

ABSTRACT

Title of Dissertation: A Multisectoral Bilateral World Trade Model

Qiang Ma, Doctor of Philosophy, 1996

Dissertation directed by: Professor Clopper Almon
Department of Economics
University of Maryland

This study presents the specification, estimation and historical simulation of a multisectoral bilateral world trade model for 16 trading partners and 120 commodity categories. The model shows, for each trade flow, the country of origin, the country of destination, and the commodity traded. It is developed to provide the bilateral trade linkage among the national models in an international multisectoral modeling system. The trade model will take each country's import demand by industry as given and focus on forecasting how much of those imports will be supplied by each other country. The bilateral trade linkage ensures that trade forecasts are consistent from country to country. It also permits the analysis, at a high level of disaggregation by commodity categories and by markets, of specific changes in international competitive relations.

The centerpiece of the bilateral trade model is the so-called trade-shares matrix. Trade shares show, for a country importing a certain product, the proportions imported from each source country. As the trade shares are not constant over time, share equations have been developed in this study -- one for

each cell of the trade-shares matrix. While the empirical results bring forward the fundamental role of relative prices in explaining the temporal variations in international trade shares, there also appears to be ample evidence suggesting that capital investment -- a proxy for quality change of product not reflected in the price indices -- significantly affects changes in the trade shares as well. In many cases, changes in trade shares also show a significant time trend not explainable by either relative prices or capital investment.

In-sample historical simulation tests indicate that the trade model, with its rather elaborate considerations of relative price and capital investment in the share equations, definitely outperforms the "naive" assumption of constant trade shares. In most cases, the trade model can reduce the predictive errors in the constant-share approach by fifty-percent or more. The analysis uses time series regressions on annual OECD and UN data of international trade by commodity and country of origin and destination for the 1974-91 period.

Chapter I gives a brief introduction to the study and an overview of the trade model. In Chapter II, the present study is compared to related econometric work in the field of international trade linkages. Chapter III describes the structure and methodology of the trade model. Chapter IV reviews the data sources and the data organization effort. Chapter V presents the parameter estimates and equation fits. Chapter VI reports the model's performance in a historical simulation. Chapter VII concludes the study.

A MULTISECTORAL BILATERAL WORLD TRADE MODEL

by

Qiang Ma

Dissertation submitted to the Faculty of the Graduate School
of the University of Maryland in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
1996

Dissertation Committee:

Professor Clopper Almon, Chairman/Advisor
Professor Christopher Clague
Assistant Professor Brian Fikkert
Assistant Professor Michael Binder
Professor Chuan Sheng Liu

ACKNOWLEDGEMENTS

I would like to thank Professor Clopper Almon, my dissertation advisor, not only for his time and guidance, but also for the opportunity to take part in the Inforum Project at the University of Maryland. I am forever grateful to him for the invaluable training I received at Inforum. I am also very thankful to Douglas E. Nyhus, Margaret McCarthy, Douglas S. Meade, Ralph M. Monaco and the rest of my Inforum colleagues for many helpful criticisms and suggestions. My wife, Wei, deserves special thanks for her unwavering support and encouragement during my graduate career. Computer support provided by the University of Maryland Computer Science Center is also gratefully acknowledged. Of course, the author alone bears responsibility for any remaining errors or omissions.

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
Chapter I	Introduction	1
	1. Purpose of the Study	1
	2. Overview of the Model	7
	3. Plan of the Report	16
Chapter II	Relation to Other Work	17
	1. Theoretical Framework for Trade Model Linking .	17
	2. Empirical Trade Models	22
Chapter III	The Multisectoral Bilateral World Trade Model	33
Chapter IV	Data Sources and Data Organization	43
Chapter V	Parameter Estimates and Equation Fits	67
	1. A Breakdown of Functional Forms	67
	2. Parameter Estimates: A Sector Focus	69
	3. Parameter Estimates: A Market Focus	89
	4. The Fit of the Equation	138
Chapter VI	Historical Simulation: A First Test	164
	1. Errors in Import Shares	166
	2. Errors in Exports	176
Chapter VII	Concluding Remarks	181
Appendix A	Sectoral Correspondence of the Trade Model and the National Models	185
Bibliography		206

LIST OF TABLES

<u>Number</u>		<u>Page</u>
1	The Bilateral Trade Model: Sectoral and Country Composition	2
2	Bilateral Trade Flows for Auto Parts (108) in Millions of U.S. Dollars for the Year 1990	9
3	Trade Share Matrix for Auto Parts (108) for the Year 1990	10
4	Reporting/Partner Countries in the Bilateral Trade Data Bank	46
5	An Illustration of Alphanumeric Codes in the OECD Trade Data	52
6	Concordance between the Trade Sector and the SITC Revision I	56
7	Concordance between the Trade Sector and the SITC Revision II	58
8	Concordance between the Trade Sector and the SITC Revision III	60
9	Trade Share Equations: A Breakdown of Functional Forms	69
10	Trade Share Estimates for Sector 108 ("Auto Parts")	72
11	Matrix of Share Price Elasticities for Auto Parts (108)	87
12	Matrix of Share Capital Elasticities for Auto Parts (108)	88
13	Share Price Elasticities by Sector and Country in the US Import Market	91
14	Share Price Elasticities by Sector and Country in the French Import Market	94
15	Share Price Elasticities by Sector and Country in the German Import Market	97
16	Share Price Elasticities by Sector and Country in the Japanese Import Market	100
17	Size Variations in the Estimated Price Parameters	103
18	Share Capital Elasticities by Sector and Country in the US Import Market	107
19	Share Capital Elasticities by Sector and Country in the French Import Market	110
20	Share Capital Elasticities by Sector and Country in the German Import Market	113
21	Share Capital Elasticities by Sector and Country in the Japanese Import Market	116
22	Size Variations in the Estimated Capital Parameters	120
23	Time Parameter by Sector and Country in the US Import Market	123
24	Time Parameter by Sector and Country in the French Import Market	126
25	Time Parameter by Sector and Country in the German Import Market	129
26	Time Parameter by Sector and Country in the Japanese Import Market	132

<u>Number</u>		<u>Page</u>
27	Size Variations in the Time Parameters	136
28	Top 300 Bilateral Trade Flows in 1990 As Ranked in Decreasing Order	139
29	Summary Statistics on the Fit of the Share Equations	162
30	Errors in the Import Shares by Sector by Year: Equation Share vs. Constant Share	168
31	Errors in the Import Shares by Market by Year: Equation Share vs. Constant Share	175
32	Ratio of Equation to Constant Share NRMSE (in logs)	178

LIST OF FIGURES

<u>Number</u>	<u>Page</u>
1-2 Market Shares of Major Exporters in the U.S. Auto Parts Import Market: 1974-91	12
3-4 Market Shares of Major Exporters in the Japanese Auto Parts Import Market: 1974-91	12
5-6 Market Shares of Major Exporters in the French Auto Parts Import Market: 1974-91	12
7-8 Market Shares of Major Exporters in the German Auto Parts Import Market: 1974-91	13
9-10 Market Shares of Major Exporters in the Italian Auto Parts Import Market: 1974-91	13
11-12 Market Shares of Major Exporters in the Spanish Auto Parts Import Market: 1974-91	13
13 Japan's Share in US Auto Imports (106)	145
14 Canada's Share in US Auto Imports (106)	145
15 Japan's Share in US Computer Imports (96)	145
16 USA's Share in Canadian Auto-parts Imports (108)	145
17 USA's Share in Canadian Auto Imports (106)	145
18 Germany's Share in Italian Auto Imports (106)	145
19 Germany's Share in UK Auto Imports (106)	146
20 Japan's Share in US Auto-parts Imports (108)	146
21 Germany's Share in US Auto Imports (106)	146
22 Canada's Share in US Auto-parts Imports (108)	146
23 Japan's Share in US Telecommunication Eq Imports (94)	146
24 Belgium's Share in German Auto Imports (106)	146
25 France's Share in German Aircraft Imports (109)	147
26 Canada's Share in US Scraps Imports (120)	147
27 Germany's Share in French Auto Imports (106)	147
28 Mexico's Share in US Crude Petroleum Imports (14)	147
29 Japan's Share in US Radio and TV Imports (93)	147
30 Germany's Share in Belgian Scraps Imports (120)	147
31 Japan's Share in German Auto Imports (106)	148
32 Canada's Share in US Crude Petroleum Imports (14)	148
33 Canada's Share in US Newsprint Imports (44)	148
34 Germany's Share in Japanese Auto Imports (106)	148
35 Japan's Share in US Semiconductors Imports (98)	148
36 USA's Share in Canadian Industrial Appliance Imports (102)	148
37 China's Share in US Wearing Apparel Imports (36)	149
38 USA's Share in Japanese Computer Imports (96)	149
39 USA's Share in Japanese Crude Wood Imports (9)	149

<u>Number</u>		<u>Page</u>
40	Italy's Share in German Wearing Apparel Imports (36)	149
41	Japan's Share in US Optical Goods Imports (112)	149
42	South Korea's Share in US Wearing Apparel Imports (36)	149
43	Mexico's Share in US Industrial Appliance Imports (102)	150
44	Japan's Share in US Industrial Appliance Imports (102)	150
45	France's Share in Italian Auto Imports (106)	150
46	USA's Share in UK Computer Imports (96)	150
47	France's Share in German Auto Imports (106)	150
48	Germany's Share in UK Auto-parts Imports (108)	150
49	USA's Share in French Computer Imports (96)	151
50	Germany's Share in Belgian Auto Imports (106)	151
51	USA's Share in Canadian Computer Imports (96)	151
52	Taiwan's Share in US Computer Imports (96)	151
53	USA's Share in Japanese Unmilled Cereals Imports (1)	151
54	Canada's Share in US Crude Wood Imports (9)	151
55	USA's Share in Japanese Aircraft Imports (109)	152
56	USA's Share in German Computer Imports (96)	152
57	USA's Share in Canadian Internal Combustion Engine Imports (78)	152
58	France's Share in Japanese Artwork Imports (118)	152
59	USA's Share in German Aircraft Imports (109)	152
60	Spain's Share in French Auto Imports (106)	152
61	Japan's Share in US Other Manufacture Imports (119)	153
62	Belgium's Share in German Iron & Steel Imports (65)	153
63	Canada's Share in US Pulp and Waste Paper Imports (43)	153
64	Taiwan's Share in US Wearing Apparel Imports (36)	153
65	UK's Share in German Crude Petroleum Imports (14)	153
66	USA's Share in Japanese Basic Chemical Imports (47)	153
67	Japan's Share in US Internal Combustion Engine Imports (78)	154
68	Taiwan's Share in US Hardware Imports (75)	154
69	Canada's Share in US Hardware Imports (75)	154
70	Germany's Share in French Hardware Imports (75)	154
71	USA's Share in Canadian Combustion Engine Imports (78)	154
72	Mexico's Share in US Auto Imports (106)	154
73	Belgium's Share in French Basic Iron & Steel Imports (65)	155
74	China's Share in Japanese Wearing Apparel Imports (36)	155
75	France's Share in UK Auto Imports (106)	155
76	Japan's Share in South Korean Semiconductor Imports (98)	155
77	Japan's Share in US Basic Iron & Steel Imports (65)	155
78	UK's Share in Belgian Jewellery Imports (78)	155
79	USA's Share in Canadian Hardware Imports (75)	156
80	Germany's Share in French Synthetic Fiber Imports (49)	156

<u>Number</u>	<u>Page</u>
81	China's Share in Japanese Crude Petroleum Imports (14) 156
82	Germany's Share in Austrian Auto Imports (106) 156
83	Canada's Share in US National Gas Imports (15) 156
84	Canada's Share in US Paper Product Imports (45) 156
85	Germany's Share in Spanish Auto Imports (106) 157
86	USA's Share in Mexican Auto-parts Imports (108) 157
87	UK's Share in German Computer Imports (96) 157
88	Germany's Share in Italian Synthetic Fiber Imports (49) 157
89	Mexico's Share in US Radio and TV Imports (98) 157
90	Canada's Share in US Petroleum Refinery Imports (54) 157
91	USA's Share in Canadian Synthetic Fiber Imports (49) 158
92	USA's Share in Japanese Precision Instrument Imports (111) 158
93	Canada's Share in US Basic Chemical Imports (47) 158
94	Canada's Share in US Industrial Appliance Imports (102) 158
95	USA's Share in French Aircraft Engine Imports (77) 158
96	USA's Share in Canadian Precision Instrument Imports (111) 158
97	USA's Share in Japanese Meat Imports (18) 159
98	USA's Share in Japanese Semiconductor Imports (98) 159
99	Japan's Share in German Computer Imports (96) 159
100	Italy's Share in French Auto Imports (106) 159
101	Germany's Share in Italian Basic Chemical Imports (47) 159
102	Japan's Share in UK Auto Imports (106) 159

CHAPTER I

INTRODUCTION

This study presents an econometric model of international trade for 120 categories of merchandise trade among fourteen individual trading partners and two regions covering the rest of the world (Table 1). The multisectoral bilateral trade model focuses on forecasting exports by industry for each of these countries. It takes each country's import demand by industry as given and forecasts how much of those imports will be supplied by each other country. Thus, the model shows, for each trade flow, the country of origin, the country of destination, and the commodity traded. These bilateral flows ensure strict accounting consistency in the trade forecasts and permit the study of specific changes in international competitive relations. The analysis uses time series regressions on annual OECD and UN data of international trade by commodity and country of origin and destination for the 1974-91 period.

1. Purpose of the Study

The primary purpose of this study is to enable the making of medium- and long-range annual forecasts, at the industry level, of bilateral trade flows among the major trading partners on the stage of the world economy. Besides their own intrinsic interest, the detailed international bilateral trade flows will provide the trade linkage within the Inforum multisectoral international modeling system at the

Table 1. The Bilateral Trade Model: Sectoral and Country Composition

<u>Sectoral Composition</u>			
SECTOR	SECTOR TITLE	SECTOR	SECTOR TITLE
1	Unmilled cereals	61	Glass
2	Fresh fruits and vegetables	62	Cement
3	Other crops	63	Ceramics
4	Livestock	64	Non-metallic mineral products nec.
5	Silk	65	Basic iron and steel
6	Cotton	66	Copper
7	Wool	67	Aluminum
8	Other natural fibers	68	Nickel
9	Crude wood	69	Lead and zinc
10	Fishery	70	Other Non-ferrous metal
11	Iron ore	71	Metal furnitures and fixtures
12	Coal	72	Structural metal products
13	Non-ferrous metal ore	73	Metal containers
14	Crude petroleum	74	Wire products
15	Natural gas	75	Hardware
16	Non-metallic ore	76	Boilers and turbines
17	Electrical energy	77	Aircraft engines
18	Meat	78	Internal combustion engines
19	Dairy products	79	Other power machinery
20	Preserved fruits and vegetables	80	Agricultural machinery
21	Preserved seafood	81	Construction,mining,oilfield eq
22	Vegetable and animal oils and fats	82	Metal and woodworking machinery
23	Grain mill products	83	Sewing and knitting machines
24	Bakery products	84	Textile machinery
25	Sugar	85	Paper mill machines
26	Cocoa, chocolate,etc	86	Printing machines
27	Food products nec.	87	Food-processing machines
28	Prepared animal feeds	88	Other special machinery
29	Alcoholic beverage	89	Service industry machinery
30	Non-alcoholic beverage	90	Pumps,ex measuring pumps
31	Tobacco products	91	Mechanical handling equipment
32	Yarns and threads	92	Other non-electrical machinery
33	Cotton fabric	93	Radio,TV,phonograph
34	Other textile products	94	Other telecommunication equipment
35	Floor coverings	95	Household electrical appliances
36	Wearing apparel	96	Computers and accessories
37	Leather and hides	97	Other office machinery
38	Leather products ex. footwear	98	Semiconductors & integrated circuits
39	Footwear	99	Electric motors
40	Plywood and veneer	100	Batteries
41	Other wood products	101	Electric bulbs,lighting eq.
42	Furnitures and fixtures	102	Electrical indl appliance
43	Pulp and waste paper	103	Shipbuilding and repairing
44	Newsprint	104	Warships
45	Paper products	105	Railroad equipment
46	Printing, publishing	106	Motor vehicles
47	Basic chemicals ex. fertilizers	107	Motorcycles and bicycles
48	Fertilizers	108	Motor vehicles parts
49	Synthetic resins, man-made fibers	109	Aircraft
50	Paints, varnishes and lacquers	110	Other transport equipment
51	Drugs and medicines	111	Professional measurement instruments
52	Soap and other toilet preparations	112	Photographic and optical goods
53	Chemical products nec.	113	Watches and clocks
54	Petroleum refineries	114	Jewellery and related articles
55	Fuel oils	115	Musical instruments
56	Product of petroleum	116	Sporting goods
57	Product of coal	117	Ordnance
58	Tyre and tube	118	Works of art
59	Rubber products,nec.	119	Manufactured goods nec.
60	Plastic products,nec.	120	Scraps,used,unclassified

Table 1. (continued)

Country Composition

The trade model consists of fourteen individual trading partners and two regions covering the rest of the world. The fourteen individual trading partners are:

In North America:

CANADA
THE UNITED STATES
MEXICO

In Europe:

AUSTRIA
BELGIUM-LUXEMBOURG
FRANCE
GERMANY
ITALY
SPAIN
THE UNITED KINGDOM

In Asia:

JAPAN
CHINA (Mainland)
SOUTH KOREA
CHINA (Taiwan)

The two regions are:

ROECD (covering all other member countries of the Organization of Economic Cooperation and Development (OECD) whose names are not separately listed above)

ROW (covering all other countries in the rest of the world)

University of Maryland.¹

Currently, the Inforum international family has thirteen complete, multisectoral macroeconometric models.² Prior to the development of the bilateral trade model, these country models were linked through their national import and export functions. For instance, the Italian furniture export function connects the total furniture exports of Italy to a weighted average of the furniture imports of all the other countries in the linked system and to the ratio of Italian export prices to a weighted average of domestic furniture prices in the partner countries. Though the relation works at the industry level -- furniture -- it says nothing about bilateral trade. That is, it does not show how much of Italian furniture is going to Germany, how much to the United States, or how much to France. Conversely,

¹ Inforum originally stood for the INterindustry FORecasting at the University of Maryland, a research group affiliated with the Department of Economics. Since its founding by Clopper Almon in 1967, Inforum has come to designate an international group with partners in Europe, Asia, and North America. This group has created a system of large scale input-output models of the United States and its major trading partners. The models are used extensively by the government and private industry in making policy decisions.

² Each national model works at or near maximum number of sectors supportable by the national input-output tables and other necessary statistics. The typical model in this group has some 60 to 100 industrial sectors and for each of these sectors generates year-by-year projections over the next 10 or 15 years for prices, outputs, exports, imports, investment, employment, profits, wages and salaries, interest rate, and taxes, as well as showing the sales of each sector to each other sector and to each component of final demand. It uses explicit and changing input-output relations among industries. Where appropriate, the typical model uses regression analysis to describe the behavior of consumers, producers, exporters, importers, investors, or other economic decision makers. The national models all share the basic input-output accounting structure and are built with a common model-building software, yet they are flexible enough to be able to imitate very closely economies as diverse as those of Mexico, China and the United States. Since the present study focuses on the linking these country models, for a more complete treatment of the structure, methodology, and applications of the Inforum national models, the reader is referred to a symposium on *Economic Systems Research*, vol. 3, number 1, 1991.

the import functions do not specify from which countries the imports come. While the trade flows in the models were probably not highly inconsistent with one another, they lacked the rigorous accounting consistency that the present bilateral trade model would offer.

With the bilateral trade model, the Inforum international system is not only ensured strict consistency in its trade forecasts, it also becomes a unique international and general equilibrium framework that is particularly suited to address quantitatively sector- and country-specific issues. For instance, it can answer a specific question like "How will the U.S. exports of dairy products to the United Kingdom be affected when Canada lowers its price of dairy products by ten percent?", or

What is the industrial impact of eliminating the U.S. quota on the imports of motor vehicles from Japan, or of lowering the Chinese tariff on its imports of motor vehicles, or of imposing uniform VAT (Value Added Taxes) rates across countries?

How would the German exports of auto parts to the United States be affected if the United States, instead of reaching an agreement last June with Japan over trade in auto parts, triggered a bruising trade war with Japan by unilaterally imposing a hefty tariff hike on its auto-parts imports from Japan?

The multisectoral bilateral world trade model is also not without interest for broader problems. For instance, recent years have seen regional trade initiatives in nearly all continents. In Europe, the economic integration of the European Community (EC) appears to be fast deepening. In the Americas, the North American Free Trade Area (NAFTA) between Canada, the United States and Mexico is now in full swing, while at the same time countries throughout Latin America are making progress towards free trade agreements in their regions. In the Asia-Pacific Basin, the Asia-Pacific Economic Conference (APEC) countries are pressing forward in setting up a possible Free Trade Area (FTA) in the year 2020.³ And in Africa, there have been attempts to create or revive some free trade zones. Problems in reaching the objectives of these free-trade arrangements are partly sector-specific. Although the macroeconomic effects of the free trade may be all positive, some sectors in some countries would be threatened with lower output and job loss. Clearly, a thorough analysis of the industrial impact of a possible FTA and other sector- and country-specific issues requires significant disaggregation by commodities and by markets. The many multi-country trade models built in the past, however, generally have not focused on trade at the detailed industry level. For instance, none of the twelve leading multi-country models reviewed in Bryant, et al. *Empirical Macroeconomics for Interdependent Economies* (Brookings Institution, 1988) link the countries with commodity-specific

³The intention to form a Free Trade Area among the APEC countries was announced in November, 1994 by the APEC leaders attending their 2nd annual meeting in Seattle, USA.

trade.⁴ Neither does the Fair multicountry model (Fair, 1982) nor the Cline trade model (Cline, 1989). The Harmonized European Research for Macrosectoral and Energy Systems (HERMES) model does have trade with sectoral detail, but for only a few sectors. Therefore, by developing international bilateral trade flows at the full industry level, this study fills an important gap in the modeling of international trade linkages.

2. Overview of the Model

As already noted, the bilateral trade model is at the very center of the Inforum international system of dynamic multisectoral forecasting models. It provides the fundamental trade linkage mechanism that directly connects the import demand of a country to the export supplies of its trading partner countries, as represented by the following matrix notation:

$$\begin{array}{c} X \\ nx1 \end{array} = \begin{array}{c} S \\ nxn \end{array} * \begin{array}{c} M \\ nx1 \end{array} \quad (1.1)$$

where X is the export vector with n elements, each of which corresponds to the total exports in a given sector by one of the 16 countries or regions in the trade model, M is the import vector for the same sector, and S is the trade-shares matrix for this sector. Equation 1.1 states clearly that for any given pair of import vector

⁴The book covers multi-country models produced by Data Resources, Inc., the European Economic Commission (EEC), the Japanese Economic Planning Agency, the LINK project, the U.S. Federal Reserve Board, the IMF, the OECD, Wharton, and by groups at Liverpool, Harvard, Stanford, and Minnesota universities.

(M) and trade-shares matrix (S), a corresponding export vector (X) may be uniquely determined. Because the import vector (M) can be readily constructed from the import projections supplied by the national forecasting models, it is with the estimation and projection of the trade-shares matrix (S) that this study is chiefly concerned.

The trade-shares matrix S is derived from the trade flows matrix F, defined as follows. For each of the 120 commodities, F is a square, 16 x 16 matrix with a row and a column for each country or region. The *i*th row of an F matrix shows the exports of country *i* to each of the other countries. The diagonal elements are all zero, except for ROECD and ROW, where intraregional flows exist. The total imports of country *j* are given by the column sum $F_{.j} = \sum_i F_{ij}$, and total exports of country *i* is the row sum $F_{i.} = \sum_j F_{ij}$. The trade-shares matrix, S, is obtained by dividing each column of F by its column sum. Hence, S_{ij} is the proportion of goods from country *i* in country *j*'s imports.

As an example of the matrix F, Table 2 shows the international flows of auto parts for the calendar year 1990 (the base year of the trade model). Each column shows the imports, in millions of U.S. 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 $F_{.j}$). Table 3 shows the S matrix (in percentage) corresponding to the F-matrix of Table 2.

TABLE 2
 BILATERAL TRADE FLOWS MATRIX FOR AUTO PARTS (108)
 IN MILLIONS OF 1990 U.S. DOLLARS
 FOR THE YEAR 1990

	CA	US	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW	TOTEXP
CANADA	0	5886	41	2	5	3	31	1	1	10	34	4	10	0	33	53	6116
USA	8669	0	2176	11	101	163	216	44	36	253	270	83	105	19	495	857	13498
MEXICO	240	1257	0	0	2	7	56	0	3	3	1	0	0	0	1	6	1576
AUSTRIA	77	11	0	0	14	42	553	56	7	24	8	9	1	0	86	66	953
BELGIUM	5	78	1	10	0	172	564	100	28	634	7	4	3	1	811	108	2525
FRANCE	56	695	118	39	838	0	1738	601	1352	1106	34	9	6	76	903	945	8516
GERMANY	136	973	397	739	839	1958	0	1322	936	3089	214	113	64	27	3009	2900	16714
ITALY	47	418	6	80	122	779	1347	0	186	387	65	7	3	9	604	646	4709
SPAIN	14	199	27	15	156	682	648	89	0	398	1	0	2	3	268	93	2595
UK	38	461	26	24	153	310	1226	143	116	0	37	8	10	5	814	673	4045
JAPAN	566	6082	398	34	145	92	390	25	163	424	0	338	404	528	973	2983	13546
CHINA	2	28	6	0	0	1	6	3	0	1	5	0	0	0	3	3062	3118
KOREA	98	129	0	0	0	0	2	2	2	6	37	7	0	31	13	66	395
TAIWAN	19	319	11	1	2	7	6	6	1	9	59	0	4	0	38	213	694
ROECD	80	282	4	68	1105	314	839	190	164	715	96	85	10	15	1513	561	6040
ROW	70	533	62	15	40	195	240	81	11	78	35	2837	2	5	135	NA	NA
TOTIMP	10117	17351	3274	1038	3523	4725	7862	2662	3006	7138	903	3506	626	719	9698	NA	NA

TABLE 3
TRADE SHARE MATRIX FOR AUTO PARTS (108)
FOR THE YEAR 1990

	CA	US	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
CANADA	0.00	33.92	1.26	0.18	0.15	0.07	0.39	0.03	0.03	0.14	3.82	0.11	1.62	0.05	0.34	0.40
USA	85.69	0.00	66.46	1.07	2.87	3.45	2.74	1.67	1.19	3.54	29.92	2.36	16.76	2.59	5.11	6.48
MEXICO	2.37	7.24	0.00	0.01	0.06	0.16	0.71	0.01	0.11	0.04	0.08	0.00	0.04	0.00	0.01	0.05
AUSTRIA	0.76	0.06	0.00	0.00	0.39	0.89	7.03	2.10	0.24	0.33	0.89	0.26	0.14	0.04	0.89	0.50
BELGIUM	0.05	0.45	0.03	0.98	0.00	3.63	7.18	3.74	0.93	8.88	0.82	0.11	0.50	0.11	8.36	0.81
FRANCE	0.55	4.00	3.61	3.74	23.78	0.00	22.10	22.58	44.98	15.50	3.74	0.26	0.99	10.60	9.31	7.14
GERMANY	1.34	5.61	12.13	71.20	23.81	41.45	0.00	49.69	31.12	43.28	23.70	3.22	10.24	3.75	31.02	21.91
ITALY	0.47	2.41	0.18	7.75	3.47	16.49	17.14	0.00	6.18	5.43	7.25	0.21	0.52	1.29	6.23	4.88
SPAIN	0.14	1.15	0.83	1.40	4.42	14.43	8.24	3.33	0.00	5.58	0.10	0.00	0.36	0.40	2.76	0.70
UK	0.38	2.66	0.79	2.29	4.35	6.56	15.59	5.37	3.86	0.00	4.12	0.23	1.60	0.73	8.39	5.09
JAPAN	5.59	35.05	12.16	3.29	4.11	1.94	4.97	0.92	5.42	5.95	0.00	9.66	64.57	73.42	10.03	22.55
CHINA	0.02	0.16	0.19	0.02	0.01	0.02	0.08	0.11	0.01	0.02	0.57	0.00	0.00	0.00	0.03	23.14
KOREA	0.97	0.75	0.01	0.00	0.01	0.01	0.03	0.08	0.08	0.09	4.05	0.21	0.00	4.31	0.13	0.50
TAIWAN	0.18	1.84	0.35	0.08	0.05	0.14	0.07	0.21	0.04	0.12	6.52	0.00	0.67	0.00	0.39	1.61
ROECD	0.79	1.62	0.11	6.58	31.38	6.64	10.67	7.13	5.45	10.02	10.60	2.43	1.66	2.08	15.60	4.24
ROW	0.69	3.07	1.88	1.42	1.15	4.13	3.05	3.03	0.37	1.09	3.83	80.94	0.33	0.63	1.39	0.00

The trade-shares matrix is not a matrix of fixed coefficients; it is different for each year. A glance at the historical trade-shares matrices quickly reveals that with a very few exceptions, hardly any single trade share stayed constant. In fact, many trade shares have experienced substantial ups and downs over time. Figures 1-12 show the course of a few selected shares in Trade Sector 108 ("Auto parts"). Figure 1 depicts the evolution of the Canadian and Japanese market shares in the U.S. auto-parts import market. While Canada's share of the U.S. market shrank from around 60% in the mid-1970s to just above 30% in the year 1991, Japan nearly doubled its U.S. market share in the same period from 20% in 1974 to 38% in 1991. In the Japanese auto-parts import market (Figures 3 and 4), the major exporter of auto parts -- the United States -- saw its market share shrink in half between 1974 and 1991, while Germany and Taiwan gained marked ground. Changing trade shares over time were equally evident in European markets. While auto-parts exporters from Germany and Italy have barely maintained their market shares in France, Spain's share has been rising steadily (Figures 5 and 6). In the German auto-parts import market (Figures 7 and 8), France lost considerable ground over time, while Italy, the United Kingdom and Japan have each managed to strengthen its market presence. In the Italian auto-parts import market (Figures 9 and 10), France gradually lost ground to Germany, Belgium, and Spain. And in the Spanish auto-parts import market (Figures 11 and 12), Italy's share shrank from a formidable 35% in 1975 to a paltry 5% in 1991, while market share differentials between Germany and France have narrowed.

Figures 1-2
Market Shares of Major Exporters in the U.S.
Auto-Parts Import Market: 1974-91

Figure 1

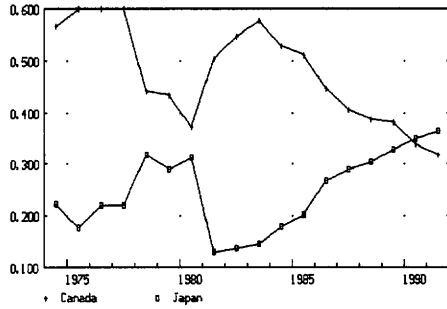
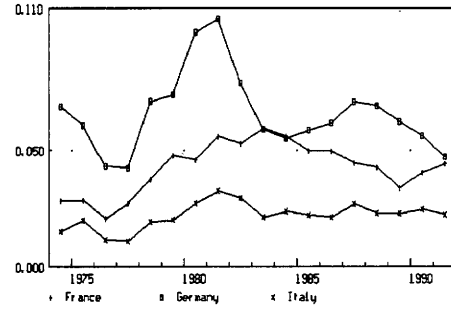


Figure 2



Figures 3-4
Market Shares of Major Exporters in the Japanese
Auto Parts Import Market: 1974-91

Figure 3

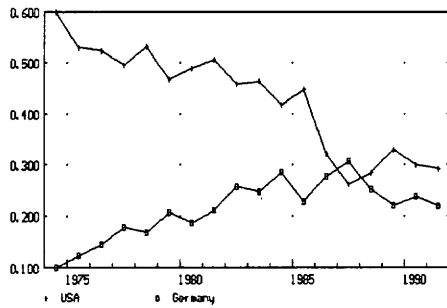
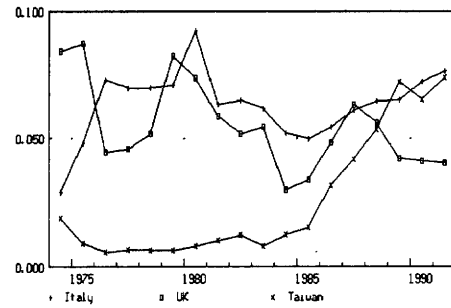


Figure 4



Figures 5-6
Market Shares of Major Exporters in the French
Auto Parts Import Market: 1974-91

Figure 5

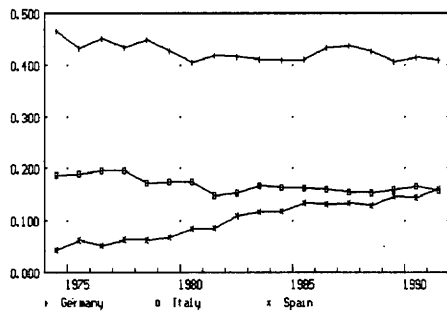
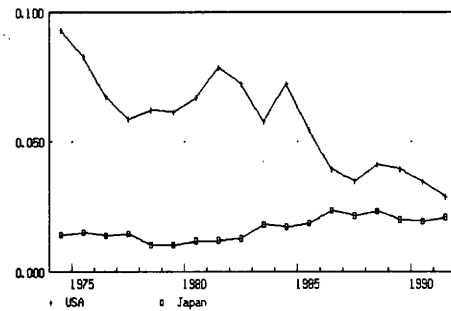


Figure 6



Source: Inforum Bilateral Trade Data Bank, 1994.

Figures 7-8
Market Shares of Major Exporters in the German
Auto Parts Import Market: 1974-91

Figure 7

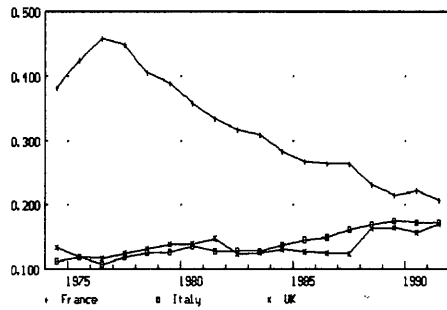
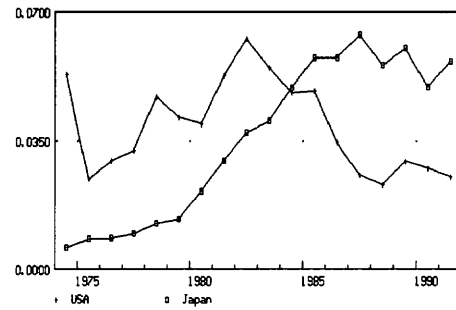


Figure 8



Figures 9-10
Market Shares of Major Exporters in the Italian
Auto Parts Import Market: 1974-91

Figure 9

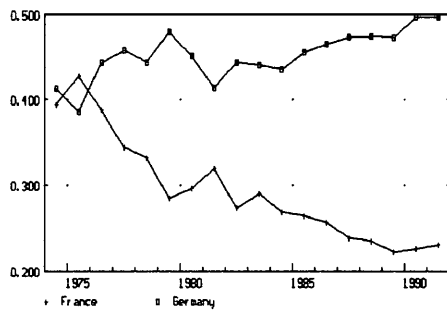
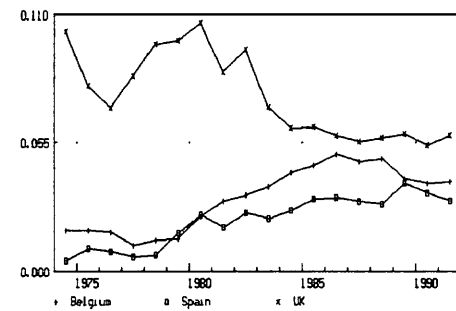


Figure 10



Figures 11-12
Market Shares of Major Exporters in the Spanish
Auto Parts Import Market: 1974-91

Figure 11

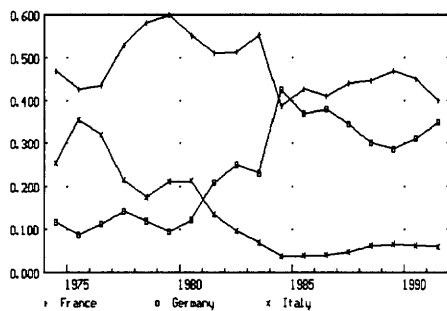
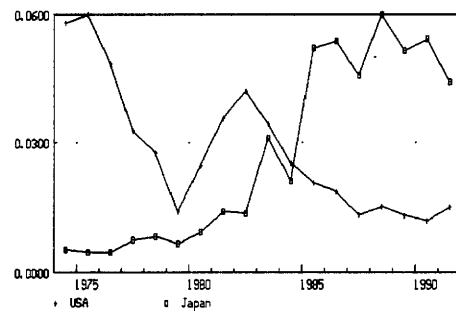


Figure 12



Source: Inforum Bilateral Trade Data Bank, 1994.

These changing trade shares are indicative of the variety one would see in similar graphs for other trade sectors and import markets. An accurate estimate of these changes in the trade shares will have important implications on the trade forecasts of the trade-model-linked international system. By estimating and projecting the changes in the trade shares, the trade model should help reduce the errors in the trade forecasts that would otherwise have resulted from using the "naive" constant-share approach. From this point of view, this study attempts to develop, cell by cell, econometrically estimated bilateral trade-share equations to predict changes in the trade-shares matrix. Presumably, changes in trade shares reflect to some extent changes in competitive relations influenced by relative prices or other factors of international competitiveness. Thus, in a typical trade-share equation in the present trade model, there are three independent variables:

- 1) an index of relative price;
- 2) an index of relative capital stock as a proxy for quality change of product not reflected in the price indices;
- 3) a sector- and country-specific time-trend-like variable. The exact nature of this variable will be explained in Chapter III.

It should be noted that the estimation methodology employed in the model explores the parameter space and only retains those with correct signs. Therefore, not all estimated share equations in this model will have the same number of

explanatory variables. So, for instance, the estimated equation for the Japanese share of auto parts in the U.S. import market has as its explanatory variables: i) an index of Japanese auto-parts price relative to the competing prices in the U.S. import market; ii) a measure of capital stock in the Japanese auto-parts industry relative to its competitors; iii) a time-trend-like variable that is specific to the Japanese auto-parts industry, whereas the estimated equation Canadian share of auto parts in the U.S. import market uses only a time-trend-like variable specific to the Canadian auto-parts industry.

The linkage scheme of the bilateral trade model may now be summarized as follows. First, the trade model draws the forecasts of the import demand by industry, export prices by industry, and capital investment by industry from the national models in the national sectoring schemes and converts them into the trade model classification. On the basis of the price and investment projections, the trade model first forecasts some 120 commodity-specific trade-shares matrices for the next year. It then allocates the import demand by industry through the projected trade-shares matrix to their supplying countries. Summing the allocations to each exporter across importers gives a forecast of exports by industry for each country in the trade model nomenclature, which are then translated into respective national classification schemes for use in the national models. The process is repeated for each year in the forecast period until an equilibrium solution is arrived.

3. Plan of the Report

The rest of the report is organized as follows. Chapter II compares the present study to related econometric work in the field of international trade linkages. Chapter III describes the structure of the trade model and defends its analytical methodology. Chapter IV reviews the data sources and illustrates the considerable data organization efforts required for a trade model that is estimated at a level of disaggregation by commodities and countries that is not customarily employed in the literature. The parameter estimates and equation fits of some 29,000 equations are summarized in Chapter V. The model's performance in a 12-year historical simulation in comparison to a simpler assumption of constant shares is discussed in Chapter VI. Finally, Chapter VII summarizes the main contributions of this study and suggests possible directions for future work.

CHAPTER II

RELATION TO OTHER WORK

In this chapter, we will briefly review other work in the field of international trade model linking. We will first discuss the theoretical studies of Armington (1969a, 1969b) and Rhomberg (1970) on the trade model approach to international linking. Then, we will briefly survey a number of empirical linkage studies, including those by Taplin (1972), Hickman and Lau (1973), Samuelson (1973), Moriguchi (1973), Nyhus (1975), Marwah (1976), Samuelson and Kurihara (1980) and Fair (1984).

1. Theoretical Framework for Trade Model Linking

The basic problem that the present study as well as other work to be reviewed below attempt to address is the linking of a system of national forecasting models, which, in most cases, are already in existence. The reasons for such undertaking and several approaches for modeling the linkage can be found in Rhomberg (1970). Rhomberg distinguishes direct from indirect linking. The "direct" linking would explicitly relate bilateral imports and exports between each of the countries in a system. But, he warns, direct linking 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." Furthermore, since the national models to be

linked normally have already be built, "it is impracticable to require such far-reaching reconstruction of each national model as would be necessary for direct linkage."

The alternative, in Rhomberg's term, is the indirect linkage, which involves the use of a world trade model to facilitate the central-processing of international linking, while leaving the existing national models relatively intact. As will become clearer shortly, many subsequent linkage studies -- including my study -- all fall under the indirect linkage category.

Rhomberg then introduces several approaches to model linkage, including "consistency", "bilateral", and "structural" approaches. The "consistency" approach is basic procedure designed to ensure consistency of national forecasts of imports and exports in a linked system. Since national forecasts of exports, if not exogenously given, are often based on more or less *ad hoc* information such as world exports or some weighted average of economic activity in the economies of a country's trading partners. Consequently, forecasts of world exports will not necessarily be consistent with world import forecasts. A simple way to implement the "consistency" approach may be described as follows: national forecasters first make national forecasts of exports, imports and economic activity on the basis of a first guess as to world exports. The sum of national import forecasts, after a due allowance for valuation change from a c.i.f. to an f.o.b. basis, is then imposed

exogenously as world exports to re-run the national models. The procedure may be iterated until a convergence solution is reached. A consistent pairing is then found between a set of import demand and world trade. However, despite its much intuitive appeal, the procedure is rather limited in that it yields, in general, little improvement in the trade forecasts and that it leaves no room for policy analysis. In summary, the "consistency" approach may be regarded as a starting point for a world trade model.

The "bilateral" approach, to Rhomberg, is a way to implement the direct linkage of national models. A major problem in this type of linkage, Rhomberg points out, is that it is difficult to represent the competitive relationships between imports from alternative countries of origin in the bilateral import functions. These competitive relationships manifest themselves, *inter alia*, in variations in prices charged by different suppliers. But any specification of bilateral import functions that follows essentially the macroeconomic procedure of relating these imports to economic activity variables and to one or two relative-price variables would tend to ignore or obscure the competitive relationships. Furthermore, he points out, 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 the prices could be made to reflect all of these factors, but the work required to do so would be quite enormous.

The third approach suggested by Rhomberg is the "structural" approach. It interposes a trade structure 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."⁵ Here, each national model will use its import functions to forecast total import demand by product and leave the task of forecasting exports to the trade model. Taking the national import forecasts as given, the trade model would then allocate them through a trade-shares matrix to yield an estimate of each supplying country's exports to each national market. Total exports for each exporting country can then be obtained by summing over its exports to each national market. In Rhomberg's view, the "structural" approach is the "most promising type of implementation of the idea of indirect linkage.

The theoretical framework of the indirect linkage approach is developed in Armington (1969a). The fundamental assumption in the Armington model, variants of which have become a standard feature of computational models of trade, states that products of the same industry produced in different countries are viewed as imperfect substitutes by demanders. Thus American automobiles, Japanese automobiles, American computers, and French computers are four

⁵As Rhomberg further notes, however, the idea of fixed trade shares should be viewed only as a starting point.

different products (from the buyers' viewpoint). He then shows that by modifying the basic Hicksian model through further assumptions, a highly simplified product demand function may be derived and market shares may be related to relative prices of the products in the markets. Specifically, he assumes: (i) that buyer's preferences for products of a given industry (say, wearing apparels) are independent of their purchases of products of any other industry (say, motor vehicles); (ii) that market shares are unaffected by changes in the size of the market, *ceteris paribus*, so that holding suppliers' price constant, a 20% increase in American imports of automobiles will not by itself change the proportions it buys from each of its suppliers; (iii) that the elasticity of substitution between products in a market is constant over all price ratios; and (iv) that this elasticity of substitution between any two products competing in the same market is the same as for any other pair in that market.

All the above assumptions seem reasonable except for the last one. The last assumption suggests that in the Canadian import market for communications equipment, for example, the elasticity of substitution between American and Japanese equipment is the same as that between American and German equipment. One need not look beyond Japan's success in maintaining its export markets in the face of the rapidly appreciating Japanese yen to see how this assumption could greatly reduce a trade model's flexibility of response to various price changes by different countries. As will be discussed in the next chapter, this

assumption will be relaxed in my present study. Although without the last assumption, estimation of the trade model becomes much more time consuming, I feel it will be rewarded with the variety of results obtained. It may be noted in passing that in a later paper, Armington (1969b) also examines the relaxation of this last assumption. He imposes two widely different sets of substitution parameters while changing the price in one country for both cases. The results show that the effect of the substitution parameters is substantial on the import shares. Armington concludes that the trade model should employ substitution parameters that are estimated from historical data.

2. Empirical Trade Models

The pioneering work of Rhomberg and Armington are closely accompanied by successive empirical modeling of the international trade linkages in the United States and abroad. Most notable among them are those conducted at the University of Maryland (the Nyhus trade model), the University of Pennsylvania (the LINK project), the Economic Planning Agency of Japan (the World Econometric Model) and the OECD in Paris (the INTERLINK model system). These studies contain different methodological schemes of measuring temporal variations in each element of the trade-shares matrix. We will briefly outline their mathematical models below.

Nyhus (1975). Douglas E. Nyhus of the University of Maryland estimated a

trade model of 119 categories of commodities based on OECD data of international trade by commodity of origin and destination for the 1962-72 period.¹ The basic linking equation is as follows:

$$S_{ijt} = S_{ij0} P_{ijt}^{b_{ij}} \quad (2.1)$$

where, the relative price term, P_{ijt} , was defined as follows:

$$P_{ij} = \frac{P_{eit}}{P_{wjt}} \quad (2.2)$$

Note that P_{eit} was the effective price of the good in question in country i, and was defined as a weighted average of present and past domestic market prices:

$$P_{eit} = \sum_{\tau=0}^5 w_{\tau} P_{it-\tau} \quad (2.3)$$

Here the weights, the w's, were assumed to vary from commodity to commodity; but, for a given commodity, they were assumed to be the same for each importing country. Further, these weights were assumed to lie on a smooth curve, and a polynomial of degree three was selected because it had enough ability to twist and turn to produce a reasonably varied adjustment pattern. P_{wjt} was the world price as seen from country j, defined implicitly by the following "adding-up condition", namely, for a given importing country, the import shares of all countries must add up to 1.0:

¹ Nyhus, Douglas E., *The Trade Model of a Dynamic World Input-output Forecasting System*, Ph.D. Thesis, University of Maryland, 1975.

$$\sum_i S_{ij0} P_{ijt}^{b_{ij}} = \sum_i S_{ij0} \left(\frac{P_{eit}}{P_{wjt}} \right)^{b_{ij}} \equiv 1 \quad (2.4)$$

Next, the share Equation 2.1 was converted into a flow equation, and a linear time trend was added to Equation 2.1 to account for trends in relevant non-price factors:

$$M_{ijt} = S_{ij0} M_{jt} P_{ijt}^{b_{ij}} + g_{ij} t \quad (2.5)$$

Because of the "adding-up condition" (Equation (2.4)), the g's had to be constrained so that

$$\sum_i g_{ij} = 0 \quad (2.6)$$

A complex non-linear estimation method was devised to simultaneously solve for all substitution parameter b's, world prices P_w , time trend parameter g's, and distributed lags on prices w's. The non-linearity arises because the b's enter Equation (2.1) both directly (in the exponents) and indirectly (through the implicit definition of the world price). The b's were determined by minimizing the sum of squares

$$\sum_i \sum_t r_{ijt}^2 \quad (2.7)$$

where

$$r_{ijt} = M_{ijt} - S_{ij0} M_{jt} P_{ijt}^{b_{ij}} \quad (2.8)$$

To simplify the estimation of b's, r_{ijt} was approximated with the first term of the

Taylor series expansion as a function of the b's, thus,

$$r_{ijt} \approx \tilde{r}_{ijt} = M_{ijt} - S_{ij0} M_{jt} \left(\sum_k \frac{\partial P_{ijt}^{b_{ij}}}{\partial b_{kj}} \cdot \Delta b_{kj} \right) \quad (2.9)$$

With given initial values of the b's, each partial derivative on the right was first evaluated. Then, by regression, the Δb_{kj} was determined by minimizing Equation (2.9). These Δb_{kj} 's were then added to the original b's, giving new b's about which another iteration was carried out. This process was continued until the new b's implied nearly the same world prices P_w 's as did their immediately preceding b's. Next, each g was independently estimated from residuals, namely,

$$M_{ijt} - S_{ij0} M_{jt} P_{ijt}^{b_{ij}} = g_{ij} t \quad (2.10)$$

To meet condition in Equation (2.6), each g was then adjusted in proportion to its standard errors until the zero sum was reached. As for the distributed lags w's, they were estimated from the following equation:

$$M_{ijt} = S_{ij0} M_{jt} \left(\sum_{\tau=0}^5 w_{\tau} \frac{P_{it-\tau}}{P_{wjt}} \right) b_{ij} \quad (2.11)$$

To complete the story, with the newly estimated w's and b's, the entire process was repeated until the change from one set of w's to the next was small.

The trade model, as envisaged in the Nyhus study, would be joined by the

national models to be built later on to form the Inforum international system, in which the trade model would draw imports and domestic prices to itself and feed exports and world prices back to the national models. However, due to the rather slow development of the national models and the failure to obtain the necessary trade data to update the linking model, the Nyhus trade model was never fully implemented as planned. It nonetheless remains after 20 years the only comprehensive effort to estimate price elasticities at a detailed commodity level, namely for 119 sectors, for a number of countries.

Taplin (1972): This is a model of world trade based on trade shares approach. His equations for forecasting the shares may be written as follows:

$$S_{ijt} = \alpha_{ij} \left(\frac{PX_i}{P_j} \right)^{-\beta_j} S_{ijt-1}^{\gamma_j} \quad (2.12)$$

Here, subscripts $i, j = 1, 2, \dots, n$, with n equal to the number of trading partners; t is time period. P_j is the weighted average of all export prices in j 's market. PX_i is the export price of country i . S_{ij} represents share of country i in j 's market. α , β , and γ are the estimated structural coefficients. Note that the model is specified in non-linear form. And it assumes that the elasticity of price substitution in the import share equation is invariant with respect to alternative suppliers. As noted earlier, this "constancy" assumption is extremely restrictive if the purpose is to predict the price effect on the trade shares for different exporting countries. The

same concern remains valid about the invariant size assumption made with regard to other structural coefficients.

Hickman and Lau (1973): In this study, a complete model of world trade, based on the trade-shares matrix approach, is specified and estimated for twenty-seven countries and regions. This model attempts to explain the composition of imports on the bases of relative prices and time trend, given the total quantity of imports of each country. With a careful and thorough theoretical development, the authors derive the linear approximation of the standard CES export demand function:

$$X_{ijt} = \alpha_{ij0} M_{jt} - \beta_j X_{ij0} (PX_i - PM_j)_t + \gamma_{ij} X_{ij0} t \quad (2.13)$$

Here, subscripts $i, j = 1, 2, \dots, n$, with n equal to the number of trading partners; t is time period and 0 denotes base period. PM_j is the import price of j and PX_i is the export price of i . M_j and X_{ij} represent respectively total imports of j and export of country i in j 's market. α , β , and γ are the estimated structural coefficients. This model assumes that the elasticity of price substitution in the export equation is invariant with respect to market of destination.

Samuelson (1973): Developed at the OECD, this is a comprehensive model of world trade that covers the trade flows of eighteen OECD countries and a residual group of the remaining countries. The basic trade equation in this model is a first

order (linear) approximation to the explicit CES demand-system functions:

$$X_{ij} = S_{ij} M_j \left(\frac{PX_i}{\sum_k S_{kj} PX_k} \right)^{\beta_j} \quad (2.14)$$

where, X_{ij} and M_j represent respectively export of country i in j 's market and total imports of j . S_{ij} represents share of country i in j 's market. PX_i is the export price of country i . $\sum_k S_{kj} PX_k$ is a weighted average of all countries' export prices, where the weight for a given country k is the share of country k 's exports to country j in the total imports of country j . Samuelson 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 seasonal variable. It may be noted that the use of capacity utilization and total demand pressure seem appropriate for an aggregate model forecasting a country's total exports, 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 should incorporate such possible pressures in their price forecasting equations. Nonetheless, Samuelson's model is an informative and helpful piece of work.² It could not, of course, be applied to the current study because of its aggregative nature.

²The basic Samuelson model has been applied in several world modeling system, including the World Econometric Model of the Japanese Economic Planning Agency, the OECD INTERLINK model system, and the World Model of Wharton Econometrics Forecasting Associates.

Moriguchi (1973): This trade model, based on the trade-shares approach, is developed to link the national models in the Project LINK system, which involves thirteen national models of major industrial countries and several regional models covering the rest of the world. The model is disaggregated by four commodity classes of Standard International Trade Classification (SITC) (a) 0 and 1, (b) 2 and 4, (c) 3, and (d) 5 through 9. The following has been estimated to modify trade-shares matrices:

$$\log_e S_{ijt} = \alpha_i + \beta_i \log_e \left(\frac{PX_{it}}{PCM_{ijt}} \right) + \gamma_i \log_e \left(\frac{SX_{it}}{M_{jt}} \right) \quad (2.15)$$

where PCM_{ij} refers to price of imported goods that are competitive with country i 's exports in j 's market, PX_i is the export price of country i , and S_{ij} represents share of exporter i in j 's market. β_i is the elasticity of substitution of country i 's exports in the world market (or in various import markets) and γ the elasticity of certain non-price competitive factors that contribute to changes in trade shares. Both parameters are assumed to be invariant with respect to different exporters in the same import market. The non-price factor (SX_i/M_j) is the relative change in country i 's total export capacity against country j 's level of total imports. Moriguchi does not use the adding-up condition in the estimation but makes use of the restriction by distributing the residuals of $(\sum_i S_{ij} - 1)$.

Marwah (1976): In this study, the market share function for S_{ij} is specified as where PX_i and PCM_{ij} refer respectively to export price of region i and prices with

$$S_{ijt} = A_{ij} \left(\frac{PCM_{ij}}{PX_i} \right)^{\alpha_{ij}} \left(\frac{X_t}{X_w} \right)^{\beta_{ij}} e^{\gamma_{ij}t} \mu_{ijt} \quad (2.16)$$

which region i competes for its exports in j 's market, e is the base of natural system of logarithms and μ is a stochastic error. A_{ij} , α , β , γ , and μ are the structural coefficients. The most important feature of the Marwah model is that market share for each region is analyzed without any *a priori* restrictions on the size of price elasticity of substitution or on any other structural coefficients. As will become clear later on, this feature is shared by the present study. On the other hand, the present study differs from the Marwah model in the selection of non-price factors for the share equations and the estimation methodology.

Samuelson-Kurihara (1980): Rather than derive trade shares directly, this approach makes adjustments to bilateral exports obtained from a base year trade share matrix without explicitly predicting each element of the trade-shares matrix. The export equation is as follows:

$$\log X_{it} = b_{0i} + b_{1i} \log (\sum_j S_{ij0} M_{jt}) + b_{2i} \log \left(\frac{P_{it}}{PC_{it}} \right) \quad (2.17)$$

where P_i refers to the export price of country i , PC_i is the competitors' export price, X_{it} is the real value of export of country i , M_{jt} is the real value of imports of country j , S_{ij0} is the trade share coefficient in the base period 1975. The model then uses predicted exports, together with import projections, to revise the base

year trade-shares matrix. Apparently, this approach is somewhat unsatisfactory because it ignores the problem of directly forecasting a trade-shares matrix.

Fair (1984): The Multicountry Model by Ray C. Fair describes quarterly aggregate trade for 64 countries. The model contains 2,388 estimated trade share equations for 43 countries. The basic share equation is as follows:

$$S_{jit} = \beta_{ji1} + \beta_{ji2}D1_t + \beta_{ji3}D2_t + \beta_{ji4}D3_t + \beta_{ji5}S_{jit-1} + \beta_{ji6} \frac{PX_{jt}}{\sum_k S_{kit}PX_{kt}} \quad (2.18)$$

$D1_t$, $D2_t$, and $D3_t$ are seasonal dummy variables. PX_{jt} is the price index of country j 's exports, and $\sum_k S_{kit}PX_{kt}$ is an index of all countries' export prices, where the weight for a given country k is the share of country k 's exports to country i in the total imports of country i . For those share equations with the wrong sign for the price parameters, Fair reestimated the equations with the relative price variable omitted. Similar to the Moriguchi model described earlier, the Fair model does not impose the adding-up condition that individual exporters' shares in a given market add up to 1 in estimation, but chooses to perform post-estimation adjustments on the predicted shares to satisfy the adding-up condition.

In summary, the brief survey of other empirical linkage studies presented in the preceding pages attempts to explain a variety of approaches that have been applied to a basic problem that is also the primary focus of the current study, namely, the estimation and projection of the changing trade-shares matrix and the

modeling of bilateral trade flows.³ As will become clearer in the next chapter, while the current study shares some of basic characteristics of the earlier work in the field, it contains several innovations of its own. They include: experimenting alternative functional forms for the share equations; exploring the significance of other non-price factors in determining the movement of trade shares that are not yet studied in the literature; and making use of a fresh set of trade data for more recent decades. Chapter IV will discuss in greater detail the world trade database developed in this study. For now, we turn to Chapter III to focus on the econometric analysis of the trade model.

³It may be noted that there is another group of models that could be followed to explain the bilateral trade flows, namely, the gravity models of the type used by Linnemann and Balassa. These models include as explanatory variables the incomes and populations of both countries and distance between them. They are not discussed here because the gravity model approach is more useful in explaining the static structure, but has not been very successful as far as the prediction and the consistency of prediction of total world trade are concerned. For the gravity approach to bilateral trade flows, see Linnemann (1966), Balassa (1961).

CHAPTER III

THE MULTISECTORAL BILATERAL WORLD TRADE MODEL

This chapter reports on the econometric analysis of the multisectoral bilateral world trade model. The trade model, the reader may recall, is primarily developed to channel import demand into export supply in 120 commodity categories among the fourteen countries and two regions of a linked international modeling system. Specifically, the trade model takes exogenously the projections of total import demand by industry from each country model and allocates them back to the supplying countries according to each supplier's share of the given import market. Export supply is derived by summing the allocations, by exporter, over all the importing markets. The forecasts of trade flows generated in this way are mutually consistent for all countries. The analysis uses time-series regressions on annual OECD and UN data of international trade by commodity and by country of origin and destination for the 1974-91 period.¹

Key to the above "import-allocation" process is the trade-shares matrix, which gives, for each country importing a certain product, the proportions imported from each source country. Trade shares, as we noted in Chapter I, are not constant. In fact, changes over time in the trade-shares matrix are often quite substantial.

¹Chapter IV will discuss the data requirement in greater detail.

As reviewed in the preceding chapter, the problem of estimating and projecting the typical element of the trade-shares matrix has been previously studied by a number of authors. The basic postulate in these studies is that each element of the trade-shares matrix is a function of relative price and some non-price factors. While the present study uses the same basic postulate in choosing the structure of the trade model, its departure from the earlier studies is discussed below.

There are three independent variables in our share equation: relative prices, relative capital stock, and a time-trend-like variable. The rationale for the first explanatory variable -- relative prices -- in the share equation is straightforward. In a given import market, the shares of the various exporting countries are expected to be inversely related to the relative prices of the exporting countries. Suppose, for the sake of simplicity, there are only two exporters in the U.S. import market for auto parts: Japan and Canada. Suppose further that in Year One, Japan and Canada evenly split the U.S. market. What would happen if the Japanese yen appreciates 10% against the U.S. dollar, other things equal? Surely, to American buyers, Japanese auto parts now appear relatively more expensive in U.S. dollar terms than Canadian auto parts, giving Canada a relative price advantage in the U.S. auto-parts import market. U.S. importers, responding to price changes, would substitute Canadian auto-parts for Japanese ones. For any given level of auto-parts imports by the U.S., the proportion imported from Japan is thus expected to fall, while the reverse is expected for the rival Canada. In an

import market with more than two rival suppliers, we may extend the above analysis concerning the substitution effect as follows. Whereas in the case of two-country rivalry, one exporter (Japan) is explicitly pitted against the other (Canada) in the fight for market share, with multi-country rivalry, a given exporter may be thought of as being pitted against a "representative rival", which does not refer to a specific competitor, but all of its competitors grouped together. In other words, like the exporter Japan in the two-exporter example, the share of a given exporter in the import market with multiple exporters is expected to fall if the product it exports is becoming more expensive relative to a weighted average of the prices of its competitors.

The prices used to formulate relative price term are export prices. They are chosen for two reasons: (1) the national models in the Inforum international system use and forecast export prices, hence, they are a logical choice; and (2) while unit-value indices could be made from the bilateral trade flows, the many well-known problems associated with them prohibits their use (see, for example, Kravis and Lipsey, 1971).

It should be noted that, in reality, the price effect normally takes more than one year to be completely felt. This suggests that a proper lag structure should be considered when the price indices are constructed. As will be seen shortly, a lag structure has been built into the relative price term in our share equation.

In addition to relative prices, we use relative capital stock in the trade share equation as a proxy for an exporting country's relative non-price competitiveness, particularly due to quality change of product that does not find expression in the price indices. If one country is a quality leader of a certain product, such product may sometimes be purchased by other countries, despite its higher price tag (for example, U.S. bearings and pumps were known to be purchased, at their higher prices, when critical uses were involved). Thus, it is certainly conceivable that quality change of a product can help an exporting country to maintain or even increase its export market share despite a lack of price competitiveness in the product. So, in our share equations, if Japan's capital stock growth rate in the automobile industry is exceeding the average capital stock growth rates of all competing exporting countries in the U.S. market, *ceteris paribus*, then the share of Japan in the imports of automobiles in United States will be projected to go up.

Since capital investment is known to have lag effects, a lag structure is built into the capital stock indices. Note that capital stock indices are cumulated from capital investment data. The indices are further adjusted by the "Almon unit buckets" (Almon, 1989), because the time series on investment is not long enough to construct capital stock series for the beginning period of the present trade model, which is 1974. The adjusted capital stock, also called "bucket 1 capital stock" by Almon, contains young equipment for which maintenance is unnecessary. It is this special capital stock index that we use as a proxy for quality change of

product that is not reflected in the price indices.

Other non-price factors, including changes in tastes, habits, preferential credit terms, and quantitative trade restrictions are, in most cases, difficult to quantify or predict. We assume these variables have trends, and add an exponential time trend variable to the share equation. Unlike the relative price and relative capital stock terms, the expected sign of the time trend could, of course, be either positive or negative. It should also be noted that the trend variable may present a potential problem, namely, the time trend term, in the long run, may force the bilateral flow to be larger than the total or, in the opposite case, negative. One solution is to adopt a special time-trend-like variable, first formulated by Nyhus (1975) to have time "slow down". The so-called Nyhus trend is cumulated from $(1 - S_{ijt-1})$ with zero decay rate, so that as the share S_{ijt} gets larger, each increment to time variable becomes smaller, thus slowing down the time.

Although S_{ijt-1} , the lagged value of the dependent variable, forms part of the Nyhus trend, the Nyhus trend itself cannot simply be considered a "lagged dependent variable." A lagged dependent variable is generally undesirable in a regression equation because it can lead to very erratic estimates of the coefficients on the other variables. This is because the lagged value of most variables will explain the current value fairly well without any help from other variables. The lagged value by itself explains so much of the variability that there is little to be

explained by the other variables. The Nyhus trend, however, is not a "true" lagged dependent variable, because the estimated coefficients on all the past values of S_{ijt} are constrained to be the same. Because of this estimation constraint, the estimated parameter on the Nyhus trend will not act like a "true" lagged dependent variable.²

Mathematically, the typical S_{ij} element of the trade-shares matrix is written as follows:

$$S_{ijt} = \beta_{ij0} * \left(\frac{P_{eit}}{P_{wjt}}\right)^{\beta_{ij1}} * \left(\frac{K_{eit}}{K_{wjt}}\right)^{\beta_{ij2}} * e^{\beta_{ij3} T_t} \quad (3.1)$$

where,

S_{ijt} = the share of country i in the imports of a given product into a given country j in year t (0 denotes the base year 1990);

P_{eit} = the effective price of the good in question in country i (exporter) in year t, defined as a moving average of domestic market prices for the last three years;

P_{wjt} = the world price of the good in question as seen from country

²A useful test to examine the effect on the equation fit of a lagged dependent variable is to use the predicted values, rather than the actual values, of the dependent variable in a simulation of the equation over the estimation period. Using this test, an equation with a "true" lagged dependent variable often leads to a drastically different regression fit than the one in which actual values of the dependent variable are used throughout the estimation period. In the present study, we have subjected a number of share equations to this test. The two regression fits for each equation are, in most cases, indistinguishable, if not entirely identical. This empirical result reinforces our theoretical assertion that the Nyhus trend is largely free from the defects of a lagged dependent variable.

j (importer) in year t (see fuller description below);

K_{eit} = an index of effective capital stock in the industry in question in country i in year t, defined as a moving average of the capital stock indices for the last three years;

K_{wjt} = an index of world average capital stock in the industry in question as seen from country j in year t (see fuller description below);

T_t = Nyhus trend variable, set to zero in the base year.

$\beta_{ij0}, \beta_{ij1}, \beta_{ij2}, \beta_{ij3}$ are estimated parameters.

The world price, P_{wjt} , is defined as a fixed-weighted average of effective prices in all exporting countries of the good in question in year t:

$$P_{wjt} = \sum_i S_{ij0} P_{eit} ; \quad \sum_i S_{ij0} = 1 \quad (3.2)$$

and the world average capital stock, K_{wjt} , is defined as a fixed-weighted average of capital stocks in all exporting countries of the sector in question in year t:

$$K_{wjt} = \sum_i S_{ij0} K_{eit} \quad (3.3)$$

The fixed weights in Equations 2-3, S_{ij0} , are the trade shares for the base year 1990. The use of the fixed weights ensures that the share equation satisfies the "homogeneity" condition as suggested by the demand theory. For example, if all effective domestic prices, P_{eit} , are doubled, then a doubling of the world prices as seen by each importing country (or its import prices) leaves the price ratio un-

changed.

In estimating the trade-shares matrix, the present study has abandoned one of the Armington assumptions that the price elasticities in a given import market are invariant with respect to each exporter. This assumption is not only contingent upon the assumption that the consumer's preferences are alike for all exporters in a given import market, it is also simply too restrictive to be useful if the purpose is to predict the price/non-price effect on trade shares. For these reasons, we will estimate the trade shares without imposing *a priori* restrictions on the size of the structural coefficients, β_{ij0} , β_{ij1} , β_{ij2} , and β_{ij3} .³ These parameters will be estimated using Ordinary Least Squares (OLS) in the following specification:

$$\log S = \alpha + \beta_1 \log P + \beta_2 \log K + \beta_3 T \quad (3.4)$$

Note that, for the sake of simplicity, we have dropped the time and country subscripts (t, i, j) and let P and K denote the relative price ratio and relative capital stock ratio, respectively.

Because these share equations will be used in a forecasting system, it is particularly important that the equation parameters are sensible and of expected signs. We searched the parameter space for estimates of β_{ij0} , β_{ij1} , β_{ij2} , and β_{ij3} ,

³By relaxing the restrictive assumption on the size of the estimated structural coefficients, we may risk introducing a higher degree of instability in the estimation of β_{ij0} , β_{ij1} , β_{ij2} , β_{ij3} , and bilateral trade flows. We will examine the model's performance under this risk in a 12-year historical simulation exercise in Chapter 6.

and included only estimates with correct signs. The search procedure explored seven alternative functional forms as follows, beginning with the form in Equation (4). If the estimated price parameter or capital parameter was of the wrong sign, various combinations of a subset of the three explanatory variables were then used in the regression. If either price parameter or capital parameter still had a wrong sign, then the share equation was regressed on the Nyhus trend variable alone, because there was no sign restriction on the Nyhus trend variable.

It should also be noted that in any forecast period each trade share must be non-negative, and that the sum of shares from all sources in a given market must add up to 1 (i.e. $\sum_i S_{ij} = 1$ for all j and t). The non-negativity condition is automatically satisfied through the use of the logarithmic functional form, but the adding-up condition is not. Methods must, therefore, be found for modifying the forecast trade shares so that the adding-up condition is met. One suggested method relies upon the "residual-share" approach, where for n exporting countries in a given importing market, only $(n-1)$ shares are forecast with econometrically estimated equations. The n -th share is then derived as 1 minus the sum of the $(n-1)$ shares. The method is not chosen for the present trade model, mainly because of the prospect that whenever the sum of $(n-1)$ forecast shares exceeds 1, the n -th share becomes negative, which violates the non-negativity condition stated above.

The present study adopts an alternative approach. It estimates all of the n

share equations separately and then adjusts the shares to meet the adding-up condition. In this way, the forecast shares in each market will satisfy both the adding-up condition and the non-negativity condition. In scaling the forecast shares to meet the adding-up condition in each import market, those with the best fits should be adjusted proportionally less than those with poor fits. There is a set of good weights at hand: the standard errors of the estimated equations. Thus, the adding-up condition in each import market is imposed by distributing the residual in proportion to the standard error of each estimated share equation.

CHAPTER IV

DATA SOURCES AND DATA ORGANIZATION

The regression analysis of the present trade model involves, among others, the use of extensive time-series data on the bilateral trade among the sixteen countries and regions for each of 120 categories of merchandise trade. The trade data that are presently available, from either the OECD or the UN, however, are not only bundled with numerous inconsistencies, but also not in a usable form that is suitable for our time-series regression analysis. It took this author over two years of his dissertation research time to process some 200 OECD and UN detailed commodity trade data tapes, to make a number of adjustments to reduce inconsistencies in the raw data, and to aggregate the commodity categories and trading partners to a more manageable level. The outcome of this effort is the "Inforum Bilateral Trade Data Bank," a consistent, comprehensive, yet usable database that covers bilateral flows in 120 commodity categories among 28 reporting countries and 60 partner countries over the 1974-91 period.¹ The major data-organization work involved is documented below.

The main data source for this study is the bilateral trade data tapes prepared by the OECD for its 24 member countries, and by the UN for the three non-

¹The data bank may be accessed in G or its public domain twin, PDG, a data-handling and regression program written by Clopper Almon for personal computers.

OECD countries for which active Inforum models exist: Korea, Mexico and China. Each year, for each of the OECD countries, data on imports and exports with nearly 200 trading partners are available by complete 5-digit SITC (Standard International Trade Classification) product classes both in physical quantities and in values at current dollar prices.² The data represent the entire spectrum of goods that can be bought and sold in the marketplace, including agricultural products, minerals, clothing, chemicals, metals, mechanical machinery, electrical machinery, scrap and waste, secondhand goods, and antiques. They do not include services. The level of product detail thus ensures the creation of trade matrices for products ranging from raw materials ("cotton") to chemical products ("drug and medicines") to hi-tech electronics ("semiconductors").

The data came on over 200 OECD and UN computer data tapes. On average, each year of the OECD trade data was written on twelve computer tapes -- six of export data and six of import data, and on each tape, a country's trade was arranged by 5-digit SITC commodity and within the commodity it was arranged by trading partner. The UN trade data for Mexico, South Korea and China came on two tapes, and each data tape was basically organized like the OECD tapes,

² Depending on a particular year, the data are recorded in one of the three "revisions" of SITC schemes. Before 1978, all of the OECD countries reported the trade statistics in SITC Revision I, which distinguishes some 1,400 products. From 1978 through 1987, most of these countries adopted SITC Revision II, which refines and expands the product detail to about 2,000 trading commodities. In 1988, all OECD countries, except for the US and Turkey, switched to SITC Revision III in their trade statistics reporting, which now covers over 3,000 products. The US and Turkey adopted Revision III in the following year.

although minor differences in tape format still exist.

Downloading the data from these tapes and storing them required hundreds of megabytes in computer disk space and a considerable amount of time on a 486 Personal Computer (PC). After reading each tape onto the computer, the data consisted of bilateral flows in complete 5-digit SITC among the 28 reporting countries and some 200 trading partner countries that make up the entire world.

As noted earlier, the raw data set from the OECD and UN is by no means a consistent time-series data bank with which the trade model can be readily estimated. To that end, we have reconciled the different commodity classification schemes used in the reported trade data, adjusted the trade flows that are associated with the special SITC codes, and reduced the commodity categories as well as the number of trading partner countries to a more manageable level.

First, by geographic aggregation, we reduced the number of trading partner countries from 200 to about 60, which are shown in Table 4. They include the 14 individual countries of the trade model as well as a number of other countries (for instance, the transitional economies in the Eastern Europe, OPEC countries, South Africa, other developing Asian countries, and major South American countries) that may in the foreseeable future be included into the trade model as the respective national forecasting models are developed.

Table 4
Reporting/Partner Countries in the Bilateral Trade Data Bank

<u>Reporting Country</u>	<u>Country Code</u>
Canada	0100
United States	0200
Japan	0500
Australia	0700
New Zealand	0800
Austria	1000
Belgium-Luxembourg	1100
Denmark	1300
Finland	1400
France	1500
Germany	1600
Greece	1700
Iceland	1800
Ireland	1900
Italy	2000
Netherlands	2100
Norway	2200
Portugal	2300
Spain	2400
Sweden	2500
Switzerland	2600
Turkey	2700
United Kingdom	2800
Former Yugoslavia	3500
Mexico	5130
China (Mainland)	6870
South Korea	6910
China (Taiwan)	6930

Table 4
(continued)

<u>Partner Country</u>	<u>Country Code</u>
Canada	0100
United States	0200
Japan	0500
Australia	0700
New Zealand	0800
Austria	1000
Belgium-Luxembourg	1100
Denmark	1300
Finland	1400
France	1500
Germany	1600
Greece	1700
Iceland	1800
Ireland	1900
Italy	2000
Netherlands	2100
Norway	2200
Portugal	2300
Spain	2400
Sweden	2500
Switzerland	2600
Turkey	2700
United Kingdom	2800
Former U.S.S.R	3310
Poland	3350
Hungary	3390
Former Yugoslavia	3500
Rest of Europe	0000
Israel	6150
Other Middle East	0000
Egypt	4070

Table 4
(continued)

<u>Partner Country</u>	<u>Country Code</u>
South Africa	4950
Africa (North)	0000
Africa (East)	0000
Africa (West)	0000
Africa (South)	0000
Mexico	5130
Central America and the Caribbean	0000
Colombia	5630
Venezuela	5650
Peru	5750
Brazil	5770
Chile	5830
Argentina	5850
Rest of South America	0000
India	6550
Rest of South Asia	0000
Thailand	6630
Malaysia	6750
Singapore	6790
Indonesia	6810
Philippines	6830
Rest of Southeast Asia	0000
China (Mainland)	6870
South Korea	6910
China (Taiwan)	6930
Hong Kong	6950
Rest of East Asia	0000
Oceania	0000
Unspecified	0000
Secret	8210
Statistical Discrepancy	9998

Note:

1. The country code follows the OECD convention. A special country code "0000" indicates a country grouping.
2. There are 13 country groupings: Rest of Europe, Other Middle East, Africa (North), Africa (East), Africa (West), Africa (South), Central America and the Caribbean, Rest of

Table 4
(continued)

South America, Rest of South Asia, Rest of Southeast Asia, Rest of East Asia, Oceania, and Unspecified.

