962 Canada accounted for 29% of world exports and "Others" for 53%; the corresponding figures in 1972 were 34% and 45%. The trends observed in constant share error disappear when the equation error is plotted. The plot for "Others" in this panel (a) is a representative example. The disappearance of the trend in the equation error is not due, necessarily, to the inclusion of a trend variable but could be also due to the fact that relative prices are trended. It can be seen that the unconstrained time forecasted errors do quite well when the constant share errors are trended. In fact, they often do better than the equation forecasted predictions. Despite their often better fit, the time forecasted shares were never seriously

considered because no economic analysis is possible with them. For those instances where the trends in the constant share error are not reasonably smooth, such as that for the United States in panel (a), the time trend forecast fails to improve on the constant share forecast. The other panels, (b) to (f), show plots for three major exporters of five other of the twelve selected products.

# Chapter VI

## Prospects

The trade model presented in this study has enabled us to examine the effects of a price change in one country on the bilateral trade between two other countries as well as the trade effects on the price changer. The analysis, however, is limited to an examination of movements of the trade shares. Several major items remain to be examined before the model presented here can be fully utilized. This chapter will examine some of these and attempt to outline approaches that will be employed to incorporate them.

Non-price factors explaining the movements of the shares need to be explored. Lee Samuelson, as explained in Chapter III, has included measures on relative capacity.[1] The data requirements to do such an analysis would be extensive since we would need annual data on both capacity and output by product for each country in the model. Output by product and country will be available as the system of national models outlined in the opening chapter take shape. Measures of capacity may also be developed in conjunction with those models. The present data limitations preclude any immediate attention being given to this possible improvement in the share equations.

Of more immediate pratical concern is an examination into the effect of price on the level of imports, not just on the shares. Clearly, when one country reduces its price and, therefore, the world

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[1] op. cit., L. Samuelson, p. 10-11.

price as seen by another drops, the imports of the price reducing country will tend to fall and those of the other will tend to rise. The price effect on the level of imports will be in addition to the effects on the trade shares themselves. Therefore, to ascertain more fully the effects of price changes on trade flows, estimates will need to be made on the price responsiveness of imports by product and country. Outputs for several countries in the system of national models have already been collected. With a few months of data collection, outputs for several others could be obtained. With outputs, exports, imports, domestic prices and world prices known, estimates of the price responsiveness of imports could be obtained. The work involved in this particular area of inquiry appears to be possible and should make the model conform closer to real world events. Work will probably proceed in this direction in the near future.

At the time of the conception of the trade model idea, the countries discussed in this study were deemed to be the most relevant. Since that time, interest has been generated toward including Austria and Sweden as possible additional countries. The inclusion of Austria would pose few problems but, because of the data collection techniques that were employed, Sweden will be more difficult. There are, however, other considerations. The model is already large, complicated and fairly expensive to estimate; the data arrangement itself is by no means a trival task. Expansion from ten to twelve countries would not be a mere 20% increase in cost but more likely on the order of a 44% increase. (Costs seem to increase by the ratio of the square of the numbers of countries.) Therefore, while expansion to include Austria

will probably take place, care and thought will need to be given to the addition of many others.

Gathering detailed annual data on tariffs by country, by commodity would be useful in improving the price variables in the trade model. Trade diverting effects could thus be examined. The trade effects of the United Kingdom's entry into the EEC could be better examined with the inclusion of the effects of the tariff reductions occurring. While acknowledging the well-known problems of tariff data, and its use, I feel that such an investigation would probably prove useful. There are, however, enormous problems in just the gathering of such data because of different classification schemes employed in tariff statistics and trade flows. Therefore, it will, in all likelihood, be some time before such a study on tariffs is accomplished.

The model in this study is of merchandise trade. Non-merchandise trade, consisting mainly of transportation services, tourism and financial flows, is also very important. A study of the structure of these flows could lead, together with the current study, to a complete model of international transactions. While such a study of the financial flows would have an interest in itself, the primary achievement that would be obtained from such a model would be in the complete model of trade. From the complete model would come the necessary data and relationships to build an exchange rate model. Thus, national models could be linked through their merchandise and financial trade flows and the interrelationships determining exchange rates could be

studied and those effects relayed back to the national models. It would be only at this point that one could say that there would exist a truly complete interdependent system of dynamic input-output models.

# Appendix

## A Note on the Data

Two large pieces of data are required for the model: (1) bilateral trade flows for each of the ten countries of the model to each of the others for the period 1962-1972 covering the entire spectrum of traded goods; and (2) prices for each commodity in each country for the period 1957-1972. Thus, for the bilateral trade flows, 132,000 numbers are required; for the price indices, 19,200.

### Bilateral Trade Flows

Data on bilateral flows are collected by at least two organizations, the United Nations (UN), and the Organization for Economic Cooperation and Development (OECD). The OECD data was chosen for three reasons: (1) OECD membership includes all of the countries of the model and the data collected by it would therefore be sufficient; (2) the OECD data was available from a local source;[1] (3) the OECD, unlike the UN, had gone to the trouble to make the national data uniform in its classification from country to country; and (4) much of the UN data would be superfluous. Indeed, the use of the UN data would have vastly increased the data preparation burden, for the data must be ordered by commodity and within the commodity by country and within the country by year--exactly the opposite its order in its raw state on the computer tapes.

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[1] I am most grateful to the Foreign Trade Statistical Office of the OECD for permission to obtain the tapes from the International Monetary Fund. In addition, the staff of the International Monetary Fund was most helpful in expediting the loan of the tapes to me.

Each year of raw data was written on ten computer tapes—five of export data and five of import data. Export data was the primary source because (1) the purpose of the model is to predict exports and so export data seems natural, and (2) classification errors are less likely by exporter than by importer. Exports of the rest of the world were derived from the import data. Intraregional, rest of the world, trade was merely approximated by other (other than the nine countries in the model) OECD countries' imports from the rest of the world.

It was possible to obtain eleven years of data covering the period 1962 to 1972. Each of the required 110 tapes had to be read binary-bit-by-binary-bit to obtain approximately 1,500,000 digits which then formed about 40,000 numbers. After this initial transformation, the data consisted of bilateral flows for 850 4-digit Standard Industrial Trade Classification (SITC) groupings from each of the 22 OECD countries to about 160 countries around the world. The next step was to compress to manageable proportions the 160 partner countries of the 22 OECD members. The geographical aggregation brought the number of partners to 30. Nine of these 30 partners were, of course, the countries in the model; other individual countries were Austria, Denmark, Switzerland, Mexico Spain, Venezuela; the rest of the 30 partners were regions such as South America, the Middle East and North Africa, Southern Asia, Southeast Asia, Non-communist East Asia, Communist East Asia, the Southwest Pacific and Central America, and Southern Africa. The next step further aggregated the partner countries to the ten used in the model. The 4-digit series were then aggregated to make the 120 sectors of the trade model. Therefore, as each year's ten tapes were read, a new

year's trade matrix for each sector was added to the time series of these matrices. Table A.1 is a list of the 120 sector titles, and the SITC codes included in each. Table A.2 is a complete list of the 850 4-digit groupings and their titles.

Prices

The prices used in the model were domestic prices. They were chosen for three reasons: (1) the national models will, when fully operational, use and forecast domestic prices, hence, they are a logical choice; (2) detailed domestic price indices were generally easier to obtain than export prices, and (3) while unit-value indexes could be made from the same computer tapes which gave the bilateral flows, the many well known problems associated with them prohibited their use. The first reason was, however, the overriding one in the decision.

Tables A.3 to A.12 give the sources of the price data. Each table links each trade sector to a specific price series whose title is listed as it appears in its source publication. Only Table A.12, "Other's" prices, does not link every trade sector to a specific price series. "Others" prices come from a variety of publications and countries. The bases of the choice of a particular country (not one of the nine) for the "other" price series were (1) importance of the country in the total world trade of the commodity, and (2) availability, reliability and series length of the index. For raw materials, ores and many agricultural prices, the source publication was the IMF's Financial Statistics which gives unit values of the exports of the countries which

have the largest proportions of world trade in a particular commodity. Thus, Zambiam copper ore was used as well as Peruvian fish meal. The other sources were Sweden and Switzerland. For those sectors not listed specifically, a simple average of the prices of the nine was used. While this leaves much to be improved upon, this procedure probably was not to bad an estimate since most of the missing prices were for machinery where "others" accounted for only a small portion of world trade.

In many instances, price series were not of adequate detail or length for the anlaysis to proceed without additonal work on the prices themselves. But proceed I did. In cases of insufficient detail, the nearest aggregate index was chosen. Thus, the index for printing machines in the U.S.A. is the index of the Special industry machinery sector of the U.S.A. INFORUM model. A printing machine index might very well have been available from a detailed wholesale price index but because the U.S. model will forecast Special industrial machinery prices and not printing machinery prices, the more aggregate index was the one to use. In cases of insufficient length, such as printing machines in the Netherlands, a longer but more aggregate series was used to extend the series. If, for instance, we have a detailed index, D, for 1966-1972, but only an aggregate, A, for 1957-1972, we extend D backwards by the regression

$$D_t = a + bA_t, \quad T = 1966\text{-}1972$$

The estimated parameters a, and b, along with the aggregated data for 1957-1965 were used to estimate the detailed series for 1967-1965. The

lengthening step was necessary for many of the series. The most common countries involved were Canada, where a great many series began in 1961, Japan, where many series began in 1959, Germany (1958), France (1962), the Netherlands (various starting dates), and the "others" (various dates).

One more set of prices is necessary for the model. Once domestic prices have been gathered for all products, a time series of exchange rates, using one country as the numeraire, is necessary in order to make the domestic prices indices comparable from one country to another. For example, if the Italian price of shoes rises ten percent, does that make Florentine slippers more expensive to both American and German consumers? Without exchange rates, one cannot tell. To go further with the example, suppose the U.S. dollar is the base currency and the Lira falls eight percent relative to the dollar during the period of the Italian shoe price rise but the Deutschmark rises eight percent against the dollar, what then can we say about the price of Italian shoes to American and German consumers? First, for the Americans we have the eight percent fall in the Italian currency relative to the dollar and so the new price is (.92) (1.10) = 1.012. For the German consumers there is first the Lira fall against the dollar and second the dollar fall against the Deutschmark, hence, the German price is (.92) (.92) = .93104.

The U.S. dollar was chosen as the numeraire because the trade conversation ratios given by IMF's Financial Statistics use the dollar as the numeraire and the bilaterial flow data were in U.S. dollars.

