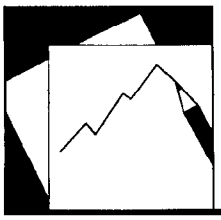
WP/01/216



IMF Working Paper

Import-Reducing Effect of Trade Barriers: A Cross-Country Investigation

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INTERNATIONAL MONETARY FUND

 WP/01/216

IMF Working Paper

Policy Development and Review Department

Import-Reducing Effect of Trade Barriers: A Cross-Country Investigation

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December 2001

Abstract

A comprehensive empirical investigation is carried out to ascertain the import-reducing effect of trade protection barriers. We first present a statistical summary of the status of global trade protection. Then, based on a monopolistic competition trade model and 1994 cross-country data on trade barriers, trade flows, and production, we estimate the import-reducing effect of trade barriers including both tariffs and non-tariff barriers (NTBs). We use the disaggregated cross-country, cross-industry data on manufactured goods and, unlike previous studies, our sample covers a broad range of countries—more than 70 in total—including countries from the most developed ones like those in the Group of Seven to the least developed one, Bangladesh. We specify an empirical model that captures the stylized facts well and helps generate sensible estimates. Our econometric framework is designed to control for the simultaneous determination of trade flows, trade barriers, and production. We find that both tariff and NTBs are quite significant in restricting imports.

JEL Classification Numbers: C5, F1

Keywords: Trade-Barriers, Tariff, non-tariff trade barriers

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[1] The author wishes to thank Clopper Almon, Margaret McCarthy, Doug Nyhus, Doug Meade, Ralph Monaco, Marianne Schulze-Ghattas, John Chao, Arvind Panagariya, Yongzheng Yang, and J-P Chauffour for their guidance and helpful comments.

Contents Page

I. INTRODUCTION

Governments of almost all the countries in the world routinely intervene in trade across borders, through the use of tariffs, quotas, and other non-tariff barriers (NTBs). Reductions in these trade restrictions have been regularly achieved through multilateral trade negotiations or preferential trade arrangements. Measuring the effects of general trade policy and the economic implications of particular trade reforms is an intriguing task facing both policy-makers and economists. Tariffs have relatively clear primary effects on product prices, but their secondary effects on employment, earnings, profits and consumer welfare are far from straightforward. Non-tariff barriers, on the other hand, have quite unclear effects on product prices, and largely unknown secondary effects. As tariff levels have fallen over the years, non-tariff barriers (NTBs) may have become the instruments of choice for protection.

We carry out a comprehensive empirical investigation to ascertain specifically the import-reducing effect of trade protection barriers. We use a monopolistic competition trade model and 1994 cross-country data on trade barriers, trade flows, and production to estimate the import-reducing effect of trade barriers including both tariffs and NTBs. We used the disaggregated cross-country, cross-industry data on manufactured goods and, unlike previous studies, our sample covers a broad range of countries—more than 70 in total—including countries from the most developed ones like those in the G-7 group to the least developed one like Bangladesh. In estimating the equation, we specify an empirical model that captures the stylized facts well and helps generate more sensible and efficient estimates. Finally, our econometric framework is designed to control for the simultaneous determination of flows, trade barriers and production. The effect of trade barriers on trade flows is the focus of this study. We obtain reasonable and robust results. We find that both tariff and NTBs are quite significant in restricting imports.

The paper has six sections. The next section we present some general evidence on global trade protection. Section III is the literature review. In section IV, we specify an empirical model based on the monopolistic competition model of international trade. In section V, we discuss the estimation and the results. The last section summarizes the paper.

II. GLOBAL TRADE PROTECTIONS: AN OVERVIEW

In this section, we present an overview of global trade protections based on a Bilateral Trade Protection Database (BTPD)[2] from two perspectives: country and industry.

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[2] See Appendix I for a detailed discussion of data used in this study and how the Bilateral Trade Protections Database was constructed.

A. Global Trade Protections: A Country Perspective

The bilateral trade protection matrix is the core of the BTPD; and it contains very rich information for comparing trade protection regimes of different countries.[3] In the matrix for a specific commodity group, the elements down a column are the import tariff rates or NTB coverage ratios imposed by a home country against its trading partners, and the elements across a row are the tariff rates or NTB coverage ratios imposed upon the home country's exports by each of its trading partners. Taking the average of each column, we can get, for a specific category of commodity, the tariff rates or NTB coverage ratios imposed by each home country. Similarly, taking the average of each row, we can get the average tariff rates or NTBs coverage ratios faced by each of the home countries. Therefore, we can figure out which country is protected or being protected against by what kind of trade protection measures. Furthermore, by comparing the variation of numbers across each column or row, we can get an idea of how discriminatory a country's import regime is or whether a country is being treated equally by its trading partners.

Table 1 presents the column means and other statistical indicators for the bilateral trade protection matrix at the highest aggregation level, i.e. covering all commodity categories. For each country, we list the average tariff rate, NTBs coverage ratio, and their corresponding coefficient of variation (COV), which we use as an indicator of the degree of discrimination of that country's import regime. The table is sorted by the average tariff rate. A country is more protected, the higher its tariff rate or NTB coverage ratio; and a country's import regime is deemed more discriminatory, the larger its COV. We computed the Spearman rank correlation of per capita GNP of each country with its average tariff rate, NTB coverage ratio and the coefficient of variation, respectively.[4] The results are listed in Table 2.[5]

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[3] See Appendix II for a sample of the bilateral trade protections matrices.

[4] See Kendall and Gibbons (1990) for detailed discussion of rank correlation.

[5] The number in parentheses is: Probability > | Computed Coefficient | under H_0: Real Coefficient = 0; namely, the smaller this number is, the more statistically significant is the computed coefficient.

Table 1. Trade Protection Imposed by Each Importing Country in 1994

	Tariff		NTBs	
Country	AVE (%)	COV	AVE (%)	COV
Bangladesh	45.10	0.90	2.87	2.86
Algeria	21.85	0.84	15.60	1.99
Tunisia	21.72	0.57	6.84	2.66
India	19.09	0.72	10.58	1.23
Philippines	18.72	0.63	0.00	0.00
Kenya	18.65	0.89	0.00	0.00
Egypt	16.59	0.86	0.00	0.00
Jamaica	14.19	1.01	28.30	1.02
Mauritius	13.25	1.01	0.00	0.00
Sri Lanka	12.63	0.87	0.02	4.66
Poland	12.61	0.53	0.00	0.00
Madagascar	12.33	0.85	0.00	0.00
Hungary	12.09	1.13	0.00	0.00
China	12.00	0.81	2.21	2.49
Cameroon	11.50	0.79	0.00	0.00
Cote d'Ivoire	11.32	0.87	0.00	0.00
Mexico	11.26	0.67	17.11	1.39
Peru	11.16	0.53	5.88	2.88
Argentina	10.51	0.57	5.49	1.89
Congo	10.48	1.12	0.00	0.00
Ecuador	10.11	0.73	0.00	0.00
Venezuela	10.09	0.61	11.79	1.87
Gabon	9.79	0.60	0.00	0.00
Malawi	9.78	1.26	0.00	0.00
Nicaragua	9.52	0.95	4.45	4.36
Bolivia	9.40	0.97	0.00	0.00
Thailand	9.14	0.64	17.22	1.70
Chile	9.01	0.43	3.47	3.96
Costa Rica	8.87	1.20	0.00	0.00
Brazil	8.72	1.08	11.73	1.63
Dominican Republic	8.42	1.12	0.00	0.00
Central African Republic	8.31	1.23	0.27	6.52
Chad	8.25	1.30	0.00	0.00
Trinidad & Tobago	8.15	0.82	0.00	0.00
Uruguay	7.90	0.78	2.01	2.53
Saudi Arabia	7.71	0.72	0.04	6.50
Korea, Republic of	7.48	0.69	0.16	4.07
Guatemala	7.21	0.79	0.00	0.00
Turkey	7.13	1.00	0.62	2.08
Honduras	6.77	0.85	0.00	0.00
Morocco	6.19	1.59	2.56	2.48
Indonesia	6.04	0.73	0.00	0.00
South Africa	5.81	0.78	0.00	0.00
Paraguay	5.74	1.00	0.00	0.00
El Salvador	5.67	1.08	13.21	1.35
Colombia	5.23	1.08	0.00	0.00
Malaysia	5.19	1.36	5.46	2.58
Canada	5.16	0.93	13.16	1.56
Czechoslovakia	4.79	0.63	0.36	5.72
United States	4.67	1.36	19.76	1.01
European Union	4.45	0.60	22.16	1.07
Norway	3.87	1.19	6.55	2.04
Iceland	3.79	1.33	0.71	3.76
New Zealand	3.62	0.91	0.89	4.85
Australia	3.53	0.77	0.90	3.15
Oman	3.43	1.43	2.85	2.62
Israel	3.28	1.27	0.00	0.00
Japan	2.81	0.71	2.71	1.42
Singapore	0.00	0.00	3.16	3.83
Switzerland	0.00	0.00	0.00	0.00
Hong Kong	0.00	0.00	0.00	0.00

Table 2: Rank Correlation Between Per Capita GNP and Import Regime Indicators

Number of Observations: 61

	Rate/Ratio	Degree of Discrimination (COV)
Tariff	-0.71 (0.00)	-0.24 (0.06)
NTBs	0.27 (0.04)	0.27 (0.03)

The correlation coefficients show that, in relative terms, the richer a country, the lower is its average tariff rate, and the less discriminatory is its tariff structure. However, when it comes to the NTBs, the situation is exactly the opposite: the richer a country, the higher is its average NTB coverage ratio, and the more discriminatory is its NTB structure. Thus efforts to discover the relationship between the level of a country's per capita income and its import protection regime yield mixed results. Two explanations can be put forward: first, implementing NTBs usually involves high administrative cost and thus poor countries tend to resort to tariffs both as means of protections and as source of fiscal revenues in government finance; second, countries, especially developed ones, use NTBs to offset the reduced tariffs negotiated in the various GATT rounds.