Rest of Europe

Former East Germany	Former Czechoslovakia	Romania	Bulgaria
Albania	Gibraltar	Malta	Faeroe Islands
Cyprus	Europe nes		

Other Middle East

Syria	Lebanon	Gaza Strip	Jordan
Iraq	Saudi Arabia	Yemen	Kuwait
Democratic Yemen	Bahrain	Abu Dhabi	Dubai
Ras Al Khaimah	Other United Arab Emirates	Qatar	Oman
Middle East nes	Iran		

Africa (North)

Morocco	Algeria	Tunisia	Libya
Sudan			

Africa (East)

Somalia	Central African Republic	Ethiopia	Djibouti
Uganda	Kenya		

Africa (West)

Western Sahara	Mauritania	Senegal	Gambia
Mali	Niger	Burkina Faso	Guinea
Guinea-Bissau	Cape Verde Islands	Sierra-Leone	Liberia
Ivory Coast	Ghana	Togo	Benin
Sao Tome Principe	Nigeria	Equatorial Guinea	Chad
Cameroon			

Africa (South)

Gabon	Congo	Zaire	Burundi
Rwanda	Tanzania	Angola	Zambia
Zimbabwe	Malawi	Mozambique	Lesotho
Comoro Islands	Madagascar	Reunion	
Mauritius	Seychelles	British Terr. in Africa nes	
Swaziland	Botswana	Afrique nes	

Table 4
(continued)

Central America and the Caribbean

Saint-Pierre-Miquelon	Cuba	Haiti	Jamaica
Dominican Republic	Guatemala	Belize	Bahamas
Bermuda	Barbados	Antigua	Dominica
Saint Lucia	Grenada	Nicaragua	Panama
Other British Terr. in America		Saint Vincent	Hondura
Netherlands Antilles	El Salvador	Costa Rica	Guadeloupe
U.S. Virgin Islands	Panama Canal Zone	Martinique	

Rest of South America

Trinidad-Tobago	Guyana	Surinam	Ecuador
French Guyana	Bolivia	Paraguay	Uruguay
Greenland	America nes		

Rest of South Asia

Afghanistan	Nepal	Pakistan	Bangladesh
Bhutan	Maldives	Sri Lanka	

Rest of Southeast Asia

Burma	Laos	Kampuchea	Vietnam
Brunei			

Rest of East Asia

Mongolia	North Korea	Macau	Far East nes
----------	-------------	-------	--------------

Oceania

Papua-New Guinea	New Caledonia	Solomon Islands	Vanuatu
French Polynesia	Nauru	Fiji	Tonga
British Terr. in Oceania nes	Western Samoa	Pacific (Trust) Islands	Guam
Others US Pacific Islands	Oceania nes		

Unspecified

Ships supplies	Miscellaneous nes	Other	
----------------	-------------------	-------	--

Another adjustment to the raw data concerns the "alphanumeric" SITC codes in the reported data. There were two kinds of alphanumeric SITC codes. First, the OECD introduced a letter "B" at the position where the national code differed from the SITC description. For example, on data from Austria, the OECD listed under code 251BB all commodities of group 251 ("Pulp and waste paper") which do not match a particular SITC. Second, to retain confidentiality in all or part of the SITC at detailed levels, the OECD gave complete data only at the less detailed level of the SITC. The non-confidential data given at a more detailed level in the same product class were subtracted by the OECD from the total of this product class and the remainder was recorded as non-disclosed data on the tape in an alphanumeric codification ending in one to four letters "A." For example, a reporting country provided the OECD with data from division 51 ("Organic chemicals") with complete geographic breakdown. These data were then treated and recorded on the tape under the code 51AAA. In adding up the data recorded under 51AAA and all other data under headings beginning with 51, the total equals that of division 51 as provided by the reporting country. When the reporting country provided total value without a complete geographic breakdown at a detailed level, the difference was recorded under the geographic code "secret" under number 8210.

Table 5 illustrates this process for a given reporting country. Here, the data given under code 51 were obtained by the OECD from the reporting country with

Table 5
An Illustration of Alphanumeric Codes in the OECD Trade Data

PARTNER COUNTRY	SITC	51	512	513	514	515	51A
		a	b	c	d	e	f = a - (b+c+d+e)
Total		596	439	88	56	1	12
XXX1		149	92	28	21	0	8
XXX2		69	48	16	3	0	2
XXX3		44	29	5	2	0	8
XXX4		45	26	2	3	0	14
XXX5		17	12	0	0	0	5
XXX6		76	58	11	3	0	4
Other		196	99	12	21	0	64
Secret		0	75	14	3	1	-93

a complete geographic breakdown. Data for groups 512, 513, 514 and 515 which made up division 51 were calculated from the 5-digit SITC level, as given by the reporting country. For some of the 5-digit positions, the reporting country has given only the total trade, and this is then registered under "secret" code 8210. The data recorded under heading 51A on the tape were thereafter obtained by subtraction. It should be noted that:

- (a) For a given product at 4- or 5-digit level, the reporting country has

maintained confidentiality. Non-disclosed trade was included with a complete geographic classification in the data of division 51. The total of this undisclosed trade was +12.

(b) The total amount in division 51 under code 8210 was zero. This is so because the reporting country provided data for division 51 with a complete geographic breakdown. Given that the sum of the data recorded under geographic code 8210 for SITC headings 512, 513, 514, 515 and 51A must be zero, the OECD placed a negative number in the column 51A for geographic code 8210. This negative number was equal in absolute value to the sum of the figures under code 8210 in columns 512, 513, 514 and 515.

In the data reported for the 1974-91 period, the OECD has resorted extensively to the use of alphanumeric product codes for reasons of confidentiality or incompatibility between national classification and the SITC. The alphanumeric codes used range from one letter ("5111A") to as many as four letters ("6AAAA"). Of course, the more letters in an alphanumeric code, the more aggregated the product class to which it belongs. It may be recalled that the trade model contains a total of 120 sectors, which are aggregated directly from the 5-digit SITC product classes. As will be shown shortly, it is not uncommon that different SITC codes under the same 1-, 2-, 3-, or even 4-digit SITC were not matched up with the same

trade sector. In aggregating the trade data from the SITC product classes to the sectoring plan of the trade model, we could either exclude the non-classifiable and non-disclosed data, or come up with some way of converting the alphanumeric codes into SITC codes. Excluding the data means that total trade at the trade model sector level will not be consistent with the totals as provided in SITC. To maintain such consistency, we adopted an approach in which the data in an alphanumeric code, say 51A, were systematically "re-allocated" over the SITC codes that fall under the same product class 51 (i.e., 512, 513, 514 and 515). We called it a "purification" process.

First, in re-allocating data associated with the alphanumeric SITC codes ending with letters "A", we applied an iterative procedure called the rAs method.³ Here, the row controls and column controls were determined from the raw data, and the initial "guess" matrices were constructed with the 5-digit commodity codes across the top of the column and trading partners down the side. The rAs procedure then would be able to eliminate the alphanumeric code, say 51A, and the "secret" trading partner 8210, without altering the total value of the data under heading 51. For alphanumeric codes ending with letters "B," a reporting country's data were directly distributed to its respective trading partners according to the share of each non-alphanumeric 5-digit SITC code under the same heading.

³The rAs method, first applied to input-output tables, is discussed in detail in Bacharach (1970). The method uses an initial guess of a matrix and derives a consistent matrix where the rows and columns sum to some given totals.

The last adjustment to the raw data dealt with the aggregation of the 5-digit SITC data into the 4-digit ISIC (International Standard Industry Classification) sectoring plan, then into the 120 sectors of the current trade model. One difficulty was that some 5-digit SITC commodity code covers a group of products which belong in different 4-digit ISIC sectors. There are essentially two ways of dealing with the problem: assigning each multi-sector commodity entirely to the single ISIC sector judged to be most appropriate, or splitting them among all the relevant sectors. We have adopted the second method and mainly relied upon a set of "conversion tables" jointly developed by the Economics and Statistics Department of OECD, the United Nations Statistical Office and the World Bank. These "conversion tables" distribute each multi-sector 5-digit SITC commodity among the relevant 4-digit ISIC codes according to the industrial composition of trade by Common Market countries in the year 1975. While this was clearly unsatisfactory because it applied the same fixed allocation factors for all years and to trade by all countries (including non-EEC Members), it nevertheless appears preferable to the alternative approach of allocating multi-sector commodities in their entirety to the single most appropriate sector.

We further modified these "conversion tables" to meet the sectoring plan of the trade model (see Tables 6-8). In particular, we have included seventeen non-manufacturing sectors and reclassified some of the manufacturing sectors to reflect finer breakdown in sectors such as electronics and non-electrical machinery.

Table 6: Concordance between the Trade Sector and the SITC Revision I

Trade Sector = SITC Rev. I	
1	= +041+0421 0.08+043+044+045
2	= +051-05173-05174+052+054-05461+05363
3	= +0721+0742+075+0811-08119+121+221+2311+292-29291
4	= +001+0616+941
5	= +261
6	= +263
7	= +262
8	= +264+265
9	= +24
10	= +0311+0313 0.7+29115+29197
11	= +2813
12	= +321-3218
13	= +283-28312-28322+28501+286
14	= +33101
15	= +341
16	= +271+273-27321 0.49+274+275-27521+276-27661+6671+6672 0.41
17	= +351
18	= +01+0913+09905+291-29114-29115-29191-29194-29197+4113-41134-41135
19	= +02+0619 0.25+09909 0.16+59953 0.5
20	= +053-0532-05363-0539 0.06+05461+055-0554+09904 0.5
21	= +0312+0313 0.3+032+29114+29194
22	= +0813+0914+4111+41134+41135+421+422+431-4314
23	= +042-0421 0.08+046+047+0481+0554-05545+0812+08191
24	= +0483+0484
25	= +061-0616-0619+08193 0.3
26	= +0532+0539 0.06+062+072-0721+073+08192
27	= +0488+05173+05174+05545+0619 0.75+0711+0713+0741+08193 0.6+099-09904 0.5-09905-09909 0.16+29291 0.08+59951 0.5+59952 0.5+59954+59957 0.5
28	= +0814+08119+08199
29	= +0482+08193 0.1+08194+112
30	= +111
31	= +122
32	= +651
33	= +652
34	= +26623+26633+2664+653+654+655+656+6574+6577+89998
35	= +6575+6576
36	= +841-84159+842
37	= +611+21+613
38	= +612-6123+831+89991
39	= +6123+851-85101
40	= +631
41	= +632+633+6578+89921+89922+89927
42	= +821-82102-82109 0.24
43	= +251
44	= +6411
45	= +59962+641-6411+642-6423
46	= +6423+892
47	= +2814+51-51327-51328+531+532+5331+53331+59956 0.5+ 5996-59962+59972+59973+59976+59992+59993+59999
48	= +561-56121+5622+5992
49	= +2312+2662-26623+2663-26633+581
50	= +5333-53331-53333+59995
51	= +29291 0.56+541-5419+59977
52	= +553+554
53	= +29291 0.36+4314+51327+5332+551+571-5714+5995 0.5-59954 0.5+59955 0.5+59959 0.5+5997-59972-59973-59976-59977+59994+59997+59998+8623+8624-86244-86245+89591+89595+89931+89932+8912 0.51
54	= +33102+332-3322-3323-3324-33251 0.2-33261 0.11-3329 0.5+521-5213
55	= +3322+3323+3324
56	= +33251 0.2+33261 0.11+3329 0.5+51328+5213+66181+89933
57	= +3218
58	= +6291
59	= +2313+621+629-6291+85101 0.37
60	= +72322 0.34+84159+85101 0.63+893+89422+89423 0.43+89954

Table 6
(continued)

Trade Sector = SITC Rev. I	
61	= +664+665+72322 0.45+81241
62	= +27321 0.49+6611+6612
63	= +6623+6624+6637 0.48+6639+666+72321+72322 0.02+8122
64	= +27521+6613+6618-66181+663-6637 0.48-6639+89592
65	= +27661+56121+67
66	= +28312+682
67	= +684
68	= +28322+683
69	= +685+686
70	= +681+687+688+689
71	= +81242+82109 0.24+89511
72	= +691+71966
73	= +692
74	= +693
75	= +69-691-692-693
76	= +7111+7112+7113+7116
77	= +7114
78	= +7115
79	= +7117+7118
80	= +712-71231-7125 0.3
81	= +7184+7185
82	= +715+71952+71954+71991+7296
83	= +71712+71713+7173
84	= +717-71712-71713-7173
85	= +7181
86	= +7182
87	= +7183
88	= +7125 0.3+71231+89999
89	= +7191
90	= +7192
91	= +7193
92	= +5714+7194+7195-71952-71954+7196-71966+7197+7198+7199-71991+8121+8123+81243+8943+8945+89512+89997
93	= +7241+7242+8911+8912 0.49
94	= +7222 0.24+7249+726+72993+72994
95	= +725
96	= +7143
97	= +714-7143
98	= +7293
99	= +72941
100	= +7291
101	= +7292+72942
102	= +7231+72322 0.19+72323+7299-72993-72994+7221+7222 0.76
103	= +735-7351
104	= +7351
105	= +731
106	= +732-7326-7327-7328-7329+7333-73333
107	= +73291+733-7333
108	= +7326+7327+7328+73292+73333
109	= +734
110	= +8941
111	= +5419+59991+7295+7297+82102+8617+8618+8619+8996
112	= +861-8617-8618-8619
113	= +864
114	= +28502+6672 0.59+6673+6674+8971+961
115	= +8914+8918+8919
116	= +8944
117	= +951
118	= +89601+89602+89603+89604+89605+89606
119	= +53333+8942-89422-89423 0.43+8952+89593+89594+8972+8991+8992-89921-89922-89927+89934+89935+8994+8995-89954+8999-89991-89997-89998-89999
120	= +2314+267+282+284+29191+86244+86245+863+911+931

Table 7: Concordance between the Trade Sector and the SITC Revision II

Trade Sector = SITC Rev. II	
1	= +041+0421+043+044+045
2	= +054-0546+0571+0572+0573+0574+05751+05772+05773+05779+0579-05799
3	= +07111+0721+0742+075+0811-08119+1211+22+232+292-29291
4	= +001+0616+941
5	= +261
6	= +263
7	= +268+65121
8	= +264+265
9	= +24
10	= +03410+036 0.7+29115+29197
11	= +2815+2816
12	= +322+32313
13	= +286+287-28712-28722-28732+28901
14	= +333
15	= +34-34131
16	= +27-27324-27721-27861+6671+66721
17	= +351
18	= +01+0913+09805+291-29115-29191-29194-29197+41131+41132 0.6
19	= +02+0619 0.25+09809 0.3+59221 0.65
20	= +0546+0561+05651+05752+0576+05799+058-0582-05891+09804 0.3
21	= +034-0341+035+036 0.3+037+29194
22	= +0813+0914+411-41131-41132 0.6+42+431-4314
23	= +0422+046+047+0481+0564-05645+0812
24	= +0483+0484
25	= +0611+0612+0615+08193 0.2
26	= +0582+05891+062+072-0721+073 0.8+08192
27	= +0488+05645+05659+05771+05774+05775+0619 0.75+071-07111+073 0.2+0741+08193 0.5 +098-09804 0.3-09805-09809 0.3+29291 0.3+5921+59222
28	= +08119+0814+08199
29	= +0482+08193 0.3+08194+112+51216
30	= +111
31	= +12-1211
32	= +651-65121
33	= +652
34	= +653+654+656+657-65733+658+82122 0.5+89998
35	= +659-6597
36	= +655+84-84822-84849
37	= +21+611+613
38	= +612-6123+83+89991
39	= +6123+851-85101
40	= +6342+6344+6416
41	= +633+634-6342-6344+635+6597+89971+89981
42	= +8211+82122 0.5+82192+82199 0.6
43	= +251
44	= +6411
45	= +59812+641-6411-6416-64182+642-6423
46	= +6423+892
47	= +2814+51-51216-51218+52-52218+531+532+5331+53351+59221 0.35+5981-59812 +59832+59892+59899 0.5
48	= +562-56221+591
49	= +2331+266+267+58-58319-58339-58349-58359-58521
50	= +5334+53353+53354+59897
51	= +29291 0.3+54-5419+59224+59893
52	= +51218+553+554
53	= +29291 0.4+4314+52218+5332+551+57+59223+59225+59229+5982+59831+59833+59891+59894 +59896+59898+59899 0.5+882-88224-88225+89591+89595+89831+89931+89932
54	= +3321+3341+33451+3351+3354-33543+34131
55	= +3322+3323+3324+334-3341-3345
56	= +33452+3352+3353+33543+64182+66181+89939
57	= +32311+32312+3232
58	= +625
59	= +23321+62-625+65733+84822
60	= +58319+58339+58349+58359+58521+82199 0.2+84849+85101+893+89422+89423 0.6+89985

Table 7
(continued)

Trade Sector = SITC Rev. II	
61	= +664+665+77322+77325+81241
62	= +27324+6611+6612
63	= +6639+666+77323+77326+81220
64	= +662+6613+6618-66181+663-6639+89592
65	= +27861+56221+67
66	= +28712+682
67	= +28732+684
68	= +28722+683
69	= +685+686
70	= +2881+681+687+688+689-68914
71	= +81242+82191+82199 0.2+89511
72	= +691
73	= +692
74	= +693
75	= +694+695-6954+696+697-69782+699-6993-69964+89997+89512+7492
76	= +711+712+71488+71499+8121
77	= +7131+7144+71481+71491
78	= +713-7131
79	= +718
80	= +7211+7212+72131+72197+72199+72230+72240+74527 0.2
81	= +723+7283+72811+72819 0.5
82	= +6954+72812+72819 0.5+72844+72845+736+737-73732+7451+74527 0.2+74991+7784
83	= +7243+7245+7246
84	= +7244+7247-72479 0.6
85	= +725
86	= +726
87	= +727
88	= +7213-72131+72191+72198+7248+7284-72844-72845
89	= +741+7452-74521-74527+7428
90	= +742-7428+743
91	= +744
92	= +7491+7493 0.5+7499-74991+74521+74527 0.6+78681+8946+89473
93	= +761+762+763+76493 0.5+76499+89832
94	= +764-76493 0.5-76499+774+77882+77883+79283
95	= +72479 0.6+775
96	= +752+7599
97	= +751-75182+7591-75919
98	= +776
99	= +716
100	= +7781
101	= +7782+81243+77832
102	= +73732+771+772+77831+7731+77321+77324+77327+77881+77884+77886+77887+77889
103	= +793-7931
104	= +7931
105	= +791
106	= +781+782+783+7861
107	= +785
108	= +7493 0.5+784+78689
109	= +792-79283
110	= +8941
111	= +5419+59895+77885+82121+872+873+874-8744 0.3+8974+8996
112	= +75182+75919+871+8744 0.3+881+884
113	= +885
114	= +27721+28902+667-6671-66721+8973+96100+97101+97102+97103
115	= +8981+8982+8989+89880
116	= +8947-89473
117	= +951
118	= +89601+89602+89603+89604+89605+89606
119	= +53352+69782+6993+69964+89421+89423 0.4+89424+89425+8952+89593+89594+8972 +8991+89934+89935+8994+89972+8998-89981-89985+89992+89993+89994+89995+89996
120	= +23322+269+282+2882+29191+68914+88224+88225+88300+91100+93100

Table 8: Concordance between the Trade Sector and the SITC Revision III

Trade Sector = SITC Rev. III
 1 = +041+0421+0422+043+044+045
 2 = +054-0547-0546+057-05752-0576-05771-05774-05775-05799
 3 = +0711+0721+07431+075-07528-07529+0811-08119+1211+22+231+292-29294-29295-29296
 4 = +001+0616
 5 = +261
 6 = +263
 7 = +268
 8 = +264+265
 9 = +24-2483
 10 = +0341+01293 0.7+036 0.7-0362 0.7+29115+29197
 11 = +281-2814
 12 = +321+32221+3223
 13 = +2831+2841+2851+286+287+2891
 14 = +333
 15 = +34-342
 16 = +27-27324-27721-27861-27862+6671+66721
 17 = +351
 18 = +01-01293+09811+4112+0985+291-29115-29191-29196-29197+41131+41132 0.6
 19 = +02+0619 0.25-06195 0.25+09812 0.3+05461 0.3+05677 0.3+09891 0.3+09899 0.3
 +59221 0.65+59222 0.65
 20 = +05469+0547+0561+0566+05671+05752+0576+05799+058-05892+059+08119+09813
 +09841 0.3+09842 0.3+09849 0.3
 21 = +034-0341+035+01293 0.3+036 0.3-0362 0.3+037+0362+29196
 22 = +0813+091+411-4112-41131-41132 0.6+42+431-4314
 23 = +0423+046+047+0481-04812+0564-05645+0812
 24 = +0483+0484
 25 = +0611+0612+0615+0815 0.2
 26 = +062+05892+072-0721+04812 0.8+073 0.8
 27 = +0485+05461 0.7+05645+0567-05671-05677 0.3+05771+05774+05775+0619 0.75
 -06195 0.75 +071-0711+073 0.2+04812 0.2+0741+07432+07528+07529+0815 0.5
 +09812 0.7+09814+0984-09841 0.3-09842 0.3-09849 0.3+0986+0989-09891 0.3
 -09899 0.3+2929 0.3-29292 0.3-29293 0.3-29297 0.3-29299 0.3+5921+59223
 28 = +0814+0819-08194
 29 = +0482+0815 0.3+08194+112+51215+51216
 30 = +111
 31 = +12-1211
 32 = +651
 33 = +652
 34 = +653+654+656-65629+657-65733-6578+658-65841-65844+8212 0.5+89996
 35 = +659
 36 = +655+65629+65841+65844+84-84822-84829-84844-84845-84849
 37 = +21+611+613
 38 = +612+83+89991
 39 = +851-85111-85113-85121-85123-8513
 40 = +6343+6344+6345
 41 = +2483+633+634-6343-6344-6345+635+8997-89972+89981
 42 = +8211+8212 0.5+8215+8217 0.6+8218 0.6
 43 = +251
 44 = +6411
 45 = +59812+641-6411-64173+642-6423
 46 = +6423+892
 47 = +06195+2814+51-51215-51216-51222+52-5221-52515+531+532+5331+53351+59221 0.35
 +59222 0.35+5981-59812+59861+59864+59865+5973 0.5+5984 0.5+5985 0.5+59869 0.5
 +59891 0.5+59893 0.5+59897 0.5+59898 0.5+59899 0.5
 48 = +562-56221+591
 49 = +2321+266+267+57-5791-5792-5793+58-5815-5817
 50 = +5334+5335-53351-53352
 51 = +2929 0.3-29292 0.3-29293 0.3-29297 0.3-29299 0.3+54-5419+59225+59867
 52 = +51222+553+554
 53 = +2929 0.4-29292 0.4-29293 0.4-29297 0.4-29299 0.4+4314+5221+5332+551+593+59224
 +59226+59227+59229+5972+5983+59863+59894+59896+5988+5973 0.5+5984 0.5+5985 0.5
 +59869 0.5+59891 0.5+59893 0.5+59897 0.5+59898 0.5+59899 0.5+8821+8822+8823
 +8824+89591+8984+8985+89931+89932

Table 8
(continued)

Trade Sector = SITC Rev. III

54 = +3341+3345+3351+3354-33543+342

55 = +334-3341-3345

56 = +5977+3352+3353+33543+64173+66181+89934+89939

57 = +3221+32222+325

58 = +625

59 = +23221+62-625+6578+65733+8482-84821

60 = +579-5799+8217 0.2+8218 0.2+84844+84845+84849+8511-85115+85121+85123
+8513+893+8139-81391+5815+5817+89422+89423+8942 0.6-89421 0.6-89422 0.6
-89423 0.6+89989

61 = +664+665+77322+81391

62 = +27324+6611+6612

63 = +662+6637+6639+666+77323+77326+8122

64 = +6613+6618-66181+663-6637-6639+77324+89592

65 = +27861+27862+28233+56221+67

66 = +2832+682

67 = +2852+684

68 = +2842+683

69 = +685+686

70 = +2881+681+687+52515+689-68914

71 = +811+81317+8132+8213+8217 0.2+8218 0.2+89511

72 = +691

73 = +692

74 = +693

75 = +694+695+696+697-69782+699-6993-69954+747+7483+89997+89512

76 = +711+712+71489+71499+8121

77 = +7131+7144+71481+71491

78 = +713-7131

79 = +718

80 = +7211+7212+7213+7219-72191-72198+722+7456 0.2

81 = +723+7283+72811+72819 0.5

82 = +72812+72819 0.5+72844+7451+7784+72846+73-7373+7456 0.2+74911

83 = +7243+7245+7246-72461 0.5

84 = +7244+72663+72661+72461 0.5+7247+7249 0.4

85 = +725

86 = +726-72661-72663

87 = +727

88 = +72191+72198+7248+72841+72842+72843+72847+72849+7285

89 = +741+74595+74597+7452+7453+7421+7427

90 = +742-7421-7427+743-74341-74345

91 = +744

92 = +746+748 0.5-7483 0.5+749-74911+74591+74593+7456 0.6+7868-78689+8946+8913

93 = +761+762+763+76493 0.5+76499+8986+8987

94 = +764-76493 0.5-76499+774+77882+77883+77884+77885+79283

95 = +7249 0.6+775+74341+74345

96 = +752+75997

97 = +751-7513+7599-75997

98 = +776

99 = +716

100 = +7781

101 = +7782+81312+8138+77834+77835

102 = +7373+771+772+77831+77833+7731+77328+77329+7786+7787-77871+77881
+77886+77889 +81311+81313+81315

103 = +793-79329

104 = +79329

105 = +791

106 = +781+782+783+7861+7862+7863

107 = +785

108 = +748 0.5-7483 0.5+784+78689

109 = +792-79283

110 = +8941

111 = +5419+59895+77871+872+873+874-87441 0.3-87442 0.3-87444 0.3+8974+8996

112 = +7513+7591+871+87441 0.3+87442 0.3+87444 0.3+881+884

113 = +885-88592-88593

**Table 8
(continued)**

Trade Sector = SITC Rev. III
114 = +27721+2892+667-6671-66721+8973+96100+97101+97102+97103
115 = +8981+8982+8989+8988
116 = +8947
117 = +891-8913+951
118 = +896
119 = +53352+69782+6993+69954+89421+8942 0.4-89421 0.4-89422 0.4-89423 0.4 +8943+8944+8952+89593+89594+88592+88593+8972+8991+8992+89933+89935+89936 +89937+8994+89972+8998-89981-89989+89992+89994+89995
120 = +23222+269+282-28233+2882+29191+68914+8825+8826+883+911+931

With the bilateral trade data bank, we were able to construct a set of time-series trade-flows matrices and the corresponding trade-shares matrices for use in the current trade model.⁴ There is one matrix for each of the 120 commodities distinguished in the current trade model, and each is a 16 x 16, covering fourteen individual countries and two country groupings for the rest of the world.

In principle, each trade-flows matrix may be formed using either the import data or the export data, since the data for country A's exports of product *i* to country B are equivalent to country B's imports of *i* from country A. In practice, however, recording discrepancies between the import data and export data do exist, because of differences in valuation (imports are usually valued in c.i.f., while exports in f.o.b.), timing gaps (recording of imports happens one period later than recording of exports), exports of ships to open-registry countries, etc. The huge task of reconciling such recording discrepancies places it outside the scope of the current study. Instead, we have derived the trade matrices fundamentally from the *import* statistics. My argument here is that the import data tend to identify the country of origin better than the export data identify the country of destination, because imports loom larger in the collection of customs revenue than do exports.

Specifically, the imports of the twenty-eight reporting countries were

⁴The trade matrices are available in a form that can be accessed by VAM, a Vector and Matrix handling program developed by Clopper Almon.

aggregated into those of fourteen individual countries and a region (the rest of OECD), filling up the first fifteen columns of the matrix. For the last column, imports of the rest of the world from each of the fifteen countries and region were filled in as exports by each of the fifteen countries and region to all countries other than those appearing on the first fifteen columns.

From the example of the trade matrices shown on Table 2 in Chapter I, the reader may have noticed that the matrix is not "closed," in the sense that the intraregional trade flows between the ROW and the ROW are absent. The absence of these intraregional flows is dictated by data availability. Presumably, these flows can be determined in two steps. In the first, total imports of the ROW can be derived from the residuals between the total world imports by commodity and the sum totals of the total imports of the first fifteen countries and regions in the aforementioned trade matrix. In the second, the intraregional trade flows between the ROW and the ROW are determined from the residuals between total imports of the ROW and ROW's imports from the first fifteen countries and regions in the trade matrix. For the first step, the total world imports at the 5-digit SITC level would be needed to derive total world imports by the 120 trade model sectors. However, we were not able to obtain such statistics in machine-readable format. The UN publishes total world exports and imports in its *Yearbook of International Trade Statistics*, although the data are not printed at the complete 5-digit SITC level. Time constraints prevented us from using them to

fill the intraregional flows between ROW and ROW at this time, which would have to be done by hand.

The current-dollar trade flows were converted into constant-dollar flows using a set of export price indices constructed from the national sources. We first collected the export price deflators from the thirteen national models to be linked by the trade model. Then, the export price deflators for the rest of OECD (ROECD) were calculated as trade-weighted averages of export deflators of the 10 OECD countries in the trade model, while the export price deflators for Taiwan and ROW were computed as trade-weighted averages of the export deflators of all thirteen countries plus ROECD.

The price indices from the national models were, of course, computed in local national currencies and in different base years. We selected the year 1990 as the uniform new base year for these price indices. Further, a time series of exchange rate vis-a-vis the U.S. dollar was used to make national price indices comparable from one country to another. The exchange rate given by the International Monetary Fund's *International Financial Statistics Yearbook* was chosen because the US dollar -- the common unit of the bilateral trade data -- was used as the numeraire. Finally, these price indices were converted from their national sectors into the 120 trade model sectors (See Appendix A for the sectoral correspondence between the trade model and the national models).

It may be noted that the price series in some of the national models lacked sufficient history to be used directly in our analysis. Specifically, in the Austrian model, the price series began in 1976, while in the Chinese and Mexican models, there were no price data prior to 1980. In those cases, we made the following assumptions:

(1) For China and Mexico, we assume that the Chinese and Mexican exporters were price-takers before the year 1980, and we used the U.S. export prices to extend backwards the price series of these two countries.

(2) For Austria, we assume the Austrian export prices were heavily influenced by the German prices, and extended the Austrian price series from 1976 backwards by the German prices.

CHAPTER V

PARAMETER ESTIMATES AND EQUATION FITS

This chapter presents the parameter estimates and equations fits of the present trade model in four subsections. It may be recalled that, in estimating the share equations, a "search" procedure is used to explore the parameter space and retain only estimates with correct signs. To see how different trade share equations take up different functional forms, a breakdown of functional forms for the trade share equations is given in Section 1. Section 2 then focuses on the estimated trade share equations of a given trade sector across different import markets. Then, in Section 3, we summarize the size variations of the parameter estimates across all trade sectors. Section 4 presents the equation fits graphically for some 100 selected trade share equations that describe the top bilateral flows in the world trade. The overall equation fits for each trade sector will also be summarized.

1. A Breakdown of Functional Forms

The significant disaggregation by commodity categories and by import markets in the present trade model entails the estimation of an unusually large number of trade share equation. For each one of the 120 trade sectors, there are 241 possible share equations ($= 16 \times 16 - 15$), one for each off-diagonal element of the trade-shares matrix, plus the diagonal element representing the intraregional trade for the rest of OECD. For the whole trade model, therefore, there are 28,920

possible trade share equations. After eliminating zero shares and those with less than 5 observations in the sample period (1974-91), a total of 19,125 trade share equations were actually estimated.

The direct consequence of our search-estimation methodology is that the estimated share equations take on various alternative functional forms. Some retain all three independent variables as specified in Equation 3.1 in Chapter III, while others have only a subset of the three explanatory variables. A breakdown of eight different functional forms for the estimated share equations is shown on Table 9. For instance, there are 6,143 Type I share equations with relative price, relative capital stock, and Nyhus trend as the explanatory variables ("EQ Count"), accounting for 21.2% of the total share equations ("EQ Weight"). The underlying trade flows represented by Type I share equations, however, amount to 37.1% of total world trade in the base year 1990 ("Trade Weight"). It may be noted that Types I and III are two of the largest equation categories in terms of the proportions of total share equations as well as total world trade. It may also be noted that although Type VIII share equations (i.e. those share equations that are not econometrically estimated because there are less than 5 observations of the trade shares in the sample period) represent 33.9% of total share equations, the trade flows associated with these shares merely equal to 0.6% of total world trade in the base year 1990. Overall, 53.2% of the share equations have at least a relative price term, while 39% of the share equations have at least a relative

capital stock term. And 17.5% of the share equations (accounting for 21.6% of total world trade in 1990) do not have a Nyhus trend.

Table 9
Trade Share Equations: A Breakdown of Functional Forms

Function Type	EQ Count	EQ Weight	Trade Weight
I: P, K, T	6,143	21.2	37.1
II: P, K	2,716	9.4	15.4
III: P, T	4,960	17.2	29.3
IV: K, T	1,643	5.7	6.5
V: P	1,556	5.4	4.4
VI: K	786	2.7	1.8
VII: T	1,317	4.5	4.9
VIII: None	9,795	33.9	0.6
Total:	28,920	100	100

37.1
15.4
6.5
1.8

60.8

2. Parameter Estimates: A Sector Focus

The parameter estimates, the reader may recall, include those on the intercept (the β_0 's), those on price (the β_1 's), those on capital investment (the β_2 's), and those on the Nyhus trend (the β_3 's). As shown in Table 9, there are 19,125 β_0 's, 15,375 β_1 's, 11,288 β_2 's, and 14,063 β_3 's. Obviously, all parameter estimates cannot be displayed at once. In this Section, we will focus on the parameter estimates across various import markets for just one trade sector -- Sector 108 ("Auto parts"), while in the next Section, we will summarize the parameter estimates

across all trade sectors.

Table 10 (pp. 72 - 79) presents the complete column-by-column estimates of each element of the trade-shares matrix across sixteen import markets for Sector 108 ("Auto parts"). Here, "B-SHARE" shows the base year 1990 share (in percentage) of a given exporter in a country importing auto parts. The third column indicates the specific functional form used to estimate a given trade share equation. For example, in the Canadian import market for auto parts, the "KT" for the USA cell says that the trade share equation for the exporter USA has two explanatory variables: relative capital stock and the Nyhus trend. Other notations that may appear in this column include:

- PKT -- meaning that the share equation has relative prices, relative capital stock, and the Nyhus trend as the explanatory variables;
- PK -- meaning that the share equation has relative prices and relative capital as the explanatory variables;
- PT -- meaning that the share equation has relative prices and the Nyhus trend as the explanatory variables;
- P -- meaning that the share equation has relative prices as the sole explanatory variable;
- K -- meaning that the share equation has relative capital stock as

- the sole explanatory variable;
- T -- meaning that the share equation has the Nyhus trend as the sole explanatory variable;
- LIMIT -- meaning that the concerned share equation was not estimated due to an insufficient number of observations in the estimation period (1974-91);
- ZERO -- meaning that the concerned share equation was not estimated because the shares were smaller than 0.001 throughout the estimation period;

The next column, under the heading "SEE", shows the standard error of estimate for each share equation, while the "RBSQ" column shows the percentage of variations in the trade shares that can be "explained" by the independent variables in the share equations. The column, "OBS", displays the number of observations used in each share equation regression (the maximum number of observations is 18). Finally, the last four columns present the parameter estimates and the corresponding t-values (in parenthesis).

Cell-by-cell examination of statistical estimates of each of the 241 possible trade shares as listed in Table 10 brings forward the fundamental role of relative prices in explaining the temporal variations in market trade shares. Of the 175 estimated share equations, 132 have relative prices as one of the explanatory

Table 10: Trade Share Estimates for Sector 108 ("Auto Parts")

Canada's Imports of Auto Parts (108), \$10.1 billion in 1990									
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
USA	85.69	KT	0.02	0.79	18	-0.1426 (-7.5)	.	0.6767 (0.6)	-0.0707 (-0.7)
MEXICO	2.37	PKT	0.24	0.82	10	-3.5529 (-19.3)	-0.5667 (-0.4)	1.6361 (2.3)	0.0500 (0.6)
AUSTRIA	0.76	LIMT	.	.	.	.	.	.	.
BELGIUM	0.05	ZERO	.	.	.	.	.	.	.
FRANCE	0.55	PT	0.45	-0.13	18	-5.4789 (-20.4)	-0.0430 (-0.1)	.	-0.0005 (-0.0)
GERMANY	1.34	K	0.31	0.46	18	-4.2442 (-27.3)	.	1.6144 (3.9)	.
ITALY	0.47	K	0.29	0.08	18	-5.3989 (-23.4)	.	1.0468 (1.6)	.
SPAIN	0.14	LIMT	.	.	.	.	.	.	.
UK	0.38	PKT	0.35	0.60	18	-5.4372 (-26.4)	-2.4590 (-3.2)	0.1029 (0.1)	0.0556 (1.6)
JAPAN	5.59	PKT	0.27	0.78	18	-3.0122 (-14.1)	-0.1145 (-0.1)	2.0098 (2.3)	0.0875 (3.5)
CHINA	0.02	ZERO	.	.	.	.	.	.	.
KOREA	0.97	LIMT	.	.	.	.	.	.	.
TAIWAN	0.18	K	0.10	0.50	8	-6.0837 (-60.0)	.	2.4973 (2.8)	.
ROECD	0.79	PT	0.20	0.10	18	-4.9259 (-41.7)	-0.3091 (-0.3)	.	-0.0186 (-1.7)
ROW	0.69	PK	0.26	0.62	12	-4.8946 (-22.2)	-0.7147 (-0.4)	6.8722 (3.7)	.
USA's Imports of Auto Parts (108), \$17.4 billion in 1990									
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	33.92	T	0.11	0.34	18	-0.9760 (-19.8)	.	.	-0.0302 (-3.2)
MEXICO	7.24	PK	0.24	0.78	18	-3.0090 (-39.4)	-2.3498 (-7.9)	0.1258 (1.6)	.
AUSTRIA	0.06	LIMT	.	.	.	.	.	.	.
BELGIUM	0.45	PK	0.25	0.77	18	-4.8036 (-40.6)	-1.4219 (-3.4)	2.3286 (7.0)	.
FRANCE	4.00	PKT	0.19	0.65	18	-3.2788 (-27.0)	-1.3412 (-3.4)	1.4076 (3.7)	0.0567 (4.6)
GERMANY	5.61	PKT	0.23	0.10	18	-2.6625 (-18.7)	-0.2662 (-0.5)	1.9083 (1.7)	-0.0094 (-0.7)
ITALY	2.41	PKT	0.25	0.16	18	-3.6133 (-19.4)	-1.0877 (-2.0)	0.5654 (0.7)	0.0415 (1.9)
SPAIN	1.15	PKT	0.26	0.34	18	-4.4408 (-21.7)	-1.1970 (-1.8)	1.3080 (1.3)	0.0965 (2.7)
UK	2.66	PKT	0.20	0.74	18	-3.5953 (-31.4)	-1.1622 (-3.3)	0.4764 (0.9)	-0.0006 (-0.0)
JAPAN	35.05	PKT	0.28	0.20	18	-0.8245 (-2.5)	-1.3987 (-0.8)	2.5625 (1.0)	0.1226 (2.1)
CHINA	0.16	LIMT	.	.	.	.	.	.	.
KOREA	0.75	PK	0.18	0.89	11	-4.6894 (-22.7)	-6.5025 (-2.4)	0.3593 (0.7)	.
TAIWAN	1.84	PKT	0.20	0.95	16	-3.9013 (-13.5)	-11.2397 (-2.5)	2.0344 (0.7)	0.2890 (4.6)
ROECD	1.62	PKT	0.10	0.87	18	-4.0525 (-75.3)	-2.4613 (-2.7)	0.6292 (1.2)	0.0823 (6.0)
ROW	3.07	KT	0.23	0.68	18	-3.1183 (-29.0)	.	3.1396 (2.9)	0.1319 (5.1)

Table 10 (continued)

		Mexico's Imports of Auto Parts (108), \$3.3 billion in 1990							
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	1.26	P	0.52	0.29	9	-5.2763 (-25.5)	-9.8632 (-2.1)	.	.
USA	66.46	PT	0.24	0.24	18	-0.5977 (-4.6)	-5.0978 (-2.1)	.	-0.0708 (-2.4)
AUSTRIA	0.00	ZERO	.	.	.	.	.	.	.
BELGIUM	0.03	LIMIT	.	.	.	.	.	.	.
FRANCE	3.61	T	0.67	-0.06	18	-3.2166 (-11.0)	.	.	0.0086 (0.3)
GERMANY	12.13	T	0.54	-0.03	18	-2.2535 (-9.5)	.	.	-0.0214 (-0.7)
ITALY	0.18	PT	0.39	0.07	15	-5.9912 (-22.9)	-1.2799 (-1.6)	.	0.0261 (1.0)
SPAIN	0.83	PK	0.50	-0.11	18	-4.6159 (-9.3)	-0.6766 (-0.6)	0.3854 (0.1)	.
UK	0.79	KT	0.49	0.23	18	-3.7577 (-17.1)	.	4.7054 (2.6)	-0.1283 (-2.5)
JAPAN	12.16	PT	0.45	0.46	18	-1.8203 (-8.1)	-3.6225 (-2.1)	.	0.1344 (4.0)
CHINA	0.19	LIMIT	.	.	.	.	.	.	.
KOREA	0.01	ZERO	.	.	.	.	.	.	.
TAIWAN	0.35	KT	0.74	-0.23	6	-3.7968 (-1.0)	.	18.5392 (0.4)	-0.1739 (-0.1)
ROECD	0.11	PK	0.74	-0.38	6	-6.2838 (-3.7)	-17.5262 (-0.3)	3.6491 (0.1)	.
ROW	1.88	LIMIT	.	.	.	.	.	.	.
		Austria's Imports of Auto Parts (108), \$1.0 billion in 1990							
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	0.18	LIMIT	.	.	.	.	.	.	.
USA	1.07	PT	0.21	0.29	18	-4.3388 (-36.2)	-1.1490 (-2.9)	.	0.0026 (0.2)
MEXICO	0.01	LIMIT	.	.	.	.	.	.	.
BELGIUM	0.98	PKT	0.14	0.17	18	-4.5754 (-39.6)	-1.8631 (-2.5)	0.3300 (0.9)	0.0073 (0.6)
FRANCE	3.74	KT	0.08	0.90	18	-3.3599 (-77.1)	.	0.0529 (0.2)	-0.0539 (-11.6)
GERMANY	71.20	PK	0.06	0.33	18	-0.3260 (-6.2)	-1.0941 (-1.5)	0.3756 (1.2)	.
ITALY	7.75	PT	0.25	-0.01	18	-2.7184 (-14.0)	-3.0036 (-1.3)	.	0.0122 (0.7)
SPAIN	1.40	KT	0.38	0.71	18	-4.4863 (-10.5)	.	0.9883 (0.4)	0.1446 (2.8)
UK	2.29	PK	0.22	0.90	18	-3.4963 (-55.7)	-2.2421 (-12.1)	1.2284 (1.4)	.
JAPAN	3.29	PT	0.29	0.32	18	-3.4500 (-19.4)	-0.2540 (-0.5)	.	0.0483 (3.1)
CHINA	0.02	ZERO	.	.	.	.	.	.	.
KOREA	0.00	ZERO	.	.	.	.	.	.	.
TAIWAN	0.08	LIMIT	.	.	.	.	.	.	.
ROECD	6.58	PK	0.10	0.27	18	-2.6500 (-61.9)	-0.8566 (-2.7)	0.5520 (1.4)	.
ROW	1.42	PKT	0.25	0.44	18	-3.6417 (-13.3)	-2.1980 (-2.6)	7.8847 (2.8)	0.1198 (3.4)

Table 10 (continued)

Belgium's Imports of Auto Parts (108), \$3.5 billion in 1990									
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	0.15	PT	0.09	0.76	7	-6.4187 (-94.8)	-4.6146 (-4.0)	.	-0.2730 (-4.5)
USA	2.87	PKT	0.26	0.10	18	-3.7446 (-22.9)	-1.6322 (-1.9)	0.5058 (0.2)	0.0072 (0.2)
MEXICO	0.06	ZERO	.	.	.	.	.	.	.
AUSTRIA	0.39	P	0.51	-0.13	9	-5.4400 (-17.1)	-0.4239 (-0.3)	.	.
FRANCE	23.78	T	0.15	0.03	18	-1.5765 (-23.5)	.	.	0.0113 (1.2)
GERMANY	23.81	PT	0.19	0.68	18	-1.3269 (-12.7)	-2.7622 (-3.9)	.	-0.1244 (-5.8)
ITALY	3.47	KT	0.20	0.48	18	-3.4800 (-16.4)	.	0.4325 (0.5)	0.0406 (3.9)
SPAIN	4.42	KT	0.46	0.62	18	-2.6397 (-4.9)	.	5.9992 (2.1)	0.1629 (5.0)
UK	4.35	PKT	0.16	0.86	18	-3.0690 (-27.7)	-0.8452 (-3.3)	1.4057 (1.4)	-0.0678 (-5.4)
JAPAN	4.11	KT	0.39	0.84	18	-2.9419 (-10.2)	.	1.7247 (1.6)	0.1900 (9.6)
CHINA	0.01	ZERO	.	.	.	.	.	.	.
KOREA	0.01	ZERO	.	.	.	.	.	.	.
TAIWAN	0.05	ZERO	.	.	.	.	.	.	.
ROECD	31.38	PKT	0.20	0.80	18	-0.7589 (-3.9)	-4.6819 (-3.7)	5.6398 (3.1)	0.0713 (6.0)
ROW	1.15	PK	0.17	0.91	18	-4.4740 (-26.7)	-12.6162 (-12.7)	0.2853 (0.2)	.
France's Imports of Auto Parts (108), \$4.7 billion in 1990									
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	0.07	LIMT	.	.	.	.	.	.	.
USA	3.45	PKT	0.11	0.81	18	-3.3917 (-50.0)	-0.6912 (-1.7)	0.6326 (0.6)	-0.0403 (-1.6)
MEXICO	0.16	LIMT	.	.	.	.	.	.	.
AUSTRIA	0.89	PT	0.16	0.74	13	-4.7858 (-49.4)	-1.1024 (-1.6)	.	0.0882 (5.8)
BELGIUM	3.63	K	0.17	0.36	18	-2.9114 (-57.2)	.	1.0637 (3.3)	.
GERMANY	41.45	PKT	0.02	0.57	18	-0.8742 (-40.8)	-0.4886 (-2.0)	0.2388 (0.8)	-0.0123 (-1.7)
ITALY	16.49	PKT	0.04	0.74	18	-1.7933 (-36.2)	-0.6934 (-2.8)	0.4754 (2.1)	-0.0163 (-5.7)
SPAIN	14.43	PT	0.09	0.94	18	-1.9479 (-32.6)	-2.4452 (-4.4)	.	0.0945 (14.3)
UK	6.56	PKT	0.12	0.87	18	-2.5242 (-32.5)	-1.5538 (-7.8)	1.8193 (3.2)	0.0103 (1.1)
JAPAN	1.94	PKT	0.13	0.75	18	-3.5616 (-33.3)	-0.2736 (-0.8)	2.5678 (4.8)	0.0526 (6.7)
CHINA	0.02	ZERO	.	.	.	.	.	.	.
KOREA	0.01	ZERO	.	.	.	.	.	.	.
TAIWAN	0.14	LIMT	.	.	.	.	.	.	.
ROECD	6.64	PKT	0.09	0.71	18	-2.5825 (-25.6)	-2.0843 (-3.6)	1.4390 (1.2)	0.0266 (3.8)
ROW	4.13	PT	0.11	0.39	18	-3.1403 (-47.5)	-0.2041 (-0.4)	.	0.0198 (3.3)

Table 10 (continued)

		Germany's Imports of Auto Parts (108), \$7.9 billion in 1990								
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF	
CANADA	0.39	PT	0.20	0.54	7	-5.3605 (-33.1)	-1.6191 (-0.5)	.	0.0785 (0.5)	
USA	2.74	K	0.24	-0.05	18	-3.5510 (-31.8)	.	0.2029 (0.3)	.	
MEXICO	0.71	PKT	0.51	0.08	18	-5.1767 (-21.2)	-0.5957 (-0.7)	0.3656 (2.1)	-0.0372 (-0.8)	
AUSTRIA	7.03	PKT	0.18	0.88	18	-2.6603 (-24.4)	-2.4070 (-5.3)	0.1017 (1.6)	0.0777 (6.6)	
BELGIUM	7.18	PKT	0.09	0.68	18	-2.6822 (-39.6)	-1.4076 (-6.0)	0.3216 (1.4)	-0.0172 (-2.9)	
FRANCE	22.10	PKT	0.05	0.95	18	-1.5385 (-49.6)	-0.0143 (-0.1)	0.7021 (3.4)	-0.0701 (-16.2)	
ITALY	17.14	PK	0.14	0.18	18	-1.7928 (-11.3)	-0.8786 (-2.1)	0.9290 (1.3)	.	
SPAIN	8.24	PKT	0.13	0.92	18	-2.2727 (-10.3)	-0.7497 (-1.1)	2.2231 (1.3)	0.1225 (7.2)	
UK	15.59	PK	0.18	0.68	18	-2.0308 (-26.6)	-1.0780 (-3.6)	0.1156 (0.1)	.	
JAPAN	4.97	T	0.24	0.90	18	-2.6940 (-25.4)	.	.	0.1473 (12.2)	
CHINA	0.08	ZERO	.	.	.	.	.	.	.
KOREA	0.03	ZERO	.	.	.	.	.	.	.
TAIWAN	0.07	ZERO	.	.	.	.	.	.	.
ROECD	10.67	PT	0.05	0.46	18	-2.1639 (-68.4)	-1.7853 (-3.9)	.	-0.0125 (-2.5)	
ROW	3.05	PKT	0.11	0.43	18	-3.3990 (-25.4)	-3.8299 (-2.9)	0.0021 (0.0)	-0.0386 (-3.1)	
		Italy's Imports of Auto Parts (108), \$2.7 billion in 1990								
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF	
CANADA	0.03	ZERO	.	.	.	.	.	.	.
USA	1.66	PK	0.22	0.09	18	-3.9979 (-32.7)	-0.7009 (-1.5)	0.7127 (1.5)	.	
MEXICO	0.01	ZERO	.	.	.	.	.	.	.
AUSTRIA	2.10	K	0.89	0.08	18	-4.3551 (-16.3)	.	0.4015 (1.6)	.	
BELGIUM	3.74	PT	0.22	0.82	18	-3.2216 (-26.0)	-3.7613 (-4.1)	.	0.0757 (6.6)	
FRANCE	22.58	PT	0.06	0.88	18	-1.5072 (-39.2)	-0.6446 (-1.5)	.	-0.0495 (-11.0)	
GERMANY	49.69	PK	0.05	0.54	18	-0.6899 (-16.9)	-0.4670 (-1.2)	0.5703 (3.2)	.	
SPAIN	3.33	PT	0.25	0.82	18	-3.5309 (-20.6)	-5.7915 (-3.2)	.	0.1642 (7.4)	
UK	5.37	PKT	0.17	0.85	18	-2.7325 (-22.8)	-1.3307 (-5.7)	0.7685 (0.7)	-0.0167 (-1.3)	
JAPAN	0.92	T	0.58	0.40	18	-4.3875 (-17.4)	.	.	0.0983 (3.5)	
CHINA	0.11	LIMT	.	.	.	.	.	.	.
KOREA	0.08	ZERO	.	.	.	.	.	.	.
TAIWAN	0.21	LIMT	.	.	.	.	.	.	.
ROECD	7.13	PKT	0.16	0.77	18	-2.3998 (-15.6)	-2.9016 (-4.8)	1.4627 (1.1)	0.0578 (4.8)	
ROW	3.03	T	0.33	0.42	18	-3.3200 (-22.9)	.	.	0.0597 (3.6)	

Table 10 (continued)

		Spain's Imports of Auto Parts (108), \$3.0					billion in 1990			
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF	
CANADA	0.03	LIMIT	.	.	.	.	.	.	.
USA	1.19	PKT	0.22	0.72	18	-4.4094 (-32.5)	-0.2015 (-0.4)	3.2979 (1.9)	-0.0143 (-0.4)	
MEXICO	0.11	LIMIT	.	.	.	.	.	.	.
AUSTRIA	0.24	PK	0.15	0.74	12	-5.8863 (-56.4)	-2.6860 (-2.9)	2.2371 (-2.9)	. (5.7)	
BELGIUM	0.93	PT	0.29	0.55	18	-4.6581 (-28.1)	-1.4719 (-1.1)	.	0.0625 (4.1)	
FRANCE	44.98	KT	0.11	0.11	18	-0.8265 (-14.1)	.	0.7358 (1.6)	-0.0199 (-1.7)	
GERMANY	31.12	PKT	0.13	0.94	18	-0.9519 (-9.2)	-6.8892 (-6.7)	1.9415 (2.2)	0.0289 (1.0)	
ITALY	6.18	KT	0.29	0.83	18	-2.2551 (-7.2)	.	4.0081 (3.2)	-0.1571 (-9.1)	
UK	3.86	PT	0.18	0.80	18	-3.1727 (-30.5)	-1.0628 (-5.8)	.	-0.0118 (-1.0)	
JAPAN	5.42	KT	0.28	0.90	18	-2.8492 (-14.2)	.	0.2967 (0.4)	0.1726 (12.1)	
CHINA	0.01	ZERO	.	.	.	.	.	.	.
KOREA	0.08	ZERO	.	.	.	.	.	.	.
TAIWAN	0.04	ZERO	.	.	.	.	.	.	.
ROECD	5.45	PKT	0.21	0.87	18	-2.6707 (-14.0)	-0.2770 (-0.4)	1.9530 (1.3)	0.1226 (10.9)	
ROW	0.37	PKT	0.37	0.36	18	-4.9418 (-14.3)	-3.6205 (-2.8)	4.9081 (1.9)	0.0133 (0.7)	
		UK's Imports of Auto Parts (108), \$7.1					billion in 1990			
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF	
CANADA	0.14	PT	0.22	0.54	18	-6.3767 (-53.1)	-0.6639 (-1.3)	.	-0.0613 (-4.4)	
USA	3.54	PK	0.14	0.83	18	-3.2075 (-40.5)	-1.2482 (-4.4)	2.9074 (8.9)	.	
MEXICO	0.04	ZERO	.	.	.	.	.	.	.
AUSTRIA	0.33	PT	0.14	0.23	9	-5.8374 (-59.3)	-2.3992 (-0.9)	.	0.1143 (1.3)	
BELGIUM	8.88	PKT	0.09	0.91	18	-2.3823 (-30.3)	-0.7149 (-1.5)	0.8617 (3.2)	-0.0574 (-7.6)	
FRANCE	15.50	KT	0.15	0.13	18	-1.9021 (-22.8)	.	0.7030 (1.6)	0.0117 (1.3)	
GERMANY	43.28	PKT	0.04	0.85	18	-0.8058 (-18.0)	-1.5544 (-3.1)	0.0715 (0.1)	0.0253 (1.5)	
ITALY	5.43	PT	0.09	0.25	18	-2.8718 (-42.3)	-1.0622 (-1.4)	.	0.0163 (2.8)	
SPAIN	5.58	T	0.19	0.69	18	-3.0028 (-35.3)	.	.	0.0603 (6.2)	
JAPAN	5.95	PT	0.28	0.55	18	-2.6950 (-15.2)	-0.3063 (-0.5)	.	0.0728 (4.6)	
CHINA	0.02	ZERO	.	.	.	.	.	.	.
KOREA	0.09	ZERO	.	.	.	.	.	.	.
TAIWAN	0.12	LIMIT	.	.	.	.	.	.	.
ROECD	10.02	PKT	0.12	0.39	18	-2.2301 (-15.1)	-1.3034 (-2.8)	1.2116 (0.7)	-0.0118 (-1.2)	
ROW	1.09	PKT	0.15	0.63	18	-4.5378 (-22.6)	-1.8577 (-3.0)	0.2679 (0.1)	-0.0354 (-3.2)	

Table 10 (continued)

		Japan's Imports of Auto Parts (108), \$902.5 million in 1990							
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	3.82	PT	0.66	0.61	13	-3.0642 (-8.2)	-4.6323 (-1.1)	.	0.1902 (2.4)
USA	29.92	PK	0.12	0.71	18	-1.1759 (-16.9)	-1.5474 (-2.8)	2.2525 (6.5)	.
MEXICO	0.08	LIMIT	.	.	.	.	.	.	.
AUSTRIA	0.89	PK	0.33	0.48	10	-4.4238 (-15.4)	-2.5065 (-2.1)	6.6953 (3.2)	.
BELGIUM	0.82	KT	0.32	0.76	18	-4.6453 (-18.6)	.	4.0296 (5.0)	-0.0374 (-1.9)
FRANCE	3.74	T	0.59	0.11	18	-3.9638 (-15.4)	.	.	0.0505 (1.8)
GERMANY	23.70	PK	0.19	0.66	18	-1.2475 (-10.0)	-1.3114 (-2.7)	1.7553 (4.7)	.
ITALY	7.25	PK	0.16	0.34	18	-2.1158 (-13.3)	-0.0268 (-0.1)	2.1359 (3.2)	.
SPAIN	0.10	LIMIT	.	.	.	.	.	.	.
UK	4.12	PT	0.27	0.74	18	-2.9500 (-18.8)	-1.7859 (-4.9)	.	0.0130 (0.6)
CHINA	0.57	LIMIT	.	.	.	.	.	.	.
KOREA	4.05	PT	0.47	0.58	18	-3.1054 (-12.5)	-1.8092 (-0.5)	.	0.0700 (0.7)
TAIWAN	6.52	PT	0.51	0.64	18	-3.0105 (-10.1)	-2.4670 (-0.2)	.	0.1542 (2.8)
ROECD	10.60	KT	0.22	0.75	18	-2.0223 (-13.7)	.	0.5244 (0.3)	0.0837 (7.1)
ROW	3.83	PKT	0.70	-0.04	18	-2.5683 (-4.3)	-16.0435 (-0.8)	2.2255 (0.4)	0.1007 (1.3)
		China's Imports of Auto Parts (108), \$3.5 billion in 1990							
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	0.11	LIMIT	.	.	.	.	.	.	.
USA	2.36	K	0.17	-0.30	5	-3.7993 (-31.9)	.	0.4592 (0.3)	.
MEXICO	0.00	LIMIT	.	.	.	.	.	.	.
AUSTRIA	0.26	K	0.23	0.77	5	-3.7029 (-5.7)	.	22.1973 (3.8)	.
BELGIUM	0.11	LIMIT	.	.	.	.	.	.	.
FRANCE	0.26	T	0.23	0.66	5	-5.5401 (-34.3)	.	.	0.2776 (3.0)
GERMANY	3.22	T	0.21	0.53	5	-3.6349 (-24.3)	.	.	0.2054 (2.3)
ITALY	0.21	K	0.30	-0.30	5	-5.7082 (-7.9)	.	0.9542 (0.3)	.
SPAIN	0.00	ZERO	.	.	.	.	.	.	.
UK	0.23	P	0.29	-0.31	5	-5.6749 (-23.4)	-0.6013 (-0.2)	.	.
JAPAN	9.66	K	0.09	-0.21	5	-2.0965 (-7.0)	.	1.2364 (0.5)	.
KOREA	0.21	LIMIT	.	.	.	.	.	.	.
TAIWAN	0.00	ZERO	.	.	.	.	.	.	.
ROECD	2.43	P	0.59	-0.32	5	-4.2699 (-4.2)	-15.7533 (-0.1)	.	.
ROW	80.94	P	0.02	-0.10	5	-0.2355 (-7.1)	-3.7940 (-0.8)	.	.

Table 10 (continued)

South Korea's Imports of Auto Parts (108), \$625.8 million in 1990									
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	1.62	LIMIT	.	.	.	.	.	.	.
USA	16.76	PT	0.35	0.44	18	-2.1825 (-13.7)	-2.5067 (-1.5)	.	0.0412 (1.6)
MEXICO	0.04	LIMIT	.	.	.	.	.	.	.
AUSTRIA	0.14	LIMIT	.	.	.	.	.	.	.
BELGIUM	0.50	K	0.68	-0.18	6	-5.4658 (-3.5)	.	4.6141 (0.5)	.
FRANCE	0.99	PT	0.63	0.26	18	-4.8119 (-12.0)	-0.7018 (-0.6)	.	-0.0923 (-2.8)
GERMANY	10.24	PKT	0.17	0.54	18	-2.4288 (-19.8)	-1.5712 (-3.6)	0.1284 (0.1)	-0.0151 (-0.5)
ITALY	0.52	PKT	0.89	0.01	18	-4.2835 (-5.8)	-0.9662 (-0.5)	5.0604 (1.5)	0.0146 (0.3)
SPAIN	0.36	T	0.29	0.09	6	-5.4882 (-28.1)	.	.	0.1053 (1.2)
UK	1.60	PKT	0.33	0.88	18	-4.0679 (-22.5)	-2.5663 (-4.1)	3.0272 (3.0)	-0.1376 (-5.2)
JAPAN	64.57	PKT	0.10	0.26	18	-0.2632 (-2.7)	-1.3468 (-1.2)	0.5683 (0.8)	0.0442 (2.4)
CHINA	0.00	LIMIT	.	.	.	.	.	.	.
TAIWAN	0.67	LIMIT	.	.	.	.	.	.	.
ROECD	1.66	PKT	0.70	0.05	14	-4.8327 (-2.2)	-10.7456 (-0.5)	2.2852 (0.1)	-0.0473 (-0.3)
ROW	0.33	PT	0.71	0.28	13	-6.0842 (-10.0)	-5.1448 (-0.6)	.	-0.1546 (-2.5)
Taiwan's Imports of Auto Parts (108), \$719.5 million in 1990									
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	0.05	LIMIT	.	.	.	.	.	.	.
USA	2.59	PK	0.42	0.18	18	-3.8860 (-16.9)	-0.6814 (-0.4)	2.2982 (2.2)	.
MEXICO	0.00	ZERO	.	.	.	.	.	.	.
AUSTRIA	0.04	LIMIT	.	.	.	.	.	.	.
BELGIUM	0.11	LIMIT	.	.	.	.	.	.	.
FRANCE	10.60	PKT	0.29	0.91	14	-2.5530 (-10.2)	-0.9242 (-0.5)	6.7873 (2.3)	0.3642 (5.0)
GERMANY	3.75	PT	0.50	0.01	18	-3.3095 (-11.0)	-1.2394 (-1.3)	.	-0.0308 (-1.1)
ITALY	1.29	T	0.85	0.05	18	-5.1160 (-13.7)	.	.	-0.0580 (-1.4)
SPAIN	0.40	K	0.36	-0.11	5	-0.2463 (-0.0)	.	47.6432 (0.8)	.
UK	0.73	PKT	0.48	0.90	18	-5.1287 (-19.8)	-3.5207 (-4.3)	3.0835 (2.3)	-0.2080 (-5.5)
JAPAN	73.42	PKT	0.08	0.67	18	-0.0694 (-0.8)	-0.7828 (-0.8)	1.0753 (1.5)	0.0961 (5.7)
CHINA	0.00	ZERO	.	.	.	.	.	.	.
KOREA	4.31	P	0.84	0.31	16	-4.5283 (-13.9)	-3.3449 (-2.8)	.	.
ROECD	2.08	PT	0.55	0.59	18	-3.9738 (-13.0)	-5.0023 (-1.9)	.	0.1042 (3.3)
ROW	0.63	KT	0.78	0.08	18	-5.1893 (-14.5)	.	1.6760 (0.4)	-0.0690 (-1.7)

Table 10 (continued)

ROECD's Imports of Auto Parts (108), \$9.7 billion in 1990									
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	0.34	PT	0.17	-0.04	18	-5.6437 (-64.6)	-0.3480 (-0.6)	.	0.0020 (0.1)
USA	5.11	PK	0.12	0.52	18	-2.9771 (-44.9)	-0.8892 (-2.4)	1.5370 (4.5)	.
MEXICO	0.01	ZERO	.	.	.	.	.	.	.
AUSTRIA	0.89	PKT	0.17	0.39	18	-4.8136 (-44.1)	-1.5085 (-3.2)	0.0430 (0.7)	0.0090 (0.9)
BELGIUM	8.36	PKT	0.07	0.61	18	-2.4374 (-44.5)	-0.6850 (-3.4)	0.1348 (0.7)	0.0135 (2.8)
FRANCE	9.31	PK	0.11	0.07	18	-2.5547 (-54.4)	-0.1016 (-0.2)	0.4941 (1.4)	.
GERMANY	31.02	PK	0.06	0.78	18	-1.1287 (-25.3)	-0.9768 (-4.0)	0.5241 (3.0)	.
ITALY	6.23	PKT	0.08	0.56	18	-2.5673 (-30.0)	-0.9339 (-3.1)	1.5504 (3.9)	-0.0101 (-2.3)
SPAIN	2.76	T	0.36	0.75	18	-3.5466 (-22.4)	.	.	0.1285 (7.3)
UK	8.39	PK	0.17	0.88	18	-2.0855 (-41.5)	-1.8142 (-7.8)	0.3599 (0.5)	.
JAPAN	10.03	PT	0.16	0.81	18	-2.1052 (-21.5)	-0.7275 (-1.7)	.	0.0758 (8.4)
CHINA	0.03	ZERO	.	.	.	.	.	.	.
KOREA	0.13	LIMT	.	.	.	.	.	.	.
TAIWAN	0.39	PKT	0.07	0.96	11	-5.1776 (-39.4)	-0.0876 (-0.1)	4.8070 (2.8)	0.1321 (11.8)
ROECD	15.60	PKT	0.04	0.54	18	-1.7835 (-38.1)	-1.5836 (-4.2)	1.3601 (2.4)	0.0020 (0.7)
ROW	1.39	PT	0.15	-0.10	18	-4.2304 (-50.7)	-0.6869 (-0.7)	.	-0.0014 (-0.2)
ROW's Imports of Auto Parts (108), \$13.2 billion in 1990									
EXPORTER	B-SHARE	FORM	SEE	RBSQ	OBS	INTERCEPT	P-COEF	K-COEF	T-COEF
CANADA	0.40	P	0.85	-0.01	18	-4.3877 (-17.4)	-2.0162 (-0.9)	.	.
USA	6.48	PKT	0.10	0.89	18	-2.5945 (-43.5)	-0.2982 (-1.0)	1.6308 (3.2)	0.0123 (0.4)
MEXICO	0.05	LIMT	.	.	.	.	.	.	.
AUSTRIA	0.50	PKT	0.20	0.66	18	-5.4750 (-45.4)	-1.8946 (-4.7)	0.1440 (2.0)	0.0841 (5.2)
BELGIUM	0.81	PT	0.18	0.42	18	-4.8156 (-46.7)	-0.7985 (-2.2)	.	0.0487 (3.7)
FRANCE	7.14	PKT	0.07	0.84	18	-2.6858 (-59.5)	-0.6709 (-3.1)	0.9805 (5.8)	0.0250 (3.5)
GERMANY	21.91	PKT	0.07	0.61	18	-1.4279 (-29.1)	-0.4856 (-1.8)	0.9390 (1.9)	0.0134 (1.1)
ITALY	4.88	PKT	0.12	0.62	18	-2.9129 (-23.1)	-1.0899 (-3.3)	0.2801 (0.6)	0.0191 (1.5)
SPAIN	0.70	PKT	0.17	0.21	18	-4.6336 (-24.1)	-1.1139 (-2.0)	0.6250 (0.6)	0.0661 (2.4)
UK	5.09	PK	0.23	0.82	18	-2.8230 (-29.8)	-1.2448 (-8.7)	0.6509 (1.4)	.
JAPAN	22.55	PKT	0.11	0.80	18	-1.3600 (-11.8)	-0.7525 (-2.7)	0.7486 (0.9)	0.1036 (5.5)
CHINA	23.14	P	0.18	0.41	5	-1.3128 (-6.2)	-4.3807 (-1.9)	.	.
KOREA	0.50	PKT	0.13	0.90	13	-5.0511 (-19.3)	-0.9125 (-0.7)	0.6870 (0.9)	0.0353 (0.3)
TAIWAN	1.61	PKT	0.11	0.96	18	-3.9447 (-75.1)	-0.0551 (-0.1)	0.9344 (1.5)	0.1295 (7.6)
ROECD	4.24	KT	0.11	0.27	18	-2.9176 (-59.0)	.	1.5800 (2.7)	0.0284 (2.0)

variables. In addition to relative prices, capital investment -- a proxy for the quality change of product not reflected in the price indices -- also appears to be a significant determinant of market shares for many exporters in many import markets. In many cases, changes in bilateral trade shares also show a significant Nyhus trend not explainable by either relative price or capital investment. Below, we present a brief summary on the estimated share equations for each of the sixteen auto-parts import markets. In each market, particular attentions will be paid to the major exporters in the market.

Canada: In the base year 1990, Canada imported some \$10.1 billion worth of auto parts, and 86% of them came from the United States. The USA's market share in Canadian auto-parts import market was investment-sensitive, although the relationship was not statistically significant. The U.S. share was also found to be perversely related to the U.S. auto-parts price relative to the world price seen from Canada, so the price term was eliminated from the estimated share equation. In addition, the U.S. share appeared to be influenced by some non-measured forces represented by the Nyhus trend. Note that in the "K-COEF" column the value 0.6767 is the share capital elasticity for exporter USA. It says that if the relative U.S. capital stock in the auto-parts industry, expressed as a ratio of the U.S. capital stock to the world average capital stock in the auto-parts industry, rises by 1%, then, other things equal, the U.S. share in Canada's imports of auto parts will rise by 0.68%. The value -0.0707 in the "T-COEF" column is the

parameter on the Nyhus trend for the U.S. share. It says that, over the 1974-91 period, the U.S. share would have declined, other things equal, at an average annual rate of about 7%. Among the relatively smaller suppliers in this market, exporter Japan was in a distant second place, with about 6% of the market in the year 1990, and exporter Mexico finished third, with slightly more than 2% of the market. Both the Japanese and the Mexican shares were responding not only to changes in capital investment, but also to changes in relative prices. For instance, the value -0.1145 in the "P-COEF" column is the share price elasticity for the exporter Japan. It says that if the relative Japanese price of auto parts, expressed as a ratio of the Japanese price to the world price seen from the U.S., falls by 1%, then, other things being equal, the Japanese share in Canada's imports of auto parts will rise by 0.11%. In addition, both the Japanese and Mexican shares were also influenced by some non-measured forces represented by the Nyhus trend.

USA: Canada and ROW (the rest of the world) excepted, the exporters' shares of the U.S. import market for auto parts were generally price-sensitive. Excluding Canada, the exporters' shares of the U.S. import market for auto parts were also investment-sensitive. However, for the two principal exporters in the U.S. market, Canada and Japan, some non-measured forces represented by the Nyhus trend appeared to be the most significant determinant of the market shares.

Mexico: There are three major foreign suppliers of auto parts to the Mexican

market: USA, Germany, and Japan. In the base year 1990, the respective market shares for the trio were: 66%, 12%, and 12%. While the U.S. and Japanese shares were price-sensitive, the only determinant for the German share appeared to be some non-measured forces represented by the Nyhus trend. The trend variable was also a significant determinant of the market shares for USA and Japan.

Austria: The dominant supplier of auto parts to Austria is Germany, which in 1990 took a formidable 71% of the import market. The German share was price-sensitive and investment-sensitive. Most small shares in the Austrian import market were also price-sensitive and investment-sensitive. Germany, the United Kingdom, and ROECD excepted, some non-measured forces represented by the Nyhus trend also appeared to be a significant determinant of the market shares.

Belgium-Luxembourg: Two of the largest suppliers of auto parts to this market are France and Germany. The German share was price-sensitive and also influenced by some non-measured forces represented by the Nyhus trend, whereas the French share was solely determined by the trend. Among the relative smaller exporters on this market, the shares of both the United States and the United Kingdom were both price-sensitive and investment-sensitive, while the shares of other exporters were mostly investment-sensitive.

France: The French import market for auto parts is heavily dominated by its European trading partners, namely, Germany, Italy, and Spain. In 1990, the trio took a combined share of over 72% of the French auto-parts import market. Each of these exporters' market share in France was strongly price-sensitive. The German and Italian shares also appeared to be investment-sensitive. Again, the market shares for these exporters were also heavily influenced by some non-measured forces represented by the Nyhus trend.

Germany: Like the French auto-parts import market, the German market is also heavily dominated by its European trading partners, namely, France, Italy, the United Kingdom and Spain. In 1990, the four exporters took a combined share of about 63% of the German auto parts import market. The European exporters' market shares in Germany were price- and investment-sensitive. In addition, the market trade shares for France and Spain were also heavily influenced by some non-measured forces represented by the Nyhus trend.

Italy: The largest supplier to the Italian auto-parts import market is Germany, whose market share in 1990 stood at 50%. France came in a distant second, with 23% of the market. The German share was price-sensitive and investment-sensitive, while the French share was price-sensitive as well as influenced by some non-measured forces represented by the Nyhus trend. The shares of most of the smaller exporters in the market were price-sensitive and/or investment-sensitive.

Spain: The Spanish auto-parts import market is mostly shared by France (45%) and Germany (31%). The French share was investment-sensitive, while the German share was highly price-elastic and investment-sensitive. Both were also influenced by some non-measured forces represented by the Nyhus trend. Most of the smaller shares in the market were also price-sensitive and/or investment-sensitive.

The United Kingdom: The largest exporters of auto parts to the United Kingdom are Germany (43%) and France (16%). The French share was investment-sensitive, while the German share was price-elastic and investment-sensitive. Both were also influenced by some non-measured forces represented by the Nyhus trend. Most of the smaller shares in the market were also price-sensitive and/or investment-sensitive.

Japan: The United States and Germany dominates the Japanese auto-parts import market. In 1990, USA's market share stood at 30%, while the corresponding figure for Germany was 24%. The market shares for both exporters were highly price- and investment-sensitive, but they did not seem to exhibit a significant Nyhus trend.

China: The largest supplier of auto parts to the Chinese import market is ROW, or the rest of the world, including all others countries not explicitly

specified in this study. In 1990, ROW's share was 81%. This share was price-elastic. The second largest supplier, Japan, had 10% of the market in 1990. The Japanese share was investment-sensitive, so was the market share for the United States. Of all the trade shares in this market, only the French and German share were solely determined by some non-measured forces represented by the Nyhus trend.

South Korea: The three largest suppliers of auto parts to this market are: Japan (65%), USA (17%), and Germany (10%). The Japanese share was price-elastic and investment-sensitive. The U.S. share was price-elastic. The German share was price-sensitive and investment-sensitive. The market shares of the three major exporters were also determined by some non-measured forces represented by the Nyhus trend.

Taiwan: Japan is the single largest supplier of auto parts to Taiwan. In 1990, Japan had 73% of Taiwan's auto-parts import market. The Japanese share was price-sensitive, investment-sensitive, and also determined by some non-measured forces represented by the Nyhus trend. The same holds true for the second largest supplier, France, which had 11% of the market in 1990. The remaining smaller shares are price-sensitive and/or investment sensitive.

ROECD: The single largest supplier of auto parts to this market is Germany,

which had 31% of the market in 1990. The German share was price-sensitive and investment-sensitive. Spain excepted, the market shares of other exporters in the market were also price-sensitive.

ROW: The three largest suppliers of auto parts to this market are: China (23%), Japan (23%), and Germany (22%). The United States and France each took another 7% of the market. The Chinese share was highly price-elastic. The Japanese, German, U.S., and French shares were price-sensitive and investment-sensitive, and also influenced by some non-measured forces represented by the Nyhus trend. ROECD excepted, the market shares of other exporters in the market were also price-sensitive. Canada and Belgium excepted, the market shares of other exporters in the market were also investment-sensitive.

Table 10 also reveals an important finding of the current study: the variations in the size of the estimated elasticity coefficients on the relative prices and capital investment span a considerable range. To further illustrate this point, the elasticity coefficients in Table 10 are rearranged into two matrices in Tables 11 and 12. The columns represent importers and the rows exporters. Thus, the value -0.57 in the Canadian column in Table 11 is the share price elasticity for the Mexican auto parts exports to Canada. And the value 0.68 in the Canadian column in Table 12 is the share capital elasticity for the U.S. auto parts exports to Canada. These matrices show large variations between columns as well as within the columns.

TABLE 11
Matrix of Share Price Elasticities for Auto Parts (108)

EXPORTER	IMPORTER															
	CA	US	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
Canada	.	-9.86	...	-4.61	...	-1.62	..	...	-0.66	-4.63	...	...	...	-0.35	-2.02	
USA	.		-5.10	-1.15	-1.63	-0.69	.	-0.70	-0.20	-1.25	-1.55	.	-2.51	-0.68	-0.89	-0.30
Mexico	-0.57	-2.35		...	..	...	-0.60	..	...	..	...	...	...	..	..	...
Austria	...	...	..		-0.42	-1.10	-2.41	.	-2.69	-2.40	-2.51	.	...	...	-1.51	-1.89
Belgium	..	-1.42	...	-1.86		.	-1.41	-3.76	-1.47	-0.71	.	...	.	...	-0.69	-0.80
France	-0.04	-1.34	.	.	.		-0.01	-0.64	.	.	.	.	-0.70	-0.92	-0.10	-0.67
Germany	.	-0.27	.	-1.09	-2.76	-0.49		-0.47	-6.89	-1.55	-1.31	.	-1.57	-1.24	-0.98	-0.49
Italy	.	-1.09	-1.28	-3.00	.	-0.69	-0.88		.	-1.06	-0.03	.	-0.97	.	-0.93	-1.09
Spain	...	-1.20	-0.68	.	.	-2.45	-0.75	-5.79		.	...	..	.	.	.	-1.11
UK	-2.46	-1.16	.	-2.24	-0.85	-1.55	-1.08	-1.33	-1.06		-1.79	-0.60	-2.57	-3.52	-1.81	-1.24
Japan	-0.11	-1.40	-3.62	-0.25	.	-0.27	.	.	.	-0.31		.	-1.35	-0.78	-0.73	-0.75
China	..	...	...	..	..	..	..	...	..	..	...		...	..	..	-4.38
Korea	...	-6.50	..	..	..	..	..	..	..	..	-1.81	...		-3.34	...	-0.91
Taiwan	.	-11.24	.	...	..	...	..	...	..	...	-2.47	..	...		-0.09	-0.06
ROECD	-0.31	-2.46	-17.53	-0.86	-4.68	-2.08	-1.79	-2.90	-0.28	-1.30	.	-15.75	-10.75	-5.00	-1.58	.
ROW	-0.71	.	...	-2.20	-12.62	-0.20	-3.83	.	-3.62	-1.86	-16.04	-3.79	-5.14	.	-0.69	

TABLE 12
Matrix of Share Capital Elasticities for Auto Parts (108)

EXPORTER	IMPORTER															
	CA	US	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
Canada	.	.	...	.	...	.	..	...	.	.	...	...	...	.	.	.
USA	0.68	.	.	0.51	0.63	0.20	0.71	3.30	2.91	2.25	0.46	.	2.30	1.54	1.63	.
Mexico	1.64	0.13	...	..	...	0.37	..	...	..	...	...	...	..	..	...	..
Austria	...	...	..	.	.	0.10	0.40	2.24	.	6.70	22.20	...	...	0.04	0.14	.
Belgium	..	2.33	...	0.33	.	1.06	0.32	.	0.86	4.03	...	4.61	...	0.13	.	.
France	.	1.41	.	0.05	.	.	0.70	.	0.74	0.70	.	.	.	6.79	0.49	0.98
Germany	1.61	1.91	.	0.38	.	0.24	.	0.57	1.94	0.07	1.76	.	0.13	.	0.52	0.94
Italy	1.05	0.57	.	.	0.43	0.48	0.93	.	4.01	.	2.14	0.95	5.06	.	1.55	0.28
Spain	...	1.31	0.39	0.99	6.00	.	2.22	.	.	...	..	.	47.64	.	0.62	.
UK	0.10	0.48	4.71	1.23	1.41	1.82	0.12	0.77	.	.	.	.	3.03	3.08	0.36	0.65
Japan	2.01	2.56	.	.	1.72	2.57	.	.	0.30	.	.	1.24	0.57	1.08	.	0.75
China	..	...	...	..	..	..	..	...	..	..	...	...	...	..	..	.
Korea	...	0.36	..	..	..	..	..	..	..	..	.	...	.	...	0.69	.
Taiwan	2.50	2.03	18.54	...	..	...	..	...	..	...	.	..	...	.	4.81	0.93
ROECD	.	0.63	3.65	0.55	5.64	1.44	.	1.46	1.95	1.21	0.52	.	2.29	.	1.36	1.58
ROW	6.87	3.14	...	7.88	0.29	.	0.00	.	4.91	0.27	2.23	.	.	1.68	.	.