Table A.1
Trade Sector Titles

| TRADE SECTOR | TITLE | TRADE SECTOR | TITLE |
|---|---|---|---|
| 1 | MEAT AND LIVE ANIMALS | 60 | LEAD AND ZINC |
| 2 | DAIRY AND EGGS | 61 | OTHER NONFERROUS |
| 3 | FISH | 62 | FINISHED STRUCTURAL PARTS |
| 4 | GRAINS UNMILLED | 63 | METAL CONTAINERS |
| 5 | GRAINS MILLED | 64 | WIRE PRODUCTS |
| 6 | FRESH FRUITS AND VEGETABLES | 65 | HARDWARE |
| 7 | PRESERVED FRUITS AND VEGETABLE | 66 | BOILERS AND TURBINES |
| 8 | SUGAR | 67 | AIRCRAFT ENGINES |
| 9 | COFFEE,TEA,COCOA,ETC | 68 | INTERNAL COMBUSTION ENGINES |
| 10 | FEED STUFFS | 69 | OTHER POWER MACHINERY |
| 11 | FATS AND OILS | 70 | AGRICULTURAL MACHINERY |
| 12 | BEVERAGES | 71 | OFFICE MACHINES |
| 13 | TOBACCO AND TOBACCO PRODUCTS | 72 | COMPUTER AND RELATED EQUIPMENT |
| 14 | HIDES,LEATHER,FURS | 73 | METAL WORKING MACHINERY |
| 15 | RUBBER(INCL. SYNTH)--CRUDE | 74 | TEXTILE AND LEATHER MACHINERY |
| 16 | CRUDE WOOD | 75 | PAPER MILL MACHINES |
| 17 | PULP AND PAPER | 76 | PRINTING MACHINES |
| 18 | SILK, OTH. NON MANMADE FIBERS | 77 | FOOD PROCESSING MACHINES |
| 19 | WOOL | 78 | CONSTRUCTION MACHINES |
| 20 | COTTON | 79 | MINERAL CRUSHING MACHINES |
| 21 | CRUDE FERTILIZERS | 80 | HEATING AND COOLING EQUIPMENT |
| 22 | MARBLE,SAND, AND OTH.CRUDE MIN | 81 | PUMPS |
| 23 | IRON ORE AND SCRAP | 82 | MECHANICAL HANDLING EQUIPMENT |
| 24 | NONFERROUS ORES AND SCRAP | 83 | ALL OTHER NON-ELECTRICAL,NES |
| 25 | VEGETABLE MATERIALS,NES | 84 | ELECTRIC POWER MACHINES |
| 26 | COAL, COKE | 85 | EQUIP OFR DISTRIBUTING ELECT. |
| 27 | CRUDE PETROLEUM | 86 | TELEVISION SETS AND RADIOS,ETC |
| 28 | PETROLEUM PRODUCTS | 87 | APPLIANCES, DOMESTIC |
| 29 | GAS, NATURAL AND SYNTHETIC | 88 | MEDICAL ELECTRICAL APPLIANCES |
| 30 | ELECTRICAL ENERGY | 89 | BATTERIES |
| 31 | CHEMICAL ELEMENTS | 90 | LAMPS |
| 32 | DYEING,TANNING, AND COAL CHEM | 91 | TRANSISTORS |
| 33 | MEDICINAL CHEMICALS | 92 | ELECTRICAL MEASURING INSTRUMEN |
| 34 | PERFUME MAT. AND OTH. CHEM.NES | 93 | OTHER ELECTRIAL MACH.,NEW |
| 35 | MANUFACTURED FERTILIZERS | 94 | RAILWAY VEHICLES |
| 36 | EXPOLSIVES | 95 | PERSONAL AUTOS |
| 37 | PLASTIC MATERIALS | 96 | BUSSES AND TRUCKS |
| 38 | RUBBER MANUFACTURES | 97 | AUTO BODIES AND CHASSES |
| 39 | VENEERS, PLYWOOD | 98 | MOTOR CYCLES |
| 40 | NEWSPRINT | 99 | ROAD VEHICLES |
| 41 | RAFTPAPER | 100 | AIRCRAFT AND PARTS |
| 42 | FIBREBOARD | 101 | WARSHIPS |
| 43 | OTHER PAPER AND PAPERBOARD | 102 | SHIPS AND BOATS |
| 44 | ART. OF PAPER AND PAPERBOARD | 103 | SANITARY,PLUMBING,HEAT. FIXTUR |
| 45 | YARNS AND THREADS | 104 | FURNITURE |
| 46 | COTTON FABRICS | 105 | TRAVEL GOODS, HANDBAGS |
| 47 | OTH TEXT FAB EXC FLOOR COVERNG | 106 | CLOTHING |
| 48 | FLOOR COVERINGS | 107 | FOOTWEAR |
| 49 | STONE AND BRICKS | 108 | SCIENTIFIC,MEDICAL INSTRUMENTS |
| 50 | GLASS | 109 | PHOTOGRAPIC SUPPLIES |
| 51 | POTTERY, PERALS, PRECIOUS GEMS | 110 | WATCHES AND CLOCKS |
| 52 | PIG IRON | 111 | MUSICAL INSTRUMENTS |
| 53 | IRON AND STEEL INGOTS AND BARS | 112 | PHONOGRAPHS AND RECORDS |
| 54 | UNIVERALS AND PLATES | 113 | PRINTED MATTER |
| 55 | HOOPS AND RAIL TRACK | 114 | ART |
| 56 | WIRE AND TUBES | 115 | TOYS AND CARRIAGES, GAMES |
| 57 | IRON AND STEEL CASTINGS | 116 | OFFICE SUPPLIES |
| 58 | COPPER | 117 | JEWELLERY |
| 59 | ALUMINUM | 118 | MANUFACTURES,NES |
| 119 | COMMERICAL AND TRANSACT.,NSK | | |

Table A.2

Correspondence of SITC Codes to Trade Sectors

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|
| 0 | LIVE ANIMALS | 0 |
| 10 | LIVE ANIMALS | 0 |
| 11 | BOVINE CATTLE-INCLUDING BUFFAL | 1 |
| 12 | SHEEP,LAMBS,AND GOATS | 1 |
| 13 | SWINE | 1 |
| 14 | POULTRY,LIVE | 1 |
| 15 | HORSES,ASSES,MULES AND HINNIES | 1 |
| 19 | LIVE ANIMALS-CHIEFLY FOR FOOD- | 1 |
| 100 | MEAT AND MEAT PREPARATIONS | 0 |
| 110 | MEAT,FRESH,CHILLED OR FROZEN | 0 |
| 111 | MEAT OF BOVINE ANIMALS,FRESH,C | 1 |
| 112 | MEAT OF SHEEP AND GOATS,FCF | 1 |
| 113 | MEAT OF SWINE,FCF | 1 |
| 114 | POULTRY,FCF | 1 |
| 115 | MEAT OF HORSES,ASSESMMULES AND | 1 |
| 116 | EDIBLE OFFALS OF ANIMALS | 1 |
| 118 | OTHER FRESH,CHILLED,FROZEN MEA | 1 |
| 120 | MEAT,DRIED,SALTED OR SMOKED | 0 |
| 121 | BACON,HAM AND OTHER PIG MEAT | 1 |
| 129 | MEAT AND EDIBLE OFFALS,NES | 1 |
| 130 | MEAT IN AIRTIGHT CONTAINERS NE | 0 |
| 133 | MEAT EXTRACTS AND JUICES | 1 |
| 134 | SAUSAGES, | 1 |
| 138 | OTHER PREPARED OR PRESERVED ME | 1 |
| 200 | DAIRY PRODUCTS AND EGGS | 0 |
| 220 | MILK AND CREAM | 0 |
| 221 | MILK AND CREAM,EVAPORATED | 2 |
| 222 | MILK AND CREAM IN SOLID FORM | 2 |
| 223 | MILK AND CREAM FRESH | 2 |
| 230 | BUTTER | 2 |
| 240 | CHEESE AND CURD | 2 |
| 250 | EGGS | 2 |
| 300 | FISH AND FISH PREPARATIONS | 0 |
| 310 | FISH,FRESH AND SIMPLY PRESERVE | 0 |
| 311 | FISH,FRESH | 3 |
| 312 | FISH,SALTED,DRIED OR SMOKED | 3 |
| 313 | CRUSTACEA DR MOLLUCSC,FCF | 3 |
| 319 | FISH,FRESH, NES | 3 |
| 320 | FISH IN AIRTIGHT CONTAINERS,NE | 3 |
| 400 | CERALS AND CERAL PREPARATIONS | 0 |
| 410 | WHEAT-INCLUDING SPELT UNMILLED | 4 |
| 420 | RICE | 0 |
| 421 | RICE IN THE HUSK OR NOT | 4 |
| 422 | RICE,GLAZED OR POLISHED | 5 |
| 430 | BARLEY,UNMILLED | 4 |
| 440 | MAIZE-CORN-UNMILLED | 4 |
| 450 | CERALS,UNMILLED-EXCL.WHEAT RIC | 0 |
| 451 | RYE UNMILLED | 4 |
| 452 | OATS UNMILLED | 4 |
| 459 | CERALS UNMILLED,NES | 4 |
| 460 | MEAL AND FLOUR OF WHEAT &RICE | 5 |
| 470 | MEAL AND FLR OF CER.EX.WH.RICE | 5 |
| 480 | CEREAL PREP AND PREPS OF FLOUR | 0 |
| 481 | CEREAL GRAIN,FLAKED,PERALED | 5 |
| 482 | MALT-INCLUDING MALT FOUR | 5 |
| 483 | MACARONI,SPAGHETTI,NOODLES,VER | 5 |
| 484 | BAKERY PRODUCTS | 5 |
| 488 | PREPARTATION OF CERALS | 5 |
| 500 | FRUIT AND VEGETABLES | 0 |
| 510 | FRUIT FRESH | 0 |
| 511 | ORANGES,TANGERINES AND CLEMENT | 6 |
| 512 | OTHER CITRUS FRUIT | 6 |
| 513 | BANANAS-INCLUDING PLANTAINS | 6 |
| 514 | APPLES,FRESH | 6 |
| 515 | GRAPES,FRESH | 6 |
| 517 | EDIBLE NUTS,FRESH OR DRIED | 6 |
| 519 | FRESH FRUIT,NES | 6 |
| 520 | DRIED FRUIT INCLUDING ART.DEHY | 7 |
| 530 | FRUIT,PRESERVED | 0 |
| 532 | FRUIT,FRUIT PEEL,PRESERVED BY | 7 |
| 533 | JAMS,MARMALADE,FRUIT JELLIES | 7 |
| 535 | FRUIT JUICED AND VEGETABLE JUI | 7 |
| 536 | FRUIT, TEMPORARILY PRESERVED | 7 |
| 539 | FRUIT AND NUTS, PREP. OR PRESE | 7 |
| 540 | VEGETABLES, ROOTS,TUBERS | 0 |
| 541 | POTATOES,FRESH | 6 |
| 542 | BEANS,PEAS,LENTILS | 6 |
| 544 | TOMATOES,FRESH | 6 |
| 545 | OTHER FRESH VEGETABLES | 6 |
| 546 | VEGETABLES,FROZED OR IN TEMPOR | 6 |
| 548 | VEGETABLES PRODUCTS FOR HUM | 6 |
| 550 | VEGETABLES,ROOTS,TUBES PRES. | 0 |
| 551 | VEGETABLES,DEHYDRATED | 7 |
| 554 | FLOUR AND FLAKES OF POATAOES,F | 7 |
| 555 | VEGETABLES PRESERVED | 7 |
| 600 | SUGAR,SUGAR PREP AND HONEY | 0 |
| 610 | SUGAR AND HONEY | 0 |
| 611 | RAW SUGAR,BEET AND CANE | 8 |
| 612 | REFINED SUGAR OTHER | 8 |
| 615 | MOLASSES | 8 |
| 616 | NATURAL HONEY | 8 |
| 619 | SUGARS AND SYRUPS, NES | 8 |
| 620 | DUHST,VONGY,DUHSTPTRD. | 8 |
| 700 | COFFEE,TEA,COCOA,SPICED | 0 |
| 710 | COFFEE | 0 |
| 711 | COFFEE,GREEN OR ROASTED | 9 |
| 713 | COFFEE,EXTRACTS,ESSENCED,CONCE | 9 |
| 720 | COCOA | 0 |
| 721 | COCOA BEANS,RAW OR ROASTED | 9 |
| 722 | COCOA POWDER,UNSWEETENED | 9 |

NOTE: A ZERO IN THE TRADE SECTOR COLUMN INDICATES THAT A PARTICULAR SITC CODE WAS NOT USED IN THE AGGREGATION TO THE TRADE MODEL.