Table 3. Trade Protection Faced by Each Exporting Country in 1994

Country	Tariff AVE (%)	COV	NTBs AVE (%)	COV
Mauritius	10.67	1.49	9.11	2.45
China	10.31	1.21	3.17	3.75
Madagascar	10.20	1.68	1.65	3.78
Bolivia	10.10	1.47	6.57	3.12
Ecuador	9.88	1.35	6.59	3.13
Hungary	9.84	1.38	6.71	2.11
Sri Lanka	9.71	1.45	5.24	2.85
Morocco	9.69	1.52	4.54	2.17
Guatemala	9.40	1.70	7.23	3.03
Iceland	9.22	1.50	1.02	3.71
Hong Kong	9.19	1.56	5.52	1.93
Cameroon	9.10	1.74	4.78	4.06
Argentina	9.03	1.45	6.53	2.45
New Zealand	8.70	1.39	5.91	2.92
Turkey	8.66	1.62	5.52	2.24
Colombia	8.56	1.29	4.96	3.75
Trinidad & Tobago	8.48	1.71	2.94	3.87
Korea RP	8.46	1.60	5.23	1.85
Singapore	8.41	1.62	3.19	2.04
Czechoslovakia	8.31	1.25	3.05	2.32
Oman	8.21	1.29	2.67	2.83
Jamaica	8.18	1.53	3.94	1.93
South Africa	8.16	1.56	2.44	2.41
Bangladesh	8.14	1.25	8.24	2.69
Chile	8.14	1.29	3.05	4.27
Egypt	8.02	1.37	5.70	2.51
Japan	7.96	1.54	4.10	2.29
Malawi	7.93	1.50	0.97	4.96
Uruguay	7.90	1.45	5.70	2.92
Tunisia	7.86	1.26	5.31	2.86
Malawi	7.60	1.59	3.81	2.49
Peru	7.57	1.40	2.69	2.69
Thailand	7.27	1.64	4.07	2.46
Gabon	7.25	1.34	5.22	2.56
El Salvador	7.13	1.36	9.59	2.58
Mexico	7.06	1.30	2.86	2.97
Australia	7.06	1.54	2.45	2.57
Cote d'Ivoire	6.94	1.47	1.35	4.80
Poland	6.93	1.52	2.93	2.68
Philippines	6.84	1.60	5.65	2.62
Canada	6.79	1.53	3.84	2.90
Brazil	6.78	1.34	2.33	2.46
Switzerland	6.71	1.69	2.08	3.18
European Union	6.69	1.60	4.15	1.91
Venezuela	6.68	1.37	3.97	4.23
Nicaragua	6.52	1.27	2.44	4.33
Honduras	6.50	1.36	3.63	4.03
Norway	6.41	1.68	2.12	2.51
Kenya	6.39	1.54	3.77	3.83
Israel	6.30	1.82	3.74	3.00
United States	6.08	1.46	2.78	2.34
India	5.79	1.22	5.20	2.30
Dominican Republic	5.69	1.35	3.13	3.38
Paraguay	5.37	1.28	4.59	3.28
Saudi Arabia	5.24	1.22	2.42	5.37
Algeria	5.04	1.84	2.21	5.93
Indonesia	5.01	1.27	3.94	3.66
Chad	3.95	1.82	1.10	7.24
Congo	3.72	1.70	0.23	7.65
Central African Republic	3.69	2.34	0.53	5.31
Costa Rica	3.38	1.42	4.11	4.43

In Table 3, we show the same statistics as in Table 1 except that this time they are computed for the rows so that we can compare protections faced by exports out of different countries. Again, the table is sorted by the average of tariff rates, with the countries at the top being subject to the most protections from the rest of world. The rank correlation coefficients between per capita GNP and trade protection indicators are as follows:

Table 4: Rank Correlation Between Per Capita GNP and Protection Faced by Exporting Countries

Number of Observations: 61

	Rate/Ratio	Degree of Being Discriminated (COV)
Tariff	0.17 (0.20)	-0.49 (0.00)
NTBs	-0.32 (0.01)	-0.41 (0.00)

Table 4 indicates that, in relative terms and in terms of tariff rates, exports coming out of richer countries tend to be more protected but less discriminated against by the rest of the world. While, in terms of NTBs, the exact opposite happens: it is the poor countries that are being targeted by both protection and discrimination. Still, there is no clear-cut answer on the relationship between countries' income levels and the degree of protection and discrimination. It all depends on which of the two indicators is being used – tariff rate or NTB coverage ratio.

B. Global Trade Protections: An Industry Perspective

Bilateral trade protection matrices similar to those shown in appendix II exist for individual commodity groups. The number in the lower right corner of each matrix can be interpreted as the average tariff rate or NTB coverage ratio imposed on that specific commodity group on the world market. In the current version of BTPD, the commodities have been aggregated according to a 120-trade-sector scheme.[6] Taking the number in the lower right corner of each of the 120 matrices, we get the average tariff rates and NTB coverage ratios imposed upon the commodities from those 120 sectors, which help to examine the global trade protections from an industry perspective. Tables 5 and 6 list the twenty most and least protected trade sectors by tariffs and NTBs, respectively.

[6] In terms of the level of aggregation, the 120-trade-sector scheme is roughly equivalent to the SITC scheme at the 3-digit level. A full list of the sectors is presented in Appendix II.

Four rank correlation coefficients are shown in Tables 7 and 8: the first is between the tariff rates and NTBs coverage ratios, the second between their respective coefficients of variation, and the last two are those between industries' world trade shares and tariff rates/NTBs coverage ratios. The findings are: in relative terms, if an industry has high protection and discrimination by one type of trade barrier, it tends to face high protection and discrimination by the other type as well. Also a high level of protections appears to be given to large trade sectors.

Table 5. Trade Protection Across Industries by Tariffs in 1994

Sector	Share of World Trade	AVE (%)	COV
	Twenty Most Protected Trade Sectors		
36 Wearing apparel	3.40	61.1	1.45
35 Floor coverings	0.20	58.4	1.58
33 Cotton fabric	0.42	48.8	1.45
34 Other textile products	1.64	40.7	1.50
32 Yarns and threads	0.90	33.8	1.58
20 Preserved fruits, vegetables	0.67	27.4	2.58
27 Food products n.e.c.	0.87	24.6	1.74
6 Cotton	0.18	24.5	1.88
7 Wool	0.10	23.0	2.46
12 Coal	0.35	21.1	3.12
25 Sugar	0.27	20.9	1.34
107 Motorcycles and bicycles	0.15	18.0	1.50
29 Alcoholic beverage	0.60	15.4	1.71
62 Cement	0.09	15.4	2.11
1 Unmilled cereals	0.65	15.1	1.86
39 Footwear	0.82	15.1	1.69
67 Aluminum	0.84	15.0	2.06
22 Vegetable, animal oils, fats	0.70	14.0	1.85
23 Grain mill products	0.23	13.9	1.59
48 Fertilizers	0.52	13.0	1.96
	Twenty Least Protected Sectors		
113 Watches and clocks	0.42	0.4	3.97
46 Printing, publishing	0.51	0.3	2.41
110 Other transport equipment	0.19	0.3	2.53
115 Musical instruments	0.11	0.3	3.50
8 Other natural fibers	0.01	0.2	2.86
42 Furniture and fixtures	0.91	0.2	3.60
44 Newsprint	0.22	0.2	4.03
50 Paints, varnishes, lacquers	0.24	0.2	3.53
79 Other power machinery	0.06	0.2	4.03
13 Non-ferrous metal ore	0.40	0.1	4.03
41 Other wood products	0.41	0.1	2.59
76 Boilers and turbines	0.48	0.1	4.03
77 Aircraft engines	0.30	0.1	4.03
11 Iron ore	0.15	0.0	0.00
17 Electrical energy	0.16	0.0	0.00
57 Product of coal	0.05	0.0	0.00
68 Nickel	0.08	0.0	4.03
104 Ships for military purpose	0.00	0.0	0.00
109 Aircraft	1.56	0.0	4.03
118 Works of art	0.14	0.0	0.00

Table 6. Trade Protection Across Industries by NTBs in 1994

Sector	Share of World Trade	AVE (%)	COV
	Twenty Most Protected Trade Sectors		
29 Alcoholic beverage	0.60	33.2	1.26
31 Tobacco products	0.48	30.1	1.10
36 Wearing apparel	3.40	24.5	0.66
106 Motor vehicles	6.21	24.5	0.88
35 Floor coverings	0.20	24.5	0.77
39 Footwear	0.82	24.3	0.68
30 Non-alcoholic beverage	0.09	24.2	0.77
24 Bakery products	0.20	23.7	0.75
20 Preserved fruits, vegetables	0.67	23.7	0.86
38 Leather products	0.40	23.2	0.73
18 Meat	1.00	22.1	1.47
42 Furniture and fixtures	0.91	21.9	0.73
2 Fresh fruits, vegetables	0.65	21.6	1.83
52 Soap, other toilet preparations	0.60	21.4	0.80
95 Household electrical appliances	0.67	21.0	0.80
33 Cotton fabric	0.42	20.2	0.88
25 Sugar	0.27	20.0	1.07
119 Manufactured goods nec	1.02	19.9	0.79
26 Cocoa, chocolate, etc.	0.39	19.9	0.74
63 Ceramics	0.33	19.8	0.77
	Twenty Least Protected Trade Sectors		
16 Non-metallic ore	0.26	7.4	1.28
78 Internal combustion engines	2.09	6.9	1.13
51 Drugs and medicines	1.35	6.7	1.24
8 Other natural fibers	0.01	6.5	1.57
44 Newsprint	0.22	6.4	1.16
55 Fuel oils	0.95	5.9	1.02
109 Aircraft	1.56	5.8	1.19
120 Scraps, used, unclassified	3.75	5.8	1.46
43Pulp and waste paper	0.54	5.5	1.78
6 Cotton	0.18	5.4	1.20
5 Silk	0.01	5.1	2.98
13 Non-ferrous metal ore	0.40	4.9	1.25
57 Product of coal	0.05	4.6	1.58
12 Coal	0.35	4.4	1.49
15 Natural gas	0.61	4.4	1.19
14 Crude petroleum	3.62	3.8	2.02
7 Wool	0.10	3.8	1.48
11 Iron ore	0.15	1.8	2.16
17 Electrical energy	0.16	0.2	4.39
104 Ships for military purpose	0.00	0.0	0.00

Table 7: Rank Correlation between Tariff Rate and NTBs Coverage Ratio Across Industries

Number of Observations: 120

Rate/Ratio	Degree of Discrimination Faced
0.53 (0.00)	0.19 (0.04)

Table 8: Rank Correlation between Industry's Trade Share and Tariff Rate/ NTB Coverage Ratio Across Industries

Number of Observations: 120

Tariffs	NTBs
0.23 (0.01)	0.11 (0.24)

C. Summary

Despite many years of multilateral trade negotiations and unilateral cuts in trade protection measures, the level of overall trade protections was still high as of 1994. It also varies considerably across countries and industries. Without delving into commodity details, we examined the overall trade protection regime from two perspectives: country and industry. The main findings are:

- Countries of lower per capita income tend to impose higher tariffs and more discriminatory tariff structures against imports from their trading partners.

- Counties of higher income tend to impose higher NTBs and more discriminatory NTB structures against imports from their trading partners.

- Exports coming out of higher income countries tend to face higher protection but less discrimination in the form of tariffs by the rest of the world.

- Exports coming out of lower income countries tend to face higher protection and higher discrimination in the form of NTBs by the rest of the world.

- If an industry has a high level protection and discrimination by one type of trade barrier, it tends to face a high level of protection and discrimination by the other type as well.

- A high level of protection tends to be given to large trade sectors.

It should be pointed out, however, that the statistical results should be interpreted with some caution in view of the potential data problems, especially those related to NTBs, as mentioned above.

III. An Overview of the Literature

This study is built upon a relatively small literature. The topic has long intrigued the profession. However, the substantial data requirement usually involved in this kind of study is so demanding that comprehensive studies did not appear until late 1980's, when progress in information technology made the task less onerous. In Table 9, we briefly summarize the key features of several representative studies closest to this one.