Tables 10-12 points to a major difference between the current study and others in which the elasticity of substitution in any given import market is assumed to remain invariant with respect to alternative source countries. The empirical results reported here seem to suggest that the assumption of constant elasticity of substitution widely used in many previous studies is not tenable.

Note that although the empirical results presented on the preceding pages involve only one of the 120 sectors in the trade model, they are nevertheless indicative of the variety one would see in similar Tables for the other 119 sectors. The results for the other 119 sectors will, however, not be presented in the same fashion, because that would occupy a lot of space but probably help little in interpreting the results.¹ Instead, we have selected four particular import markets: one in North America (USA), two in Europe (France and Germany), and one in Asia (Japan). We will examine the parameter estimates across all sectors in each of these markets and then provide some overall summary statistics.

8/2/97.

3. Parameter Estimates: A Market Focus

Price Parameters

Tables 13-16 (pp. 91-102) present the estimated share price elasticities by

¹To display parameter estimates in the form of Tables 10-12 for the other 119 sectors would require 1,190 (119 x 10) additional pages of computer output.

sector and exporter in the four selected import markets. Table 13 (pp. 91-93), for instance, focuses on the U.S. import market. The first two columns in Table 13 list the trade sector number and titles. Then the estimated share price elasticities of each of the 15 exporters in the U.S. import market are displayed. The meaning of various "dots" in these Tables is as follows:

A single dot (".") means that the estimated parameter is of wrong sign, and not included in the estimated equation;

A double-dot ("..") denotes an absence of bilateral trade flows in the entire historical period (1974-91);

A triple-dot ("...") indicates that the relevant trade share was not estimated because the number of valid observations is less than 5;

A quadruple-dot ("....") refers to a limited number of cases where the trade share equations were not estimated because the exporter in question was the only supplier in a given import market throughout the historical period.

In Sector 2 ("Fruits"), for instance, we observe that the estimated share price elasticity is -1.72 for the exporter Canada, -1.63 for Mexico, -2.43 for Belgium, -5.89 for France, -1.89 for Germany, -3.78 for Italy, -3.78 for Spain, -2.04 for Japan, -1.00 for China, -3.48 for the rest of OECD, and -0.52 for the rest of the world. The double dots in the exporter Austria's cell and South Korea's cell indicate that USA never imported "Fruits (2)" from the two countries throughout the historical

TABLE 13: Share Price Elasticity by Sector and Country in the U.S. Import Market

SECTOR TITLE		EXPORTER														
		CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
1	Cereals	.	...	..	..	...	...	...	...	...	...	...	...	..	..	..
2	Fruits	-1.72	-1.63	..	-2.43	-5.89	-1.89	-1.92	-3.78	...	-2.04	-1.00	...	...	-3.48	-0.52
3	OtherCrop	-1.66	-1.72	..	...	-2.39	-2.86	-1.47	-2.67	-1.26	-1.02	-1.53	-4.13	-10.14	-15.83	.
4	Livestock	-0.43	-0.97	..	...	-2.70	-0.41	...	...	-0.74	...	-3.10	..	..	-0.62	-0.94
5	Silk	..	..	..	..	...	...	...	...	...	-0.45	-2.76	...	...	-8.08	-0.88
6	Cotton	-2.66	-0.31	..	...	...	...	...	...	-2.33	...	...	..	...	..	-0.01
7	Wool	-2.82	...	...	-1.82	-4.86	-4.43	-5.48	...	-1.64	...	-1.54	...	...	-1.72	-2.95
8	OtherFiber	-1.95	-4.64	..	-0.32	-2.88	...	...	...	-0.18	...	-1.00	..	...	-6.75	-2.17
9	Wood	-0.08	-1.37	..	..	..	...	...	...	...	...	...	..	...	-1.52	-0.47
10	Fish	-2.94	-1.70	..	...	...	...	..	...	-1.69	-1.41	-5.87	-0.79	-0.38	-5.91	.
11	IronOre	-13.18	..	...	...	..	...	...	...	..	...	...	..	...	-35.88	-8.57
12	Coal	-2.02	...	..	...	...	...	..	...	...	...	...	..	...	-6.78	-3.90
13	OthMetOre	-3.26	-1.67	..	...	...	-7.95	...	...	...	-1.55	-2.26	...	...	-0.23	.
14	Petroleum	-5.22	-6.27	..	..	..	..	...	..	-0.21	...	-3.69	..	..	-2.47	-0.16
15	NatGas	-0.15	-7.25	..	..	..	...	...	...	...	...	...	..	..	..	-0.73
16	NonMetal	-0.79	-1.28	...	-4.88	-1.69	-1.10	-0.04	-2.07	-3.95	-1.78	-0.06	...	...	-2.37	-3.86
17	Elec	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	Meat	-5.01	..	..	-0.90	-3.97	-3.37	...	...	...	-1.30	-0.20	...	-2.16	-0.11	-1.39
19	Dairy	-1.01	-2.23	-0.21	...	-2.05	-6.25	-2.11	-1.60	-1.57	-0.53	-1.86	...	-12.03	..	-6.29
20	PreFruit	-1.15	-1.33	-2.85	-3.10	-0.27	-5.14	-6.87	..	-1.13	-2.47	-1.10	-3.93	-3.76	-0.25	.
21	Seafood	-4.97	-0.75	..	...	-14.34	...	...	..	-0.84	-2.81	-4.64	-0.40	-0.17	..	-5.44
22	OilFats	-2.14	-0.06	..	...	-4.52	-1.00	..	-0.47	..	-0.51	-4.41	...	..	-1.59	-3.59
23	GrainMill	-0.78	-0.77	..	...	-2.92	..	..	...	-2.61	-2.06	-0.08	..	..	..	-4.77
24	Bakery	-1.12	-1.01	..	-3.57	-2.44	-1.33	-1.09	-5.31	-1.46	-1.53	-0.92	-2.03	..	-0.68	-0.42
25	Sugar	-4.69	-0.35	..	...	...	...	...	..	...	..	..	..	-45.87	-4.66	-6.50
26	Cocoa	-1.52	-0.64	...	-5.06	..	-0.01	..	-1.54	-1.52	-0.14	..	-3.77	..	-0.92	.
27	OtherFood	-2.57	-0.20	...	-3.04	..	-5.59	-0.82	-3.87	-0.38	-3.97	-2.50	-5.51	..	..	-5.37
28	Feeds	-1.97	...	...	...	...	...	...	...	-0.32	..	..	...	..	-3.93	-3.80
29	Alcohol	-1.74	-0.93	..	...	-1.33	-1.86	-0.14	-0.90	-1.38	-0.11	-3.18	..	..	..	.
30	NonAlcohol	..	...	...	-5.74	..	-4.23	-2.73	-11.24	-1.21	-0.93	-0.51	-3.27	..	-2.39	-11.17
31	Tobacco	-0.36	-1.86	...	..	-11.17	-1.74	-2.30	..	-1.86	-1.67	...	...	...	-22.16	.
32	Yarns	-1.06	-1.51	-2.26	-0.97	..	-1.77	-5.10	-2.82	-1.91	-3.11	-6.20	..	..	-3.79	.
33	CottonFabr	-2.29	-0.60	-0.85	-1.95	..	-0.81	-1.36	..	-1.38	-0.27	-0.57	..	-0.51	..	-0.72
34	OthTextile	-0.06	-0.65	-2.80	-2.49	-0.23	-0.92	-0.44	-2.32	-1.30	-1.74	-0.31	..	-0.24	-0.04	-1.01
35	FloorCover	-0.90	-2.04	...	-0.79	-1.08	-0.68	..	-2.45	-1.11	-1.37	-3.30	..	...	-0.91	.
36	Apparel	-1.25	-0.26	...	...	-2.33	-1.04	-0.23	...	-0.26	-3.16	-1.40	-0.46	-0.14	..	-0.09
37	Leather	-1.17	-0.78	-0.72	-1.97	-0.09	-2.05	-0.49	-1.46	-0.70	-3.56	-1.23	-3.29	-1.09	..	-0.95
38	LeatherPrd	..	-0.78	...	...	..	-0.71	-0.04	-0.84	-0.96	-0.42	-1.65	-0.85	-1.30	-0.56	-0.72
39	Footwear	-1.96	-0.92	...	..	-1.09	-1.03	-2.22	-0.01	-1.27	...	-3.24	-1.72	-1.91	-4.60	-0.05
40	Plywood	..	-0.80	..	...	...	..	-3.27	-4.60	...	-8.88	...	...	..	..	-13.36

TABLE 13: (continued)

SECTOR	TITLE	EXPORTER														
		CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
41	OtherWood	-0.20	-1.08	...	...	.	-2.38	-1.01	-0.27	-0.81	-2.98	-2.13	-2.26	.	-1.93	.
42	Furniture	-2.24	-1.37	-0.24	-4.19	-1.40	-2.76	-1.77	-2.86	-2.94	-3.25	-5.14	-1.54	.	-1.41	.
43	Pulp	.	...	..	...	..	...	..	.	...	...	..	..	..	.	.
44	Newsprint	.	...	..	...	..	...	..	..	...	...	..	..	..	.	...
45	Paper	-2.60	-1.40	-0.61	-1.75	-0.72	-3.27	-4.85	-0.08	-1.15	-0.57	-1.36	-1.14	.	-2.97	-8.63
46	Printing	-3.23	-0.64	-0.78	-1.79	-0.91	-0.87	-1.05	-0.34	-1.16	-2.09	-1.85	-1.18	.	-1.22	.
47	Chemical	-2.36	-2.09	-1.95	-2.50	-3.59	-0.42	-0.10	-2.16	-1.08	-0.77	-1.33	-0.68	-7.44	-10.20	-5.11
48	Fertilizer	-0.13	.	...	-0.59	.	-0.18	...	...	-0.57	-2.11	-6.20	...	...	.	-0.04
49	SynthFiber	-1.43	-3.12	.	-0.41	-1.34	-0.50	-0.57	.	-1.35	-0.21	-0.69	-9.04	-0.42	-5.31	-8.76
50	Paints	.	-5.93	...	-5.89	-5.28	-0.23	-3.10	.	-1.97	-0.26	...	...	-10.55	-13.43	-21.14
51	Drugs	-2.96	-0.73	-0.48	.	-0.99	-0.49	-0.54	.	-0.95	-0.95	-0.65	...	...	.	-5.49
52	Soaps	-2.59	-1.24	..	-6.62	-0.73	-0.47	-2.53	-0.86	-0.96	-3.55	-0.45	-1.87	.	-3.58	.
53	OtherChem	-2.14	-2.01	.	-1.24	-1.79	-0.30	.	-0.43	-1.33	-0.92	-0.31	-6.00	-3.29	-6.05	-2.40
54	PetroRefin	-1.40	-2.69	..	-3.40	.	-4.19	-1.88	-2.76	.	.	-5.85	...	...	.	-2.25
55	FuelOil	-0.23	-1.89	..	.	.	...	.	-6.46	-0.83	..	...	...	...	-29.98	.
56	PetroProd	-2.63	-3.86	...	...	-2.44	.	-9.66	...	-3.00	-2.11	-19.61	-5.39	..	-5.65	.
57	CoalProd	-4.84	...	...	...	...	...	...	...	...	-5.90	...	...	..	-4.31	...
58	Tyre	-1.08	-3.70	...	-1.67	.	-0.78	-1.86	-2.11	-1.54	-0.20	...	-0.76	.	-7.27	-4.33
59	Rubber	-6.05	-1.66	-2.30	-4.38	.	.	-0.31	-1.14	-0.23	-2.00	-3.69	-3.20	-6.25	.	.
60	Plastic	-0.22	.	-2.46	-0.47	-0.39	-0.57	-0.20	-0.44	-1.24	-0.81	-1.05	-1.78	.	-0.66	-0.19
61	Glass	-0.01	-0.82	-0.41	-2.23	-0.25	-1.04	-2.24	-0.56	-0.78	-1.23	-1.53	-2.24	.	-1.22	.
62	Cement	-1.68	-2.45	...	-2.50	...	...	...	-5.06	-2.98	.	...	...	...	.	-3.12
63	Ceramics	-6.71	-0.20	-18.85	-1.93	-1.22	-0.20	.	-2.72	-1.29	-1.00	-1.14	-1.81	...	-1.01	.
64	NonMetProd	-1.40	-1.63	-2.26	-4.77	-1.92	-0.44	-0.52	-3.04	-1.66	-0.30	-1.37	-4.25	-11.63	-15.34	-12.96
65	IronSteel	-0.76	-1.96	-2.52	-1.26	-0.70	-1.79	-2.59	-9.96	-1.35	-2.56	-1.96	-2.07	.	-0.23	-1.46
66	Copper	-1.01	-0.05	.	-3.59	-1.50	-0.26	-8.18	...	-1.07	.	...	.	.	-1.19	-0.93
67	Aluminum	-1.42	-4.33	...	-5.66	-2.10	-2.39	-3.56	-0.62	-0.61	-0.30	...	...	...	-14.36	-1.49
68	Nickel	-4.04	...	...	...	-1.61	-3.73	...	.	-0.16	-0.78	...	...	...	-0.86	-7.39
69	LeadZinc	-0.58	-1.59	...	-1.01	...	-7.60	.	.	-0.30	...	...	...	...	-0.25	-0.88
70	OtherMetal	.	-1.39	...	-1.97	.	-0.09	...	...	-1.08	-0.94	-2.15	...	...	.	-4.26
71	MetalFurn	-5.01	-2.80	-7.12	-5.06	-0.40	.	-1.18	-4.93	-2.19	-2.53	-3.46	-6.85	-1.75	-1.66	-1.46
72	StrucMetal	-5.28	-1.11	...	-2.48	.	-0.42	-6.64	...	-2.47	-1.22	...	-13.82	.	-4.28	.
73	Container	-6.92	-1.51	...	-0.18	-0.08	-0.42	-1.15	-2.48	-2.86	-2.95	-2.05	-15.42	.	-2.72	-1.39
74	Wire	-1.19	-3.43	...	-1.84	-0.33	-0.50	-2.77	-1.90	-1.15	-3.86	-1.27	-0.91	.	-5.56	.
75	Hardware	-0.97	-0.67	-0.20	-0.06	.	-0.67	-0.36	-0.57	-1.60	-1.43	-4.10	-2.98	.	-2.70	.
76	Boilers	.	-3.25	.	...	-1.91	.	-2.68	-0.64	-1.70	-1.12	-3.28	-20.14	...	.	-11.09
77	AirEngine	-5.20	-7.66	...	-3.99	-2.43	-0.57	-1.79	..	-1.66	-1.32	...	-3.67	..	-11.46	-0.58
78	IntEngine	-2.00	-1.63	-0.92	-0.14	-4.15	-0.09	-1.19	-1.75	-1.83	-0.55	..	...	.	-6.06	-3.26
79	PowerMach	-2.93	.	-1.60	-2.69	-0.19	-0.46	-1.84	-0.25	-1.75	.	-2.31	-43.73	-8.66	-2.83	.
80	AgriMach	-2.63	-0.65	...	.	-3.30	-0.82	-1.75	-0.82	-1.34	-2.02	-2.48	-10.09	-12.87	-5.04	-6.81

TABLE 13: (continued)

SECTOR TITLE		EXPORTER														
		CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
81	ConstrEQ	-0.59	-0.53	-3.90	-1.32	-0.77	-0.49	-1.89	.	-1.39	-1.49	-3.93	-4.95	-3.71	-1.51	.
82	MetalMach	-0.81	-2.33	-1.40	-0.03	-0.56	-0.43	-1.33	-1.27	-1.47	-0.54	-1.85	-1.89	-1.34	-2.63	.
83	SewingMach	-1.30	...	-3.03	.	.	-0.47	-0.56	-1.35	-2.18	-1.27	...	-4.81	.	-0.92	-0.14
84	TextMach	-3.27	...	-1.73	-2.21	-9.98	-0.78	.	-1.08	-1.95	-0.46	...	-3.17	.	-3.55	-5.69
85	PaperMach	-2.05	...	.	...	-1.25	-1.58	-0.09	-0.53	-1.57	-1.77	...	...	.	-0.92	-6.11
86	PrintMach	-0.66	-6.69	-31.56	-0.48	-2.15	-0.87	-3.27	...	-0.80	-3.29	..	...	-25.94	-5.22	.
87	FoodMach	-0.73	-0.37	.	-0.67	-0.23	-1.13	-0.29	-1.16	-0.71	-2.39	..	-1.12	.	-1.60	.
88	SpecMach	-0.90	-3.14	-2.51	-1.94	.	-0.28	-1.75	-0.98	-0.86	-4.66	...	.	.	.	-0.24
89	ServMach	-0.66	-0.68	-1.69	-0.02	-2.30	-0.97	-0.27	-2.79	-1.24	-1.29	...	-11.07	.	-0.41	.
90	Pumps	-0.41	-0.01	.	-0.06	-0.32	-0.03	-3.52	-0.03	-1.82	-2.18	-6.35	-1.49	.	-5.12	.
91	MechEQ	-0.16	-0.18	-0.40	-3.00	-1.51	-0.65	-0.22	-4.04	-1.06	-1.15	-2.42	-10.11	.	-1.24	-0.03
92	OtherMach	-0.80	-0.15	-0.22	-1.83	-1.90	-0.64	-1.23	-0.62	-1.14	-1.27	-4.70	.	-2.64	-2.17	.
93	RadioTV	-0.23	-2.74	...	-5.47	.	-0.78	...	..	-2.06	-0.12	-3.78	-1.15	-1.43	-0.94	-0.86
94	TelecommEQ	-1.23	-0.98	...	-1.38	-0.37	-0.94	-0.65	-0.96	-0.59	-1.85	-1.40	-0.61	-1.02	-1.52	-1.26
95	HomeAppl	-0.05	-2.37	-2.65	...	-0.78	-0.02	-1.56	-1.82	-1.76	-1.27	-2.85	.	.	-0.38	.
96	Computers	-0.48	-0.03	...	...	-3.55	-1.97	-1.67	...	-0.47	-0.20	...	-0.91	.	-0.27	-1.69
97	OfficeMach	-1.13	.	...	...	-0.55	-0.75	-0.19	...	-1.20	-2.13	-7.38	-0.60	-0.11	-0.20	-2.78
98	Semicon	-0.45	.	...	...	-1.26	-0.04	-2.45	...	-0.96	-1.80	..	-0.51	-0.81	-2.74	-0.24
99	ElecMotor	-2.34	-2.65	.	-3.75	-0.62	-0.92	-3.21	-0.16	-1.99	-1.17	-12.90	.	.	.	-2.46
100	Battery	-1.65	-5.38	...	-4.97	-0.39	-0.70	-5.23	-0.46	-0.83	-3.04	-1.80	-0.70	.	-1.19	-3.84
101	ElecBulbs	-0.79	-0.81	...	-0.75	-0.98	-0.38	.	-3.91	-1.57	-0.79	-3.45	-1.41	.	-6.66	-1.88
102	IndlApp	-1.67	-1.14	-0.07	-0.93	-1.20	-0.61	.	-0.44	-1.18	-0.82	-5.84	-1.61	-0.28	-0.92	-1.12
103	Ship	-1.64	-1.41	...	...	-2.07	-3.85	-4.88	...	-1.44	-0.30	-1.96	-2.47	.	-3.24	.
104	Warships	...	...	...	...	...	...	...	..	...	...	..	..	...	...	...
105	RailroadEQ	-11.80	-7.33	-2.82	...	..	-2.93	-12.48	...	-1.74	-2.17	...	...	.	.	.
106	Auto	-0.91	.	..	-0.00	...	-1.04	...	..	-1.31	-1.79	..	-14.01	.	-5.06	.
107	Motorcycle	-4.47	-1.38	.	...	-1.30	-1.32	-0.41	...	-2.14	-2.82	-12.12	-2.96	-2.72	-9.94	-5.52
108	AutoParts	.	-2.35	...	-1.42	-1.34	-0.27	-1.09	-1.20	-1.16	-1.40	...	-6.50	-11.24	-2.46	.
109	Aircraft	.	-1.57	...	-1.87	-0.30	-1.62	-0.02	-0.18	-0.72	-0.58	...	.	...	-4.66	-14.67
110	OtherTrans	...	...	...	...	...	...	...	...	-2.12	-10.33	...	...	.	.	-15.57
111	Instrument	.	-0.56	-1.45	-1.63	.	-0.27	-1.40	-4.09	-1.12	-0.79	-7.64	-0.69	-13.25	-2.57	-4.17
112	Optical	-0.33	-1.70	-1.48	...	-2.81	-0.58	-0.55	...	-1.20	-1.18	-6.17	-2.23	.	-2.49	-4.52
113	Watches	-0.76	-0.57	...	..	-0.59	-0.75	-0.57	...	-2.32	-0.62	-1.23	-1.18	-0.20	-7.03	-1.92
114	Jewellery	-1.46	-0.98	..	-1.49	-1.93	-1.71	-2.67	-0.69	-2.32	-1.10	...	-3.63	-1.63	.	-4.84
115	MusicInst	-0.46	-1.47	-0.90	...	-0.86	-1.18	-1.90	...	-1.44	-1.70	-4.13	-0.85	.	-5.60	.
116	Sporting	-0.14	-1.47	-0.95	-1.73	-0.29	-0.97	-1.25	-3.01	-1.70	-1.48	-4.43	-0.30	.	-0.29	-5.26
117	Ordinance	-4.34	...	-3.42	-0.06	-2.00	-0.65	-0.55	-1.11	-1.47	-2.65	-1.55	.	.	-4.19	-2.52
118	ArtWork	.	-2.02	.	-0.51	-1.92	-1.76	-1.14	-0.30	-1.11	-0.86	-2.81	-1.55	...	-1.70	-1.50
119	OtherMfg	.	-0.55	-2.88	-0.69	-0.17	-0.84	-0.65	-0.94	-1.34	-1.41	-0.81	-0.19	.	-1.81	.
120	Scraps	-0.90	-1.16	-2.77	-0.96	-0.77	-0.54	-1.33	-0.74	-1.13	-0.86	-4.19	-0.64	.	-1.52	-1.83

TABLE 14: Share Price Elasticity by Sector and Country in the French Import Market
 EXPORTER

SECTOR	TITLE	CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
1	Cereals	-1.23	-0.82	..	.	-0.25	-1.81	-0.63	.	-2.02	..	-1.07	..	..	.	-0.97
2	Fruits	-2.67	-1.24	-1.77	..	-2.35	.	-0.47	-0.30	..	..	-7.57	..	..	.	-1.32
3	OtherCrop	.	.	-2.74	..	-0.53	-1.81	.	-0.70	-0.60	-1.06	-4.50	..	..	-11.65	-3.25
4	Livestock	.	-0.38	..	.	-1.97	-1.35	.	.	-2.48	..	-2.97	..	..	-1.28	.
5	Silk	..	..	..	..	..	..	-3.22	-3.56	..	-1.74	-1.17	..	..	..	-2.38
6	Cotton	..	.	..	..	-0.65	-1.38	-1.40	-1.33	-0.43	-1.19	..	..	..	-3.75	-3.16
7	Wool	..	.	..	..	-1.08	-2.86	-1.27	-3.54	-1.23	..	-1.24	..	..	-6.28	-2.97
8	OtherFiber	..	..	..	..	-2.59	-0.08	-4.38	-9.08	..	..	-0.18	..	..	.	-5.79
9	Wood	-4.46	-4.59	..	.	-1.37	-3.09	.	-0.09	-1.91	..	..	..	..	.	.
10	Fish	-3.66	.	..	..	-0.83	-2.11	-1.73	-1.21	-1.33	..	-1.45	..	..	-0.56	-1.29
11	IronOre	-7.02	..	..	..	..	..	..	-0.51	..	..	..	..	..	.	-12.51
12	Coal	-6.70	-1.02	..	..	-1.25	-1.38	..	..	-2.61	..	-0.06	..	..	-14.25	.
13	OthMetOre	-2.25	.	-1.29	..	-3.74	-2.59	..	-2.72	-0.01	..	-0.98	..	..	-2.58	-2.73
14	Petroleum	..	..	-4.54	..	..	..	..	..	-1.66	..	..	..	..	-1.16	-0.41
15	NatGas	..	..	..	..	..	..	..	..	..	..	..	..	..	-1.02	.
16	NonMetal	-0.93	-2.41	..	-2.51	-1.61	-0.23	-0.54	-2.32	-1.08	-1.28	-1.14	..	..	-2.41	-3.41
17	Elec	..	..	..	..	-3.64	-1.86	-6.46	.	..	..	..	..	..	.	..
18	Meat	-1.14	-2.34	..	-0.32	-2.10	-0.38	-1.64	.	-0.74	..	-0.77	..	..	-5.79	.
19	Dairy	..	-0.04	..	..	-0.84	.	-0.79	.	-1.04	..	..	..	..	.	.
20	PreFruit	-3.03	-4.50	..	..	-2.66	-2.55	-2.31	.	-1.93	..	-1.20	..	..	-0.61	.
21	Seafood	-8.01	-6.34	-1.07	..	-2.82	-0.51	-0.91	-0.46	-0.67	-0.87	-1.32	-1.39	..	.	-2.28
22	OilFats	..	-5.13	..	..	-1.31	-1.13	-1.44	-1.59	-1.78	..	-2.29	..	..	-0.78	-3.87
23	GrainMill	..	-0.56	..	..	-0.36	-2.02	-1.64	.	-3.20	..	..	..	..	-3.51	.
24	Bakery	..	..	..	-3.57	-1.19	-1.07	-0.64	-3.90	-1.50	-2.52	.	..	..	-1.40	-8.29
25	Sugar	..	-1.13	..	..	.	-2.71	-57.39	-12.57	..	..	..	..	..	-17.54	-0.17
26	Cocoa	..	-4.11	..	-2.45	-1.66	-3.41	-0.30	.	-2.24	..	..	..	..	-1.22	-0.27
27	OtherFood	-0.37	-2.31	..	..	-0.23	-1.77	-0.49	-6.14	-1.65	-0.94	-1.44	..	-9.31	.	-15.11
28	Feeds	..	.	..	..	-1.89	-0.55	-1.10	-4.38	-0.87	-0.26	..	..	..	.	-4.57
29	Alcohol	..	-6.37	-2.80	..	-0.99	-0.64	-0.26	-0.24	-0.84	..	-3.41	..	..	-0.68	.
30	NonAlcohol	..	.	..	..	-7.24	-4.30	-4.57	.	-1.00	..	..	..	-20.39	-9.18	-8.24
31	Tobacco	..	-1.22	..	..	-3.44	.	-0.32	..	-1.92	..	..	..	..	.	.
32	Yarns	-2.31	-0.22	..	-3.87	-1.89	.	-1.14	-0.58	-1.60	..	-3.18	-2.07	-9.28	-0.16	-0.25
33	CottonFabr	..	-6.27	.	-1.59	-2.71	-0.91	-0.70	-0.02	-1.10	-0.85	-1.46	-1.42	-1.07	.	.
34	OthTextile	-1.03	-2.13	..	..	-0.83	.	-1.35	-1.24	-1.47	-1.58	-0.97	-0.16	-0.09	.	-1.35
35	FloorCover	..	-1.89	..	-6.10	-1.29	.	-2.64	-2.45	-1.52	..	-1.21	..	..	-0.33	-0.94
36	Apparel	..	-3.82	..	-0.52	-1.22	-0.36	-0.57	-1.44	-0.74	..	-1.57	-0.86	-1.02	-0.26	-3.02
37	Leather	-5.56	-2.73	..	-2.70	-1.13	-0.53	-1.92	-3.66	-0.90	-3.46	-0.79	..	-8.58	-3.65	.
38	LeatherPrd	..	-2.47	-3.27	..	-0.66	-0.97	-0.20	-0.44	-0.63	-0.74	-2.33	-0.17	-2.03	-0.39	-0.33
39	Footwear	..	-1.79	-2.38	-13.60	-2.38	-0.14	-0.05	.	-1.16	..	-1.58	-0.60	.	-0.94	.
40	Plywood	-5.16	-3.96	..	.	-1.88	-2.47	-2.99	-4.79	-1.87	..	..	..	..	-11.05	-8.02

TABLE 14: (continued)
SECTOR TITLE

		EXPORTER														
		CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
41	OtherWood	-1.94	-0.87	..	-2.49	-1.44	-0.13	-1.26	-0.41	-1.62	.	-1.08	..	-10.39	-1.98	-4.15
42	Furniture	...	-2.03	..	.	-2.77	-2.50	-0.42	-1.86	-1.43	..	-1.89	..	-14.99	-1.74	-1.41
43	Pulp	-0.17	-1.10	..	-1.83	-0.88	-1.29	...	-0.64	-0.94	...	..	..	..	-2.90	-10.20
44	Newsprint	-21.90	...	..	-0.88	-2.99	-2.07	...	...	-2.62	..	..	..	..	-1.79	...
45	Paper	-3.64	-5.99	..	-3.13	-0.78	-1.10	-1.04	-1.81	-1.26	-1.58	...	...	..	-0.78	-1.31
46	Printing	-2.33	-1.11	..	-0.46	-1.15	-1.36	-0.36	-0.05	-1.13	-1.45	-6.85	-1.74	-18.14	-2.84	-3.91
47	Chemical	-4.98	-2.24	...	-2.52	-1.21	-0.65	-1.06	-0.50	-1.31	.	-2.77	..	...	-0.88	-4.17
48	Fertilizer	-1.41	-5.79	...	-0.86	-1.99	-0.24	-0.53	-1.69	-0.86	.	..	..	..	-0.06	-5.93
49	SynthFiber	...	-1.36	...	-7.61	-0.83	-1.12	-0.55	-3.25	-0.96	-0.92	..	...	-51.62	-2.20	.
50	Paints	.	-1.03	..	...	-0.89	-0.86	-0.61	.	-1.14	-0.40	..	..	..	-1.61	-8.55
51	Drugs	-6.09	-1.53	..	-2.61	-0.81	-1.09	-0.20	-2.19	-1.71	-0.92	-1.69	..	..	.	.
52	Soaps	-1.53	-0.82	..	-3.47	.	-1.15	-2.25	-4.88	-0.77	.	...	..	-55.99	-2.82	-22.41
53	OtherChem	-0.43	-0.98	...	.	-0.82	-0.55	-0.61	-0.75	-1.30	.	-1.08	-5.71	...	-3.61	-8.59
54	PetroRefin	...	-2.77	...	..	-1.29	.	-0.99	-3.66	-0.67	...	...	..	...	-9.85	-5.37
55	FuelOil	...	-1.33	...	...	-2.64	.	.	-0.93	-0.62	...	...	..	..	-10.21	-0.60
56	PetroProd	-6.79	-0.08	...	-2.42	-0.47	-2.67	-4.01	-0.19	-1.34	.	...	...	..	-4.88	.
57	CoalProd	...	...	..	..	-1.58	.	...	...	...	...	-2.44	..	..	-2.38	...
58	Tyre	...	-0.41	..	..	-0.65	-0.40	-0.93	-0.24	-1.43	.	...	-8.58	.	.	.
59	Rubber	-2.11	-0.75	-1.17	-2.85	-1.25	-1.08	-0.35	-0.71	-1.56	-1.19	-0.92	.	.	-1.06	-3.64
60	Plastic	...	-0.94	...	-2.43	-1.16	-0.82	-0.98	-0.75	-0.98	-0.55	-1.84	-2.93	.	-0.86	.
61	Glass	...	-0.36	...	-4.30	-0.98	-0.45	-2.71	-4.88	-1.43	.	...	...	-0.93	-3.36	-0.51
62	Cement	...	-4.01	..	..	-0.59	-1.47	-7.46	-3.38	-0.10	...	...	...	...	-15.61	-12.31
63	Ceramics	...	.	...	-21.70	-4.48	-0.93	-0.27	-1.32	-0.85	-1.15	-1.06	-1.74	.	.	.
64	NonMetProd	...	-3.48	..	-3.25	-4.18	-0.43	-1.45	-1.34	-1.44	-0.57	...	...	-12.55	-7.46	-5.75
65	IronSteel	-0.05	-2.34	..	-0.82	-1.55	-0.80	-2.52	-3.96	-1.09	-1.43	..	...	...	-0.33	.
66	Copper	-1.46	-0.23	...	-2.52	-1.85	-2.56	-1.47	-2.14	-0.81	-8.91	..	..	..	-5.67	.
67	Aluminum	-10.46	-10.80	..	-3.43	-1.16	-1.21	-0.36	-4.52	-1.56	...	...	..	..	-5.48	.
68	Nickel	-4.33	-2.79	..	...	-2.44	-2.34	-4.08	...	-1.25	...	...	...	...	-1.33	.
69	LeadZinc	...	...	...	...	-1.81	-0.45	-2.90	-15.14	-0.89	...	..	..	...	-1.72	-4.30
70	OtherMetal	-2.08	-2.12	...	-0.11	.	-0.90	-0.16	-0.60	-0.54	-0.24	-2.86	...	..	..	-0.02
71	MetalFurn	...	-1.87	..	-2.99	-2.52	-0.35	-0.60	.	-1.92	.	...	...	-8.04	-4.78	-2.10
72	StrucMetal	...	-0.54	..	.	-3.79	-0.39	-0.14	.	-1.27	...	..	..	..	-0.57	-4.60
73	Container	...	-2.43	..	..	-2.04	.	-0.28	-2.08	-1.73	...	...	..	...	-3.77	-5.43
74	Wire	..	-0.02	..	-1.04	-0.62	-3.11	-7.03	-0.82	-1.27	.	...	-0.12	...	-2.67	.
75	Hardware	-0.97	-0.22	..	-0.67	-0.88	-0.71	-1.36	-1.24	-1.36	-0.65	-2.29	-4.22	-11.66	-2.70	-0.13
76	Boilers	...	-1.95	..	..	-1.38	-0.28	-3.17	-1.23	-0.23	...	..	..	..	-1.82	-7.71
77	AirEngine	-5.90	-5.27	..	..	-1.45	...	...	...	-3.83	..	..	...	..	.	.
78	IntEngine	...	-0.64	-6.09	-1.07	-0.72	-0.80	-1.03	-0.54	-1.16	-1.14	..	..	...	.	.
79	PowerMach	..	-2.70	..	...	-2.27	-2.24	-2.67	...	-3.27	...	..	..	..	-7.78	-5.67
80	AgriMach	-6.27	-2.74	..	-1.76	-0.01	-0.87	-2.02	.	-1.24	-1.50	..	..	..	-4.06	-3.70

TABLE 14: (continued)

SECTOR	TITLE	EXPORTER														
		CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
81	ConstrEQ	-2.29	-0.81	..	-1.51	-0.49	-1.02	-1.13	-0.80	-1.48	-0.75	...	...	..	-2.97	-16.35
82	MetalMach	-0.16	-0.79	..	-2.88	-0.87	-0.55	-0.55	-1.74	-1.27	-1.40	-5.04	...	-7.63	-0.06	-4.55
83	SewingMach	-0.66	-0.21	..	-8.92	-1.86	-0.28	-0.14	-0.20	-1.60	-3.50	...	...	..	-1.97	..
84	TextMach	...	-2.15	..	-7.18	-0.66	-0.93	-1.55	-0.41	-1.71	-1.74	..	..	..	-0.36	-1.89
85	PaperMach	-1.96	-1.64	..	-2.01	-2.01	-0.82	-1.40	-4.16	-1.75	..	..	..	..	-10.08	-9.51
86	PrintMach	...	-1.16	..	...	-1.72	-0.77	-0.15	-1.05	-1.38	-4.64	..	..	...	-1.88	..
87	FoodMach	...	-1.52	..	-0.18	-0.96	-1.29	-1.98	-0.34	-1.72	..	..	..	..	-5.30	-9.04
88	SpecMach	-1.42	..	..	-3.43	-1.13	-0.23	-0.11	..	-1.47	-2.45	..	..	-16.24	-0.23	-2.91
89	ServMach	-11.45	-0.35	..	-1.10	..	-0.33	..	..	-1.27	-3.78	...	..	...	-2.00	-12.75
90	Pumps	...	-0.36	..	-1.57	-0.57	-1.17	-1.36	-1.28	-1.20	-6.98	...	..	-15.49	-0.73	-1.19
91	MechEQ	-0.22	-1.65	..	-0.14	-1.14	-0.69	-1.07	-0.76	-1.51	-3.92	-2.78	-8.88	-14.71	-1.05	-7.50
92	OtherMach	...	-0.57	...	-2.14	-0.34	-0.89	-1.26	-3.24	-1.35	-2.63	-2.90	...	-3.86	-2.95	-4.90
93	RadioTV	...	-1.00	..	-0.49	..	-1.35	-0.02	..	-1.58	-2.20	-7.21	-4.95	..	-0.38	..
94	TelecommEQ	-0.13	-0.71	...	-0.77	-1.81	-1.03	-0.88	-0.04	-1.09	-0.69	...	-0.69	-4.50	-0.43	-1.19
95	HomeAppl	..	-3.78	...	-1.38	-1.97	-0.42	-0.89	-0.62	-2.39	-0.63	-10.92	-1.85	..	..	-1.85
96	Computers	-0.59	-0.68	...	...	-0.98	-1.20	-0.42	-2.15	-1.13	-3.83	...	-9.38	-10.01	-0.23	..
97	OfficeMach	-3.93	-0.66	...	..	-1.72	-0.11	-0.24	-0.99	-0.94	-2.08	-4.71	..	..	-0.16	..
98	Semicon	-2.28	-1.36	-0.71	-6.45	-2.39	-1.26	..	..	-0.90	-2.76	..	..	..	-0.25	..
99	ElecMotor	...	-0.03	...	-2.11	..	-0.32	-0.39	..	-1.50	-1.33	...	...	..	..	..
100	Battery	...	-1.47	...	-2.65	-1.47	-0.46	-0.04	-1.45	-1.72	-1.22	-2.60	-0.80	-0.66	..	-3.11
101	ElecBulbs	...	-0.41	...	-0.39	-0.94	-0.81	-0.64	-1.82	-1.60	-0.71	...	-0.15	-3.31	-2.22	..
102	IndlApp	-1.01	-0.30	-0.23	-0.97	-0.62	-1.08	-0.09	-0.90	-1.08	-0.83	...	-2.83	-5.09	-4.42	-1.32
103	Ship	...	-7.78	..	...	-0.62	-0.09	-0.38	..	-0.42	-0.52	...	...	-2.19	-1.60	..
104	Warships	...	...	..	...	...	...	...	...	...	...	...	...	..	..	..
105	RailroadEQ	...	-2.13	..	-4.58	-3.53	-1.61	-5.28	..	-3.03	...	...	..	..	-4.23	-16.21
106	Auto	...	-3.99	..	...	-1.27	-0.52	-0.40	-2.51	-2.17	-3.27	...	..	..	-2.54	-7.08
107	Motorcycle	...	-4.53	..	-4.06	-5.13	-1.80	-1.30	-0.66	-0.63	-0.75	-15.89	..	-15.18	..	..
108	AutoParts	...	-0.69	...	-1.10	..	-0.49	-0.69	-2.45	-1.55	-0.27	..	..	...	-2.08	-0.20
109	Aircraft	..	-5.67	..	..	-2.32	-2.99	-0.66	-2.55	-2.77	..	..	..	..	-0.49	-1.30
110	OtherTrans	..	...	..	...	...	-1.06	-0.59	..	-1.39	...	...	...	..	-3.83	..
111	Instrument	..	-0.48	..	-0.44	-0.73	-0.83	-0.68	-1.78	-0.96	-0.66	-4.85	-2.01	-30.06	-1.83	-0.12
112	Optical	..	..	...	-2.46	-3.87	-0.53	-0.23	-0.57	-1.41	-1.84	-8.76	-9.03	..	-0.76	-7.07
113	Watches	..	-0.36	..	...	-0.08	-0.68	-0.71	-0.10	-1.51	-0.09	-0.75	-1.81	-6.07	-2.85	..
114	Jewellery	...	-3.52	...	-0.68	-0.12	-4.46	-0.86	..	-1.85	-3.48	-0.82	...	-11.35	..	-6.46
115	MusicInst	..	-3.29	..	-2.47	...	-1.80	-1.90	-0.70	-1.28	-3.19	-0.43	-1.58	..	..	-2.87
116	Sporting	-1.18	-1.94	-0.84	-1.95	-1.83	-0.74	-2.01	-0.99	-1.12	-2.19	-2.07	-2.56	..	..	-4.79
117	Ordnance	...	-1.28	...	-4.41	..	..	-0.25	..	-2.18	-0.06	...	...	-0.92	-0.07	-0.01
118	ArtWork	-3.01	-2.57	...	-1.04	-1.91	-1.77	-0.38	-1.84	-0.76	-2.25	-0.44	...	...	-4.42	-0.54
119	OtherMfg	...	-2.31	-1.64	-1.84	-1.73	-0.93	-0.51	-0.55	-1.29	-1.25	-2.94	-0.35	..	-0.45	..
120	Scraps	-0.08	-1.60	-1.05	-0.70	-1.44	-0.11	-0.91	..	-1.02	-1.54	..	...	-111.64	-1.36	-0.28

TABLE 15: Share Price Elasticity by Sector and Country in the German Import Market

SECTOR	TITLE	CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
1	Cereals	-0.92	-3.77	..	-1.06	.	-2.09	-0.56	.	-1.52	..	...	..	..	-1.33	.
2	Fruits	...	-0.79	...	-1.80	-1.09	-2.96	-0.67	-0.72	-2.65	..	-1.68	..	..	-0.49	-2.41
3	OtherCrop	-4.81	-3.82	-2.19	-1.39	-0.58	-2.74	-1.98	-0.56	.	...	-0.15	...	..	-9.04	-5.05
4	Livestock	-0.18	-4.40	-1.45	-0.74	-0.18	-1.24	-0.10	-0.52	-2.02	..	-2.53	..	..	.	.
5	Silk	..	...	..	..	...	...	-1.37	...	...	-0.86	-20.48	...	..	-0.99	-1.14
6	Cotton	..	.	-3.06	-1.20	-0.19	.	.	-1.61	-0.78	-0.19	...	..	..	-7.84	-2.95
7	Wool	..	.	..	...	-0.56	-1.26	-4.85	-1.47	-0.54	...	-2.00	..	..	-8.25	-3.26
8	OtherFiber	..	...	..	-8.10	-1.94	.	-8.65	...	.	..	-1.62	..	...	-4.03	-6.34
9	Wood	-1.16	-2.24	...	.	-1.23	-1.42	.	-1.27	-0.63	-0.79	..	...	..	-0.79	.
10	Fish	-16.14	-1.96	..	...	-0.55	-0.84	-1.39	-1.66	-0.71	-1.01	-1.60	...	...	.	-0.99
11	IronOre	-5.36	...	..	..	...	...	..	...	...	..	..	..	..	-26.39	.
12	Coal	-2.61	-4.57	..	...	-2.45	-2.72	..	...	-3.48	..	...	..	..	.	-24.88
13	OthMetOre	-3.33	.	-2.83	...	-1.50	...	...	.	-1.84	...	-2.01	...	..	-8.13	-4.42
14	Petroleum	..	..	-2.87	..	..	...	...	...	-0.06	..	..	..	..	-0.79	-0.47
15	NatGas	..	..	..	...	...	...	...	...	...	..	..	..	..	-17.61	-5.30
16	NonMetal	-3.71	-1.76	-1.03	-0.86	-1.14	-0.76	-0.18	-1.40	-1.38	-1.48	-1.44	..	..	-3.61	-3.19
17	Elec	..	..	..	.	-0.32	-12.04	-9.39	..	..	..	..	..	..	.	...
18	Meat	.	-1.70	..	-1.94	-0.71	-1.25	-2.94	-1.10	-1.16	..	-0.98	..	...	-0.38	-0.18
19	Dairy	...	-1.47	..	-0.49	-1.99	-1.48	-0.78	.	-1.09	..	..	..	..	-3.05	.
20	PreFruit	-3.69	-3.21	...	.	-1.97	-4.52	-1.56	-1.80	-1.43	...	-0.82	...	-30.43	-2.06	-6.30
21	Seafood	-6.76	-6.62	..	..	-1.74	-1.80	.	.	-1.32	-3.48	-1.62	-4.48	-28.88	.	-0.64
22	OilFats	...	-1.72	...	-1.27	-2.10	-1.26	-0.07	-1.70	-1.44	-2.48	-3.83	..	..	-15.06	.
23	GrainMill	...	-3.03	...	...	-0.37	-0.19	-2.64	-2.77	-2.21	..	-1.68	...	..	-2.25	-0.30
24	Bakery	..	...	..	-1.68	-1.26	-1.76	.	...	-1.34	-0.57	..	..	...	-0.46	-2.64
25	Sugar	..	-1.15	-0.31	-4.00	-1.77	-8.34	...	...	-2.22	..	...	..	..	.	-2.04
26	Cocoa	...	-3.45	...	-2.56	-0.76	-1.96	.	-2.71	-1.81	...	-2.82	..	-11.66	-1.15	-4.43
27	OtherFood	.	-1.56	...	-1.85	.	.	-4.70	-5.73	-0.48	-0.19	-1.56	...	-5.39	.	-6.39
28	Feeds	...	-0.62	...	-0.59	-2.25	-1.42	-2.00	...	-1.90	-0.85	-2.05	...	..	.	-3.20
29	Alcohol	...	-0.22	...	-0.59	-1.92	-1.64	-0.08	-2.48	-0.82	.	..	..	..	-1.42	-1.64
30	NonAlcohol	..	...	..	-6.52	-6.06	-0.62	...	...	-0.78	..	..	..	..	-2.53	-6.81
31	Tobacco	-4.13	-16.56	-5.44	...	-3.21	.	-1.31	...	-1.88	...	...	-1.49	..	-9.14	.
32	Yarns	-5.99	-1.90	...	..	-0.93	-0.00	-1.49	-1.72	-1.50	..	-1.19	-0.33	.	-1.30	-2.45
33	CottonFabr	...	-6.32	...	-0.59	-1.23	.	.	-3.42	-0.84	-1.52	-0.91	-0.34	.	-1.57	-1.67
34	OthTextile	...	-0.87	..	-1.80	-0.63	-0.81	-1.15	-0.03	-1.21	-1.02	-1.45	-1.85	.	-0.47	-1.37
35	FloorCover	...	-6.15	..	-3.08	-1.12	.	-0.15	-2.94	-1.78	..	-0.49	..	..	.	-0.24
36	Apparel	...	-2.38	...	.	-1.18	-1.86	-1.33	-0.08	-1.07	-0.24	-0.69	-0.16	-1.27	.	-0.78
37	Leather	-2.53	-1.15	...	-0.72	-1.18	-0.68	-3.62	-3.15	-0.30	-1.13	-0.32	...	-55.84	-1.36	-4.09
38	LeatherPrd	..	-1.59	...	-1.55	-0.38	-0.08	-0.06	-0.25	-1.37	-0.44	-1.36	-0.10	-0.95	.	-0.18
39	Footwear	...	-2.62	-0.59	-3.85	.	-1.47	-0.65	-0.18	-0.52	...	-2.06	-3.06	-4.69	.	-3.06
40	Plywood	-0.99	-3.05	..	-4.35	-1.56	-0.39	-1.06	-6.43	-1.32	...	..	...	.	-5.67	-4.24

TABLE 15: (continued)

SECTOR	TITLE	EXPORTER														
		CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
41	OtherWood	-0.20	-1.59	..	-1.66	-0.11	.	-0.96	.	-1.31	...	-0.06	-2.30	-4.91	-3.26	.
42	Furniture	...	-1.34	..	-3.91	-1.49	.	-0.01	-0.24	-1.26	...	-1.88	..	-17.53	-3.48	.
43	Pulp	-0.70	-0.69	...	-1.38	-1.22	.	-5.47	-1.56	-1.45	...	..	..	..	-22.94	.
44	Newsprint	-4.09	...	..	-3.15	.	-1.56	.	..	-0.09	..	..	..	..	.	.
45	Paper	-4.21	-4.71	..	-1.63	-0.75	-1.63	-1.25	-1.67	-1.15	-1.59	...	..	..	-1.15	-0.27
46	Printing	...	.	..	-1.01	-1.40	-0.55	-0.19	-0.62	-0.97	-1.54	-0.15	-1.29	-11.57	-1.22	-1.40
47	Chemical	-4.52	-0.46	...	-1.21	-0.49	-1.73	.	-0.10	-0.91	-0.94	-1.31	-2.77	...	-0.48	-9.67
48	Fertilizer	...	-3.78	...	-4.39	-2.09	.	-1.18	.	-1.30	-3.37	..	..	..	-7.13	-4.81
49	SynthFiber	-3.78	-0.75	-0.87	-0.79	-0.90	-1.10	-0.52	-3.14	-1.22	-1.28	...	-2.32	.	-2.10	-0.99
50	Paints	...	-1.70	..	-1.15	-0.35	-0.48	-0.48	.	-1.01	.	..	..	..	-1.28	-1.51
51	Drugs	..	-0.27	..	-1.18	-1.23	-0.94	-1.63	-0.32	-1.48	-0.86	-0.46	...	...	-0.90	-1.10
52	Soaps	-0.15	-0.57	..	-1.30	-0.02	-1.08	-1.08	-0.91	-0.83	.	...	..	..	-2.90	.
53	OtherChem	-11.78	-1.71	...	-0.73	-1.59	-0.17	-0.64	-0.06	-0.83	-0.85	-0.89	-5.48	...	-4.34	.
54	PetroRefin	...	-3.92	..	-3.31	.	.	-1.78	-1.31	...	...	..	..	..	.	-0.95
55	FuelOil	...	-0.30	...	...	-0.30	-0.54	.	...	-0.52	..	..	..	..	.	-4.28
56	PetroProd	-5.87	-3.21	..	-1.48	-2.02	-1.11	.	-0.12	-1.08	-0.17	...	..	..	-3.95	.
57	CoalProd	...	-4.48	...	...	-1.50	.	...	.	-0.25	...	...	..	..	-2.76	-8.82
58	Tyre	...	-2.14	..	-1.37	-1.31	-0.69	-1.13	-0.12	-1.14	-0.79	..	-1.83	-3.16	.	-7.41
59	Rubber	.	-0.75	...	-2.11	-1.77	-0.87	-0.22	-0.18	-1.12	-0.61	-3.20	-3.42	-5.63	-4.22	-2.88
60	Plastic	...	-0.32	...	-1.35	-1.49	-1.48	-0.45	.	-0.78	-0.06	-2.11	-3.51	..	-0.12	-1.51
61	Glass	-1.73	-0.52	-1.18	-0.98	-1.77	-0.03	-1.64	.	-1.08	-1.96	-3.95	...	-1.35	-4.03	-1.42
62	Cement	...	...	..	-5.22	-0.27	-3.53	-4.91	.	-0.48	...	..	..	..	-8.13	-2.50
63	Ceramics	..	.	...	-4.88	-0.90	-2.14	.	-1.32	-0.32	-2.21	-2.09	..	..	-0.12	-0.77
64	NonMetProd	...	-2.24	...	...	-4.46	-1.60	-1.23	-0.16	-1.27	.	...	-2.21	-5.04	-3.64	-2.05
65	IronSteel	.	-1.90	...	-0.56	-0.96	-0.99	-2.08	-6.47	-1.00	-1.17	...	-6.75	.	-0.88	-0.52
66	Copper	-0.57	.	...	-1.06	.	-0.44	-0.71	-0.78	-1.66	-1.78	...	..	..	-2.61	.
67	Aluminum	...	-5.75	..	-2.40	-3.31	-0.90	-0.49	-5.11	-1.02	-1.03	...	..	..	-0.43	-0.12
68	Nickel	-4.64	-8.69	..	-2.05	-4.08	.	-0.96	...	-1.07	...	...	...	...	-0.38	-6.49
69	LeadZinc	.	-14.24	...	-2.07	-1.94	-2.48	-0.67	.	-1.06	...	...	..	..	-1.14	.
70	OtherMetal	-2.04	-2.56	...	-0.84	.	-2.58	-1.25	-2.46	-1.25	-1.03	-1.01	...	..	.	-0.14
71	MetalFurn	...	-0.61	..	-1.94	-0.71	.	-1.61	-0.56	-1.80	.	..	.	-75.33	-5.98	-19.20
72	StrucMetal	...	-2.59	..	-2.68	-2.08	.	-0.27	-2.33	-1.18	...	..	..	..	-0.61	-6.48
73	Container	...	-5.78	..	-2.35	-2.20	-0.10	.	.	-1.40	...	...	...	..	.	-3.70
74	Wire	..	-0.73	..	-1.44	-1.24	-5.57	.	-4.11	-0.83	.	-5.19	-2.80	-27.03	-8.88	-4.32
75	Hardware	-2.87	-0.25	..	-0.60	-0.57	-0.74	-0.80	.	-0.97	-0.78	-3.05	-3.32	-12.49	-1.99	-3.62
76	Boilers	...	-3.12	...	-0.64	-0.75	-0.25	-0.66	-1.59	-0.75	-2.30	..	..	..	-0.06	-1.96
77	AirEngine	-1.21	-2.80	..	...	-2.77	-1.02	-0.86	...	-1.54	-13.51	...	...	..	.	-4.71
78	IntEngine	...	-1.57	-1.56	-6.70	.	.	-1.80	-1.35	-0.80	-0.16	...	-20.69	..	-0.85	-2.13
79	PowerMach	-10.26	-3.52	...	-1.95	-2.40	-0.16	-0.66	-3.81	-0.83	-1.51	..	..	...	-0.36	-10.13
80	AgriMach	...	-1.79	..	-1.71	-0.81	-0.68	-1.45	-0.17	-1.60	-2.73	..	..	..	-3.03	-11.69

TABLE 15: (continued)

SECTOR TITLE	EXPORTER														
	CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
81 ConstrEQ	-6.22	-2.65	..	-1.80	-1.78	-0.52	-1.08	-0.37	-1.61	-2.21	...	...	..	-2.23	.
82 MetalMach	-0.25	-0.90	..	-1.03	-2.09	-0.85	-0.30	-0.09	-1.35	-1.35	-2.21	-0.67	.	.	.
83 SewingMach	...	-1.16	..	-3.54	-1.23	-1.27	-0.39	-0.29	-2.01	-1.06	..	-0.76	.	-0.07	-9.20
84 TextMach	...	-2.39	..	-0.57	-0.48	-0.23	-0.28	-2.75	-1.68	-2.35	...	...	...	-2.59	.
85 PaperMach	-1.61	-0.44	..	-2.22	-0.85	-0.72	-1.77	-2.61	-0.31	-4.04	..	..	...	-1.74	-4.11
86 PrintMach	...	-1.33	..	-1.61	-1.39	-0.74	-1.35	-1.13	-1.49	-4.38	...	..	...	-1.96	.
87 FoodMach	...	-2.08	..	-0.75	-2.50	-0.84	-1.94	-4.29	-1.22	-2.63	..	..	..	-5.01	-23.48
88 SpecMach	-1.51	.	..	-0.75	-1.85	-0.58	-0.39	-0.80	-1.13	-3.92	..	..	.	-18.72	-6.57
89 ServMach	...	.	..	-0.42	-0.45	-0.46	-0.17	-0.98	-1.34	-2.57	...	..	-12.44	-4.63	-8.29
90 Pumps	.	-0.00	...	-1.90	-0.48	-0.91	-0.77	-1.19	-1.29	-1.72	...	...	-1.31	-1.37	-3.02
91 MechEQ	...	-4.26	...	-2.25	-1.87	.	-0.15	-0.89	-1.50	-0.70	-0.75	...	-5.76	.	-7.54
92 OtherMach	-0.96	-0.06	...	-1.55	-1.04	-0.93	-1.04	.	-0.74	-2.92	-1.83	...	-22.31	-0.62	.
93 RadioTV	-3.70	-1.80	...	-0.53	-0.34	.	-1.51	.	-1.60	-1.25	-6.21	-5.02	-0.58	-1.56	-0.56
94 TelecommEQ	-1.95	-1.35	...	-1.41	-1.11	-0.68	-0.83	-0.42	-1.34	-0.01	...	-1.52	-8.97	-1.34	.
95 HomeAppl	...	-2.37	..	-2.71	-0.42	.	-0.31	-0.84	-1.79	-2.93	...	-14.67	-12.85	.	.
96 Computers	-0.24	-0.30	..	-0.90	-0.93	-0.18	-1.35	-1.09	-1.25	-2.08	...	-4.01	-29.77	.	-0.77
97 OfficeMach	...	-0.82	-1.73	-0.53	.	-1.86	-0.60	-1.02	-1.65	-2.87	-2.63	-1.28	.	.	.
98 Semicon	-4.17	-1.21	...	-0.08	.	-1.55	-1.58	-1.96	-0.13	-1.73	..	.	.	-2.71	.
99 ElecMotor	.	.	...	-1.19	-0.91	-0.35	-0.43	.	-2.09	-1.65	-4.66	...	.	.	.
100 Battery	...	-1.63	...	-1.45	-2.01	-0.01	.	-2.30	-1.45	-0.66	...	-0.25	-3.15	-0.36	-0.71
101 ElecBulbs	...	-0.52	..	.	-0.17	-1.17	-2.72	.	-1.42	-1.07	-11.10	-3.12	-0.92	-10.44	.
102 IndlApp	-0.89	.	...	-0.42	-0.12	-0.83	-0.05	-1.97	-1.19	-1.12	...	-1.88	-4.95	-2.74	-8.41
103 Ship	...	-2.87	...	.	-1.20	-2.51	-4.18	.	.	-1.00	...	...	-14.33	.	-23.68
104 Warships	..	...	..	...	...	...	...	..	...	...	..	...	...	...	...
105 RailroadEQ	...	.	...	.	.	-0.21	-0.06	..	-0.18	...	..	..	..	-1.87	-86.72
106 Auto	..	-6.57	...	-3.10	-0.59	.	.	-5.66	-1.44	-1.87	..	...	..	-2.05	.
107 Motorcycle	...	-2.59	..	-1.33	-1.33	-1.24	-1.41	-0.58	-0.18	-2.22	...	...	..	-3.80	-6.48
108 AutoParts	-1.62	.	-0.60	-2.41	-1.41	-0.01	-0.88	-0.75	-1.08	.	..	..	..	-1.79	-3.83
109 Aircraft	-0.42	-4.10	..	...	-1.59	-1.20	-3.54	-1.19	-0.33	...	...	...	...	-3.35	.
110 OtherTrans	..	...	..	-23.03	...	-1.22	-1.46	.	...	...	...	...	-1.53	-1.33	...
111 Instrument	-0.20	-0.13	..	-0.68	-0.54	-0.70	-0.09	-1.38	-0.97	-1.11	-1.64	-2.86	.	-0.46	.
112 Optical	.	.	..	-2.61	-1.55	-0.78	-0.38	-0.43	-1.13	-1.89	-5.62	-2.49	-5.22	-13.95	-27.41
113 Watches	...	.	-2.46	-0.58	-1.14	-0.30	-1.50	-0.85	-2.32	-2.19	-0.98	-1.13	.	-3.10	.
114 Jewellery	-2.25	-1.32	-3.27	-3.21	-1.62	-0.63	-2.23	.	-0.18	-2.13	-5.17	...	-2.90	-1.66	-1.54
115 MusicInst	-1.84	-3.21	..	-1.81	.	-1.23	-1.30	-0.29	-1.47	-2.52	-0.30	-0.72	-0.67	-1.98	-1.29
116 Sporting	.	-2.22	...	-1.73	-3.27	-1.23	-0.68	-0.92	-1.06	-1.17	-0.90	-0.93	.	.	-0.85
117 Ordnance	-1.88	-0.62	...	-2.20	-3.17	.	-1.35	-1.60	-2.97	-1.26	-5.86	...	-1.35	-5.46	.
118 ArtWork	-0.59	-0.86	...	-1.25	-0.02	-1.11	-1.46	-0.93	-0.63	-1.27	-0.21	...	-1.47	-1.08	-0.59
119 OtherMfg	...	-1.25	-0.61	-1.54	-1.21	-0.91	-0.62	-0.35	-0.68	-1.44	-1.34	.	-0.38	-0.07	-0.05
120 Scraps	-1.44	-0.43	...	-1.39	-0.82	-0.40	-0.35	-0.72	-0.85	-0.83	-5.95	-1.04	-57.05	-0.82	-16.36

TABLE 16: Share Price Elasticity by Sector and Country in the Japanese Import Market

SECTOR	TITLE	EXPORTER														
		CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
1	Cereals	-0.41	.	..	..	..	..	...	..	..	..	-13.81	...	..	-1.35	-1.17
2	Fruits	-5.00	-0.86	-1.33	..	..	...	.	-0.89	...	...	-0.60	-0.68	-2.19	-0.76	-1.28
3	OtherCrop	-2.03	-3.37	-2.03	..	..	...	...	...	...	...	-1.26	-1.51	-3.64	-1.96	.
4	Livestock	-0.95	-1.50	...	..	-0.86	-0.84	.	..	...	-1.80	-1.39	...	-0.53	.	-4.25
5	Silk	..	..	..	..	..	..	...	...	...	..	-1.43	...	-0.51	...	-0.68
6	Cotton	..	..	-1.59	..	..	..	..	..	..	..	-5.79	...	..	..	-0.68
7	Wool	...	-5.59	..	..	...	-3.92	.	..	...	-0.08	-2.03	...	..	-1.69	.
8	OtherFiber	...	..	...	..	-3.70	-4.60	..	...	..	...	-2.63	...	.	...	-0.43
9	Wood	-1.62	-3.09	..	..	..	...	...	..	..	..	-1.44	-1.27	-1.20	-4.86	-1.82
10	Fish	-1.73	-4.53	-2.12	..	..	-2.93	...	...	-0.07	...	-2.07	-2.66	-2.32	..	-0.37
11	IronOre	-5.21	...	..	..	..	..	..	..	..	..	..	..	..	-17.74	.
12	Coal	-1.94	-4.91	..	..	..	..	...	..	..	..	-5.23	..	..	-2.65	-2.77
13	OthMetOre	-1.79	-0.92	-1.34	..	...	..	...	..	-3.20	...	-1.69	...	..	-6.53	-0.28
14	Petroleum	...	..	-1.30	..	..	..	..	..	..	..	-1.26	..	..	..	-0.66
15	NatGas	...	-1.86	..	..	..	...	...	..	..	..	..	...	..	...	-4.49
16	NonMetal	-0.27	.	-1.45	..	-2.39	-0.46	-3.23	-0.72	-1.09	-2.43	-1.58	-0.59	.	-1.06	-1.24
17	Elec	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	Meat	-2.12	-1.94	-1.37	..	..	-2.28	-1.52	..	..	..	-1.15	..	-6.05	-0.55	-3.36
19	Dairy	-3.32	-1.66	..	-1.73	.	-0.50	-5.41	-1.41	...	-4.02	-0.12	-4.39	-4.00	-2.01	-8.82
20	PreFruit	.	-0.61	-1.07	-12.41	..	-1.01	-1.96	-1.68	.	-1.68	-1.20	-1.63	-1.96	-2.02	.
21	Seafood	-2.11	-0.59	-0.76	..	..	...	...	...	-0.44	-1.28	-2.50	-0.80	-2.71	-0.25	-0.24
22	OilFats	-0.94	-0.04	...	..	...	-0.08	-2.70	-1.13	-0.49	-0.61	-2.64	-2.42	-0.92	-0.74	-0.73
23	GrainMill	-0.43	-5.10	..	..	..	...	...	..	..	..	-3.06	...	...	-2.40	-2.37
24	Bakery	-0.50	-2.80	..	-3.30	.	-0.53	.	-0.69	...	-2.60	-0.65	..	-3.68	-1.61	.
25	Sugar	...	-0.45	..	...	...	..	..	..	...	..	-2.21	-0.42	-4.83	.	.
26	Cocoa	-17.45	-0.49	...	-2.09	-1.43	.	-0.15	..	-2.90	-1.47	-1.32	-3.90	.	-0.96	-1.41
27	OtherFood	-3.47	.	...	...	-1.85	.	.	-1.20	.	-1.84	-3.15	-4.51	.	.	-4.21
28	Feeds	-2.69	.	...	...	-6.98	.	-1.32	...	-10.41	-7.29	...	-2.12	.	.	.
29	Alcohol	-0.39	-0.36	-2.57	...	-0.04	-0.62	-1.22	-0.18	-1.97	-1.14	-3.54	-5.44	-10.59	-4.39	-4.78
30	NonAlcohol	-36.66	-2.02	..	...	...	-2.47	-5.50	...	..	-6.02	-1.11	-1.96	-0.64	-3.91	-2.13
31	Tobacco	...	.	-5.24	...	...	..	..	..	..	-1.74	-3.22	...	-26.31	-0.98	.
32	Yarns	..	-0.86	...	...	...	-3.07	-0.82	-1.57	.	-0.75	-1.24	-1.94	..	-0.81	-1.18
33	CottonFabr	..	-1.87	...	-0.16	-0.38	-0.55	-0.93	-0.96	...	-1.42	-3.82	-1.14	-3.35	-1.11	-0.04
34	OthTextile	.	.	..	-1.73	.	-1.38	-0.91	-0.52	-0.04	-0.76	-0.63	-1.44	.	-0.33	.
35	FloorCover	-1.30	-1.24	...	-1.26	-0.12	-0.10	-0.05	.	.	-1.20	-1.33	-1.65	-0.76	-0.08	-1.48
36	Apparel	-1.46	-2.24	..	...	..	-0.41	-0.42	-0.70	-1.67	-0.55	-2.41	-0.55	.	-1.06	-0.02
37	Leather	-0.51	-1.02	...	..	...	..	-0.40	..	..	-2.06	-0.75	.	.	-3.27	-2.51
38	LeatherPrd	...	-2.81	...	...	...	-2.44	-1.03	-0.49	.	-1.48	-3.53	-5.16	.	-4.19	-2.84
39	Footwear	...	.	...	...	-0.10	.	-2.83	-0.80	-0.24	-1.11	-0.59	-0.02	-0.98	-0.32	.
40	Plywood	-18.49	-6.00	...	..	..	...	...	...	..	...	-3.16	...	.	-1.31	-60.97

TABLE 16: (continued)

SECTOR TITLE	EXPORTER														
	CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
41 OtherWood	-3.58	-2.72	...	...	..	-1.29	-0.71	-0.88	-0.88	-0.60	-1.51	-0.65	-1.04	.	-0.09
42 Furniture	-1.80	-5.44	..	-1.02	.	.	-2.54	.	.	-2.05	-1.57	-1.65	-4.99	-6.09	.
43 Pulp	-1.09	-3.06	...	..	...	...	...	..	...	..	..	..	...	-7.01	-12.71
44 Newsprint	-6.02	-0.72	..	..	...	...	...	..	..	..	..	..	..	-4.70	...
45 Paper	-1.87	-1.72	..	-17.74	-1.76	.	.	.	...	-1.21	-1.17	-1.44	-3.71	.	.
46 Printing	-1.85	-0.07	..	-0.64	-1.85	-0.21	-0.85	-0.72	-0.75	-0.77	-1.20	-0.98	-0.53	-1.64	-2.48
47 Chemical	-1.25	.	-0.94	-1.85	-0.69	-0.38	-0.43	-0.78	-3.36	-1.46	-1.73	.	-2.99	-0.70	.
48 Fertilizer	-0.58	-1.68	..	..	-4.69	-0.97	-0.76	-2.98	...	-0.80	-2.56	.	-20.81	.	-0.52
49 SynthFiber	-2.10	-2.03	-0.39	...	-2.41	-1.44	-0.40	-0.45	...	-1.13	-0.81	-3.56	-5.68	-0.36	.
50 Paints	.	-0.42	..	..	-4.22	-0.68	-0.58	-0.26	...	-1.96	...	-1.17	-6.85	.	.
51 Drugs	-0.28	.	...	-1.37	-4.90	-0.57	.	-0.92	-4.71	-1.91	-0.97	-0.45	-6.79	-1.60	.
52 Soaps	-7.55	-0.89	...	...	.	-0.08	-1.14	.	...	-0.45	-0.12	-1.51	.	.	-7.91
53 OtherChem	-2.28	-1.33	.	..	-1.65	-0.69	-0.48	-0.07	-0.11	-0.62	-1.14	-0.22	-0.67	-1.47	-0.02
54 PetroRefin	-0.41	-3.30	...	...	...	...	...	...	...	...	-6.67	-2.13	...	.	-2.17
55 FuelOil	-18.45	.	...	...	...	-9.51	...	...	...	...	-4.83	-11.36	...	-6.40	-4.22
56 PetroProd	-1.65	-5.05	..	...	-2.53	-0.87	.	-1.22	...	-1.40	-2.57	-10.49	-8.21	.	-17.59
57 CoalProd	..	...	...	...	...	...	-9.06	..	..	..	.	-6.29	-0.40	.	...
58 Tyre	-1.07	-5.78	..	-4.64	-4.10	-1.48	-1.00	-4.21	-7.66	-1.46	..	-0.74	.	.	-3.77
59 Rubber	.	.	..	-3.10	.	.	-0.55	-1.07	...	-1.39	-1.34	.	-1.24	-0.62	-1.67
60 Plastic	-3.76	.	...	-2.33	-2.76	-2.47	-1.57	-2.48	.	-1.25	-4.68	-1.05	.	-0.64	-1.64
61 Glass	...	-1.27	.	-0.08	-1.44	-0.98	-2.03	.	-1.11	-1.18	-4.30	-1.88	-0.87	-0.39	.
62 Cement	...	-7.31	...	...	...	-5.12	...	..	..	...	...	-7.05	-0.28	-8.10	-30.74
63 Ceramics	...	.	-0.39	-0.42	-2.33	-0.69	-0.49	-0.53	-0.22	-1.20	-1.89	-5.48	-1.79	.	.
64 NonMetProd	.	-0.78	...	-1.00	-1.60	-0.34	-2.25	.	-0.59	-0.80	-1.47	-0.53	-3.11	-4.06	-0.93
65 IronSteel	-4.75	-4.78	...	-1.44	...	-5.97	.	...	-3.45	-2.15	-12.82	-0.76	-7.57	-5.15	-0.75
66 Copper	.	-0.70	...	..	...	...	-3.58	...	..	...	-3.71	-0.95	.	-44.86	-0.41
67 Aluminum	-2.25	-5.80	..	-2.97	-6.47	-0.47	.	...	-12.40	-0.53	-4.01	-4.85	.	-11.39	-4.15
68 Nickel	-4.46	.	...	...	...	...	...	...	..	-0.32	...	...	...	.	-10.68
69 LeadZinc	-3.53	-9.63	-2.01	..	.	.	-1.98	..	...	...	-4.76	.	.	.	-2.97
70 OtherMetal	.	-0.93	-2.17	...	..	-0.90	-0.01	...	-1.04	-1.53	-1.86	-2.11	-65.02	.	-1.98
71 MetalFurn	-13.00	.	...	-1.13	...	-2.20	-3.41	-1.56	-5.04	-0.96	-1.38	-3.00	.	.	.
72 StrucMetal	.	-0.94	...	...	...	-2.72	-0.21	-4.65	...	-1.67	-14.03	-2.64	.	.	-2.68
73 Container	...	-3.80	...	...	...	-1.58	-2.25	.	...	-1.86	...	-4.42	.	-5.76	.
74 Wire	...	-0.55	...	...	-2.53	-3.41	-0.54	.	..	-1.30	-33.40	-3.53	.	-2.36	-11.83
75 Hardware	-2.88	.	..	-1.03	-0.57	-1.46	-0.67	-0.05	-3.89	-1.41	-1.83	.	.	-2.87	.
76 Boilers	...	.	...	...	...	-0.36	.	-1.09	...	-0.21	...	-7.77	...	.	-29.72
77 AirEngine	.	-0.83	..	..	..	...	...	..	..	-2.75	..	..	..	...	...
78 IntEngine	.	-0.16	-6.40	-0.35	...	-6.35	-1.42	-0.47	...	-0.76	...	-7.63	-2.78	-6.64	.
79 PowerMach	-1.85	-1.35	..	...	...	-0.42	-0.40	.	...	-0.77	-8.29	.	.	-4.31	...
80 AgriMach	-4.33	-1.11	..	-1.59	-1.80	-3.41	-0.55	.	...	-1.68	...	.	-5.19	-3.19	-5.37

TABLE 16: (continued)

SECTOR	TITLE	EXPORTER														
		CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
81	ConstrEQ	.	-0.57	...	.	-2.71	-0.84	-0.86	-1.41	...	-1.25	...	-28.57	.	-12.09	-4.28
82	MetalMach	-2.79	-2.23	..	-0.25	-0.46	-0.07	-0.28	.	..	-1.07	-0.47	-2.87	.	-6.78	-9.74
83	SewingMach	...	-1.07	..	-0.41	-2.89	-3.45	-0.20	-4.78	...	-1.27	...	-2.41	.	-2.42	-6.82
84	TextMach	...	-0.44	..	...	.	-2.92	-1.69	-2.23	..	-1.42	..	-6.45	.	-7.67	.
85	PaperMach	-1.49	.	..	...	..	.	.	-0.59	-0.76	-1.36	...	-8.13	-23.84	-2.15	...
86	PrintMach	...	-1.36	...	...	..	-1.27	-1.02	.	...	-2.44	...	-0.74	-18.39	-0.79	-22.52
87	FoodMach	...	-2.09	...	-3.67	...	-4.08	-0.55	-5.44	-2.46	-2.32	...	.	-10.30	-3.16	.
88	SpecMach	-2.80	.	..	-1.13	-0.14	-1.04	-0.22	.	-0.82	-2.13	...	-11.16	.	-16.65	.
89	ServMach	-3.68	.	..	-2.84	.	-2.13	-0.17	-1.65	-2.70	-1.48	...	-13.17	.	-1.90	.
90	Pumps	-1.11	.	...	-0.09	-0.79	-0.73	-0.48	-3.53	-0.54	-1.48	-0.82	-15.44	-0.92	.	.
91	MechEQ	-6.28	-1.48	..	-4.98	...	.	-0.24	-0.08	..	-1.53	...	-13.16	.	.	.
92	OtherMach	-0.48	-2.69	...	...	-1.26	.	-0.22	.	...	-1.51	-6.86	-9.14	.	.	-11.08
93	RadioTV	.	.	..	...	-5.42	-0.27	-2.91	.	...	-1.71	-4.99	-2.18	-0.77	-1.94	.
94	TelecommEQ	-4.42	-1.71	...	...	-0.04	.	-1.27	-0.00	...	-0.80	..	-0.39	-2.57	-0.25	-5.43
95	HomeAppl	-11.17	-1.23	...	...	-3.39	-0.59	-0.67	.	-5.63	-1.36	-1.96	-3.43	.	-2.64	.
96	Computers	-4.05	.	-2.44	...	...	.	-1.85	-0.32	...	-1.29	...	-3.77	.	-5.43	-10.76
97	OfficeMach	...	-2.70	...	...	...	...	-1.50	-0.13	...	-1.71	-3.69	-2.47	-20.89	-2.44	-16.56
98	Semicon	-6.23	-0.91	...	...	...	-1.72	-1.67	-2.13	..	-0.62	...	-1.95	-0.28	-3.26	.
99	ElecMotor	...	.	...	...	...	-0.01	-0.80	-0.43	...	-1.58	-3.21	.	.	.	.
100	Battery	-4.61	-1.23	...	...	-0.10	.	-1.76	...	...	-0.12	-0.66	-25.61	-13.16	-5.93	.
101	ElecBulbs	.	.	...	...	-1.86	.	-1.11	.	...	-2.91	-9.54	-4.14	.	-8.13	.
102	IndlApp	-4.65	.	-0.39	-0.07	.	-0.35	-0.76	.	..	-1.33	-4.92	-2.58	.	-2.65	.
103	Ship	.	-0.97	..	..	...	.	.	.	...	.	...	.	.	-5.67	-1.86
104	Warships	...	...	..	..	...	...	...	...	...	...	...	...	...	...	...
105	RailroadEQ	...	.	..	.	...	-3.92	-4.05	...	...	-1.00	-2.47	-4.57	...	-8.61	...
106	Auto	-0.01	-4.58	...	...	...	...	-2.08	...	..	-1.99	..	-3.81	...	-1.85	-58.02
107	Motorcycle	...	-5.48	...	-2.12	-6.71	-2.77	-2.25	-2.49	...	-1.88	-13.58	-6.55	.	-5.36	.
108	AutoParts	-4.63	-1.55	...	-2.51	.	.	-1.31	-0.03	...	-1.79	...	-1.81	-2.47	.	-16.04
109	Aircraft	-8.55	-0.12	..	..	..	-0.62	-0.21	-0.46	..	-1.30	..	..	..	...	...
110	OtherTrans	...	...	..	...	...	...	...	...	...	...	...	-11.06	.	...	...
111	Instrument	.	.	..	..	...	-0.07	-0.15	-0.34	...	-1.19	...	.	-2.12	-2.13	.
112	Optical	.	.	...	-0.96	...	-1.21	-0.50	-1.05	...	-1.18	-2.98	-0.14	-0.07	-0.46	.
113	Watches	..	-0.08	...	...	..	-0.00	-1.52	-1.35	...	-2.33	-2.70	-0.36	.	-7.98	.
114	Jewellery	..	-1.52	...	...	-1.28	-1.25	-1.89	.	-1.49	-2.62	-1.23	-3.26	.	.	-3.26
115	MusicInst	-0.10	-2.98	...	-1.16	...	-2.08	-1.23	-0.35	-0.93	-0.74	-1.67	.	-1.51	-1.17	-2.92
116	Sporting	.	-3.33	...	-2.00	...	-1.69	-4.08	-5.43	-2.11	-2.97	-2.26	-2.34	.	-3.70	.
117	Ordnance	..	-2.51	..	..	...	...	-2.83	...	...	...	...	...	..	-11.05	..
118	ArtWork	...	-0.36	...	...	-2.15	.	-3.09	-0.66	-0.20	-1.07	-1.06	-0.69	...	.	.
119	OtherMfg	-0.98	-0.39	.	-0.86	...	-1.26	-0.89	-0.34	.	-1.18	-2.40	-0.69	.	-1.36	-0.83
120	Scraps	-0.62	-0.14	.	...	-1.47	.	-2.04	-1.59	.	-0.58	-1.90	-1.88	-12.71	-9.79	.