Table A.2 (Cont'd)

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|
| 723 | COCOA BUTTER AND COCOA PASTE | 9 |
| 730 | CHOCOLATED OTH FOOD PREP. | 9 |
| 740 | TEA AND MATE | 0 |
| 741 | TEA | 9 |
| 742 | MATE | 9 |
| 750 | SPICES | 0 |
| 751 | PEPPER AND PIMENTO | 9 |
| 752 | SPICES,EXC PEPPER | 9 |
| 800 | FEED.-STUFF FOR ANIMALS | 0 |
| 810 | FEED.-STUFF FOR ANIMALS | 0 |
| 811 | HAY AND FODDER | 10 |
| 812 | BRAN | 10 |
| 813 | OIL SEED | 10 |
| 814 | MEAT AND FISH MEAL | 10 |
| 819 | FOOD WASTES AND PREP.ANIM.FEED | 10 |
| 900 | MISCELLANEOUS FOOD PREPARATION | 0 |
| 910 | MARGARINE AND SHORTENING | 0 |
| 913 | LARD | 11 |
| 914 | MARGARINE | 11 |
| 990 | FOOD PREPS.,NES | 11 |
| 1000 | BEVERAGES AND TOBACCO | 0 |
| 1100 | BEVERAGES | 0 |
| 1110 | NON-ALCOHOLIC BEVERAGES,NES | 12 |
| 1120 | ALCOHOLIC BEVERAGES | 0 |
| 1121 | WINE OF FRESH GRAPS | 12 |
| 1122 | CIDER AND FERMENTED BEVERAGES | 12 |
| 1123 | BEER-INCLUDING ALE,STOUT,PORTE | 12 |
| 1124 | DISTILLED ALCOHOLIC BEVERAGES | 12 |
| 1129 | ALCHOLIC BEVERAGES,NES | 12 |
| 1200 | TOBACCO AND TOBACCO MANUFACTUR | 0 |
| 1210 | TOBACCO,UNMANUFACTURED | 13 |
| 1220 | TOBACCO,MANUFACTURES | 0 |
| 1221 | CIGARS, AND CHEROOTS | 13 |
| 1222 | CIGARETTES | 13 |
| 1223 | TOBACCO, MANUFACTURED FOR SMOK | 13 |
| 2000 | CRUDE MATERIALS,INEDIBLE,EXCEP | 0 |
| 2100 | HIDES,SKINS AND FUR SKINS,UNDR | 0 |
| 2110 | HIDES AND SKIN | 0 |
| 2111 | BOVINE AND EQUINE HIDES | 14 |
| 2112 | CALF SKINS | 14 |
| 2114 | GOAT AND KID SKINS | 14 |
| 2116 | SHEEP AND LAMB SKINS | 14 |
| 2117 | SHEEP AND LAMB | 14 |
| 2118 | WASTE AND USED LEATHER | 14 |
| 2119 | HIDES AND SKIN,NES | 14 |
| 2120 | FUR SKINS | 14 |
| 2200 | OIL-SEEDS,OIL NUTS,KERNELS | 0 |
| 2210 | OIL-SEEDS,OIL NUTS,KERNELS | 0 |
| 2211 | GROUNDNUTS | 11 |
| 2212 | COPRA | 11 |
| 2213 | PALM NUTS | 11 |
| 2214 | SOYA BEANS | 11 |
| 2215 | LINSEED | 11 |
| 2216 | COTTON SEED | 11 |
| 2217 | CASOTR OIL SEED | 11 |
| 2218 | OIL SEED NES | 11 |
| 2219 | FLOUR AND MEAL OF OIL SEED | 11 |
| 2300 | CRUDE RUBBER INCL.SYNTHETIC | 0 |
| 2310 | CRUDE RUBBER INCL.SYNTHETIC | 0 |
| 2311 | NAT. RUBBER AND SIM.NAT.GUMS | 15 |
| 2312 | SYNTHETIC RUBBER AND RUBBER SU | 15 |
| 2313 | RECLAIMED RUBBER | 15 |
| 2314 | WASTE AND SCRAP OF UNHARDENED | 15 |
| 2319 | CRUDE RUBBER,NES | 15 |
| 2400 | WOOD,LUMBER AND CORK | 0 |
| 2410 | FUEL WOOD AND CHARCOAL | 0 |
| 2411 | FUEL WOOD AND WOOD WASTE | 16 |
| 2412 | WOOD CHARCOAL | 16 |
| 2420 | WOOD IN THE ROUGH OR ROUGHLY S | 0 |
| 2421 | PULPWOOD | 16 |
| 2422 | SAWLOGS AND VENEER LOGS | 16 |
| 2423 | NONCONFIER SAWLOGS | 16 |
| 2424 | PITPROPS | 16 |
| 2428 | NO TITLE | 16 |
| 2429 | POLES,POLING,POSTS | 16 |
| 2430 | WOOD SHAPED | 0 |
| 2431 | RAILWAY SEEPERS-TIES | 16 |
| 2432 | LUMBER,SAWN,PLANED CONIFER | 16 |
| 2433 | LUMBER,SAWN,PLANED NON-COFIFER | 16 |
| 2440 | CORK,RAW AND WASTE | 16 |
| 2500 | PULP AND PAPER | 0 |
| 2510 | PULP AND WASTE PAPER | 0 |
| 2511 | PAPERWASTE AND OLD PAPER | 17 |
| 2512 | MECHANICAL WOOD PULP | 17 |
| 2514 | NO TITLE | 17 |
| 2515 | PULP OTHER AND WOOD PULP | 17 |
| 2516 | CHEMICAL WOOD PULP,DISSOLVING | 17 |
| 2517 | SULPHATE WOOD PULP | 17 |
| 2518 | SULPHITE WOOD PULP | 17 |
| 2519 | SEMI-CHEMICAL WOOD PULP | 17 |
| 2600 | TEXTILE FIBRES,NOT MAN. | 0 |
| 2610 | SILK | 0 |
| 2611 | SILK WORM COCOONS | 18 |
| 2612 | UNREELABLE COCOONS | 18 |
| 2613 | RAW SILD NOT THROWN | 18 |
| 2620 | WOOL AND OTHER ANIMAL HAIR | 0 |
| 2621 | SHEEPS AND LAMBS WOOL | 19 |
| 2622 | DEGREASED WOOL AND LAMB | 19 |
| 2623 | FINE ANIMAL HAIR | 19 |
| 2624 | NO TITLE | 19 |

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Table A.2 (Cont'd)

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|
| 2625 | HORSEHAIR | 19 |
| 2626 | WOOL SHODDY | 19 |
| 2627 | WOOL OR ANIM. HAIR,CARDED | 19 |
| 2628 | WOOL TOPS | 19 |
| 2629 | WASTE OF WOOD AND OTH.AN.HAIR | 19 |
| 2630 | COTTON | 0 |
| 2631 | RAW COTTON | 20 |
| 2632 | COTTON LINTERS | 20 |
| 2633 | COTTON WASTE NOT CARDED | 20 |
| 2634 | COTTON CARDED | 20 |
| 2639 | COTTON,NES | 20 |
| 2640 | JUTE | 18 |
| 2650 | VEGETABLE FIBRES | 0 |
| 2651 | FLAX | 18 |
| 2652 | TRUE HEMP | 18 |
| 2653 | RAMIE | 18 |
| 2654 | SISAL | 18 |
| 2655 | MANILA | 18 |
| 2658 | VEGETABLE TESTILE FIBRES,NES | 18 |
| 2660 | SYNTHETIC FIBRES | 0 |
| 2662 | SYNTHETIC FIBRES FOR SPINNING | 18 |
| 2663 | REGENERATED FIBRES SUITABLE FO | 18 |
| 2664 | WASTE OF SYNTHETIC FIBRES | 18 |
| 2670 | WASTE MATERAILS FROM TEXTILE F | 18 |
| 2700 | CRUDE FERTILEZERS AND CR.MINER | 0 |
| 2710 | FERTILIZERS,CRUDE | 0 |
| 2711 | NATURALFERTILIZERS | 21 |
| 2712 | NATURAL SODIUM NITRATE | 21 |
| 2713 | NATURAL PLOSPHATES | 21 |
| 2714 | NATURAL POTASSIC SALTS,CRUDE | 21 |
| 2730 | STONE, SAND AND GRAVEL | 0 |
| 2731 | BUILDING MONUMENTAL STONE,ROUG | 22 |
| 2732 | GYPSUM,PLASTERS,LIMESTONE | 22 |
| 2733 | SAND-ENCL.MET-BEARING SAND | 22 |
| 2734 | GRAVEL AND CRUSHED STONE | 22 |
| 2740 | SULPHUR AND UNROASTED IRON PYR | 0 |
| 2741 | SULPHUR, NOT SUBLIMED | 22 |
| 2742 | IRON PYRITES | 22 |
| 2750 | NATURAL ABRASIVED | 0 |
| 2751 | INDUSTRIAL DIAMONDS | 22 |
| 2752 | NATURAL ABRASIVES | 22 |
| 2760 | OTHER CRUDE MINERALS | 0 |
| 2761 | NATURAL ASPHALT AND NAT.BITUME | 22 |
| 2762 | CLAY | 22 |
| 2763 | SALT | 22 |
| 2764 | ASBESTOS | 22 |
| 2765 | QUARTZ | 22 |
| 2766 | SLAG,DROSS | 22 |
| 2769 | MINERALS CRUDE,NES | 22 |
| 2800 | METALLIFERROUR ORES AND SCRAP | 0 |
| 2810 | IRON ORE | 0 |
| 2813 | IRON ORE EX.ROASTED IRON PYRIT | 23 |
| 2814 | ROASTED IRON PYRITES | 23 |
| 2820 | IRON AND STEEL SCRAP | 23 |
| 2830 | ORES AND CON. OF NON-FERR.BASE | 0 |
| 2831 | COPPER | 24 |
| 2832 | NICKEL | 24 |
| 2833 | BAUXITE | 24 |
| 2834 | LEAD | 24 |
| 2835 | ZINC | 24 |
| 2836 | TIN | 24 |
| 2837 | MANGANESE | 24 |
| 2839 | NON-FERROUS, NES | 24 |
| 2840 | NON-FERROUS METAL SCRAP | 24 |
| 2850 | SILVER AND PLATINUM ORES | 24 |
| 2860 | URANIUM AND THORIUM | 24 |
| 2900 | CRUDE ANIMAL AND VEG. MAT.NES | 0 |
| 2910 | CRUDE ANIMAL AND VEG. MAT.NES | 0 |
| 2911 | BONES,IVORY | 1 |
| 2918 | NO TITLE | 1 |
| 2919 | MAT. OF ANIMAL ORIGIN,NES | 1 |
| 2920 | CRUDE VEG.MAT.NES | 0 |
| 2921 | PLANTS USED IN DYEING AND TANN | 25 |
| 2922 | NATURAL GUMS,RESINS,BALSAM | 25 |
| 2923 | VEG. MATERIALS USED OR PLAITIN | 25 |
| 2924 | PLANTS,SEED,FLOWERS IN PERF.PH | 25 |
| 2925 | SEED, FRUIT AND SPORES FOR PLA | 25 |
| 2926 | BULBS,TUBER,RHIZOMES FOR FLOWE | 25 |
| 2927 | CUT FLOWERS | 25 |
| 2929 | MATERIALS OF VEG. ORIGIN.NES | 25 |
| 3000 | MINERAL FUELS,LUB. AND REL.MAT | 0 |
| 3200 | COAL,COKE AND BRIQUITTES | 0 |
| 3210 | COAL,COKE AND BRIQUITTES | 0 |
| 3214 | COAL | 26 |
| 3215 | BRIQUETTES OF COAL | 26 |
| 3216 | LIGNITE BRIGQUETTES | 26 |
| 3217 | PEAT | 26 |
| 3218 | COKE | 26 |
| 3219 | COAL,COKE,NES | 26 |
| 3300 | PETROLEUM | 0 |
| 3310 | CRUDE PERTROEUM | 27 |
| 3320 | PETROLEUM PRODUCTS | 0 |
| 3321 | MOTORSPIRIT,GASOLINE | 28 |
| 3322 | LAMP OIL | 28 |
| 3323 | DISTILLATE FUELS | 28 |
| 3324 | RESIDUAL FEUL OILS | 28 |
| 3325 | LUBRICATING OILS AND GREASES | 28 |
| 3326 | MINERAL JELLY AND WAXES | 28 |
| 3329 | PITCH | 28 |
| 3400 | GAS, NAT. AND MANU. | 0 |

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Table A.2 (Cont'd)