A. The Theoretical Foundation

When studying the effects of trade barriers on trade flows, a natural starting point is a theoretical model describing what trade patterns would be in absence of trade barriers. The usual practice in the literature is then to modify the original model by adding variables related to trade barriers. Therefore, how one models the effects of trade barriers on trade flows, to a large extent, depends on one's choice of trade determination model.

The Ricardian model is the cornerstone of international trade theory, and it attributes comparative advantage entirely to differences in labor requirements of production. Its most important implication is that there is complete specialization in equilibrium under free trade. If relative labor costs of production could be observed, a simple regression of trade on these labor costs would suffice to test the theory and then make inferences on the trade pattern. However, observing relative labor requirements has at least two almost insurmountable obstacles: first, relative labor requirements are just as difficult to observe as relative autarky prices; second, comparing labor requirements in all countries of the world poses enormous practical difficulties. It is no surprise that we do not find, in the literature, any study of the trade barriers effects being made within the Ricardian framework.

Table 9. Summary of Representative Studies

Author (date)	Theoretical Model	Data Sample Coverage	Empirical Model	Major Findings
Leamer (1988a)	Generalized factor proportions model	Fourteen OECD countries; nineteen commodity categories in 1978.	Regress domestic output on capital, labor, tariffs and commodity dummies; also do the same regression for each industry separately.	Measured trade barriers have a clear effect on the composition of output; Credible estimates of trade barriers may require simultaneous treatment for the trade barriers.
Leamer (1990)	Generalized factor proportions model	Fourteen OECD countries; ten commodity categories in 1983.	Regress imports on tariffs and NTB's with importer and commodity dummies; Baysian method is used to help to generate sensible coefficient estimates which vary across importers and commodities.	The model that accounts for differences in commodities and countries shows that NTB's effects are difficult to detect, whereas the effects of tariffs are more substantial.
Lawrence (1987)	Monopolistic Competition Model	Thirteen OECD countries for the period of 1970-1983; Twenty-one manufacturing sectors.	Regress import penetration ratio on world production share, distance and country dummy.	Japan has an unusually low volume of imports in manufactures.
Harrigan (1993)	Monopolistic Competition Model	Thirteen OECD countries; Twenty-eight manufacturing sectors in 1983.	Regress the share of bilateral imports in aggregate spending on exporting countries' output, bilateral trade barriers and transport cost.	In 1983, imports were not reduced very as much by NTBs; transport cost and tariffs had large negative effects on imports.

Table 9: Summary of Representative Studies (concluded)

Author (date)	Theoretical Model	Data Sample Coverage	Empirical Model	Major Findings
Ray (1981b)	Generalized factor proportions model	The U.S. data in 1970 at 4-digit SIC level	Imports and trade barriers equation are simultaneously estimated; factor intensity and NTBs are included in the imports equation.	The NTBs have no apparent concurrent impact in the structure of imports across the manufacturing sectors.
Trefler (1993)	Generalized factor proportions model	The U.S. data in 1983 at BEA Input-Output classification level.	Import penetration ratio equation and NTBs equation are simultaneously estimated in a Tobit model; factor shares and NTBs are included in the import penetration ratio equation.	When NTB are modeled endogenously, their restrictive impact on imports is much larger than otherwise.
Lee and Swagel (1995)	Monopolistic Competition Model	Forty countries; twenty-eight manufacturing sector in 1988.	Import penetration ratio and NTBs are simultaneously determined; output share, distance and trade barriers are included in import equation.	The structure of NTBs across countries and industries can be explained by sectoral conditions, which is consistent with the political-economy explanations of trade protection.
Harrigan (1996)	Monopolistic Competition Model	Twenty OECD countries; Twenty-eight manufacturing sectors in 1985.	Regress bilateral imports on exporting countries' output and commodity, exporter, and importer dummies.	The openness between Japan, the US and the EU countries differs significantly.

The Heckscher-Ohlin (H-O) model has occupied a central place in trade theory for much of the post-war period. It says that countries will tend to export those goods which use relatively intensively the relatively abundant factors of production. Put differently, countries will tend to export the services of their abundant factors, embodied as factor content in the goods they trade. The H-O model is generally regarded as superior to the Ricardian model because it offers an intellectually more sophisticated explanation of trade. Leontief's (1954) seminal application of the H-O model of factor proportions stimulated a large body of research that continues today in an effort to more rigorously test the theory. Nonetheless, it remains true that no unambiguously correct and conclusive test has been formulated and applied. Realizing that a full understanding of trade pattern seems to require some departure from the H-O assumptions, economists resort to a "generalized factor proportions model" as a theoretical basis for empirical work and adopt a new strategy which is, as characterized by Leamer and Levinsohn (1994), "estimate, don't test!". The generalized factor proportion model allows for factors beyond just capital and labor. As a general approach to understanding trade, the factor proportions theory has stood remarkably well to the empirical scrutiny of commodity composition of trade.

Within the framework of the generalized factor proportions model, Edward E. Leamer is the leading figure in exploring the empirical issues of the effect of trade barriers. In a series of studies which started with Leamer (1974) and culminated in Leamer (1990), Leamer gives this issue a more persistent and comprehensive treatment than anyone else does in the literature. His contributions range from building the theoretical foundation for empirical models suitable for cross-section estimation, and discussing the data problems caused by the dimension of the data sets to applying particular econometric techniques to the estimation of the effects of trade barriers. Leamer (1990) estimates the effects of trade barriers based on cross-country as well as cross-commodity variability of barriers and imports. Although it has been hailed as the best attempt at the relevant issues, Leamer's model is not free from the common weakness of the factor proportion model, namely its inability to address the bilateral patterns and gross volume of trade. In a strict sense, the model derived by Leamer is for the determination of net trade flows. However, when it comes to the empirical study, the trade barriers' impact on gross import is what should be under investigation. In a word, Leamer's empirical model specification is supported only by a loose theoretical justification.

Beginning in the late 1970's, an initially small group of theorists began to develop a different approach to international trade, which later became known as the New Trade Theory. This line of work was, in part, motivated by the observation that much international trade appears to be in goods that are quite similar. The core of the new trade theory is the so-called monopolistic competition trade model as summarized in Helpman and Krugman (1985). Two major assumptions distinguish the monopolistic competition trade model from various traditional factor proportions models. The first is that there are internal economies of scale at the level of the firm; the second is that there is an aggregate demand for variety in goods. This demand for variety can come from variety-loving and/or heterogeneous consumers, or from final goods production processes that make use of differentiated intermediate products

(Ethier, 1988). Because of the interaction between scale economies and demand for variety, in equilibrium each firm in an industry produces a single differentiated product.[7]

One of the major implications of the model is that the volume of trade is much larger than it would be if differences in international factor endowments were the only cause of trade. The model gives predictions about the equilibrium volume of trade:[8]

$$M_j^n = s_j(y^n - y_j^n) \qquad (1)$$

$$m_{ij}^n = s_j y_i^n \qquad (2)$$

where M_j^n is the total gross import of good n by country j; m_{ij}^n is the gross import of good n by country j from country i, s_j is country j's share of total world spending; y_j^n is output of industry n in country j; y^n is the total world production of good n. Equation (1) and (2) provide a basic framework to estimate trade pattern and gross volume of trade. This frictionless model predicts that a country's import of good n is proportional to the amount of good n produced outside that country.

Lawrence (1987) was the first to use the monopolistic competition model to specify predicted volumes of trade and to use disaggregated data on production and trade flows to determine which countries and industries differ significantly from the model prediction. Lawrence's conclusion that Japan has an unusually low volume of imports attributable to the existence of trade barriers has attracted considerable attention in the literature. Harrigan (1993) investigates import-reducing effects of trade barriers in OECD countries for the year of 1983. His model is based on Equation (2). Rather than attributing any deviation of actual imports from predicted imports to the effects of protections as did in Lawrence (1987), Harrigan explicitly adds measures of trade barriers to the original model so that he can directly examine the impact of trade barriers on trade flows. His finding is that in 1983, tariffs and transport costs were a more substantial barrier to trade in manufactures between developed countries than were NTBs. In a follow-up study, Harrigan (1996) addressed a similar issue using a slightly different version of his 1993 model. Lee and Swagel (1995) was another recent study of trade barriers within monopolistic competition framework. Theirs has so far been the most comprehensive study, in which they investigate the trade flows at 3-digit ISIC just as Harrigan (1993) did, but the number of countries that they covered was almost triple

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[7] Bhagwati, Panagariya and Srinivasan (1998) provide an excellent survey of various kinds of models in this literature.

[8] The assumptions are: identical, symmetric, homothetic preferences worldwide; identical technology; sufficiently 'similar' factor endowments; and free trade.

that of Harrigan (1993). However, their focus is more on the political economy determinants of NTBs than on the impact of protections (both tariff and non-tariff measures) on disaggregated trade flows.

B. Data Support and Empirical Model Specification

Strong data support is critical to reliable empirical estimation. It is more so for the estimation of the effect of trade barriers, which usually involves data from multiple sources including trade flows, trade protection measures, production, factor endowments and so on. All the investigations in the literature face the same fundamental problem, which is caused by the dimension of those data sets. In terms of time dimension, it is usually easy to obtain time series data on trade flows, but, for trade protection data, it is extremely difficult. In terms of the number of countries, for a long time, only OECD countries published reliable trade protection data. It is not until recently that a more comprehensive data set has been made available to the public, namely the Trade Analysis Information System (TRAINS). In terms of the number of commodities, the situation is much better --- we have many commodities. It is, accordingly, essential to pool across countries and/or commodities to estimate the effects of trade barriers.

Leamer (1990) estimated a model similar to:

$$\log(M_i^n) = a_i + b_n + (c_i + d_n)NTB_i^n + (e_i + f_n)TAR_i^n + u_i^n \qquad (3)$$

where i is importer, n is commodity, M is imports, TAR is the tariff rate and NTB is NTB coverage ratio, a and b are constants. He used one-year trade protection and import data from 14 OECD countries with commodities disaggregated into 10 categories. In order to capture trade barriers' import-reducing effects that vary by importers and commodities, he pooled across both countries and commodities and controls for their difference by dummy variables. One contribution of his paper was that he used a Baysian estimation method to overcome the lack of degrees of freedom usually required by such kind of dummy variable model. However, Leamer did not hesitate to mention his discomforting with the fact that he had to resort to cross-commodity variation to carry out the estimation, because it was like estimating a demand equation by comparing demand for different commodities.

Lawrence (1987), for the first time in the literature, used a monopolistic competition model to investigate the issue of openness. His model was a variant of Equation (1),

$$\log(M_i^n / DU_I^n) = a_n + b_n \log(y_i^n / y^n) + c_n \log(T_i^n) + u_i^n \qquad (4)$$

where DU is domestic use (production + imports - exports), T is transaction cost. Instead of modeling trade barriers explicitly, he attributed deviations from model predictions to trade

protection measures. Free from the dimensionality constraint imposed by the paucity of trade protection data, he was able to run regressions by industry based on a panel of 13 OECD countries for the period of 1970-83. Lawrence avoided Leamer's dilemma of pooling across commodities, but he ignored the simultaneity problem between trade and production, which is a potentially important issue since the monopolistic model suggests that imports and production are jointly determined. Also, there may be many other sources of errors in the model, not just trade barriers.