Table 17: Size Variations in the Estimated Price Parameters

SECTOR TITLE	NEQ	PEQ	Pe<=1	Pe<=2	Pe<=3	Pe<=5	Pe>5
1 Unmilled Cereals	112 (99)	79 (80)	21 (15)	40 (54)	51 (62)	61 (68)	18 (12)
2 Fresh fruits & vegs	150 (100)	134 (95)	46 (45)	83 (68)	109 (89)	123 (94)	11 (1)
3 Other crops	162 (100)	132 (80)	31 (9)	73 (20)	91 (40)	109 (54)	23 (26)
4 Livestock	143 (100)	114 (83)	35 (28)	66 (61)	80 (72)	95 (80)	19 (2)
5 Silk	55 (99)	48 (98)	15 (27)	30 (51)	35 (58)	40 (92)	8 (6)
6 Cotton	107 (94)	75 (58)	19 (16)	37 (19)	48 (32)	63 (52)	12 (6)
7 Wool	135 (100)	111 (92)	28 (18)	61 (47)	79 (62)	94 (73)	17 (20)
8 Other natural fibers	91 (99)	75 (84)	16 (24)	30 (41)	40 (55)	53 (64)	22 (19)
9 Crude wood	117 (100)	97 (86)	26 (25)	63 (52)	76 (62)	87 (81)	10 (5)
10 Fishery	145 (100)	119 (82)	34 (34)	68 (52)	86 (67)	95 (72)	24 (9)
11 Iron ores	49 (100)	32 (56)	3 (3)	4 (4)	5 (4)	6 (7)	26 (49)
12 Coal	79 (97)	71 (88)	6 (2)	16 (15)	34 (41)	43 (48)	28 (40)
13 Nonferrous metal ore	126 (99)	96 (80)	22 (28)	41 (38)	66 (51)	82 (63)	14 (16)
14 Crude petroleum	50 (99)	42 (97)	21 (82)	26 (86)	33 (90)	38 (91)	4 (6)
15 Natural gas	41 (96)	31 (85)	10 (20)	14 (25)	17 (26)	22 (55)	9 (30)
16 Non-metallic ore	188 (100)	165 (83)	52 (24)	103 (48)	124 (56)	148 (70)	17 (13)
17 Electrical energy	21 (63)	13 (31)	1 (1)	2 (2)	2 (2)	3 (7)	10 (23)
18 Meat	150 (100)	121 (92)	38 (44)	67 (57)	87 (69)	99 (80)	22 (11)
19 Dairy products	150 (100)	117 (87)	29 (10)	68 (49)	82 (65)	99 (84)	18 (3)
20 Preserved fruits,veg	173 (100)	139 (79)	39 (25)	73 (42)	94 (59)	124 (72)	15 (7)
21 Preserved seafood	171 (100)	136 (79)	39 (39)	72 (48)	94 (60)	112 (70)	24 (9)
22 Veg & animal oil,fat	147 (99)	115 (78)	33 (18)	66 (44)	85 (53)	103 (66)	12 (12)
23 Grain mill products	122 (100)	93 (88)	27 (41)	46 (62)	60 (70)	75 (81)	18 (7)
24 Bakery products	153 (100)	123 (91)	30 (26)	76 (76)	93 (81)	107 (88)	16 (2)
25 Sugar	88 (93)	63 (71)	19 (28)	31 (37)	40 (43)	50 (47)	13 (24)
26 Cocoa, chocolate,etc	165 (100)	128 (79)	27 (21)	65 (56)	91 (62)	106 (70)	22 (9)
27 Food products,nec	191 (100)	134 (68)	38 (22)	70 (37)	87 (43)	104 (52)	30 (16)
28 Prepared animal feed	150 (100)	117 (80)	27 (21)	57 (51)	75 (60)	96 (72)	21 (8)
29 Alcoholic beverages	164 (100)	135 (93)	47 (40)	89 (82)	102 (86)	119 (90)	16 (3)
30 Nonalcoholic beverage	123 (99)	94 (72)	21 (27)	34 (40)	46 (50)	59 (54)	35 (18)
31 Tobacco products	125 (100)	91 (66)	20 (9)	42 (23)	52 (38)	66 (41)	25 (25)
32 Yarns and threads	206 (100)	172 (90)	48 (31)	100 (69)	127 (76)	145 (83)	27 (7)
33 Cotton fabrics	196 (100)	159 (89)	51 (36)	101 (61)	118 (65)	135 (69)	24 (20)
34 Other textile prod	213 (100)	178 (84)	63 (38)	133 (74)	154 (81)	165 (82)	13 (2)
35 Floor coverings	162 (100)	133 (78)	38 (26)	77 (60)	96 (65)	115 (73)	18 (5)
36 Wearing apparels	190 (100)	163 (89)	66 (52)	119 (72)	137 (77)	154 (89)	9 (0)
37 Leather and hides	190 (100)	162 (94)	47 (21)	89 (45)	115 (60)	143 (83)	19 (11)
38 Leather Products	193 (100)	157 (88)	75 (44)	106 (69)	126 (80)	145 (84)	12 (4)
39 Footwear	176 (100)	130 (80)	40 (39)	73 (60)	96 (66)	111 (77)	19 (3)
40 Plywood and veneer	126 (100)	97 (88)	12 (8)	25 (17)	47 (33)	62 (43)	35 (45)
41 Other wood products	195 (100)	149 (81)	53 (36)	93 (59)	111 (70)	133 (80)	16 (2)
42 Furnitures,fixtures	190 (100)	144 (79)	23 (30)	74 (49)	102 (62)	122 (71)	22 (8)
43 Pulp and waste paper	116 (100)	95 (78)	20 (17)	46 (31)	61 (44)	74 (58)	21 (20)
44 Newsprint	72 (89)	50 (28)	13 (12)	18 (15)	25 (17)	32 (21)	18 (7)
45 Paper products	190 (100)	159 (94)	34 (33)	91 (75)	115 (87)	140 (93)	19 (2)
46 Printing,publishing	204 (100)	186 (92)	67 (41)	134 (79)	155 (85)	167 (88)	19 (4)
47 Basic chemicals	222 (100)	198 (92)	72 (41)	131 (67)	158 (80)	177 (86)	21 (6)
48 Fertilizers	169 (100)	141 (94)	54 (34)	78 (54)	97 (66)	116 (74)	25 (20)
49 Synthetic resin, fiber	207 (100)	184 (92)	56 (37)	101 (67)	130 (82)	154 (88)	30 (3)
50 Paints and varnishes	160 (100)	129 (90)	33 (40)	74 (73)	90 (84)	104 (87)	25 (3)
51 Drugs and medicines	201 (100)	178 (87)	66 (25)	126 (72)	148 (80)	163 (85)	15 (2)
52 Soaps & other toilet	182 (100)	148 (92)	47 (46)	84 (75)	105 (85)	123 (89)	25 (2)
53 Chemical product,nec	205 (100)	176 (94)	57 (37)	114 (72)	139 (78)	159 (90)	17 (4)
54 Petroleum refinery	133 (99)	98 (76)	22 (12)	44 (23)	60 (59)	78 (66)	20 (9)
55 Fuel oils	93 (98)	64 (65)	23 (12)	32 (21)	38 (24)	49 (53)	15 (13)
56 Product of petroleum	164 (99)	131 (77)	28 (12)	55 (26)	71 (39)	94 (56)	37 (22)
57 Product of coal	77 (97)	58 (73)	12 (33)	27 (50)	36 (59)	45 (64)	13 (8)
58 Tyre and tube	184 (100)	147 (91)	42 (46)	89 (75)	113 (82)	131 (88)	16 (3)
59 Rubber products,nec	204 (100)	166 (85)	55 (31)	111 (62)	128 (70)	152 (79)	14 (6)
60 Plastic product,nec	210 (100)	174 (86)	69 (42)	121 (73)	144 (80)	167 (86)	7 (0)
61 Glass	202 (100)	169 (89)	55 (41)	104 (64)	131 (79)	154 (87)	15 (2)
62 Cement	106 (99)	85 (83)	18 (17)	38 (40)	53 (45)	62 (53)	23 (30)

Table 17: (continued)

SECTOR TITLE	NEQ	PEQ	Pe<=1	Pe<=2	Pe<=3	Pe<=5	Pe>5
63 Ceramics	205 (100)	148 (64)	43 (29)	92 (47)	112 (58)	126 (61)	22 (3)
64 Nonmetallic min prod	196 (100)	159 (90)	38 (26)	85 (58)	111 (73)	136 (83)	23 (7)
65 Basic iron and steel	203 (100)	180 (96)	36 (37)	84 (65)	121 (82)	150 (88)	30 (8)
66 Copper	163 (99)	122 (73)	34 (24)	66 (43)	83 (58)	101 (64)	21 (9)
67 Aluminum	169 (100)	141 (84)	31 (16)	53 (33)	75 (41)	99 (56)	42 (27)
68 Nickel	128 (98)	96 (72)	14 (11)	34 (25)	52 (30)	69 (48)	27 (24)
69 Lead and zinc	136 (99)	96 (84)	19 (25)	44 (55)	59 (74)	71 (79)	25 (5)
70 Other nonferrous met	171 (100)	136 (86)	40 (21)	77 (49)	99 (56)	121 (82)	15 (3)
71 Metal furnitures	191 (100)	146 (84)	17 (11)	60 (50)	85 (58)	110 (65)	36 (18)
72 Structural metal prod	156 (100)	113 (76)	26 (29)	56 (59)	74 (66)	92 (70)	21 (5)
73 Metal containers	151 (100)	117 (80)	23 (35)	51 (53)	78 (69)	91 (73)	26 (7)
74 Wire products	189 (100)	154 (86)	35 (29)	65 (49)	86 (59)	110 (72)	44 (14)
75 Hardware	222 (100)	186 (90)	74 (50)	125 (78)	150 (83)	170 (88)	16 (2)
76 Boilers and turbines	147 (99)	104 (65)	35 (32)	60 (47)	68 (49)	84 (59)	20 (6)
77 Aircraft engines	110 (99)	82 (84)	19 (22)	40 (43)	50 (57)	63 (66)	19 (19)
78 Internal combust eng	167 (100)	139 (93)	47 (49)	85 (77)	102 (81)	121 (86)	18 (6)
79 Other power machines	152 (100)	110 (77)	31 (28)	54 (38)	71 (61)	83 (68)	27 (9)
80 Agricultural machine	173 (100)	154 (96)	34 (23)	80 (65)	103 (81)	127 (91)	27 (6)
81 Construction equip	185 (100)	159 (94)	43 (39)	89 (63)	119 (77)	139 (85)	20 (9)
82 Metalworking machine	205 (100)	172 (80)	61 (49)	111 (68)	133 (74)	150 (78)	22 (2)
83 Sewing machines	191 (100)	148 (83)	54 (44)	91 (60)	114 (75)	128 (79)	20 (4)
84 Textile machinery	167 (100)	133 (88)	32 (32)	68 (65)	96 (75)	116 (82)	17 (5)
85 Paper mill machines	171 (100)	144 (95)	35 (25)	80 (59)	97 (73)	112 (78)	32 (17)
86 Printing machines	159 (100)	127 (92)	28 (45)	61 (65)	85 (76)	103 (86)	24 (6)
87 Food-processing mach	170 (100)	135 (82)	45 (35)	73 (64)	89 (68)	109 (73)	26 (10)
88 Other special machine	194 (100)	139 (73)	45 (31)	76 (42)	98 (50)	113 (59)	26 (14)
89 Service ind. machine	184 (99)	159 (90)	46 (38)	99 (72)	121 (80)	136 (88)	23 (2)
90 Pumps	190 (100)	163 (93)	57 (40)	109 (70)	123 (80)	140 (87)	23 (6)
91 Mechanical handle eq	200 (100)	168 (91)	41 (27)	88 (65)	111 (75)	134 (79)	34 (12)
92 Other non-elec mach	201 (100)	176 (94)	58 (51)	112 (79)	142 (89)	157 (93)	19 (1)
93 Radio,TV,phonograph	190 (100)	148 (87)	41 (35)	87 (60)	111 (72)	129 (80)	19 (7)
94 Other telecom equip	204 (100)	175 (95)	79 (35)	144 (89)	155 (90)	165 (91)	10 (4)
95 Household appliances	195 (99)	156 (78)	47 (34)	91 (56)	111 (66)	134 (75)	22 (3)
96 Computers	189 (100)	154 (82)	63 (43)	98 (70)	112 (73)	135 (78)	19 (4)
97 Other office machine	188 (100)	145 (80)	59 (25)	88 (39)	109 (67)	131 (77)	14 (3)
98 Semiconductors	183 (100)	140 (83)	45 (38)	87 (70)	114 (76)	122 (77)	18 (5)
99 Electric motors	179 (99)	112 (69)	36 (28)	63 (43)	82 (62)	100 (67)	12 (2)
100 Batteries	180 (99)	151 (94)	52 (44)	98 (70)	115 (78)	133 (90)	18 (4)
101 Electric bulbs	197 (99)	163 (86)	60 (39)	109 (71)	129 (77)	143 (81)	20 (5)
102 Industrial appliance	210 (100)	167 (89)	65 (41)	112 (70)	135 (77)	157 (85)	10 (4)
103 Shipbuilding	145 (99)	105 (57)	26 (31)	49 (43)	68 (47)	78 (49)	27 (9)
104 Warships	7 (93)	5 (60)	0 (0)	1 (0)	1 (0)	2 (1)	3 (58)
105 Railroad equipment	136 (99)	92 (71)	21 (17)	37 (30)	55 (38)	68 (42)	24 (29)
106 Motor vehicles	155 (100)	124 (91)	28 (38)	62 (71)	78 (82)	96 (86)	28 (5)
107 Motorcycle & bicycle	167 (99)	134 (84)	29 (30)	59 (46)	84 (67)	105 (74)	29 (9)
108 Motor vehicle parts	175 (100)	132 (74)	51 (32)	90 (56)	107 (61)	119 (70)	13 (4)
109 Aircraft	107 (100)	81 (89)	25 (15)	44 (45)	58 (60)	69 (76)	12 (13)
110 Other transport eq	86 (94)	63 (46)	11 (10)	26 (26)	35 (30)	46 (38)	17 (9)
111 Precision instrument	206 (100)	176 (89)	86 (58)	124 (74)	146 (81)	161 (88)	15 (1)
112 Optical goods	200 (100)	168 (89)	47 (24)	91 (67)	114 (72)	141 (79)	27 (10)
113 Watches and clocks	171 (100)	140 (83)	73 (41)	103 (57)	117 (61)	127 (70)	13 (13)
114 Jewellery	171 (100)	142 (90)	34 (23)	69 (48)	88 (55)	111 (71)	31 (18)
115 Musical instruments	192 (100)	166 (91)	42 (12)	95 (51)	124 (74)	146 (87)	20 (3)
116 Sporting goods	213 (100)	180 (74)	49 (22)	108 (47)	140 (57)	167 (68)	13 (6)
117 Ordnance	112 (96)	83 (77)	23 (30)	36 (34)	53 (57)	66 (60)	17 (17)
118 Works of art	160 (100)	132 (75)	46 (31)	92 (54)	111 (59)	119 (65)	13 (10)
119 Manufacture goods nec	213 (100)	176 (80)	91 (41)	148 (69)	162 (77)	169 (78)	7 (2)
120 Scraps,used	167 (100)	139 (87)	49 (34)	95 (62)	110 (70)	121 (73)	18 (14)
Overall:							
NEQ	PEQ	Pe<=1	Pe<=2	Pe<=3	Pe<=5	Pe>5	
19125 (99)	15375 (86)	4598 (36)	8795 (61)	11021 (71)	12973 (78)	2402 (8)	

period (1974-91), and so no share equations were estimated for these exporters. As for exporters UK and Taiwan, no share equations were estimated due to a lack of sufficient observations in the sample period, and thus in the Table a 3-dot takes the place of actual estimated share price elasticities.

Overall, the estimated share price elasticities vary considerably by exporter in each import market. For any given sector, there are some exporters whose market shares are price-elastic or highly price-elastic, and others whose market shares are not very price-elastic.

To summarize the variation in the size of share price elasticities, Table 17 (pp. 103-104) is presented. It may be noted that in nearly every sector, for those shares equations with a price term, the absolute values of the price parameters in the majority of these equations are below 5. For instance, in Sector 1 ("Cereals"), the number of estimated equations (or "NEQ") is 112, out of a total of 241 possible share equations. The value 99 in parenthesis indicates the total trade flows represented by the 112 share equations equal to 99% of the total trade flows in this sector. Next, we see 79 under the title "PEQ", which indicates that of the 112 estimated share equations, 79 have a price term. We can also see that there are 21 share equations whose price parameters are less than or equal to 1 (in absolute value), 40 share equations whose price parameters are less than or equal to 2 (in absolute value), 51 share equations whose price parameters are less than or equal

to 3 (in absolute value), and 61 share equations whose price parameters are less than or equal to 5 (in absolute value). The number of share equations whose price parameters exceed 5 (in absolute value) is 18, and they account for about 12% of total trade flows in Sector 1.

Of all the share equations estimated, 15,375 have a price term, accounting for 86% of total world trade in 1990. The number of share equations whose share price elasticities are less or equal to 1 (in absolute value) is 4,598, representing 36% of the total world trade. The number of share equations whose share price elasticities are less or equal to 2 (in absolute value) is 8,795, representing 61% of total world trade. The number of share equations whose share price elasticities are less or equal to 3 (in absolute value) is 11,021, representing 71% of total world trade. The number of share equations whose share price elasticities are less or equal to 5 (in absolute value) is 12,973, representing 78% of total world trade. The number of share equations whose share price elasticities are larger than 5 (in absolute value) is 2,402, representing 8% of total world trade.

Capital Parameters

Tables 18-21 (pp. 108-119) present the estimated share capital elasticities by sector and exporter in the selected import markets. Table 20 (pp. 108-110), for instance, focuses on the German import market. The first two columns list the trade sector number and titles. Then the estimated share capital elasticities of

TABLE 18: Share Capital Elasticity by Sector and Country in the US Import Market

SECTOR	TITLE	CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
1	Cereals	.	...	..	..	...	...	...	...	...	...	...	...	...	15.81	1.22
2	Fruits	.	.	..	.	0.02	1.15	.	.	...	.	0.38	..	...	.	.
3	OtherCrop	2.63	0.01	..	...	1.40	7.77	.	3.92	.	0.55	.	.	.	0.24	1.18
4	Livestock	0.36	0.12	..	...	2.88	1.12	...	...	0.60	...	0.00	..	..	0.67	0.82
5	Silk	..	..	..	..	...	...	...	...	...	1.56	.	...	...	2.40	0.02
6	Cotton	0.94	.	..	...	...	...	...	...	...	...	...	...	...	.	0.98
7	Wool	.	...	...	2.49	7.95	.	3.07	...	0.99	...	.	...	...	4.82	2.35
8	OtherFiber	.	.	..	.	.	...	...	...	0.11	...	0.20	..	...	.	1.50
9	Wood	0.41	1.72	..	..	..	...	...	...	...	...	...	...	...	.	.
10	Fish	0.84	.	..	...	...	...	...	...	0.08	2.87	0.30	0.54	.	0.58	0.50
11	IronOre	3.87	..	...	...	...	...	...	...	...	...	...	...	...	.	.
12	Coal	.	...	..	...	...	...	...	...	...	...	...	...	...	0.92	4.35
13	OthMetOre	.	0.09	..	...	...	.	...	...	...	.	...	...	...	.	1.63
14	Petroleum	.	.	..	..	..	...	...	...	3.49	...	1.20	..	..	5.57	1.01
15	NatGas	.	0.36	..	..	...	...	...	...	...	...	...	...	...	...	3.05
16	NonMetal	.	.	...	3.70	.	1.40	.	.	.	.	.	...	...	...	1.18
17	Elec	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	Meat	2.62	0.35	..	.	2.54	0.79	...	...	...	3.27	.	...	4.65	1.27	.
19	Dairy	3.96	0.14	.	...	.	3.34	.	4.71	3.45	.	.	...	6.62	3.12	.
20	PreFruit	2.81	0.03	0.14	4.07	.	3.98	.	2.05	0.86	0.59	.	.	0.88	0.65	2.48
21	Seafood	.	0.01	..	...	45.84	...	...	0.76	.	1.37	.	0.38	.	4.19	.
22	OilFats	3.02	.	..	...	.	.	3.16	0.67	29.69	0.87	2.51	...	0.05	.	8.08
23	GrainMill	0.30	.	..	...	15.04	.	3.40	...	.	.	.	0.82	24.51	6.02	3.37
24	Bakery	0.50	0.01	.	.	1.90	2.84	1.17	7.13	.	0.92	.	0.60	3.13	3.37	0.29
25	Sugar	6.80	0.55	..	...	...	...	...	..	...	..	..	..	..	.	0.80
26	Cocoa	1.71	0.02	...	.	0.86	5.28	.	.	.	.	0.75	0.98	7.28	0.75	3.15
27	OtherFood	.	0.05	...	.	0.77	.	10.41	.	.	.	.	..	9.00	.	.
28	Feeds	.	...	...	...	9.29	...	...	...	...	0.69	..	...	0.01	4.70	.
29	Alcohol	0.77	0.02	..	...	2.29	4.19	3.41	0.45	0.42	.	0.06	..	..	1.90	3.46
30	NonAlcohol	1.56	0.14	...	...	5.85	0.29	.	0.68	.	.	.	..	..	.	.
31	Tobacco	2.59	.	...	13.90	71.18	.	6.86	5.43	.	.	...	...	...	.	3.29
32	Yarns	0.78	0.17	2.41	.	1.19	.	0.37	6.87	0.79	1.15	2.61	0.26	2.91	.	3.88
33	CottonFabr	0.28	4.05	.	2.52	.	.	.	0.86	1.37	.	.	0.29	2.18	0.31	0.24
34	OthTextile	.	0.07	0.11	5.13	0.16	.	.	.	0.41	.	.	0.41	.	.	0.52
35	FloorCover	2.04	0.35	...	.	0.21	1.37	1.31	.	0.16	1.76	.	8.32	...	.	0.32
36	Apparel	.	.	...	...	0.99	.	.	...	.	0.02	.	0.26	2.08	.	0.10
37	Leather	.	0.24	0.02	.	.	1.04	2.76	1.02	0.47	.	.	24.46	.	4.24	0.79
38	LeatherPrd	0.00	.	...	...	.	.	.	.	.	2.74	0.77	0.18	.	.	0.35
39	Footwear	0.04	.	...	..	3.37	2.09	0.10	2.40	.	...	.	0.29	.	0.68	0.05
40	Plywood	1.68	3.27	..	...	...	.	.	27.38	...	0.36	...	...	1.48	.	.

TABLE 18: (continued)

SECTOR	TITLE	EXPORTER														
		CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
41	OtherWood	.	0.01	...	...	0.27	.	.	1.54	.	2.13	.	0.34	1.43	.	0.53
42	Furniture	1.14	0.00	.	.	0.44	1.79	.	.	4.91	3.63	0.11	0.46	3.31	0.80	1.80
43	Pulp	0.10	...	..	...	..	...	..	2.04	...	...	..	..	..	3.11	0.03
44	Newsprint	0.10	...	..	..	..	...	...	..	...	...	..	..	..	..	...
45	Paper	1.32	.	2.67	.	0.17	.	1.01	.	.	.	2.19	0.19	1.59	0.95	.
46	Printing	1.67	.	0.05	0.12	0.37	0.94	0.31	0.42	0.86	.	.	0.61	5.48	0.72	.
47	Chemical	.	0.00	0.17	3.54	0.46	.	.	9.61	.	.	.	0.02	.	.	0.22
48	Fertilizer	.	0.36	...	0.59	.	0.60	...	...	.	1.29	2.61	...	...	0.93	.
49	SynthFiber	0.50	0.21	.	3.60	1.49	0.27	.	2.30	1.22	1.68	0.38	1.05	4.91	.	3.49
50	Paints	3.31	.	...	.	9.86	1.48	.	7.70	.	2.92	...	...	1.59	.	.
51	Drugs	2.50	0.09	0.76	0.36	.	0.28	1.18	.	1.89	.	.	...	...	.	3.07
52	Soaps	1.27	0.09	..	7.79	0.15	1.93	.	.	0.21	1.07	.	0.61	.	2.56	.
53	OtherChem	.	0.11	0.03	1.53	.	.	0.19	1.29	.	5.64	.	0.46	.	.	1.16
54	PetroRefin	2.02	.	..	.	.	2.55	5.57	.	2.10	0.19	.	...	...	2.40	.
55	FuelOil	.	.	..	3.82	.	...	3.41	.	0.96	.	...	...	...	4.09	.
56	PetroProd	.	.	...	...	5.36	1.81	0.25	...	.	13.63	11.98	16.01	..	3.95	.
57	CoalProd	1.78	...	...	...	...	...	...	...	...	3.84	...	...	...	...	...
58	Tyre	1.92	0.77	...	.	0.78	.	1.63	1.21	2.21	.	...	0.62	0.29	1.74	5.37
59	Rubber	1.20	.	..	3.35	2.78	4.94	.	.	3.24	.	.	0.61	6.37	2.57	.
60	Plastic	.	0.00	0.02	.	0.24	0.50	.	2.54	0.24	0.13	0.19	.	0.81	0.23	.
61	Glass	1.07	0.12	.	0.64	1.29	0.69	0.04	1.39	0.61	.	0.12	0.24	0.29	.	1.44
62	Cement	0.83	0.24	...	0.40	.	...	...	.	.	.	..	...	...	.	.
63	Ceramics	12.75	0.21	.	.	.	1.49	.	.	0.36	.	.	0.51	7.13	.	.
64	NonMetProd	1.21	.	0.08	4.27	.	2.42	0.33	.	0.30	.	2.72	2.53	1.13	.	.
65	IronSteel	0.94	0.31	0.32	1.02	.	0.82	2.09	9.17	.	1.50	1.39	0.18	.	.	2.68
66	Copper	1.86	0.12	3.08	3.64	2.01	1.61	3.27	...	0.06	0.07	...	0.25	.	2.45	1.60
67	Aluminum	5.33	5.42	...	2.21	0.25	.	0.48	.	0.07	2.94	...	...	...	5.86	1.74
68	Nickel	2.99	...	...	...	2.73	1.29	...	..	0.75	8.91	...	...	...	.	4.82
69	LeadZinc	.	0.14	...	2.72	...	2.41	68.80	1.37	1.39	...	...	...	...	.	1.01
70	OtherMetal	.	0.09	...	0.51	.	0.30	...	...	.	.	0.04	...	...	.	1.60
71	MetalFurn	13.74	0.04	28.49	1.57	3.60	.	0.15	19.33	0.98	.	0.23	0.25	4.88	.	4.99
72	StrucMetal	2.13	0.22	...	.	0.77	.	.	...	0.35	.	...	1.93	.	.	.
73	Container	4.66	0.51	...	3.24	.	1.90	.	6.31	3.13	.	.	4.78	3.64	.	3.46
74	Wire	1.37	0.24	...	1.51	2.28	.	.	11.10	0.46	0.44	0.95	0.65	.	0.28	0.46
75	Hardware	1.34	0.07	0.06	3.13	1.28	.	0.45	0.87	0.56	.	.	0.58	3.84	0.18	0.72
76	Boilers	.	.	11.77	...	...	7.25	2.48	.	0.88	0.23	.	0.14	...	2.15	.
77	AirEngine	.	0.12	...	0.12	7.28	10.81	.	..	0.96	3.34	...	.	..	19.68	8.72
78	IntEngine	1.04	0.25	0.47	1.07	1.12	.	0.77	0.67	0.68	.	..	...	.	1.70	6.26
79	PowerMach	.	.	0.22	.	.	4.28	0.44	.	.	.	2.14	.	4.95	.	9.53
80	AgriMach	0.48	0.18	...	9.30	.	0.35	0.10	0.94	.	2.60	.	.	1.31	.	.

TABLE 18: (continued)

SECTOR TITLE	EXPORTER														
	CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
81 ConstrEQ	.	.	0.03	.	.	0.81	.	12.61	1.21	1.07	.	0.94	.	.	3.34
82 MetalMach	0.12	0.04	0.10	1.42	.	.	.	1.50	0.78	.	0.15	1.49	9.64	1.00	4.22
83 SewingMach	.	...	0.09	.	.	.	.	.	0.04	1.23	...	.	5.10	5.88	.
84 TextMach	3.78	...	.	.	0.76	.	0.29	9.77	.	0.94	...	1.09	6.12	8.27	.
85 PaperMach	0.70	...	0.04	...	4.62	1.32	.	1.39	.	.	...	...	.	.	5.18
86 PrintMach	.	0.93	.	1.96	.	0.88	0.61	...	.	.	...	...	5.43	2.54	1.93
87 FoodMach	0.23	.	.	.	.	.	0.54	7.60	1.04	.	...	...	4.09	0.74	3.04
88 SpecMach	1.16	.	0.60	3.33	3.35	2.52	.	2.37	0.51	7.10	...	0.61	1.87	12.66	0.42
89 ServMach	0.51	0.60	0.18	3.85	0.60	2.36	0.30	.	1.29	.	...	.	.	0.33	2.01
90 Pumps	1.24	0.15	0.14	.	0.65	.	.	5.57	0.55	0.47	.	0.54	15.72	0.37	10.39
91 MechEQ	.	0.13	0.17	.	1.12	0.47	2.03	1.27	.	.	.	5.23	9.09	0.08	0.10
92 OtherMach	2.01	0.19	0.00	.	0.12	1.20	.	0.19	0.16	.	.	0.40	2.10	0.12	4.11
93 RadioTV	0.82	.	...	.	0.16	0.20	...	..	1.57	.	2.72	0.43	.	.	0.61
94 TelecommEQ	0.19	.	...	2.03	.	.	.	.	0.04	.	.	0.54	0.36	.	.
95 HomeAppl	0.19	0.03	0.24	...	0.36	.	0.02	.	.	1.45	3.26	0.55	4.10	1.51	1.13
96 Computers	.	.	...	...	0.71	0.75	.	...	2.10	.	...	0.64	8.27	1.23	17.20
97 OfficeMach	0.88	0.32	...	...	.	1.01	.	...	2.79	.	.	0.30	.	2.02	.
98 Semicon	.	0.17	...	...	1.68	1.00	0.41	...	.	.	...	0.05	.	.	1.91
99 ElecMotor	.	.	46.58	.	0.83	1.86	.	15.96	0.56	.	.	0.13	.	0.94	1.41
100 Battery	1.54	0.18	...	1.32	0.13	0.05	.	.	0.17	.	1.41	0.08	1.63	1.08	0.21
101 ElecBulbs	.	0.02	...	.	0.38	0.14	.	.	.	0.07	3.87	0.57	0.91	.	0.78
102 IndlApp	1.21	0.02	0.04	0.01	0.32	0.19	0.28	0.76	0.62	.	1.84	0.34	.	1.18	0.01
103 Ship	3.16	0.22	...	...	0.47	0.31	.	...	0.17	5.04	.	0.62	1.30	.	.
104 Warships	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
105 RailroadEQ	3.43	.	.	...	1.14	0.94	9.03	...	0.30	0.92	...	...	.	1.42	6.47
106 Auto	0.86	14.60	...	.	...	.	3.56	...	.	.	...	.	.	0.71	3.71
107 Motorcycle	.	.	...	...	0.20	.	.	...	.	.	.	.	0.25	.	.
108 AutoParts	.	0.13	...	2.33	1.41	1.91	0.57	1.31	0.48	2.56	...	0.36	2.03	0.63	3.14
109 Aircraft	0.02	.	...	.	1.88	.	0.42	0.64	.	.	...	1.96	...	.	.
110 OtherTrans	...	...	...	...	...	...	.	...	0.30	18.50	...	...	4.74	.	.
111 Instrument	.	.	.	1.67	1.04	0.60	.	...	0.46	.	.	0.39	.	2.09	3.62
112 Optical	.	0.35	.	...	1.01	1.38	.	...	.	.	.	0.11	3.39	.	.
113 Watches	1.44	.	...	...	1.66	.	.	...	.	2.44	.	0.05	.	.	.
114 Jewellery	3.26	0.30	...	.	.	0.37	1.48	7.31	.	7.04	...	0.39	.	3.18	0.76
115 MusicInst	.	.	.	...	2.55	0.03	.	...	0.05	.	0.03	0.25	2.59	0.77	2.08
116 Sportng	0.96	0.07	.	3.92	1.26	.	0.10	0.47	.	0.28	0.45	0.61	1.68	0.51	0.55
117 Ordnance	1.44	...	.	1.57	1.63	.	1.47	3.10	1.84	.	.	0.78	.	10.84	6.84
118 ArtWork	.	.	0.29	.	6.65	1.05	.	0.42	.	0.69	.	0.22	...	.	2.18
119 OtherMfg	.	0.15	.	.	.	.	.	0.15	0.53	0.95	0.13	.	3.29	0.54	1.51
120 Scraps	.	0.03	0.12	0.13	0.36	0.28	.	.	.	2.12	.	0.08	.	.	0.88

TABLE 19: Share Capital Elasticity by Sector and Country in the French Import Market
 EXPORTER

SECTOR TITLE	CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
1 Cereals	.	4.95	..	15.28	2.89	4.62	6.06	15.45	19.54	..	.	..	..	.	.
2 Fruits	.	1.43	0.06	..	.	0.03	0.77	.	..	..	1.29	..	..	.	.
3 OtherCrop	0.10	2.46	.	..	9.37	0.01	.	5.11	..	1.97	0.64	..	..	.	3.29
4 Livestock	.	2.68	..	24.61	1.53	0.59	.	3.45	5.41	..	0.40	..	..	0.25	.
5 Silk	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.
6 Cotton	..	3.93	..	..	7.23	0.99	0.52	8.41	3.42	0.24	..	..	..	.	.
7 Wool	..	1.99	..	..	3.32	.	1.52	.	2.83	..	..	..	..	1.25	.
8 OtherFiber	..	..	..	..	2.53	0.69	13.45	.	..	..	..	..	..	1.13	.
9 Wood	..	3.53	..	.	2.56	2.11	1.06	.	..	..	..	..	..	.	0.13
10 Fish	4.18	1.74	..	..	.	.	1.16	2.25	4.49	..	0.09	..	..	.	0.19
11 IronOre	3.93	..	..	..	..	..	..	.	..	..	..	..	..	0.00	0.38
12 Coal	3.31	.	..	..	3.76	0.69	..	..	2.44	..	..	..	..	7.47	.
13 OthMetOre	0.76	.	0.16	..	.	5.82	..	4.25	.	..	..	..	..	.	0.83
14 Petroleum	..	..	.	..	..	..	..	..	.	..	..	..	..	5.74	0.30
15 NatGas	..	..	.	..	..	..	..	..	..	..	..	..	..	0.87	.
16 NonMetal	.	2.65	..	0.08	2.57	.	0.48	5.99	0.27	3.07	0.04	..	..	3.79	0.52
17 Elec	..	..	..	..	4.25	.	..	.	..	..	..	..	..	.	..
18 Meat	0.82	6.46	..	0.01	.	0.90	0.33	.	0.13	..	..	..	..	0.50	.
19 Dairy	..	.	..	..	3.30	0.43	.	.	4.75	..	..	..	..	.	4.70
20 PreFruit	3.25	.	..	..	.	.	.	2.17	4.67	..	..	..	..	5.61	.
21 Seafood	.	19.15	4.70	..	.	0.86	3.93	1.19	1.39	.	1.72	0.81	..	.	.
22 OilFats	..	..	..	..	.	1.55	.	.	..	..	..	..	..	.	1.71
23 GrainMill	..	2.43	..	..	.	.	1.34	5.46	7.05	..	..	..	..	.	.
24 Bakery	..	..	..	0.17	3.13	.	0.96	.	1.51	4.65	0.04	..	..	0.16	7.29
25 Sugar	..	1.17	..	..	2.25	0.52	.	.	..	..	..	..	..	.	0.31
26 Cocoa	..	0.26	..	10.99	4.15	1.36	.	0.42	7.27	..	..	..	..	0.98	0.13
27 OtherFood	.	.	..	..	.	2.59	4.38	.	3.65	1.31	.	..	5.40	2.39	.
28 Feeds	..	2.56	..	..	2.53	3.22	.	16.96	0.38	1.46	..	..	..	.	0.66
29 Alcohol	..	1.34	2.35	..	.	.	1.38	6.31	.	..	0.67	..	..	1.82	.
30 NonAlcohol	..	3.10	..	..	2.62	1.86	.	186.57	1.65	..	..	..	23.67	7.09	.
31 Tobacco	..	.	..	..	8.11	1.46	.	..	5.20	..	..	..	..	.	1.55
32 Yarns	0.94	0.15	..	.	0.44	.	0.33	2.02	0.69	4.69	0.51	0.26	..	.	2.65
33 CottonFabr	..	4.55	2.52	0.03	0.36	2.30	0.22	.	0.59	5.77	.	..	..	1.09	.
34 OthTextile	1.61	4.57	..	0.01	1.29	.	0.50	2.50	0.66	.	.	1.13	..	0.78	1.52
35 FloorCover	..	1.37	..	0.54	.	.	.	0.99	0.10	..	..	..	..	.	1.01
36 Apparel	..	0.17	..	0.02	1.18	0.21	1.00	0.72	1.59	..	..	0.34	..	.	.
37 Leather	1.53	2.07	..	0.07	0.15	.	0.88	1.26	0.10	0.90	.	..	17.18	3.91	2.79
38 LeatherPrd	..	0.29	0.72	..	2.51	.	0.66	.	0.17	1.63	0.03	1.27	..	0.02	1.81
39 Footwear	..	.	15.46	0.02	0.76	.	0.90	0.45	.	..	..	0.41	0.41	.	0.79
40 Plywood	.	2.52	..	0.07	3.40	.	0.34	.	.	..	..	..	..	0.25	2.08

TABLE 19: (continued)

SECTOR TITLE		EXPORTER														
		CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
41	OtherWood	0.61	2.79	..	0.17	.	0.50	1.27	.	0.93	0.00	0.38	2.67	.	.	
42	Furniture	...	0.80	..	0.16	0.97	.	1.40	0.24	0.01	..	0.01	..	18.73	2.78	
43	Pulp	.	.	..	1.22	0.75	0.87	...	4.23	.	...	..	..	.	.
44	Newsprint	9.20	...	..	25.55	.	.	...	...	.	..	..	..	1.98	...
45	Paper	3.50	8.40	..	.	.	0.34	0.59	4.14	0.17	1.70	...	..	.	2.61
46	Printing	0.66	2.40	..	0.07	0.30	0.64	1.13	2.19	1.35	.	0.56	.	.	5.06	
47	Chemical	1.31	.	...	0.10	0.43	.	0.77	0.74	.	1.81	0.01	..	...	4.99
48	Fertilizer	10.95	0.69	...	.	2.61	1.25	.	11.71	1.52	.	..	..	0.79	1.40
49	SynthFiber	...	0.19	...	0.04	0.01	.	0.11	3.71	0.41	6.01	..	...	.	2.84
50	Paints	0.32	1.63	..	...	1.14	.	1.62	0.21	0.27	.	..	..	0.52	5.79
51	Drugs	10.38	2.33	..	0.04	1.13	.	0.48	.	3.24	.	..	..	.	.
52	Soaps	0.99	0.89	..	0.37	2.84	.	.	5.26	0.48	4.05	...	..	.	12.40
53	OtherChem	.	1.32	...	1.15	0.63	.	1.14	2.22	9.92	0.03	2.28	...	.	.
54	PetroRefin	...	.	...	..	2.17	2.85	1.54	.	0.84	...	..	...	0.57	.
55	FuelOil	...	.	...	..	.	0.01	3.41	.	.	...	..	..	1.13	2.08
56	PetroProd	.	.	...	0.45	.	.	3.99	.	.	...	..	..	1.83	2.37
57	CoalProd	...	...	..	..	1.51	0.08	.	...	...	..	..	..	.	...
58	Tyre	...	3.59	..	.	0.92	0.99	0.74	.	3.42	0.71	...	1.32	12.23	2.09	
59	Rubber	2.47	.	..	.	0.41	0.34	.	4.32	1.11	2.73	.	1.09	5.96	.
60	Plastic	...	1.69	...	0.08	.	.	0.80	.	1.77	1.70	1.08	0.32	1.50	2.16	
61	Glass	...	0.43	...	0.08	0.23	.	0.77	1.71	2.27	2.99	...	...	6.19	0.93
62	Cement	...	.	..	13.22	2.47	.	2.00	.	0.49	...	...	..	0.98	5.03
63	Ceramics	...	1.12	...	..	2.08	1.21	.	.	3.87	.	..	4.00	14.18	0.78
64	NonMetProd	...	.	..	0.03	3.51	1.27	2.30	3.03	1.20	.	...	...	.	.
65	IronSteel	.	0.17	..	.	0.22	.	3.28	.	0.05	.	...	...	.	.
66	Copper	.	.	...	0.07	1.51	1.17	.	.	19.03	..	..	..	0.55	.
67	Aluminum	17.03	3.03	..	0.15	0.19	0.92	.	0.17	.	...	..	..	.	0.14
68	Nickel	2.79	1.75	..	...	0.16	.	.	...	0.26	...	...	...	3.76	1.71
69	LeadZinc	...	...	...	...	0.48	2.78	1.42	.	3.01	...	..	..	1.72	.
70	OtherMetal	.	.	...	...	0.55	.	.	...	.	0.12	...	...	2.52	0.33
71	MetalFurn	...	.	..	0.10	1.82	.	2.37	0.40	0.29	0.21	...	...	2.52	.
72	StrucMetal	...	.	..	0.03	.	.	.	2.93	1.49	...	...	..	.	3.22
73	Container	...	0.66	..	39.70	0.79	.	2.03	10.38	1.01	...	...	..	0.18	6.26
74	Wire	..	1.25	..	1.08	0.19	.	.	.	0.04	3.00	...	0.15	.	7.44	
75	Hardware	.	.	..	0.03	0.88	.	0.24	.	0.62	.	..	0.15	12.53	.
76	Boilers	...	0.82	..	0.07	0.02	1.41	0.69	13.99	0.15	...	..	..	.	18.94
77	AirEngine	5.57	.	..	..	7.73	9.67	...	...	.	..	...	...	2.28	0.07
78	IntEngine	...	.	4.44	.	3.66	1.12	0.74	.	0.31	0.42	..	..	3.00	5.15
79	PowerMach	..	.	..	...	1.78	.	.	...	.	...	..	..	1.20	.
80	AgriMach	0.04	0.20	..	0.04	1.46	.	0.41	4.10	0.52	.	..	..	.	.

TABLE 19: (continued)
SECTOR TITLE

		EXPORTER														
		CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
81	ConstrEQ	6.39	0.25	..	0.03	.	0.24	.	6.06	0.48	2.44	...	...	..	0.35	15.26
82	MetalMach	0.19	0.01	..	0.02	1.92	.	.	2.50	0.35	.	.	...	2.00	0.94	3.34
83	SewingMach	.	.	..	.	3.63	.	0.32	.	0.53	1.63	...	...	19.04	2.49	.
84	TextMach	...	0.27	..	.	.	0.79	.	1.53	1.56	.	..	..	14.28	0.11	.
85	PaperMach	1.33	1.52	..	0.04	.	1.90	0.94	0.19	0.29	1.31	..	..	..	2.34	6.15
86	PrintMach	...	2.08	..	...	2.37	0.83	0.05	2.10	0.56	6.32	..	..	...	1.86	1.74
87	FoodMach	...	0.61	..	.	.	.	0.26	.	.	6.52	..	..	..	0.96	6.39
88	SpecMach	2.01	.	..	0.17	2.44	2.08	.	3.00	1.18	8.93	..	..	.	.	1.97
89	ServMach	.	.	..	.	0.74	1.66	.	0.51	0.76	5.00	...	..	...	.	6.83
90	Pumps	...	.	..	.	0.21	0.54	.	3.95	.	6.52	...	...	15.98	.	0.67
91	MechEQ	0.85	3.33	..	.	0.77	.	0.12	.	0.27	4.64	.	..	13.62	1.11	7.93
92	OtherMach	...	1.93	...	.	2.28	0.52	0.18	.	0.58	0.71	.	...	.	.	4.51
93	RadioTV	...	.	..	0.11	1.16	0.15	0.19	3.02	.	.	.	0.13	4.48	3.73	.
94	TelecommEQ	2.09	.	...	.	0.93	0.95	.	0.08	.	.	...	1.78	.	1.88	.
95	HomeAppl	..	0.71	...	.	0.01	.	0.12	1.79	0.59	.	.	10.24	1.82	0.90	.
96	Computers	1.72	.	...	...	0.65	1.31	1.60	.	0.92	1.74	...	0.47	.	.	.
97	OfficeMach	.	.	...	0.11	1.09	0.30	0.49	4.43	2.39	.	2.50	2.83	.	.	.
98	Semicon	1.45	.	0.84	0.04	1.46	0.04	.	0.44	0.03	.	..	0.98	3.56	3.38	6.08
99	ElecMotor	...	0.92	...	0.23	4.36	.	1.69	1.04	.	0.77	...	...	8.64	5.61	2.47
100	Battery	...	0.11	...	0.19	0.85	.	.	0.02	0.58	1.66	.	..	6.36	1.39	.
101	ElecBulbs	...	0.62	...	0.25	.	0.44	0.03	1.48	.	1.41	...	0.50	12.40	.	1.20
102	IndlApp	3.49	0.94	0.06	0.14	0.25	0.35	.	1.31	0.63	0.53	...	..	5.66	0.95	.
103	Ship	...	2.48	..	...	.	.	4.80	0.19	0.50	.	...	...	11.28	6.83	3.04
104	Warships	...	...	..	..	...	...	...	...	...	...	...	..	..	...	...
105	RailroadEQ	...	8.78	..	.	4.48	.	0.49	1.81	2.55	...	...	..	..	1.34	2.33
106	Auto	...	1.91	..	...	0.70	.	0.05	2.27	.	.	..	..	..	.	2.23
107	Motorcycle	...	3.96	..	.	2.74	0.42	.	.	2.40	.	..	..	.	3.11	.
108	AutoParts	...	0.63	...	.	1.06	0.24	0.48	.	1.82	2.57	..	..	...	1.44	.
109	Aircraft	0.70	0.01	..	..	7.07	1.76	.	1.01	0.54	..	..	..	..	4.58	.
110	OtherTrans	..	...	..	...	...	...	6.63	5.71	.	...	...	...	8.20	4.47	12.00
111	Instrument	1.46	.	..	0.04	0.42	0.03	.	.	0.75	1.91	.	0.75	.	1.10	0.75
112	Optical	.	0.12	...	.	1.95	0.33	.	.	2.30	1.19	.	2.29	.	0.09	0.60
113	Watches	..	6.85	..	...	.	.	.	.	0.35	.	0.25	0.67	.	.	.
114	Jewellery	...	.	...	...	.	.	.	.	1.83	5.40	.	...	.	2.50	.
115	MusicInst	9.05	1.67	..	0.06	...	0.06	0.48	.	0.74	.	.	0.20	.	2.10	1.31
116	Sporting	.	.	.	0.04	0.99	.	.	.	1.24	.	0.25	0.38	1.81	0.99	.
117	Ordnance	...	2.95	...	.	1.09	.	.	.	.	.	...	...	.	8.17	29.46
118	ArtWork	5.74	.	...	.	.	0.71	0.78	1.74	1.19	2.85	.	...	...	.	.
119	OtherMfg	...	1.42	0.12	0.10	.	.	0.18	0.04	0.67	.	0.37	0.02	.	0.66	3.86
120	Scraps	6.72	.	.	0.05	0.94	0.57	1.19	.	0.20	.	..	...	.	0.24	1.51

TABLE 20: Share Capital Elasticity by Sector and Country in the German Import Market

SECTOR	TITLE	CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
1	Cereals	4.27	6.84	..	.	.	1.73	4.91	.	14.47	..	...	..	..	.	0.07
2	Fruits	...	2.07	...	0.01	2.05	0.25	0.35	2.17	37.02	..	..	..	..	.	1.26
3	OtherCrop	.	3.47	0.04	2.07	4.59	3.33	.	2.78	1.25	...	0.00	...	..	.	3.06
4	Livestock	.	.	0.03	0.03	3.23	2.73	0.53	.	8.29	..	..	..	..	1.38	0.87
5	Silk	..	...	..	..	...	...	..	...	.	0.20	0.04	...	..	0.30	0.45
6	Cotton	..	3.09	.	.	4.25	1.28	1.44	4.66	2.24	.	...	..	..	0.02	.
7	Wool	..	0.96	..	...	9.15	.	0.03	5.70	2.64	...	..	..	..	0.96	.
8	OtherFiber	..	...	...	..	1.61	3.16	0.05	...	8.89	..	..	..	...	1.71	.
9	Wood	.	1.89	...	.	.	0.36	.	.	.	.	..	...	..	.	0.05
10	Fish	6.00	.	..	...	0.77	4.49	.	1.94	.	.	..	...	...	0.07	1.72
11	IronOre	1.00	...	..	..	...	...	..	...	...	..	..	..	..	.	0.59
12	Coal	.	.	..	...	.	0.80	...	...	2.40	..	...	..	..	4.32	7.93
13	OthMetOre	.	.	.	...	0.52	...	...	5.64	3.56	...	..	...	..	.	2.37
14	Petroleum	..	..	..	..	..	...	...	...	2.73	..	..	..	..	2.05	0.60
15	NatGas	..	..	..	..	...	...	...	...	...	..	..	..	..	.	.
16	NonMetal	.	2.32	2.31	0.03	.	0.34	1.65	.	0.12	.	..	..	..	0.10	0.95
17	Elec	..	..	..	.	.	18.54	.	..	..	..	..	..	..	.	...
18	Meat	..	6.98	..	.	4.80	0.23	0.37	8.17	4.69	..	0.01	..	...	1.90	1.41
19	Dairy	...	.	..	0.28	2.59	.	.	.	4.47	..	..	..	..	0.33	.
20	PreFruit	.	.	...	0.09	6.24	.	0.97	4.18	8.03	...	0.04	...	.	0.27	2.79
21	Seafood	.	2.47	..	..	.	1.15	.	0.60	1.35	5.55	0.18	0.57	.	0.17	2.73
22	OilFats	...	17.81	...	0.39	3.56	.	.	9.89	0.79	.	1.69	..	..	1.08	.
23	GrainMill	...	18.72	...	...	.	.	.	.	5.17	..	..	..	..	0.22	8.25
24	Bakery	..	...	..	.	1.93	.	0.03	...	2.04	2.41	..	..	...	.	6.94
25	Sugar	..	.	.	.	2.67	0.41	...	...	.	..	...	..	..	8.62	.
26	Cocoa	...	1.27	...	0.00	.	1.94	.	4.97	0.68	...	0.11	..	..	.	7.83
27	OtherFood	0.14	.	...	.	.	1.13	.	3.94	1.81	8.64	0.04	...	5.41	5.89	.
28	Feeds	...	3.35	...	1.64	.	.	.	...	2.05	.	5.21	...	..	.	4.50
29	Alcohol	...	.	...	0.01	4.56	0.23	.	3.68	0.55	2.03	..	..	..	2.12	2.43
30	NonAlcohol	..	...	..	0.30	3.38	7.56	0.05	...	.	..	..	..	..	3.51	.
31	Tobacco	.	6.43	.	...	.	.	.	...	.	...	...	0.80	..	0.08	10.78
32	Yarns	.	3.63	...	0.10	1.72	0.29	0.09	0.91	0.35	2.61	0.26	0.18	.	0.70	0.75
33	CottonFabr	...	7.06	...	0.04	0.57	0.16	0.41	.	0.32	2.39	.	0.00	.	0.67	.
34	OthTextile	...	.	..	.	0.38	.	0.05	.	1.31	.	.	0.57	.	0.25	1.05
35	FloorCover	..	..	..	.	.	.	.	.	0.20	..	0.01	..	..	.	1.12
36	Apparel	...	0.86	...	0.02	0.43	0.24	0.36	4.92	1.44	.	.	0.43	2.27	.	.
37	Leather	2.73	1.04	...	0.06	0.24	.	0.13	1.29	.	.	.	...	.	0.47	0.68
38	LeatherPrd	..	.	...	0.15	5.23	.	0.57	2.71	1.28	1.65	0.06	1.01	.	.	0.66
39	Footwear	...	.	.	.	0.22	.	0.15	.	0.74	...	0.22	0.24	.	0.79	.
40	Plywood	.	.	..	0.15	0.63	.	.	.	0.78	...	..	...	.	1.25	2.13

TABLE 20: (continued)

SECTOR TITLE	EXPORTER														
	CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
41 OtherWood	.	8.96	..	0.01	.	.	1.36	1.10	0.38	...	0.02	0.49	2.13	.	0.02
42 Furniture	...	1.81	..	.	0.68	.	0.94	.	0.76	...	0.09	..	12.63	.	1.07
43 Pulp	.	1.94	...	.	1.18	.	4.41	4.45	.	...	..	..	..	.	4.24
44 Newsprint	.	...	..	0.02	2.21	.	0.55	..	.	..	..	..	..	0.17	.
45 Paper	3.44	4.74	..	0.01	.	0.44	1.57	1.61	.	2.10	...	..	..	.	0.90
46 Printing	...	.	..	.	1.48	.	1.62	.	0.66	.	.	2.62	2.85	0.51	2.04
47 Chemical	.	0.05	...	0.00	0.07	0.50	.	0.43	1.21	2.60	.	.	...	.	1.16
48 Fertilizer	...	1.40	...	0.03	2.96	.	1.30	.	0.50	.	..	..	..	2.54	0.91
49 SynthFiber	0.98	.	.	.	0.20	0.26	.	6.27	.	4.62	...	.	.	.	3.73
50 Paints	...	1.18	..	0.02	.	1.90	0.27	8.09	.	13.63	..	..	..	.	1.45
51 Drugs	0.97	0.95	0.04	0.00	0.99	1.03	0.04	1.10	1.12	.	.	...	...	.	.
52 Soaps	0.30	1.12	..	.	1.31	.	.	1.27	0.33	3.26	...	..	.	0.84	11.79
53 OtherChem	0.77	0.50	...	0.01	1.33	.	0.01	0.73	0.20	.	0.03	4.27	...	.	.
54 PetroRefin	...	.	..	0.38	0.40	.	2.23	.	5.61	...	...	..	..	.	3.33
55 FuelOil	...	.	...	...	.	0.97	.	...	3.24	..	..	..	..	1.41	0.69
56 PetroProd	1.15	.	..	0.11	0.75	1.00	5.56	.	3.85	.	...	..	..	0.32	.
57 CoalProd	...	2.03	...	...	.	2.48	...	8.78	3.78	...	...	..	..	.	3.54
58 Tyre	...	0.07	..	.	2.41	0.22	1.19	.	.	5.44	...	0.60	.	.	.
59 Rubber	4.33	.	...	.	0.40	0.10	0.97	.	1.85	1.97	0.03	.	.	0.50	.
60 Plastic	...	2.28	...	0.02	.	0.08	0.27	.	1.64	.	1.33	0.02	.	0.35	1.76
61 Glass	0.06	1.29	0.04	0.06	1.26	.	0.39	3.37	1.58	0.29	.	...	7.84	0.52	1.27
62 Cement	...	...	..	.	0.17	0.06	3.16	25.43	.	...	..	..	..	4.22	0.59
63 Ceramics	..	11.45	...	0.05	0.06	.	.	4.93	3.23	.	0.08	0.85	27.06	.	.
64 NonMetProd	...	0.32	...	0.03	3.79	.	1.03	.	0.17	.	...	0.63	.	.	2.33
65 IronSteel	0.41	.	...	0.03	0.57	.	1.95	3.97	0.34	.	...	.	10.57	1.00	.
66 Copper	.	.	...	0.10	0.18	0.21	.	1.98	.	7.17	...	..	..	1.45	.
67 Aluminum	...	5.70	..	0.05	0.79	0.03	2.31	4.69	.	9.92	...	..	..	0.63	.
68 Nickel	.	6.67	..	1.48	1.50	.	0.44	...	...	...	...	...	...	0.93	2.30
69 LeadZinc	.	.	...	0.20	0.55	1.70	.	23.63	1.56	...	...	..	..	2.05	.
70 OtherMetal	2.96	0.73	...	0.01	0.55	.	0.86	4.65	.	.	0.15	...	..	3.52	.
71 MetalFurn	...	.	..	0.03	2.01	.	1.48	.	.	.	0.73	5.18	14.91	0.65	.
72 StrucMetal	...	3.52	..	0.13	.	0.02	.	.	1.02	...	..	..	..	.	.
73 Container	...	3.81	..	0.04	.	0.85	.	.	0.41	...	...	...	...	0.09	.
74 Wire	..	1.14	..	0.29	.	0.44	.	3.16	0.38	7.94	.	1.69	.	.	.
75 Hardware	2.83	.	..	0.03	0.50	0.26	0.45	.	0.62	.	.	0.27	9.05	.	0.03
76 Boilers	...	8.01	...	0.07	.	3.46	0.85	.	1.18	.	..	..	..	.	17.30
77 AirEngine	5.56	.	...	...	3.90	2.79	.	...	1.23	.	...	...	..	1.16	.
78 IntEngine	...	0.18	0.77	0.21	0.07	1.74	1.81	.	1.55	.	...	.	..	1.23	0.87
79 PowerMach	.	3.72	...	.	.	.	.	.	0.00	.	..	..	...	.	.
80 AgriMach	...	0.41	..	.	1.05	.	2.84	9.63	0.20	.	..	..	..	.	5.47

TABLE 20: (continued)

SECTOR TITLE		EXPORTER														
		CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
81	ConstrEQ	0.87	3.58	..	0.19	.	.	0.65	.	1.32	3.05	...	...	..	.	.
82	MetalMach	.	0.49	..	.	.	.	.	.	0.05	.	0.48	.	0.68	0.76	.
83	SewingMach	...	1.83	..	0.03	3.27	.	.	.	1.45	0.15	..	0.30	7.26	1.94	.
84	TextMach	...	1.83	..	.	.	.	0.75	.	.	3.25	...	...	..	.	1.43
85	PaperMach	0.86	0.37	..	0.05	.	0.38	0.54	6.15	.	1.55	..	..	...	1.03	1.48
86	PrintMach	...	2.08	..	.	1.43	.	.	.	0.95	4.25	...	..	...	1.35	0.42
87	FoodMach	...	0.75	..	0.01	0.37	1.25	.	5.09	1.05	2.23	..	..	..	0.38	.
88	SpecMach	4.87	.	..	0.02	2.36	.	.	.	2.43	6.26	..	..	.	.	2.52
89	ServMach	...	.	..	0.10	2.01	.	0.24	0.22	0.67	.	...	..	.	0.03	1.65
90	Pumps	21.72	0.44	...	0.04	.	0.17	.	0.14	0.89	.	...	..	2.75	0.70	.
91	MechEQ	...	5.98	..	0.00	.	0.16	0.82	.	.	0.12	0.04	...	8.98	0.72	2.33
92	OtherMach	0.93	0.38	...	0.05	2.61	0.67	.	0.34	0.14	.	0.97	...	.	0.19	0.44
93	RadioTV	2.63	.	...	0.11	.	0.20	0.20	.	.	.	3.45	.	.	1.36	.
94	TelecommEQ	.	.	...	.	1.62	0.04	0.41	.	0.58	5.10	...	0.46	3.57	1.23	.
95	HomeAppl	...	.	..	.	0.07	.	0.37	1.54	.	0.84	...	..	.	.	0.66
96	Computers	4.14	.	..	0.19	.	1.33	0.97	.	0.22	.	...	0.62	4.74	.	4.87
97	OfficeMach	...	1.15	0.03	.	3.60	.	1.91	.	0.69	.	4.25	.	0.22	1.06	3.81
98	Semicon	1.89	0.12	...	.	6.56	.	.	3.10	0.63	.	..	0.14	.	.	.
99	ElecMotor	0.10	0.73	...	1.12	8.37	.	.	.	6.23	1.83	.	...	.	.	.
100	Battery	...	4.46	...	.	0.66	.	.	6.50	3.17	0.84	...	.	0.96	.	2.43
101	ElecBulbs	...	1.44	..	0.08	.	0.59	0.29	.	0.72	0.72	.	0.07	.	.	4.87
102	IndlApp	5.81	0.57	...	.	0.34	0.25	.	.	0.57	0.85	...	0.39	2.90	2.41	.
103	Ship	...	0.79	...	19.87	4.08	1.42	.	.	2.94	.	...	...	0.34	.	3.33
104	Warships	..	...	..	...	...	...	...	..	...	...	..	...	...	...	...
105	RailroadEQ	...	12.55	...	0.05	6.27	.	3.97	.	5.67	...	..	..	..	9.04	39.42
106	Auto	..	1.10	...	0.17	1.02	.	.	9.13	0.35	.	..	...	..	.	6.34
107	Motorcycle	...	1.08	..	.	.	.	.	.	.	.	...	...	..	.	.
108	AutoParts	.	0.20	0.37	0.10	0.32	0.70	0.93	2.22	0.12	.	..	..	..	.	0.00
109	Aircraft	1.00	2.86	..	...	0.92	3.04	1.85	.	.	...	...	...	...	.	.
110	OtherTrans	..	...	..	1.26	...	.	.	6.57	2.81	...	...	...	8.52	.	...
111	Instrument	.	.	..	0.02	.	0.25	1.00	5.06	1.32	1.30	.	0.07	5.21	0.86	.
112	Optical	6.27	.	..	0.04	5.35	0.16	.	.	1.28	0.73	.	0.13	0.52	0.72	0.58
113	Watches	...	7.32	..	0.06	2.31	2.04	.	.	0.38	.	1.75	0.18	7.71	.	4.41
114	Jewellery	0.22	0.16	0.23	0.01	.	0.28	.	6.19	.	2.22	.	...	.	.	1.48
115	MusicInst	.	0.86	..	0.08	2.44	0.07	0.22	.	0.51	.	0.06	0.50	5.98	1.38	.
116	Sporting	.	.	...	0.01	1.81	.	.	2.26	1.00	1.48	0.29	0.27	.	1.32	.
117	Ordinance	.	.	...	0.63	.	.	0.83	2.49	2.39	.	.	...	9.97	3.28	6.16
118	ArtWork	.	.	...	.	2.00	0.09	0.27	.	0.59	0.59	0.05	...	.	0.71	.
119	OtherMfg	...	0.41	1.37	0.07	.	.	0.48	2.94	.	.	0.13	0.02	.	0.17	.
120	Scraps	1.16	.	...	0.04	0.04	0.57	1.00	.	1.03	0.08	.	2.52	10.44	.	3.09

TABLE 21: Share Capital Elasticity by Sector and Country in the Japanese Import Market

SECTOR TITLE	CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
1 Cereals	.	.	..	..	..	..	..	..	..	..	1.34	...	..	.	.
2 Fruits	0.82	.	0.07	..	1.39	...	0.09	.	...	...	.	0.83	1.52	6.53	.
3 OtherCrop	0.45	0.59	.	..	..	...	...	...	...	...	0.06	.	.	.	2.39
4 Livestock	.	.	...	..	.	.	1.25	..	...	...	.	...	5.89	4.79	0.09
5 Silk	..	..	..	..	..	..	...	...	...	..	0.02	...	1.51	...	.
6 Cotton	..	..	..	..	..	..	...	..	..	..	0.43	...	..	4.43	0.07
7 Wool	...	4.35	..	..	...	18.44	5.23	.	...	0.14	.	...	1.58	.	0.53
8 OtherFiber	...	..	...	..	6.85	4.77	..	...	..	...	.	...	16.20	...	0.93
9 Wood	.	.	..	..	..	...	...	..	..	..	0.15	.	.	1.18	0.22
10 Fish	1.31	0.69	0.06	..	..	2.11	...	...	.	...	0.00	.	2.94	2.14	0.52
11 IronOre	2.17	...	..	..	..	..	..	..	..	..	..	...	..	0.13	0.61
12 Coal	0.82	3.78	..	..	..	..	...	..	..	..	..	...	..	1.40	1.27
13 OthMetOre	0.35	1.02	..	..	...	..	...	..	..	...	0.17	...	..	.	.
14 Petroleum	...	..	0.81	..	..	..	..	..	..	...	..	...	..	.	0.02
15 NatGas	...	0.20	..	..	..	...	...	..	..	..	..	...	..	...	0.05
16 NonMetal	.	0.74	..	..	7.47	3.43	9.21	2.62	.	.	.	0.14	0.24	.	.
17 Elec	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18 Meat	.	.	0.02	..	...	13.73	..	..	...	...	..	..	..	3.50	.
19 Dairy	1.54	.	..	9.44	.	.	2.11	1.05	...	6.66	.	.	.	1.69	.
20 PreFruit	.	2.59	0.38	83.72	..	.	.	.	0.27	0.47	0.02	0.62	0.07	0.53	0.13
21 Seafood	1.58	5.72	0.05	..	..	...	...	...	.	.	0.14	0.09	.	.	3.77
22 OilFats	.	2.82	...	..	...	.	.	.	.	.	0.22	0.27	20.48	5.14	.
23 GrainMill	.	1.71	..	..	..	...	...	..	...	...	..	...	..	..	.
24 Bakery	.	.	..	9.64	..	0.00	.	0.44	...	...	0.04	.	16.85	9.41	3.35
25 Sugar	...	.	..	...	..	...	..	..	...	...	0.94	.	5.80	.	.
26 Cocoa	65.85	1.07	...	0.26	.	0.96	2.57	1.62	33.05	.	.	1.22	.	0.42	1.70
27 OtherFood	.	.	...	...	.	3.79	1.51	.	1.60	.	.	.	4.73	.	.
28 Feeds	3.99	13.00	...	...	..	0.63	.	...	21.77	.	...	.	15.16	2.66	.
29 Alcohol	.	0.43	.	...	6.63	2.26	0.26	0.70	5.58	0.41	0.63	.	7.05	2.25	5.42
30 NonAlcohol	70.68	.	..	...	...	3.67	1.53	...	..	39.58	.	.	.	.	7.33
31 Tobacco	...	4.08	..	...	...	...	...	7.78	..	.	.	...	.	8.22	22.84
32 Yarns	..	0.11	...	...	...	2.21	.	2.53	15.94	.	0.06	0.27	.	2.34	.
33 CottonFabr	..	.	...	0.02	.	.	.	.	...	0.52	.	0.05	0.63	0.67	.
34 OthTextile	0.60	1.32	..	0.22	3.06	.	.	.	..	..	.	0.18	1.45	0.58	0.08
35 FloorCover	6.09	0.04	...	5.20	..	..	0.46	.	0.23	1.66	.	.	.	.	.
36 Apparel	0.75	.	..	...	..	0.95	.	0.14	0.19	0.55	.	.	2.63	0.38	1.25
37 Leather	0.24	2.37	...	..	...	..	..	1.38	4.08	1.05	.	6.19	19.19	3.02	.
38 LeatherPrd	...	0.07	...	...	...	1.61	1.87	2.15	0.86	.	0.14	.	4.06	.	.
39 Footwear	...	2.39	...	...	0.93	1.52	.	.	.	.	.	.	.	.	.
40 Plywood	.	6.72	...	..	..	...	...	...	..	...	.	...	.	1.11	.

TABLE 21: (continued)

SECTOR TITLE	EXPORTER														
	CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
41 OtherWood	3.78	.	...	...	..	2.82	.	.	1.69	0.54	0.02	0.11	0.90	.	.
42 Furniture	0.97	9.15	..	8.62	9.46	0.19	.	.	.	.	.	0.00	3.82	.	.
43 Pulp	.	.	...	..	...	...	...	...	...	..	..	..	...	3.34	4.23
44 Newsprint	9.80	6.56	..	..	...	...	...	...	..	..	..	..	..	.	...
45 Paper	.	4.05	..	45.66	.	.	.	...	0.34	0.15	.	.	.	1.28	4.79
46 Printing	7.49	.	..	0.05	.	.	0.58	0.72	3.56	0.65	.	.	.	0.43	1.42
47 Chemical	1.18	0.49	0.09	0.26	0.71	2.53	0.48	1.01	.	.	.	0.75	.	.	1.77
48 Fertilizer	.	0.26	..	..	1.31	0.55	0.94	.	...	.	3.97	1.28	4.65	.	.
49 SynthFiber	2.20	1.17	4.29	...	0.05	0.78	.	...	...	.	0.31	.	.	.	.
50 Paints	9.00	0.36	..	..	2.59	.	2.13	.	...	2.08	...	.	10.83	.	2.53
51 Drugs	0.86	2.84	..	0.15	.	0.49	.	0.47	12.50	1.41	0.01	0.02	0.72	0.13	3.45
52 Soaps	7.83	0.93	...	...	13.97	1.25	0.67	.	...	0.08	0.73	0.01	1.79	.	.
53 OtherChem	0.88	1.67	30.63	..	.	.	1.22	1.81	1.89	0.73	0.08	0.29	.	.	.
54 PetroRefin	.	.	...	...	...	...	...	...	...	.	.	0.05	...	6.95	.
55 FuelOil	9.62	7.78	...	...	...	...	...	...	...	.	.	2.33	...	.	.
56 PetroProd	4.85	.	..	...	.	.	5.50	.	...	.	.	3.88	.	.	9.68
57 CoalProd	..	...	...	..	...	...	5.83	...	..	..	11.46	6.51	.	0.78	...
58 Tyre	5.13	13.95	..	.	3.68	1.19	1.19	.	.	.	..	.	0.97	.	6.89
59 Rubber	6.15	1.46	..	.	1.09	0.07	.	.	...	0.16	0.10	.	.	1.04	.
60 Plastic	.	1.16	...	0.10	0.82	.	0.05	0.37	0.23	.	.	0.00	0.66	.	.
61 Glass	...	.	2.65	.	2.41	.	1.26	.	3.91	1.18	0.08	0.08	4.51	2.00	.
62 Cement	...	3.81	...	..	...	12.20	...	..	..	...	...	4.73	.	16.85	.
63 Ceramics	...	3.66	...	0.70	3.92	1.23	0.14	.	10.35	0.90	...	.	.	1.70	2.11
64 NonMetProd	.	2.09	...	2.85	0.41	1.33	2.87	.	.	0.05	0.04	0.39	.	1.07	.
65 IronSteel	.	.	...	.	...	0.03	1.60	...	7.01	0.21	.	.	2.04	.	0.42
66 Copper	6.02	.	...	..	...	...	...	...	..	...	.	.	.	.	0.21
67 Aluminum	.	.	..	.	.	1.83	3.77	...	9.98	1.59	.	0.35	7.58	1.33	.
68 Nickel	4.27	1.98	..	...	...	...	.	...	..	.	...	...	...	0.05	4.49
69 LeadZinc	.	.	.	..	6.42	23.58	.	..	...	...	0.09	0.53	7.69	3.44	0.53
70 OtherMetal	4.87	.	.	...	3.15	.	7.44	...	.	.	0.14	0.02	0.94	0.77	0.82
71 MetalFurn	15.41	.	...	0.13	...	1.69	2.39	3.30	.	0.11	0.01	0.43	.	.	.
72 StrucMetal	12.08	4.92	...	...	...	2.06	.	.	...	0.92	.	.	.	3.74	.
73 Container	...	4.69	...	...	...	3.48	.	.	...	1.49	...	1.05	.	1.37	1.46
74 Wire	...	0.66	...	...	.	.	.	.	...	0.24	.	.	.	1.83	0.39
75 Hardware	.	1.31	..	..	.	0.71	.	.	.	0.50	0.09	.	.	.	.
76 Boilers	...	0.91	...	...	...	...	.	.	...	2.35	...	1.12	...	2.16	2.66
77 AirEngine	.	0.77	..	..	..	...	...	..	..	0.77	..	..	..	...	...
78 IntEngine	6.82	0.09	.	.	...	2.89	0.60	.	...	0.90	...	2.43	3.90	1.70	21.44
79 PowerMach	.	3.31	..	...	...	.	.	6.16	...	2.50	.	0.25	.	5.90	...
80 AgriMach	.	1.15	..	.	0.33	2.20	0.97	1.61	...	0.11	...	0.21	9.21	4.21	.

TABLE 21: (continued)

SECTOR	TITLE	EXPORTER														
		CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
81	ConstrEQ	2.73	0.48	...	62.17	1.91	4.53	2.99	.	...	0.06	...	0.85	.	2.02	19.25
82	MetalMach	1.17	0.69	..	0.08	.	.	.	0.89	.	.	0.65	0.10	9.48	1.03	0.01
83	SewingMach	...	1.72	..	.	5.01	.	0.39	.	...	1.06	...	0.10	1.97	0.05	2.81
84	TextMach	...	0.63	..	...	0.03	.	0.47	.	13.81	0.14	..	0.25	17.28	1.08	0.58
85	PaperMach	.	0.76	..	...	..	0.29	.	.	.	0.94	...	.	.	1.37	...
86	PrintMach	...	1.21	..	...	..	57.92	0.26	0.41	...	1.25	...	0.24	.	.	5.10
87	FoodMach	...	0.65	...	.	...	3.00	.	0.56	.	0.29	...	1.76	.	.	7.02
88	SpecMach	2.74	.	..	.	0.30	1.33	4.02	0.29	.	.	...	0.38	25.94	22.10	3.06
89	ServMach	3.90	0.26	..	0.53	7.97	.	2.14	0.85	.	0.87	...	0.24	.	0.22	.
90	Pumps	.	0.47	...	0.03	.	1.81	0.75	4.98	8.19	.	0.49	0.64	.	.	1.49
91	MechEQ	.	1.28	..	1.33	...	.	5.54	.	20.04	1.15	...	.	.	0.29	.
92	OtherMach	1.01	2.98	...	0.06	1.13	0.33	.	.	...	0.59	.	.	9.57	0.48	7.44
93	RadioTV	1.96	1.86	16.45	...	.	.	.	.	...	0.95	0.08	.	2.16	1.15	0.37
94	TelecommEQ	.	.	...	...	0.69	0.26	0.33	.	...	0.83	3.99	.	.	0.50	1.21
95	HomeAppl	24.65	.	...	...	0.42	0.51	0.70	.	.	2.31	4.59	0.68	0.63	0.58	5.69
96	Computers	0.26	0.15	0.18	...	...	2.39	1.63	4.78	...	1.61	...	1.02	0.16	2.32	3.44
97	OfficeMach	...	0.78	...	..	...	...	2.17	2.29	...	.	2.12	.	.	.	9.83
98	Semicon	.	0.05	...	...	...	1.39	2.44	0.80	..	2.03	...	.	.	2.22	.
99	ElecMotor	...	2.78	...	...	...	.	2.09	.	...	.	5.78	0.19	14.86	3.69	6.17
100	Battery	4.86	2.09	...	...	.	.	1.47	...	...	0.42	.	8.40	.	11.62	.
101	ElecBulbs	9.10	0.78	...	...	.	1.86	2.17	.	...	.	.	.	.	.	0.29
102	IndlApp	0.76	1.77	0.82	0.10	.	0.87	.	.	9.27	0.43	.	.	1.56	1.01	0.30
103	Ship	6.38	.	..	..	...	45.76	17.28	13.95	...	13.35	...	22.19	9.72	9.60	.
104	Warships	...	...	..	..	...	...	...	...	...	...	...	...	...	...	...
105	RailroadEQ	...	12.59	..	..	...	...	7.75	...	...	.	.	35.95	...	1.12	...
106	Auto	0.63	4.87	...	...	0.46	.	1.07	1.94	..	.	..	.	...	1.98	.
107	Motorcycle	...	6.02	...	9.53	14.11	.	.	3.67	...	1.38	.	.	.	.	.
108	AutoParts	.	2.25	...	6.70	4.03	.	1.76	2.14	...	.	...	.	.	0.52	2.23
109	Aircraft	.	.	..	..	..	3.37	.	.	..	1.56	..	..	..	...	...
110	OtherTrans	...	...	..	...	...	...	...	...	...	...	...	.	18.58	...	...
111	Instrument	.	.	..	0.00	...	0.08	.	.	...	0.42	...	.	.	.	1.18
112	Optical	4.59	.	...	0.00	...	0.74	1.10	.	...	3.32	2.10	0.24	3.70	1.33	3.54
113	Watches	..	1.68	...	...	..	0.75	.	.	...	0.72	3.64	0.46	6.14	.	3.28
114	Jewellery	..	.	...	...	.	1.28	.	0.67	11.82	.	.	.	0.98	0.27	0.30
115	MusicInst	.	2.33	...	0.33	...	0.27	1.27	.	2.71	0.18	.	.	.	0.03	5.69
116	Sporting	.	2.17	...	0.11	...	0.83	.	.	3.58	1.55	0.09	0.04	.	0.51	4.05
117	Ordnance	..	5.29	..	..	...	...	3.19	...	...	2.10	..	...	..	11.46	..
118	ArtWork	...	.	...	...	6.80	0.16	0.64	0.87	.	0.66	.	0.55	...	2.30	1.11
119	OtherMfg	.	0.85	..	0.08	...	1.07	0.36	0.26	7.40	.	0.02	.	3.15	.	3.26
120	Scraps	.	.	0.91	...	.	0.70	1.37	.	.	.	0.08	0.40	.	.	0.77

each of the 15 exporters in the German import market are displayed. In Sector 98 ("Semiconductors and integrated circuits"), for instance, we observe that the estimated share capital elasticity is 1.89 for the exporter Canada, 0.12 for USA, 6.56 for Belgium-Luxembourg, 3.1 for Spain, 0.63 for UK, and 0.14 for South Korea. The double-dot in the exporter China's cell indicates that Germany never imported "Semiconductors and integrated circuits (98)" from China throughout the historical period (1974-91). The triple-dot in the exporter Mexico's cell indicates that the particular share equation was not estimated due to a lack of sufficient observations in the sample period. The single-dot in the cells of other exporters indicates that the capital term was dropped from these share equations due to a perverse sign. Overall, the estimated share capital elasticities vary considerably by exporter in each import market.