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|
| 3410 | GAS, NAT. AND MANU. | 0 |
| 3411 | NATURAL GAS | 29 |
| 3412 | MANUFACTURED GAS | 29 |
| 3500 | ELECTRIC ENERGY | 0 |
| 3510 | ELECTRIC ENERGY | 30 |
| 4000 | ANIMAL AND VEG. OILS AND FATS | 0 |
| 4100 | ANIMAL OILS AND FATS | 0 |
| 4110 | ANIMAL OILS AND FATS | 0 |
| 4111 | OILD OF FISH | 11 |
| 4113 | ANIMALS OILS EX.LARD | 11 |
| 4200 | FIXED VEG. OILS AND FATS | 0 |
| 4210 | FIXED BEG. OILS, SOFT | 0 |
| 4212 | SOYA BEAN OIL | 11 |
| 4213 | COTTON SEED OIL | 11 |
| 4214 | GROUNDNUT OIL | 11 |
| 4215 | OLIVE OIL SUNFLOWER SEED OIL | 11 |
| 4216 | SUNFLOWER SEED OIL | 11 |
| 4217 | RAPE,COLZE AND MUSTARD OILS | 11 |
| 4220 | OTHER FIXED VEG. OILS | 0 |
| 4221 | LINSEED OIL | 11 |
| 4222 | PALM OIL | 11 |
| 4223 | COCONUT-COPRA OIL | 11 |
| 4224 | PALM KERNEL OIL | 11 |
| 4225 | CASTOR OIL | 11 |
| 4229 | FIXED VEG. OILS NES | 11 |
| 4300 | ANIMAL AND VEG. OIL PROCESSED | 0 |
| 4310 | ANIMAL AND VEG. OIL PROCESSED | 0 |
| 4311 | ANIM.VEB.OILS,GOILDED | 11 |
| 4312 | HYRDOGENATED OILS AND FATS | 11 |
| 4313 | ACID OILS,FATTY ACIDS | 11 |
| 4314 | WAXES OF ANIMALOR VEG. ORIGIN | 11 |
| 4319 | ANIMAL AND VEG. OIL,NES | 11 |
| 5000 | CHEMICALS | 0 |
| 5100 | CHEMICAL ELEMENTS AND COMPOUND | 0 |
| 5120 | ORGANIC CHEMCIALS | 0 |
| 5121 | HYDROCARBONS AND DERIVATATIVES | 31 |
| 5122 | ALCOHOLS, PHENOLS, GLYCERINE | 31 |
| 5123 | EITHERS | 31 |
| 5124 | ALDEHYDE | 31 |
| 5125 | ACIDS | 31 |
| 5126 | INORGANIC ESTERS | 31 |
| 5127 | NITROGEN-FUNCTION COMPOUNDS | 31 |
| 5128 | ORGAN-INORGANIC AND HETEROCYCL | 31 |
| 5129 | OTHER ORGANIC CHEMICALS | 31 |
| 5130 | INORGANIC CHEMICALS | 0 |
| 5131 | OXYGEN,NTIROGEN,HYDROGEN,RARE | 31 |
| 5132 | CHEMICAL ELEMENTS,NES | 31 |
| 5133 | INORGANIC ACIDS | 31 |
| 5134 | HALOGEN AND SULPHUR COM. | 31 |
| 5135 | METALLIC OXIDES | 31 |
| 5136 | OTHER INORGANIC BASES | 31 |
| 5140 | OTHER INORGANIC BASES AND META | 0 |
| 5141 | METALLIC SALTS | 31 |
| 5142 | OTH.METAL SALTS | 31 |
| 5143 | OTHER METAL SALTS | 31 |
| 5148 | INORGANIC CHEMICAL, NO TITLE | 31 |
| 5149 | INORGANIC CHEMICAL PRODUCTS,NE | 31 |
| 5150 | RADIOACTIVE AND ASS. MATERIALS | 0 |
| 5151 | RATIOACTIVE CHEM.ELEMENTS AND | 31 |
| 5152 | STABLE ISOTOPES | 31 |
| 5153 | COMPOUNDS AND MIXTURES,NES | 31 |
| 5159 | OTHER COMPOUNDS AND MIXTURES | 31 |
| 5200 | CRUDE CHEMICALS FROM COAL,PETR | 0 |
| 5210 | CRUDE CHEMICALS FROM COAL,PETR | 0 |
| 5211 | MINERAL TAR | 32 |
| 5213 | AMMONICAL GAS | 32 |
| 5214 | OILS AND OTHER PROD OF DISTILL | 32 |
| 5300 | DYEING,TANNING AND COL.MATER. | 0 |
| 5310 | SYNTH.ORGANDYESTUFFS,NAT | 32 |
| 5320 | DYEING,TANNING EXTRACTS,SYNTH. | 0 |
| 5321 | DYEING EXT.VEG.AND ANIMAL | 32 |
| 5323 | SYNTHETIC TANNING MAT. | 32 |
| 5324 | TANNING EXTRACTS OF VEG.ORIGIN | 32 |
| 5325 | TANNIC ACIDS | 32 |
| 5329 | TANNING EXT.,NES | 32 |
| 5330 | PIGMENTS,PAINTS,VARNISHES | 0 |
| 5331 | COLORING MATERIALS,NES | 32 |
| 5332 | PRINTING INKS | 32 |
| 5333 | PREPARED PAINTS,ENAMELS | 32 |
| 5400 | MEDICINAL AND PHARMACEUTICAL | 0 |
| 5410 | EDICINAL AND PHARMACEUTICAL | 0 |
| 5411 | VITAMINS AND PROVITAMINS | 33 |
| 5413 | PENICILLIN STREPTOM | 33 |
| 5414 | ALKOLOIDS OF OPIUM | 33 |
| 5415 | HORMONES | 33 |
| 5416 | GLYCOSIDES | 33 |
| 5417 | MEDICAMENTS | 33 |
| 5418 | NO TITLE | 33 |
| 5419 | PHARMACEUTICAL GOODS | 33 |
| 5500 | PERFUME MATERIALS | 0 |
| 5510 | ESSENTIAL OILS,PERFUME | 0 |
| 5511 | ESSENTIAL OILS AND RESINOIDS | 34 |
| 5512 | SYNTH.PERFUME | 34 |
| 5530 | PERFUMERY,COSMETICS | 34 |
| 5540 | SOAPS,CLEANSING PREPS | 0 |
| 5541 | SOAPS | 34 |
| 5542 | SURFACE-ACTING AGENTS | 34 |
| 5543 | POLISHED PASES,POWDER | 34 |
| 5600 | FERTILIZERS,MANUFACTURED | 0 |
| 5610 | FERTILIZERS MANUFACTURED | 0 |

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Table A.2 (Cont'd)

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR | SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|---|---|---|
| 5611 | NITROGENOUS FERTILIZERS | 35 | 6318 | WOOD SIMPLY SHAPED OR WORKED,N | 39 |
| 5612 | PHOSPATIC FERTILIZERS | 35 | 6320 | WOOD MANUFACTURES,NES | 0 |
| 5613 | POTASSIC FERTILIZERS | 35 | 6321 | BOXES,CASES,CRATES,COMPLETE | 39 |
| 5619 | FERTILIZERS,NES | 35 | 6322 | COOPERAGE PRODUCTS | 39 |
| 5700 | EXPLOSIVES AND PYROTECHNIC PRO | 0 | 6324 | BUILDERS WORKWORD AND PREFAB. | 39 |
| 5710 | EXPLOSIVES AND PYROTECHNIC PRO | 0 | 6327 | MAUNF.OF WOOD FOR DOMESTIC USE | 39 |
| 5711 | PROPELLENT POWDERS | 36 | 6328 | OTHER ARTS OF WOOD NES | 39 |
| 5712 | FUSES | 36 | 6330 | CORK MANUFACTURES | 39 |
| 5713 | PYROTECHNICAL ARTICLES | 36 | 6400 | PAPER,PAPERBOARD AND MAN.THERE | 0 |
| 5714 | HUNTING AD SPORTING AMMUNITION | 36 | 6410 | PAPER AND PAPERBOARD | 0 |
| 5800 | PLASTIC MATERIALS,ETC | 0 | 6411 | NEWSPRINT PAPER | 40 |
| 5810 | PLASTIC MATERIALS, REGENERATED | 0 | 6412 | OTHER PRINTING AND WRITING PAP | 43 |
| 5811 | PRODS OF CONDESATION | 37 | 6413 | KRAFT PAPER AND KRAFT PAPERBOA | 41 |
| 5812 | PROD. OF POLYMERIZATION | 37 | 6414 | CIGARETT PAPER | 43 |
| 5813 | REGEN,CELLULOSE | 37 | 6415 | MACHINE MADE PAPER AND BOARD | 43 |
| 5814 | NO TITLE | 37 | 6416 | FIBREBOARDS | 42 |
| 5819 | OTHER ARTIFICIAL RESINS | 37 | 6417 | HAND MADE PAPERS | 43 |
| 5900 | CHEMICAL MATERIALS AND PRODUCT | 0 | 6418 | NO TITLE | 43 |
| 5990 | CHEMICAL MATERIALS AND PRODUCT | 0 | 6419 | PAPER, PAPERBOARD IN ROLLS, NE | 43 |
| 5992 | INSECTICIDES | 34 | 6420 | ARTICLES OF PAPER,PULP PAPERBO | 0 |
| 5995 | STARCHES,INULINE,GLUTEN | 34 | 6421 | PAPER BAGS,PAPERBOARDS BOXES | 44 |
| 5996 | WOOD AND RESIND BASED CHEM | 34 | 6422 | ENVELOPES, WRITING BOOKS | 44 |
| 5997 | ORGANICAL CHEMICAL PROD.NES | 34 | 6423 | EXERCISE BOOKS,REGISTER,ALBUMS | 44 |
| 5999 | CHEMICAL PRODUCTS, NES | 34 | 6429 | ART. OF PAPER PULP,PAPER | 44 |
| 6000 | MANUFACTURED GOODS | 0 | 6500 | TEXTILE YARN,FABRICS | 0 |
| 6100 | LEATHER | 0 | 6510 | TEXTILE YARN AND THREAD | 0 |
| 6110 | LEATHER | 0 | 6511 | THROWN SILK AND SILK YARN | 45 |
| 6112 | RECONSTITUTED AND ARTIFICAL LE | 14 | 6512 | YARN OF WOOL AND ANIMAL HAIR | 45 |
| 6113 | CALF LEATHER | 14 | 6513 | COTTON YARN | 45 |
| 6114 | LEATHER OF OTHE OOVINE CATTLE | 14 | 6514 | COTTON YARN BLEACHED | 45 |
| 6119 | LEATHE,NES | 14 | 6515 | YARN OF FLAX,RAMIE,HEMP | 45 |
| 6120 | ART. OF READ OR ARTIF. LEATHER | 0 | 6516 | YARN OF SYNTHETIC FIBRES | 45 |
| 6121 | MACHINE LEATHER BELTING | 14 | 6517 | YARN OF REGENERATED FIBRES | 45 |
| 6122 | SADDLERY | 14 | 6518 | YARN OF GLASS FIBRE | 45 |
| 6123 | UPPERS,LEGS AND FOOTWEAR | 14 | 6519 | YARN OF TEXTILE FIBRES,NES | 45 |
| 6128 | NO TITLE | 14 | 6520 | COTTON FABRICS | 0 |
| 6129 | MANUF. OF LEATHER,NES | 14 | 6521 | COTTON FABRICS,WOVEN GREY | 46 |
| 6130 | FUR SKINS | 14 | 6522 | OTHER WOVEN COTTON FABRICS | 46 |
| 6200 | RUBBER MANUFACTURES | 0 | 6530 | TEXTILE FABRICS,WOVEN | 0 |
| 6210 | MATERIALS OF RUBBER | 38 | 6531 | SILK FABRICS | 47 |
| 6290 | ARTICLES OF RUBBER,NEW | 0 | 6532 | WOOLLEN FABRICS | 47 |
| 6291 | RUBBER TYRES AND TUBES | 38 | 6533 | LINEN | 47 |
| 6293 | HYGIENTIC AND PHARM. ARTI. | 38 | 6534 | JUTE | 47 |
| 6294 | TRANSMISSION CONVEYOR BELTS | 38 | 6535 | SYNTHETICS | 47 |
| 6299 | OTHER ARTICLES OF RUBBER,NEW | 38 | 6536 | REGENERATED GIBRES | 47 |
| 6300 | WOOD AND CORK MAN.EX.FURNITURE | 0 | 6537 | KNITTED | 47 |
| 6310 | VENEERS,PLYWOOD BOARDS | 0 | 6538 | GLASS FIBRE | 47 |
| 6311 | VENEER SHEETS | 39 | 6539 | COARSE HAIR AND PAPER, NES | 47 |
| 6312 | PLYWOOD,INCLUDING VENEERED PAN | 39 | 6540 | TULLE,LACE,EMBROIDERY | 47 |
| 6314 | IMPROVED OR RECONSTITUTED WOOD | 39 | 6550 | SPECIAL TEXTILE FABRICS | 0 |