Harrigan's (1993) data set was the same as Leamer's (1990), but since he adopted a distinct theoretical framework and thus could specify an empirical model which allowed him to take advantage of another dimension of the original data set. He slightly transformed equation (2):

$$m_{ij}^n / \pi_j = y_i^n / \pi \qquad (5)$$

where, j is importing country, i is exporting country, n is commodity, π is aggregate spending. Equation (5) says that bilateral imports are proportional to each partner country's output. This implication allows him to exploit the bilateral variation in the trade pattern within a certain category of commodity and, therefore, nearly increase the number of observations by a factor of its original size. (i.e. from the number of importing countries to the product of the number of importing countries and trading partners.) For each of the 28 sectors at 3-digit ISIC level, he estimated an equation as follows:

$$\log(m_{ij}^n / \pi_j) = a_n + b_n \log(y_i^n) + c_n \log(1 + TAR_{ij}^n) + d_n \log(1 + NTB_{ij}^n) + u_{ij}^n \qquad (6)$$

Harrigan also addressed the simultaneity problem between imports and output. In his study, economy-wide factor endowments were used as an instrument for production. He found that in 1983, gross imports were not reduced much by NTBs, and although their levels are generally low, average tariffs had large negative effect on imports.

Puzzled over the "small " estimates of the impact of NTBs, some trade theorists look for answers from the endogenous protection literature. The theory of endogenous protection predicts that, in response to increased import competition, domestic interests will intensify their lobbying activity for protection, which implies that higher levels of import penetration will lead to greater protection.[9] Ray (1981b) was among the first to test the prediction. He estimated trade and protection equations simultaneously for both United States and an aggregate of seven other industrialized countries, and he found no empirical evidence supporting the notion that trade protection and imports are concurrently determined. In a more recent attempt at this issue, Trefler (1993) found that, just on the contrary, taking into account the simultaneous determination of imports and trade protection results in a significantly larger estimate of the effect of protections on imports. Since both studies were based on U.S. data, the mixed results call for testing in a broader context.

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[9] Brock and Magee (1978); Hillman (1982); Baldwin (1985); and Magee, Brock and Young (1989).

With their focus on the trade protection determination, Lee and Swagel (1994) also estimated trade and protection equations simultaneously. They included in their sample both developed and developing countries, and their results turned out to be similar to Trefler's. However, due to the model specification in the paper, their work seemed to bring more debates than closure to this issue. When specifying the determinants of trade protection, previous researchers chose import competition and variables such as industry concentration, economies of scale, labor structure, occupation, foreign protection level etc., which are presumably close proxies of political-economy factors and, in this context, reasonably exogenous. However, when the sample is expanded to include many other countries, the same kinds of variables are extremely difficult to obtain. Lee and Swagel therefore had to use some readily available data such as real wage change, export share in gross output, labor productivity, sectoral share of value added. From the point of view of estimating the trade barriers' effect, we think that introducing those remote proxies of political-economy factors into the protection equation opens the door to a wide variety of endogeneity problems, precisely what their use was supposed to overcome.

IV. The Empirical Model

The monopolistic competition model suggests that correlating the difference between the actual trade flows and the flows predicted by the model with information on trade barriers can give an indication of the trade-reducing effects of trade barriers. One prediction from Equation (1) is that the import share of a good in a particular country is inversely related to that country's share of world output of that good,

$$M_i^n / DU_i^n = F(y_i^n / y^n), \qquad F' < 0 \qquad (7)$$

Three assumptions are, however, crucial for this result: similarity in tastes, absence of trade barriers, and zero transaction costs. If countries have a preference for goods made at home, shares of home goods in domestic consumption will exceed those of home goods in world production. Import barriers such as tariffs and NTBs will raise the share of home goods in home consumption relative to their share in world production. If there are international transaction costs, home goods will be relatively cheaper in the domestic market and their share in domestic consumption could deviate from that in world production.

In specifying the equation to be estimated, we add to the theoretical model those real world complexities that have been originally assumed away. We follow Lawrence (1987), Harrigan (1993), and Lee and Swagel (1994) among many others in the literature and adopt a log-linear functional form:

$$\log(\frac{m_i^n}{du_i^n}) = a_n + b*\log(\frac{y_i^n}{y^n}) + c*\log(DISTANCE^i) + d*\log(1+TAR_i^n) + e*\log(1+NTB_i^n) + u_i^n \qquad (8)$$

where,

m_i^n = total value of imports of commodity n by country i.

du_i^n = domestic demand (production + imports – exports) of commodity n by country i.

du^n = world total domestic demand of commodity n.

y_i^n = output of commodity n in country i.

y^n = world total output of commodity n

$DISTANCE^i$= the trade-weighted average of the distance between country i and all its trading partners.

TAR_i^n = *ad valorem* tariff rate imposed on commodity n by country i.

NTB_i^n = NTB coverage ratio imposed on commodity n by country i.[10]

a, b, c, d, and *e* are parameters to be estimated.

The larger the share of a country's output in the world, the larger is portion of its domestic demand that will be met by its own production, and thus the smaller is the import penetration ratio (m_i^n/du_i^n). Distance is used as an indicator of international transaction costs. Higher transaction costs prevent a country from importing more. On top of that, the presence of tariffs and NTBs will further reduce the volume of imports. Since the production of each good is determined simultaneously with trade flow, we follow Harrigan (1992) and use factor endowments as instrumental variables for the sectoral production share. Specifically, we regress production share on factor endowments such as skilled labor, unskilled labor, capital stock and land. We then use the fitted values of production shares in estimating equation (8). However, it should be pointed out that there is a tradeoff associated with introducing instrumental variables. On the one hand, instrumental variables may help to get asymptotically consistent estimates; on the other hand, they can compromise the efficiency of the estimates.

As for another simultaneity problem caused by the political economy factors leading to import barriers often being erected in response to large volumes of imports, we also control for it by a set of instrumental variables. Since tariff rates in most of the countries are under WTO strictures, they can be more comfortably taken as exogenous than NTBs. Moreover,

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[10] As to be detailed in later section, we calculate and include in the equation the coverage ratios of several different categories of NTBs.

because our main concern is to control for the simultaneity problem rather than to specify a structural model of trade protection, in the instrumental variables set we include all the predetermined variables as well as variables such as tariffs and NTBs faced by a country's exports, which can be justifiably treated as exogenous. The econometric strategy amounts to a two-stage estimation.

V. Model Estimation and Results

As pointed out by Leamer and Bowen (1981) and Leamer (1988), the response of imports to tariffs and NTBs is likely to vary across industries, since it depends on the elasticities of supply and demand, which might differ widely across industries. In contrast, there is likely to be less variation in these elasticities within a given industry across countries. We choose to pool across both countries and industries and use industry dummy to control for the industry-specific effect.

Our estimation procedure involves two stages. The first stage includes two steps. In step one, for each industry, we regress production shares on factor endowments. The results are presented in Table 10. The estimated coefficients, which are comparable across the industries, indicate that capital stock and skilled labor are important to all the industries, whereas unskilled labor has a negative effect on output share for a majority of the industries. In step two, aiming at controlling for the endogeneity problem of NTBs, we regress the import NTB coverage ratio of a country on a set of instrumental variables which includes the tariff rates and NTB coverage ratios faced by the country's exports plus other exogenous variables including the country's import tariff rates, distance and factor endowments such as the areas of different kinds of land, skilled and unskilled labor, and capital stock. Our argument is that, when it comes to a country's decision on import NTBs, the tariffs and NTBs faced by that specific country's exports can be justifiably treated as given. The regression results are presented in Table 11. A point worth mentioning is that one needs to be very careful in selecting instruments, because the potential exogeneity of the instruments is just as important as their relevance. At the second stage, we estimate the model as specified in equation (8) by using the corresponding fitted values of the output share and the NTBs coverage ratio from the first stage regression. As mentioned in previous section, there is a tradeoff between efficiency and consistency associated with introducing instrumental variables. For the sake of comparison, we report the estimation results with and without instrumental variables for either NTBs or output share.

Table 12 shows that the estimation results are in general in line with the predictions of our model. Output share, distance and tariffs are correctly signed and statistically significant. Trade flow-weighted distance as a proxy of transaction cost does effectively impede the potential trade flows between countries. The presence of tariffs significantly reduces a country's imports. Our estimation shows that, assuming that domestic demand does not change, a one percent increase in the tariff rate will lead to a two percent decrease in a country's imports. Introducing instrumental variables for the output share and NTBs, while having little impact on the estimates of the tariff effect, does make a difference for the estimate of the effect of NTBs. Using instrumental variables for NTBs gives the correct sign

for the estimated effect of NTBs, and the estimation is also statistically significant, whereas using instrumental variables for the output share leads to an enhanced effect of NTBs.

The functional features of various NTBs are not homogenous. As a matter of fact, different categories of NTBs may play quite different roles in restricting imports. We categorize the NTBs into five types based on UNCTAD's trade barriers classification scheme and calculate a coverage ratio for each of them.[11] Then, in place of a single overall NTB coverage ratio, we include in the equation the coverage ratios for all the five different types of NTBs. In carrying out this estimation, we decided not to tackle the simultaneity problem for NTBs, because it is very difficult to get a different set of instrumental variables for each different type of NTBs. In column 1 and 2 of Table 13, we present the estimation without and with instrumental variables for the output share, respectively. After breaking down NTBs by categories, the coefficients on output share, relative demand, distance and tariff are still signed correctly as well as statistically significant, and their magnitudes do not differ much from those from the previous estimation. As far as NTBs are concerned, three of the five types of NTBs, including quantity control measures, monopolistic measures and technical measures, are estimated to negatively influence the import penetration ratio, and the magnitudes of their effects all fall into a range between -0.4 and –0.6. We found positive coefficients on tariff measures[12] and price control measures regardless of whether we used instrumental variables for output share or not. To the extent that the estimated positive coefficients of NTBs can be explained by the theory of endogenous protection, the results in Table 13 appear to indicate that, when facing high import penetration ratios, a country is more likely to have recourse to tariff measures and price control measures than to quantity control, monopolistic measures and technical measures.

[11] See Appendix III for a full list of the UNCTAD trade barrier classification scheme.

[12] Tariff measures refer to general tariff measures excluding *ad valorem* tariffs, such as tariff quota, seasonal charges, temporary duties and etc.