Table 22 (pp. 120-121) illustrates the variation in size of the capital parameters in the estimated share equations. Here, "NEQ" shows the number of share equations estimated in a given sector, and "KEQ" refers to the number of share equations with a capital term. " $Ke \leq 1$ " indicates the number of share equations whose capital parameters are less than or equal to 1 (in absolute value), while " $Ke \leq 2$ ", " $Ke \leq 3$ " and " $Ke \leq 5$ " refer to the number of share equations whose capital parameters are less than or equal to 2, 3, or 5. " $Ke > 5$ " shows the number of share equations whose capital parameters are greater than 5.

Table 22: Size Variations in the Estimated Capital Parameters

SECTOR TITLE	NEQ	KEQ	Ke<=1	Ke<=2	Ke<=3	Ke<=5	Ke>5
1 Unmilled cereals	112 (99)	64 (58)	8 (25)	21 (43)	24 (43)	32 (50)	32 (8)
2 Fresh fruits & vegs	150 (100)	96 (58)	38 (25)	65 (47)	72 (55)	77 (56)	19 (2)
3 Other crop	162 (100)	107 (76)	42 (17)	55 (29)	74 (53)	88 (73)	19 (2)
4 Livestock	143 (100)	88 (73)	28 (28)	38 (56)	44 (60)	60 (70)	28 (4)
5 Silk	55 (99)	25 (37)	12 (37)	17 (37)	20 (37)	23 (37)	2 (0)
6 Cotton	107 (94)	70 (41)	25 (19)	32 (20)	38 (22)	51 (30)	19 (12)
7 Wool	135 (100)	78 (57)	24 (31)	33 (40)	45 (48)	60 (55)	18 (2)
8 Other natural fibers	91 (99)	47 (49)	13 (23)	22 (32)	27 (41)	36 (47)	11 (2)
9 Crude wood	117 (100)	63 (65)	26 (54)	40 (61)	45 (63)	52 (64)	1 (1)
10 Fishery	145 (100)	92 (81)	28 (50)	44 (65)	54 (71)	68 (77)	24 (4)
11 Iron ores	49 (100)	31 (77)	9 (55)	17 (62)	18 (62)	21 (68)	10 (9)
12 Coal	79 (97)	51 (81)	13 (18)	26 (47)	29 (49)	39 (62)	12 (19)
13 Nonferrous metal ore	126 (99)	53 (44)	26 (25)	34 (37)	38 (43)	45 (44)	8 (0)
14 Crude petroleum	50 (99)	26 (80)	12 (53)	18 (74)	20 (76)	21 (77)	5 (3)
15 Natural gas	41 (96)	19 (35)	8 (34)	9 (34)	9 (34)	12 (35)	7 (0)
16 Non-metallic ore	188 (100)	105 (55)	42 (28)	59 (40)	71 (44)	87 (51)	18 (4)
17 Electrical energy	21 (63)	7 (21)	0 (0)	1 (4)	1 (4)	4 (12)	3 (9)
18 Meat	150 (100)	98 (72)	32 (20)	49 (46)	57 (57)	75 (67)	23 (4)
19 Dairy product	150 (100)	81 (70)	22 (40)	38 (52)	43 (54)	61 (66)	20 (4)
20 Preserved fruits,veg	173 (100)	101 (75)	44 (32)	57 (42)	66 (65)	79 (69)	22 (6)
21 Preserved seafood	171 (100)	111 (59)	37 (15)	59 (26)	71 (30)	88 (46)	23 (13)
22 Veg & animal oil,fats	147 (99)	78 (51)	25 (20)	34 (32)	42 (39)	49 (41)	29 (10)
23 Grain mill product	122 (100)	69 (74)	10 (24)	17 (30)	22 (34)	31 (41)	38 (33)
24 Bakery products	153 (100)	93 (70)	30 (27)	44 (42)	56 (56)	67 (67)	26 (3)
25 Sugar	88 (93)	45 (52)	11 (19)	19 (29)	25 (33)	29 (42)	16 (9)
26 Cocoa, chocolate,etc	165 (100)	102 (75)	32 (24)	54 (49)	61 (55)	73 (69)	29 (5)
27 Food products,nec	191 (100)	109 (53)	24 (13)	48 (24)	60 (29)	78 (41)	31 (13)
28 Prepared animal feed	150 (100)	77 (47)	10 (3)	23 (14)	36 (33)	49 (39)	28 (7)
29 Alcoholic beverages	164 (100)	113 (79)	41 (37)	58 (55)	71 (66)	84 (74)	29 (5)
30 Nonalcoholic beverage	123 (99)	62 (53)	18 (16)	26 (23)	31 (29)	39 (32)	23 (20)
31 Tobacco product	125 (100)	64 (77)	11 (3)	21 (18)	29 (42)	37 (59)	27 (18)
32 Yarns and threads	206 (100)	138 (62)	71 (45)	91 (52)	110 (57)	121 (60)	17 (3)
33 Cotton fabrics	196 (100)	105 (44)	56 (31)	66 (39)	74 (41)	87 (43)	18 (1)
34 Other textile prod	213 (100)	131 (55)	76 (41)	94 (48)	104 (52)	118 (54)	13 (1)
35 Floor coverings	162 (100)	77 (45)	31 (22)	47 (38)	51 (43)	54 (43)	23 (2)
36 Wearing apparel	190 (100)	113 (48)	63 (33)	79 (42)	89 (46)	101 (47)	12 (0)
37 Leather and hides	190 (100)	126 (68)	42 (23)	66 (35)	78 (44)	98 (58)	28 (10)
38 Leather products	193 (100)	116 (67)	58 (47)	84 (59)	94 (64)	98 (65)	18 (1)
39 Footwear	176 (100)	101 (64)	54 (53)	67 (57)	74 (59)	84 (62)	17 (1)
40 Plywood and veneer	126 (100)	57 (35)	19 (9)	30 (23)	35 (28)	46 (30)	11 (6)
41 Other wood products	195 (100)	121 (53)	54 (30)	79 (43)	93 (49)	108 (50)	13 (2)
42 Furnitures,fixtures	190 (100)	119 (71)	52 (38)	75 (60)	85 (61)	96 (69)	23 (2)
43 Pulp and waste paper	116 (100)	63 (48)	20 (27)	29 (33)	34 (38)	50 (46)	13 (2)
44 Newsprint	72 (89)	35 (69)	8 (57)	12 (62)	14 (62)	18 (63)	17 (6)
45 Paper products	190 (100)	119 (60)	36 (29)	64 (48)	76 (52)	95 (58)	24 (2)
46 Printing,publishing	204 (100)	116 (61)	61 (43)	83 (54)	101 (58)	109 (59)	7 (2)
47 Basic chemicals	222 (100)	145 (62)	76 (39)	110 (56)	128 (59)	138 (62)	7 (0)
48 Fertilizer	169 (100)	99 (58)	38 (31)	62 (44)	75 (53)	87 (57)	12 (1)
49 Synthetic resin, fiber	207 (100)	129 (63)	53 (43)	79 (55)	91 (57)	110 (61)	19 (2)
50 Paints and varnishes	160 (100)	106 (56)	30 (33)	51 (48)	65 (50)	81 (54)	25 (2)
51 Drugs and medicines	201 (100)	136 (65)	71 (38)	102 (56)	113 (62)	126 (64)	10 (1)
52 Soaps & other toilet	182 (100)	115 (71)	46 (41)	73 (65)	80 (67)	90 (69)	25 (2)
53 Chemical product,nec	205 (100)	123 (58)	61 (34)	83 (43)	97 (47)	110 (53)	13 (6)
54 Petroleum refinery	133 (99)	69 (45)	24 (12)	34 (17)	45 (31)	52 (35)	17 (9)
55 Fuel oil	93 (98)	48 (41)	12 (16)	18 (29)	25 (33)	34 (37)	14 (4)
56 Product of petroleum	164 (99)	91 (62)	22 (17)	38 (31)	50 (34)	65 (44)	26 (18)
57 Product of coal	77 (97)	50 (61)	13 (18)	18 (34)	24 (35)	34 (55)	16 (6)
58 Tyre and tube	184 (100)	120 (66)	42 (28)	69 (49)	79 (53)	94 (56)	26 (10)
59 Rubber products,nec	204 (100)	117 (62)	42 (28)	72 (52)	85 (57)	102 (60)	15 (2)
60 Plastic products,nec	210 (100)	126 (65)	78 (51)	99 (61)	112 (63)	116 (64)	10 (1)
61 Glass	202 (100)	132 (69)	61 (34)	96 (60)	111 (63)	119 (68)	13 (0)
62 Cement	106 (99)	59 (44)	17 (28)	26 (30)	31 (31)	40 (37)	19 (7)

Table 22: (continued)

SECTOR TITLE	NEQ	KEQ	Ke<=1	Ke<=2	Ke<=3	Ke<=5	Ke>5
63 Ceramics	205 (100)	126 (49)	40 (24)	55 (30)	73 (36)	99 (43)	27 (6)
64 Nonmetallic min prod	196 (100)	116 (63)	44 (24)	66 (47)	89 (56)	105 (62)	11 (1)
65 Basic iron and steel	203 (100)	123 (73)	64 (52)	83 (63)	95 (67)	106 (70)	17 (4)
66 Copper	163 (99)	96 (66)	36 (30)	53 (55)	65 (59)	77 (63)	19 (3)
67 Aluminum	169 (100)	104 (64)	30 (23)	47 (37)	56 (40)	76 (47)	28 (17)
68 Nickel	128 (98)	77 (70)	19 (18)	33 (32)	44 (50)	62 (67)	15 (3)
69 Lead and zinc	136 (99)	82 (66)	24 (34)	39 (48)	53 (58)	62 (62)	20 (4)
70 Other nonferrous met	171 (100)	96 (65)	41 (28)	55 (51)	68 (57)	78 (62)	18 (3)
71 Metal furnitures	191 (100)	112 (61)	48 (29)	68 (43)	80 (48)	92 (54)	20 (6)
72 Structural metal prod	156 (100)	76 (38)	32 (25)	46 (33)	54 (36)	60 (37)	16 (1)
73 Metal container	151 (100)	94 (66)	34 (46)	51 (52)	57 (55)	75 (64)	19 (2)
74 Wire products	189 (100)	107 (57)	44 (34)	65 (46)	76 (51)	89 (55)	18 (2)
75 Hardware	222 (100)	131 (64)	83 (51)	106 (59)	112 (60)	121 (63)	10 (1)
76 Boilers and turbines	147 (99)	86 (52)	27 (20)	37 (27)	51 (39)	57 (41)	29 (11)
77 Aircraft engines	110 (99)	74 (67)	18 (36)	31 (42)	40 (45)	52 (49)	22 (17)
78 Internal combust eng	167 (100)	113 (68)	41 (27)	72 (53)	84 (56)	98 (65)	15 (3)
79 Other power machines	152 (100)	75 (56)	18 (6)	28 (23)	38 (31)	52 (40)	23 (16)
80 Agricultural machine	173 (100)	98 (69)	50 (42)	65 (51)	75 (61)	83 (67)	15 (2)
81 Construction equip	185 (100)	125 (70)	52 (29)	72 (50)	83 (59)	101 (67)	24 (3)
82 Metalworking machine	205 (100)	118 (47)	57 (26)	86 (40)	97 (42)	108 (45)	10 (2)
83 Sewing machines	191 (100)	106 (43)	41 (15)	65 (28)	76 (34)	91 (39)	15 (5)
84 Textile machinery	167 (100)	96 (52)	39 (31)	62 (42)	67 (47)	77 (48)	19 (4)
85 Paper mill machinery	171 (100)	111 (69)	33 (19)	60 (43)	71 (57)	85 (64)	26 (4)
86 Printing machines	159 (100)	110 (68)	40 (35)	64 (55)	79 (60)	87 (61)	23 (7)
87 Food-processing mach	170 (100)	99 (59)	38 (34)	61 (44)	74 (56)	84 (57)	15 (2)
88 Other special machine	194 (100)	124 (61)	36 (16)	51 (27)	72 (39)	88 (43)	36 (18)
89 Service ind. machine	184 (99)	111 (68)	55 (46)	73 (56)	81 (61)	98 (66)	13 (2)
90 Pumps	190 (100)	118 (75)	54 (40)	76 (66)	89 (69)	99 (72)	19 (3)
91 Mechanical handle eq	200 (100)	126 (76)	57 (40)	77 (58)	92 (66)	106 (72)	20 (3)
92 Other non-elec mach	201 (100)	123 (63)	58 (41)	85 (51)	105 (58)	108 (60)	15 (4)
93 Radio,TV,phonograph	190 (100)	97 (40)	50 (25)	67 (32)	83 (38)	93 (40)	4 (0)
94 Other telecom equip	204 (100)	120 (52)	59 (27)	80 (35)	103 (44)	109 (49)	11 (3)
95 Household appliance	195 (99)	106 (59)	52 (39)	74 (51)	84 (52)	93 (58)	13 (1)
96 Computers	189 (100)	119 (58)	51 (30)	76 (38)	90 (41)	103 (48)	16 (11)
97 Other office machine	188 (100)	93 (41)	37 (18)	59 (30)	74 (35)	86 (38)	7 (2)
98 Semiconductors	183 (100)	107 (53)	46 (23)	69 (45)	80 (47)	91 (52)	16 (2)
99 Electric motors	179 (99)	99 (54)	30 (22)	44 (37)	55 (40)	73 (47)	26 (7)
100 Batteries	180 (99)	100 (60)	39 (29)	70 (47)	76 (52)	85 (57)	15 (3)
101 Electric bulbs	197 (99)	112 (61)	55 (41)	77 (51)	82 (52)	99 (61)	13 (1)
102 Industrial appliance	210 (100)	154 (80)	83 (52)	113 (69)	125 (73)	136 (75)	18 (5)
103 Shipbuilding	145 (99)	91 (61)	23 (13)	35 (49)	47 (54)	61 (56)	30 (5)
104 Warships	7 (93)	2 (59)	0 (0)	0 (0)	0 (0)	1 (58)	1 (1)
105 Railroad equipment	136 (99)	82 (68)	19 (12)	33 (27)	48 (44)	57 (63)	25 (5)
106 Motor vehicles	155 (100)	83 (50)	30 (23)	50 (43)	60 (46)	72 (48)	11 (2)
107 Motorcycle & bicycle	167 (99)	71 (27)	18 (11)	26 (15)	34 (17)	46 (22)	25 (5)
108 Motor vehicle parts	175 (100)	116 (73)	56 (49)	81 (61)	95 (71)	106 (72)	10 (2)
109 Aircraft	107 (100)	63 (77)	21 (24)	39 (58)	44 (65)	53 (76)	10 (1)
110 Other transport eq	86 (94)	42 (61)	3 (4)	8 (7)	12 (7)	21 (43)	21 (19)
111 Precision instrument	206 (100)	113 (48)	62 (34)	84 (44)	94 (46)	102 (48)	11 (0)
112 Optical goods	200 (100)	119 (63)	58 (35)	83 (53)	95 (58)	111 (62)	8 (1)
113 Watches and clocks	171 (100)	92 (33)	43 (13)	55 (22)	66 (26)	73 (31)	19 (2)
114 Jewellery	171 (100)	90 (48)	25 (20)	35 (27)	48 (33)	59 (45)	31 (3)
115 Music instrument	192 (100)	116 (48)	60 (28)	76 (33)	93 (44)	100 (47)	16 (2)
116 Sporting goods	213 (100)	127 (67)	64 (39)	88 (56)	101 (63)	112 (65)	15 (2)
117 Ordnance	112 (96)	70 (86)	9 (15)	22 (53)	30 (54)	44 (70)	26 (16)
118 Works of art	160 (100)	90 (56)	43 (44)	59 (48)	67 (51)	77 (52)	13 (4)
119 Manufacture goods nec	213 (100)	136 (68)	74 (44)	94 (52)	99 (55)	118 (64)	18 (3)
120 Scraps,used	167 (100)	98 (46)	46 (26)	66 (35)	77 (37)	89 (45)	9 (1)
Overall:							
NEQ	19125 (99)	11288 (61)	4497 (33)	6569 (47)	7780 (52)	9142 (57)	2146 (4)

Of all the share equations estimated, 11,288 have a capital term, accounting for 61% of total world trade in 1990. The number of share equations whose share capital elasticities are less or equal to 1 (in absolute value) is 4,497, representing 33% of total world trade. The number of share equations whose share capital elasticities are less or equal to 2 (in absolute value) is 6,569, representing 47% of total world trade. The number of share equations whose share capital elasticities are less or equal to 3 (in absolute value) is 7,780, representing 52% of total world trade. The number of share equations whose share capital elasticities are less or equal to 5 (in absolute value) is 9,142, representing 57% of total world trade. The number of share equations whose share capital elasticities are larger than 5 (in absolute value) is 2,146, representing 4% of total world trade.

Time Parameters

Tables 23-26 (pp. 123-134) present the estimated time parameters by sector and by exporter in the selected import markets. Table 24, for instance, shows the time parameters for the French import market. The first two columns list the trade sector number and titles. Then the estimated time parameters of each of the 15 exporters in the French import market are displayed. In Sector 80 ("Agricultural machinery"), for instance, we observe that the time parameter is -0.18 for the exporter Canada, suggesting that, other things equal, the annual average growth rate of the Canadian share in France's imports of Agricultural

TABLE 23: Time Parameter by Sector and Country in the US Import Market

SECTOR TITLE		EXPORTER														
		CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
1	Cereals	-0.06	...	..	..	...	...	...	...	...	...	...	...	...	1.14	0.01
2	Fruits	0.00	-0.01	..	0.07	.	.	0.03	0.13	...	0.06	-0.01	..	...	0.08	0.00
3	OtherCrop	-0.06	0.03	..	...	.	0.02	-0.10	-0.01	.	.	0.01	-0.02	0.14	0.09	-0.00
4	Livestock	0.04	0.02	..	...	0.05	0.12	...	...	.	...	-0.09	..	..	.	.
5	Silk	..	..	..	..	...	...	...	...	...	0.10	0.10	...	...	0.75	-0.02
6	Cotton	-0.01	0.04	..	...	...	...	...	...	0.13	...	...	..	...	0.19	.
7	Wool	0.00	...	...	-0.03	-0.14	-0.11	.	...	.	...	-0.06	...	...	.	-0.12
8	OtherFiber	.	.	..	0.05	0.24	...	...	...	-0.08	...	0.13	..	...	0.02	.
9	Wood	.	.	..	..	..	...	...	...	...	...	...	..	...	.	0.00
10	Fish	0.00	-0.03	..	...	...	...	..	...	.	-0.08	0.27	-0.12	-0.01	-0.04	0.07
11	IronOre	0.02	..	...	...	...	...	..	...	..	...	...	..	...	-0.04	0.00
12	Coal	0.05	...	..	...	...	...	..	...	...	...	...	..	...	-0.19	0.12
13	OthMetOre	0.08	.	..	...	...	.	...	...	...	.	0.15	...	...	0.05	0.01
14	Petroleum	0.11	-0.16	..	..	..	..	...	...	.	...	.	..	..	0.25	.
15	NatGas	0.04	-0.69	..	..	..	..	...	...	...	...	...	..	..	...	.
16	NonMetal	0.02	0.07	...	-0.14	-0.00	0.04	0.06	0.00	0.17	0.12	0.18	...	...	0.04	.
17	Elec	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	Meat	.	-0.10	..	0.04	-0.08	-0.01	...	...	...	0.06	0.10	...	-0.01	-0.00	-0.04
19	Dairy	0.05	-0.02	-0.08	...	-0.00	-0.04	0.05	0.10	.	0.05	-0.11	...	.	-0.01	-0.04
20	Prefruit	0.07	-0.02	0.10	0.12	0.00	0.24	-0.00	.	-0.00	-0.04	0.08	-0.15	-0.13	.	0.17
21	Seafood	0.09	-0.09	..	...	0.90	...	...	.	.	.	-0.00	-0.01	0.08	0.09	0.07
22	OilFats	0.18	0.46	..	...	.	0.13	.	0.03	-0.22	0.04	-0.87	...	0.08	0.05	.
23	GrainMill	-0.09	0.02	..	...	-0.17	0.14	-0.01	...	0.08	0.07	.	.	0.17	0.01	0.14
24	Bakery	-0.02	.	0.00	0.07	0.09	0.08	0.09	0.19	-0.02	0.03	0.03	.	0.09	0.03	0.02
25	Sugar	-0.07	0.01	..	...	...	...	...	..	...	..	..	..	-0.08	0.06	-0.04
26	Cocoa	.	.	...	0.12	-0.06	0.10	0.01	0.01	-0.02	0.03	-0.06	-0.14	0.00	-0.01	-0.00
27	OtherFood	0.20	-0.03	...	0.10	.	.	0.11	0.20	0.09	0.26	.	-0.27	0.14	0.14	-0.05
28	Feeds	0.01	...	...	...	0.01	0.01	...	...	.	-0.01	..	...	0.08	.	0.08
29	Alcohol	-0.04	0.08	..	...	-0.00	0.04	.	.	-0.01	0.04	-0.17	..	..	0.06	0.12
30	NonAlcohol	0.11	0.02	...	0.30	-0.10	.	.	.	0.12	0.16	-0.08	-0.03	0.22	0.05	0.18
31	Tobacco	0.07	-0.06	...	-0.32	-0.66	-0.01	.	-0.20	-0.02	0.28	...	...	...	-0.18	0.16
32	Yarns	0.10	0.01	-0.03	0.02	-0.03	-0.01	0.10	-0.02	0.06	.	-0.93	.	0.07	-0.01	0.10
33	CottonFabr	0.06	0.23	..	0.03	0.06	0.05	.	.	0.08	0.03	0.09	-0.00	0.09	0.01	.
34	OthTextile	0.08	0.04	0.08	0.14	-0.00	0.03	0.04	0.01	0.04	-0.03	0.27	0.07	0.12	.	.
35	FloorCover	0.10	.	...	0.02	0.04	0.00	0.01	0.17	0.01	.	.	0.22	...	0.01	-0.01
36	Apparel	0.02	-0.00	...	...	...	0.02	0.00	...	-0.05	.	0.17	-0.02	.	0.03	0.03
37	Leather	-0.01	0.09	0.03	-0.06	-0.08	0.03	.	-0.01	.	0.09	-0.03	-0.64	0.17	-0.03	0.01
38	LeatherPrd	-0.01	-0.03	...	...	0.06	.	.	.	-0.04	.	0.10	0.04	0.07	.	.
39	Footwear	-0.05	-0.01	...	..	-0.12	.	.	.	0.00	...	0.10	0.08	0.09	.	0.04
40	Plywood	-0.05	-0.15	..	...	...	0.02	0.19	0.91	...	.	...	...	-0.03	0.02	0.26

TABLE 23: (continued)
SECTOR TITLE

	EXPORTER														
	CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
41 OtherWood	0.01	-0.00	...	...	0.09	0.09	0.00	.	-0.00	.	-0.02	0.04	0.00	0.01	.
42 Furniture	-0.02	0.08	0.04	0.03	0.03	0.11	0.08	.	0.04	0.13	.	-0.03	0.14	-0.02	0.01
43 Pulp	-0.10	...	..	...	..	...	..	.	...	...	..	..	..	0.05	0.13
44 Newsprint	-0.04	...	..	..	..	...	...	..	...	...	..	..	..	0.13	...
45 Paper	-0.00	-0.02	0.18	0.11	-0.02	0.05	0.03	-0.04	-0.00	0.01	.	-0.03	0.06	0.01	0.01
46 Printing	.	.	0.02	.	0.01	0.01	0.02	.	-0.03	0.08	0.45	-0.05	0.20	.	0.08
47 Chemical	-0.01	0.01	.	0.06	-0.01	0.03	.	0.11	0.01	0.01	0.06	0.06	0.05	-0.01	0.03
48 Fertilizer	.	0.02	...	.	0.04	0.01	...	...	-0.01	0.12	-0.63	...	...	-0.04	0.10
49 SynthFiber	.	0.08	-0.10	0.06	-0.01	-0.03	-0.02	.	0.06	.	.	.	0.13	-0.00	0.15
50 Paints	-0.16	-0.12	...	0.17	-0.19	-0.01	0.12	0.04	0.04	-0.02	...	...	.	-0.00	0.00
51 Drugs	-0.03	-0.09	.	0.03	-0.01	-0.00	.	-0.02	-0.04	-0.00	0.12	...	...	0.01	.
52 Soaps	.	0.09	..	0.27	0.00	0.02	0.06	-0.06	-0.02	0.01	0.13	-0.06	0.35	.	0.03
53 OtherChem	-0.01	-0.06	0.02	-0.03	-0.03	0.01	.	-0.05	0.00	0.16	0.08	.	0.06	0.02	.
54 PetroRefin	0.00	0.10	..	0.12	0.16	-0.07	-0.22	0.16	.	.	-0.29	...	...	0.03	-0.01
55 FuelOil	0.07	0.14	..	0.03	0.01	...	-0.09	-0.02	0.09	..	...	...	...	0.04	-0.08
56 PetroProd	0.04	0.09	...	...	-0.12	.	0.11	...	0.20	0.57	-3.82	-0.50	..	0.12	-0.02
57 CoalProd	.	...	...	...	...	...	...	..	...	.	...	...	.	.	...
58 Tyre	-0.02	-0.27	...	0.02	.	-0.06	.	.	0.06	0.07	...	...	0.05	.	0.21
59 Rubber	0.06	0.06	-0.17	0.10	0.10	0.16	-0.10	-0.12	0.07	0.12	-0.06	-0.19	0.04	0.03	0.12
60 Plastic	0.02	.	.	0.03	0.02	.	-0.09	0.03	.	.	0.47	0.02	0.05	.	-0.03
61 Glass	-0.01	0.08	0.04	.	.	-0.02	.	.	-0.01	0.01	0.11	0.05	0.08	-0.00	0.00
62 Cement	.	0.04	...	-0.03	0.01	...	...	0.08	.	0.12	..	...	...	0.04	0.09
63 Ceramics	0.15	.	.	0.08	0.03	-0.01	0.04	.	.	-0.07	0.19	-0.05	0.19	-0.01	0.11
64 NonMetProd	0.01	-0.08	0.06	0.05	0.05	0.00	0.04	0.08	0.02	.	.	-0.38	0.09	-0.01	0.03
65 IronSteel	.	0.05	.	.	0.00	-0.00	0.01	-0.31	0.03	.	.	.	0.08	0.03	0.09
66 Copper	-0.00	0.14	-0.08	0.09	-0.01	0.02	0.19	...	.	.	...	...	0.17	0.09	.
67 Aluminum	-0.17	-0.06	...	-0.03	-0.02	0.02	-0.10	-0.00	.	.	...	...	...	.	.
68 Nickel	-0.11	...	...	...	0.20	0.13	...	..	-0.07	0.10	...	...	...	0.06	-0.00
69 LeadZinc	0.06	-0.03	...	.	...	-0.03	3.70	0.07	-0.03	...	...	...	...	.	-0.01
70 OtherMetal	0.01	-0.03	...	0.07	0.03	.	...	...	0.04	-0.06	.	...	...	0.01	0.04
71 MetalFurn	0.00	-0.09	-0.32	.	-0.02	0.01	-0.02	.	0.05	-0.05	.	...	0.23	-0.06	.
72 StrucMetal	0.03	.	...	.	0.03	0.13	0.14	...	0.11	-0.09	...	-0.26	0.19	0.14	0.27
73 Container	-0.08	.	...	-0.03	-0.02	.	0.01	-0.04	0.26	-0.08	.	-1.14	0.16	0.06	0.09
74 Wire	0.02	0.06	...	.	0.06	-0.00	0.13	0.32	0.04	-0.00	0.10	-0.08	0.11	.	0.05
75 Hardware	-0.02	0.06	0.02	-0.02	0.01	0.02	0.00	-0.03	0.04	-0.05	.	-0.12	0.16	.	0.04
76 Boilers	0.03	0.42	.	...	-0.03	-0.06	0.04	.	0.10	-0.01	0.02	.	...	.	.
77 AirEngine	-0.09	-0.16	...	.	0.32	.	0.17	..	-0.04	0.07	...	.	..	0.30	0.09
78 IntEngine	.	0.10	0.05	0.11	0.05	0.00	0.05	.	-0.05	0.14	..	...	0.08	0.06	0.28
79 PowerMach	0.09	0.17	-0.07	.	-0.01	0.09	0.02	.	0.05	-0.00	-0.51	-1.07	0.06	0.00	0.16
80 AgriMach	-0.21	0.05	...	0.06	0.08	0.05	0.03	-0.06	0.10	0.11	-0.14	0.14	0.09	-0.00	.

TABLE 23: (continued)
SECTOR TITLE

		EXPORTER														
		CA	MX	AU	BE	FR	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
81	ConstrEQ	.	0.03	0.04	0.04	0.02	-0.04	0.02	0.18	0.06	0.08	.	0.05	0.12	0.02	0.18
82	MetalMach	-0.05	0.01	-0.00	-0.04	-0.05	-0.03	0.02	-0.00	-0.01	0.10	.	-0.09	0.22	-0.02	0.03
83	SewingMach	-0.10	...	.	0.08	-0.04	0.00	0.02	-0.01	.	0.02	...	-0.01	0.13	.	0.05
84	TextMach	-0.32	...	-0.13	0.01	-0.16	0.02	.	0.22	-0.01	0.07	...	.	0.29	-0.01	0.02
85	PaperMach	-0.09	...	.	...	0.13	0.03	0.03	0.06	0.04	0.12	...	...	0.12	-0.01	0.29
86	PrintMach	.	0.06	.	-0.03	.	-0.03	.	...	-0.01	0.16	..	...	0.17	0.03	-0.00
87	FoodMach	.	0.02	0.00	.	0.03	-0.03	0.07	0.17	-0.01	0.08	..	.	0.03	.	0.07
88	SpecMach	-0.05	-0.23	-0.05	0.03	0.10	-0.02	-0.01	0.03	-0.05	0.14	...	-0.09	0.13	0.29	-0.04
89	ServMach	-0.02	.	.	.	.	0.01	0.02	0.06	0.01	0.07	...	0.06	0.16	.	0.18
90	Pumps	-0.04	0.14	-0.06	.	.	-0.05	0.07	0.12	0.04	0.12	-0.28	0.03	0.31	0.03	0.25
91	MechEQ	0.03	0.18	.	0.06	.	-0.03	0.08	0.10	0.06	0.06	.	.	0.25	.	.
92	OtherMach	.	.	0.01	0.05	0.05	-0.00	0.04	0.03	-0.01	0.08	-0.07	-0.01	0.23	0.02	0.10
93	RadioTV	0.05	0.09	...	0.16	0.08	.	...	..	0.02	-0.06	.	-0.03	.	0.00	0.09
94	TelecommEQ	.	-0.08	...	0.04	0.02	-0.01	-0.01	0.06	-0.02	0.01	0.56	-0.09	0.01	0.02	0.08
95	HomeAppl	.	.	-0.02	...	-0.05	0.01	-0.01	.	0.06	.	0.13	0.13	0.39	.	0.06
96	Computers	-0.14	-0.09	...	...	.	.	-0.04	...	-0.04	0.29	...	.	0.33	0.01	0.52
97	OfficeMach	0.00	-0.12	...	...	-0.08	-0.03	-0.08	...	.	0.01	.	.	0.12	.	0.05
98	Semicon	0.10	-0.07	...	...	0.14	.	0.11	...	0.05	0.10	..	.	0.01	0.00	.
99	ElecMotor	0.02	0.13	0.66	0.03	0.08	.	-0.00	0.44	0.05	-0.01	.	0.20	0.06	0.21	0.01
100	Battery	-0.03	.	...	0.05	-0.10	.	0.48	.	-0.06	0.04	.	0.08	0.04	.	0.08
101	ElecBulbs	0.03	0.05	...	0.07	-0.03	.	0.01	0.29	0.07	.	.	-0.16	0.08	0.02	.
102	IndlApp	0.01	0.02	-0.08	-0.01	-0.01	-0.01	.	.	0.03	0.01	.	-0.05	0.06	.	.
103	Ship	-0.18	0.01	...	...	-0.02	.	0.04	...	.	0.08	-0.02	-0.09	0.03	0.00	-0.01
104	Warships	...	...	..	..	...	...	...	..	...	...	..	..	...	...	...
105	RailroadEQ	0.10	0.77	-0.15	...	.	-0.03	0.20	...	-0.08	0.06	...	...	0.09	.	0.24
106	Auto	-0.05	0.41	..	0.13	...	-0.05	.	..	-0.00	0.08	..	-0.42	..	0.04	-0.08
107	Motorcycle	.	.	-0.10	...	...	-0.04	0.00	...	-0.07	.	.	0.04	0.25	0.00	0.11
108	AutoParts	-0.03	.	...	.	0.06	-0.01	0.04	0.10	-0.00	0.12	...	.	0.29	0.08	0.13
109	Aircraft	-0.02	.	...	-0.03	0.12	-0.07	0.02	0.17	-0.02	0.05	...	.	...	0.12	0.07
110	OtherTrans	...	...	..	...	...	...	-0.35	...	-0.15	-0.12	...	...	0.52	0.16	0.11
111	Instrument	-0.01	0.05	0.00	-0.02	0.06	-0.02	-0.02	0.02	0.03	0.02	.	-0.05	.	-0.01	0.06
112	Optical	0.03	0.04	-0.02	...	.	.	.	...	0.08	-0.00	.	-0.01	0.11	0.05	0.04
113	Watches	.	-0.10	...	...	.	-0.07	0.01	...	-0.09	.	0.50	.	-0.07	0.08	0.10
114	Jewellery	-0.15	-0.04	..	-0.01	-0.04	-0.08	0.07	-0.02	-0.02	-0.13	...	-0.01	-0.00	-0.00	0.00
115	MusicInst	-0.04	-0.09	-0.01	...	...	-0.05	-0.03	...	.	0.05	.	.	0.16	.	0.07
116	Sporting	.	.	-0.03	.	-0.09	.	-0.01	.	-0.02	.	.	-0.09	0.14	-0.07	0.05
117	Ordnance	-0.06	...	.	.	0.12	-0.02	.	0.03	.	0.20	0.45	.	0.08	0.32	0.24
118	ArtWork	-0.00	-0.24	-0.18	0.08	-0.13	.	-0.02	-0.02	0.09	0.06	-0.12	.	...	0.05	-0.24
119	OtherMfg	0.00	0.03	.	0.01	-0.05	-0.01	-0.05	-0.01	.	0.09	0.37	.	0.13	.	-0.01
120	Scraps	-0.01	-0.00	0.04	.	0.03	.	0.04	0.02	0.03	0.06	-0.06	.	0.06	0.02	-0.03

TABLE 24: Time Parameter by Sector and Country in the French Import Market
SECTOR TITLE EXPORTER

		CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
1	Cereals	-0.06	.	..	-0.95	0.04	.	-0.14	0.33	-0.25	..	.	..	..	0.13	.
2	Fruits	-0.03	.	0.03	..	0.04	-0.00	-0.04	0.02	...	..	-0.49	..	...	0.00	-0.01
3	OtherCrop	-0.04	-0.11	-0.01	..	-0.09	.	0.00	-0.02	0.09	0.04	-0.33	...	...	0.05	-0.06
4	Livestock	-0.01	0.06	...	-1.07	-0.01	.	-0.02	0.09	0.10	...	.	...	..	.	-0.10
5	Silk	...	...	..	..	...	...	0.11	.	...	-0.01	.	...	...	...	0.16
6	Cotton	..	0.03	...	...	-0.05	.	0.09	.	.	..	...	...	..	-0.01	-0.06
7	Wool	...	-0.01	..	..	0.00	-0.01	-0.00	-0.02	-0.02	..	0.04	..	...	-0.01	0.01
8	OtherFiber	..	...	..	..	0.16	.	0.59	0.01	...	..	0.08	..	...	0.00	-0.10
9	Wood	0.09	0.09	..	0.00	0.11	.	.	0.02	.	..	..	...	..	-0.00	-0.03
10	Fish	-0.18	.	...	...	-0.08	-0.15	-0.13	0.01	0.09	...	0.06	...	...	.	0.03
11	IronOre	0.10	...	..	...	...	...	0.01	..	..	..	..	..	..	0.00	-0.03
12	Coal	.	0.09	..	..	0.12	-0.07	..	...	0.01	...	0.39	..	..	0.10	0.02
13	OthMetOre	0.07	0.02	..	...	0.03	-0.16	...	.	..	...	0.09	...	..	0.05	-0.04
14	Petroleum	..	..	-0.15	..	..	..	..	...	0.21	..	...	..	..	0.29	-0.09
15	NatGas	..	..	...	..	..	...	...	...	...	..	..	..	..	.	0.15
16	NonMetal	.	-0.01	...	0.10	0.06	0.09	0.02	.	0.04	0.10	0.16	...	..	0.05	.
17	Elec	...	..	..	..	0.14	-0.07	.	0.02	...	..	..	..	..	-0.09	...
18	Meat	-0.04	-0.05	..	.	0.03	0.01	0.04	0.11	-0.01	..	-0.07	..	..	-0.00	-0.04
19	Dairy	...	.	..	...	0.08	0.01	0.02	0.41	-0.08	..	..	..	..	-0.05	-0.02
20	PreFruit	.	0.00	...	...	0.13	-0.01	-0.05	.	-0.08	..	0.07	...	...	-0.00	-0.01
21	Seafood	0.03	0.23	.	..	0.02	.	-0.02	.	.	-0.00	.	..	...	0.04	-0.05
22	OilFats	...	-0.16	..	..	0.04	-0.03	0.04	.	-0.00	...	.	..	..	.	0.04
23	GrainMill	...	-0.01	..	..	0.12	.	-0.10	0.11	.	..	...	..	..	.	-0.02
24	Bakery	...	...	..	0.16	.	0.05	-0.01	0.22	-0.01	0.04	-0.03	..	..	0.02	0.06
25	Sugar	...	0.20	...	..	0.12	0.13	.	0.17	...	..	...	..	..	0.21	-0.16
26	Cocoa	..	.	...	-0.28	0.06	0.03	-0.02	0.11	-0.15	..	...	..	..	.	-0.09
27	OtherFood	.	0.15	...	...	0.17	.	0.08	0.08	0.03	0.02	0.05	..	-0.20	0.08	.
28	Feeds	...	0.06	...	...	0.01	.	0.05	0.15	0.06	-0.16	...	...	...	-0.03	-0.00
29	Alcohol	...	.	0.17	...	.	0.01	-0.14	0.16	0.09	...	.	..	..	.	-0.03
30	NonAlcohol	..	..	..	..	0.16	.	.	2.51	-0.09	..	...	..	-0.02	-0.04	0.07
31	Tobacco	...	-0.08	...	..	-0.02	.	-0.02	...	0.10	..	...	...	..	-0.00	-0.03
32	Yarns	.	0.03	...	0.22	-0.05	-0.00	0.03	.	0.03	0.11	-0.44	-0.03	0.13	.	0.02
33	CottonFabr	...	-0.09	-0.09	0.17	0.01	-0.02	0.03	0.08	0.07	0.15	-0.03	0.02	-0.03	0.04	0.02
34	OthTextile	-0.06	.	...	0.06	-0.02	-0.01	0.02	0.05	0.04	0.13	0.08	0.02	0.02	0.02	0.06
35	FloorCover	...	0.04	..	-0.01	-0.00	-0.00	.	0.07	0.04	..	0.02	..	...	0.04	-0.01
36	Apparel	...	-0.10	...	0.04	.	-0.06	-0.04	-0.03	-0.04	0.01	0.08	-0.01	0.03	0.05	0.07
37	Leather	-0.13	.	..	0.13	-0.02	-0.01	0.10	.	.	..	-0.13	...	0.29	-0.01	.
38	LeatherPrd	...	.	.	...	0.03	.	-0.05	0.01	-0.01	.	0.26	-0.03	0.17	.	0.08
39	Footwear	..	0.10	.	-0.14	-0.07	.	-0.08	-0.01	0.10	...	0.04	0.07	.	0.09	.
40	Plywood	-0.08	0.08	..	.	.	-0.03	-0.03	0.01	0.02	...	..	...	...	0.04	.

TABLE 24: (continued)

SECTOR TITLE	EXPORTER														
	CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
41 OtherWood	-0.04	0.07	..	0.12	0.05	.	-0.02	-0.01	-0.01	-0.11	.	-0.18	-0.04	0.01	-0.02
42 Furniture	...	.	..	.	-0.05	.	0.03	0.00	.	..	-0.02	..	-0.04	0.04	0.00
43 Pulp	-0.02	0.02	..	-0.09	-0.01	-0.02	...	0.18	0.05	...	..	..	..	.	0.07
44 Newsprint	0.17	...	..	-0.00	-0.06	0.02	...	...	.	..	..	..	..	.	...
45 Paper	-0.08	.	..	0.14	-0.02	0.01	...	0.13	0.04	-0.01	...	...	..	0.00	.
46 Printing	.	0.02	..	0.00	-0.00	0.02	-0.01	0.07	.	0.03	.	-0.06	-0.15	-0.01	0.08
47 Chemical	.	-0.04	...	0.03	0.00	-0.01	0.00	0.02	0.04	-0.00	..	..	...	0.01	-0.03
48 Fertilizer	-0.51	-0.07	...	0.10	.	.	0.04	0.12	0.01	-0.01	..	..	..	-0.01	.
49 SynthFiber	...	-0.00	...	.	-0.00	-0.00	.	.	0.03	-0.07	..	...	.	-0.00	0.06
50 Paints	-0.08	-0.04	..	...	.	-0.00	0.08	.	0.07	0.15	..	..	..	-0.02	0.07
51 Drugs	-0.46	0.01	..	.	0.04	-0.01	.	0.10	-0.05	0.07	-0.00	..	..	0.00	-0.02
52 Soaps	.	-0.01	..	-0.11	0.04	-0.03	0.03	0.03	0.01	0.17	...	..	-0.02	.	0.11
53 OtherChem	-0.04	0.00	...	.	.	-0.01	-0.02	0.01	0.12	.	-0.03	.	...	0.00	-0.01
54 PetroRefin	...	-0.08	...	..	0.06	.	-0.13	0.04	0.05	...	...	..	...	0.01	0.06
55 FuelOil	...	.	...	..	0.04	.	-0.16	0.12	0.03	...	...	..	..	.	-0.04
56 PetroProd	0.07	-0.07	...	.	0.07	.	-0.14	.	-0.03	0.08	...	...	..	0.11	-0.04
57 CoalProd	...	...	..	..	0.15	-0.12	-0.02	...	...	...	.	..	..	0.07	...
58 Tyre	...	.	..	-0.05	-0.04	-0.03	-0.01	.	0.14	0.24	...	.	0.03	.	.
59 Rubber	-0.11	-0.03	-0.13	0.08	-0.00	0.01	.	0.10	0.03	-0.01	.	.	0.24	-0.01	0.11
60 Plastic	...	.	...	.	0.00	-0.03	0.01	0.05	-0.03	0.03	0.25	-0.04	0.09	0.03	0.05
61 Glass	...	-0.06	...	0.09	.	0.00	-0.01	.	0.03	0.06	...	...	0.02	0.03	0.03
62 Cement	...	0.04	..	-0.09	.	-0.01	-0.11	.	.	...	...	..	...	.	.
63 Ceramics	...	0.05	...	0.01	0.04	-0.07	0.01	0.08	-0.02	0.00	0.09	-0.74	0.06	0.08	0.06
64 NonMetProd	...	-0.04	..	.	0.06	-0.01	-0.06	.	.	0.12	...	...	0.08	0.06	0.00
65 IronSteel	0.03	0.01	..	0.07	.	-0.03	0.00	-0.02	0.07	-0.09	..	...	...	0.02	-0.00
66 Copper	-0.10	-0.07	...	.	0.00	.	0.07	-0.07	0.01	.	..	..	..	-0.00	0.01
67 Aluminum	.	-0.05	..	0.06	-0.00	-0.04	0.00	.	0.03	...	...	..	..	0.03	0.03
68 Nickel	-0.16	0.06	..	...	-0.01	0.04	0.04	...	.	...	...	...	...	-0.04	0.01
69 LeadZinc	...	...	...	...	-0.02	.	0.05	.	0.04	...	..	..	...	.	-0.19
70 OtherMetal	.	0.08	...	0.07	0.02	-0.00	0.08	0.11	-0.02	.	-0.11	...	..	-0.01	-0.02
71 MetalFurn	...	0.05	..	0.08	.	-0.03	-0.08	.	0.10	.	...	...	0.17	0.03	0.02
72 StrucMetal	...	-0.09	..	.	0.01	-0.00	-0.01	-0.02	0.03	...	..	..	..	0.02	0.14
73 Container	...	.	..	.	-0.05	-0.00	0.04	.	0.07	...	...	..	...	0.01	0.16
74 Wire	..	.	..	-0.07	-0.02	-0.03	0.03	.	-0.02	.	...	..	...	0.04	0.11
75 Hardware	-0.02	-0.01	..	0.02	-0.04	-0.02	0.02	0.03	0.05	0.03	.	-0.00	0.11	-0.00	0.05
76 Boilers	...	-0.02	..	0.01	-0.01	.	0.05	0.43	-0.05	...	..	...	..	-0.02	.
77 AirEngine	0.04	.	..	..	-0.11	-0.33	...	...	0.04	..	..	...	..	.	.
78 IntEngine	...	0.01	0.44	.	-0.07	-0.07	.	0.10	0.01	0.11	..	..	...	0.10	0.11
79 PowerMach	..	-0.05	..	...	0.21	0.03	.	...	-0.03	...	..	..	..	.	0.02
80 AgriMach	-0.18	.	..	.	-0.05	-0.00	0.01	0.03	0.05	0.05	..	..	..	-0.02	-0.04

TABLE 24: (continued)

SECTOR TITLE	EXPORTER														
	CA	US	MX	AU	BE	GE	IT	SP	UK	JA	CN	SK	TW	RO	RW
81 ConstrEQ	-0.43	-0.04	..	0.02	-0.03	.	0.04	0.04	0.01	0.10	...	...	..	.	.
82 MetalMach	.	.	..	.	-0.03	-0.03	0.03	0.07	0.02	0.15	.	...	0.14	-0.00	-0.00
83 SewingMach	.	.	..	-0.20	0.05	-0.04	0.02	.	-0.05	.	...	...	0.23	.	0.08
84 TextMach	...	.	..	-0.18	-0.01	-0.03	0.06	0.06	0.02	0.08	..	..	0.16	.	.
85 PaperMach	-0.15	.	..	0.08	-0.05	-0.08	.	0.10	0.05	0.13	..	..	..	0.03	.
86 PrintMach	...	.	..	...	-0.00	0.01	-0.00	0.05	0.01	0.10	..	..	...	-0.02	0.05
87 FoodMach	...	.	..	0.04	-0.01	-0.02	0.02	.	0.04	-0.04	..	..	..	0.00	0.10
88 SpecMach	.	-0.00	..	.	-0.12	.	.	0.06	0.01	-0.03	..	..	.	.	-0.02
89 ServMach	.	.	..	-0.04	-0.04	-0.03	0.01	0.07	0.02	.	...	...	...	-0.01	.
90 Pumps	...	-0.02	..	.	-0.03	-0.01	0.02	0.14	0.03	.	...	...	0.05	-0.02	0.07
91 MechEQ	.	.	..	0.05	-0.01	-0.01	0.02	0.08	0.04	.	-0.06	-0.28	0.02	0.00	0.05
92 OtherMach	...	.	...	0.00	-0.03	-0.02	0.03	.	0.03	.	0.13	...	0.11	-0.01	0.07
93 RadioTV	...	0.04	...	-0.02	.	.	-0.09	0.07	0.13	0.09	-0.07	-0.08	0.07	.	0.03
94 TelecommEQ	0.06	-0.01	...	-0.04	0.01	.	0.03	-0.01	-0.00	0.13	...	-0.33	0.15	.	0.12
95 HomeAppl	..	0.02	...	.	.	-0.03	0.01	0.01	0.08	0.12	.	-2.18	0.30	-0.00	.
96 Computers	.	0.02	...	...	-0.01	0.02	0.03	0.21	-0.00	.	...	.	0.44	.	0.20
97 OfficeMach	0.10	-0.04	...	.	.	.	0.02	-0.03	0.00	0.07	.	-0.62	0.18	.	0.04
98 Semicon	-0.01	-0.05	.	0.34	0.11	0.00	-0.01	0.00	.	.	..	-0.17	.	-0.09	.
99 ElecMotor	...	0.02	...	.	-0.05	-0.00	0.05	0.05	-0.01	0.04	...	...	0.05	.	0.01
100 Battery	...	.	...	.	.	-0.03	0.02	0.07	.	.	.	0.03	0.03	-0.00	-0.00
101 ElecBulbs	...	-0.01	...	.	0.03	-0.03	0.02	0.09	0.02	.	...	-0.02	0.16	-0.01	0.03
102 IndlApp	.	.	.	.	.	-0.02	0.02	0.03	0.00	0.05	...	.	0.15	-0.00	0.06
103 Ship	...	.	..	...	0.04	-0.01	0.04	0.02	.	.	...	...	.	-0.09	0.08
104 Warships	...	...	..	...	...	...	...	...	...	...	..	..	..	...	...
105 RailroadEQ	...	-0.11	..	0.02	0.02	-0.10	.	0.14	0.08	...	...	...	..	..	-0.07
106 Auto	...	.	..	...	-0.01	-0.03	-0.03	0.08	0.10	0.04	..	..	..	-0.02	.
107 Motorcycle	...	0.27	..	-0.02	.	-0.06	-0.01	.	-0.05	0.01	.	..	0.39	0.08	0.10
108 AutoParts	...	-0.04	...	0.09	.	-0.01	-0.02	0.09	0.01	0.05	..	..	...	0.03	0.02
109 Aircraft	.	.	..	..	-0.00	-0.07	0.03	0.07	.	.	..	..	..	0.03	0.14
110 OtherTrans	..	...	..	...	...	-0.08	.	0.82	-0.11	...	...	...	0.18	-0.04	-0.12
111 Instrument	0.07	0.01	..	0.04	.	-0.02	0.03	0.10	-0.01	0.00	.	.	0.08	-0.01	0.13
112 Optical	0.18	0.04	...	-0.04	-0.02	.	0.03	0.01	0.05	.	.	.	0.18	-0.03	0.05
113 Watches	..	-0.06	...	...	...	-0.05	-0.09	0.13	-0.08	.	0.17	.	0.01	0.03	0.18
114 Jewellery	...	-0.08	...	-0.03	-0.04	-0.06	0.08	0.08	0.09	-0.09	.	...	0.11	-0.04	0.01
115 MusicInst	.	.	..	0.01	...	0.00	-0.02	0.04	-0.02	0.09	0.16	0.08	0.12	-0.01	.
116 Sporting	-0.04	0.01	0.12	-0.05	.	0.00	0.03	.	0.02	-0.07	0.00	0.01	0.15	-0.01	0.01
117 Ordnance	...	.	...	-0.11	-0.02	-0.12	-0.02	0.09	-0.00	-0.04	...	...	-0.09	.	.
118 ArtWork	-0.18	.	...	0.01	0.04	.	.	-0.03	-0.04	-0.04	-0.06	...	...	0.00	0.02
119 OtherMfg	...	.	0.06	0.00	0.02	-0.03	-0.01	.	0.04	0.02	0.05	0.09	0.12	0.02	0.04
120 Scraps	-0.11	-0.01	-0.14	0.03	-0.03	0.01	-0.02	0.03	0.03	-0.00	..	...	.	0.00	.

TABLE 25: Time Parameter by Sector and Country in the German Import Market

SECTOR	TITLE	EXPORTER														
		CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
1	Cereals	-0.22	.	..	.	0.03	.	.	0.08	0.04	..	...	..	..	0.03	0.03
2	Fruits	...	.	...	-0.04	0.00	.	-0.04	0.05	0.22	..	-0.04	..	..	-0.01	-0.02
3	OtherCrop	-0.09	.	-0.05	.	-0.06	.	.	0.01	0.06	...	0.13	...	..	0.02	0.00
4	Livestock	0.06	-0.00	-0.01	-0.05	-0.04	.	0.01	0.02	0.13	..	-0.11	..	..	0.01	.
5	Silk	..	...	..	..	...	...	-0.02	...	0.04	0.08	.	...	..	.	.
6	Cotton	..	0.07	-0.06	0.08	-0.09	.	.	-0.07	-0.02	-0.02	...	..	..	0.02	-0.06
7	Wool	..	.	..	...	0.03	-0.04	0.05	.	0.01	...	-0.01	..	..	0.05	-0.00
8	OtherFiber	..	...	...	0.21	0.08	-0.03	0.14	...	.	..	.	..	...	0.06	-0.01
9	Wood	0.02	0.02	...	0.01	0.07	0.01	0.16	0.01	.	.	...	..	..	0.03	-0.05
10	Fish	-0.28	-0.14	..	...	.	-0.05	-0.00	0.11	-0.00	-0.08	-0.00	...	...	.	.
11	IronOre	0.02	...	..	..	...	...	..	...	..	..	..	..	..	-0.01	0.01
12	Coal	-0.07	-0.13	..	...	-0.01	0.04	...	...	0.03	..	...	..	..	-0.00	.
13	OthMetOre	0.05	-0.05	-0.13	...	0.00	...	...	-0.25	0.06	...	.	...	..	0.05	-0.01
14	Petroleum	..	..	.	..	..	...	...	...	-0.00	..	..	..	..	0.20	-0.06
15	NatGas	..	..	..	...	...	...	...	...	...	..	..	..	..	-0.25	0.19
16	NonMetal	.	-0.02	.	0.06	0.02	0.04	-0.01	-0.01	0.07	-0.00	0.07	..	..	0.05	.
17	Elec	..	..	..	-0.01	-0.08	.	0.34	..	..	..	..	..	..	-0.02	...
18	Meat	-0.04	-0.03	..	0.01	0.04	.	0.06	0.25	-0.10	..	0.00	..	...	-0.01	0.02
19	Dairy	...	0.06	..	0.04	0.01	-0.01	0.08	0.11	-0.05	..	..	..	..	-0.02	-0.02
20	Prefruit	0.07	0.03	...	-0.03	0.03	-0.07	-0.02	0.08	-0.17	...	-0.00	...	.	0.02	0.07
21	Seafood	0.01	-0.00	..	..	0.06	-0.05	-0.07	.	0.00	-0.06	0.02	-0.14	.	0.02	0.03
22	OilFats	...	-0.12	...	-0.06	0.04	-0.02	0.08	0.03	.	0.01	-0.61	..	..	..	-0.00
23	GrainMill	...	.	...	...	0.08	.	0.06	0.24	0.19	..	0.00	...	..	0.08	-0.22
24	Bakery	..	...	..	0.08	-0.00	0.08	0.04	...	-0.05	.	..	...	...	-0.03	0.05
25	Sugar	..	-0.00	.	0.15	.	.	...	...	0.05	..	...	..	..	-0.00	-0.03
26	Cocoa	...	-0.02	...	0.13	0.04	.	-0.01	0.12	0.02	...	-0.14	..	..	..	-0.06
27	OtherFood	.	0.07	...	0.10	0.11	0.06	0.16	0.20	.	0.03	-0.02	...	-0.33	0.15	.
28	Feeds	...	-0.03	...	-0.04	0.07	0.01	-0.08	...	0.07	-0.07	-1.20	...	..	0.01	-0.07
29	Alcohol	...	.	...	-0.12	-0.03	0.01	-0.02	0.07	-0.01	.	..	..	..	0.07	-0.03
30	NonAlcohol	..	...	..	.	0.04	.	-0.00	...	0.06	..	..	..	..	..	0.04
31	Tobacco	0.02	.	..	...	0.14	-0.16	-0.04	...	-0.04	...	...	-0.14	..	0.04	0.25
32	Yarns	0.01	0.07	...	..	-0.03	-0.04	0.05	0.00	0.06	0.01	-0.08	-0.03	-0.05	-0.02	0.03
33	CottonFabr	...	-0.03	...	0.05	-0.00	-0.06	.	0.09	0.07	.	0.08	..	-0.00	0.00	0.02
34	OthTextile	...	0.00	..	0.04	-0.02	-0.01	0.01	0.06	0.04	0.05	0.07	0.06	0.06	.	0.03
35	FloorCover	..	-0.01	..	0.16	0.01	0.01	.	0.02	.	..	0.16	..	..	0.01	-0.00
36	Apparel	...	.	...	0.02	-0.05	.	.	.	0.02	-0.04	0.20	-0.04	.	0.04	0.02
37	Leather	0.03	.	...	0.13	-0.04	-0.05	0.11	-0.08	-0.04	-0.01	-0.04	...	.	..	-0.03
38	LeatherPrd	..	0.02	...	-0.01	0.22	.	-0.09	-0.03	0.08	.	0.34	0.03	0.08	0.01	0.02
39	Footwear	...	0.08	0.11	-0.02	-0.09	-0.04	-0.06	0.01	.	...	.	0.13	0.05	.	0.07
40	Plywood	-0.07	-0.02	..	.	-0.06	-0.05	0.01	0.00	.	...	..	...	-0.04	0.04	.

TABLE 25: (continued)
SECTOR TITLE

	EXPORTER														
	CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
41 OtherWood	0.01	0.39	..	0.10	0.08	-0.04	-0.03	-0.05	-0.02	...	0.02	-0.19	-0.06	0.02	.
42 Furniture	...	.	..	0.11	-0.06	-0.01	.	0.00	-0.03	...	-0.02	..	0.14	0.01	0.03
43 Pulp	0.01	0.03	...	-0.00	-0.03	-0.01	0.22	0.21	0.06	...	..	..	..	-0.00	0.05
44 Newsprint	0.05	...	..	.	-0.04	0.63	-0.07	..	0.31	..	..	..	..	-0.04	-0.03
45 Paper	-0.04	.	..	0.03	-0.01	0.00	0.03	0.06	0.04	.	...	..	..	0.00	0.02
46 Printing	...	0.04	..	-0.00	0.01	0.01	0.01	0.06	.	0.08	0.19	-0.21	0.10	.	0.03
47 Chemical	0.01	-0.02	...	0.04	-0.03	-0.01	0.02	0.04	0.04	0.03	0.05	-0.06	...	.	-0.03
48 Fertilizer	...	-0.04	...	.	.	-0.03	0.09	0.03	.	0.13	..	..	..	.	.
49 SynthFiber	.	.	.	0.05	0.00	-0.03	0.00	.	0.03	0.01	...	.	0.18	-0.01	0.05
50 Paints	...	.	..	0.10	-0.00	-0.02	0.05	.	0.07	-0.01	..	..	..	-0.03	.
51 Drugs	-0.06	0.02	-0.05	.	.	-0.01	0.00	0.05	.	0.05	0.14	...	..	0.01	-0.05
52 Soaps	-0.04	.	..	0.10	.	0.01	0.05	.	-0.01	0.20	...	..	0.05	-0.00	0.12
53 OtherChem	.	-0.02	...	0.01	-0.03	-0.02	-0.03	0.01	0.05	0.13	0.06	-0.36	...	-0.01	-0.00
54 PetroRefin	...	-0.06	..	.	0.01	-0.02	-0.17	.	0.12	...	..	..	..	-0.01	-0.01
55 FuelOil	...	.	...	...	.	-0.11	-0.12	...	0.02	..	..	..	..	.	-0.04
56 PetroProd	0.02	-0.06	..	0.20	0.03	-0.01	-0.13	0.13	0.08	0.03	...	..	..	.	-0.08
57 CoalProd	...	-0.23	...	...	0.20	-0.17	...	-0.44	-0.33	...	..	..	..	0.01	.
58 Tyre	...	0.05	..	-0.02	.	-0.03	-0.01	.	0.06	.	..	-0.06	0.04	-0.00	.
59 Rubber	-0.16	0.00	...	0.03	.	-0.01	.	0.06	0.03	.	..	-0.08	0.03	.	0.05
60 Plastic	...	0.06	...	0.04	.	.	-0.03	0.01	-0.03	-0.02	0.21	-0.02	0.07	0.03	0.03
61 Glass	.	-0.00	-0.03	.	0.00	-0.01	0.01	0.05	0.00	0.08	.	...	0.08	0.02	.
62 Cement	...	...	..	.	.	-0.06	-0.08	0.24	0.16	...	..	..	..	.	0.10
63 Ceramics	..	0.21	...	-0.04	.	0.01	0.00	.	-0.07	-0.06	0.02	-0.25	0.04	0.01	0.05
64 NonMetProd	...	.	...	.	0.03	-0.01	-0.04	0.08	0.07	0.08	...	-0.14	0.02	0.01	0.02
65 IronSteel	-0.06	-0.02	...	.	.	-0.01	0.00	-0.24	0.10	-0.13	...	-0.13	.	0.00	0.02
66 Copper	-0.04	-0.03	...	.	.	0.04	0.03	-0.01	0.02	-0.17	...	..	..	0.02	-0.03
67 Aluminum	...	.	..	.	.	-0.03	0.06	-0.04	0.00	-0.23	...	..	..	-0.02	0.07
68 Nickel	-0.12	0.17	..	.	0.06	0.01	.	...	-0.02	...	..	..	..	.	.
69 LeadZinc	-0.03	-0.00	...	.	0.00	0.05	.	-0.16	-0.02	...	..	..	..	-0.00	-0.06
70 OtherMetal	.	-0.05	...	0.02	.	-0.00	-0.04	-0.12	0.03	-0.02	0.03	...	..	0.01	.
71 MetalFurn	...	0.03	..	.	-0.12	-0.00	-0.05	-0.06	0.06	0.01	0.26	-0.73	.	0.01	-0.03
72 StrucMetal	...	-0.08	..	.	0.00	-0.04	-0.03	0.02	0.05	...	..	..	...	0.01	0.07
73 Container	...	-0.00	..	.	-0.00	-0.05	0.02	-0.02	0.06	...	..	..	...	-0.02	.
74 Wire	..	0.04	..	0.11	-0.02	.	0.03	0.07	0.10	.	..	-0.15	.	0.11	0.06
75 Hardware	-0.02	-0.01	..	.	-0.04	-0.01	.	0.01	0.03	-0.03	.	-0.02	0.11	0.01	0.01
76 Boilers	...	0.07	...	-0.00	0.07	0.03	0.02	-0.00	0.03	-0.26	..	..	..	-0.00	-0.11
77 AirEngine	.	.	..	...	-0.15	0.00	-0.06	...	-0.11	.	...	..	..	0.05	0.08
78 IntEngine	...	.	.	0.14	-0.07	.	.	0.05	0.04	.	...	..	..	.	.
79 PowerMach	.	-0.02	...	-0.03	-0.04	0.08	.	0.33	0.03	-0.10	..	..	...	0.04	.
80 AgriMach	...	0.01	..	0.00	-0.06	-0.07	-0.01	0.12	0.06	0.21	..	..	..	0.01	0.05

TABLE 25: (continued)
SECTOR TITLE

		EXPORTER														
		CA	US	MX	AU	BE	FR	IT	SP	UK	JA	CN	SK	TW	RO	RW
81	ConstrEQ	-0.24	.	..	.	0.01	-0.03	-0.01	0.04	0.03	0.04	...	...	..	0.01	0.08
82	MetalMach	.	.	..	0.01	-0.07	-0.05	0.00	.	0.03	0.11	.	-0.00	0.21	0.00	-0.02
83	SewingMach	...	.	..	.	0.04	-0.03	0.01	-0.01	-0.01	0.01	..	0.02	0.08	-0.00	0.04
84	TextMach	...	.	..	-0.01	-0.02	0.00	-0.02	.	-0.03	0.11	...	...	...	0.03	0.09
85	PaperMach	-0.17	-0.02	..	.	-0.05	.	0.03	0.15	-0.03	0.08	..	..	...	-0.00	-0.01
86	PrintMach	...	.	..	0.01	-0.02	-0.01	-0.01	.	0.01	.	...	..	...	0.03	.
87	FoodMach	...	.	..	0.01	-0.04	0.00	0.05	0.17	0.04	.	..	..	..	-0.01	-0.02
88	SpecMach	-0.31	0.09	..	0.07	-0.08	-0.12	.	.	-0.01	.	..	..	0.10	0.21	0.01
89	ServMach	...	0.00	..	0.06	-0.05	-0.02	.	-0.00	0.01	0.09	...	..	0.07	-0.01	.
90	Pumps	-0.62	.	...	.	-0.03	-0.02	-0.02	0.12	0.02	0.15	...	...	0.10	-0.00	0.03
91	MechEQ	...	.	..	.	-0.03	.	.	0.11	0.05	0.03	0.14	...	0.04	0.01	0.05
92	OtherMach	.	-0.03	...	.	-0.03	0.01	0.04	0.11	0.00	0.07	.	...	0.17	-0.04	0.06
93	RadioTV	.	0.02	...	0.02	0.02	0.09	.	0.04	0.12	0.03	.	-0.02	.	0.02	0.03
94	TelecommEQ	0.17	0.01	...	0.01	-0.04	-0.05	.	0.07	0.07	.	...	.	0.20	.	0.03
95	HomeAppl	...	0.01	..	0.06	.	-0.02	-0.04	0.11	0.06	.	...	-0.44	.	0.03	0.02
96	Computers	.	-0.01	..	0.02	0.01	-0.01	.	0.15	0.05	0.18	...	.	0.49	0.05	0.25
97	OfficeMach	...	-0.05	0.11	.	0.20	.	0.06	-0.07	0.12	0.04	.	.	0.12	-0.04	0.08
98	Semicon	0.07	-0.01	...	0.03	0.16	-0.01	0.02	0.27	0.04	0.08	..	0.20	0.09	-0.00	0.05
99	ElecMotor	0.06	.	...	.	0.13	-0.04	.	-0.06	-0.15	.	.	...	0.12	0.12	0.09
100	Battery	...	0.10	...	-0.02	.	-0.01	0.02	0.30	-0.07	0.10	...	0.30	0.03	-0.01	0.01
101	ElecBulbs	...	.	..	.	0.05	0.02	0.01	0.05	-0.02	0.02	.	.	0.17	-0.01	0.03
102	IndlApp	-0.03	.	...	0.02	.	-0.03	0.01	0.05	0.04	0.04	...	.	0.20	-0.01	0.02
103	Ship	...	0.09	...	-0.59	0.00	-0.02	-0.02	0.07	-0.03	.	...	...	.	-0.03	0.10
104	Warships	..	...	..	...	...	...	...	..	...	...	..	..	...	...	...
105	RailroadEQ	...	-0.19	...	.	0.04	-0.12	0.05	0.29	0.04	...	..	..	..	0.03	.
106	Auto	..	...	...	.	.	-0.05	-0.05	0.26	0.05	0.19	..	...	..	0.01	.
107	Motorcycle	...	0.19	..	-0.10	0.00	-0.06	-0.04	0.01	0.02	0.07	...	...	0.29	0.01	0.01
108	AutoParts	0.08	.	-0.04	0.08	-0.02	-0.07	.	0.12	.	0.15	..	..	..	-0.01	-0.04
109	Aircraft	0.02	-0.12	..	...	.	0.16	-0.04	-0.02	-0.04	...	...	...	...	-0.05	-0.03
110	OtherTrans	..	...	..	0.06	...	-0.00	0.03	0.66	-0.27	...	...	...	0.58	.	...
111	Instrument	.	.	..	.	-0.00	.	0.01	0.01	0.01	0.03	.	0.12	0.07	-0.01	0.01
112	Optical	0.11	-0.00	..	-0.03	0.17	0.00	.	-0.01	0.01	.	.	.	0.14	0.04	0.04
113	Watches	...	-0.02	0.23	-0.03	0.15	.	.	0.08	0.04	.	.	-0.09	0.14	0.04	0.14
114	Jewellery	.	0.02	-0.04	-0.01	0.14	-0.02	0.03	0.03	-0.06	.	-0.11	...	0.04	-0.03	0.02
115	MusicInst	0.08	0.01	..	0.01	-0.05	.	-0.10	0.06	0.05	0.14	0.21	.	0.21	.	0.05
116	Sporting	0.00	0.04	...	-0.03	.	-0.04	-0.03	.	0.05	.	0.14	.	0.12	0.02	-0.00
117	Ordnance	-0.05	-0.04	...	-0.01	-0.03	-0.03	.	-0.06	.	-0.06	-0.06	...	.	0.09	0.09
118	ArtWork	0.04	0.02	...	-0.01	0.10	-0.00	.	0.02	-0.04	0.03	.	...	.	.	-0.04
119	OtherMfg	...	.	.	0.05	0.01	-0.02	.	0.06	0.01	0.01	0.25	.	0.06	0.01	-0.00
120	Scraps	-0.02	-0.02	...	.	-0.05	.	-0.02	0.07	0.01	0.09	-0.38	.	.	0.00	.