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Table A.2 (Cont'd)

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|
| 6551 | SPECIAL TEXTILE FABRICS | 47 |
| 6553 | NO TITLE | 47 |
| 6554 | COATED OR IMPR.TEXTILE FABRICS | 47 |
| 6555 | ELASTIC FABRICS | 47 |
| 6556 | CORDAGE,CABLES,ROPES | 47 |
| 6557 | HAT BODIES | 47 |
| 6558 | WADDING,WICKS | 47 |
| 6559 | SPECIAL PROD. OF TEXTILE MAT | 47 |
| 6560 | MADE-UP ART. OF TEXT MAT | 0 |
| 6561 | BAGS AND SACKS | 47 |
| 6562 | TARPAULINES,TENTS | 47 |
| 6566 | WOOL BLACKETS | 47 |
| 6569 | OTHER MADEUP ART OF TEXT MAT,N | 47 |
| 6570 | FLOOR COVERINGS,TAPESTRIES | 0 |
| 6574 | LINOLEUM | 48 |
| 6575 | CARPETS | 48 |
| 6576 | NONKNITTED CARPETS | 48 |
| 6577 | TAPESTRIES | 48 |
| 6578 | MATS,MATTING,SCREENS | 48 |
| 6600 | NON-METALLIC MINERAL MANUFACTU | 0 |
| 6610 | LIME,CEMENT | 0 |
| 6611 | LIME | 49 |
| 6612 | CEMENT | 49 |
| 6613 | WORKED STONE | 49 |
| 6618 | UNFIRED BUILDING MATERIALS | 49 |
| 6620 | CLAY AND REFRACTORY | 0 |
| 6623 | REFRACTORY BRICKS | 49 |
| 6624 | NONREFRACTORY CERAMIC BRICKS | 49 |
| 6630 | MINERAL MANUFACTURES,NEW | 0 |
| 6631 | GRINGING AND POLISHING WHEELS | 49 |
| 6632 | ABRASIVE CLOTHS AND PAPERS | 49 |
| 6634 | WORKED MICA AND ART. THEREOF | 49 |
| 6635 | MINERAL INSULATING MATERIALS,N | 49 |
| 6636 | MANUFACTURES OF INERALMAT.NES | 49 |
| 6637 | REFACTORY PROD. NO CONST.MAT. | 49 |
| 6638 | MAN. OF ASBESTOS | 49 |
| 6639 | ARTICLES OF CERAMIC MATERIALSN | 49 |
| 6640 | GLASS | 0 |
| 6641 | GLASSIN THE MASS,RODS | 50 |
| 6642 | OPTICAL GLASS | 50 |
| 6643 | DRAWN OR BLOWN GLASS | 50 |
| 6644 | GLASS IN RECTANGLES | 50 |
| 6645 | CAST OR ROLLED GLASS | 50 |
| 6646 | BRICKS,TILES | 50 |
| 6647 | SAFETY GLASS | 50 |
| 6648 | SHEET OR PLATE GLASS | 50 |
| 6649 | GLASS,NES | 50 |
| 6650 | GLASSWARE | 0 |
| 6651 | GLASS CARBOYS,BOTTLES | 50 |
| 6652 | GLASS TABLEWARE | 50 |
| 6658 | ARTICLED MADE OF GLASS,NES | 50 |
| 6660 | POTTERY | 0 |
| 6664 | PORCELAIN OR CHINE HOUSEHOLD W | 51 |
| 6665 | HOUSEHOLD WARE OF OTHER CERAMI | 51 |
| 6666 | ORNAMENTS OF CERAMIC MATERIALS | 51 |
| 6670 | PEARLS AND PRECIOUS STONES | 0 |
| 6671 | PERALS,NOT SET OR STRUNG | 51 |
| 6672 | DIAMONDS,NOT INDUSTRIAL | 51 |
| 6673 | OTHER PRECIOUS STONES | 51 |
| 6674 | SYNTHETIC PRECIOUS STONES | 51 |
| 6679 | PEARLS AND PREC. STONES,NES | 51 |
| 6700 | IRON AND STEEL | 0 |
| 6710 | PIG IRON | 0 |
| 6711 | SPIEGELESIN | 52 |
| 6712 | PIG IRON,INCL.CAST IRON | 52 |
| 6713 | IRON AND STEEL POWDERS | 52 |
| 6714 | FERRO-MANGANESE | 52 |
| 6715 | OTHER FERRO-ALLOYS | 52 |
| 6720 | INGOTS AND OF IRON OR STEEL | 0 |
| 6721 | PUDDLED BARS | 53 |
| 6723 | INGOTS OF IRON OR STEEL | 53 |
| 6724 | NO TITLE | 53 |
| 6725 | BLOOMS, BILLETS, SLABS | 53 |
| 6727 | IRON AND STEEL COILS | 53 |
| 6729 | BLANKS FOR TUBES AND PIPES | 53 |
| 6730 | IRON AND STEEL BARS,RODS | 0 |
| 6731 | WIRE ROD | 53 |
| 6732 | BARS AND RODS | 53 |
| 6734 | ANGLES 80MM OR MORE | 53 |
| 6735 | ANGLES LESS THAN 80MM | 53 |
| 6739 | NO TITLE | 53 |
| 6740 | UNIVERALS,PLATES | 0 |
| 6741 | UNIVERALS OVER 4.75MM | 54 |
| 6742 | MEDIUM PLATED UNIVERSALS | 54 |
| 6743 | PLATES OF I AND S LT.3MM | 54 |
| 6747 | TINNED PLATED AND SHEETS | 54 |
| 6748 | OTH. COATED IRON STEEL | 54 |
| 6749 | NO TITLE | 54 |
| 6750 | HOOP AND STRIP OF IRON OR STEE | 55 |
| 6760 | RAILS AND RLWY TRACK | 0 |
| 6761 | RAILS OF IRON OR STEEL | 55 |
| 6762 | SLEEPERS AND RAILWAY TRACK | 55 |
| 6770 | IRON AND STEEL WIRE | 56 |
| 6780 | TUBES,PIPES | 0 |
| 6781 | TUBES AND PIPES OF CAST IRON | 56 |
| 6782 | TUBES OF PIPES IRON SEAMLESS | 56 |
| 6783 | TUBES OF IRON WELDED | 56 |
| 6784 | HIGH PRESSURE HYDRO-ELECTRIC C | 56 |
| 6785 | TUBE AND PIPE FITTING OF IRON | 56 |
| 6790 | IRON STEEL CASTING,FORGINGS | 0 |

NOTE: A ZERO IN THE TRADE SECTOR COLUMN INDICATES THAT A PARTICULAR SITC CODE WAS NOT USED IN THE AGGREGATION TO THE TRADE MODEL.

Table A.2 (Cont'd)

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|
| 6791 | IRON CASTING IN THE ROUGH STAT | 57 |
| 6792 | STEEL CAST. IN THE ROUGH STATE | 57 |
| 6793 | IRON AND STEEL FORGINS-ROUGH S | 57 |
| 6800 | NON-FERROURS METS | 0 |
| 6810 | SILVER AND PLATINUM | 0 |
| 6811 | SIVER,UNWORKED | 61 |
| 6812 | PLATINUM,UNWORKED | 61 |
| 6820 | COPPER | 0 |
| 6821 | COPPER AND ALLOYS,UNWROUGHT | 58 |
| 6822 | COPPER WORKED | 58 |
| 6830 | NICKEL | 0 |
| 6831 | NICKEL UNWROUGHT | 61 |
| 6832 | NICKEL WORKED | 61 |
| 6840 | ALUMINIUM | 0 |
| 6841 | ALUMINIUM,UNWROUGHT | 59 |
| 6842 | ALUMINIUM WORKED | 59 |
| 6850 | LEAD | 0 |
| 6851 | LEAD,UNWROUGHT | 60 |
| 6852 | LEAD,WORKED | 60 |
| 6860 | ZINC | 0 |
| 6861 | ZINC UNWROUGHT | 60 |
| 6862 | ZINC WORKED | 60 |
| 6870 | TIN | 0 |
| 6871 | TIN,UNWROUGHT | 61 |
| 6872 | TIN WORKED | 61 |
| 6880 | URANIUM AND THORIUM | 61 |
| 6890 | MISCELL.NON-FERROUS BASE METAL | 0 |
| 6893 | MAGNESIUM AND BERYLLIUM | 61 |
| 6894 | TUNGSTEN,MOLYBDENUM | 61 |
| 6895 | BASEMETTALS,NES | 61 |
| 6900 | MANUFACTURES OF METAL,NES | 0 |
| 6910 | FINISHED STRUCTURAL PARTS | 0 |
| 6911 | FIN.STRU.PARTS.IRON AND STEEL | 62 |
| 6912 | F.S.P. ALUMINIUM | 62 |
| 6913 | F.S.P. ZINC | 62 |
| 6920 | METAL CONTAINERS FOR STORAGES | 0 |
| 6921 | TANKS,VATS | 63 |
| 6922 | CASKS,CRUMS, | 63 |
| 6923 | COMPRESSED GAS CYLINDERS | 63 |
| 6930 | WIRE PRODUCTS-EX.ELECTRIC | 0 |
| 6931 | WIRE CABLES,ROPES | 64 |
| 6932 | WIRE OF IRON OR STEEL | 64 |
| 6933 | GAUZE NETTING | 64 |
| 6934 | EXPANDED METAL | 64 |
| 6939 | WIRE PROD.,NONELECT.,NES | 64 |
| 6940 | NAILS,SCREWS,NUTS,BOLTS | 0 |
| 6941 | NAILS,TACKS | 65 |
| 6942 | NUTS,BOLTS,SCREWS,RIVETS | 65 |
| 6950 | TOOLS FOR HAND USE | 0 |
| 6951 | HAND TOOLS FOR AG. AND FORESTR | 65 |
| 6952 | OTHER HAND TOOLS | 65 |
| 6960 | CUTLERY | 65 |
| 6970 | HOUSEHOLD EQU. OF BASE METALS | 0 |
| 6971 | DOMESTIC STOVES | 65 |
| 6972 | DOMESTIC UTENSILS OF BASE META | 65 |
| 6979 | OTHER HOUSEHOLD EQUIP. | 65 |
| 6980 | MAN. OF METAL,NES | 0 |
| 6981 | LOCKSMITHS WARES | 65 |
| 6982 | SAFES | 65 |
| 6983 | CHAIN FENCE | 65 |
| 6984 | ANCHORS | 65 |
| 6985 | PINS | 65 |
| 6986 | SPRINGS | 65 |
| 6987 | NO TITLE | 65 |
| 6988 | MISCELL ART. OF BASE METAL | 65 |
| 6989 | ARTICLES OF BASE METALS,NES | 65 |
| 7000 | MACHINERY AND TRANSPORT EQUIPM | 0 |
| 7100 | MACHINERY,OTHER THAN ELECTRIC | 0 |
| 7110 | POWER GENERATING MACHINERY | 0 |
| 7111 | STEAM GENERATING BILERS | 66 |
| 7112 | BOILER HOUSE PLANT | 66 |
| 7113 | STEAM ENGINES AND STEAM TURBIN | 66 |
| 7114 | AIRCRAFT ENGINES | 67 |
| 7115 | INTERNAL COMBUSTION ENGINES | 68 |
| 7116 | GAS TURBINES | 66 |
| 7117 | NUCLEAR REACTORS | 69 |
| 7118 | ENGINES,NES | 69 |
| 7120 | AGRICUTLURAL MACINERY | 0 |
| 7121 | AG.MACH CULTIVATION THE SOIL | 70 |
| 7122 | AG.MACH.THRESHING | 70 |
| 7123 | MILKING MACHINES | 70 |
| 7125 | TRACTORS, | 70 |
| 7129 | AG.MACH NES | 70 |
| 7140 | OFFICE MACHINES | 0 |
| 7141 | TYPEWRITERS | 71 |
| 7142 | CALCUATING MACHINES | 71 |
| 7143 | STATISTICAL MACHINES | 72 |
| 7149 | OFFICE MACHINES | 71 |
| 7150 | METALWORKING MACHINERY | 0 |
| 7151 | MACH TOOLS FOR WORKING METALS | 73 |
| 7152 | OTHER METAL MET. MACH.MUM/TEXT | 73 |
| 7170 | TEXTILE AND LEATHER MACHINERY | 0 |
| 7171 | TEXTILE MACHINERY | 74 |
| 7172 | MACH. FOR WORKING HIDES | 74 |
| 7173 | SEWING MACHINES | 74 |
| 7180 | SPECIAL INDUCTRIAL MACHINERY | 0 |
| 7181 | PAPER MILL MACHINES | 75 |
| 7182 | PRINTING MACHINES | 76 |
| 7183 | FOOD PROCESSING MACHINES | 77 |
| 7184 | CONSTRUCTION MACHINES | 78 |