Table 10: Results from Regressing Output Share on A Set of Instrumental Variables by Industry

Dependent variable: Output share			**Independent Variables**						
Sectors	**No. of Observations**	R^2	Constant	Capital Stock	Unskilled Labor	Skilled Labor	Crop Land	Pasture Land	Other Land
311 Food products	58	0.89	-13.38*	0.74*	-0.62*	0.67*	0.42*	-0.002	0.30*
313 Beverages	62	0.82	-12.37*	0.78*	-0.47*	0.54*	0.08	0.19*	-0.27*
314 Tobaccos	60	0.83	-15.77*	0.86*	0.18	0.02	0.08	0.02	-0.16*
321 Textiles	61	0.86	-18.59*	0.70*	-0.05	0.73*	0.25*	0.03	-0.44
322 Apparel, except footwear	52	0.82	-15.22*	0.98*	0.04	0.01	0.60*	-0.01	-0.57*
323 Leather products	54	0.82	-18.28*	0.76*	0.15	0.10	0.35*	0.18*	-0.38*
324 Footwear	56	0.76	-18.22*	0.62*	0.10	0.63*	-0.03	0.16	-0.33*
331 Wood products	58	0.80	-17.07*	1.20*	-0.65*	0.23	0.53*	-0.28*	0.16
332 Furniture, except metal	60	0.86	-10.91*	1.52*	-81*	0.03	0.41*	0.03	-0.25*
341 Paper and products	59	0.88	-16.09*	1.00*	-0.70*	0.86*	0.24	-0.09	-0.16
342 Printing and publishing	61	0.84	-12.91*	1.08*	-0.93*	0.87*	0.33*	-0.09	-0.28*
351 Industrial chemicals	61	0.85	-17.32*	1.12*	-0.44*	0.53	0.55*	-0.07	-0.43*
352 Other chemicals	61	0.85	-17.85*	0.74*	-0.40*	0.80*	0.40*	0.07	-0.43*
353 Petroleum refineries	55	0.64	-16.95*	0.62*	-0.91*	1.13*	0.56*	0.03	-0.31
354 Miscellaneous petroleum and coal	54	0.55	-14.18*	0.97*	-0.12	0.10	0.45	-0.11	-0.33
355 Rubber products	60	0.85	-18.08*	1.05*	-0.16	0.03	0.67*	-0.06	-0.32*
356 Plastic products	57	0.87	-16.69*	0.94*	-0.78*	1.00*	0.33	0.06	-0.36*
361 Pottery, china, earthenware	59	0.67	-15.46*	1.17*	-0.10	0.12	0.22	0.15	-0.44*
362 Glass and products	60	0.78	-15.75*	1.13*	-0.44*	0.37	0.14	0.12	0.19
369 Nonmetal mineral products	61	0.77	-14.60*	0.89*	-0.30	0.40	0.29*	0.02	-0.32*
371 Iron and steel	58	0.86	-20.32*	1.14*	-0.30	0.39	0.49*	-0.20*	-0.12
372 Nonferrous metals	58	0.81	-18.41*	1.54*	-0.50*	0.06	0.23	-0.09	0.14
381 Fabricated metal products	60	0.89	-15.55*	1.27*	-0.68*	0.62*	0.30*	-0.01	-0.32*
382 Non-electrical machinery	58	0.90	-19.62*	1.52*	-0.97*	1.12*	0.36	-0.07	-0.41*
383 Electric machinery	59	0.91	-17.78*	1.36*	-0.49*	0.59*	0.40*	-0.14	-0.39*
384 Transport equipment	61	0.88	-21.75*	1.44*	-0.37	0.31	0.42*	-0.04	-0.19
385 Professional and scientific equipment	54	0.84	-14.16*	1.55*	-0.78*	0.66	0.00	0.04	-0.32*
390 Other manufactures	54	0.73	-15.85*	1.11*	-0.31	0.27	0.41	-0.18	-0.21

Note: * significant at 0.05

Table 11. Results from Regressing Import NTB Coverage Ratio on a Set of Instrumental Variables with Industry Fixed Effect

Independent Variable: NTBs	Parameter	t-ratio
NTBs faced by exports	-0.14	-5.72
Tariff faced by exports	0.05	1.92
Import Tariff	0.07	2.97
Distance	-25.2	-5.06
Capital	4.15	1.44
Skilled labor	-0.54	-0.11
Unskilled labor	6.20	1.70
Crop land	0.09	0.97
Pasture land	2.25	1.48
Other land	-3.05	-1.62
Adjusted R^2	0.16	
Number of Observations	1652	

Table 12. Estimation of Trade Protection Effects on Trade Flows with Industry Fixed Effects

Independent Variable: Import Penetration Ratio	(1)	(2)	(3)	(4)
Output Share	-0.14 (-17.6)	-0.13 (-15.0)	-0.10 (-11.5)	-0.08 (-8.5)
Distance	-0.13 (-3.0)	-0.20 (-3.6)	-0.18 (-4.2)	-0.31 (-5.4)
Tariff	-2.30 (-14.3)	-2.23 (-13.3)	-2.21 (-12.9)	-2.03 -(11.5)
NTBs	0.06 (0.30)	-0.66 (-2.0)	0.002 (0.01)	-1.22 (-3.4)
Adjusted R^2	0.53	0.53	0.49	0.49
Number of Observations	1675	1675	1675	1675

Note:

In column 1, no instrumental variables are used for either NTBs or output share.
In column 2, instrumental variables are used for NTBs, but not for output share.
In column 3, instrumental variables are used for output share, but not for NTBs.
In column 4, instrumental variables are used for both NTBs and output share.
In parentheses are the corresponding t-ratios

Table 13. Estimation of the Trade Protection Effects on Trade Flows with Industry Fixed Effects and Categorized NTBs

Independent Variable: *Import Penetration Ratio*	(1)	(2)	(3)	(4)
Output Share	-0.14 (-18.1)	-0.10 (-12.0)	-0.13 (-16.2)	-0.09 (-10.2)
Distance	-0.12 (-3.0)	-0.18 (-11.1)	-0.13 (-3.1)	-0.18 (-4.2)
Tariff	-2.04 (-12.5)	-1.90 (-11.1)	-2.22 (-13.4)	-2.08 (-11.9)
Tariff measures	1.39 (4.9)	1.28 (4.4)	-0.50 (...)	-0.50 (...)
Price control measures	2.83 (5.5)	3.06 (5.8)	-0.50 (...)	-0.50 (...)
Quantity control measures	-0.42 (-2.4)	-0.46 (-2.6)	-0.43 (-2.4)	-0.49 (-2.6)
Monopolistic measures	-0.61 (-1.4)	-0.53 (-1.2)	-0.51 (-0.7)	-0.42 (-0.5)
Technical measures	-0.44 (-2.5)	-0.58 (-3.4)	-0.54 (-3.1)	-0.62 (-3.9)
Adjusted R^2	0.55	0.52	0.53	0.50
Number of Observations	1675	1675	1675	1675

Note:

In column 1, no instrumental variables are used for output share;
In column 2, instrumental variables are used for output share;
In column 3, no instrumental variables are used for output share with the coefficient for tariff measures and price control measures being constrained to be –0.50;
In column 4, instrumental variables for output share, with tariff measures and price control measures being constrained to be –0.50.
The corresponding t-ratios are shown in parentheses.

It follows that the estimated coefficients for quantity control measures, monopolistic measures and technical measures may be, to some extent, less affected by the endogeneity problem. Therefore, we re-estimated the equation, constraining the coefficients of both tariff measures and price control measures to be –0.5, the magnitude with which we feel more comfortable.

As shown in columns 3 and 4 of Table 13, the constrained estimation results in lower R^2, the other coefficients, however, are robust to the constraints. According to the estimation, assuming that domestic demand does not change, a one percent increase in the coverage ratio of one category will lead roughly to a 0.5 percent decrease in a country's imports. It should be pointed out, however, that while the model used in this paper controls for differences across industries, it assumed away the differences across countries, which may call for caution in interpreting its results.

VI. SUMMARY

The bilateral trade flow data from WTDB and trade barriers data from TRAINS were combined, to produce a bilateral trade protection database. One of the important features of bilateral trade protection database is that it reveals the effective bilateral discrimination in a country's trade protection regime. The analysis based on this bilateral trade protection database shows that despite many years of multilateral trade negotiations and unilateral cuts in trade barriers, the current level of overall trade barriers was still high as of 1994. Trade barriers also vary considerably across countries and industries. Moreover, we also showed that the bilateral effective discrimination of trade barriers attributable to the difference of a country's trade structure in terms of commodity difference was quite significant. We presented our analysis on the global trade protection regime from two perspectives: country and industry.

An econometric estimation helped to determine the marginal import-reducing impact of trade barriers. We used a model that is based on the monopolistic competition trade model and 1994 cross-country and cross-industry data on trade barriers, trade flows, and production to estimate the import-reducing effect of trade barriers. The estimation results are in general consistent with the predictions of the model. Output share, distance and tariffs are correctly signed and statistically significant. The more a country produces a kind of good domestically, the less it will import from abroad. Trade flow-weighted distance as a proxy of transaction cost does effectively impede the potential trade flows between countries. The presence of tariffs significantly reduces a country's imports. More specifically, our estimation shows that, assuming that domestic demand does not change, a one percent increase in the tariff rate will lead to a two percent decrease in a country's imports. Introducing instrumental variables for output share and NTBs, while having little impact on the estimate of the tariff effect, does make a difference for the estimation of the effects of NTBs. Using instrumental variables for NTBs helps to get the correct sign for the estimated effect of NTBs, and the estimation is also statistically significant, whereas using instrumental variables for output share leads to an enhanced effect of NTBs. The different impact of various types of NTBs was also explored.

The results were mixed however: among the five types of NTBs, quantity control measures, monopolistic measures and technical measures reduce a country's imports and the magnitudes of their estimated effects all fall into a range between –0.4 and –0.6. Not controlling for the NTBs' simultaneity problem may explain the fact that we obtained positive estimates for the effect of tariff measures and price control measures on imports.

REFERENCES

Armington, P. S., 1969, "A Theory of Demand for Products Distinguished by Place of Production," *IMF Staff Papers*, 16, pp.159-176.

Baldwin, Robert E., 1985, *The Political Economy of U.S. Import Policy*, Cambridge, Mass., MIT Press.

Baltagi, B. H., 1995, *Econometric Analysis of Panel Data*, John Wiley & Sons, New York.

Bergstrand, J. H., 1985, "The Gravity Equation in International Trade: Some Micro-economic Foundations and Empirical Evidence," *Review of Economics and Statistics*, 67, August, pp. 474-481.

Bhagwati, J., Panagariya, A. and Srinivasan, T.N., *Lectures in the Trade Theory*, 1998, second edition, MIT Press.

Bowen, Hollander and Viaene, *Applied International Trade Analysis*, 1998, The University of Michigan Press.

Brock, William A., and Stephen Magee, 1978, "The Economics of Special Interest Politics: The Case of the Tariff," *AER Papers and Proceedings*, 68.

Feenstra, Robert C., 1995, "Estimating the Effects of Trade Policy," NBER Working Paper No. 5051.

_____, editor, 1988, Empirical Methods for International Trade, The MIT Press, Cambridge, Mass.

Harrigan, James, 1996, "Openness to Trade in Manufactures in the OECD," Journal of International Economics 40, pp.23-39.