TABLE 26: Time Parameter by Sector and Country in the Japanese Import Market

SECTOR TITLE		EXPORTER														
		CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
1	Cereals	-0.01	0.03	..	..	..	..	...	..	..	..	-0.45	...	..	-0.04	-0.06
2	Fruits	0.02	0.01	0.11	..	..	...	-0.03	0.19	...	...	0.01	-0.09	-0.05	0.11	-0.01
3	OtherCrop	-0.00	.	-0.04	..	..	...	...	...	...	...	0.04	0.12	0.04	0.07	0.06
4	Livestock	-0.07	0.03	...	..	0.00	-0.01	.	..	...	0.12	0.05	...	-0.12	.	-0.07
5	Silk	..	..	..	..	..	..	...	...	...	..	0.08	...	.	...	0.05
6	Cotton	..	0.03	-0.16	..	..	..	..	..	..	..	.	...	..	0.15	-0.08
7	Wool	...	0.20	..	..	...	0.00	.	0.09	...	..	0.06	...	0.09	-0.03	.
8	OtherFiber	...	..	..	..	0.42	0.49	..	...	..	...	.	...	0.86	...	.
9	Wood	0.10	-0.02	..	..	..	...	...	..	..	..	0.11	-0.03	.	0.11	-0.05
10	Fish	0.04	.	-0.15	..	..	.	...	...	-0.06	...	0.06	0.01	.	0.07	0.04
11	IronOre	-0.05	...	..	..	..	..	..	..	..	..	..	...	..	-0.01	.
12	Coal	.	.	..	..	..	..	...	..	..	..	-0.05	..	..	0.05	0.07
13	OthMetOre	.	0.09	..	..	...	..	...	..	-0.04	...	0.05	...	..	0.05	-0.01
14	Petroleum	...	..	-0.07	..	..	..	..	..	..	...	0.07	..	..	0.13	-0.05
15	NatGas	...	-0.04	..	..	..	...	...	..	..	..	..	...	..	...	..
16	NonMetal	-0.04	0.01	0.05	..	0.05	0.09	0.39	0.08	0.10	0.09	0.08	.	0.08	0.04	0.01
17	Elec	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	Meat	-0.08	0.04	-0.05	..	..	-0.05	.	..	...	...	0.00	-0.04	0.13	-0.04	.
19	Dairy	.	0.06	..	-0.46	0.05	0.04	.	0.31	...	0.08	-0.05	-0.09	0.03	-0.07	0.02
20	PreFruit	0.06	0.11	0.03	.	...	0.06	0.21	0.07	.	0.01	0.06	-0.05	.	.	-0.00
21	Seafood	.	0.21	-0.15	..	..	...	...	...	-0.09	.	-0.11	-0.03	0.08	0.06	-0.01
22	OilFats	0.13	0.03	...	..	...	0.05	0.06	0.24	0.08	0.03	0.16	-0.10	0.83	0.14	0.00
23	GrainMill	-0.03	0.05	..	..	..	...	...	..	...	...	-0.17	...	...	.	-0.01
24	Bakery	.	0.09	..	0.02	0.12	0.04	0.00	0.21	...	0.01	.	-0.09	0.14	.	0.05
25	Sugar	...	0.15	..	...	..	...	..	..	...	..	-0.17	-0.00	-0.31	0.03	0.01
26	Cocoa	-0.14	0.08	...	0.08	0.11	.	0.04	0.06	1.18	-0.01	0.17	.	0.01	0.02	-0.01
27	OtherFood	0.14	0.09	...	..	0.22	0.04	0.04	0.20	0.02	0.00	0.06	-0.04	0.07	0.03	0.02
28	Feeds	-0.07	0.07	...	...	0.05	0.11	0.06	...	0.62	.	...	..	-0.05	-0.05	-0.00
29	Alcohol	-0.02	0.13	.	...	-0.09	.	-0.01	.	.	0.00	-0.27	-0.07	0.05	-0.07	-0.03
30	NonAlcohol	-1.56	0.05	...	...	...	0.18	-0.09	...	..	1.25	0.08	-0.13	.	0.07	0.23
31	Tobacco	...	0.03	-0.04	...	...	...	...	-0.17	..	-0.09	-0.22	...	.	.	0.01
32	Yarns	..	..	...	...	...	0.02	0.05	0.09	0.27	.	.	-0.11	0.04	-0.08	0.07
33	CottonFabr	..	-0.01	...	..	-0.00	-0.03	-0.00	0.03	...	0.13	.	..	.	.	0.01
34	OthTextile	-0.00	0.07	..	0.04	0.15	-0.00	0.04	0.06	0.19	-0.02	0.11	-0.03	0.08	.	0.00
35	FloorCover	-0.08	.	...	0.02	-0.05	.	-0.08	0.24	.	-0.01	.	-0.00	.	0.02	0.13
36	Apparel	.	0.06	...	...	..	..	0.02	0.04	.	0.01	0.06	0.00	0.03	.	0.04
37	Leather	.	0.05	...	..	...	-0.04	-0.02	.	0.01	0.03	-0.04	.	-0.21	-0.01	.
38	LeatherPrd	...	.	...	...	...	0.02	.	.	.	-0.01	0.02	0.16	0.10	.	.
39	Footwear	...	0.17	...	...	0.01	0.00	.	-0.00	.	0.12	0.15	-0.02	0.01	.	0.05
40	Plywood	-0.15	.	...	..	..	...	...	...	..	...	-0.01	...	-0.10	-0.17	0.32

TABLE 26 (continued)
SECTOR TITLE

	EXPORTER														
	CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
41 OtherWood	0.03	0.05	...	...	..	.	0.08	0.08	0.04	0.01	0.01	-0.09	-0.05	0.02	0.05
42 Furniture	0.04	0.03	..	.	.	.	0.00	0.04	0.03	0.08	-0.01	0.03	0.02	.	-0.02
43 Pulp	-0.02	0.01	...	..	...	...	...	..	...	..	..	..	...	-0.03	0.08
44 Newsprint	-0.00	0.25	..	..	...	...	...	..	..	..	..	..	..	-0.18	...
45 Paper	-0.08	0.06	..	0.87	0.06	-0.03	-0.04	0.02	...	-0.03	0.02	-0.01	0.08	.	.
46 Printing	-0.06	-0.01	..	0.05	-0.01	.	0.01	0.01	0.24	.	0.03	-0.01	0.03	-0.00	0.03
47 Chemical	.	-0.01	0.04	0.04	.	0.03	-0.02	.	-0.02	0.04	0.02	-0.09	0.04	-0.02	.
48 Fertilizer	-0.04	0.03	..	..	0.03	0.02	-0.01	0.00	...	0.02	-0.80	-0.05	0.24	-0.01	.
49 SynthFiber	-0.13	.	-0.45	...	..	.	-0.01	.	...	0.02	0.09	.	0.10	0.01	0.10
50 Paints	-0.61	-0.02	..	..	0.01	-0.02	0.01	.	...	0.06	...	.	0.21	-0.01	.
51 Drugs	-0.08	0.06	...	.	0.13	-0.00	-0.00	.	-0.02	.	0.06	-0.01	-0.07	.	-0.11
52 Soaps	-0.43	.	...	...	0.37	0.00	-0.02	0.03	...	.	.	.	0.17	-0.01	0.03
53 OtherChem	.	0.03	.	..	0.00	-0.05	0.01	0.05	.	-0.01	-0.02	0.02	.	0.00	.
54 PetroRefin	-0.13	0.02	...	...	...	...	...	...	...	...	-0.09	0.21	...	0.03	-0.01
55 FuelOil	.	0.05	...	..	...	0.25	...	...	...	...	-0.04	.	...	0.03	0.01
56 PetroProd	-0.08	-0.15	..	...	0.03	-0.08	0.23	0.08	...	-0.04	-0.00	-0.29	.	0.14	0.74
57 CoalProd	..	...	...	..	...	...	0.36	..	..	..	-1.95	.	-0.84	-0.00	...
58 Tyre	.	0.26	..	0.12	.	.	.	0.09	0.07	0.02	..	-0.07	-0.02	0.11	0.14
59 Rubber	-0.17	0.03	..	0.01	-0.02	-0.03	0.01	.	...	0.03	.	-0.01	.	.	0.09
60 Plastic	0.03	.	...	-0.09	.	0.09	-0.02	0.05	.	-0.01	.	.	0.06	-0.02	0.02
61 Glass	...	-0.00	.	0.01	0.15	0.00	-0.05	-0.01	0.03	-0.04	.	-0.04	0.05	-0.01	0.03
62 Cement	...	..	...	..	...	1.14	...	..	...	...	...	..	.	0.76	.
63 Ceramics	...	0.06	-0.01	0.05	0.09	-0.01	-0.01	-0.02	0.05	0.04	-0.11	-0.12	0.05	.	.
64 NonMetProd	0.17	0.00	...	-0.09	.	0.08	0.09	0.11	0.14	-0.09	0.01	-0.02	.	.	0.00
65 IronSteel	.	0.03	...	-0.14	...	-0.08	.	...	-0.13	.	-0.39	0.16	0.16	.	0.01
66 Copper	.	.	...	..	...	...	-0.04	...	..	...	.	.	0.36	0.11	.
67 Aluminum	-0.01	0.04	..	-0.02	..	-0.03	-0.02	...	-0.47	-0.01	.	.	.	0.03	-0.00
68 Nickel	-0.18	-0.00	..	...	...	...	0.01	...	..	0.02	...	...	...	-0.06	.
69 LeadZinc	0.19	0.14	-0.04	..	0.60	1.52	0.14	..	...	...	0.01	.	0.22	0.21	.
70 OtherMetal	-0.08	0.03	-0.07	...	0.28	0.22	.	...	-0.05	0.09	0.06	.	0.04	0.04	-0.08
71 MetalFurn	.	0.04	...	0.09	...	-0.03	-0.11	-0.12	-0.19	-0.05	-0.05	-0.14	0.06	-0.01	-0.05
72 StrucMetal	-0.02	.	...	...	...	-0.05	0.01	0.11	...	-0.00	.	0.07	0.03	0.01	0.23
73 Container	...	0.00	...	...	...	.	-0.02	0.08	...	-0.02	...	.	0.03	0.10	0.02
74 Wire	...	.	...	...	0.07	.	-0.05	0.03	..	-0.13	.	.	0.14	0.10	0.27
75 Hardware	-0.16	0.04	..	0.01	-0.01	0.02	-0.01	0.02	0.23	-0.01	0.11	0.01	0.10	.	0.02
76 Boilers	...	-0.01	..	...	...	0.12	-0.00	.	...	-0.00	...	.	...	-0.11	0.71
77 AirEngine	-0.07	0.14	..	..	..	...	...	..	..	-0.02	..	..	..	...	...
78 IntEngine	.	.	0.11	0.10	...	0.11	-0.00	0.01	...	-0.08	...	-0.12	0.08	0.19	0.20
79 PowerMach	-0.14	-0.05	..	...	...	.	.	.	...	.	.	0.19	-0.04	.	...
80 AgriMach	-0.11	0.05	..	-0.02	.	.	.	.	...	.	...	-0.02	0.13	-0.03	-0.12

TABLE 26: (continued)

SECTOR TITLE		EXPORTER														
		CA	US	MX	AU	BE	FR	GE	IT	SP	UK	CN	SK	TW	RO	RW
81	ConstrEQ	-0.01	-0.06	...	.	-0.03	-0.02	.	0.25	...	.	...	.	0.15	0.09	0.38
82	MetalMach	-0.28	-0.00	..	0.01	-0.02	-0.03	-0.01	.	0.10	-0.00	.	.	.	0.03	0.01
83	SewingMach	...	0.00	..	0.12	0.11	.	-0.04	0.10	...	-0.09	...	-0.01	0.21	-0.01	.
84	TextMach	...	.	..	...	.	.	.	.	0.29	.	..	.	0.33	0.05	0.12
85	PaperMach	-0.22	-0.01	..	...	..	0.07	-0.03	0.13	0.02	0.02	...	-0.00	-0.12	0.03	...
86	PrintMach	...	.	..	...	0.01	1.28	.	-0.08	...	0.07	...	-0.05	0.14	0.00	0.02
87	FoodMach	...	.	...	0.04	...	0.02	-0.01	0.11	0.18	0.05	...	0.20	0.04	0.03	0.05
88	SpecMach	-0.31	0.12	..	.	.	0.09	.	0.02	0.27	-0.09	...	.	.	.	.
89	ServMach	-0.48	.	..	.	-0.22	-0.01	-0.01	0.08	0.24	0.02	...	.	0.17	.	0.02
90	Pumps	.	-0.03	...	0.05	0.04	0.07	.	0.00	0.10	0.06	.	.	0.22	0.00	-0.01
91	MechEQ	-0.35	.	..	-0.17	...	0.05	-0.10	0.13	.	0.06	...	-0.05	0.30	-0.01	0.06
92	OtherMach	.	.	...	0.02	-0.06	.	-0.02	-0.01	...	0.00	.	0.03	.	-0.04	0.21
93	RadioTV	0.05	0.12	0.53	...	0.27	0.07	0.02	-0.01	...	.	.	.	.	0.01	0.07
94	TelecommEQ	.	0.02	...	...	-0.04	.	.	-0.07	...	-0.07	.	0.03	0.08	-0.04	0.19
95	HomeAppl	-0.39	.	...	...	0.01	.	0.04	0.01	0.21	0.04	.	.	0.12	0.01	0.20
96	Computers	.	.	0.17	...	...	-0.02	0.05	.	...	.	...	-0.15	0.15	0.05	0.10
97	OfficeMach	...	.	...	..	...	...	0.06	-0.03	...	.	.	0.02	0.47	.	0.38
98	Semicon	0.26	0.04	...	...	...	.	.	0.16	..	0.12	...	-0.06	0.01	0.03	-0.00
99	ElecMotor	...	0.02	...	...	...	.	.	.	...	-0.07	.	.	0.72	0.11	0.40
100	Battery	-0.07	0.01	...	...	...	0.13	0.00	...	...	.	.	-2.49	0.05	0.00	.
101	ElecBulbs	-0.18	-0.00	...	...	0.09	-0.15	0.08	-0.03	...	0.07	.	-0.08	0.05	.	0.03
102	IndlApp	.	0.05	-0.13	-0.02	0.06	-0.04	-0.02	0.05	.	0.05	.	-0.08	0.02	.	0.08
103	Ship	.	0.19	..	..	...	0.52	0.42	.	...	-0.12	...	-4.23	0.08	-0.10	-0.10
104	Warships	...	...	..	...	...	...	...	..	...	...	...	...	...	...	...
105	RailroadEQ	...	0.41	..	-0.07	...	-0.00	0.10	...	...	0.05	.	-5.87	...	.	...
106	Auto	.	-0.00	...	...	0.18	0.04	.	0.02	..	0.06	..	.	...	0.02	-0.57
107	Motorcycle	...	0.18	...	-0.10	...	-0.05	-0.03	0.02	...	.	.	-0.20	0.18	0.13	0.01
108	AutoParts	0.19	.	...	...	-0.04	0.05	.	.	...	0.01	...	0.07	0.15	0.08	0.10
109	Aircraft	.	-0.09	..	..	...	0.30	0.11	.	..	-0.04	..	..	..	..	..
110	OtherTrans	...	...	..	...	...	...	...	...	...	...	..	-1.37	...	...	...
111	Instrument	0.02	-0.00	..	0.04	...	0.02	0.03	0.02	...	0.03	...	-0.03	0.02	.	0.07
112	Optical	0.12	0.02	...	-0.00	...	-0.07	-0.07	.	...	0.03	.	.	0.08	0.00	.
113	Watches	..	-0.07	...	...	...	0.01	-0.05	.	...	.	..	-0.11	0.04	-0.00	0.07
114	Jewellery	..	-0.02	...	...	0.02	.	-0.06	.	0.05	0.00	-0.08	-0.10	0.01	-0.01	0.02
115	MusicInst	.	.	...	0.05	...	0.03	-0.01	.	-0.02	0.01	.	0.02	0.14	0.05	0.01
116	Sporting	-0.04	.	...	.	...	0.03	0.01	0.12	0.13	.	.	.	0.13	0.00	0.16
117	Ordnance	..	.	..	..	...	...	.	...	...	-0.39	..	...	..	.	..
118	ArtWork	...	0.05	...	...	0.17	.	0.02	-0.04	-0.02	.	-0.13	-0.19	...	-0.04	-0.15
119	OtherMfg	0.01	.	0.18	-0.06	...	.	-0.02	-0.02	0.23	-0.00	0.04	-0.01	0.15	-0.01	0.09
120	Scraps	-0.01	.	-0.17	...	0.11	0.08	0.04	0.06	0.14	0.07	.	0.03	0.07	-0.00	0.01

machinery over the 1974-91 period would be -18 percent. For the same sector, one can also see that the time parameter is -0.05 for Belgium-Luxembourg, -0.00 for Germany, 0.01 for Italy, 0.03 for Spain, 0.05 for UK, 0.05 for Japan, -0.02 for ROECD, and -0.04 for ROW. The double-dot in the cells of exporters Mexico, China, South Korea, and Taiwan indicates that the concerned share equations were not estimated because France never imported "Agricultural machinery" from the above countries throughout the historical period (1974-91). The single-dot in the cells of other exporters indicates that the Nyhus time trend was not included in the share equations. Overall, the estimated share time parameters vary by exporter in each import market.

Table 27 shows the variation in the size of the estimated time parameters of the share equations. Here, "NEQ" denotes the number of estimated share equations for a given sector. "TEQ" shows the number of share equations with a time variable. "T \leq .02" shows the number of share equations whose time parameters are less than or equal to 0.02 (in absolute value). "T \leq .03", "T \leq .05", and "T \leq .1" show the number of share equations whose time parameters are less than or equal to 0.03, 0.05, and 0.10, respectively. "T $>$.1" refers to the number of share equations whose time parameters are greater than 0.10 (in absolute value).

Of all the share equations estimated, 14,063 have a Nyhus trend, accounting

Table 27: Size Variations in the Estimated Time Parameters

SECTOR TITLE	NEQ	TEQ	T<=.02	T<=.03	T<=.05	T<=.1	T>.1
1 Unmilled cereals	112 (99)	77 (43)	12 (14)	20 (25)	25 (27)	40 (30)	37 (13)
2 Fresh fruits & vegg	150 (100)	116 (89)	37 (42)	45 (52)	71 (79)	93 (86)	23 (3)
3 Other crop	162 (100)	102 (75)	27 (37)	34 (44)	49 (54)	77 (72)	25 (3)
4 Livestock	143 (100)	108 (78)	27 (26)	34 (34)	48 (57)	77 (72)	31 (7)
5 Silk	55 (99)	42 (55)	9 (3)	12 (3)	16 (12)	24 (30)	18 (25)
6 Cotton	107 (94)	80 (79)	21 (9)	27 (28)	37 (47)	57 (63)	23 (16)
7 Wool	135 (100)	102 (81)	26 (15)	36 (25)	53 (66)	79 (74)	23 (7)
8 Other natural fibers	91 (99)	70 (79)	11 (23)	13 (28)	21 (31)	43 (50)	27 (29)
9 Crude wood	117 (100)	86 (78)	31 (23)	44 (47)	55 (65)	66 (68)	20 (10)
10 Fishery	145 (100)	116 (85)	19 (16)	26 (27)	43 (53)	74 (77)	42 (8)
11 Iron ores	49 (100)	36 (64)	16 (44)	19 (49)	27 (58)	33 (62)	3 (2)
12 Coal	79 (97)	52 (58)	7 (5)	10 (11)	17 (30)	31 (46)	21 (11)
13 Nonferrous metal ore	126 (99)	96 (83)	22 (35)	32 (41)	47 (49)	67 (71)	29 (12)
14 Crude petroleum	50 (99)	41 (77)	2 (2)	4 (3)	8 (27)	16 (57)	25 (21)
15 Natural gas	41 (96)	26 (61)	1 (0)	1 (0)	3 (11)	4 (11)	22 (51)
16 Non-metallic ore	188 (100)	136 (74)	30 (16)	41 (24)	68 (42)	108 (59)	28 (15)
17 Electrical energy	22 (31)	15 (29)	4 (0)	6 (1)	6 (1)	12 (17)	3 (12)
18 Meat	150 (88)	110 (69)	31 (20)	37 (22)	65 (52)	83 (58)	27 (12)
19 Dairy products	150 (86)	112 (60)	26 (32)	33 (36)	50 (44)	83 (54)	29 (6)
20 Preserved fruit,veg	173 (76)	138 (67)	33 (15)	48 (23)	65 (32)	99 (57)	39 (9)
21 Preserved seafood	171 (96)	116 (67)	29 (13)	41 (25)	59 (33)	83 (52)	33 (15)
22 Veg & animal oil,fat	147 (64)	110 (51)	19 (10)	28 (13)	50 (21)	73 (32)	37 (19)
23 Grain mill products	122 (67)	86 (45)	17 (7)	23 (14)	28 (17)	45 (24)	41 (21)
24 Bakery products	153 (88)	117 (69)	24 (13)	38 (19)	60 (36)	90 (53)	27 (16)
25 Sugar	88 (42)	68 (36)	13 (8)	18 (11)	24 (14)	43 (26)	25 (9)
26 Cocoa,chocolate,etc	165 (84)	131 (72)	38 (20)	45 (22)	60 (35)	89 (56)	42 (17)
27 Food products,nec	191 (84)	144 (54)	13 (4)	23 (5)	41 (9)	81 (25)	63 (29)
28 Prepared animal feed	150 (75)	115 (59)	19 (10)	27 (16)	48 (36)	79 (54)	36 (6)
29 Alcoholic beverages	164 (87)	118 (73)	38 (29)	46 (34)	62 (50)	92 (63)	26 (10)
30 Nonalcoholic beverage	123 (77)	90 (52)	11 (23)	16 (24)	32 (28)	53 (40)	37 (12)
31 Tobacco products	125 (66)	88 (54)	11 (1)	19 (6)	32 (31)	45 (32)	43 (22)
32 Yarns and threads	206 (89)	158 (72)	38 (20)	58 (31)	82 (41)	120 (62)	38 (10)
33 Cotton fabrics	196 (69)	149 (51)	39 (14)	54 (20)	76 (27)	115 (47)	34 (3)
34 Other textile prod	213 (92)	160 (75)	49 (20)	68 (30)	96 (45)	134 (64)	26 (11)
35 Floor coverings	162 (75)	118 (47)	37 (25)	42 (25)	63 (31)	86 (39)	32 (8)
36 Wearing apparel	190 (100)	138 (81)	34 (19)	54 (45)	81 (61)	118 (75)	20 (6)
37 Leather and hides	190 (100)	132 (80)	23 (17)	42 (33)	63 (44)	96 (61)	36 (19)
38 Leather products	193 (100)	139 (74)	41 (20)	52 (22)	70 (34)	95 (47)	44 (26)
39 Footwear	176 (100)	137 (79)	29 (16)	35 (19)	56 (34)	95 (72)	42 (7)
40 Plywood and veneer	126 (100)	93 (72)	19 (7)	31 (18)	49 (30)	71 (42)	22 (30)
41 Other wood products	195 (100)	148 (84)	41 (35)	59 (47)	82 (61)	116 (79)	32 (6)
42 Furnitures,fixtures	190 (100)	139 (79)	52 (36)	74 (55)	95 (63)	112 (72)	27 (7)
43 Pulp and waste paper	116 (100)	96 (90)	32 (39)	44 (52)	56 (63)	77 (86)	19 (4)
44 Newsprint	72 (89)	53 (74)	7 (6)	9 (7)	18 (61)	26 (65)	27 (9)
45 Paper products	190 (100)	130 (88)	42 (51)	54 (59)	77 (79)	109 (86)	21 (3)
46 Printing,publishing	204 (100)	155 (83)	63 (45)	85 (65)	112 (73)	136 (82)	19 (2)
47 Basic chemicals	222 (100)	164 (84)	73 (50)	95 (60)	130 (79)	154 (83)	10 (0)
48 Fertilizer	169 (100)	116 (49)	35 (29)	48 (34)	69 (41)	96 (45)	20 (3)
49 Synthetic resin,fiber	207 (100)	140 (80)	44 (43)	61 (51)	86 (69)	118 (75)	22 (5)
50 Paints and varnishes	160 (100)	113 (81)	39 (50)	51 (63)	66 (72)	86 (77)	27 (4)
51 Drugs and medicines	201 (100)	141 (78)	48 (45)	60 (50)	87 (68)	119 (77)	22 (2)
52 Soaps & other toilet	182 (100)	131 (74)	38 (46)	53 (56)	73 (64)	104 (72)	27 (2)
53 Chemical product,nec	205 (100)	139 (78)	53 (37)	69 (45)	89 (54)	114 (65)	25 (12)
54 Petroleum refinery	133 (99)	103 (88)	20 (49)	30 (54)	48 (67)	72 (80)	31 (9)
55 Fuel oil	93 (98)	68 (70)	14 (23)	20 (26)	34 (42)	46 (65)	22 (6)
56 Product of petroleum	164 (99)	119 (75)	22 (19)	33 (25)	46 (33)	73 (46)	46 (29)
57 Product of coal	77 (97)	51 (63)	5 (12)	9 (17)	12 (19)	21 (37)	30 (26)
58 Tyre and tube	184 (100)	129 (79)	29 (26)	47 (44)	66 (51)	99 (71)	30 (7)
59 Rubber products,nec	204 (100)	159 (83)	41 (31)	60 (38)	93 (57)	118 (71)	41 (12)
60 Plastic product,nec	210 (100)	168 (83)	56 (34)	81 (45)	114 (66)	144 (73)	24 (10)
61 Glass	202 (100)	145 (84)	56 (49)	66 (54)	97 (68)	129 (78)	16 (6)
62 Cement	106 (99)	69 (67)	12 (16)	14 (16)	27 (35)	44 (48)	25 (19)

Table 27: (continued)

SECTOR TITLE	NEQ	TEQ	T<=.02	T<=.03	T<=.05	T<=.1	T>.1
63 Ceramics	205 (100)	159 (85)	57 (48)	64 (50)	90 (63)	119 (74)	40 (11)
64 Nonmetallic min prod	196 (100)	146 (84)	45 (39)	58 (46)	85 (63)	123 (79)	23 (6)
65 Basic iron and steel	203 (100)	137 (62)	49 (32)	59 (37)	76 (45)	105 (55)	32 (7)
66 Copper	163 (99)	115 (74)	26 (25)	40 (43)	53 (52)	81 (63)	34 (12)
67 Aluminum	169 (100)	116 (76)	33 (25)	42 (35)	61 (56)	92 (65)	24 (11)
68 Nickel	128 (98)	98 (73)	26 (18)	33 (28)	40 (30)	67 (54)	31 (19)
69 Lead and zinc	136 (99)	103 (82)	14 (19)	26 (39)	42 (49)	63 (70)	40 (12)
70 Other nonferrous met	171 (100)	124 (80)	25 (14)	40 (21)	63 (56)	96 (75)	28 (5)
71 Metal furnitures	191 (100)	141 (83)	30 (22)	53 (44)	75 (60)	111 (75)	30 (8)
72 Structural metal prod	156 (100)	118 (90)	31 (41)	43 (49)	61 (70)	87 (85)	31 (6)
73 Metal containers	151 (100)	111 (68)	31 (29)	41 (36)	59 (51)	80 (64)	31 (5)
74 Wire products	189 (100)	129 (77)	26 (25)	41 (40)	61 (50)	91 (65)	38 (12)
75 Hardware	222 (100)	172 (73)	76 (47)	94 (51)	122 (61)	149 (67)	23 (6)
76 Boilers and turbines	147 (99)	116 (84)	34 (37)	44 (50)	60 (66)	81 (73)	35 (11)
77 Aircraft engines	110 (99)	78 (67)	11 (12)	15 (14)	30 (35)	49 (45)	29 (22)
78 Internal combust eng	167 (100)	128 (73)	36 (25)	45 (28)	63 (42)	95 (51)	33 (21)
79 Other power machines	152 (100)	104 (80)	18 (10)	29 (16)	47 (31)	73 (52)	31 (27)
80 Agricultural machine	173 (100)	136 (81)	35 (35)	51 (45)	68 (56)	100 (69)	36 (12)
81 Construction equip	185 (100)	128 (68)	31 (31)	45 (37)	76 (56)	101 (65)	27 (3)
82 Metalworking machine	205 (100)	152 (85)	57 (35)	79 (52)	99 (63)	118 (76)	34 (9)
83 Sewing machines	191 (100)	138 (85)	42 (33)	66 (47)	86 (59)	111 (78)	27 (7)
84 Textile machines	167 (100)	118 (78)	40 (38)	57 (50)	75 (67)	97 (72)	21 (5)
85 Paper mill machines	171 (100)	127 (83)	30 (28)	39 (38)	62 (58)	90 (73)	37 (9)
86 Printing machines	159 (100)	109 (71)	43 (36)	54 (48)	75 (59)	91 (65)	18 (5)
87 Food-processing mach	170 (100)	129 (83)	33 (25)	53 (45)	80 (61)	108 (81)	21 (2)
88 Other special machine	194 (100)	130 (65)	20 (11)	38 (15)	55 (26)	85 (41)	45 (24)
89 Service ind. machine	184 (99)	136 (73)	49 (36)	61 (44)	83 (60)	114 (70)	22 (3)
90 Pumps	190 (100)	134 (75)	44 (37)	62 (46)	85 (60)	111 (66)	23 (9)
91 Mechanical handle eq	200 (100)	137 (75)	34 (39)	41 (44)	72 (58)	102 (72)	35 (3)
92 Other non-elec mach	201 (100)	145 (82)	62 (43)	78 (52)	104 (67)	125 (79)	20 (4)
93 Radio,TV,phonograph	190 (100)	130 (74)	19 (5)	35 (15)	55 (34)	97 (65)	33 (8)
94 Other telecom equip	204 (100)	146 (72)	37 (29)	58 (39)	75 (44)	106 (58)	40 (14)
95 Household appliances	195 (99)	138 (81)	41 (38)	54 (47)	77 (55)	99 (67)	39 (14)
96 Computers	189 (100)	132 (78)	28 (17)	38 (22)	59 (34)	88 (50)	44 (28)
97 Other office machine	188 (100)	124 (81)	26 (27)	38 (39)	61 (60)	86 (66)	38 (15)
98 Semiconductors	183 (100)	144 (80)	36 (25)	45 (29)	61 (36)	102 (59)	42 (20)
99 Electric motors	179 (99)	137 (82)	36 (32)	41 (34)	64 (42)	91 (57)	46 (25)
100 Batteries	180 (99)	141 (83)	31 (22)	50 (33)	72 (55)	107 (70)	34 (13)
101 Electric bulbs	197 (99)	150 (80)	40 (32)	59 (44)	80 (53)	112 (71)	38 (9)
102 Industrial appliance	210 (100)	157 (81)	56 (48)	64 (55)	94 (64)	121 (71)	36 (10)
103 Shipbuilding	145 (99)	112 (90)	22 (21)	37 (45)	54 (63)	80 (73)	32 (17)
104 Warships	7 (93)	4 (61)	0 (0)	0 (0)	0 (0)	1 (3)	3 (59)
105 Railroad equipment	136 (99)	101 (69)	16 (8)	29 (14)	39 (20)	62 (41)	39 (28)
106 Motor vehicles	155 (100)	120 (84)	32 (14)	45 (30)	67 (53)	88 (75)	32 (10)
107 Motorcycle & bicycle	167 (99)	132 (85)	26 (23)	35 (27)	54 (45)	84 (62)	48 (22)
108 Motor vehicle parts	175 (100)	129 (77)	36 (21)	43 (28)	60 (38)	95 (61)	34 (16)
109 Aircraft	107 (100)	83 (93)	9 (7)	17 (10)	32 (19)	50 (53)	33 (40)
110 Other transport eq	86 (94)	74 (85)	7 (11)	10 (17)	18 (26)	27 (29)	47 (56)
111 Precision instrument	206 (100)	152 (85)	78 (69)	96 (76)	116 (79)	140 (84)	12 (1)
112 Optical goods	200 (100)	143 (71)	45 (31)	65 (42)	96 (59)	118 (66)	25 (4)
113 Watches and clocks	171 (100)	126 (64)	32 (26)	45 (29)	67 (38)	96 (56)	30 (8)
114 Jewellery	171 (100)	141 (84)	31 (24)	42 (34)	66 (45)	101 (80)	40 (4)
115 Music instruments	192 (100)	139 (75)	32 (10)	42 (13)	65 (18)	94 (52)	45 (24)
116 Sporting goods	213 (100)	155 (75)	46 (15)	62 (23)	88 (34)	118 (45)	37 (30)
117 Ordnance	112 (96)	82 (49)	10 (1)	16 (3)	27 (9)	51 (14)	31 (35)
118 Works of art	160 (100)	121 (68)	31 (22)	47 (26)	73 (47)	96 (62)	25 (6)
119 Manufacture goods nec	213 (100)	160 (81)	53 (31)	70 (36)	93 (44)	124 (60)	36 (20)
120 Scraps,used	167 (100)	132 (76)	33 (27)	47 (42)	67 (53)	102 (66)	30 (11)
Overall:							
NEQ	TEQ	T<=0.02	T<=0.03	T<=0.05	T<=0.1	T>0.1	
19126 (98)	14063 (77)	3732 (27)	5125 (36)	7371 (50)	10433 (65)	3630 (12)	

for 77% of total world trade in 1990. The number of share equations whose time parameters are less or equal to 0.02 (in absolute value) is 3,732, representing 27% of total world trade. The number of share equations whose time parameters are less or equal to 0.03 (in absolute value) is 5,125, representing 36% of total world trade. The number of share equations whose time parameters are less or equal to 0.05 (in absolute value) is 7,371, representing 50% of total world trade. The number of share equations whose time parameters are less or equal to 0.1 (in absolute value) is 10,433, representing 65% of total world trade. The number of share equations whose time parameters are larger than 0.1 (in absolute value) is 3,630, representing 12% of the total world trade.

4. The Fit of the Equation

How well did the equations fit the historical data? We now turn to this question. The best way to see the fit of the equations is to look at the regression graphs that plot the predicted values against actual history. However, since there are 19,125 estimated share equations, it would be impractical to show all of the regression graphs here. In selecting a sample set of regression graphs, we ranked 300 largest bilateral trade flows in the world for the base year 1990 (Table 28, pp. 139-143), and selected the top 90 bilateral flows which are not related to either the rest of OECD (ROECD) or the rest of world (ROW). ROECD and ROW are excluded for two. First, we are more interested in the trade flows between the fourteen individual countries than trade with the two regions. Secondly, unlike the

Table 28: Top 300 Bilateral Trade Flows in 1990 As Ranked in Decreasing Order

(The flows are shown in thousands of 1990 U.S. Dollar)

Rank ====	Flow =====	Sector =====	Commodity =====	Source =====	Destination =====
1	33251768.0	14	Crude petroleum	Rest of World	United State
2	27277690.0	14	Crude petroleum	Rest of World	Japan
3	22266088.0	106	Motor vehicles	Japan	United State
4	20542204.0	106	Motor vehicles	Canada	United State
5	18519832.0	14	Crude petroleum	Rest of World	Rest of OECD
6	13625642.0	36	Wearing apparel	Rest of World	United State
7	11580108.0	14	Crude petroleum	Rest of World	Italy
8	9315068.0	14	Crude petroleum	Rest of World	France
9	8778837.0	106	Motor vehicles	Japan	Rest of World
10	8762934.0	96	Computers	Japan	United State
11	8669040.0	108	Motor vehicles parts	United State	Canada
12	8629202.0	14	Crude petroleum	Rest of World	Germany
13	8460967.0	106	Motor vehicles	United State	Canada
14	8330980.0	106	Motor vehicles	Germany	Rest of OECD
15	7572419.0	106	Motor vehicles	Japan	Rest of OECD
16	7441006.0	109	Aircraft	United State	Rest of World
17	7242358.0	36	Wearing apparel	Rest of World	Germany
18	6616255.5	54	Petroleum refineries	Rest of World	Japan
19	6536875.0	106	Motor vehicles	Germany	Italy
20	6266384.0	14	Crude petroleum	Rest of World	Korea
21	6112406.0	55	Fuel oils	Rest of World	United State
22	6082030.0	106	Motor vehicles	Germany	United Kingdom
23	6081933.0	108	Motor vehicles parts	Japan	United State
24	6076236.0	36	Wearing apparel	China	Rest of World
25	6019811.0	106	Motor vehicles	Germany	United State
26	6017766.0	14	Crude petroleum	Rest of World	Spain
27	6006486.0	15	Natural gas	Rest of World	Japan
28	5939256.0	96	Computers	United State	Rest of OECD
29	5889713.0	96	Computers	Rest of World	United State
30	5886379.0	108	Motor vehicles parts	Canada	United State
31	5788207.0	54	Petroleum refineries	Rest of World	United State
32	5549815.0	94	Other telecomm eq	Japan	United State
33	5522072.0	106	Motor vehicles	Belgium	Germany
34	5484872.0	109	Aircraft	France	Germany
35	5439209.0	65	Basic iron and steel	Japan	Rest of World
36	5436765.0	36	Wearing apparel	Rest of OECD	Germany
37	5353822.0	109	Aircraft	United State	Rest of OECD
38	5288296.0	120	Scraps,used,unclassified	Canada	United State
39	5194930.0	1	Unmilled cereals	United State	Rest of World
40	5147735.0	106	Motor vehicles	Germany	France
41	4965535.0	14	Crude petroleum	Mexico	United State
42	4960181.0	93	Radio,TV,phonograph	Japan	United State
43	4886185.5	47	Basic chemicals	Germany	Rest of OECD
44	4844967.0	120	Scraps,used,unclassified	Germany	Belgium
45	4809519.0	103	Shipbuilding,repairing	Japan	Rest of World
46	4718856.0	106	Motor vehicles	Japan	Germany
47	4704218.0	14	Crude petroleum	Canada	United State
48	4570630.0	109	Aircraft	Rest of World	United Kingdom
49	4528457.0	98	Semiconductors	United State	Rest of World
50	4513572.5	65	Basic iron and steel	Germany	Rest of OECD
51	4495904.0	104	Warships	United Kingdom	Rest of World
52	4359260.0	44	Newsprint	Canada	United State
53	4296277.5	93	Radio,TV,phonograph	Japan	Rest of World
54	4275143.0	14	Crude petroleum	Rest of OECD	United Kingdom
55	4239559.0	102	Electrical indl appliance	Japan	Rest of World
56	4226823.0	102	Electrical indl appliance	Germany	Rest of OECD
57	4204116.0	98	Semiconductors	Rest of World	United State
58	4192432.5	55	Fuel oils	Rest of World	Japan

Table 28: (continued)

Rank =====	Flow =====	Sector =====	Commodity =====	Source =====	Destination =====
59	4187255.0	106	Motor vehicles	Germany	Japan
60	4103672.0	49	Synthetic resins, fibers	Germany	Rest of OECD
61	4091183.8	75	Hardware	Germany	Rest of OECD
62	4085740.0	114	Jewellery	Rest of World	United State
63	3977359.5	45	Paper products	Rest of OECD	Rest of OECD
64	3913441.5	47	Basic chemicals	Rest of OECD	Germany
65	3893956.0	109	Aircraft	United Kingdom	Rest of World
66	3819021.0	98	Semiconductors	Japan	United State
67	3789613.0	102	Electrical indl appliance	United State	Canada
68	3704251.0	36	Wearing apparel	China	United State
69	3699460.0	98	Semiconductors	Japan	Rest of World
70	3698966.0	120	Scraps, used, unclassified	United State	Rest of World
71	3690024.0	14	Crude petroleum	Rest of OECD	Rest of OECD
72	3650314.0	114	Jewellery	Rest of World	Belgium
73	3588247.0	114	Jewellery	Belgium	Rest of World
74	3556611.0	96	Computers	United State	Japan
75	3495316.0	36	Wearing apparel	Rest of World	Rest of OECD
76	3484698.0	36	Wearing apparel	Rest of World	France
77	3478747.0	3	Other crops	Rest of World	United State
78	3440615.0	9	Crude wood	United State	Japan
79	3431281.0	36	Wearing apparel	Italy	Germany
80	3422008.0	112	Photographic, optical	Japan	United State
81	3416736.0	36	Wearing apparel	Korea	United State
82	3412049.0	3	Other crops	Rest of World	Rest of OECD
83	3387838.5	36	Wearing apparel	Rest of OECD	Rest of OECD
84	3387637.0	45	Paper products	Rest of OECD	Germany
85	3386903.0	102	Electrical indl appliance	Mexico	United State
86	3382199.0	49	Synthetic resins, fibers	Rest of OECD	Germany
87	3375320.0	102	Electrical indl appliance	Japan	United State
88	3304079.0	106	Motor vehicles	France	Italy
89	3283714.0	96	Computers	United State	United Kingdom
90	3266074.2	47	Basic chemicals	Rest of OECD	Rest of World
91	3224659.0	45	Paper products	Rest of OECD	United Kingdom
92	3209383.0	9	Crude wood	Rest of World	Japan
93	3146772.0	114	Jewellery	Rest of World	United Kingdom
94	3140982.0	14	Crude petroleum	Rest of World	Taiwan
95	3140058.8	36	Wearing apparel	Germany	Rest of OECD
96	3129702.0	106	Motor vehicles	France	Germany
97	3114114.5	47	Basic chemicals	Germany	Rest of World
98	3107150.5	47	Basic chemicals	United State	Rest of World
99	3101527.8	19	Dairy and eggs	Rest of OECD	Rest of World
100	3098643.0	96	Computers	Rest of OECD	United Kingdom
101	3089218.0	108	Motor vehicles parts	Germany	United Kingdom
102	3061545.0	108	Motor vehicles parts	China	Rest of World
103	3057330.0	96	Computers	United State	Rest of World
104	3025803.0	36	Wearing apparel	Rest of World	United Kingdom
105	3024513.0	96	Computers	United State	France
106	3023814.0	12	Coal	Rest of OECD	Japan
107	3008690.0	108	Motor vehicles parts	Germany	Rest of OECD
108	2994991.0	106	Motor vehicles	Germany	Belgium
109	2983346.0	108	Motor vehicles parts	Japan	Rest of World
110	2974373.0	96	Computers	United State	Canada
111	2965443.0	96	Computers	Taiwan	United State
112	2955110.5	34	Other textile product	Korea	Rest of World
113	2948620.0	96	Computers	United Kingdom	Rest of OECD
114	2946827.0	47	Basic chemicals	Rest of OECD	Rest of OECD
115	2930512.8	65	Basic iron and steel	Rest of OECD	Rest of OECD
116	2913391.0	1	Unmilled cereals	United State	Japan
117	2901565.0	55	Fuel oils	Rest of OECD	Germany
118	2899624.0	108	Motor vehicles parts	Germany	Rest of World
119	2895235.0	9	Crude wood	Canada	United State

Table 28: (continued)

Rank =====	Flow =====	Sector =====	Commodity =====	Source =====	Destination =====
120	2890660.0	109	Aircraft	United State	Japan
121	2875696.0	96	Computers	United State	Germany
122	2848082.0	106	Motor vehicles	Belgium	Rest of OECD
123	2842993.0	78	Internal combustion engine	United State	Canada
124	2837442.5	108	Motor vehicles parts	Rest of World	China
125	2821875.0	118	Works of art	France	Japan
126	2804558.0	109	Aircraft	United State	Germany
127	2777696.0	55	Fuel oils	Rest of World	Rest of OECD
128	2757452.0	106	Motor vehicles	Spain	France
129	2750641.2	119	Manufactured goods n.e.c.	Japan	United State
130	2746133.0	3	Other crops	Rest of World	Germany
131	2738524.0	14	Crude petroleum	Rest of World	United Kingdom
132	2733853.0	65	Basic iron and steel	Rest of OECD	Germany
133	2727250.0	33	Cotton fabric	Rest of World	China
134	2726808.5	106	Motor vehicles	Germany	Rest of World
135	2717230.0	55	Fuel oils	Rest of World	Italy
136	2681813.0	65	Basic iron and steel	Germany	Rest of World
137	2677876.0	65	Basic iron and steel	Belgium	Germany
138	2674719.0	111	Pro measurement instrument	Germany	Rest of OECD
139	2668347.0	49	Synthetic resins, fibers	Rest of OECD	Rest of OECD
140	2662977.0	43	Pulp and waste paper	Canada	United State
141	2651360.0	36	Wearing apparel	Taiwan	United State
142	2632807.0	14	Crude petroleum	United Kingdom	Germany
143	2629242.8	47	Basic chemicals	United State	Japan
144	2628486.0	78	Internal combustion engine	Japan	United State
145	2619663.5	18	Meat	Rest of OECD	United Kingdom
146	2593853.0	106	Motor vehicles	France	Rest of OECD
147	2583871.0	106	Motor vehicles	Japan	Canada
148	2572282.5	94	Other telecomm eq	Japan	Rest of World
149	2558339.0	103	Shipbuilding, repairing	Rest of OECD	Rest of World
150	2557205.8	45	Paper products	Germany	Rest of OECD
151	2524933.0	39	Footwear	Korea	United State
152	2524071.0	49	Synthetic resins, fibers	United State	Rest of World
153	2507575.2	47	Basic chemicals	Rest of OECD	United Kingdom
154	2484714.0	103	Shipbuilding, repairing	Rest of World	Rest of OECD
155	2469916.0	81	Construction, mining equip	United State	Rest of World
156	2469172.0	120	Scraps, used, unclassified	Rest of World	Italy
157	2467275.0	106	Motor vehicles	France	Rest of World
158	2467016.0	36	Wearing apparel	Korea	Japan
159	2446141.0	18	Meat	Rest of OECD	Germany
160	2434961.2	60	Plastic products, n.e.c.	China	United State
161	2429144.0	114	Jewellery	Rest of World	Japan
162	2420732.0	109	Aircraft	France	Rest of World
163	2420239.0	106	Motor vehicles	Mexico	United State
164	2412361.0	96	Computers	Germany	Rest of OECD
165	2410902.0	65	Basic iron and steel	Belgium	France
166	2407262.5	34	Other textile product	China	Rest of World
167	2404606.0	36	Wearing apparel	China	Japan
168	2384387.0	14	Crude petroleum	Rest of World	Belgium
169	2381175.0	104	Warships	Rest of World	United Kingdom
170	2377643.0	106	Motor vehicles	France	United Kingdom
171	2360077.0	98	Semiconductors	Japan	Korea
172	2341920.0	65	Basic iron and steel	Japan	United State
173	2332903.0	114	Jewellery	Rest of World	Rest of OECD
174	2314517.0	114	Jewellery	United Kingdom	Belgium
175	2312044.2	19	Dairy and eggs	Rest of OECD	Germany
176	2296284.0	15	Natural gas	Rest of OECD	Germany
177	2287886.5	93	Radio, TV, phonograph	Rest of World	United State
178	2287245.2	120	Scraps, used, unclassified	Rest of OECD	Rest of World
179	2284880.0	75	Hardware	United State	Canada

Table 28: (continued)

Rank =====	Flow =====	Sector =====	Commodity =====	Source =====	Destination =====
180	2281707.0	36	Wearing apparel	Italy	Rest of OECD
181	2279980.0	49	Synthetic resins, fibers	Germany	France
182	2277838.0	14	Crude petroleum	China	Japan
183	2260458.0	106	Motor vehicles	Germany	Austria
184	2255345.0	102	Electrical incl appliance	Rest of OECD	Germany
185	2249927.0	15	Natural gas	Canada	United State
186	2241551.0	106	Motor vehicles	Rest of OECD	United Kingdom
187	2235060.2	10	Fishery	Rest of World	Japan
188	2234521.0	15	Natural gas	Rest of World	Germany
189	2234299.0	102	Electrical incl appliance	Rest of OECD	Rest of OECD
190	2228520.5	45	Paper products	Rest of OECD	Rest of World
191	2218775.0	111	Pro measurement instrument	United State	Rest of OECD
192	2218380.0	34	Other textile product	Taiwan	Rest of World
193	2216537.0	106	Motor vehicles	Rest of OECD	Rest of OECD
194	2214135.0	120	Scraps, used, unclassified	Rest of OECD	Germany
195	2201246.5	47	Basic chemicals	Rest of OECD	France
196	2198292.0	45	Paper products	Canada	United State
197	2190118.0	96	Computers	Rest of OECD	Rest of OECD
198	2188931.2	47	Basic chemicals	Rest of OECD	Belgium
199	2179539.0	106	Motor vehicles	Germany	Spain
200	2175684.5	108	Motor vehicles parts	United State	Mexico
201	2169917.5	75	Hardware	Rest of OECD	Rest of OECD
202	2150626.0	2	Fresh fruits, vegetable	Rest of World	United State
203	2136840.2	82	Metal, woodworking machinery	Germany	Rest of World
204	2134636.0	39	Footwear	Rest of World	United State
205	2129910.0	14	Crude petroleum	United Kingdom	Rest of OECD
206	2125375.0	49	Synthetic resins, fibers	Japan	Rest of World
207	2125335.5	51	Drugs and medicines	Rest of OECD	Rest of World
208	2123578.0	96	Computers	United Kingdom	Germany
209	2106758.8	34	Other textile product	Germany	Rest of OECD
210	2101360.8	82	Metal, woodworking machinery	Germany	Rest of OECD
211	2096520.8	65	Basic iron and steel	Rest of OECD	Rest of World
212	2095233.0	93	Radio, TV, phonograph	China	Rest of World
213	2092317.0	102	Electrical incl appliance	Germany	Rest of World
214	2086201.2	18	Meat	Rest of OECD	United State
215	2075812.0	49	Synthetic resins, fibers	Germany	Italy
216	2067801.0	15	Natural gas	Rest of World	France
217	2061205.0	93	Radio, TV, phonograph	Mexico	United State
218	2061142.0	54	Petroleum refineries	Canada	United State
219	2060786.0	49	Synthetic resins, fibers	United State	Canada
220	2059518.0	111	Pro measurement instrument	United State	Japan
221	2054023.2	47	Basic chemicals	Canada	United State
222	2053269.5	47	Basic chemicals	United Kingdom	Rest of OECD
223	2050608.0	102	Electrical incl appliances	Canada	United State
224	2049034.0	2	Fresh fruits, vegetables	Rest of World	Rest of OECD
225	2039458.0	77	Aircraft engines	United State	France
226	2032690.0	75	Hardware	Rest of OECD	Germany
227	2030098.0	111	Pro measurement instrument	United State	Canada
228	2021554.8	18	Meat	United State	Japan
229	2015090.0	54	Petroleum refineries	Rest of OECD	Germany
230	2009449.0	98	Semiconductors	United State	Japan
231	2000710.0	120	Scraps, used, unclassified	Rest of World	United State
232	1993249.0	3	Other crops	Rest of OECD	Germany
233	1992400.0	96	Computers	Japan	Rest of OECD
234	1990704.0	96	Computers	Japan	Germany
235	1988779.5	94	Other telecomm eq	Rest of World	United State
236	1985515.0	106	Motor vehicles	Italy	France
237	1979668.0	47	Basic chemicals	Germany	Italy
238	1969934.0	106	Motor vehicles	Japan	United Kingdom
239	1964949.8	111	Pro measurement instrument	United State	Rest of World

Table 28: (continued)

Rank =====	Flow =====	Sector =====	Commodity =====	Source =====	Destination =====
240	1960896.1	47	Basic chemicals	Germany	France
241	1958229.5	108	Motor vehicles parts	Germany	France
242	1957195.0	11	Iron ore	Rest of World	Japan
243	1954082.4	47	Basic chemicals	Germany	United State
244	1949216.0	13	Non-ferrous metal ore	Rest of World	Japan
245	1946779.6	60	Plastic products,n.e.c.	Germany	Rest of OECD
246	1944840.9	51	Drugs and medicines	Rest of OECD	Rest of OECD
247	1943909.0	49	Synthetic resins, fibers	Germany	Rest of World
248	1939552.2	114	Jewellery	Rest of OECD	Rest of World
249	1937614.0	120	Scraps,used,unclassified	United Kingdom	Rest of World
250	1930485.0	1	Unmilled cereals	Canada	Rest of World
251	1913308.1	82	Metal,woodworking machinery	Japan	United State
252	1887307.0	120	Scraps,used,unclassified	Rest of OECD	United State
253	1885532.0	102	Electrical indl appliance	United State	Rest of World
254	1879250.0	67	Aluminum	Canada	United State
255	1875472.0	78	Internal combustion engine	Japan	Rest of World
256	1872918.0	1	Unmilled cereals	Rest of OECD	Rest of World
257	1872366.5	47	Basic chemicals	Rest of OECD	United State
258	1871300.2	60	Plastic products,n.e.c.	Taiwan	United State
259	1867149.0	36	Wearing apparel	Italy	France
260	1866106.0	75	Hardware	Japan	United State
261	1865507.5	47	Basic chemicals	France	Rest of OECD
262	1859954.0	65	Basic iron and steel	Germany	France
263	1859527.4	47	Basic chemicals	United State	Canada
264	1852503.8	55	Fuel oils	Rest of OECD	Rest of World
265	1852019.9	47	Basic chemicals	Rest of World	United State
266	1851032.0	67	Aluminum	Rest of World	Japan
267	1849410.6	53	Chemical products n.e.c.	Japan	United State
268	1849169.0	98	Semiconductors	Japan	Taiwan
269	1841325.2	47	Basic chemicals	United State	Rest of OECD
270	1836642.5	54	Petroleum refineries	Rest of World	Rest of OECD
271	1827572.0	120	Scraps,used,unclassified	United State	Canada
272	1818935.1	47	Basic chemicals	Japan	Rest of World
273	1814953.0	98	Semiconductors	Korea	United State
274	1805376.0	45	Paper products	Rest of OECD	France
275	1802939.2	53	Chemical products n.e.c.	United State	Rest of World
276	1802505.4	49	Synthetic resins, fibers	Rest of OECD	Rest of World
277	1802206.0	75	Hardware	Taiwan	United State
278	1798551.0	70	Other Non-ferrous metals	Rest of World	United State
279	1788824.0	106	Motor vehicles	Italy	Germany
280	1781398.0	98	Semiconductors	Korea	Rest of World
281	1780249.0	94	Other telecomm eq	United State	Rest of World
282	1778049.0	109	Aircraft	United State	France
283	1764319.0	96	Computers	Rest of OECD	Germany
284	1763430.4	47	Basic chemicals	Rest of OECD	Italy
285	1753860.0	78	Internal combustion engines	Canada	United State
286	1753794.0	106	Motor vehicles	Rest of OECD	United State
287	1751880.0	89	Service industry machinery	Germany	Rest of OECD
288	1747125.9	94	Other telecomm eq	Rest of OECD	Rest of World
289	1741274.8	18	Meat	Rest of OECD	Italy
290	1740752.0	103	Shipbuilding,repairing	Korea	Rest of World
291	1740433.0	65	Basic iron and steel	Rest of World	Japan
292	1739629.0	106	Motor vehicles	Belgium	Italy
293	1738525.0	53	Chemical products n.e.c.	Germany	Rest of OECD
294	1737829.5	108	Motor vehicles parts	France	Germany
295	1735167.0	2	Fresh fruits,vegetables	Rest of OECD	Germany
296	1730726.0	96	Computers	Canada	United State
297	1727581.1	102	Electrical indl appliance	Rest of OECD	Rest of World
298	1716910.1	94	Other telecomm eq	Japan	Rest of OECD
299	1714613.0	90	Pumps,ex measuring pumps	Germany	Rest of OECD
300	1712874.0	49	Synthetic resins, fibers	Rest of OECD	United Kingdom

share equations for the individual countries, the fit of the share equations related to the two regions is inevitably obscured by the fact that, due to data limitations, the price and capital data used in the estimation of share equations for the two regions were simply some crude averages of the known data for the fourteen individual countries.

Figures 13-102 (pp. 146-160) show the regression graphs of the share equations corresponding to the selected top 90 bilateral flows. An examination of these graphs quickly reveals that the estimated equations worked well for a number of bilateral trade shares related to the top bilateral flows in world trade. For example, the following are some of the estimated share equations which are able to show both trends in the trade shares and their reversals:

- Figure 7: Germany's Share in UK Motor Vehicle Imports
- Figure 11: Japan's Share in US Telecommunications Equipment Imports
- Figure 20: Canada's Share in US Crude Petroleum Imports
- Figure 22: Germany's Share in Japanese Motor Vehicle Imports
- Figure 24: USA's Share in Canadian Industrial Appliance Imports
- Figure 31: Mexico's Share in US Industrial Appliance Imports
- Figure 32: Japan's Share in US Industrial Appliance Imports
- Figure 48: Spain's Share in French Motor Vehicle Imports
- Figure 53: UK's Share in German Crude Petroleum Imports

The fact that these share equations can track both trends in the trades shares and their reversals is significant, because it suggests that, in these share equations, the two explanatory variables that are economically meaningful (i.e. relative prices and relative capital stock), rather than the trend variable, are responsible for the bulk of the explanation in the movement of the underlying trade shares.