NOTE: A ZERO IN THE TRADE SECTOR COLUMN INDICATES THAT A PARTICULAR SITC CODE WAS NOT USED IN THE AGGREGATION TO THE TRADE MODEL.

Table A.2 (Cont'd)

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|
| 7185 | MINERAL CRUSHING MACHINES | 79 |
| 7190 | MACH. AND APP.-NON ELECT.PARTS | 0 |
| 7191 | HEATING AND COLING EQUIPMENT | 80 |
| 7192 | PUMPS AND CENTRIFUGES | 81 |
| 7193 | MECHANICAL HANDLING EQUIPMENT | 82 |
| 7194 | DOMESTIC APP. NON ELECTRICAL | 87 |
| 7195 | POWERED TOOLS,NES | 83 |
| 7196 | OTHER NON-ELECTRICAL MACH. | 83 |
| 7197 | BALL,ROLLER AND NEEDLE BEARING | 83 |
| 7198 | MACH. AND MECH. ALL,NES | 83 |
| 7199 | PARTS AND ACCESSORIES OF MACH. | 83 |
| 7200 | ELECTRICAL MACHINERY | 0 |
| 7220 | ELECTRIC POWER MACHINERY | 0 |
| 7221 | ELECTRIC POWER MACHINERY | 84 |
| 7222 | APPARATUS FOR ELECTRICAL CIRCU | 85 |
| 7230 | EQUIPMENT FOR DISTRICUT ELECT | 0 |
| 7231 | INSULATED WIRE AND CABLE | 85 |
| 7232 | ELECTRICAL INSULATING EQUIPMEN | 85 |
| 7240 | TELECOMMUNICATION APPARATUS | 0 |
| 7241 | TV SETS | 86 |
| 7242 | RADIOS | 86 |
| 7249 | TELECOMMUNICATIONS EQ., NES | 86 |
| 7250 | COMESTIC ELECTRICAL EQUIPMENT | 87 |
| 7260 | ELEC.APP. MEDIC RADIOLGICAL AP | 0 |
| 7261 | ELECTRO-MEDICAL APPARATUS | 88 |
| 7262 | X-RAY APPARATUS | 88 |
| 7290 | OTHER ELECTRICAL MACHINER. | 0 |
| 7291 | BATTERIES | 89 |
| 7292 | LAMPS | 90 |
| 7293 | TRANSISTORS | 91 |
| 7294 | AUTO ELECTRIC | 93 |
| 7295 | EL. MEASURING INSTRUMENTS | 92 |
| 7296 | EL. HAND TOOLS | 93 |
| 7297 | EL. PROTON ACCELERATORS | 93 |
| 7299 | ELECTRIC, NES | 93 |
| 7300 | TRANSPORT EQUIPMENT | 0 |
| 7310 | RAILWAY VEHICLES | 0 |
| 7311 | RAILWAY LOCOMOTIVES | 94 |
| 7312 | EL. RAILWAY LOCO | 94 |
| 7313 | RAIL LOCO. NOT STEAM OR ELE. | 94 |
| 7314 | MECH PROP. RAIL AND CARS | 94 |
| 7315 | RAIL PASSENGER CARS | 94 |
| 7316 | RAIL CARD NOT MECH PROPEDLLED | 94 |
| 7317 | PARTS OF RAILWAY LOCOMOTIVES | 94 |
| 7319 | NO TITLE | 94 |
| 7320 | ROAD MOTOR VEHICLES | 0 |
| 7321 | PASSENGER CARS | 95 |
| 7322 | BUSES | 96 |
| 7323 | LORRIES | 96 |
| 7324 | SPECIAL PURPOSE LORRIES | 96 |
| 7325 | ROAD TRACTOR | 96 |
| 7326 | CHASSIS WITH ENGINES | 97 |
| 7327 | CHASSIS WITH ENGINES MOUNTED | 97 |
| 7328 | BODIES OF MOTOR VEHICLES | 97 |
| 7329 | MOTORCYCLES | 98 |
| 7330 | ROAD VEHICLES | 0 |
| 7331 | BICYCLES | 99 |
| 7333 | TRAILERS | 99 |
| 7334 | INVALID CARRIAGES | 99 |
| 7339 | NON-AUTO ROAD VEHICLES,NES | 99 |
| 7340 | AIRCRAFT | 0 |
| 7341 | AIRCRAFT HEAVIER THAN AIR | 100 |
| 7349 | PARTS OF AIRCRAFT,BALLOONS,AIR | 100 |
| 7350 | SHIPS AND BOATS | 0 |
| 7351 | WARSHIPS OF ALL KINDS | 101 |
| 7353 | SHIPS AND BOATS OTHER THAN WAR | 102 |
| 7358 | SHIPS FOR BREAKING UP | 102 |
| 7359 | SPECIAL PURPOSE SHIPS AND BOAT | 102 |
| 8000 | MICSELLANEOUS MANUFACTURED ART | 0 |
| 8100 | SANITARY,PLUMBING | 0 |
| 8120 | SAITARY,PLUMBING HEATING FIX | 0 |
| 8121 | CENTRAL HEATING APP. | 103 |
| 8122 | SINK | 103 |
| 8123 | STEEL SINKS | 103 |
| 8124 | LIGHTING FIXTURES | 103 |
| 8200 | FURNITURE | 0 |
| 8210 | FURNITURE | 104 |
| 8300 | TRAVEL GOOD,HANDBAGS | 0 |
| 8310 | TRAVEL GOOD,HANDBAGS | 105 |
| 8400 | CLOTHING | 0 |
| 8410 | CLOTHING | 0 |
| 8411 | COTHING OF TEXT FABRIC | 106 |
| 8412 | COTHING ACCESSORIES | 106 |
| 8413 | APPAREL AND OF LEATHER | 106 |
| 8414 | KNITTED OR CROCHETED CLOTHING | 106 |
| 8415 | HEADGEAR | 106 |
| 8416 | GOVES | 106 |
| 8419 | CLOTHING,NES | 106 |
| 8420 | FURCLOTHING | 106 |
| 8500 | FOOTWEAR | 0 |
| 8510 | FOOTWEAR | 107 |
| 8600 | SCIENTIFIC INSTRUMENTS | 0 |
| 8610 | SCIENTIFIC MEDICAL INSTRUMENTS | 0 |
| 8611 | OPTICAL ELEMENT | 108 |
| 8612 | SPECTACLES | 108 |
| 8613 | BINOCULARY | 108 |
| 8614 | PHOTOGRAPHIC CAMERAS | 109 |
| 8615 | PROJECTORS | 109 |
| 8616 | CINEMATOGRAPHIC EQUIPENT,NES | 109 |
| 8617 | MEDICAL INSTRUMENT,NES | 108 |

NOTE: A ZERO IN THE TRADE SECTOR COLUMN INDICATES THAT A PARTICULAR SITC CODE WAS NOT USED IN THE AGGREGATION TO THE TRADE MODEL.

Table A.2 (Cont'd)

| SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR | SITC CODE | 4-DIGIT SITC TITLE | TRADE SECTOR |
|---|---|---|---|---|---|
| 8618 | METERS AND COUNTERS | 108 | 8945 | FAIR GROUND AMUSEMENT,ETC | 115 |
| 8619 | MEASURING AND CONTROLLING INST | 108 | 8949 | TOYS,GAMES,NES | 115 |
| 8620 | PHOTOGRAPHIC SUPPIES | 0 | 8950 | OFFICE AND STATIONERY SUPPLIES | 0 |
| 8623 | CHEMICAL PROD. OF PHOTOGRAPHY | 109 | 8951 | OFF. AND STAT. SUPP. OF BASE M | 116 |
| 8624 | PHOTO FILM | 109 | 8952 | PENS,PENCILS AND FOUNTAIN PENS | 0 |
| 8630 | DEVELOPED CINEMATOGRAPHIC FILM | 109 | 8958 | NO TITLE | 0 |
| 8640 | WATCHES AND CLOCKS | 0 | 8959 | OTHER OFF. AND STAT. SUPPLIES | 0 |
| 8641 | WATCHES, AND CASES | 110 | 8960 | WORKS OF ART,COLLECTOR OF PIEC | 114 |
| 8642 | CLOCKS AND PARTS | 110 | 8970 | JEWELERY AND GOLD/SILVER WARES | 0 |
| 8900 | MISCELLANEIOUS MAN.ART,NES | 0 | 8971 | GOLD JEWELLERY | 117 |
| 8910 | MUSICAL INSTRUMENTS | 0 | 8972 | IMITATION JEWELLERY | 117 |
| 8911 | PHOTOGRAPHS TAPES RECORDERS | 112 | 8990 | MANUFACTURED ARTICLES,NES | 0 |
| 8912 | RECORDS | 112 | 8991 | ARTICLES OF CARVING | 118 |
| 8914 | PIANOS | 111 | 8992 | BASKETWORK | 118 |
| 8918 | MUSICAL INSTRUMENTS,NES | 111 | 8993 | CANDLES | 118 |
| 8919 | PARTS FOR MUSICAL INSTRUMENTS | 111 | 8994 | UMBRELLAS | 118 |
| 8920 | PRINT MATTER | 0 | 8995 | SMALL-WARES AND TOILET ARTICLE | 118 |
| 8921 | BOOKS | 113 | 8996 | ORTHOPADIC APP. HEARING AIDS | 118 |
| 8922 | NEWSPRPAERS | 113 | 8999 | OTHER MAN.ART.NES | 118 |
| 8923 | MUSIC | 113 | 9000 | COMM. AND TRANSAC.NSK | 0 |
| 8924 | PICTURE POSTCARDS | 113 | 9100 | POSTAL PACKAGES,NSK | 0 |
| 8929 | PRINTED MATTER,NES | 113 | 9110 | POSTAL PACKAGES,NSK | 119 |
| 8930 | ARTICLES OF ART. PLAST. MATER. | 114 | 9300 | SPECIAL TRANS,NSK | 0 |
| 8940 | PERAMBULATORS,TOYS,GAMES | 0 | 9310 | SPECIAL TRANS,NSK | 119 |
| 8941 | BABY CARRIAGES | 115 | 9400 | ANIMALS,NES,ZOOS | 0 |
| 8942 | CHILDRENS TOYS | 115 | 9410 | ANIMALS,NES,ZOOS | 119 |
| 8943 | NON-MILITARY ARMS | 115 | 9500 | FIREARMS OF WAR AND AMMUNITION | 0 |
| 8944 | OTHER SPORTING GOODS | 115 | 9510 | FIREARMS OF WAR AND AMMUNITION | 119 |
| 8945 | FAIR GROUND AMUSEMENT,ETC | 115 | 9600 | COIN OTHER THAN GOLD NOT LEGAL | 0 |

NOTE: A ZERO IN THE TRADE SECTOR COLUMN INDICATES THAT A PARTICULAR SITC CODE WAS NOT USED IN THE AGGREGATION TO THE TRADE MODEL.