_____, 1995, "Factor Endowments and the International Location of Production: Econometric Evidence for the OECD, 1970-1985, Journal of International Economics, 39, pp.123-144.

_____, 1993, "OECD Imports and Trade Barriers in 1983," Journal of International Economics 35, pp.95-111.

Helpman, E., and P. Krugman, 1985, Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy (MIT Press, Cambridge, MA).

Hertel, T. W., 1997, Global Trade Analysis: Modeling and Applications, Cambridge University Press.

Hillman, Arye L., 1977, "Declining Industries and Political-Support Projectionist Motives," American Economic Review, 72, pp1182-87.

Hummels, D., and Levinsohn, J., "Monopolistic Competition and International Trade: Reconsidering the Evidence," Quarterly Journal of Economics, 110(3), pp.799-836.

Kendall, Maurice, Jean Dickinson Gibbons, (1990), *Rank Correlation Methods*, London, Edward Arnold, a division of Hodder & Stoughton.

Krugman, P., 1990, *Rethinking International Trade*, The MIT Press, Cambridge, Mass.

Laird, S, and Alexander Yeats, 1990, Quantitative Methods for Trade-Barrier Analysis, New York University Press.

Laird, S., 1996, "Quantifying Commercial Policies," WTO Staff Working Paper TPRD-96-001.

Lawrence, Robert, 1987, "Imports in Japan: Closed Markets or Minds?," Brookings Papers on Economic Activity, no. 2.

Leamer, Edward E., 1974, "The Commodity Composition of International Trade in Manufactures: An Empirical Analysis," Oxford Economics Papers, 26, 350-74.

_____, 1988a, "Cross-section Estimation of the Effects of Trade Barriers," in Robert Feenstra, ed., Empirical Methods for International Trade, The MIT Press.

_____, 1988b, "Measures of Openness," in Robert E. Baldwin, ed., Trade Policy Issues and Empirical Analysis (University of Chicago Press, Chicago, IL) 147-200.

_____, 1990, "Latin America As A Target of Trade Barriers Erected By The Major Developed Countries in 1983," Journal of Developmental Economics 32, pp.337-368.

_____ and Levinsohan, J., 1994, "International Trade Theory: The Evidence," NBER working paper No. 4940.

Lee, Jong-Wha, and Phillip Swagel, 1994, "Trade Barriers and Trade Flows Across Countries and Industries," NBER Working Paper No. 4799.

Leontief, W. 1954, "Domestic Production and Foreign Trade: the American Capital Position Re-examined," Economia Internazionale.

Maskus, K. E., 1991, "Comparing International Trade Data and Product and National Characteristics Data for the Analysis of Trade Models," in Hopper, P. and J. David Richardson edited, International Economic Transactions.

Magee, Stephen, William Brock and Leslie Young, 1989, *Black Hole Tariffs and Endogenous Policy Theory: Political Economy in General Equilibrium*, New York, Cambridge University Press.

Ray, Edward J., 1981a, "The Determinants of Tariff and Nontariff Trade Restrictions in the United States," Journal of Political Economy, vol. 89, no.1.

Ray, Edward J, 1981b, "Tariff And Nontariff Barriers to Trade in the United States and Abroad," The Review of Economics and Statistics, vol LXIII, no. 2.

Trefler, Daniel, 1993, "Trade Liberalization and the Theory of Endogenous Protection: An Econometric Study of U.S. Import Policy," Journal of Political Economy, vol 101, no.1.

Data in this Study

Data requirement for this study is large. It involves four data sets, the scopes of which are all across countries and industries: trade flows, trade protection measures, production and factor endowments. Ideally, in order to be consistent with the theoretical model, we should include in our sample as many countries and commodities as possible. However, at the more disaggregated level of commodity, we end up with fewer countries and hence a smaller number of observations for each commodity category.[13] In other words, there is a trade-off between the sample size in terms of countries and commodities. As pointed out by Leamer (1988), in this context, pooling across countries for each industry is definitely a more legitimate practice than pooling across industries for each country. After balancing between the losses and gains, we decided to settle for a disaggregation level of 28 industries, i.e. 3-digit ISIC (Rev. 2) so that our sample covers as many as 74 countries.

1. Trade Flows

The source of our trade flow data is the World Trade Database (WTD) released by Statistics Canada. The WTD is a complete matrix of international trade flows, created from data reported by member countries to the United Nations (U.N.) Statistical Office and broken down by partner country and commodity. In constructing the WTD, Statistics Canada has performed a number of adjustments to minimize inconsistency in the data as reported to the United Nations. Relying on the principle that import statistics are generally more accurate than export statistics, the WTD uses imports as the basis for allocating international trade flows. In cases where reporting countries group individual partner countries differently, geographic groupings have been created for which trade is comparable. The trade of non-reporting and late reporting countries is imputed using the trade data reported by their trading partners. The commodity data reported by the U.N. are adjusted to conform to the Canadian version of the SITC at the 4-digit level. The value of trade is measured consistently in thousands of U.S. dollars and valuation adjustments are performed to ensure that the dollar value of exports will equal the dollar value of import for all trade flows.[14]

The WTD covers trade flow data for some 160 countries for the period of 1980-96. We get the unilateral and bilateral imports data in this study by aggregating the data from 4-digit SITC to 3-digit ISIC level according to a classification conversion table between the two. The trade data from WTD is also used in computing tariffs and NTBs indicators.

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[13] Some countries do not report their data at as detailed levels as others.

[14] A fuller description of the WTD can be found in Feenstra (1997)

2. Trade Protections

2.1 The Measurement of Trade Protections

This sub-section discusses measurement of trade protections for use in the trade policy modeling. Trade protection measures consist of two broad categories: custom tariffs and NTBs.

A. Tariffs

Customs tariffs are usually published in book form indicating the percentage of customs duty to be charged on commodities being imported, and they are typically classified according to national tariff classifications, which, based on the 6-digit Harmonized Commodity Coding and Classification System (HS), may contain as many as 13 digits. Since most of the tariffs are currently specified in *ad valorem* form, measurement of tariffs entails taking the average of tariff rates at the tariff line level in order to obtain the *ad valorem* tariffs at a more aggregated level. If it is desired to use some kind of weighting, an ideal but unavailable set of weights for these averages would be the level of imports that would have occurred if there were no barriers.

Three alternative sets of weights are suggested instead of the ideal weights: home imports, global imports and equal weights. However, each of these sets of weights is likely to depart from the ideal. Weighting by home imports understates the ideal rates if barriers are effective in reducing imports. Weighting by total global imports can also suffer from downward bias especially when the commodity structure of barriers is similar in most countries. Moreover, since the same set of weights is used for every country, country-specific import structures are not taken into account. Unweighted averages seem likely to be even worse approximation to the ideal average since barriers against commodities with negligible trade are treated the same as those against the imports of major commodities. In addition, like world import-weighted averages, unweighted averages also ignore different countries' characteristics that would cause differences in their free-trade import levels. It has also been suggested that domestic output (or demand) should be used as weights instead of trade flows. However, output (demand) weights may introduce upward bias, since high trade barriers could lead to larger domestic output than would occur if there were no barriers. Moreover, since domestic output (or demand) data are usually not available at the tariff line level, it is still necessary to make simple averages of tariff lines to the point where the lowest level of output classification starts.[15]

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[15] According to Lee, Jong-Wha and Phillip Swagel (1994), the simple correlation between the two weighting schemes at zero digit level is 0.96 for both tariffs and NTBs in 1988.

The average tariff rates generated by using different weighting methods can be utilized as indicators of the home country's tariff barriers against all of its trading partners. However, tariff rates faced by different exporters may vary for a variety of reasons. Discriminatory rates could result from regional trade agreements and an importer's refusal to grant Most Favored Nation (MFN) status to a particular exporter. It has also been argued that, in reality, implicit discrimination, operating through the composition of trade in country-specific tariff schedules, far outweighs in importance the explicit discriminatory tariff practices like preferential trading arrangements.[16] So if one chooses to focus on the issue of bilateral tariffs, then, when the relevant average is taken, the bilateral trade flows should be employed as weights to account for the compositional differences in trade.

B. Non-tariff Trade Barriers (NTBs)

In the literature and practice, two different approaches have been adopted to quantify the NTBs. These alternative approaches differ considerably in their methodology and in the nature of their empirical results. The first approach attempts to quantify trade and other economic effects of NTBs, often through the estimation of their *ad valorem* equivalents. The second, often referred to as the "inventory" approach, has been used primarily to produce descriptive statistics on the kinds, pattern and frequency of use of NTBs.

For empirical modeling, an important input is the price effect or "price wedge" associated with each NTB - often called the tariff equivalent of the NTBs. This is the difference between the world price of a product and the domestic price which is protected by NTBs. If world prices are genuinely free, they can be obtained from world commodity markets. They can then be compared directly with the domestic prices of identical products. It might also be possible to use an economic model of an industry, together with relevant supply and demand elasticities, to compute the price wedge based on observed changes in the volume of production and trade. Since no central records exist for non-tariff nominal equivalents, they must be independently estimated. As far as modeling disaggregated trade flows on a global scale is concerned, this approach is deemed impractical because it usually involves collecting data on prices from various sources which are not readily available.

The inventory approach is to record the number, form, and trade coverage of non-tariff trade policies as determined through surveys, frequency of complaints by trading partners and government reports. For empirical analysis involving NTBs inventories, two indices have been designed. One measure is a frequency index (F*j*) showing the percentage of tariff lines covered by some pre-selected group of non-tariff measures,

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[16] Hertel, T. W. (1997)

$$Fj = \frac{\sum D_i N_i}{\sum N_i} * 100 \qquad (A1)$$

where N*i* is *i*th tariff line, D*i* is a dummy variable that takes the value of unity if one or more NTBs are applied to the *i*th item, or zero otherwise. The above summation is made over all countries exporting to the importing country *j*. Given that matched tariff-line-level import statistics are available, in which individual countries of origin for shipments are identified, a second index showing the share of total imports subject to NTBs can be computed. This trade coverage ratio (C*j*) is defined as,

$$C_j = \frac{\sum D_{i,t-m} \times V_{i,t-n}}{\sum V_{i,t-n}} * 100 \qquad (A2)$$

where *Vi, t-n* represents the value of imports if tariff-line item *i* in year (*t-n*), and D*i, t* is a dummy variable that takes the value of unity if an NTB is applied to the item, and zero otherwise. If *n* and *m* are zero, the index is based on current trade values, otherwise it is expressed in a base year's trade weights. Holding *n* constant and varying *m* will measure the effects of changes in effective protections with constant trade weights, whereas holding *m* constant and varying *n* will measure the effects of changes in effective protections caused by changes in the structure of trade.

Since both the frequency index and the coverage ratio are numbers falling into the range between 0 and 1, in empirical analysis, they are typically treated in the same way as are the average *ad valorem* tariff rates. In the literature, almost all the empirical studies which involve NTBs in a multi-countries and multi-sectors context have used either of those two ratios as NTBs indicators.