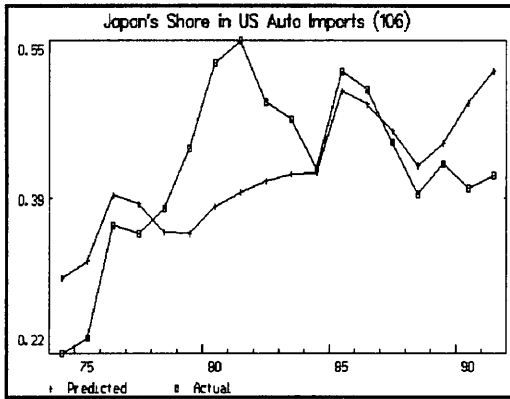


Figure 13

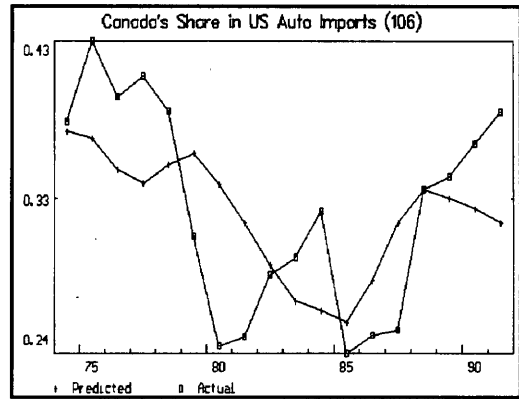


Figure 14

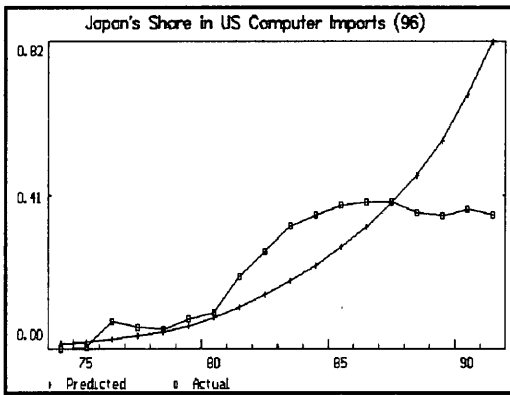


Figure 15

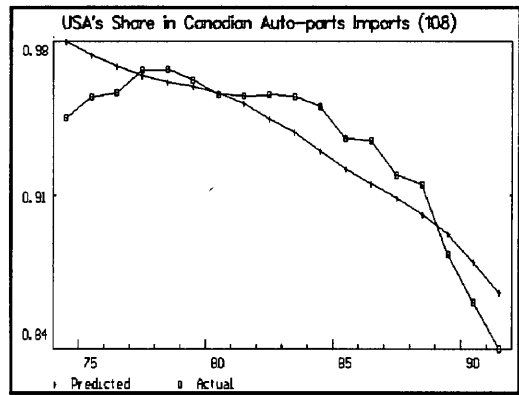


Figure 16

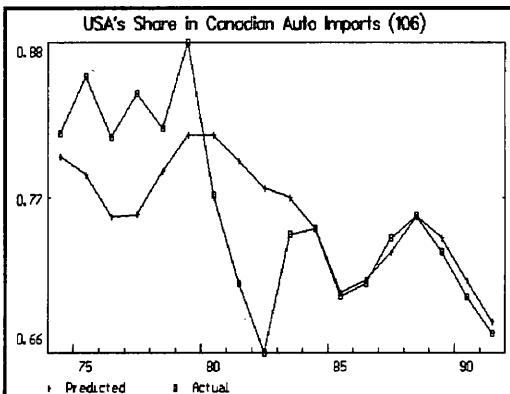


Figure 17

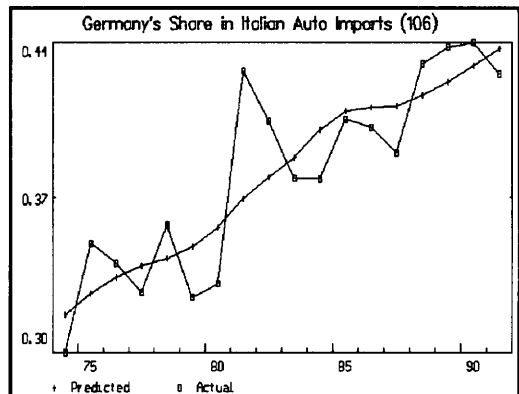


Figure 18

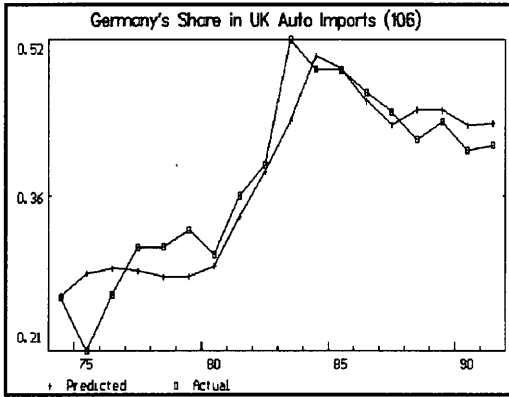


Figure 19

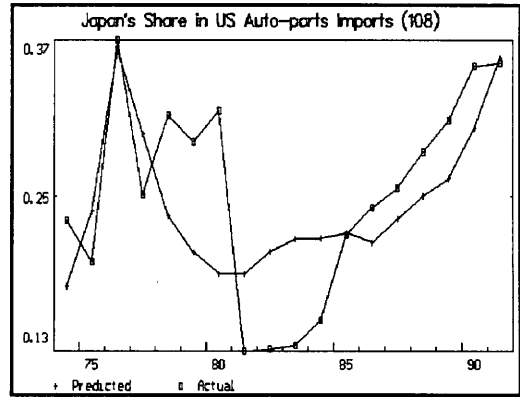


Figure 20

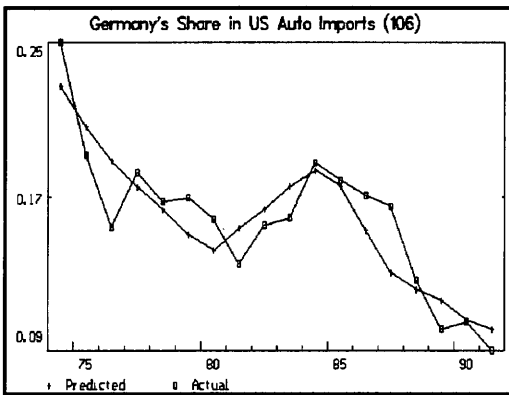


Figure 21

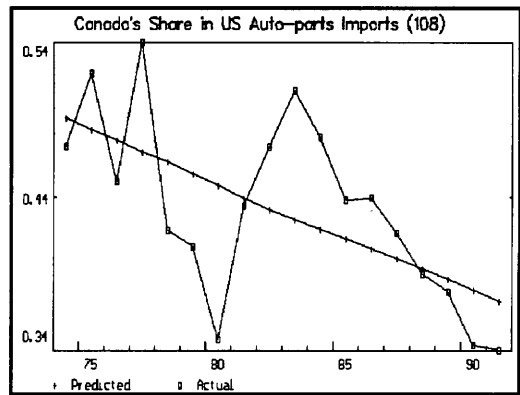


Figure 22

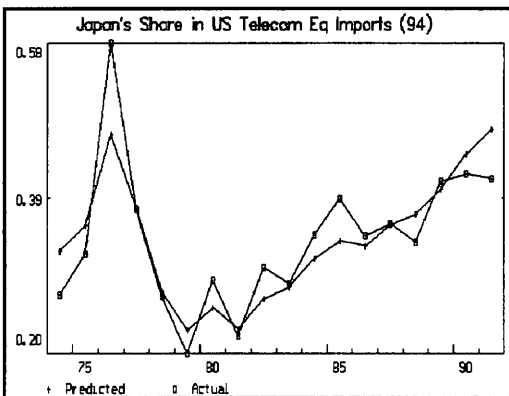


Figure 23

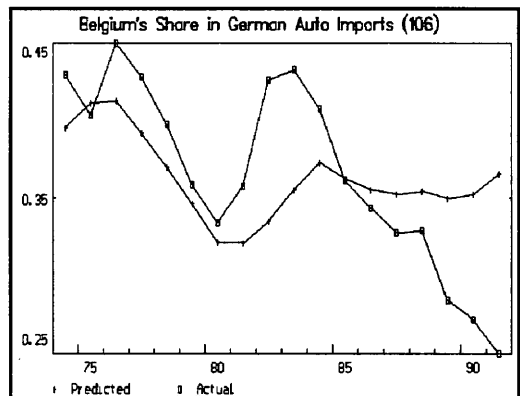


Figure 24

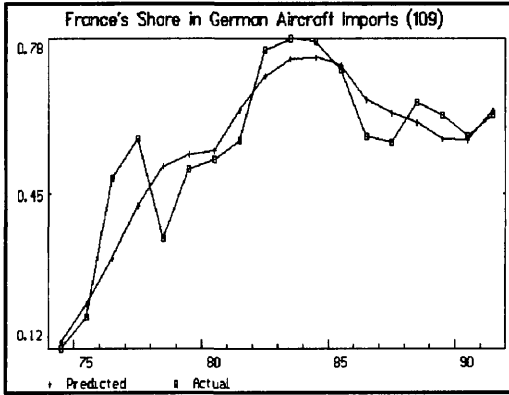


Figure 25

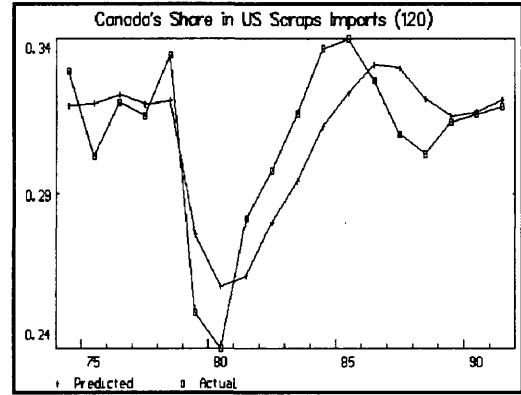


Figure 26

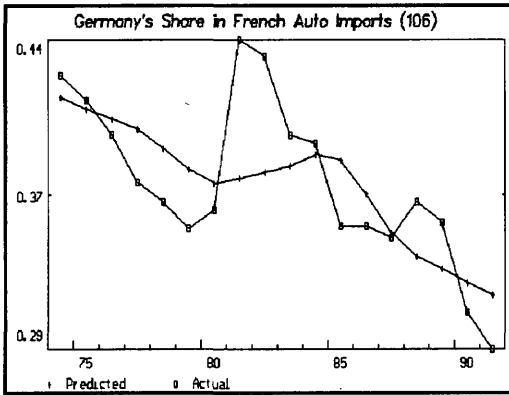


Figure 27

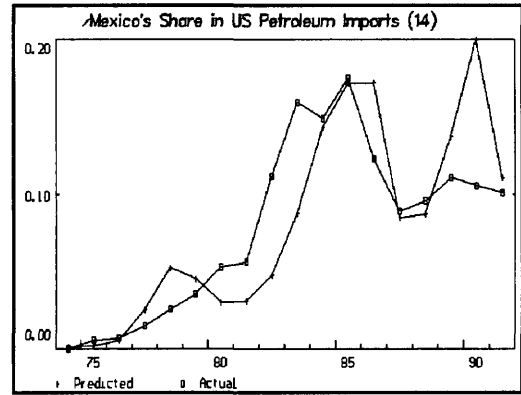


Figure 28

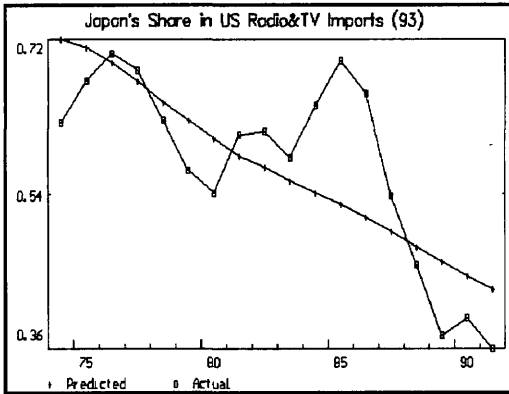


Figure 29

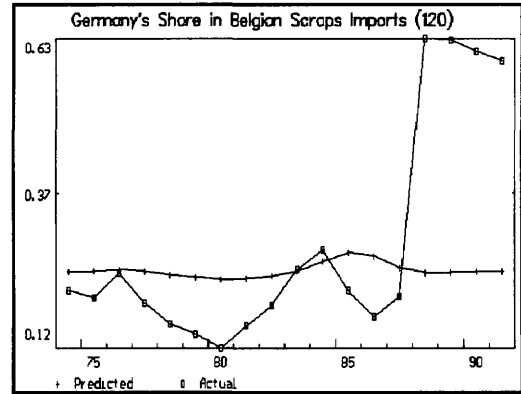


Figure 30

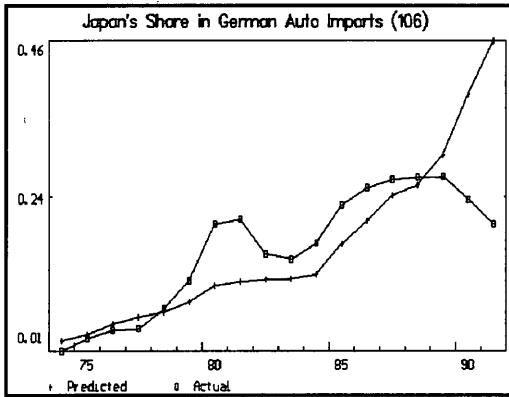


Figure 31

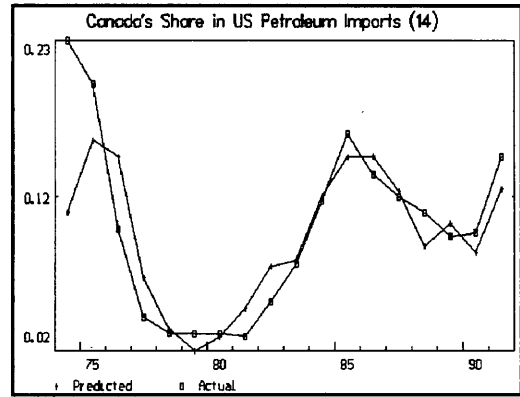


Figure 32

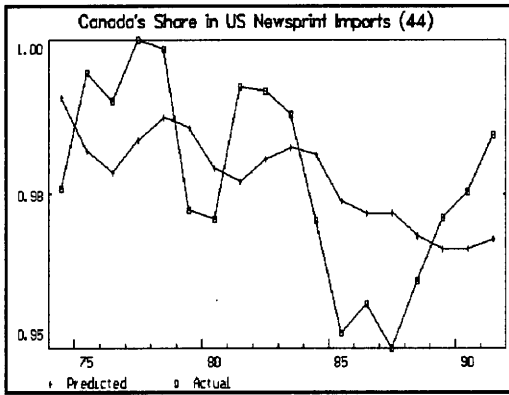


Figure 33

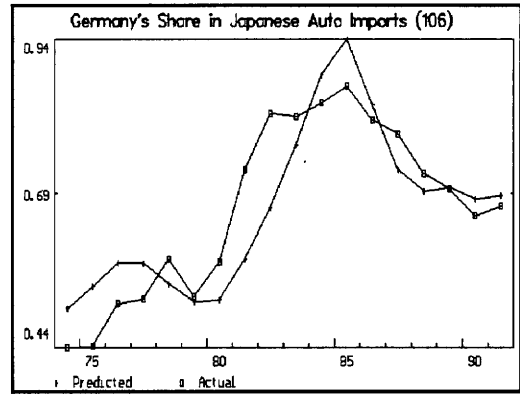


Figure 34

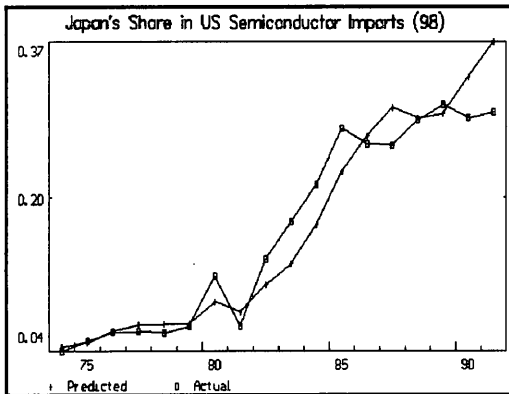


Figure 35

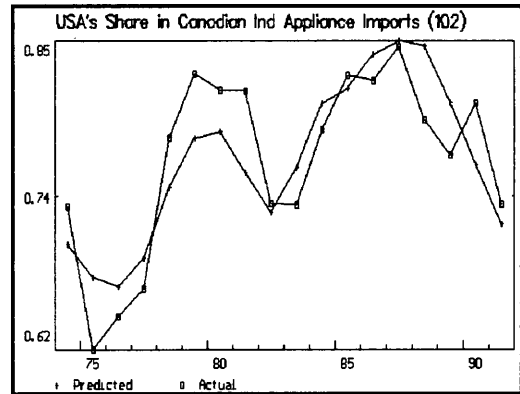


Figure 36

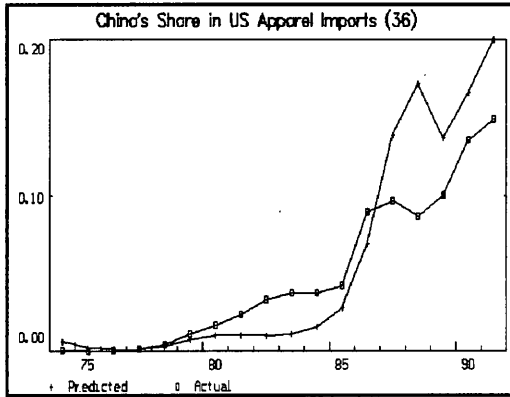


Figure 37

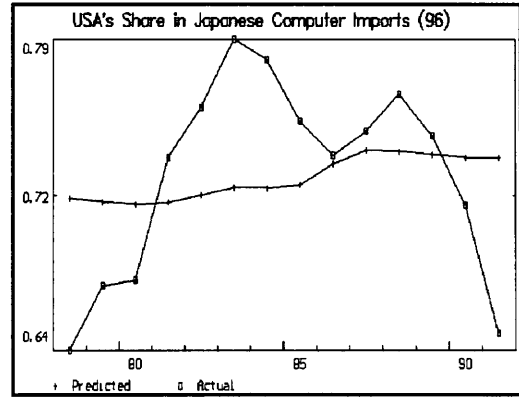


Figure 38

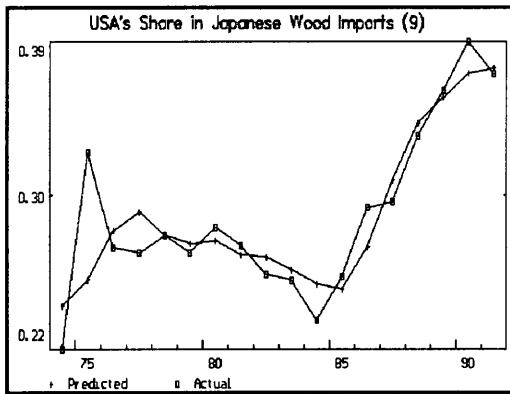


Figure 39

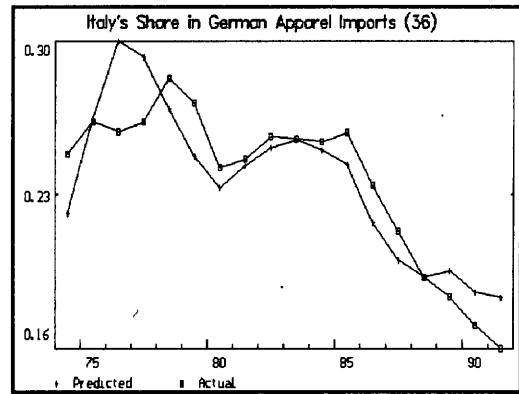


Figure 40

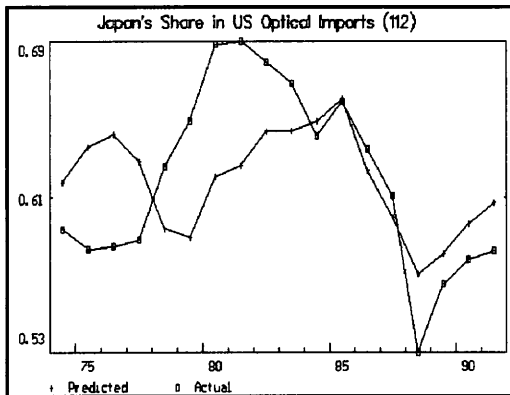


Figure 41

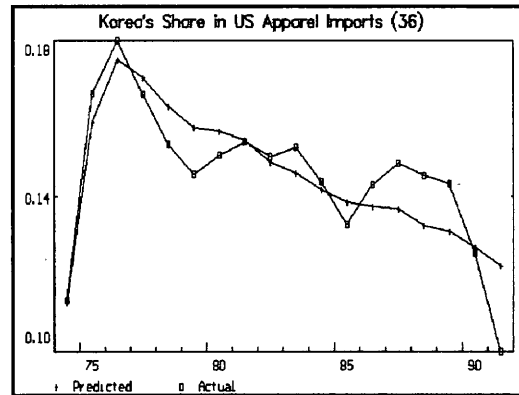


Figure 42

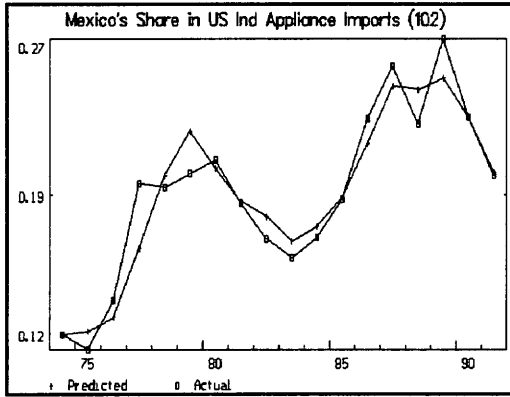


Figure 43

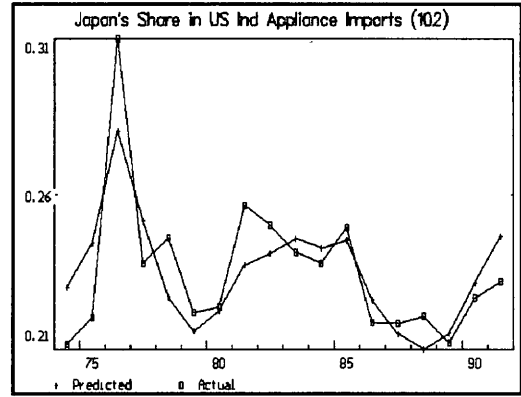


Figure 44

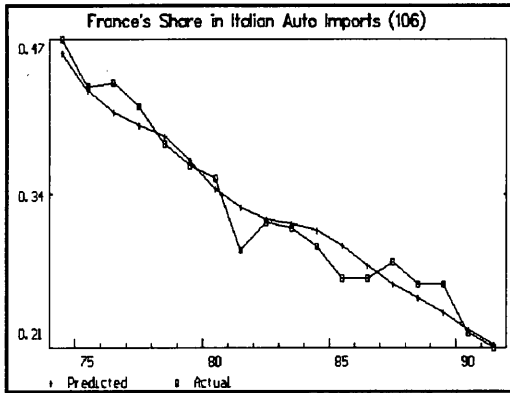


Figure 45

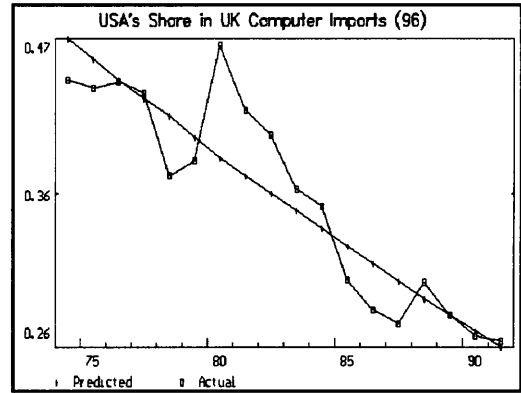


Figure 46

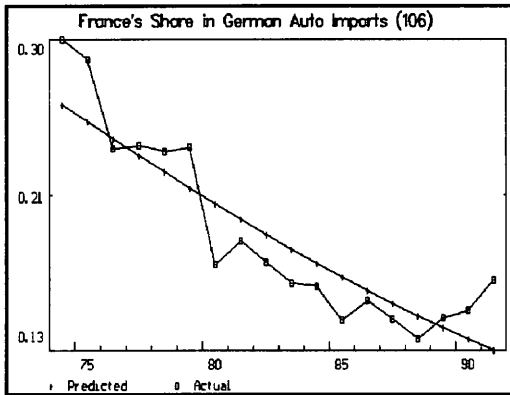


Figure 47

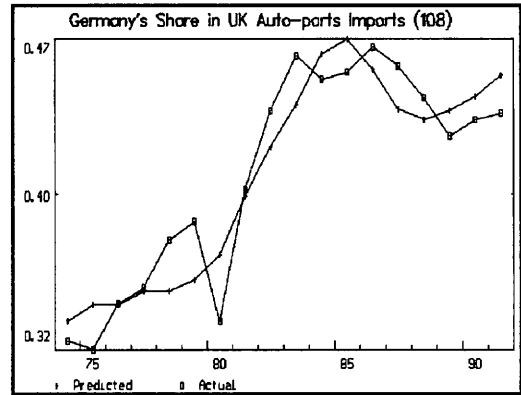


Figure 48

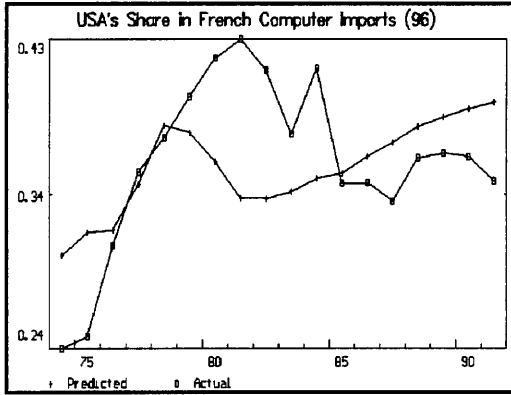


Figure 49

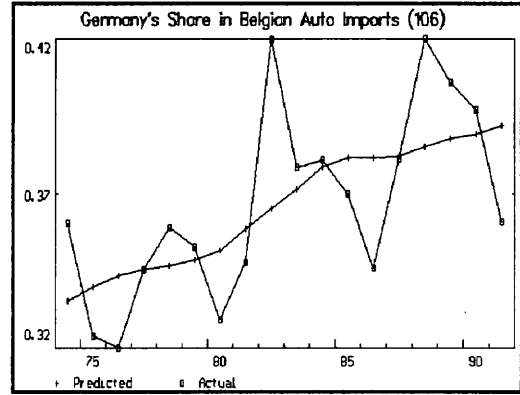


Figure 50

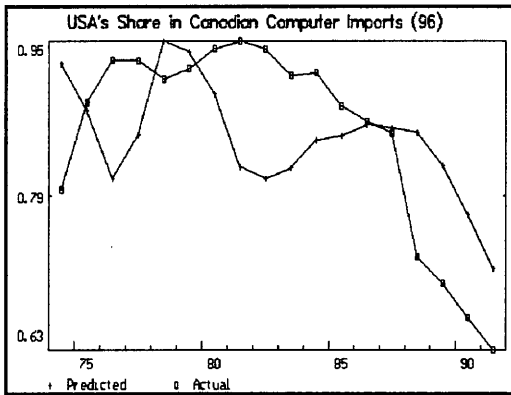


Figure 51

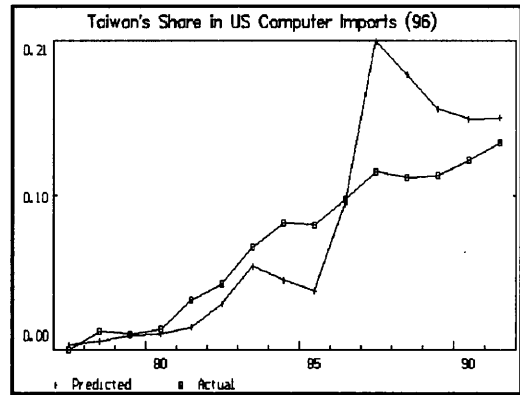


Figure 52

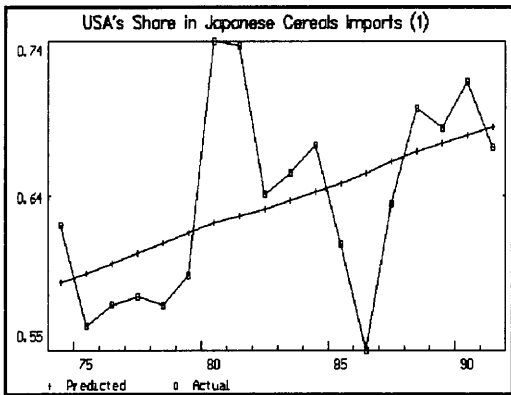


Figure 53

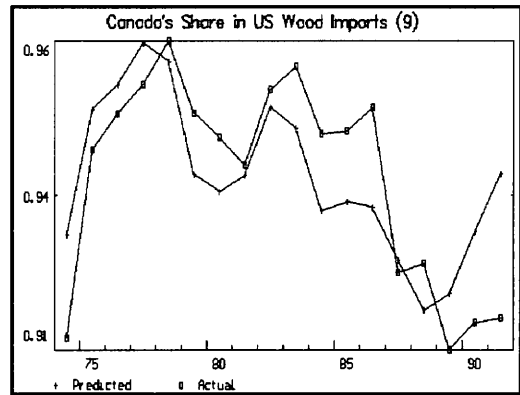


Figure 54

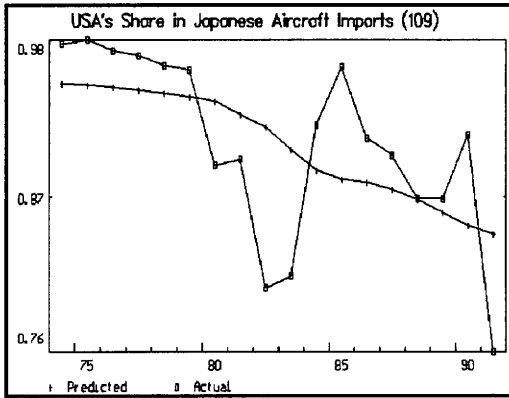


Figure 55

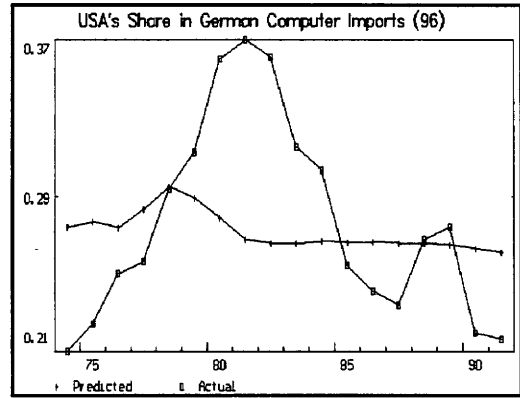


Figure 56

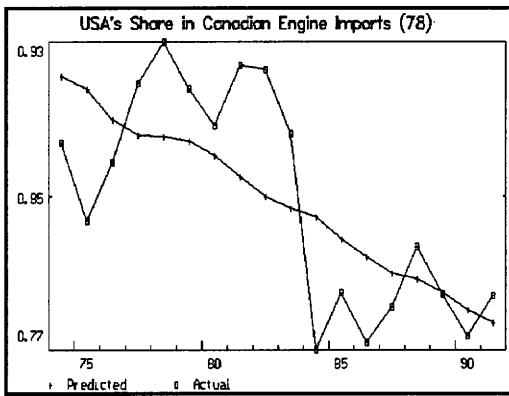


Figure 57

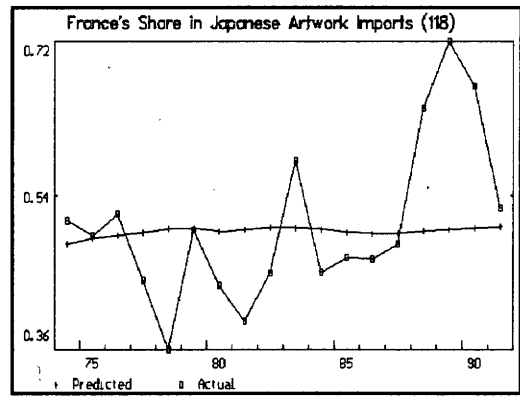


Figure 58



Figure 59

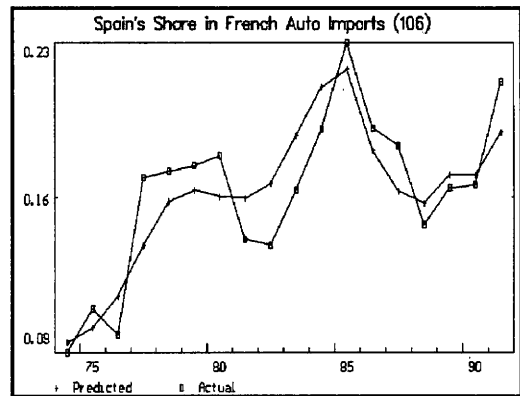


Figure 60

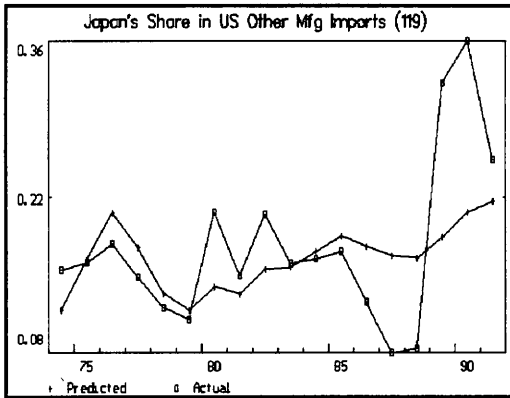


Figure 61

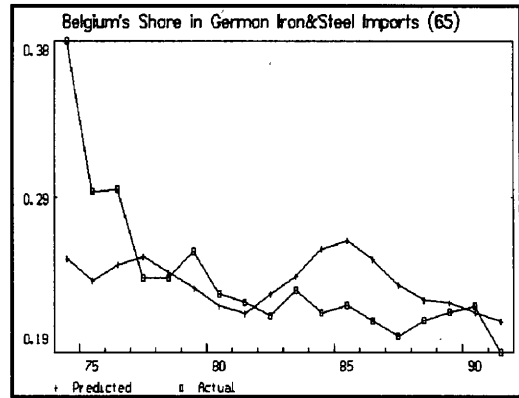


Figure 62

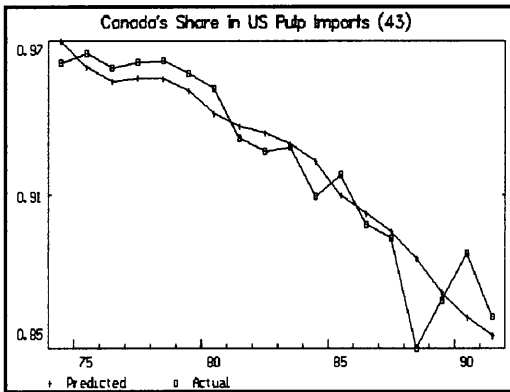


Figure 63

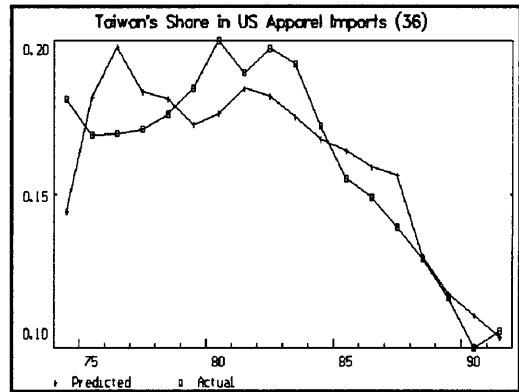


Figure 64

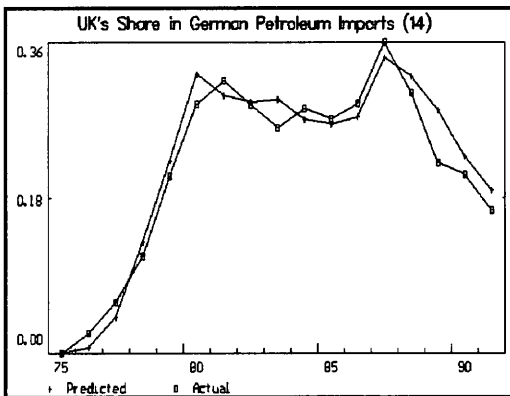


Figure 65

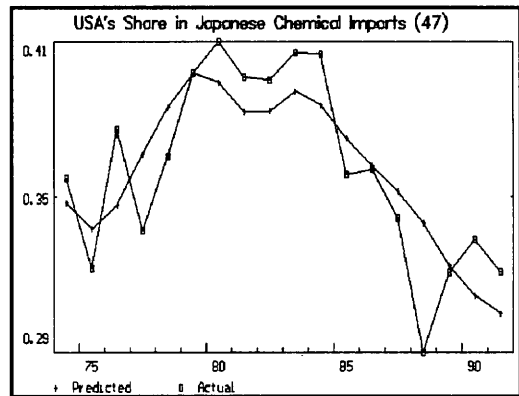


Figure 66

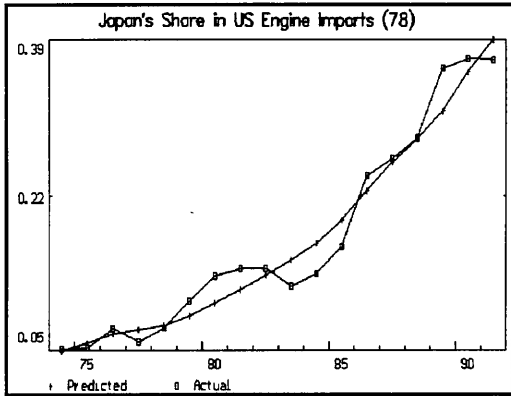


Figure 67

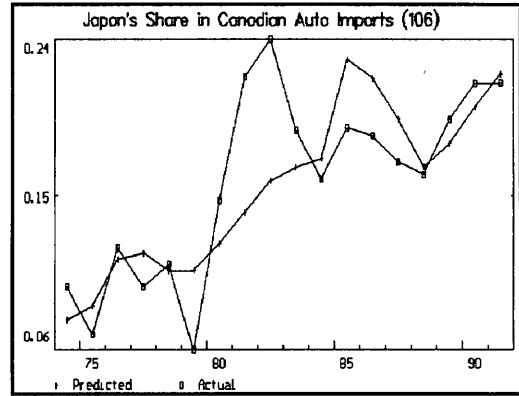


Figure 68

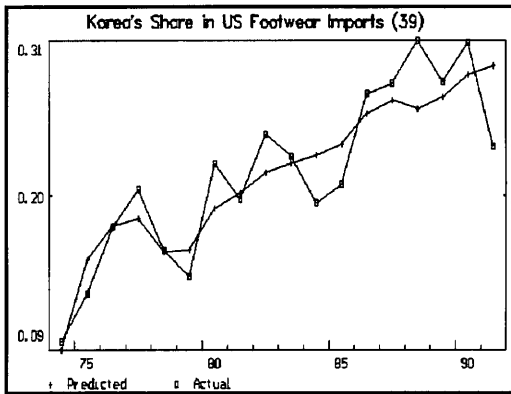


Figure 69

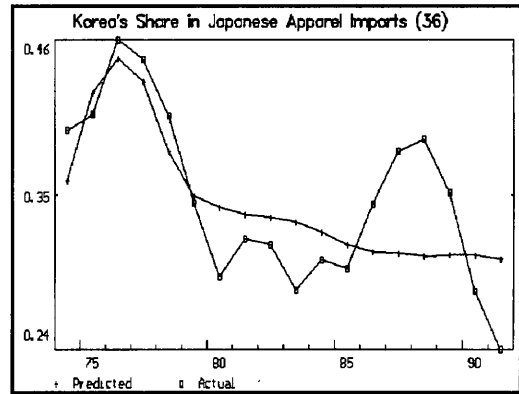


Figure 70

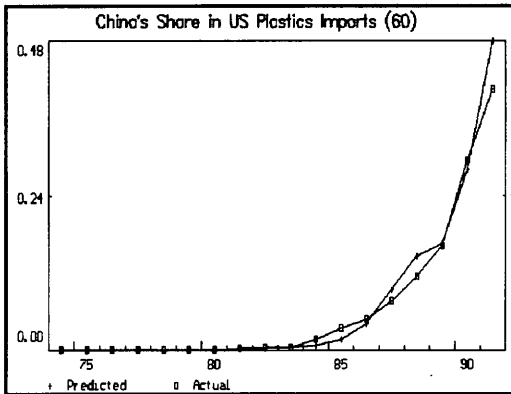


Figure 71

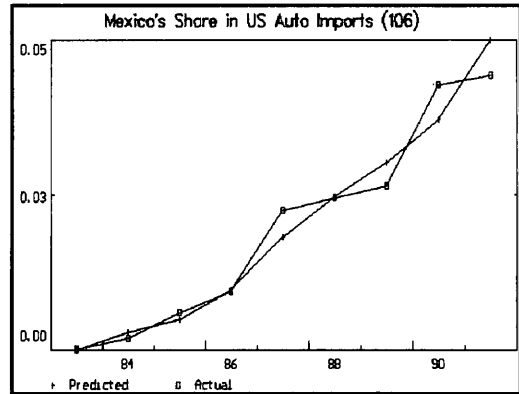


Figure 72

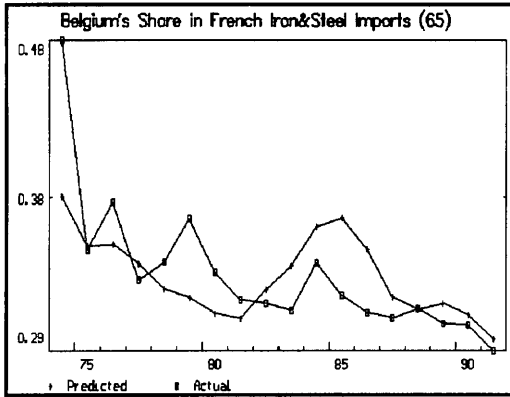


Figure 73

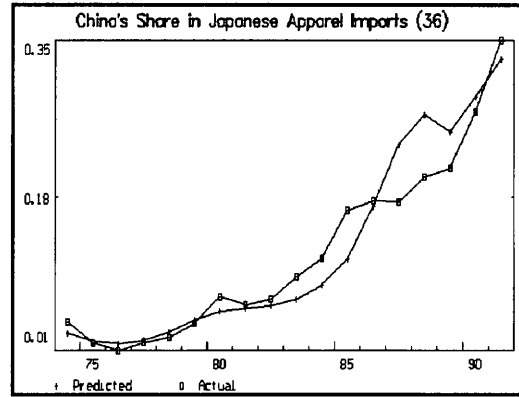


Figure 74

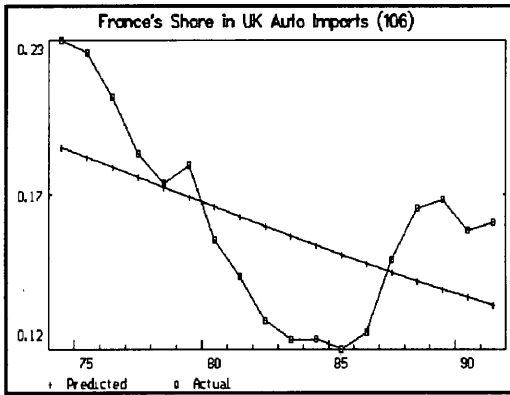


Figure 75

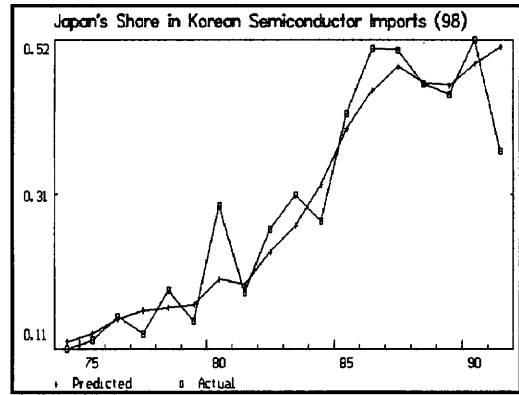


Figure 76

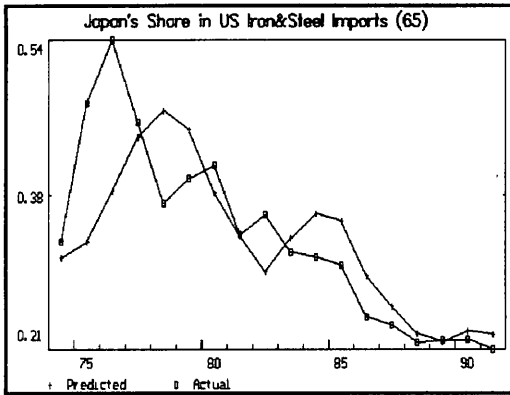


Figure 77

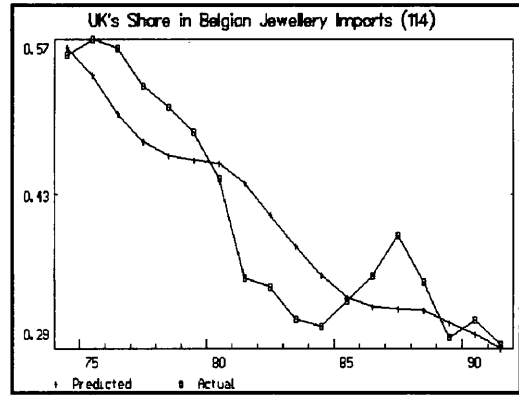


Figure 78

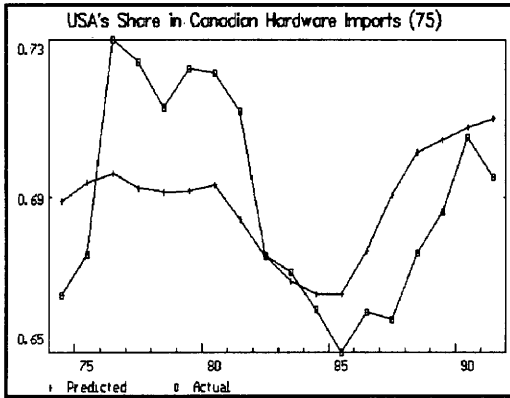


Figure 79

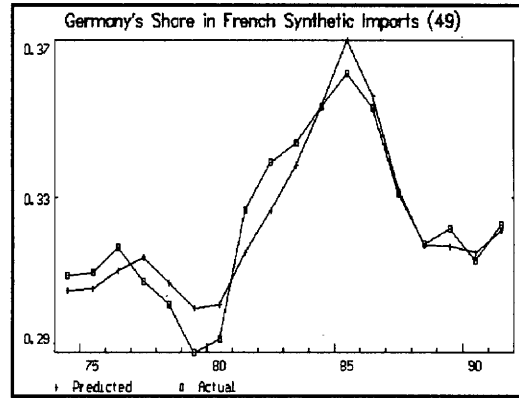


Figure 80

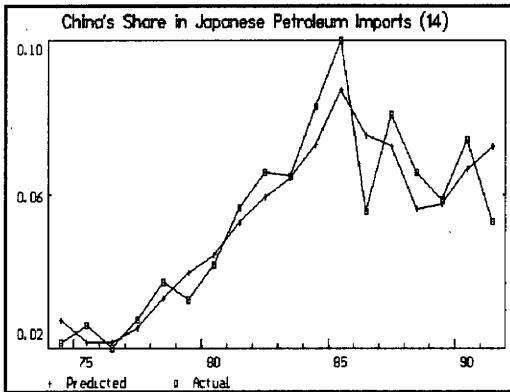


Figure 81

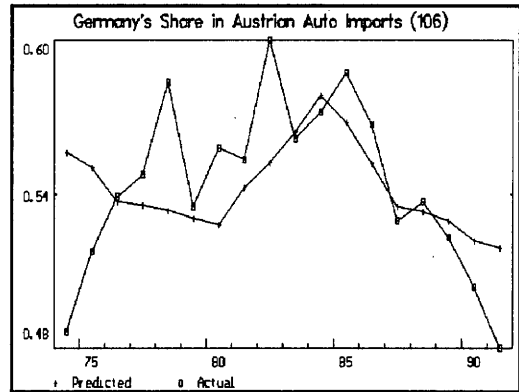


Figure 82

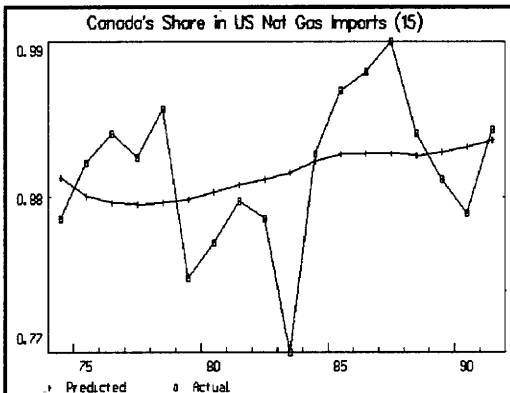


Figure 83

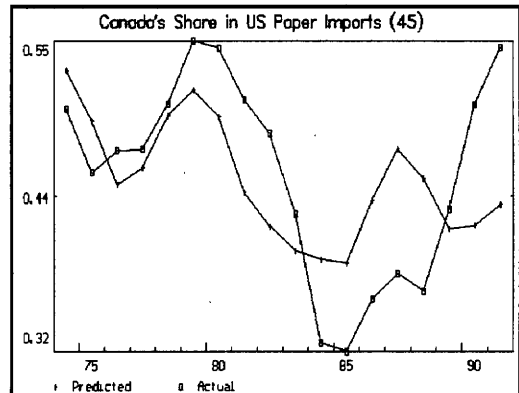


Figure 84

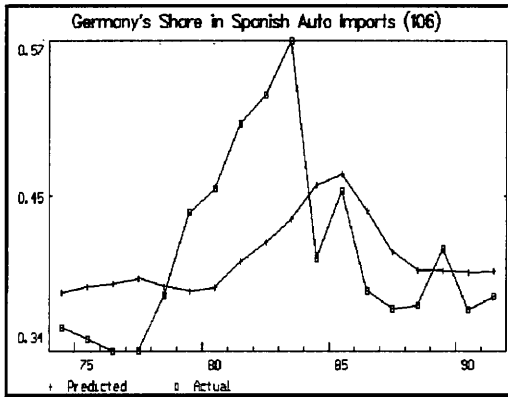


Figure 85

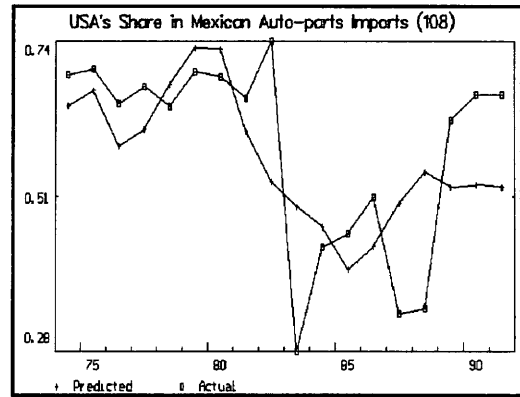


Figure 86

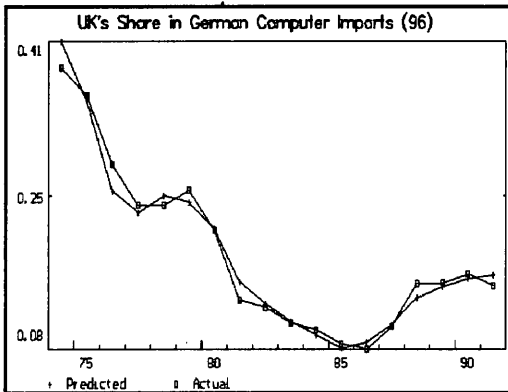


Figure 87

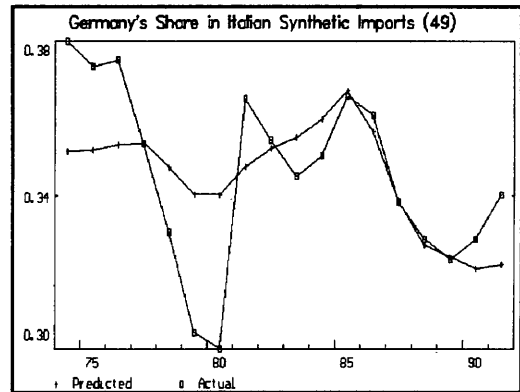


Figure 88

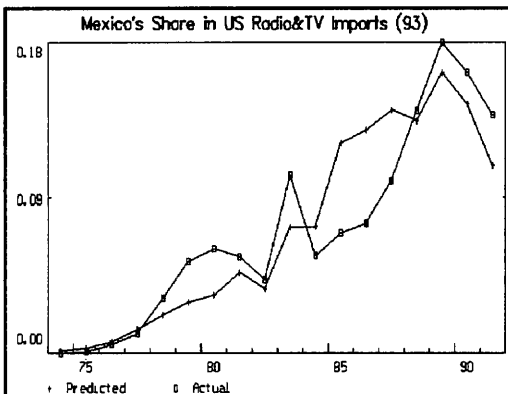


Figure 89

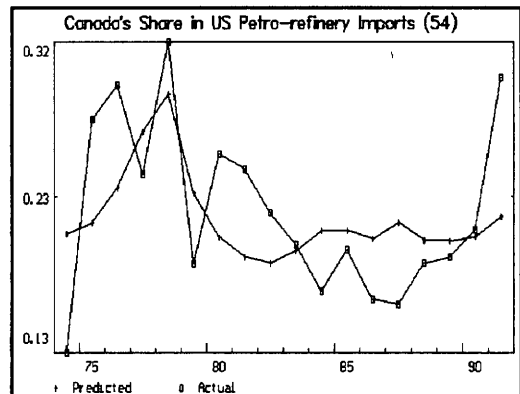


Figure 90

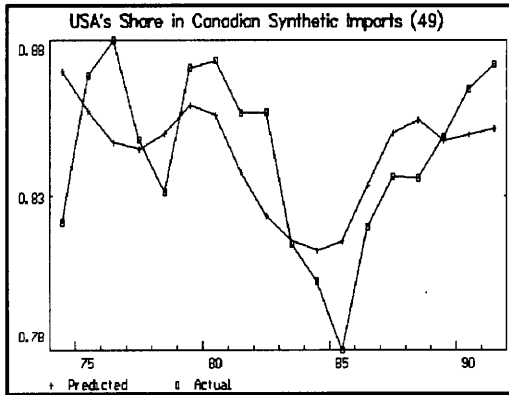


Figure 91

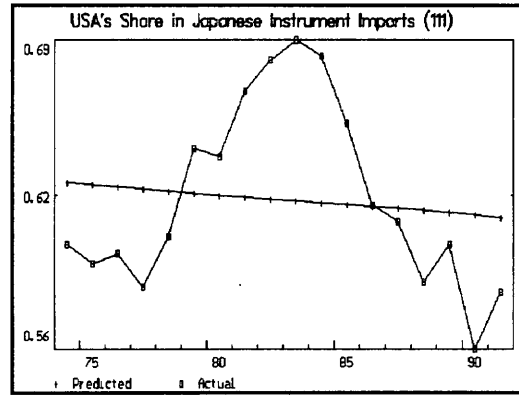


Figure 92

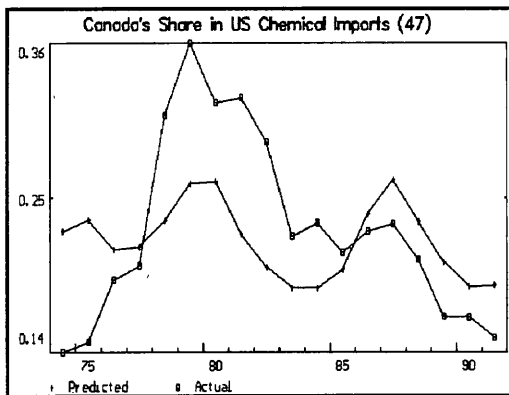


Figure 93

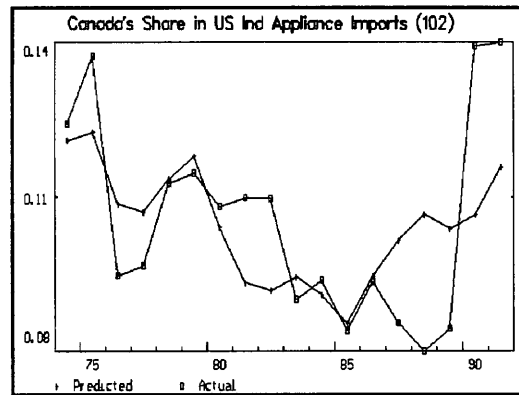


Figure 94

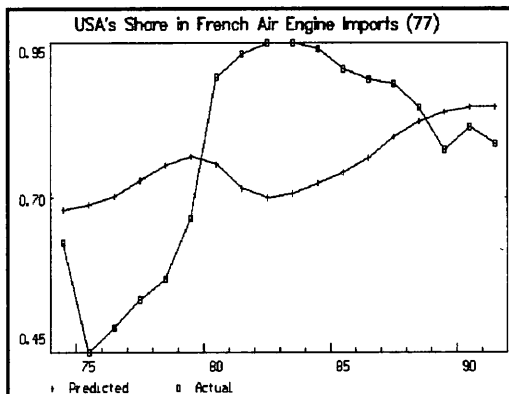


Figure 95

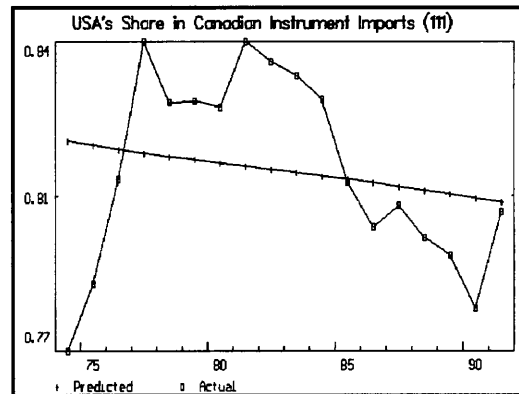


Figure 96

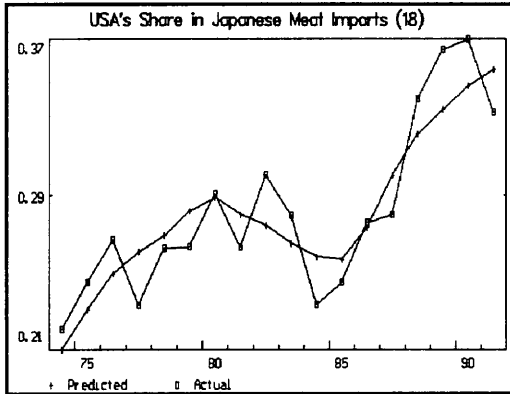


Figure 97

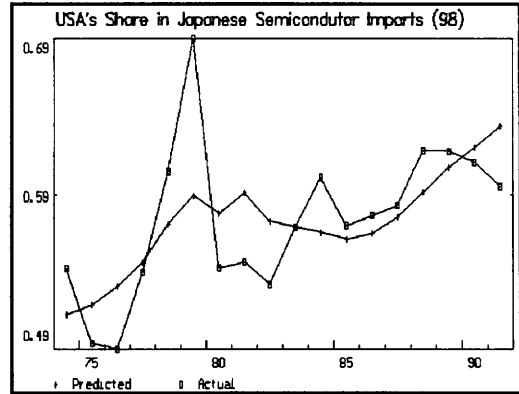


Figure 98

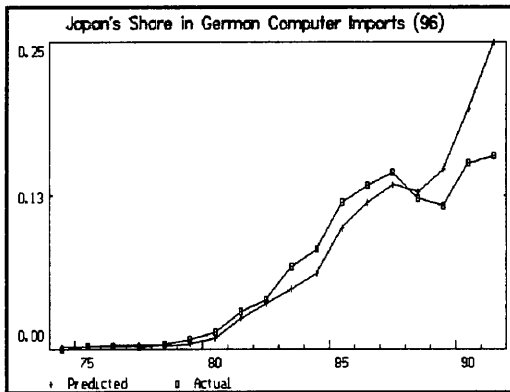


Figure 99

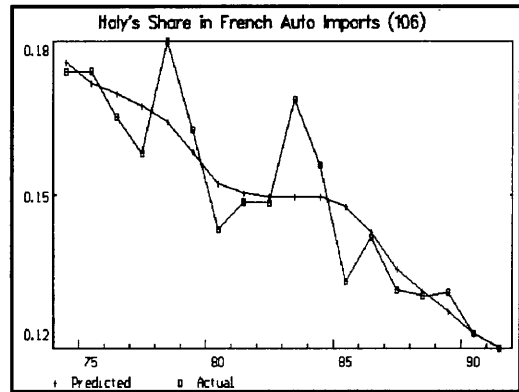


Figure 100

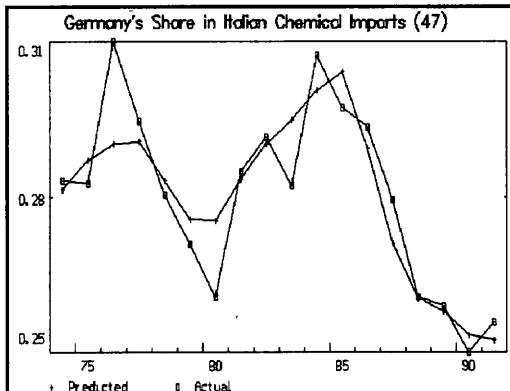


Figure 101

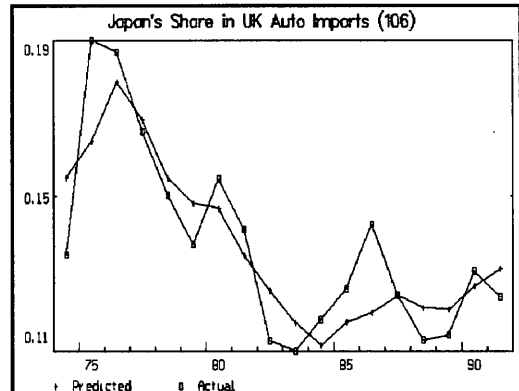


Figure 102

It can also be seen from these regression graphs that in some cases the estimated share equations failed badly. This may have resulted from inherent problems in the trade data. It could also be because the share equations omitted certain special explanatory variables that are important to the movement of these shares. This, however, remains an important area that needs to be further investigated upon in the future research.

To summarize the fit of the equation across all sectors, Table 29 is presented. Here, the "NEQ" column indicates the number of estimated share equations in a given sector. For instance, in Sector 19 ("Dairy products"), the number of estimated share equations is 150. The value in parenthesis is the base year 1990 share (in percentage) of total trade flows in Sector 19 as represented by the estimated share equations. In this case, the total trade flows represented by the estimated share equations account for all of the trade flows in this sector. The next column, PEQ, refers to the number of estimated share equations with a price term. In this case, Sector 19 has 117 share equations with a price term, accounting for 87% of total trade flows in this sector. Of the 117 share equations, 46 have a significant price term, shown under the column "Pt2".² Likewise, the number of share equations in Sector 19 that contain a capital term is 81, shown under the column "KEQ". Of the 81 share equations, 24 have a significant capital term,

²Note that a "significant" explanatory variable in the present context is defined as one with a t-value that is greater than or equal to 2 (in absolute value).

shown under the column "Kt2". The column, TEQ, shows that in Sector 19, 113 estimated share equations have a Nyhus trend, while the next column, Tt2, shows that 43 have a significant Nyhus trend. The last column, R50, shows the number of share equations whose independent variables can account for at least half of the variations in the trade shares over the 1974-91 period. For Sector 19, that number is 53, representing 32% of total trade in Dairy products in the base year 1990.

In summary, of all 19,125 estimated share equations, those with a significant price term number at 6,573, and the trade flows associated with these share equations amount to 41% of total world trade in 1990; those with a significant capital term number at 3,582, accounting for 22% of total world trade; and those with a significant Nyhus trend number at 6,317, representing 43% of total world trade in 1990. Note also that in 8,383 share equations, the movement in the independent variables can account for at least half of the variations in the trade shares over the 1974-91 period. These equations account for 54% of total world trade in the year 1990.

Table 29: Summary Statistics on the Fit of the Share Equations

SECTOR	TITLE	NEQ	PEQ	Pt2	KEQ	Kt2	TEQ	Tt2	R50
1	Cereals	112 (99)	79 (80)	11 (9)	64 (58)	28 (26)	77 (43)	30 (22)	31 (17)
2	Fruits	150 (100)	134 (95)	57 (45)	96 (58)	33 (25)	116 (89)	51 (43)	67 (46)
3	OtherCrop	162 (100)	132 (80)	47 (23)	107 (76)	36 (51)	102 (75)	36 (28)	67 (52)
4	Livestock	143 (100)	114 (83)	38 (30)	88 (73)	36 (31)	108 (78)	48 (29)	51 (38)
5	Silk	55 (99)	48 (98)	14 (25)	25 (37)	5 (14)	42 (55)	6 (22)	13 (25)
6	Cotton	107 (94)	75 (58)	23 (19)	70 (41)	21 (9)	80 (79)	29 (56)	36 (39)
7	Wool	135 (100)	111 (92)	46 (37)	78 (57)	24 (28)	102 (81)	39 (41)	51 (45)
8	OtherFiber	91 (99)	75 (84)	26 (29)	47 (49)	13 (13)	70 (79)	28 (36)	37 (56)
9	Wood	117 (100)	97 (86)	40 (50)	63 (65)	19 (13)	86 (78)	43 (52)	50 (54)
10	Fish	145 (100)	119 (82)	48 (32)	92 (81)	28 (14)	116 (85)	58 (55)	70 (73)
11	IronOre	49 (100)	32 (56)	17 (42)	31 (77)	4 (7)	36 (64)	14 (28)	18 (33)
12	Coal	79 (97)	71 (88)	30 (50)	51 (81)	22 (39)	52 (58)	25 (36)	34 (43)
13	OthMetOre	126 (99)	96 (80)	34 (29)	53 (44)	15 (10)	96 (83)	33 (30)	26 (15)
14	Petroleum	50 (99)	42 (97)	16 (39)	26 (80)	17 (46)	41 (77)	24 (58)	27 (59)
15	NatGas	41 (96)	31 (85)	13 (15)	19 (35)	5 (1)	26 (61)	16 (41)	18 (41)
16	NonMetal	188 (100)	165 (83)	77 (52)	105 (55)	31 (15)	136 (74)	71 (50)	106 (54)
17	Elec	21 (63)	13 (31)	4 (6)	7 (21)	1 (5)	14 (57)	3 (3)	6 (15)
18	Meat	150 (100)	121 (92)	48 (41)	98 (72)	36 (43)	110 (80)	60 (49)	69 (67)
19	Dairy	150 (100)	117 (87)	46 (40)	81 (70)	24 (22)	113 (68)	43 (23)	53 (32)
20	PreFruit	173 (100)	139 (79)	70 (34)	101 (75)	38 (25)	137 (88)	74 (65)	83 (60)
21	Seafood	171 (100)	136 (79)	60 (34)	111 (59)	36 (19)	116 (85)	54 (54)	77 (57)
22	OilFats	147 (99)	115 (78)	39 (35)	78 (51)	25 (17)	111 (69)	59 (38)	63 (43)
23	GrainMill	122 (100)	93 (88)	28 (40)	69 (74)	25 (33)	85 (66)	44 (31)	48 (55)
24	Bakery	153 (100)	123 (91)	56 (40)	93 (70)	36 (39)	117 (83)	61 (59)	83 (73)
25	Sugar	88 (93)	63 (71)	11 (15)	45 (52)	14 (21)	68 (79)	19 (27)	27 (38)
26	Cocoa	165 (100)	128 (79)	59 (40)	102 (75)	39 (30)	131 (80)	64 (45)	82 (59)
27	OtherFood	191 (100)	134 (68)	52 (24)	109 (53)	32 (11)	145 (82)	83 (61)	90 (63)
28	Feeds	150 (100)	117 (80)	43 (31)	77 (47)	22 (16)	114 (73)	40 (32)	37 (24)
29	Alcohol	164 (100)	135 (93)	83 (69)	113 (79)	40 (37)	119 (86)	49 (43)	95 (70)
30	NonAlcohol	123 (99)	94 (72)	29 (25)	62 (53)	15 (25)	90 (74)	35 (29)	36 (32)
31	Tobacco	125 (100)	91 (66)	49 (47)	64 (77)	17 (9)	88 (71)	38 (16)	53 (66)
32	Yarns	206 (100)	172 (90)	78 (42)	138 (62)	50 (22)	158 (79)	88 (57)	103 (65)
33	CottonFabr	196 (100)	159 (89)	63 (20)	105 (44)	29 (15)	149 (60)	69 (35)	86 (42)
34	OthTextile	213 (100)	178 (84)	88 (38)	131 (55)	56 (26)	159 (76)	87 (46)	122 (63)
35	FloorCover	162 (100)	133 (78)	63 (46)	77 (45)	32 (26)	119 (87)	60 (56)	83 (63)
36	Apparel	190 (100)	163 (89)	77 (44)	113 (48)	50 (20)	138 (81)	66 (51)	104 (71)
37	Leather	190 (100)	162 (94)	76 (54)	126 (68)	55 (35)	132 (80)	65 (43)	108 (64)
38	LeatherPrd	193 (100)	157 (88)	56 (38)	116 (67)	55 (43)	139 (74)	53 (38)	102 (61)
39	Footwear	176 (100)	130 (80)	57 (32)	101 (64)	37 (30)	137 (79)	81 (56)	102 (72)
40	Plywood	126 (100)	97 (88)	47 (34)	57 (35)	21 (14)	93 (72)	45 (57)	45 (54)
41	OtherWood	195 (100)	149 (81)	48 (17)	121 (53)	42 (20)	148 (84)	72 (47)	85 (45)
42	Furniture	190 (100)	144 (79)	66 (33)	119 (71)	43 (35)	139 (79)	57 (38)	81 (54)
43	Pulp	116 (100)	95 (78)	46 (48)	63 (48)	15 (8)	96 (90)	54 (63)	52 (66)
44	Newsprint	72 (89)	50 (28)	12 (6)	35 (69)	8 (2)	53 (74)	24 (17)	25 (14)
45	Paper	190 (100)	159 (94)	95 (55)	119 (60)	37 (18)	130 (88)	67 (39)	103 (53)
46	Printing	204 (100)	186 (92)	111 (64)	116 (61)	36 (24)	155 (83)	69 (48)	110 (71)
47	Chemical	222 (100)	198 (92)	108 (58)	145 (62)	55 (20)	164 (84)	71 (37)	115 (51)
48	Fertilizer	169 (100)	141 (94)	60 (45)	99 (58)	29 (21)	116 (49)	42 (20)	57 (31)
49	SynthFiber	207 (100)	184 (92)	102 (67)	129 (63)	54 (22)	140 (80)	84 (56)	120 (72)
50	Paints	160 (100)	129 (90)	58 (49)	106 (56)	39 (27)	113 (81)	57 (42)	85 (58)
51	Drugs	201 (100)	178 (87)	101 (55)	136 (65)	44 (27)	141 (78)	65 (30)	114 (62)
52	Soaps	182 (100)	148 (92)	69 (59)	115 (71)	36 (27)	131 (74)	57 (26)	94 (53)
53	OtherChem	205 (100)	176 (94)	93 (49)	123 (58)	43 (22)	139 (78)	66 (43)	116 (63)
54	PetroRefin	133 (99)	98 (76)	38 (27)	69 (45)	19 (15)	103 (88)	39 (26)	44 (39)
55	FuelOil	93 (98)	64 (65)	19 (18)	48 (41)	11 (12)	68 (70)	25 (33)	32 (39)
56	PetroProd	164 (99)	131 (77)	51 (21)	91 (62)	26 (27)	119 (75)	46 (34)	72 (49)
57	CoalProd	77 (97)	58 (73)	16 (15)	50 (61)	9 (23)	51 (63)	23 (43)	24 (39)
58	Tyre	184 (100)	147 (91)	68 (46)	120 (66)	46 (29)	129 (79)	62 (40)	80 (56)
59	Rubber	204 (100)	166 (85)	71 (52)	117 (62)	28 (12)	159 (83)	72 (44)	87 (58)
60	Plastic	210 (100)	174 (86)	82 (43)	126 (65)	38 (15)	168 (83)	73 (40)	112 (64)
61	Glass	202 (100)	169 (89)	88 (49)	132 (69)	37 (32)	145 (84)	66 (40)	96 (51)
62	Cement	106 (99)	85 (83)	33 (35)	59 (44)	20 (10)	69 (67)	28 (22)	39 (32)

Table 29: (continued)

SECTOR	TITLE	NEQ	PEQ	Pt2	KEQ	Kt2	TEQ	Tt2	R50
63	Ceramics	205 (100)	148 (64)	58 (27)	126 (49)	47 (15)	159 (85)	63 (32)	66 (36)
64	NonMetProd	196 (100)	159 (90)	77 (38)	116 (63)	45 (33)	146 (84)	65 (43)	88 (55)
65	IronSteel	203 (100)	180 (96)	88 (43)	123 (73)	35 (20)	137 (62)	61 (28)	97 (52)
66	Copper	163 (99)	122 (73)	41 (20)	96 (66)	28 (21)	115 (74)	59 (41)	68 (54)
67	Aluminum	169 (100)	141 (84)	60 (42)	104 (64)	38 (17)	116 (76)	41 (34)	63 (36)
68	Nickel	128 (98)	96 (72)	44 (31)	77 (70)	22 (17)	98 (73)	31 (22)	36 (30)
69	LeadZinc	136 (99)	96 (84)	42 (32)	82 (66)	18 (16)	103 (82)	39 (32)	45 (50)
70	OtherMetal	171 (100)	136 (86)	51 (24)	96 (65)	20 (6)	124 (80)	47 (31)	50 (30)
71	MetalFurn	191 (100)	146 (84)	65 (42)	112 (61)	37 (23)	141 (83)	66 (51)	90 (62)
72	StrucMetal	156 (100)	113 (76)	36 (24)	76 (38)	16 (10)	118 (90)	46 (47)	41 (40)
73	Container	151 (100)	117 (80)	35 (36)	94 (66)	20 (18)	111 (68)	47 (34)	41 (35)
74	Wire	189 (100)	154 (86)	50 (33)	107 (57)	32 (23)	129 (77)	61 (43)	63 (51)
75	Hardware	222 (100)	186 (90)	100 (65)	131 (64)	48 (20)	172 (73)	92 (44)	116 (56)
76	Boilers	147 (99)	104 (65)	27 (21)	86 (52)	20 (13)	116 (84)	40 (27)	36 (27)
77	AirEngine	110 (99)	82 (84)	33 (41)	74 (67)	22 (20)	78 (67)	32 (36)	36 (45)
78	IntEngine	167 (100)	139 (93)	64 (42)	113 (68)	29 (15)	128 (73)	59 (34)	85 (54)
79	PowerMach	152 (100)	110 (77)	24 (10)	75 (56)	9 (5)	104 (80)	26 (18)	25 (12)
80	AgriMach	173 (100)	154 (96)	72 (52)	98 (69)	23 (16)	136 (81)	59 (32)	84 (61)
81	ConstrEQ	185 (100)	159 (94)	76 (65)	125 (70)	36 (27)	128 (68)	61 (41)	75 (54)
82	MetalMach	205 (100)	172 (80)	73 (30)	118 (47)	35 (15)	152 (85)	66 (49)	92 (47)
83	SewingMach	191 (100)	148 (83)	62 (45)	106 (43)	37 (19)	138 (85)	61 (44)	82 (50)
84	TextMach	167 (100)	133 (88)	53 (31)	96 (52)	25 (15)	118 (78)	41 (33)	52 (33)
85	PaperMach	171 (100)	144 (95)	34 (32)	111 (69)	13 (8)	127 (83)	39 (27)	42 (28)
86	PrintMach	159 (100)	127 (92)	65 (45)	110 (68)	32 (20)	109 (71)	32 (23)	55 (45)
87	FoodMach	170 (100)	135 (82)	54 (30)	99 (59)	23 (17)	129 (83)	51 (47)	62 (52)
88	SpecMach	194 (100)	139 (73)	38 (13)	124 (61)	36 (27)	130 (65)	47 (38)	68 (40)
89	ServMach	184 (99)	159 (90)	55 (33)	111 (68)	28 (17)	136 (73)	50 (29)	69 (38)
90	Pumps	190 (100)	163 (93)	72 (52)	118 (75)	34 (20)	134 (75)	67 (38)	89 (51)
91	MechEQ	200 (100)	168 (91)	70 (52)	126 (76)	30 (17)	137 (75)	59 (31)	78 (55)
92	OtherMach	201 (100)	176 (94)	81 (54)	123 (63)	44 (24)	145 (82)	62 (38)	94 (61)
93	RadioTV	190 (100)	148 (87)	60 (37)	97 (40)	22 (7)	130 (74)	50 (24)	93 (63)
94	TelecommEQ	204 (100)	175 (95)	76 (51)	120 (52)	28 (19)	146 (72)	74 (40)	110 (68)
95	HomeAppl	195 (99)	156 (78)	65 (40)	106 (59)	32 (13)	138 (81)	59 (45)	84 (52)
96	Computers	189 (100)	154 (82)	57 (27)	119 (58)	37 (21)	132 (78)	57 (54)	109 (63)
97	OfficeMach	188 (100)	145 (80)	45 (39)	93 (41)	25 (11)	124 (81)	46 (27)	78 (49)
98	Semicon	183 (100)	140 (83)	70 (41)	107 (53)	33 (14)	144 (80)	68 (45)	94 (66)
99	ElecMotor	179 (99)	112 (69)	40 (39)	99 (54)	43 (26)	137 (82)	59 (43)	69 (44)
100	Battery	180 (99)	151 (94)	70 (49)	100 (60)	35 (28)	141 (83)	72 (46)	96 (59)
101	ElecBulbs	197 (99)	163 (86)	61 (38)	112 (61)	40 (22)	150 (80)	78 (40)	109 (56)
102	IndlApp	210 (100)	167 (89)	80 (52)	154 (80)	46 (29)	157 (81)	81 (40)	114 (66)
103	Ship	145 (99)	105 (57)	30 (11)	91 (61)	16 (24)	112 (90)	29 (29)	22 (39)
104	Warships	7 (93)	5 (60)	2 (0)	2 (59)	1 (1)	4 (61)	3 (59)	3 (1)
105	RailroadEQ	136 (99)	92 (71)	28 (33)	82 (68)	16 (28)	101 (69)	29 (26)	29 (26)
106	Auto	155 (100)	124 (91)	70 (34)	83 (50)	34 (24)	120 (84)	70 (68)	88 (56)
107	Motorcycle	167 (99)	134 (84)	59 (28)	71 (27)	25 (10)	132 (85)	75 (56)	79 (48)
108	AutoParts	175 (100)	132 (74)	64 (38)	116 (73)	42 (21)	129 (77)	76 (44)	94 (60)
109	Aircraft	107 (100)	81 (89)	30 (46)	63 (77)	14 (29)	83 (93)	40 (64)	33 (42)
110	OtherTrans	86 (94)	63 (46)	25 (18)	42 (61)	26 (53)	74 (85)	45 (61)	48 (67)
111	Instrument	206 (100)	176 (89)	84 (55)	113 (48)	43 (22)	152 (85)	69 (37)	106 (56)
112	Optical	200 (100)	168 (89)	86 (64)	119 (63)	36 (29)	143 (71)	74 (38)	96 (44)
113	Matches	171 (100)	140 (83)	65 (48)	92 (33)	35 (6)	126 (64)	61 (32)	98 (52)
114	Jewellery	171 (100)	142 (90)	56 (47)	90 (48)	34 (24)	141 (84)	59 (44)	58 (50)
115	MusicInst	192 (100)	166 (91)	82 (68)	116 (48)	38 (21)	139 (75)	71 (60)	116 (83)
116	Sporting	213 (100)	180 (74)	92 (43)	127 (67)	48 (32)	155 (75)	89 (56)	120 (69)
117	Ordnance	112 (96)	83 (77)	23 (38)	70 (86)	15 (23)	82 (49)	28 (33)	21 (17)
118	ArtWork	160 (100)	132 (75)	49 (40)	90 (56)	20 (18)	121 (68)	42 (38)	45 (25)
119	OtherMfg	213 (100)	176 (80)	87 (36)	136 (68)	52 (29)	160 (81)	71 (32)	118 (54)
120	Scraps	167 (100)	139 (87)	63 (44)	98 (46)	27 (12)	132 (76)	62 (37)	63 (41)
Overall:									
	NEQ	PEQ	Pt2	KEQ	Kt2	TEQ	Tt2	R50	
19125 (99)	15375 (86)	6573 (41)	11288 (61)	3582 (22)	14063 (78)	6317 (43)	8383 (54)		

CHAPTER VI

HISTORICAL SIMULATION: A FIRST TEST

Historical simulation is one of the basic tests model-builders apply to any forecasting model to gauge its predictive accuracy. This test runs the model over the period for which it was estimated. Actual values of exogenous variables are used. Lagged values of endogenous variables may be either their actual values (for a static simulation) or the values calculated by the model (for a dynamic simulation). Here, we will be concerned only with the dynamic simulation.

We run the trade model for twelve sample years (1980-91).¹ In solving the model, the competitive prices and relative capital stock for each country are computed from the export prices and capital investment supplied by the country models in the Inforum international system, and the solutions are obtained for trade-shares matrix. Then, for the given total import demand by industry of each country, the solutions are also obtained for bilateral trade flows and each country's exports.

Before we proceed to evaluate the trade model's performance in the historical simulation, we should note that good historical simulation results are not

¹The model is built using the *Interdyme* software for complete, multisectoral modeling developed by Clopper Almon and the Inforum group.

necessarily indicative of the strong explanatory power of the underlying model. It is certainly true that a model can be "rigged" to do well in dynamic historical simulation. All that is necessary is to put exogenous variables in each equation that provide the bulk of the explanation. For example, in a macroeconomic model of the U.S. economy, one could put into its equation for inflation in the GDP deflator the rate of inflation in the Consumer Price Index (CPI), and left the latter exogenous. Obviously such an equation would have fit well and would perform well in historical simulation. Its explanatory power and its value in forecasting, however, is nil.

We submit that the dynamic historical simulation reported below does not involve such "rigging", because there are only a limited number of explanatory variables in the model: relative prices, relative capital investment and the Nyhus trend. Further, these explanatory variables are not exogenous to the linked system; they are solved in the country models and then fed to the trade model. Therefore, good historical simulation results in this case can be taken as robust evidence on the explanatory power of the model.

To judge the predictive accuracy of the trade model, we will compare its historical simulation with what trade flows would have been had trade shares remained constant since 1980, the year of the historical simulation period. As we will see on the next few pages, with its rather elaborate consideration of prices and

capital investment, the present trade model has definitely outperformed the simpler scheme, namely, the assumption of constant shares.

We will first examine the predictive errors in the import shares. Then, we will look at the errors in exports.

1. Errors in Import Shares

To compare errors in the predicted import shares under the two alternative historical simulations, we have calculated, for each historical simulation run, the length or "norm" of the difference of two vectors a and b , where a is a vector of the predicted shares of all exporting countries in a given import market, and b a vector of actual shares in the same market. Let c denote the difference between vectors a and b , that is, $c = a - b$, then, the "1-norm" of c is computed as follows:²

$$\|c\| = \sum_{i=1}^n |c_i| \quad (6.1)$$

Note that the lower limit of the "1-norm" of vector c is zero, which is the case of a perfect fit, where the predicted shares of all exporting countries in a given import market match exactly the corresponding historical shares. To determine the upper limit of the "1-norm" of vector c , recall that a general property of norms holds that,

²The 1 in "1-norm" refers to the French mathematician Henri Leon Lebesgue (1875-1941).

$$\|a-b\| \leq \|a\| + \|b\| \quad (6.2)$$

where the "1-norm" of a is equal to the sum of predicted trade shares of all exporting countries in a given import market, which, by the "adding-up" condition, is necessarily equal to 1. Likewise, the "1-norm" of b is the sum of the actual trade shares of all exporting countries in a given import market, which is also equal to 1. Hence, the upper limit of the "1-norm" of vector c -- the result of a worst possible fit between the predicted and actual shares -- must be 2 (= 1 + 1).

Table 30 (pp. 168-173) shows sum of the "1-norm" of vector c over all 16 import markets for each trade model sector for each of the 12 years in the historical simulation period (1974-91). Note that the lower limit of this sum total is zero, while the upper limit of this sum is 32 (= 16 x 2). Note also that within each sector, the first line indicates the sum of the "1-norm" of vector c for the equation-share based trade model, and the second line shows the sum of the "1-norm" of vector c for the simulation results based on the constant share approach. As the constant shares used are those for the year 1980, the first number on the second line for each sector is always zero, because the predicted share is the actual share in 1980 in the alternative historical simulation.

Even a quick examination of Table 30 will reveal the marked improvements in the predictive accuracy obtained by the current equation share based trade

Table 30: Errors in the Import Shares by Sector by Year: Equation Share vs. Constant Share

Sector	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
1 Cereals	4.15 0.00	4.58 2.72	5.46 3.94	4.62 4.89	4.41 6.13	5.39 8.20	5.00 9.08	5.08 9.03	5.13 9.69	5.81 9.08	5.23 8.69	4.74 10.97
2 Fruits	2.05 0.00	2.28 2.15	3.30 2.95	2.44 3.57	2.53 4.53	2.80 4.67	2.19 4.58	2.21 5.38	1.78 5.54	1.87 5.80	2.02 6.69	2.03 7.06
3 OtherCrop	1.89 0.00	2.43 2.48	2.24 2.93	1.94 2.52	1.68 2.23	2.26 3.13	2.00 3.05	2.47 5.55	2.31 5.76	1.94 6.07	2.58 7.09	2.58 7.45
4 Livestock	4.83 0.00	5.34 3.98	4.61 5.18	3.70 4.81	3.84 5.38	4.40 6.44	3.82 6.83	3.43 7.38	3.58 7.98	3.88 7.95	3.87 8.37	4.68 8.86
5 Silk	5.28 0.00	5.00 7.99	5.40 8.75	5.52 7.62	5.59 11.36	4.81 9.52	4.37 9.18	3.20 12.07	2.90 11.70	3.62 14.28	3.96 14.29	2.97 15.43
6 Cotton	3.11 0.00	3.47 3.34	3.75 2.57	3.14 3.35	2.89 3.85	3.14 4.02	4.21 7.74	3.00 7.98	3.29 7.22	2.52 6.62	2.51 6.72	2.54 7.18
7 Wool	2.04 0.00	3.27 1.96	2.75 2.35	2.83 3.29	3.02 4.06	2.34 3.76	2.61 3.52	2.62 5.00	2.68 5.19	2.71 5.71	3.25 5.54	3.17 6.20
8 OtherFiber	2.97 0.00	3.05 3.02	3.04 4.48	4.57 5.42	4.77 6.74	4.59 5.71	4.84 6.24	4.45 9.90	4.29 9.46	4.55 8.30	5.26 8.58	4.85 10.15
9 Wood	2.16 0.00	2.50 1.32	2.06 1.70	1.52 2.21	1.55 2.71	1.88 3.21	2.30 3.21	1.61 3.98	1.93 4.39	1.70 5.13	1.66 5.18	2.15 5.74
10 Fish	4.60 0.00	4.38 4.72	4.20 5.95	4.05 6.29	4.09 6.66	3.80 6.72	4.25 6.77	3.83 7.66	3.71 7.88	3.89 8.35	3.44 8.51	4.00 8.80
11 IronOre	2.07 0.00	2.84 2.11	2.54 2.61	2.94 3.44	2.28 2.87	2.38 3.46	1.71 3.44	2.20 4.44	1.78 4.48	1.42 5.04	1.30 5.51	1.20 5.39
12 Coal	4.27 0.00	5.34 5.41	4.18 4.51	4.18 6.71	4.22 8.13	3.52 7.64	3.74 7.22	3.05 8.38	2.15 7.96	1.63 7.73	1.84 8.03	1.86 8.49
13 OthMetOre	4.16 0.00	3.24 3.53	3.86 4.14	3.80 5.04	3.41 5.31	3.28 6.03	3.00 6.35	2.89 7.56	3.29 7.59	3.35 7.66	3.76 7.92	3.92 8.17
14 Petroleum	2.37 0.00	2.82 2.06	3.55 4.51	3.71 5.83	3.06 3.93	2.61 5.39	2.31 4.43	2.12 7.34	1.59 8.27	1.28 7.01	1.47 6.31	1.84 6.86
15 NatGas	1.65 0.00	2.17 3.25	3.14 4.10	2.80 4.86	2.54 5.25	1.81 6.87	2.86 6.72	2.58 8.54	2.12 6.25	1.57 6.75	1.66 7.47	1.22 6.94
16 NonMetal	2.48 0.00	3.96 3.54	3.89 4.16	4.11 5.03	3.27 5.62	3.37 6.13	3.91 5.77	3.52 7.27	2.87 6.65	3.23 7.08	3.01 7.25	3.46 7.76
17 Elec	1.62 0.00	1.54 4.53	2.10 4.36	1.83 5.33	1.74 7.06	1.58 5.20	2.02 6.73	1.70 8.70	1.66 9.62	1.55 9.27	1.64 9.12	1.64 9.92
18 Meat	3.28 0.00	3.24 2.88	2.94 3.70	2.74 4.00	2.67 4.63	2.73 4.46	2.90 4.58	3.29 5.92	3.32 5.89	3.30 6.57	3.16 6.97	3.41 7.33
19 Dairy	3.34 0.00	3.57 2.00	3.17 2.72	3.19 3.93	2.93 3.96	2.83 3.78	3.52 4.41	3.42 5.21	3.39 5.29	3.61 5.63	3.72 6.17	4.33 6.41
20 PreFruit	3.36 0.00	4.74 2.67	3.65 3.18	3.33 3.87	3.40 4.50	3.59 4.79	3.70 4.75	4.42 5.86	3.22 5.81	3.63 6.76	3.60 7.61	3.73 7.75

Table 30: (continued)

Sector	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
21 Seafood	4.23 0.00	5.11 2.67	4.15 3.62	4.45 4.47	4.69 5.12	5.27 5.28	5.18 5.52	4.55 6.72	4.78 7.99	4.34 7.81	4.42 7.68	4.36 7.95
22 OilFats	3.40 0.00	3.30 2.46	3.36 2.99	3.52 4.53	2.97 4.96	2.71 5.62	3.17 5.63	3.74 6.91	3.23 7.45	3.64 8.14	4.21 9.17	4.81 9.60
23 GrainMill	5.18 0.00	6.22 4.87	6.63 6.90	6.24 7.31	6.38 7.67	5.33 9.09	4.19 8.53	5.22 10.56	5.12 10.95	4.77 10.11	4.56 10.30	4.30 10.13
24 Bakery	3.27 0.00	5.34 3.81	4.79 5.04	4.73 6.09	4.25 7.18	3.46 7.10	3.82 7.23	3.75 7.47	4.29 8.31	4.18 9.16	4.12 9.50	4.75 9.98
25 Sugar	4.53 0.00	4.75 5.19	3.84 5.25	3.44 5.50	4.30 6.25	3.44 6.50	3.67 6.32	3.29 8.33	3.17 8.69	4.05 8.22	2.76 8.32	3.58 9.15
26 Cocoa	4.39 0.00	4.03 3.87	4.33 4.71	5.69 5.79	5.34 6.09	5.61 6.60	4.85 6.45	5.62 7.73	5.23 7.38	5.35 7.84	5.56 7.82	5.45 8.13
27 OtherFood	5.03 0.00	5.97 2.48	6.30 3.88	5.74 4.75	6.14 4.91	5.30 5.73	5.17 5.66	4.36 6.43	4.45 6.43	4.55 6.85	4.36 7.03	5.17 7.30
28 Feeds	5.75 0.00	4.76 4.12	4.42 5.49	5.11 6.54	4.43 6.33	4.29 6.97	3.86 6.86	3.48 7.71	3.16 7.97	3.04 8.08	3.58 8.02	3.71 8.56
29 Alcohol	3.25 0.00	4.97 3.35	4.27 5.17	4.02 7.39	3.42 8.54	3.55 8.29	4.05 7.30	4.43 8.06	3.40 7.80	3.35 8.53	3.33 7.79	3.10 7.70
30 NonAlcohol	4.14 0.00	5.06 6.34	5.52 6.55	5.19 8.30	5.62 9.41	5.52 10.65	5.49 11.33	4.41 13.16	5.39 12.55	4.56 11.20	5.13 10.88	5.58 11.13
31 Tobacco	4.46 0.00	5.03 2.77	3.96 4.12	5.70 6.14	3.53 6.29	4.41 6.85	5.91 5.28	4.56 7.97	5.10 7.53	5.01 7.32	5.52 7.50	6.39 7.42
32 Yarns	3.82 0.00	3.45 3.43	3.42 4.19	2.90 4.74	3.09 5.54	2.24 6.17	3.00 6.20	3.19 8.24	2.59 8.09	2.73 8.08	2.91 8.01	3.20 8.60
33 CottonFabr	3.30 0.00	3.17 3.29	3.75 4.14	2.90 5.02	3.02 5.70	3.23 6.29	3.34 6.01	2.73 8.12	2.76 7.86	2.70 7.71	2.79 7.63	3.21 7.99
34 OthTextile	2.27 0.00	2.54 2.03	3.38 2.79	2.23 3.61	2.14 4.14	2.28 4.97	2.61 5.41	2.52 6.41	2.40 6.59	2.41 6.81	2.40 6.75	2.47 7.17
35 FloorCover	3.27 0.00	3.74 3.60	3.62 5.64	4.00 7.65	3.40 7.79	3.33 7.30	4.04 7.64	2.83 8.43	2.95 8.54	3.23 8.99	3.50 9.15	3.01 9.35
36 Apparel	3.06 0.00	2.87 2.52	3.56 3.53	2.56 4.42	2.46 4.98	2.55 5.22	2.23 5.02	2.46 6.61	2.47 6.93	2.71 7.44	3.15 8.02	3.39 8.80
37 Leather	3.14 0.00	4.13 2.73	3.78 3.23	3.18 3.97	2.94 4.84	2.71 5.23	3.41 5.20	2.99 6.08	2.29 6.73	2.18 7.35	2.58 8.08	2.50 8.46
38 LeatherPrd	3.79 0.00	3.94 2.61	3.90 3.37	3.91 5.23	4.14 5.88	4.09 6.32	3.71 7.31	3.74 9.60	3.73 10.59	3.20 10.40	4.15 11.09	4.65 11.71
39 Footwear	4.08 0.00	4.28 3.58	4.68 4.46	4.61 5.51	4.47 5.36	4.15 5.55	4.16 5.58	3.66 7.06	4.03 6.92	3.63 7.68	4.40 8.66	4.89 9.33
40 Plywood	5.15 0.00	5.80 4.03	4.95 5.67	5.28 6.53	4.33 6.83	4.27 8.58	4.90 8.65	3.70 10.45	4.44 10.65	4.05 10.86	4.18 11.24	5.07 11.74

Table 30: (continued)

Sector	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
41 OtherWood	2.60 0.00	3.30 3.02	2.59 3.26	2.35 3.49	2.38 4.31	2.09 4.53	3.24 4.68	2.81 6.24	2.77 6.12	3.10 6.63	3.89 6.85	4.53 7.18
42 Furniture	2.36 0.00	3.41 2.81	3.19 3.82	2.71 3.93	2.49 4.33	2.51 4.99	2.72 4.98	2.83 6.37	2.58 5.91	2.64 5.87	3.22 6.01	3.51 6.33
43 Pulp	2.29 0.00	2.44 1.50	2.52 2.20	2.22 2.88	2.03 2.81	1.93 2.93	2.08 2.79	2.81 3.67	2.93 4.09	2.79 4.16	2.87 4.38	3.17 5.17
44 Newsprint	3.44 0.00	4.37 3.58	4.16 3.15	4.10 4.95	4.11 5.83	4.17 5.13	4.10 7.04	5.06 8.04	4.09 10.00	3.86 9.37	4.01 9.78	4.27 10.52
45 Paper	2.49 0.00	3.60 1.99	2.78 2.53	2.05 3.48	2.35 4.42	2.82 4.89	3.74 4.51	4.28 5.20	4.58 5.70	3.96 5.91	3.47 5.24	3.65 5.20
46 Printing	1.78 0.00	2.54 2.06	2.75 3.04	2.07 3.69	2.06 4.19	2.16 4.70	2.48 4.15	2.45 4.56	2.49 4.40	2.29 5.48	2.48 5.57	2.91 6.05
47 Chemical	1.50 0.00	2.04 2.22	1.68 2.84	1.50 3.45	1.60 4.10	1.33 4.28	2.10 3.79	1.84 4.57	2.00 4.80	1.94 4.97	1.96 4.97	1.89 5.05
48 Fertilizer	3.61 0.00	3.67 3.25	3.08 4.29	2.80 4.53	2.66 5.22	2.77 5.24	3.07 5.95	3.34 6.46	3.36 7.10	2.52 7.33	2.78 7.03	3.37 7.36
49 SynthFiber	2.00 0.00	2.57 1.66	2.27 2.31	1.97 3.15	1.75 3.65	1.64 4.10	1.76 3.64	2.21 4.27	2.36 4.45	2.00 4.64	1.86 4.53	1.73 4.63
50 Paints	1.86 0.00	2.52 2.05	2.28 2.61	1.83 3.51	2.00 4.22	2.18 4.54	2.27 4.58	3.03 5.22	3.46 5.50	3.57 5.93	3.15 5.62	3.23 5.80
51 Drugs	1.77 0.00	2.57 1.99	2.63 2.90	2.22 3.62	1.92 4.23	2.05 4.87	2.21 4.39	2.46 5.26	2.02 5.29	2.31 5.89	2.10 5.86	2.31 5.96
52 Soaps	1.80 0.00	2.77 2.00	2.78 2.99	2.15 4.21	2.10 5.08	2.15 5.26	2.70 4.85	2.66 5.40	2.73 5.11	2.52 5.53	2.66 5.00	2.65 5.25
53 OtherChem	1.73 0.00	2.18 1.74	2.50 3.34	1.72 4.01	1.63 4.53	1.70 5.45	2.19 4.91	2.77 5.49	2.94 5.38	2.70 6.24	2.19 6.15	2.98 6.37
54 PetroRefin	3.41 0.00	4.47 3.79	4.04 4.85	3.30 5.70	2.97 6.01	2.92 6.05	2.94 6.15	2.83 7.02	2.54 6.72	2.95 7.05	3.03 6.54	3.43 6.69
55 FuelOil	2.82 0.00	4.11 4.46	4.01 5.92	4.12 7.84	3.37 8.37	3.07 8.94	2.36 9.34	1.97 9.78	1.77 10.48	2.39 10.49	2.65 9.79	3.38 10.17
56 PetroProd	5.55 0.00	8.04 5.55	5.73 4.73	5.38 6.91	5.10 7.36	5.16 7.62	5.08 7.61	5.99 9.04	4.72 9.94	4.19 9.93	4.03 10.43	4.78 9.71
57 CoalProd	4.84 0.00	4.94 4.22	5.24 6.24	5.85 7.34	5.30 6.97	4.51 7.60	4.42 7.58	3.42 8.57	3.31 9.09	3.39 9.81	2.76 10.98	3.67 11.89
58 Tyre	4.54 0.00	5.24 2.94	4.49 4.39	4.87 5.74	4.31 6.04	4.47 6.38	4.90 6.10	4.16 7.01	4.63 7.33	4.70 7.42	4.95 7.51	5.43 7.57
59 Rubber	2.88 0.00	3.29 2.45	3.06 3.39	2.55 4.38	2.44 4.22	2.25 4.49	3.21 4.09	3.31 5.20	3.31 5.34	3.13 5.94	3.02 6.10	3.09 6.38
60 Plastic	2.80 0.00	2.67 2.01	2.80 2.60	2.23 3.42	2.15 3.66	2.08 3.93	2.51 4.12	2.72 5.35	3.01 5.59	3.04 5.81	3.21 6.08	3.39 6.71

Table 30: (continued)

Sector	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
61 Glass	1.92 0.00	2.53 2.37	2.89 3.31	2.26 4.05	1.59 4.31	1.70 4.34	2.40 4.03	2.46 4.90	2.04 5.03	2.29 5.40	2.27 5.20	2.51 5.45
62 Cement	6.03 0.00	7.65 3.35	7.67 6.35	6.21 8.00	7.10 8.37	6.50 9.76	5.49 10.93	4.73 12.83	4.93 15.08	4.68 14.57	5.56 14.61	5.06 13.85
63 Ceramics	3.94 0.00	4.35 3.01	4.73 5.07	3.55 4.92	3.09 5.30	3.00 5.36	3.83 5.55	4.50 6.85	4.04 8.91	4.57 9.69	4.32 9.36	4.77 9.59
64 NonMetProd	2.08 0.00	2.85 2.30	2.21 3.08	1.91 3.89	1.80 4.44	2.16 4.86	2.73 4.60	2.80 5.44	2.80 6.51	2.66 6.86	3.06 6.93	3.11 7.17
65 IronSteel	2.31 0.00	3.05 2.47	2.99 2.76	3.07 2.89	2.75 3.73	2.48 3.78	2.91 3.44	2.68 4.81	2.63 5.43	2.21 5.67	2.51 5.86	3.15 6.19
66 Copper	4.55 0.00	3.49 3.76	3.98 4.49	4.13 4.67	3.32 6.20	2.83 5.85	2.60 5.83	2.50 7.69	2.96 8.41	2.67 8.75	2.94 8.73	3.53 8.59
67 Aluminum	5.03 0.00	3.85 4.80	3.33 6.36	3.12 7.19	3.21 7.67	2.81 7.55	2.33 7.43	2.92 8.17	3.51 7.81	2.93 8.09	2.82 8.00	2.87 7.90
68 Nickel	5.15 0.00	5.94 4.02	5.79 4.64	5.46 4.86	4.90 5.54	4.70 6.31	5.24 6.38	6.02 7.22	4.33 8.85	3.95 9.16	3.79 9.55	3.47 9.16
69 LeadZinc	5.76 0.00	4.77 5.71	3.83 5.64	5.03 7.52	4.64 7.93	3.63 7.53	3.64 7.14	4.20 9.38	3.51 8.43	4.16 9.00	3.65 8.98	4.50 9.04
70 OtherMetal	4.07 0.00	4.23 4.58	3.77 5.78	4.46 5.67	3.09 5.49	3.26 6.11	3.56 5.66	4.01 7.35	3.18 7.63	3.50 8.10	4.01 8.27	4.79 9.34
71 MetalFurn	2.39 0.00	3.24 2.63	3.41 3.04	3.61 4.15	3.76 4.65	4.22 5.20	4.56 5.76	4.56 7.04	4.02 7.26	3.95 7.36	4.43 7.39	3.65 7.60
72 StrucMetal	3.48 0.00	4.75 4.62	4.74 4.67	5.65 7.12	4.58 6.96	3.14 7.24	3.96 6.67	4.53 9.95	3.68 9.34	4.44 7.97	4.09 8.61	4.75 9.10
73 Container	4.76 0.00	5.21 5.53	4.94 6.75	5.51 7.48	5.08 7.37	5.07 8.35	4.99 8.04	4.01 8.19	4.21 8.29	3.69 8.39	4.25 8.03	4.11 8.15
74 Wire	3.62 0.00	4.35 4.03	4.23 6.04	4.74 5.53	3.91 6.36	3.93 7.31	4.74 6.76	4.63 8.38	4.89 7.85	5.25 8.52	4.68 8.64	4.58 9.24
75 Hardware	1.86 0.00	2.34 1.49	2.60 2.53	1.73 3.20	1.46 3.41	1.34 3.71	2.00 3.52	2.04 4.30	1.79 4.40	1.89 4.66	1.85 4.35	1.93 4.66
76 Boilers	4.70 0.00	5.71 4.05	5.28 4.91	6.79 6.60	5.28 6.88	5.09 7.41	5.11 6.13	5.44 7.98	5.15 7.37	5.56 7.76	4.53 7.19	4.61 7.88
77 AirEngine	3.49 0.00	4.45 3.87	4.46 4.93	5.08 6.67	4.92 7.18	4.17 7.32	4.03 7.46	4.37 8.92	3.90 9.32	3.53 9.40	3.69 8.67	4.20 8.78
78 IntEngine	3.00 0.00	4.12 3.07	4.46 4.42	4.00 6.03	3.40 6.74	4.12 6.97	4.51 6.88	3.49 7.93	3.58 8.39	3.45 8.51	3.81 8.78	3.67 8.62
79 PowerMach	7.07 0.00	7.89 6.79	5.21 7.63	4.98 8.53	5.71 10.39	5.16 10.10	6.67 9.87	5.95 11.65	8.01 13.06	5.17 9.84	6.21 9.97	5.71 10.32
80 AgriMach	2.40 0.00	3.61 2.88	3.09 3.88	2.97 5.08	2.35 4.79	2.23 5.93	3.14 5.38	3.73 6.56	3.33 6.55	2.46 6.59	2.70 6.27	3.59 6.59