Table A.3

Canadian Prices

Source: Canadian Statistical Review, "Industry Selling Prices", various dates

| Trade Sector | Title of Series |
|---|---|
| 1 | Slaughtering |
| 2 | Butter and cheese |
| 3 | Fish products |
| 4, 6 | Field crops |
| 5 | Flour mills |
| 7 | Fruit and vegetable canners |
| 8 | Sugar refiners |
| 9,11,25 | Miscellaneous foods |
| 12 | Breweries |
| 13 | Tobacco products |
| 14 | Leather tanneries |
| 15,38 | Rubber products |
| 16-17,39 | Sawmills |
| 18,20,45,47 | Cotton yarn |
| 19 | Wool cloth |
| 21,35 | Manufactures of fertilizers |
| 22 | Non-metallic mineral |
| 23 | Iron ore |
| 24 | Nickel |
| 26 | Coal |
| 27 | Crude petroleum |
| 28 | Gasoline |
| 29 | Natural gas |
| 30 | Electricity |
| 31,32,36 | Chemicals |
| 33 | Manufacturers of pharmaceuticals |
| 34 | Soaps |
| 37 | Plastic products |
| 40 | Newsprint |
| 41 | Other paper converters |
| 42-44 | Folding boxes |
| 46,48 | Carpets and rugs |
| 49 | Concrete |
| 50 | Glass |
| 51 | Clay products |
| 52-53 | Iron foundries |
| 54-55,57 | Iron and steel mills |
| 56 | Steel pipe |
| 58 | Copper |
| 59 | Aluminum |
| 60-61 | Metal rolling |

Table A.3 (Cont'd)

| Trade Sector | Title of Series |
|---|---|
| 62,63 | Metal product |
| 64 | Wire products |
| 65 | Hardware |
| 66 | Heating equipment |
| 67-79,81-83,90,94,100-102, 105,109,119 | Total industry |
| 80 | Heating equipment |
| 84-85 | Electrical products |
| 86 | Television and radio manufactures |
| 87-88 | Major electrical appliances |
| 89 | Batteries |
| 91-93,108 | Electrical equipment |
| 95-99 | Motor vehicles |
| 103 | Non-metallic mineral products |
| 104 | Furniture |
| 106 | Clothing |
| 107 | Shoe factories |
| 110 | Clocks |
| 111-115,118 | Miscellaneous manufacturing |
| 116 | Office supplies |
| 117 | Jewelry |

Table A.4

American Prices

Source: INFORUM model of the United States

| Trade Sector | INFORUM Sector Title |
|---|---|
| 1 | Meat animals |
| 2 | Dairy farm products |
| 3,25 | Forestry and fishery products |
| 4 | Grains |
| 5 | Grain mill products |
| 6-7 | Fruits and vegetables |
| 8 | Sugar |
| 9-10 | Miscellaneous food products |
| 11 | Fats and oils |
| 12 | Alcholic beverages |
| 13 | Tobacco |
| 14,105 | Other leather products |
| 15 | Rubber products |
| 16 | Lumber and wood products |
| 17 | Pulp mills |
| 18 | Non-cellulosic fibers |
| 19,46 | Broad and narrow fabrics |
| 20 | Cotton |
| 21 | Chemical fertilizer mining |
| 22 | Stone and clay mining |
| 23 | Iron ore |
| 24 | Copper ore |
| 26 | Coal mining |
| 27,29 | Crude petroleum, natural gas |
| 28 | Petroleum refining |
| 30 | Electric utilities |
| 31,33,35 | Industrial chemicals |
| 32,36 | Miscellaneous chemical products |
| 34 | Drugs |
| 37 | Plastic mat'ls and resins |
| 38 | Synthetic rubber |
| 39 | Veneer and plywood |
| 40-41 | Paper products, nec |
| 42-44 | Paperboard containers |
| 45 | Cellulosic fibers |
| 47 | Misc textiles |
| 48 | Floor coverings |
| 49 | Structural clay products |
| 50 | Glass |
| 51 | Pottery |
| 52-55,57 | Steel |
| 56 | Metal stampings |
| 58 | Copper |

Table A.4 (Cont'd)

| Trade Sector | INFORUM Sector Title |
|---|---|
| 59 | Aluminum |
| 60 | Lead |
| 61 | Other primary non-ferrous metals |
| 62 | Structural metal products |
| 63 | Metal barrels and drums |
| 64 | non-ferrous wire drawing |
| 65 | Cutlery, hand tools, hardware |
| 66 | Engines and turbines |
| 67 | Aircraft engines |
| 68,95,97 | Motor vehicles |
| 69 | Other metal working machinery |
| 70 | Farm machinery |
| 71 | Other office machinery |
| 72 | Computers |
| 73 | Metal cutting machine tools |
| 74-77 | Special industrial machinery |
| 78-79,83 | Construction, mine oilfield machinery |
| 80,103 | Plumbing and heating equipment |
| 81 | Pumps |
| 82 | Materials handling machinery |
| 84 | Power transmission equipment |
| 85 | Transformers and switchgear |
| 86 | Radio, TV receiving |
| 87 | Household appliances |
| 88,114,117,118 | Misc. manufacturing, nec |
| 89 | Batteries |
| 90,93 | Electrical lighting equipment |
| 91 | Electronic components |
| 92 | Electrical measuring instruments |
| 94 | Railroad equipment |
| 96 | Truck, bus, trailer bodies |
| 98 | Cycles |
| 99 | Trailer coaches |
| 100 | Aircraft |
| 101-102 | Ship and boat building |
| 104 | Household furniture |
| 106 | Apparel |
| 107 | Footwear |
| 108 | Engineering and scientific instruments |
| 109-110 | Photographic equipjment |
| 111,115 | Toys |
| 112 | Phonograph records |
| 116 | Office supplies |
| 117 | Jewelry and silverware |

Table A.5

Japanese Prices

Source: INFORUM model of Japan

| Trade Sector | Japan 56-Sector Title |
|---|---|
| 1 | Slaughtered livestock |
| 2 | Other livestock & poultry |
| 3 | Fisheries |
| 4,6-8 | Fruit crops |
| 5 | Grain mills |
| 9,11 | Miscellaneous processed foods |
| 10,25 | Crops for industrial use |
| 12 | Beverages |
| 13 | Tobacco |
| 14 | Leather products |
| 15,38 | Rubber products |
| 16,39,41,44 | Sawed products |
| 17,40,42 | Pulp and paper |
| 18-20 | Spinning fibers |
| 21,35-36 | Miscellaneous chemicals |
| 22,49 | Other mining |
| 23 | Iron ores |
| 24 | Non-ferrous metallic ores |
| 26 | Coal |
| 27,29 | Crude petroleum |
| 28 | Petroleum chemicals |
| 30 | Electricity |
| 31,33 | Basic chemicals |
| 32,34,37 | Raw materials of chemicals & synthetic fibers |
| 43 | Printing and publishing |
| 45-48 | Fabrics |
| 50-51,h05,111-119 | Miscellaneous manufactured goods |
| 52-53 | Pig iron |
| 54-57 | Basic iron and steel |
| 58-61 | Basic-non ferrous metal |
| 62-65,103 | Metal products |
| 66-78 | Machinery |
| 79-94 | Electrical machinery |
| 95-102 | Transport equipment |
| 104 | Furniture |
| 106-107 | Wearing apparel |
| 108-110 | Precision instruments |

Table A.6

Belgian Prices

Source: Annuaire Statistique de la Belgique, "Indices des prix de gros d'apres la nature des produits", various dates

| Trade sector | Title of Price Series |
|---|---|
| 1-3 | Produits agricoles, regne animal |
| 4-13,25 | Produits agricoles, regne vegetal |
| 14,107 | Peau et cuirs |
| 15,38 | Caoutchouc |
| 16,39-40 | Bois |
| 17,41-44 | Papiers et cartons |
| 18 | Lin |
| 19 | Laine |
| 20 | Coton |
| 21,35 | Engrais chimiques |
| 22,49-50 | Materiaux de construction |
| 23-24 | Minerais |
| 26 | Sous-produits du charbon |
| 27-30 | Produits petroliers |
| 31-34,36-37 | Produits chimiques |
| 45-48,106 | Produits textiles |
| 51,67-105,108-119 | Indice total |
| 52-57 | Siderurgie |
| 58-61 | Metaux non ferreux |
| 62-66 | Fabrications metalliques |

Table A.7

French Prices

Source: INFORUM model of France

| Trade sector | French sector title |
|---|---|
| 1 | Vivandes |
| 2 | Produits laitiers |
| 3 | Peche et produits |
| 4-5 | Produits cereales |
| 6-8,10,25 | Agriculture |
| 9 | Produits alimen. devers |
| 11 | Aliments pour animaux |
| 12 | Boissons et alcools |
| 13 | Tabac et allumettes |
| 14 | Cuirs |
| 15 | Caoutchouc brut |
| 16 | Bois bruts et scies |
| 17,39-40 | Demi-produits en bois |
| 18-20 | Mat. premieres textiles |
| 22,49,103 | Mat. de construction et ceramic |
| 23 | Minerai de fer |
| 24,52 | Feraille |
| 26 | Houille et lignite |
| 27 | Petrole brut |
| 28 | Petrole raffine |
| 29 | Gaz naturel |
| 30 | Electricite |
| 31,35 | Chimie minerale |
| 32 | Parachimie |
| 33 | Pharmacie |
| 34 | Chimie organiques |
| 36,81-88,94 | Equipment mechiques |
| 37 | Transformation des plastiques |
| 38 | Ouvrages en caotchouc |
| 41 | Pates a papier |
| 42-44 | Papier et cartons |
| 45-46 | Fils et files |
| 47-48 | Fils artificiels et synthetique |
| 50-51 | Verre |
| 53-57 | Siderugie |
| 58-61 | Minerai non ferreux |
| 62-64 | Prem. transf. de l'acie |
| 65 | Travai des metaux |
| 66-80 | Materiel d'equipment |
| 89 | Mat. electrique industrie |
| 90-93 | Materiel eletronique |
| 95-99 | Auto, motocycles et cycle |
| 100 | Construction aeronautique |
| 101-102 | Construction navale |

| Trade sector | French sector title |
|---|---|
| 104 | Meubles |
| 105,109-119 | Industries diverses |
| 106 | Habillement |
| 107 | Cuirs |