A point to note, however, is that the inventory data are compiled mainly from official publications such as national customs schedules or GATT notifications. The reliance on official sources may cause understating the importance of some NTBs. Furthermore, the import coverage ratio and frequency ratio measure the extent to which imports are subject to NTBs and not the degree to which they are restricted. Finally, since the coverage ratio involves the value of imports, those drawbacks associated with tariffs when the import-weighted average of *ad valorem* tariff rates is being computed will nevertheless exist in the case of NTBs.

2.2 A Bilateral Trade Protection Database

As noted above, the measurement of trade protections across industries and countries involves computing the weighted average *ad valorem* tariff rates and NTB coverage ratios based on very detailed data of tariffs, NTBs and corresponding trade flows.

The United Nations Conference on Trade and Development (UNCTAD) has been tracking and compiling the information on worldwide trade protection measures for decades. The

Trade Analysis and Information System (TRAINS), published by UNCTAD, is acclaimed by a leading figure in this field as "the most comprehensive collection of publicly available information" (Laird, 1996) on tariffs and NTB's. It contains, *inter alia*, information on tariffs, NTBs and trade flows for most OECD countries and some 80 developing countries. For each basic Harmonized System item (6-digit level) as well as for any aggregate thereof, TRAINS allows for a cross-country comparison of indicators on import regime, such as tariff average and NTB's frequency ratio; likewise, it allows the same comparison to be made of import values. Tariff schedules for most countries contain between 5,000 and 10,000 tariff lines and product differentiation. Empirical trade policy models necessarily incorporate trade policies based on aggregations of these tariff lines. However, when TRAINS carries out the aggregation, it only computes the unweighted average of tariff rates and NTB frequency ratios which are, as pointed out before, probably the worst approximation to the ideal average. Moreover, since TRAINS does not have data on bilateral trade flows, it cannot provide information on the bilateral trade protection, which is particularly important and interesting as far as the trade relationship among a group of countries is concerned.

By combining the WTD and TRAINS, we can create a Bilateral Trade Protection Database (BTPD) which constitutes the data source of bilateral and unilateral tariffs and NTBs in this study. From TRAINS, we can extract the *ad valorem* nominal rates for total import charges which include all duties and customs fees collected at the national border, NTB frequency ratios and the corresponding value of imports for each item of 6 digit HS. For the sake of simplicity, we call the total import charges "tariff rates" below. We then compute, with the help of a concordance table between 6 digit HS and 4 digit SITC, the import-weighted tariff rates, NTB coverage ratios and the corresponding trade value of imports at 4-digit SITC for each country.[17] It is from this point that the combination of TRAINS and WTDB begins. Bilateral tariff rates and NTB coverage ratios at higher aggregation levels than 4-digit SITC are constructed by aggregating average tariff rates and NTB coverage ratios to the desired level using bilateral import values as weights. As pointed out above, this can result in significant differences in aggregated tariff rates or NTB coverage ratios for the same commodity imported from different sources. Given the Armington framework (product differentiation by region of origin), the incorporation of bilateral average tariff rates means that each trade flow can be subjected to a unique tariff rate or NTB coverage ratio.

When taking the import-weighted average of tariff rates and NTB coverage ratios, we use trade flow data in 1994 from the WTDB. The resulting BTPD consists of three kinds of matrices: bilateral trade flows, bilateral tariff rates and bilateral NTB coverage ratios, each for one category of commodity at the desired level of aggregation based on 4 digit SITC. The dimension of the matrix varies according to how the trading partner countries are grouped.

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[17] There are altogether 74 individual countries and one region called the rest of the world. The rest of the world is assumed to have the average tariff rates and NTB coverage ratios of the available non-OECD countries excluding Singapore, Hong Kong.

In this study, all the information on trade protections is from the BTPD. The information includes unilateral tariff rates and NTB coverage ratios, bilateral tariffs and coverage ratios, and export tariff rates and NTB coverage ratios faced by each country. An overview of the trade protection data from the BTPD is provided in the next section.

3. Production

As specified in the model, the production data at industrial level for all countries involved is required to calculate the import penetration ratios as well as production share. The United Nations Industrial Development Organization (UNIDO) makes available to users its database of industrial statistics at 3-digit ISIC level. The database covers 89 countries and regions. The data are generally for the period 1981-96 and arranged according to ISIC Revision 2. Information is presented by country, year and industry.

We take from the UNIDO database the production data for one single year, 1994. Since the industrial output is reported in domestic currency, we convert it into U.S. dollar based on exchange rates provided by the World Development Indicator (WDI) Database of The World Bank. The industrial production data are then used to calculate the output ratio and, together with import and export data from the WTD, the import penetration ratio.

4. Factor Endowment and Distance

The factor endowments include skilled labor, unskilled labor, capital stock and land. The data on cropland, pasture and other land areas can be taken directly from the WDI database. However, we have to compute the capital stock based on time series data on gross fixed investment, which can also be found in the WDI. In deriving the capital stock, we use an overall depreciation rate of 13.3%, the same rate as used by Summers and Heston (1990) in their construction of the Penn World Table. The International Labor Organization (ILO) publishes labor force data according to seven occupational categories. Following Maskus and Penubarti (1995), we define skilled labor as occupational category 0/1 and 2 and unskilled labor as total labor force minus skilled labor.

The distance data is downloaded from the web-site maintained by Dr. Jon Haveman.[18] In the original data set, he provides the distance between economic centers of any two countries for some 100 countries. Following the usual practice in the Gravity Model literature, we use a trade-weighted measure of distance between a country and its trading partners as proxy for its transportation cost.

[18] http://intrepid.mgmt.purdue.edu/Trade.html

Bilateral Tariff Rate Matrix in 1994
Upper Left Panel
(In percentage)

	USA	SIN	SWI	HK	JAP	NOR	ICE	CAN	AUS	EU	ISR	NEW	KOR	CHI	CZE	MAL	SAU	ARG	MAU	OMA	VEN	URU	MEX	SOU	HUN	COL	THA	COS	BRA	GAB	TRI
USA	0	0	0	0	2.7	2.9	6.1	0	3	4.1	4.3	3	34.3	10.4	4.9	2.9	9.7	11.1	26.7	6	10.4	9.6	0	4.9	11.3	10.5	13.2	11.6	10.1	10.3	6.1
SIN	2	0	0	0	1.6	4.4	0	2.6	1.9	4.4	2.5	3.3	11.5	8.1	1.9	6.8	11.8	15.5	19.9	5	8.6	9.9	10.2	5.5	11.9	4.8	13.4	14.3	8.9	7.3	13.5
SWI	3.6	0	0	0	1.7	4.1	5.1	4.2	2.5	4	3.7	3.8	8.6	10.9	5.4	3	10.4	10.9	19.6	5.2	8.2	10.6	8.8	2.6	13	5.1	11	17.8	8.2	6.9	5.9
HK	6.4	0	0	0	6	12.4	10.4	8.9	8.2	7.1	9.3	7.3	10.3	10.5	5.7	7.7	12	18.8	11.9	4.8	16.7	15.6	17.5	12.3	17.7	13.7	19.6	27.4	10.1	15.4	11.8
JAP	2.4	0	0	0	0	2.6	0.6	4	6	4.8	4.2	9.4	7.8	10.3	8.1	8.3	11.8	14.9	33.6	5	22.8	12	9.9	11.8	18.9	2.6	19.6	19.4	11.3	12	16.5
NOR	1.5	0	0	0	3.3	0	2	0.5	2	2.3	1.7	4	7.2	9.4	3.6	4.3	10.8	13.1	24.6	2.9	5.4	5.4	10.3	4.8	9	2.1	6.2	10.3	6.9	6.5	2.2
ICE	0.8	0	0	0	3.9	1.7	0	1.1	2	10.5	0.3	4	7.5	10.8	1.1	7.6	12.1	19.5	17.7	0	13.7	0	12.1	7.4	40.3	0	3.4	0	24.5	14.4	0
CAN	0	0	0	0	1.7	0.6	3.5	0	2.8	2.3	2.4	3.1	8.4	10.8	5.6	4.2	6.5	11.6	23.3	6.8	13.9	7.2	0	3.2	11.8	6.5	8.5	13.9	27.3	7.8	7.6
AUS	2.8	0	0	0	5.6	0.6	0.1	2.4	0	1.5	4.3	5.1	5.8	10.9	1.8	3.7	10	6.1	9.8	3.6	8.2	5.3	20.9	6.7	9.3	3.6	3.7	10.4	10.2	7.9	5.1
EU	3	0	0	0	2.9	4.3	4.1	4.3	4.5	0	5.9	5.4	8.8	10.5	6.4	7.3	11	13.7	21.5	5.5	11	11.5	10.9	7.1	14.4	5.5	19.8	16.1	10.3	9.5	6.1
ISR	2.7	0	0	0	0.6	3.9	4.6	3.4	3.2	5	0	3.5	7.9	6.4	6.2	0.6	0	10.9	18.2	0	7.6	8.2	9.8	6.2	5.9	5.1	8.4	12.6	12.3	7.3	9.3
NEW	4.5	0	0	0	6.1	1.6	0.8	6.7	4.5	2.7	4.9	0	11.3	9.2	1.3	2.4	6.9	13.7	5	2.5	19.8	6.9	42.2	6.5	14.3	1.2	15.7	0	16.7	13	4.8
KOR	3.6	0	0	0	3.7	3.3	1.9	5.3	7.5	5.7	6.1	6	0	9.7	11.1	4.6	12.1	16	25.9	5	23.2	13.9	11.8	17.2	16.1	11.6	22.6	16.1	15.9	18.9	16.2
CHI	2.3	0	0	0	1.8	0.8	0.6	1.9	1.8	1.9	6.1	3.9	4.4	0	4.7	1.2	12	11.3	3.8	5	9.4	12.9	13.7	1.3	7.6	13.6	7.7	0	35.9	13.5	21.9
CZE	4.3	0	0	0	3.8	4.7	1.7	6.8	5.3	4.6	4.3	4.5	7.5	10.9	0	5	12.3	13.7	36.8	5.4	12.2	5.5	10.9	5.7	8.9	3.9	12.3	5.9	0.9	22.7	7.8
MAL	2.3	0	0	0	1.3	8.7	5.1	5.3	3.6	5.5	0	3.2	6.2	10.3	3.3	0	12.3	13.3	21.5	2.7	11.4	11.1	12.1	4.5	8.2	7.9	13.3	22.5	8.7	7.6	15.2
SAU	0.8	0	0	0	0.4	6.8	0	0.1	0.2	0.9	0	0.3	5.1	11	5.7	7.2	0	3.7	24.4	4.9	12	0	4.9	0.3	6.5	0	5.7	0	0	14.8	6.8
ARG	5.1	0	0	0	4.3	0.5	0	3.8	3.2	3.4	1.5	1	19.6	10.9	1.6	0.9	5.5	0	9.9	0.1	15.5	10.1	9.5	2.3	7	4.4	16.1	22.2	12.3	12.5	24
MAU	0	0	0	0	3.2	16.1	14.9	22	1.9	8.3	0.4	5.7	7.2	11	12.6	17.2	1.8	19.8	0	0	0	22.6	35	5.4	7.8	0	19	30	15.1	0	0
OMA	5.5	0	0	0	0	2.1	0	12.9	0.2	4.1	0	0	5	0	0	13.4	9.2	0	0	0	10.1	0	10.7	0.1	0.6	0	0	0	0	0	0
VEN	1.2	0	0	0	0.3	3.5	0	1.8	5	2.3	0.6	0	3.1	11	0	0.1	15.2	6.7	0	0	0	3.4	7.8	8.5	12.2	2.9	6	0	0	15.8	6.7
URU	6.1	0	0	0	4.4	0.2	0	6	6.1	3.2	0.2	7.9	4.2	10.5	1.7	0	8.1	16.2	0	0	18.3	0	16.7	5.4	14.2	12	13.7	20	6.3	10.7	9.8
MEX	0	0	0	0	1.4	0.6	14.4	0	3.7	3.5	7.5	4.8	8.5	10.1	5.6	24.6	12.4	12.7	38	5	11	10.6	0	8.8	13.8	8.8	21.3	0	8.2	12.1	6.5
SOU	2.1	0	0	0	2	0.2	2	3.4	3.6	2.7	3.4	4.1	12.9	10.9	2.4	2.7	11.9	11.6	26.8	4.5	4.9	9.3	8	0	8.2	8.4	9.6	18.4	17.9	7.6	5.6
HUN	5	0	0	0	3.1	7.9	5.9	6.9	5	6.6	4.3	5	13.5	9.6	9	5.2	11.5	16.1	34.1	4.3	12.2	11.6	13.4	6.2	0	10.9	15.7	16.7	25.3	13.3	12.2
COL	3.6	0	0	0	4.6	0.5	0.6	2.6	0.3	7.6	8.4	4.2	5.7	10.9	3.1	8.5	14.3	13.5	0	4.9	10.8	0	12.7	0	36.8	0	13.3	0	28.7	13.4	9.8
THA	4.9	0	0	0	2.5	1.4	0.9	5.1	4.7	5.1	6.3	6.6	13	10.9	2.9	6.4	15.6	13.8	16.9	2	12.5	11.6	9.7	7.2	8.2	6.1	0	20.5	7	11.5	8.2
COS	0.4	0	0	0	0.2	0	0	7	0	0.5	2.2	0	4.9	0	0	0	0	4	0	0	0	0	10.1	3.6	1	0	5.5	0	0	5	0
BRA	5.1	0	0	0	4.4	5.4	7.9	5.6	5.9	5.8	5.3	5.4	7.3	11	8.6	6.6	19.2	11.4	19.3	3.1	9.2	13.9	9.6	9.9	17.1	0	12.1	0	0	8	9.3
GAB	3.3	0	0	0	2.4	0.1	0	2.5	3.2	4.3	1.9	2.3	3.9	10.9	4.5	7.9	11.6	11.7	53.1	0	15.5	14.4	8.8	3.1	8	6.2	9.1	22.7	25.2	0	11.1
TRI	1.8	0	0	0	8	0	0	5.5	4.5	5.1	0	0.3	8	11	9.6	0	12.4	6.9	0	0	9.5	10	9.3	6.8	60	2.4	8	0	0	8.9	0