Table 30: (continued)

Sector	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
81 ConstrEQ	2.36 0.00	3.40 2.87	2.96 3.72	3.09 4.98	2.74 5.57	2.37 6.06	3.66 5.57	2.75 6.52	2.69 6.21	3.22 6.73	2.90 6.67	2.96 6.76
82 MetalMach	2.27 0.00	3.01 2.69	2.64 3.22	2.76 3.53	2.29 4.04	1.83 3.75	2.58 3.67	2.50 4.65	2.23 4.75	1.87 5.39	2.20 5.31	3.06 5.26
83 SewingMach	3.79 0.00	4.37 3.54	4.19 3.02	2.86 3.94	3.03 4.31	2.96 4.39	3.15 4.62	3.31 5.98	3.46 6.29	3.81 6.74	3.72 6.87	4.02 7.00
84 TextMach	2.91 0.00	3.11 2.64	2.99 3.88	2.76 3.91	3.25 5.07	2.27 4.70	2.64 4.23	2.73 5.10	2.67 5.21	2.68 5.38	3.22 6.19	3.38 6.05
85 PaperMach	4.99 0.00	4.52 4.22	5.41 5.29	4.21 5.41	3.55 5.03	3.74 4.75	4.13 4.86	4.31 6.53	3.91 6.83	4.31 7.14	3.43 7.24	4.46 6.19
86 PrintMach	2.79 0.00	3.36 3.84	2.90 4.27	2.87 5.34	2.41 5.56	2.49 6.19	3.07 6.00	3.00 6.53	2.71 6.49	2.98 6.65	2.75 6.42	3.04 6.30
87 FoodMach	3.04 0.00	3.45 3.24	2.29 3.52	2.78 4.82	2.09 4.32	2.61 5.12	2.57 4.39	2.52 5.52	2.56 5.72	2.24 5.75	2.88 5.90	2.50 5.76
88 SpecMach	3.70 0.00	4.55 2.12	4.90 3.95	3.87 3.68	3.38 4.15	2.98 4.32	3.80 4.85	4.79 5.83	4.38 6.11	4.16 6.70	4.28 6.32	5.19 6.45
89 ServMach	1.73 0.00	2.42 2.27	2.12 3.12	1.95 3.43	1.73 3.66	1.62 4.07	2.15 3.87	2.38 4.98	2.34 4.71	2.36 5.07	2.56 5.13	3.29 5.43
90 Pumps	1.70 0.00	2.38 2.21	2.32 2.99	2.27 3.88	1.93 4.42	1.81 4.68	2.78 4.61	2.19 5.29	2.16 4.86	2.69 5.28	2.49 5.08	3.06 5.24
91 MechEQ	2.57 0.00	3.15 3.45	3.35 4.83	2.81 4.89	3.19 5.54	2.99 5.63	3.00 5.64	2.74 6.33	3.05 6.20	2.88 6.17	2.85 5.89	3.13 5.96
92 OtherMach	1.93 0.00	2.38 1.96	2.38 3.03	2.00 3.45	2.03 3.98	2.45 4.08	2.57 4.03	2.67 4.98	2.12 5.06	2.26 5.33	2.16 5.15	2.14 5.47
93 RadioTV	2.67 0.00	3.96 2.31	4.63 3.72	4.06 4.40	3.21 4.25	3.27 4.17	4.08 3.91	3.93 5.53	3.18 7.66	2.46 8.47	3.08 9.20	3.83 9.98
94 TelecommEQ	4.02 0.00	4.85 3.61	4.45 3.70	3.90 4.81	4.10 5.20	2.83 4.85	3.05 4.58	3.94 6.50	3.34 7.10	3.63 7.20	4.03 7.78	4.70 7.93
95 HomeAppl	3.01 0.00	2.87 2.12	3.63 3.00	3.51 3.63	3.41 4.37	3.44 4.49	3.32 4.37	4.20 6.00	3.64 7.07	3.71 7.43	3.88 7.31	5.10 7.47
96 Computers	3.43 0.00	4.95 3.15	4.84 3.96	4.44 4.88	4.15 5.42	4.21 6.70	4.22 7.47	4.05 8.21	3.66 8.67	3.35 8.93	3.54 9.88	4.10 10.13
97 OfficeMach	4.30 0.00	4.55 3.29	4.90 4.41	4.91 5.34	4.74 6.19	5.36 7.22	4.04 6.63	4.15 8.59	4.27 8.86	4.28 8.49	4.03 8.38	6.15 8.69
98 Semicon	5.05 0.00	5.01 3.91	5.31 3.52	4.30 4.39	4.03 4.85	4.96 5.51	4.36 6.23	4.02 7.09	3.38 7.65	2.88 7.87	3.28 8.12	4.17 8.30
99 ElecMotor	4.72 0.00	4.64 2.61	4.63 3.83	4.21 4.08	3.59 4.10	3.63 4.64	4.07 4.84	5.27 6.91	4.83 6.83	4.78 6.84	5.14 6.95	4.90 7.34
100 Battery	4.54 0.00	4.98 3.25	6.22 5.20	5.00 5.60	4.71 5.80	5.01 6.88	4.34 6.95	4.94 7.76	4.28 7.62	4.38 7.99	3.83 8.11	4.38 8.34

Table 30: (continued)

Sector	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
101 ElecBulbs	2.31 0.00	2.90 2.35	3.35 3.96	3.41 3.92	2.73 4.75	2.80 4.49	2.65 4.44	2.54 5.77	3.19 6.11	2.63 6.26	3.06 6.12	3.49 6.62
102 IndlApp	2.71 0.00	3.31 1.69	3.29 2.75	2.45 3.12	2.22 3.25	2.12 3.43	2.24 3.26	2.60 4.01	2.51 4.26	2.35 4.73	2.46 4.81	2.71 5.32
103 Ship	6.99 0.00	8.12 6.83	7.02 9.65	7.94 10.11	6.43 9.21	7.09 9.24	8.30 8.56	6.85 10.56	6.38 11.22	7.08 10.56	6.77 11.23	8.10 10.84
104 Warships	0.70 0.00	1.17 2.94	1.75 3.30	2.61 5.73	0.07 9.43	1.09 5.09	1.14 2.93	0.38 5.82	0.12 14.93	0.13 16.40	0.22 15.85	0.77 14.62
105 RailroadEQ	7.00 0.00	8.23 6.22	7.66 9.16	6.70 9.90	5.96 9.72	5.50 10.03	5.10 10.06	7.53 12.02	6.95 12.09	4.98 11.56	5.51 11.32	8.06 12.46
106 Auto	3.79 0.00	3.89 2.99	3.38 4.72	2.47 5.16	2.54 5.14	3.34 4.92	3.24 4.65	3.38 5.98	2.48 6.59	2.53 6.67	2.72 6.53	3.07 6.80
107 Motorcycle	5.72 0.00	6.05 2.24	7.00 3.59	6.36 4.29	5.74 5.42	4.74 5.13	4.55 6.60	5.55 8.77	5.28 9.03	5.36 9.78	5.64 10.27	6.06 11.27
108 AutoParts	2.43 0.00	3.06 2.48	3.14 3.35	2.80 5.30	2.29 5.67	2.29 5.53	2.96 5.35	2.73 6.77	2.34 7.23	1.96 6.81	2.04 6.89	2.51 7.15
109 Aircraft	5.93 0.00	5.78 5.59	6.04 8.44	5.47 9.55	6.31 8.86	5.69 9.18	6.81 7.06	4.89 9.60	4.94 7.94	4.67 7.65	3.07 7.17	4.31 6.98
110 OtherTrans	6.17 0.00	8.02 7.23	8.02 8.84	8.26 11.23	8.32 13.08	9.09 13.78	8.34 16.09	5.92 17.65	5.70 17.21	4.94 17.70	4.83 18.13	5.44 19.06
111 Instrument	1.05 0.00	1.69 1.59	1.66 2.33	1.58 2.89	1.35 3.14	1.38 3.50	1.86 2.91	2.02 3.69	1.79 3.82	1.83 3.98	1.72 4.03	1.94 4.19
112 Optical	2.47 0.00	2.56 1.85	2.38 2.90	2.01 3.29	2.35 3.95	2.04 4.18	3.22 3.82	2.65 4.82	2.69 5.19	2.45 5.48	1.93 5.89	2.95 6.29
113 Watches	4.40 0.00	4.41 3.69	3.27 4.92	3.86 4.94	6.93 4.10	3.77 4.21	3.30 4.19	3.27 5.66	3.03 5.98	3.30 6.73	3.77 7.90	4.21 8.09
114 Jewellery	5.87 0.00	6.32 6.07	5.77 6.18	5.22 6.97	5.39 8.03	3.80 8.14	4.75 8.59	4.74 9.81	5.21 9.27	5.51 10.89	5.48 10.25	5.91 10.78
115 MusicInst	4.33 0.00	5.13 2.48	4.14 3.83	3.75 5.30	3.14 5.99	3.63 7.00	3.54 7.27	3.77 8.26	3.35 7.87	3.51 8.47	3.69 8.54	5.55 8.53
116 Sporting	3.82 0.00	4.31 3.21	4.17 4.30	3.07 4.69	2.98 5.06	3.41 4.95	3.38 4.94	3.93 6.53	3.70 7.08	3.01 7.56	2.91 7.77	3.56 8.16
117 Ordnance	7.91 0.00	7.77 9.63	7.03 12.77	7.45 13.18	6.93 13.74	5.23 14.94	4.50 13.54	5.48 11.90	4.28 11.67	6.38 13.28	5.67 11.63	6.13 13.26
118 ArtWork	5.44 0.00	4.93 7.13	4.89 6.30	5.23 6.62	5.13 8.56	4.97 8.55	4.50 8.45	4.58 9.12	4.71 10.64	5.03 10.44	3.93 10.80	3.74 11.03
119 OtherMfg	3.93 0.00	3.91 2.71	4.10 3.44	3.41 4.30	3.33 4.86	3.77 5.21	3.67 5.85	3.77 7.41	3.59 7.66	3.68 8.05	3.88 8.34	4.06 8.97
120 Scraps	3.66 0.00	4.09 3.72	3.46 4.72	3.28 5.55	3.10 5.59	3.45 5.57	3.63 5.78	3.55 7.48	3.70 8.08	4.72 9.68	4.42 8.89	4.99 9.85

model over the simpler approach based on the constant share. Note also that while the trade model's predictive errors in import shares tend to be fairly stable over time in every trade sector, the errors resulted from the constant-share approach appear to be an increasing function of time across all trade sectors.

Table 31 presents the sum of the "l-norm" of vector c over all 120 trade sectors for each import market for each of the 12 years in the historical simulation period. Note that the lower limit of this sum total is zero, while the upper limit of this sum is 240 ($= 120 \times 2$). Note also that within each year, the first line indicates the sum of the "l-norm" of vector c over all sectors for the equation-share based trade model, and the second line shows the sum of the "l-norm" of vector c for the simulation results based on the constant share approach. As the constant shares used are those for the year 1980, the second line for the year 1980 for each import market is always zero, because the predicted share is the actual share in 1980 in the alternative historical simulation.

The last column of Table 12 lists the sum total by row. Each row sum corresponds to the sum of the "l-norm" of vector c over all sectors and all import markets in each year. Again, we observe that as time progresses, the improvement in the predictive accuracy obtained by the current equation share based trade model over the simpler approach based on the constant share grows more and more pronounced. By 1991, the error resulted from the constant-share

Table 31: Errors in the Import Shares by Market by Year: Equation Share vs. Constant Share

YEAR	CAN	USA	MEX	AUS	BEL	FRA	GER	ITA	SPA	UK	JAP	CHN	KOR	TW	ROECD	ROW	SUM
1980	20.17 0.00	29.27 0.00	34.90 0.00	22.21 0.00	22.45 0.00	20.45 0.00	21.03 0.00	24.18 0.00	39.75 0.00	26.57 0.00	28.77 0.00	0.00 0.00	47.80 0.00	46.91 0.00	17.11 0.00	25.47 0.00	427.03 0.00
1981	23.39 18.92	35.18 22.13	38.81 31.16	28.66 22.06	26.97 23.23	25.15 18.46	25.65 16.15	31.76 26.52	43.99 40.02	30.21 29.71	33.84 23.15	0.00 0.00	47.42 44.84	41.55 46.17	24.18 19.27	32.09 26.19	488.86 407.98
1982	22.96 26.04	34.76 28.84	43.84 46.76	24.10 26.73	24.14 29.84	23.68 27.21	24.36 24.10	27.09 31.90	39.56 47.31	27.13 37.19	32.30 30.69	0.00 0.00	50.67 53.74	46.08 49.77	22.28 27.38	30.22 35.33	473.17 522.84
1983	23.63 32.61	36.58 37.09	42.88 65.66	20.76 29.11	23.00 34.40	20.65 31.84	21.17 29.18	25.61 37.71	36.40 52.72	24.12 41.27	32.56 38.99	0.00 0.00	50.38 58.48	44.47 58.29	20.16 34.64	28.15 42.17	450.53 624.15
1984	21.73 38.87	34.11 42.41	39.70 61.34	21.43 33.16	22.04 40.60	19.47 38.16	19.78 32.32	24.56 41.46	36.71 59.65	21.20 45.09	30.82 43.76	0.00 0.00	43.44 62.45	44.19 59.67	18.25 39.69	25.01 46.72	422.45 685.36
1985	18.17 41.70	35.66 47.50	35.34 57.83	21.65 35.67	20.21 41.21	19.93 40.04	19.64 36.41	23.15 44.82	34.54 60.97	21.75 46.70	31.40 46.91	0.00 0.00	41.85 63.95	43.42 64.57	16.89 42.01	24.74 49.35	408.34 719.66
1986	19.13 42.01	34.48 46.21	37.12 57.28	23.46 35.19	23.72 39.69	23.32 38.22	22.15 36.31	24.33 43.86	35.17 62.53	24.68 47.00	34.17 48.17	0.00 0.00	42.49 68.32	43.87 64.80	19.45 39.08	26.26 47.45	433.80 716.12
1987	16.47 40.47	30.52 48.54	35.66 57.43	23.03 37.12	21.94 39.63	19.00 40.37	20.18 37.38	22.61 44.91	33.42 67.27	22.76 49.04	32.16 51.80	31.59 116.00	39.31 73.08	38.67 70.22	18.13 38.49	23.84 58.15	429.29 869.89
1988	16.91 46.49	29.65 50.04	31.87 56.20	21.64 41.39	21.27 43.79	19.05 43.65	18.73 40.06	23.16 48.31	30.11 66.47	21.01 45.71	30.29 54.40	29.60 118.00	36.66 78.90	40.58 72.75	17.34 38.73	22.99 59.71	410.85 904.61
1989	15.38 47.74	28.02 55.69	28.53 55.16	22.88 45.09	21.42 46.44	18.10 44.57	17.99 42.89	24.72 51.68	29.82 67.22	21.61 47.84	29.33 56.32	30.21 117.00	37.27 77.94	39.17 72.06	17.36 41.76	22.91 62.88	404.72 932.29
1990	16.04 47.28	27.88 56.09	27.06 54.04	24.43 45.08	21.67 46.30	20.30 45.40	19.27 45.14	24.26 52.10	31.07 68.87	22.73 48.25	29.32 57.48	27.98 118.00	38.36 80.46	39.62 70.11	18.05 41.98	23.90 66.15	411.95 942.73
1991	20.53 48.36	31.24 58.49	27.37 54.46	27.57 47.93	24.93 48.61	23.70 46.92	24.07 47.76	28.80 54.82	34.45 71.67	23.39 48.45	30.94 59.81	26.48 118.00	38.50 86.74	44.04 73.33	21.23 44.80	27.74 70.44	454.98 980.58

approach is more than twice as large as that produced by the equation-share based trade model. And if we add up these errors over the twelve years in the historical simulation period, then for the constant-share approach, the sum is equal to 8,305.41, which is nearly twice as large as the corresponding error sum for the equation-based trade model (4,788.86). It should be clear by now that the moral of the foregone analysis is that when dealing with trade flows, constant shares are not a good assumption.

2. Errors in Exports

Ultimately, the trade model is developed to forecast exports for each country in the linked international system. Therefore, the predictive accuracy of the trade model from the exporter side should also be examined. The statistic used here is normalized root mean square error (NRMSE), defined as follows:

$$NRMSE\% = 100 * \frac{\sqrt{\frac{1}{N} \sum_{t=1}^N (X_p - X_a)_t^2}}{X_m} \quad (6.3)$$

where,

X_p = Predicted export of a given product by a given exporter;

X_a = Actual export of a given product by a given exporter;

X_m = Arithmetic mean of X_a ;

N = The number of years in the simulation period, which is 12.

Table 32 shows the ratio of the equation NRMSE to constant 1980 share NRMSE (in logs) for all sectors by exporter. It should be noted that a negative number in the Table indicates an improvement by the trade model over the constant-shares approach: -0.1 is equivalent to a 10% improvement in NRMSE, -0.5 to a 40% improvement in NRMSE, and -1.2 to a 70% improvement in NRMSE. An inspection of Table 32 reveals marked improvements in "root mean square error" by the equation-share trade model over the simpler constant share approach. For exporter USA, for instance, the trade model approach leads to over 70% improvement in NRMSE of its export projections in Sector 2 (Fresh fruits and vegetables), 80% improvement in NRMSE of its export projections in Sector 9 (Crude wood), 85% improvement in NRMSE in Sector 36, 58% improvement in NRMSE in Sector 42 (Furnitures and fixtures), 70% improvement in NRMSE in Sector 51 (Drugs and medicines), 70% improvement in NRMSE in Sector 61 (Glass), and 70% improvement in NRMSE in Sector 80 (Agricultural machinery).

It may be noted in passing that had we used the constant 1980 import shares instead of the equation shares to predict exports, by 1991 (the last year of the historical simulation period), the absolute error on the total world trade would be \$961 billion, or 29% of the total world exports in 1991. The corresponding figures for the trade model are \$414 billion and 10%.

Table 32: Ratio of Equation to Constant Share NRMSE (in logs)

	CAN	USA	MEX	AUS	BEL	FRA	GER	ITA	SPA	UK	JAP	CHN	KOR	TW	ROECD	ROW	WT.	AVE.
1 Cereals	0.11	-0.76	0.16	-0.27	0.86	-1.59	-0.52	-0.21	-0.17	0.09	-0.57	-1.00	0.00	0.17	-0.04	-0.40	-0.71	
2 Fruits	0.41	-1.25	0.04	0.87	-1.19	-0.69	-0.89	-1.74	-0.98	-1.10	-0.21	-0.18	0.15	-1.02	-1.53	-0.77	-1.00	
3 OtherCrop	0.26	-0.87	0.14	-0.26	0.58	-0.81	-0.67	0.68	-0.73	0.20	1.05	-0.46	-0.21	-0.15	-1.08	-0.51	-0.68	
4 Livestock	0.14	0.05	0.15	-0.38	-0.79	-0.71	-0.86	0.36	0.05	-0.93	1.03	-0.14	-0.13	-0.91	-0.12	0.45	-0.30	
5 Silk	0.00	2.72	0.22	0.00	-0.24	-0.51	-0.28	-1.58	-0.22	-0.12	0.50	-0.24	0.31	0.18	-0.05	-0.20	-0.24	
6 Cotton	-0.73	-0.14	-0.44	-0.45	-0.49	0.61	-0.32	0.89	-0.40	0.69	1.14	-0.46	0.35	-1.30	-0.57	0.30	-0.06	
7 Wool	1.69	0.12	1.05	0.22	-0.51	0.58	0.15	-0.69	0.32	-0.82	1.25	-0.47	0.38	0.03	-0.09	0.48	-0.04	
8 OtherFiber	-0.31	0.41	1.07	0.49	-0.81	0.29	0.09	1.40	0.37	-0.72	1.16	-0.30	1.78	-0.20	-0.10	-1.19	-0.85	
9 Wood	0.24	-1.68	0.04	-0.02	-1.31	-1.56	-0.67	-0.26	-0.73	-0.66	-0.11	-0.38	0.47	0.43	0.43	-1.62	-1.10	
10 Fish	-0.39	-0.07	-1.32	-0.01	-0.37	-0.11	0.12	0.61	0.08	-0.53	-1.33	-0.36	-1.25	0.04	-0.37	-0.63	-0.52	
11 IronOre	-0.22	-1.08	0.03	-0.76	-0.51	-0.90	0.13	0.18	0.32	0.74	0.12	-0.09	0.13	0.02	-0.33	-1.12	-0.76	
12 Coal	-0.32	-0.32	0.04	-0.19	-0.54	-0.12	-0.58	-0.08	-0.14	-1.56	-1.11	-0.42	0.39	0.32	-0.65	-0.44	-0.48	
13 OthMetOre	-0.30	0.01	-0.12	-0.53	-0.00	-0.51	0.34	-0.24	-0.20	-1.19	0.40	-0.44	-0.33	-0.00	-0.54	-0.21	-0.27	
14 Petroleum	-0.67	-1.15	-0.43	0.99	0.01	0.13	-0.01	-0.63	-0.15	-0.25	-0.29	-0.65	0.00	0.00	-0.38	-0.56	-0.54	
15 NatGas	-0.31	-0.85	-0.02	-0.55	0.35	-0.29	0.32	0.60	0.52	-0.11	2.29	0.95	-0.93	0.70	0.18	0.12	0.13	
16 NonMetal	-0.04	-0.60	-0.47	-1.03	-0.79	-0.65	-1.13	-0.44	-0.62	-0.63	-0.14	-1.47	-0.31	0.89	-0.20	0.01	-0.24	
17 Elec	0.00	0.00	0.00	-0.20	0.57	-1.10	0.23	-0.12	-1.09	0.51	0.00	-0.36	0.00	0.00	0.24	-0.23	-0.26	
18 Meat	0.75	-0.94	0.37	0.88	-1.10	-0.81	-1.12	-0.34	-0.28	-1.52	0.98	-1.15	0.22	-1.22	-0.11	-1.21	-0.34	
19 Dairy	0.30	-0.13	0.54	0.19	0.13	0.38	-0.40	-0.45	0.99	-1.65	0.10	-1.11	-0.44	0.60	-0.48	0.25	-0.40	
20 Prefruit	0.14	-1.11	-0.72	-0.10	-0.81	0.03	-0.74	-1.39	-0.27	-1.54	-1.85	-0.53	-0.29	-1.69	0.37	-0.23	-0.36	
21 Seafood	-0.91	0.82	-0.67	-0.53	-0.38	-0.97	-0.03	-0.46	0.66	-0.62	-1.16	-0.19	-0.10	0.52	1.54	-0.43	0.20	
22 OilFats	0.71	-1.22	-0.17	0.76	-1.30	0.81	-0.64	-0.78	0.07	-0.22	0.16	-1.93	-0.35	0.75	-1.14	-0.11	-0.63	
23 GrainMill	-0.64	0.38	0.89	2.68	-0.33	-0.50	0.48	-0.45	-0.03	-0.62	0.58	-0.78	-0.34	1.77	0.33	0.59	0.11	
24 Bakery	-2.29	-0.32	0.62	0.79	0.37	-0.11	-1.80	-1.40	-0.76	-1.56	-0.52	-1.01	-1.10	0.58	0.08	0.49	-0.88	
25 Sugar	0.35	-0.06	0.16	-0.08	0.02	0.16	0.35	0.02	-0.49	0.39	0.17	-1.36	-0.73	-0.15	0.49	0.19	0.22	
26 Cocoa	-0.00	-0.52	0.81	-0.27	-0.97	-1.19	-1.31	-0.12	-0.10	-1.65	-0.03	-1.83	-0.50	-0.36	-0.47	-1.28	-1.02	
27 OtherFood	-0.22	-0.87	0.21	0.64	-0.63	0.20	-0.91	-0.20	0.84	-1.44	0.59	-1.33	0.50	-1.04	-1.42	-0.97	-0.95	
28 Feeds	0.02	-1.03	0.03	-0.31	-0.85	-1.22	-0.95	-0.14	0.76	-0.59	0.08	-0.82	0.17	-0.08	-0.08	-0.12	-0.51	
29 Alcohol	-0.53	-0.95	-0.19	0.70	-0.54	-1.40	-0.93	-0.21	-0.67	-1.37	0.58	-1.03	-0.12	-0.09	-1.46	-0.67	-1.30	
30 NonAlcohol	-0.24	0.40	0.39	-1.15	0.24	-0.07	0.61	0.01	-0.06	-1.04	-0.65	-0.12	0.05	0.41	-0.03	0.04	-0.00	
31 Tobacco	0.00	-1.40	-1.02	0.42	-0.16	-0.28	-0.31	0.25	-0.06	-1.54	-0.89	-0.30	0.68	0.37	-0.25	0.08	-1.08	
32 Yarns	-0.94	-0.90	-0.16	-0.03	-0.11	-1.16	-1.16	-0.99	-0.75	-1.42	-0.76	-1.46	-0.20	-0.25	-0.49	-0.72	-0.87	
33 CottonFabr	-0.98	-0.13	-0.28	0.69	0.45	-0.51	0.24	0.28	-1.13	-1.27	0.27	-0.30	0.53	-0.55	0.74	-0.13	-0.10	
34 OthTextile	-0.20	-1.39	-0.40	-0.05	-0.65	-0.72	-1.61	-0.45	0.43	-1.52	-1.18	-1.84	-1.50	-1.35	-0.42	-0.01	-1.13	
35 FloorCover	-0.13	0.44	-0.04	1.19	-1.12	-0.02	-0.80	-0.37	-0.60	-0.66	-0.75	-1.25	1.63	0.96	-0.05	-1.06	-0.85	
36 Apparel	0.76	-1.91	0.19	0.58	0.27	-0.79	0.02	-0.66	0.48	-1.99	-1.26	-0.98	-0.23	-0.64	-0.41	-0.50	-0.75	
37 Leather	-0.28	-0.47	0.06	-1.05	-0.01	-0.46	-0.77	-1.03	-0.06	-1.32	-1.42	-0.89	0.16	-0.92	-0.62	-0.13	-0.65	
38 LeatherPrd	0.51	-1.48	0.38	0.69	-0.37	-0.46	-1.03	-1.23	-0.20	-1.74	-1.28	-1.52	-0.22	-0.27	-0.56	-0.91	-1.13	
39 Footwear	-1.27	0.47	-0.24	-0.72	-0.73	-1.36	-0.28	-1.42	0.50	-1.55	-0.34	-0.83	-0.64	0.10	-0.30	-0.71	-0.85	
40 Plywood	-0.39	0.39	0.26	-0.11	0.04	-0.49	-0.33	0.76	0.98	-1.77	0.72	-0.42	-1.17	-0.80	-0.10	-0.56	-0.54	

Table 32:(continued)

	CAN	USA	MEX	AUS	BEL	FRA	GER	ITA	SPA	UK	JAP	CHN	KOR	TW	ROECD	ROW	WT. AVE.
41 OtherWood	-0.45	-0.47	-1.05	-0.40	-0.72	-0.25	-0.14	-0.65	-0.71	-1.75	-0.53	-0.10	-0.37	-0.43	0.08	-0.12	-0.22
42 Furniture	-1.30	-0.86	-1.78	-0.15	-0.80	-0.96	-0.18	-1.27	0.03	-1.41	0.46	-0.11	-0.00	0.50	0.09	-1.03	-0.63
43 Pulp	-0.57	-0.95	0.10	0.48	0.20	-0.26	-0.11	0.22	-0.31	-0.26	-1.00	-0.92	0.66	0.07	0.35	0.67	-0.29
44 Newsprint	0.21	0.67	-0.00	-0.24	0.05	-0.22	-0.70	0.22	1.30	-0.65	-0.52	-0.11	-0.01	-0.06	0.04	0.48	0.12
45 Paper	-0.93	-0.66	0.12	-0.84	0.24	-0.84	-0.90	-1.51	-0.35	-1.27	0.08	-1.54	-0.62	-0.15	0.18	-0.55	-0.56
46 Printing	0.01	-0.50	0.58	-0.07	-1.34	-1.18	-0.83	-0.04	0.03	-1.38	0.09	-0.44	1.84	-0.40	0.17	-0.03	-0.87
47 Chemical	-0.76	-0.43	-0.02	-0.30	-0.44	-0.94	-1.12	-0.58	-0.91	-1.25	0.32	-1.07	-0.76	0.13	-1.03	-0.03	-0.91
48 Fertilizer	-0.84	-0.52	-0.74	0.60	0.05	-0.54	-0.52	0.90	-0.24	-1.05	0.39	-1.09	0.01	-0.49	-1.56	-0.50	-0.66
49 SynthFiber	-0.03	-0.57	-0.66	-0.41	-0.64	-0.18	-1.20	-1.30	-1.14	-1.57	0.41	-0.19	-1.11	-0.40	-0.87	-1.14	-0.93
50 Paints	-0.71	-0.53	-0.62	-0.58	-1.04	-0.64	-1.90	-1.12	0.26	-1.52	0.11	-1.31	0.04	-0.59	-0.10	0.12	-1.14
51 Drugs	0.50	-1.12	0.01	-0.33	-0.53	-0.98	-1.03	-0.53	-0.48	-1.24	-0.67	-0.97	0.07	0.81	-1.14	-0.71	-1.09
52 Soaps	0.17	-0.38	-0.97	0.75	0.37	-1.53	-0.71	-0.61	0.83	-1.55	0.23	-1.40	-0.10	-0.71	-0.26	-0.03	-1.18
53 OtherChem	-1.08	-1.00	-1.10	-0.04	-0.23	-0.56	-1.42	-0.67	0.22	-1.23	-0.66	-1.09	-0.92	-0.58	-0.95	-0.52	-0.99
54 PetroRefin	-0.58	-0.84	-0.24	0.54	-0.14	0.45	-0.88	-1.04	-0.76	-1.27	-0.50	-0.23	-0.85	-0.89	-0.44	-0.34	-0.47
55 FuelOil	0.06	-0.71	-0.47	-0.15	-0.33	-0.38	-0.14	-0.38	-0.96	-0.98	-0.05	-1.32	-0.00	-0.57	-0.14	-0.78	-0.64
56 PetroProd	-1.13	-0.12	-1.05	0.09	-1.28	-0.17	-0.33	0.30	-0.74	-0.86	1.20	-0.62	-0.68	-0.41	-0.99	-0.17	-0.41
57 CoalProd	-0.81	-0.07	-0.71	0.11	-0.15	-0.20	0.46	0.18	0.11	-1.14	0.12	-0.53	-0.48	-0.13	-1.09	-0.14	-0.16
58 Tyre	-0.22	0.12	-0.02	1.05	-0.17	-0.45	-0.36	-0.69	0.31	-1.45	-0.17	-0.91	-0.13	1.66	-0.58	-0.21	-0.36
59 Rubber	0.39	0.39	-0.57	0.15	-0.31	0.21	0.06	-1.02	-0.60	-1.86	-0.41	-0.26	0.51	-0.06	-0.13	-0.82	-0.51
60 Plastic	-0.21	-0.58	0.37	0.64	-1.16	-0.60	-0.33	-1.49	0.34	-1.63	-0.44	-0.85	-0.44	0.41	0.58	0.38	-0.63
61 Glass	-1.12	-1.23	-1.20	-0.88	-0.57	-0.15	-0.67	0.88	-0.40	-1.71	-0.24	-0.56	-1.01	-1.18	0.26	-0.45	-0.59
62 Cement	-1.46	-1.09	-0.84	-2.30	0.03	0.34	-1.05	-0.06	0.25	-1.26	-0.59	-0.19	0.32	-0.33	-1.05	-0.39	-0.46
63 Ceramics	0.51	0.14	0.20	0.15	-0.90	-0.66	-0.88	-0.50	-1.26	-1.44	-1.25	-0.98	-0.02	1.16	0.63	-1.25	-0.68
64 NonMetProd	-0.59	-0.64	-0.12	0.48	-0.59	-1.17	-0.76	0.03	-0.63	-1.27	-0.56	-0.68	-0.42	-0.48	-0.88	-0.33	-0.52
65 IronSteel	-0.87	-0.95	-0.78	-0.29	0.35	0.15	-0.09	-0.68	0.26	-0.18	-0.81	-0.67	-0.07	-1.13	-1.15	-0.97	-0.64
66 Copper	-0.35	0.21	-0.67	0.37	-0.27	-1.48	-1.19	-1.44	0.84	-1.43	-1.42	-0.63	-0.50	-0.79	-1.78	0.23	-0.61
67 Aluminum	0.41	-1.09	-0.01	-0.79	-0.58	-0.01	-1.31	-0.96	0.30	-1.34	0.60	-0.61	-0.26	-0.32	-0.27	0.16	-0.43
68 Nickel	0.59	-1.31	0.11	2.29	-0.07	1.40	0.02	1.14	0.62	-0.52	0.76	-0.33	0.47	-0.24	0.29	-0.27	0.17
69 LeadZinc	0.10	-1.02	-0.52	-0.74	-0.91	-1.00	-0.71	-0.96	-0.81	-1.55	-0.65	-0.55	-0.31	-0.01	-0.73	0.12	-0.57
70 OtherMetal	0.37	0.04	0.14	-0.80	0.31	-0.48	-0.60	0.66	0.65	-0.35	0.10	-1.75	0.40	-0.80	0.20	0.64	0.31
71 MetalFurn	-0.26	-0.37	-0.27	0.60	0.43	-0.72	-1.16	-0.73	0.04	-1.06	-0.21	-1.05	-0.51	-0.94	-0.90	-0.57	-0.77
72 StrucMetal	-0.16	-1.09	0.29	-0.65	-1.10	-0.60	-0.53	0.09	-0.25	-1.06	-0.79	-0.34	-0.60	-0.00	-1.44	-0.44	-0.88
73 Container	0.29	-1.01	-0.39	-0.27	-0.99	-0.10	-1.10	-0.30	-0.13	-1.19	-0.06	-0.30	-0.62	-0.34	-0.26	0.03	-0.72
74 Wire	-0.44	-0.36	-0.29	-0.99	-0.27	-0.99	-0.41	-0.36	0.57	-1.05	-1.14	-1.16	-0.34	-0.60	-0.64	-1.08	-0.60
75 Hardware	-0.60	-0.75	-0.29	-0.09	-0.38	-0.89	-1.18	-1.47	0.96	-1.43	-0.47	-0.78	0.06	-0.26	0.14	-0.55	-0.79
76 Boilers	0.12	-0.09	-0.54	0.78	-0.20	-0.55	-0.04	-0.22	-0.16	-1.38	-0.90	-0.44	-0.56	-0.63	-0.99	-0.76	-0.58
77 AirEngine	0.55	-1.43	1.45	-0.98	-0.15	-0.10	0.62	0.45	-0.48	-1.90	0.25	-0.89	0.45	0.29	0.52	0.16	-0.88
78 IntEngine	-0.28	-1.56	-1.14	-1.15	0.18	0.01	-0.43	-1.28	-0.26	-1.99	-1.39	-0.41	-0.12	0.39	-0.61	0.99	-1.16
79 PowerMach	-1.84	-0.07	-0.30	0.33	0.07	-0.07	-0.62	-0.08	-0.25	-0.96	-0.91	-1.24	-0.14	-0.14	-0.33	-0.02	-0.39
80 AgriMach	0.77	-1.18	-0.10	-0.51	0.51	-1.07	-1.02	-0.21	-0.15	-1.04	0.33	-0.66	-0.83	-0.40	-0.58	0.18	-0.64

Table 32: (continued)

	CAN	USA	MEX	AUS	BEL	FRA	GER	ITA	SPA	UK	JAP	CHN	KOR	TW	ROECD	ROW	WT.	AVE.
81 ConstrEQ	0.04	-0.78	0.37	-0.58	-0.55	-0.72	-0.56	-0.89	0.21	-1.24	-0.47	-0.17	-0.89	0.09	-0.98	-1.00	-0.74	
82 MetalMach	0.24	-1.26	0.61	-0.30	-0.25	-0.68	-0.87	-0.87	0.80	-1.62	-0.26	-0.58	-0.47	-0.53	0.50	0.44	-0.57	
83 SewingMach	0.50	-0.49	0.17	-0.29	0.33	0.67	-0.70	-0.72	0.18	-1.65	-0.42	-0.64	0.18	0.15	-0.54	-0.39	-0.52	
84 TextMach	-0.15	-1.57	-0.24	0.97	0.16	0.04	-0.83	-1.22	-0.51	-1.80	-0.69	-1.57	-1.03	-0.68	0.65	-1.03	-0.68	
85 PaperMach	0.23	-1.34	-0.05	-0.15	0.81	-0.13	-0.40	-0.67	0.21	-1.71	-0.63	-0.39	-1.06	-0.60	-0.32	-0.61	-0.49	
86 PrintMach	0.44	-1.60	-0.06	-0.11	-0.29	0.02	-1.11	-0.38	0.20	-1.32	-0.06	-0.24	0.04	-0.32	-0.09	0.75	-0.94	
87 FoodMach	0.30	-1.32	0.70	-0.65	0.02	-0.20	0.26	-1.46	0.03	-1.45	-0.22	-1.30	-0.17	-0.09	-1.22	-0.70	-0.93	
88 SpecMach	-0.68	-0.46	-0.61	-0.30	0.72	0.56	0.50	-1.49	0.37	-1.72	-0.84	-0.01	-0.37	-0.74	1.49	-1.09	-0.19	
89 ServMach	-0.45	-0.92	-0.36	-0.55	0.34	-0.47	-0.12	-1.40	0.15	-1.47	-0.40	-0.53	-0.99	-0.30	0.03	-0.73	-0.65	
90 Pumps	1.15	-0.44	-0.80	-0.01	-0.38	-0.28	-1.30	-0.39	-0.37	-1.59	-0.75	-0.57	-1.27	0.39	-0.30	1.22	-0.87	
91 MechEQ	0.51	-0.60	-0.88	-0.14	0.04	-0.17	-1.05	-0.47	-0.06	-1.48	-0.34	-0.19	-1.51	0.33	-0.44	0.18	-0.73	
92 OtherMach	-1.65	-0.12	0.85	-0.34	-0.57	-0.80	-0.89	-0.81	-0.58	-1.73	0.09	-0.69	-0.45	-0.83	-0.63	-1.03	-0.71	
93 RadioTV	-0.31	-1.38	-0.19	0.43	0.10	-1.02	-0.26	0.05	0.68	-0.42	-0.58	-1.44	-0.98	-1.14	0.32	-0.39	-0.61	
94 TelecommEQ	0.72	0.08	-1.74	0.63	-1.35	-0.91	-0.94	-0.68	0.29	-1.04	-1.66	-1.28	-0.73	0.06	-0.84	-0.80	-1.17	
95 HomeAppl	-0.43	-1.98	-0.02	0.56	0.89	-0.24	-0.19	-0.81	0.50	-1.23	-0.10	-0.55	0.02	-0.20	-0.47	0.38	-0.39	
96 Computers	-2.22	-0.96	-1.41	0.83	-0.73	-1.91	-0.27	-1.33	0.14	-1.83	-1.56	-0.89	-1.08	-1.32	-1.84	-0.99	-1.27	
97 OfficeMach	-0.92	-0.50	0.64	0.24	0.24	0.43	0.19	-0.87	-0.92	-0.07	0.12	-1.00	-0.38	-0.97	-1.52	-0.19	-0.15	
98 Semicon	0.29	-0.57	0.63	-0.13	-0.84	-0.40	-0.78	-0.08	0.79	-1.08	-0.78	-0.65	-0.94	-0.25	-0.09	-0.03	-0.60	
99 ElecMotor	-0.16	-1.12	0.73	0.90	0.32	-0.57	-0.90	-0.70	0.59	-1.06	0.21	-0.62	-0.87	0.07	1.15	-0.74	-0.38	
100 Battery	-1.27	-0.64	-0.15	-0.54	-0.48	-0.96	-0.94	-0.30	0.50	-1.86	-1.28	-1.49	-0.87	0.03	0.03	0.58	-0.94	
101 ElecBulbs	-0.41	-0.61	-0.34	0.94	-0.04	-0.71	-0.85	-0.71	-0.14	-1.65	0.07	-0.91	-0.30	0.16	-0.11	0.62	-0.40	
102 InclApp	-0.03	-1.29	-0.48	0.33	-0.14	-0.62	-0.85	-0.40	1.19	-1.55	-0.38	-0.64	-0.51	-1.49	0.05	-1.51	-0.71	
103 Ship	-0.96	-0.15	-0.49	0.30	1.33	0.11	0.30	0.59	0.22	-1.34	-0.02	-0.15	-0.40	-0.12	-0.05	-0.38	-0.17	
104 Warships	-1.13	0.01	-0.54	0.05	-0.00	-0.07	-0.71	0.01	-0.00	-1.29	-0.23	-0.06	-0.85	-0.00	-1.91	-1.10	-1.23	
105 RailroadEQ	-0.16	0.07	0.82	-0.10	-0.30	-0.18	-0.32	0.05	-0.56	-0.58	0.36	-0.49	0.79	-0.69	0.34	-0.53	-0.16	
106 Auto	-0.52	-0.00	0.86	1.67	-0.01	-0.24	-0.96	-0.56	0.43	-0.52	0.22	-0.69	-0.36	-0.76	0.85	0.04	-0.16	
107 Motorcycle	-0.08	0.17	1.56	-1.15	-1.07	-0.23	-0.21	-0.60	0.43	-0.69	-0.56	-0.78	-0.21	-0.72	-0.25	-0.08	-0.58	
108 AutoParts	-0.31	-1.72	-0.40	-0.52	0.16	-0.72	-0.51	0.11	-1.19	-1.68	-0.13	-1.05	-0.50	-1.41	0.51	-0.06	-0.58	
109 Aircraft	0.21	0.15	0.12	-0.20	0.45	-0.39	-0.49	-0.25	0.16	-0.61	0.49	-1.01	0.14	0.56	0.55	0.12	-0.17	
110 OtherTrans	-2.06	-1.64	-0.14	-0.18	-0.10	-0.97	0.13	-1.33	-0.02	-2.15	1.36	-0.51	-0.17	-0.42	0.68	0.55	-0.53	
111 Instrument	0.15	-0.29	-0.35	-0.04	0.30	-0.54	-1.05	-1.61	0.36	-1.51	-0.14	-0.51	0.75	-0.25	0.54	-0.61	-0.61	
112 Optical	0.94	0.42	-0.15	0.56	0.48	-0.55	-0.61	-0.41	1.13	-1.71	0.27	-0.27	0.00	-0.52	0.16	-0.45	-0.01	
113 Watches	-1.33	-0.31	-0.41	0.48	-0.02	-0.25	-0.54	-0.68	2.13	-1.44	0.50	-1.47	-0.71	-0.30	-0.88	-0.50	-0.60	
114 Jewellery	0.81	-0.36	0.35	0.15	-1.06	-0.01	-0.37	-0.59	-0.05	-0.93	-1.10	-0.66	-1.83	-0.03	0.14	-0.27	-0.40	
115 MusicInst	-0.13	-0.84	-1.19	-0.35	0.78	-0.19	-0.32	-1.70	0.84	-1.35	-0.22	-0.60	-0.87	0.33	-1.38	-0.78	-0.35	
116 Sporting	0.66	-0.77	-0.02	-0.90	0.51	-0.82	-0.75	-0.54	0.16	-1.48	-0.05	-0.62	0.25	-0.31	-0.90	-0.20	-0.37	
117 Ordnance	-1.08	-0.53	-0.11	-0.13	-0.10	-0.55	-0.54	-0.53	0.74	-0.12	-0.46	-0.32	-0.12	0.48	-0.72	-0.79	-0.48	
118 ArtWork	0.22	-0.05	-0.10	1.11	0.03	-0.70	-0.70	-0.68	0.01	-0.13	-0.22	-0.20	0.89	-1.83	-1.40	-0.93	-0.68	
119 OtherMfg	0.75	-0.89	0.54	0.18	-0.67	-0.23	-0.91	-1.17	0.39	-1.47	-0.12	-1.18	-0.06	0.85	0.10	-0.97	-0.65	
120 Scraps	-1.26	-0.86	0.02	-0.67	-0.33	-0.48	-0.52	0.21	-0.52	-1.74	-0.68	-0.14	-0.81	-0.94	-0.11	0.30	-0.65	
Ave. of Sectors	-0.52	-0.67	-0.26	-0.21	-0.26	-0.60	-0.83	-0.78	0.03	-1.12	-0.35	-0.97	-0.61	-0.73	-0.34	-0.52	-0.63	

CHAPTER VII

CONCLUDING REMARKS

The present study contains several major innovations. First, this study has devoted a considerable effort to the organization of a multisectoral bilateral world trade database. Over 200 bilateral trade data tapes from the OECD and UN have been processed and a number of adjustments made to reduce the inconsistencies in the raw data. The effort led to the creation of a comprehensive, consistent, and usable time-series bilateral trade database. The database contains eighteen years of bilateral flows in 120 products for twenty-eight reporting countries and sixty partner countries and country groupings that make up the entire world, and can be accessed through a personal computer. Using an accompanying data-handling software, VAM, one can, for instance, bring up in a spreadsheet the 16 x 16 trade (flows) matrices for each of the 120 products in each year or a given source country's exports to or imports from its partner countries over the 1974-91 period, graph the time series, and perform other data transformations. Evidently, its usefulness goes beyond the present study.

Secondly, by developing a multisectoral bilateral world trade model, the study fills a gap in the modeling of the international trade linkages. Because the trade model is estimated at a level of disaggregation by commodities and countries that is not customarily employed in the literature, it is finally possible to link complete,

multisectoral national models with consistent, bilateral trade flows and to examine sector- and country-specific issues in an international general equilibrium framework. Of course, the economies are actually linked by trade which is conducted at a much deeper level of product detail; but the step from no or few sectors to the maximum detail supportable by sectoral statistics and input-output tables is a significant increase in realism.

Thirdly, in the process of building the trade model, this study has estimated some 29,000 trade share equations. While the empirical results in the current study bring forward the fundamental role of relative prices in explaining the temporal variations in international trade shares, the study finds that capital investment -- a proxy for quality change of product not reflected in the relative price indices -- is also a significant determinant of the trade shares for a number of exporting countries in many sectors. In many cases, changes in bilateral trade shares also show a significant trend not explainable by either relative prices or capital investment.

Fourthly, the trade model has been subjected to a historical simulation test. The test results show that the equation shares, with its rather elaborate considerations of relative prices and capital investment, has definitely outperformed the "naive" assumption of constant shares. It thus provides strong evidence suggesting that when dealing with trade shares, constant shares are not

a good assumption.

In the near term, further research with the trade model developed in the current study will focus on: (1) adopting the model as the new linking model in the Inforum international system; (2) preparing long-range trade forecasts for all the countries in the new Inforum international system; (3) conducting policy simulations of interest.

In the medium- to long-term, further research with the model may be directed toward some of the structural issues of the model that are not sufficiently addressed in the current study. In the current study, the effects of tariffs and their change are ignored due to a lack of sufficient tariff data. Thus, it may prove useful to gather detailed annual data on tariffs by country, by commodity. This data would be useful in improving the price variable in the trade model and enabling us to examine trade diverting effects of tariffs. For instance, the trade effects of the European integration could be better examined with the inclusion of the effects of the tariff reductions occurring. However, there are enormous problems in just the gathering of such data because tariff statistics and trade flows employ different classification schemes. Apparently, it would require a major effort in the future to accomplish this task.

It also may prove useful to explore factors that may provide explanation for the

movements in the trade shares, especially those share equations that fit poorly with the current formulation. While the use of capital investment in the current study as a proxy for quality change of product not reflected in the price indices to explain the temporal variations in the trade shares has generally been successful, other non-price factors such as relative capacity utilization and domestic demand pressure also deserve some attention.

The current trade model, the reader will remember, deals with the merchandise trade only. It does not include non-merchandise trade (i.e. service trade and financial flows). Obviously, a truly complete modeling system of the world economy calls for a complete world trade model that incorporates both the merchandise and the non-merchandise trade flows. This task to expand the current trade model in that direction is undoubtedly extremely challenging, yet it may also prove to be most fruitful in the future research.

APPENDIX Sectoral Concordance of the Trade Model and the National Models

<u>Trade Sector</u>	<u>US Sector</u>	<u>Sector Title</u>
1-10	1	Agriculture, forestry, fishery
11	2	Iron ore mining
13	3	Non-ferrous metals mining
12	4	Coal mining
15	5	Natural gas extraction
14	6	Crude petroleum
16	7	Non-metallic mining
0	8	Construction
18-31	9	Food & tobacco
32-34	10	Textiles, excluding Knits
36	11	Knitting
35,36	12	Apparel, household textiles
43-45	13	Paper
46	14	Printing & publishing
47,48	15	Agricultural fertilizers
49-50,52-53	16	Other chemicals
54,56-57	17	Petroleum refining
55	18	Fuel oil
58-59	19	Rubber products
60	20	Plastic products
37-39	21	Shoes and leather
40-41	22	Lumber
42	23	Furniture
61-64	24	Stone, clay, glass
65	25	Ferrous metals
66	26	Copper
67-70	27	Other nonferrous metals
71-75	28	Metal products
76-79	29	Engines and turbines
80	30	Agricultural machinery
81	31	Construction, mining, oilfield equipment
82	32	Metalworking machinery
83-88	33	Special industry machinery
90-92	34	Misc non-electrical machinery
96	35	Computers
97	36	Other office equipment
89	37	Service industry machinery
94,98	38	Communications eq,electronic component
102	39	Electric industrial appl & distribution eq

<u>Trade Sector</u>	<u>US Sector</u>	<u>Sector Title</u>
95	40	Household appliances
99-101	41	Misc electrical equipment
93	42	TV sets, radios, phonographs
106-108	43	Motor vehicles
109	44	Aerospace
103-104	45	Ships, boats
105,110	46	Other transport equipment
111-113	47	Instruments, excl. medical equipment
114-117,119	48	Misc. manufacturing
17	56	Electric utilities
118,120	74	Scraps and used
51	79	Drugs
111	80	Medical instruments, supplies
112	81	Ophthalmic goods

<u>Trade Sector</u>	<u>Canadian Sector</u>	<u>Sector Title</u>
1	1	Grains
4,5,7	2	Live animals
2-3,6,8	3	Other agricultural products
9	4	Forestry products
10	5	Fish landings
0	6	Hunting and trapping products
11	7	Iron ores
13	8	Other metal ores
12	9	Coal
14	10	Crude mineral oils
15	11	Natural gas
16	12	Non-metallic minerals
0	13	Services incidental to mining
18	14	Meat products
19	15	Dairy products
21	16	Fish products
20	17	Fruits & vegetables prepared
28	18	Feeds
23	19	Flour wheat,meal and other
24	20	Breakfast cereal and other
25	21	Sugar
22,26,27	22	Misc. food products
30	23	Soft drinks
29	24	Alcoholic beverages
3	25	Tobacco raw
31	26	Cigarettes and tobacco manufacture
58	27	Tires and tubes
59	28	Other rubber products
60	29	Plastic fabricated products
37-39	30	Leather and leather products
32	31	Yarn and manmade fibers
33	32	Fabrics
34,35	33	Other textile products
36	34	Hosiery and knitted wear
36	35	Clothing and accessories
40	36	Lumber and timber
40	37	Veneer and plywood
41	38	Other wood fabricated products
42	39	Furniture and fixtures
43	40	Pulp
44	41	Newsprint

<u>Trade Sector</u>	<u>Canadian Sector</u>	<u>Sector Title</u>
45	42	Paper products
46	43	Printing and publishing
0	44	Advertising print media
65	45	Iron and steel products
67	46	Aluminum products
66	47	Copper and copper products
68	48	Nickel products
69,70	49	Other nonferrous metal products
76-79	50	Boilers tanks, etc
72	51	Structural metal products
71,73-75	52	Other fabricated metal products
80	53	Agricultural machinery
81-92	54	Other industry machinery
106-107	55	Motor vehicles
108	56	Motor vehicle parts
103-105,109-110	57	Other transport equipment
93-95	58	Appliances and receivers
96-102	59	Other electrical products
62	60	Cement and concrete products
61,63-64	61	Other non-metallic minerals
54-55	62	Gasoline and oil
56-57	63	Other petroleum products
47	64	Industrial chemicals
48	65	Fertilizers
51	66	Drugs
49-50,52-53	67	Other chemical products
111-113	68	Scientific equipment
114-120	69	Other manufacturing equipment
17	78	Electric power

<u>Trade Sector</u>	<u>Mexican Sector</u>	<u>Sector Title</u>
1-3,6,8	1	Plant agriculture
4,5,7	2	Animals, livestock
9	3	Forestry products
10	4	Fishery products
12	5	Coal mining
14-15	6	Crude petroleum, natural gas
11	7	Ferrous mining
13	8	Non-ferrous mining
16	9	Stone and clay mining
16	10	Other non-metal mining
18-19	11	Meat products & milk
20	12	Canned fruits & vegetables
23	13	Processed grain
23	14	Processed corn
27	15	Coffee
25-26	16	Sugar
22	17	Fats and oils
28	18	Food for animals
21,24,27	19	Other food products
29	20	Alcoholic beverages
29	21	Beer
30	22	Soft drinks and fla
31 ^c	23	Tobacco products
33	24	Soft fibers textile
32	25	Hard fibers textile
34,35	26	Other textiles
36	27	Apparel
37-39	28	Leather
40	29	Lumber
41-42	30	Other lumber products
43-45	31	Paper and paperboard
46	32	Printing
54-57	33	Petroleum refining
47	34	Basic petrochemicals
47	35	Basic chemicals
48	36	Pesticides and fertilizers
49	37	Plastic materials, resins
51	38	Medicinal products
52	39	Cleaning and toiletries
50,53	40	Other chemicals
58-59	41	Rubber products

<u>Trade Sector</u>	<u>Mexican Sector</u>	<u>Sector Title</u>
60	42	Plastic products
61	43	Glass
62	44	Cement
63-64	45	Other non-metal product
65	46	Steel
66-70	47	Non-ferrous metal products
71	48	Metallic furniture
72	49	Structural metallic
73-75	50	Other metallic product
76-92	51	Non-electric machinery
94,97-98	52	Electrical machinery
93,95	53	Household appliances
96	54	Electronic equipment
99-102	55	Other electrical equipment
106-107	56	Motor vehicles
108	57	Auto parts
103-105,109-110	58	Other transportation
111-120	59	Other manufacturing industries
17	61	Electricity

<u>Trade Sector</u>	<u>Japanese Sector</u>	<u>Sector Title</u>
1	1	Cereals
2	2	Fresh fruits and vegetables
3,6,8	3	Other crops
4,5,7	4	Livestock
9	5	Forestry
10	6	Fishing
11,13	7	Metal ores
16	8	Non-metallic mining
12	9	Coal mining
14-15	10	Crude petroleum and natural gas
18-19	11	Meat & dairy products
21	12	Seafood
20,22-27	13	Other food
29	14	Alcoholic beverages
30	15	Soft drinks
28	16	Animal feeds
31	17	Tobacco products
32,33	18	Yarns and threads
36	19	Apparel
34-35	20	Other textiles
40-41	21	Wood products
42	22	Furniture
43,44,45	23	Pulp and paper products
46	24	Printing and publishing
47	25	Basic chemicals
48	26	Fertilizers and agricultural chemicals
49	27	Synthetic resins and fibers
51	28	Drugs
50,52-53	29	Other chemical products
54-57	30	Petroleum products
58,59	31	Tires
60	32	Plastic products
37-39	33	Leather and footwear
61	34	Glass
62	35	Cement
63	36	Ceramics
64	37	Non-metallic mineral products nec
65	38	Steel
66	39	Copper
67	40	Aluminum
68-70	41	Other non-ferrous metals

<u>Trade Sector</u>	<u>Japanese Sector</u>	<u>Sector Title</u>
72	42	Metal structural products
73	43	Metal containers
71,74-75	44	Other metal products
76-79	45	Engines and boilers
83	46	Sewing and knitting machines
81	47	Construction mining oilfield equipment
82	48	Machine tools
80	49	Agricultural machinery
84	50	Textile machinery
85-92	51	Service and other non-electrical
97	52	Office machines
93	53	Radio and TV receivers
95	54	Other household electric appliances
96	55	Computers and accessories
94	56	Telecommunications equipment
98	57	Semiconductors
0	58	Electron tubes
99	59	Electric motors
102	60	Electrical equipment for engines
101	61	Electric bulbs
100	62	Parts of electric equipment
0	63	Other electric equipment
106,107	64	Autos, trucks, motorcycles
108	65	Auto parts
103,104	66	Shipbuilding
105	67	Railroad equipment
109	68	Aircraft
110	69	Other transport equipment
112	70	Optical instruments
113	71	Watches
111	72	Other mechanical instruments
114	73	Jewelry, pens and stationery
117	74	Ordnance
115,116,119	75	Other manufactured goods
17	81	Electricity
118,120	100	Scrap and unclassified

<u>Trade Sector</u>	<u>Korean Sector</u>	<u>Sector Title</u>
1	1	Cereals
2	2	Fruits and vegetables
3,6,8	3	Industrial crops
4,5,7	4	Livestock
9	5	Forestry products
10	6	Fishery
12	7	Coal mining
11,13	8	Metallic ores
14-16	9	Non-metallic ores
18-20	10	Meat, dairy and fruits
21	11	Seafood
23	12	Polished grains
23	13	Flour and cereal preparations
25	14	Sugar
26	15	Bakery and confectionery
27-28	16	Other food
29-30	17	Beverages
31	18	Tobacco products
32	19	Fiber yarn
33-34	20	Textile fabrics
35-36	21	Fabricated textile products
37-39	22	Leather and leather products
40-42	23	Lumber and wood products
43-45	24	Pulp and paper
46	25	Printing and publishing
47	26	Basic chemicals
48	27	Chemical fertilizers
51	28	Drugs and cosmetics
49	29	Synthetic resins and rubber
49	30	Chemical fibers
50,52-53	31	Other chemicals
54-56	32	Petroleum products
57	33	Coal products
58-60	34	Rubber products
61-64	35	Non-metallic mineral products
65	36	Iron and steel manufacturing
65	37	Primary iron and steel
66-70	38	Primary nonferrous metals
71-75	39	Fabricated metals
76-92	40	General industrial equipment
99-102	41	Electrical equipment

<u>Trade Sector</u>	<u>Korean Sector</u>	<u>Sector Title</u>
93,95	42	Household electronics
96-97	43	Electronic appliances
98	44	Semiconductors
0	45	Other electronic components
94	46	Communication equipment
103-104	48	Shipbuilding
106-108	49	Motor vehicles
105,109-110	50	Other transport equipment
111-112	51	Measuring med and opt inst
113-119	52	Miscellaneous manufacturing
17	55	Electric power
120	71	Unclassifiable

<u>Trade Sector</u>	<u>Chinese Sector</u>	<u>Sector Title</u>
1-2	1	Crop cultivation
9	2	Forestry
4,5,7	3	Livestock
3,6,8	4	Other agricultural products
10	5	Fishing
12	6	Coal mining
14-15	7	Crude petroleum & natural gas
11	8	Ferrous ore mining
13	9	Non-ferrous ore mining
16	10	Non-metallic mining
16	11	Salt mining
0	12	Logging and transport of timber
0	13	Production and supply of water
18-27	14	Food
29-30	15	Beverages
31	16	Tobacco
28	17	Forage
32-35	18	Textiles
36	19	Wearing apparel
37-39	20	Leather and leather products
40-41	21	Sawmills and bamboo products
42	22	Furnitures
43-45	23	Paper and paper products
46	24	Printing
46,115-116	25	Cultural,edu,arts,sports articles
17	26	Electricity,steam & hot water
54-56	27	Petroleum refineries
57	28	Coking and gas supply
47-48,50,52-53	29	Chemicals
51	30	Medicines
49	31	Chemical fibers
58-59	32	Rubber products
60	33	Plastic products
61-64	34	Building materials
65	35	Primary iron and steel
66-70	36	Primary non-ferrous metals
71-75	37	Metal products
76-92	38	Machinery
105	39	Railroad equipment
106-108	40	Motor vehicles
103-104	41	Shipbuilding

<u>Trade Sector</u>	<u>Chinese Sector</u>	<u>Sector Title</u>
109-110	42	Aircraft and other transport equipment
95,97-102	43	Electrical machinery & instrument
93-94,96	44	Electronic & communication equipment
111-112	45	Instruments
113-114,117-120	46	Industries not elsewhere classified

<u>Trade Sector</u>	<u>German Sector</u>	<u>Sector Title</u>
1-8	1	Agriculture products
9-10	2	Forestry and fishery products
17	3	Electric power
0	4	Gas
0	5	Water
12	6	Coal mining
11,13,16	7	Non-energy mining
14-15	8	Crude oil
47-53	9	Chemical products
54-57	10	Petroleum refining
60	11	Plastic products
58-59	12	Rubber products
62,64	13	Stone and clay
63	14	Ceramic products
61	15	Glass and glass products
65	16	Iron and steel
66-70	17	Nonferrous metals
71	18	Foundry products
71	19	Metal drawing, cold rolling mills
72	20	Structural metal products
76-92	21	Nonelectrical machinery
96-97	22	Office machinery, data processing
105-108,110	23	Road vehicles
103-104	24	Ships,boats, floating structures
109	25	Aircraft and spacecraft
93-95,98-102	26	Electrical machinery,equipment
111-113	27	Precision and optical instruments
73-75	28	Tools and finished metal products
114-120	29	Musical instruments,games,sports
40	30	Wood
41-42	31	Wood products
43	32	Pulp, paper and paperboard
44-45	33	Paper and -board
46	34	Printing and duplicating
37-39	35	Leather and leather products
32-35	36	Textiles
36	37	Wearing apparel
18-28	38	Food products
29-30	39	Beverages
31	40	Tobacco products

<u>Trade Sector</u>	<u>French Sector</u>	<u>Sector Title</u>
1-8	1	Agriculture
9	2	Forestry
10	3	Fishing
12	4	Coal
12	5	Coke
14	6	Crude oil
15	7	Natural gas
54-57	8	Petroleum refining
17	9	Electric utilities
0	10	Gas utilities
0	11	Water and heating services
11	12	Iron ore
65	13	Steel
71-74	14	Steel products
13	15	Non-ferrous ores
66-70	16	Non-ferrous metals
0	17	Miscellaneous metals
16,62-64	18	Construction materials
61	19	Glass
47-50,53	20	Inorganic chemicals
47-50,53	21	Organic chemicals
52	22	Perfumes,household chemicals,cosmetics
51	23	Pharmaceutical products
65	24	Casting
71-75	25	Metal products
80	26	Agricultural machinery
82	27	Machine tools
76-79,83-92	28	Industrial equipment
81	29	Construction equipment
117	30	Ordnance
96-97	31	Office equipment
99-102	32	Electrical equipment
94,98	33	Industrial electronic equipment
93	34	Household electronic equipment
95	35	Household appliances
106-108,110	36	Motor vehicles
105	37	Railroad equipment
103-104	38	Ships and boats
109	39	Aircraft
111-112	40	Precision instruments
18	41	Meat

<u>Trade Sector</u>	<u>French Sector</u>	<u>Sector Title</u>
19	42	Milk and dairy products
20-21	43	Canned and frozen foods
24	44	Bakery products
23	45	Other grain products
22	46	Fats and oils
25	47	Sugar
26-28	48	Other food products
29-30	49	Beverages
31	50	Tobacco and tobacco products
32	51	Synthetic fibers and yarns
32	52	Natural yarn and thread
36	53	Knitting
33-35	54	Misc textiles
37	55	Leather and hides
38	56	Leather products, excluding footwear
39	57	Footwear
36	58	Apparel
40-41	59	Wood products
42	60	Furniture
43-45	61	Paper and cardboard
46	62	Printing and publishing
58-59	63	Tires
60	64	Plastic products
113-116,118-119	65	Miscellaneous industrial
120	67	Scrap

<u>Trade Sector</u>	<u>Italian Sector</u>	<u>Sector Title</u>
1-10	1	Agriculture, forestry, fishery
12	2	Coal, lignite & briquettes
57	3	Products of coking
14-15,54-56	4	Petroleum, gas, petroleum products
17	5	Electricity, gas, water
0	6	Nuclear fuels
11,13,65-70	7	Ferrous & Non-ferrous ores & metals
16,61-64	8	Non-metallic mineral products
47-53	9	Chemical products
71-75	10	Metal products
76-92	11	Agricultural & industrial machinery
96-97,111-112	12	Office, precision & optical instruments
93-95,98-102	13	Electrical goods
106-108	14	Motor vehicles
103-105,109-110	15	Other transport equipment
18	16	Meat, meat preparations & preserves
19	17	Milk & dairy products
20-28	18	Other food products
29-30	19	Non-alcoholic & alcoholic beverages
31	20	Tobacco products
32-36	21	Textiles & clothing
37-39	22	Leather & footwear
40-42	23	Timber, wooden products & furniture
43-46	24	Paper & printing products
58-60	25	Rubber & plastic products
113-120	26	Other manufactured products

<u>Trade Sector</u>	<u>British Sector</u>	<u>Sector Title</u>
1-10	1	Agriculture, forestry, fishery
12	2	Coal, coke & solid fuels
14-15	3	Oil & natural gas extraction
54-57	4	Mineral oil processing
17	5	Electricity production & distribution
0	6	Public gas supply
0	7	Water supply
11,13	8	Metal ores & minerals n.e.s.
16	9	Stone, clay sand & gravel
65,71-75	10	Iron & steel & steel products
66-70	11	Other metals
61-64	12	Products of stone, clay, etc.
47	13	Basic chemicals
51	14	Pharmaceuticals
52	15	Soap & toilet preparations
49	16	Man-made fibers
0	17	Other metal products n.e.s.
0	18	Industrial plant & steelwork
80	19	Agricultural machinery
82	20	Machine tools & engine's tools
81,83-84	21	Textile, mining, construction machinery
76-79,85-92	22	Other machinery n.e.s.
117	23	Ordnance
96-97	24	Office machinery & computers
102	25	Basic electrical equipment
93-94,98-100	26	Electronic equipment
95	27	Domestic electrical appliances
101	28	Electric lighting equipment
106-108	29	Motor vehicles & parts
103-104	30	Shipbuilding & repairing
109	31	Aerospace engineering
105,110	32	Other vehicles
111-112	33	Instrument engineering
18-28	34	Food
29-30	35	Drink
31	36	Tobacco
32	37	Yarn
33-35	38	Textiles
36	39	Apparel
37-39	40	Leather & footwear
40-42	41	Timber & wood products

<u>Trade Sector</u>	<u>British Sector</u>	<u>Sector Title</u>
43-45	42	Pulp & paper
46	43	Printing & publishing
58-59	44	Rubber
60	45	Plastics
113-116,118-120	46	Other manufacturing

<u>Trade Sector</u>	<u>Spanish Sector</u>	<u>Sector Title</u>
1-10	1	Agriculture, forestry, fishery
12	2	Coal, lignite & briquettes
57	3	Products of coking
14-15,54-56	4	Petroleum, gas, petroleum products
17	5	Electricity, gas, water
11,13,65-70	6	Ferrous & non-ferrous ores & metals
16,61-64	7	Non-metallic mineral products
47-53	8	Chemical products
71-75	9	Metal products
76-92	10	Agriculture & industry machinery
96-97,111-112	11	Office, precision & optical instruments
93-95,98-102	12	Electrical goods
106-108	13	Motor vehicles
103-105,109-110	14	Other transport equipment
18	15	Meat, meat preparations & preserves
19	16	Milk & dairy products
20-28	17	Other food products
29-30	18	Non-alcoholic & alcoholic beverages
31	19	Tobacco products
32-36	20	Textiles & clothing
37-39	21	Leather & footwear
40-42	22	Timber, wooden products & furniture
43-46	23	Paper & printing products
58-60	24	Rubber & plastic products
113-120	25	Other manufactured products

<u>Trade Sector</u>	<u>Austrian Sector</u>	<u>Sector Title</u>
1-10	1	Agriculture and forestry
11-13	2	Mining
14-15,54-57	3	Crude petroleum and natural gas
16	4	Non-metallic mining
62-64	5	Cement and gypsum
61	6	Glass
18	7	Meat and products
23	8	Grain mill products
24	9	Bakery
25-26	10	Sugar
19	11	Dairy
20-22,27-28	12	Other food products
29-30	13	Beverages
31	14	Tobacco
32-35	15	Textiles
36	16	Apparel
37-39	17	Leather and shoes
47-53	18	Chemicals
65	19	Iron and steel
76-92	20	Machinery
103-105	21	Ships, locomotives
65	22	Steel castings
66-70	23	Nonferrous metals
71-73,75	24	Fabricated metals
111-112	25	Instruments
99	26	Electric motors
74	27	Wires and cables
94-98,100-102	28	Other electrical goods
93	29	Radio, TVs, etc
106-108	30	Automobile and parts
0	31	Auto repair
40	32	Sawmills
41	33	Lumber
42	34	Wood products
43-44	35	Paper making
45	36	Paper goods
46	37	Printing
17	40	Electric utilities

<u>Trade Sector</u>	<u>Belgian Sector</u>	<u>Sector Title</u>
1-9	1	Agriculture
10	2	Fishery
12	3	Coal
57	4	Cokes
14-15,54-56	5	Petroleum
17	6	Electricity
0	7	Gas distributed
0	8	Water distributions
11,65	9	Iron and steel
13,66-70	10	Non-ferrous metals
61	11	Glass
62	12	Cement
16,63-64	13	Other non-metallic minerals
47-53	14	Chemicals
71-75	15	Metal products
76-92	16	Machinery
96-97,111-112	17	Office & precision instruments
93-95,98-102	18	Electrical machinery
106-108	19	Autos and motors
103-105,109-110	20	Other transportation vehicles
18	21	Meat
19	22	Milk
20-28	23	Other food
29-30	24	Beverages
31	25	Tobacco
36	26	Clothing
32-35	27	Other textiles
37-39	28	Leather and shoes
40-42	29	Wood and furniture
43-45	30	Paper
46	31	Printing
58-59	32	Rubberware
60	33	Plastics
113-120	34	Other manufacturing

BIBLIOGRAPHY

- Almon, Clopper.** *Industrial Effects of a Free Trade Agreement between Mexico and the USA.* Research report prepared for the U.S. Department of Labor, March 1991.
- _____. *The Craft of Economic Modeling.* Second Edition. College Park, MD: The Interindustry Economic Research Fund, Inc. 1990.
- Amano, Akihiro, E. Kurihara, and L. Samuelson.** "Trade Linkage Submodels in the EPA World Economic Model." *Economic Bulletin*, 19. Tokyo: Economic Planning Agency, Economic Research Institute, 1980.
- Armington, P.S.** "A Theory of Demand for Products Distinguished by Place of Production," *International Monetary Fund Staff Papers*. 16: 159-176, 1969a.
- _____. "The Geographic Patterns of Trade and the Effects of Price Changes," *International Monetary Fund Staff Papers*. 16: 179-197, 1969b.
- Bacharach, M.** *Biproportional Matrices and Input-Output Change*, Cambridge: Cambridge University Press, 1970.
- Balassa, B.** *The Theory of Economic Integration*, Homewood, 1961.
- Brenton, P.** "Modeling Bilateral Trade Flows: An Empirical Analysis Using Disaggregate Commodity Data," *Journal of Policy Modeling*. 11 (4):547-567, 1989.
- Bryant, R.C. et al.** *Empirical Macroeconomics for Interdependent Economies.* Washington D.C.: The Brookings Institution, 1988.
- Christou, C. and D. E. Nyhus.** *Industrial Effects of the European Community Integration.* Inforum Working Paper, University of Maryland, 92-1, 1992.
- Cline, W.R.** *United States External Adjustment and the World Economy.* Washington, D.C.: Institute for International Economics, 1989.
- Fair, R.C.** *Specification, Estimation, and Analysis of Macroeconometric Models.* Cambridge, Mass.: Harvard University Press, 1984.
- Hickman, B.G., and Lau, L.J.** "Elasticities of Substitution and Export Demands in a World Trade Model," *European Economic Review*, 4 (1973), pp. 347-380.

- Houthakker, H.S., and Magee, S.P.** "Income and Price Elasticities in World Trade," *The Review of Economics and Statistics*, LI (May, 1969), pp. 111-125.
- Italianer, Alexander.** *Theory and Practice of International Trade Linkage Models*. Dordrecht: Martinus Nijhoff Publishers, 1986.
- Junz, H.B., and Rhomberg, R.R.** "Price Competitiveness in Export Trade Among Industrial Countries," *American Economic Review*, 63 (May, 1973), pp. 412-418.
- Klein, L.R. and Van Peeterssen, A.** "Forecasting World Trade within Project LINK," in R.J. Ball, (ed.) *The International Linkage of National Economic Models*, Amsterdam: North-Holland, 1973.
- Kravis, I.B. and Lipsey, R.E.,** "Price Competitiveness in World Trade," *Studies in International Economic Relations*, No. 6., National Bureau of Economic Research, New York, 1971.
- Kreinin, M.E.,** "Price Elasticities in International Trade," *The Review of Economics and Statistics*, vol. 49 (November, 1967), pp. 510-517.
- Linnemann, H.** *An Econometric Study of International Trade Flows*, 1966.
- Magee, S.P.** "Prices, Incomes and Foreign Trade," in Kenen, P.B. (ed.), *International Trade and Finance: Frontiers for Research*. Cambridge: Cambridge University Press, pp. 175-252, 1975.
- Marwah, Kanta.** "A World Model of International Trade: Forecasting Market Shares and Trade Flows," *Empirical Economics*, Vol. 1, Issue 1, pp. 1-39, 1976.
- Maskus, Keith E.** "Comparing International Trade Data and Product and National Characteristics Data for the Analysis of Trade Models," Paper presented at the *Conference on Research in Income and Wealth*. Nov. 3-4, 1989, Washington, D.C.
- Moriguchi, C.** "Forecasting and Simulation Analysis of the World Economy," *American Economic Review*, vol. 63, No. 2, pp. 402-409.
- Nyhus, Douglas E.** "The Inforum International System," *Economic Systems Research*. Vol. 3, No. 1, 1991.
- _____. "The INFORUM-ERI International System of Macroeconomic Input-Output Models," in M. Ciaschini, ed., *Input-Output Analysis: Current Developments*. New York: Chapman and Hall, 1988.

- _____. "A Detailed Model of Bilateral Commodity Trade and the Effects of Exchange Rate Changes," in Peterson (ed.), *Econometric Contribution To Public Policy*. London: Macmillan, 1978.
- _____. *The Trade Model of a Dynamic World Input-output Forecasting System*. Ph.D. Thesis, University of Maryland, 1975.
- Parikh, A.**, *The Estimation and Forecasting of Trade Shares*, Development Papers No. 5, Economic and Social Commission for Asia and the Pacific, United Nations, 1-344, 1986.
- Preeg, E.H.**, *Traders and Diplomats*, Brookings Institution, Washington, D.C., 1970.
- Rhomberg, R.R.** "Possible Approaches to a Model of World Trade and Payments," *International Monetary Fund Staff Papers*. 17 : 1-26, 1970.
- _____. "Towards a General Trade Model," in Ball, R.J. (ed.), *The International Linkage of National Economic Models*. Amsterdam: North-Holland, 9-20, 1973.
- Samuelson, L.** "A New Model of World Trade," *OECD Economic Outlook, Occasional Studies*. December, 1973.
- Taplin, G.B.** "Models of World Trade," *International Monetary Fund Staff Papers*. 14 : 433-455, 1967.
- Uno, Kimio.** *Technology, Investment, and Trade*. Amsterdam: Elsevier Science Publishers, 1991.
- Waelbroeck, J.** "The Methodology of Linkage," in Ball, R.J. (ed.), *The International Linkage of National Economic Models*. Amsterdam: North-Holland, 45-61, 1973.