Table A.8

German Prices

Source: Statistiches Jahrbuch, "Index der Erzeugerpreise industrieller Produkte", various dates

| Trade sector | Series title |
|---|---|
| 1 | Fleisch und Fleisherzeugnisse |
| 2 | Butter und Molkereiergzeugnisse |
| 3 | Fischerzeugnisse |
| 4 | Mahl-und Schmaelmuehlenerzeugnisse |
| 5 | Brot |
| 6-7,9-10,25 | Nahrungs-und Genussmillelinindustrien |
| 11 | Margarine |
| 12 | Spiritus |
| 13 | Tabakwaren |
| 14 | Leder |
| 15 | Gummi-und Asbestwaren |
| 16-17,39-40 | Schnittholz |
| 18-20,48 | Textilen |
| 21,37,65,80,86-87,100-102,119 | Industrieerzeugnisee ingesamt |
| 22 | Steine und Erden |
| 23 | Eisenerze |
| 24 | NE - Metalle |
| 26 | Kohlenwertstoffe |
| 27 | Mineraloelerzergnisse |
| 28-29 | Gas |
| 30 | Elektrischer Strom |
| 31 | Organische Industriechemikalien |
| 32 | Chemische Erzeugnisse |
| 33-34 | Chemische Verbrauchsgueter |
| 35-36 | Chemische Erzeugnisse |
| 38 | Bereifungen |
| 41-44 | Papier und Pappe |
| 45-47 | Gespinit Textilien |
| 49 | Steine und Erden |
| 50 | Glasfasern |
| 51 | Feinkermische Erzeugnisse |
| 52 | Roheisen |
| 53 | Eisen und Stahl |
| 54-55,57 | Walzstahl |
| 56,64 | Giessereierzeugnisse |
| 58-61 | NE - Metallhalbzeug |
| 62 | Giessereierzeugnisse |
| 63 | Erzeugnisse der Stahlverforumun |
| 66 | Dampfkessel und Behaelter |
| 67,69,79,82-83 | Kraft maschinen |
| 68,95-97 | Personkraftwagen |
| 70,77 | Landmaschinen |
| 71,72 | Bueromaschinen |

Table A.8 (Cont'd)

| Trade sector | Series title |
|---|---|
| 73 | Metallbearbeitungsmaschinen der hebenden Formung |
| 74 | Textilmaschinen |
| 75 | Papiermaschinen |
| 76 | Foerdermittel |
| 78 | Stahlkonstruktionen |
| 81 | Fluessigkeitspumpen |
| 84,89,93 | Elektromotoren |
| 85 | Transformatoren |
| 88,92,108,113 | Rundfunk-Fernseh-Phonotechnische Geraete |
| 91 | Geraete and Einrichtungen der Elektrizitaetverteilung |
| 94 | Schienengebundene Wagen |
| 98-99 | Kraftraeder |
| 103 | Bleckwaren |
| 104 | Moebel |
| 105 | Lederwaren |
| 106 | Bekleidung |
| 107 | Schuhe |
| 109 | Fotoerzeugnisse |
| 110,115 | Spielwaren |
| 111 | Musikinstrumente |
| 113 | Druckeierzeugnisse |
| 114 | Kunstofferzeugnisse |
| 116 | Bueromoebel |
| 117 | Snaitaere Keramik |

Table A.9

Italian Prices

Source: Annuario Statistico Italiano, "Numeri indici dei prizzi all'ingrosso per classi e categorie di prodotti", various dates

| Trade sector | Title of price series |
|---|---|
| 1 | Carni conservate |
| 2 | Burro e formaggi |
| 3 | Pesce conservato |
| 4 | Frumento |
| 5 | Farine |
| 6 | Legumi, patate e ortaggi |
| 7 | Conserve vegetali |
| 8 | Zucchero e dolciumi |
| 9 | Caffe crudo |
| 10,21,25 | Producti agricoli e zootechnici non alimentari |
| 11 | Olii Alimentari di semi |
| 12 | Vino |
| 13 | Prodotti dell'industrial del tabbaco |
| 14 | Pellami |
| 15 | Gommi greggia |
| 16,29,20,39,40,62-65,90-91, 103,105-106,108-119 | Indice generale |
| 17,41-44 | Carta e cartoni |
| 18,45 | Bozzoli |
| 19 | Lana greggia |
| 20 | Cotone greggia |
| 22 | Materiali di cava |
| 23,52-57 | Prodotti sideru'gici |
| 24,58-61 | Metalli non ferrosi |
| 26 | Carbone coke |
| 27 | Petrolio greggio |
| 28 | Benzina |
| 31 | Prodotti chimici di base |
| 32,34,36 | Derivati dei de prodotti |
| 33 | Chimici di base ed altri |
| 35 | Prodotti chimici per l'agricultura |
| 37 | Materie plastiche |
| 38 | Pneumatici |
| 46,48 | Tessuti |
| 47 | Fibre tessili artificiali e sintetiche |
| 49,51 | Laterizi |
| 50 | Lastre di vetro e di cristallo |
| 66,69-83 | Macchine e attrezzature non elettriche |
| 67-68,94-102 | Mezzi di trasporto |
| 84-89,92-93 | Macchine e apparecchiature elettriche |
| 104 | Mobili ed altri manufatti in legno e sughero |
| 107 | Calzature |

Table A.10

Dutch Prices

Source: Maandstatistiek van de binnenlandse handle, "Indexcijfers van groothandelsprijzen", various dates

| Trade sector | Title of series |
|---|---|
| 1 | Vleeswaren |
| 2 | Zuivelprodten |
| 3 | Visconserven |
| 4 | Bloem |
| 5 | Bloem en meel |
| 6-7 | Groeten en fruitconserven |
| 8 | Suiker |
| 9 | Koffie |
| 10 | Veevoeder |
| 11 | Ruwe olien and vetten |
| 12 | Sterk en zwak alcoholhoundende dranken |
| 13 | Tabak |
| 14,105 | Leder |
| 15,38 | Rubber produkten |
| 16 | Triplex, fineer en |
| 17-18,40 | Papier en karton |
| 19 | Wolindustrie |
| 20 | Kateon |
| 21,65,82-83,86-87,108-119 | Producentenprijen |
| 22 | Bouwmaterialen |
| 23 | Ruw ijzer |
| 24 | Alumininum |
| 25 | Overige voedingsmiddeln |
| 26 | Steenkohlen |
| 27 | Ruwe aardolie |
| 28 | Olieraffinaderijprodukten |
| 29 | Gan en diselolie |
| 30 | Elektriciteit ann grootverbruikers |
| 31 | Chemische |
| 32 | Harsen |
| 33 | Zeep |
| 34 | Fabrieken van verfstoffen |
| 35 | Kunstmestfabrieken |
| 36 | Chemische |
| 37 | Kunstof |
| 41 | Papierzakken |
| 42-44 | Papierkarton |
| 45 | Katoenen 3-cilinder-weefgarens |
| 46 | Katoenenweefsels |
| 47 | Tapijlindustrie |
| 48 | Textielindustrie |
| 49,51 | Zand |

Table A.10 (Cont'd)

| Trade sector | Title of series |
|---|---|
| 50 | Glas |
| 51 | Aardewerk |
| 52-54 | Ruwijzer |
| 55-56,63,103 | Slatenbuizen en pijpen |
| 57 | Ijzergietwerk |
| 58 | Koperlegering |
| 59 | Aluminiumlegering |
| 60 | Loodlegering |
| 61 | Tinlegering |
| 62 | Walserijprodukten |
| 64 | Gereedschapstaal |
| 66,68-69 | Stoomketels, turbines, en motoren |
| 67 | Luchtbehandelingsapparaten |
| 70 | Landbouwmachines |
| 71-72 | Kantoormachines |
| 73,75-77,79 | Machine industrie |
| 74 | Textielnijverheid |
| 78 | Hijs-,hef- en graafwerktuigen |
| 80 | Huishoudelijke verwarmingsapparaten |
| 81 | Vloeistofpompen |
| 84-85,91-92 | Transformatoren |
| 88 | Overige elektrische apparaten |
| 89 | Batterijen |
| 90,93 | Elektrotechnische industrie |
| 94-102 | Rijivielindustrie |
| 104 | Meubelen |
| 106 | Confectie |
| 107 | Schoeisel en schoenonderdelen |

Table A.11

British Prices

Source: Annual Abstract of Statistics, "Wholesale Prices: Index numbers of commodities produced in the United Kingdom:, various dates

| Trade Sector | Title of Series |
|---|---|
| 1-3,11 | Livestock |
| 4 | Wheat |
| 5 | Flour |
| 6-7 | Fruits |
| 8 | Sugar |
| 9 | Confectionary |
| 10,25 | Feedstuffs |
| 12 | Beer |
| 13 | Tobacco |
| 14 | Leather |
| 15 | Raw rubber |
| 16,39 | Sawn hardwood |
| 17,40,43-44 | Paper and board |
| 18-19 | Wools |
| 20 | Cotton yar |
| 21,35 | Fertilizers |
| 22 | Granite |
| 23 | Iron castings |
| 24 | Aluminum ingots |
| 26 | Coal |
| 27,37 | Plastic products |
| 28 | Gasoline |
| 29 | Other petroleum products |
| 30 | Electricity |
| 31 | General chemicals |
| 32 | Dyes and dyestuffs |
| 33 | Medicinal chemicals |
| 34 | Toilet preparations |
| 36 | Plastic materials |
| 38 | Rubber tires |
| 41 | Kraft papers |
| 42 | Fibreboard boxes |
| 45 | Man-made yarns |
| 46 | Cotton cloth |
| 47 | Man-made fabrics |
| 48 | Carpets and rugs |
| 49-51 | Stone, clay and glass |
| 52-55,57 | Iron castings |
| 56 | Steel tubes |
| 58 | Copper |
| 59 | Rolled aluminum |

Table A.11 (Cont'd)

| Trade Sector | Title of Series |
|---|---|
| 60 | Lead |
| 61 | Nickel |
| 62,64 | Steel sheets |
| 63,66 | Vats and tanks |
| 65,89 | Hardware |
| 67-70 | Agricultural machiners |
| 71-79,81-83,85,90-98,100-104 | Construction machinery |
| 80,86-87 | Home appliances |
| 84 | Portable power tools |
| 88,108,110-111 | Dental goods |
| 99 | Baby carriages |
| 105 | Travel goods |
| 106 | Clothing |
| 107 | Footwear |
| 109 | Photo and films |
| 112 | Phonograph records |
| 113-115 | Toys and games |
| 116-119 | Office supplies |

Table A.12

"Other's" Prices

Source: International Financial Statistics, "Prices, Major World Trade Commodities", various dates

| Trade sector | Country | Series title |
|---|---|---|
| 1 | Argentina | Beef |
| 2 | Denmark | Butter |
| 3 | Peru | Fishmeal |
| 4 | Australia | Wheat |
| 8 | Phillipines | Sugar |
| 9 | Brazil | Coffee |
| 11 | Argentina | Linseed oil |
| 13 | Greece | Tobacco |
| 14 | Australia | Hides |
| 15 | Malaysia | Rubber |
| 17 | Sweden | Pulp |
| 18 | Bangladesh | Jute |
| 19 | Australia | Wool |
| 20 | Egypt | Cotton |
| 24 | Zambia | Copper ore |
| 25 | Tanzania | Sisal |
| 27 | Iran | Petroleum |
| 38 | Malaysia | Rubber |
| 40 | Finland | Newsprint |

Source: Sweden: Allman Manadsstatistik, "Indextal foer partipriser"

| Trade sector | Series title |
|---|---|
| 39 | Rundvirke o. traeindustriprdukter |
| 41-42 | Pappersmassa, papper or papp |
| 43-44 | Papper |
| 52 | Tackjaern or ferrolegeringar |
| 53-54 | Mellanprodukter au jaern |
| 55-56 | Rostfritt stal |
| 57 | Metall manufaktur |

Source: Switzerland: Statistiches Jahrbuch, "Grosshandelspreisindex"

| | |
|---|---|
| 31,33 | Chemikalien und verwandte Erzeugnisse |
| 32 | Farben, Lacke |
| 34 | Kosmetika |
| 35 | Duengemittel |
| 37 | Kunststoffe |
| 49 | Backsteine |

Table A.12 (Cont'd)

| Trade sector | Title of series |
|---|---|
| 50 | Glas |
| 51 | Keramische Waren |
| 58 | Kupfer |
| 59 | Aluminium |
| 60 | Zink |
| 61 | Eisen-, Blech-, Metallwaren |

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