Bilateral Tariff Rate Matrix in 1994
Lower Left Panel
(In percentage)

	USA	SIN	SWI	HK	JAP	NOR	ICE	CAN	AUS	EU	ISR	NEW	KOR	CHI	CZE	MAL	SAU	ARG	MAU	OMA	VEN	URU	MEX	SOU	HUN	COL	THA	COS	BRA	GAB	TRI
TUR	11.9	0	0	0	4	8.4	8.5	8.6	4.4	8.8	6.8	3.5	14.7	10.7	6.8	10.8	10.1	13.6	5.8	6	10.5	15.5	15.7	21.4	8.5	9.8	12.4	25	13.2	11.5	16.7
POL	5.1	0	0	0	4.4	4	0.9	4.4	5.8	5.5	2.3	4.3	7.1	11	4.3	6.2	12.3	14.6	33.2	5	9.5	11.7	1.5	9.3	5.4	12.4	2.1	2	6.8	8.3	6.6
ECU	1.5	0	0	0	6.2	0.2	0	2	2.2	9.2	0.4	0.3	5.6	11	2.4	4.6	0	10.5	32.2	0	15.9	6.5	12.1	8.5	36.3	0	9.9	0	0	18.7	17.1
ALG	1	0	0	0	3.4	0	0	0.1	0	0.8	0	0	6.8	0	7.6	21.1	7.4	0	0	4.4	0	0	0	0	0	0	5.8	0	0	0	0
TUN	5.1	0	0	0	2.8	6.2	4.8	9.3	0.5	8.9	0	5.4	3.7	0	6.3	3.6	12.1	14.5	40	5	6.4	2	14.9	3.3	0	0	4.3	26.8	11.3	15	0
PER	4.5	0	0	0	1.8	1.1	14.9	2.1	1.6	2.9	1.7	3.3	4.2	10.9	7.7	0	12	8.4	3.8	0	8.5	15.2	10.3	1.1	7.2	9.3	5.6	0	3.7	11.5	12.6
DOM	10.1	0	0	0	3.3	1.5	11.5	7.2	4.5	6	7.9	2.2	5.4	11	3	0	0	12.9	0	0	10	0	25.4	10.8	0	0	12.7	0	0	7	10.1
GUA	3.3	0	0	0	0.5	0.7	0	1.7	1.5	4.2	17.5	1	3.3	10.9	4.9	0	6.2	14.9	0	0	19.7	14.7	6.1	0.1	10.8	13.8	9.8	0	7.3	6.8	12.2
PHI	3	0	0	0	2.4	8.5	14.3	8.7	5	4.7	9.4	6.3	14.3	10.9	4.7	2.2	13.3	14.3	3.4	3.5	16.6	15.7	11.2	9.4	5.7	8	9.2	0	7.8	12.9	18.7
PAR	6.8	0	0	0	1.3	0	0	10.6	4.3	0.8	0	9.5	3.5	11	4.5	0	8.8	4	0	0	12.7	8.1	11.7	3.6	5	0	5.7	0	0	10.4	16
JAM	5.8	0	0	0	6.1	10.7	8.9	9.6	13.1	6.1	10.2	9.1	16.6	10.4	7.9	10.1	11.4	17	16.5	5	12.9	15.7	11.4	13.1	12.9	13.8	13	24.2	10.2	11.6	8.9
CHN	4.9	0	0	0	4.4	0.8	10	3.3	0.9	8.5	21.4	0	3.2	11	5.4	0.7	12.1	6.8	3.9	5	16.6	3.2	5.2	12.6	58	20	6.1	26.1	23.7	15.6	0
MOR	7.1	0	0	0	2.4	9.6	14.9	9.7	4.3	7.5	0	3.9	8.1	10.7	5.3	15.9	12.1	15	18	4.9	7.6	16.6	12.2	10.6	16.3	9.6	14.6	28.2	10.2	9.6	8.4
INE	3.6	0	0	0	2.7	0	0	0.8	6	0.6	0	17.7	8.3	11	4.4	0	1.4	3.3	0	5	9.9	7.8	9.8	1.6	1.2	0	13	0	3.5	13.1	0
BOL	10.7	0	0	0	3.7	0	6.1	1.7	4.5	4.4	0	2.8	4.4	11	8.3	41.2	0	21.8	0	5	8.3	19.7	16.2	9.9	58.4	0	2.3	0	0	7.9	14.4
EGY	5.5	0	0	0	2.4	8.4	15	14.1	7.2	5.5	1.8	0.8	4.9	11	3.6	11	11.5	13.2	13.2	4.9	10	12.2	20.7	12.6	12.4	20	4.8	29.4	6.1	5.3	17.2
SAL	11.7	0	0	0	3.3	0.1	0	3.9	1.9	3.6	0	0	11.7	10.6	5	1.7	0	18.5	0	0	19.8	10.3	12.6	1.2	10.6	0	5.2	0	0	12.9	11.2
SRI	12.2	0	0	0	3.7	11.5	9.4	16.6	8	7.5	2.4	4.8	7.7	11	4	6.3	9.2	8.6	31.4	35.6	0	11	7	7.6	3.5	12.3	10.8	0	34	9.9	7.8
HON	3.2	0	0	0	0.6	0	0	0.3	0	3.7	0	0	3.3	11	5	0	0	0	0	0	14	0	9.9	0	0	14.1	0	0	20.2	5.4	2.5
CAM	0.4	0	0	0	0.5	9.1	0	0	5	2.3	0	3.6	4.9	0	0	0	12.1	0	0.6	0	11.1	0	6.9	5.6	4.1	0	3	22.7	0	0	0
NIC	4	0	0	0	1.5	0	0	0.2	5.6	3.9	0	0	5	8.1	5.8	0	0	14.1	0	0	20	0	9	0	1.1	11.5	11.1	0	0	15.3	0
COT	2.2	0	0	0	8.2	0.2	0	3.8	1.9	5	2.7	4.6	5.7	11	9.6	1.3	0	0.1	5.3	0	0	0	9.5	3.4	4.6	0	9.8	0	0	23.6	0
INA	5.4	0	0	0	2.7	13.3	6.5	12.3	10.3	6.5	5.8	9	6.3	10.8	6	4.8	0	14.1	10.3	4.9	9.5	15.8	15.4	8.2	10	0	13.3	0	9.5	11.4	10.3
CER	1.9	0	0	0	0	3.9	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
CON	0.7	0	0	0	0.1	0	0	1.6	5	0.2	4.4	0	5	0	0.3	0	0	2	5.2	0	8.5	0	13.6	0.2	0.1	0	0	0	0	0	0
KEN	5.6	0	0	0	2.9	4.8	0	3.6	0.2	6.9	0.5	2.6	5.1	11	7.1	1.2	0	9.6	3.6	5	0	0	7.9	1.3	20.2	0	3.8	0	0	20	23.2
BAN	11.5	0	0	0	6	17.5	14.4	20.3	4.5	11.6	0	7.7	7.1	11	8.8	4	0	17.9	21.5	2.4	0	13.4	27.1	9	26	0	10.3	0	0	18.6	2.5
MAD	2.7	0	0	0	4.1	0	0	4.3	1.8	4.9	2.1	0	9.5	11	4.4	0	5.7	0	16.1	0	10.3	0	4.8	6.1	0.2	0	8.2	0	0	0	0
CHA	0.1	0	0	0	0	15.2	0	4.6	0	0.1	0	0	3	0	0	0.4	0	0	0	0	0	0	10.7	7.5	5	0	0	0	0	0	0
MAL	47.8	0	0	0	0	0	0	8.6	0	1	0	1.7	0	11	9.7	0	0	14	5.3	5	0	9.2	0	4.9	0	0	0	0	0	0	13.6
ROW	3.1	0	0	0	1.1	2.1	1.6	3.3	2.7	3.8	4.3	3.2	6.2	11	5.5	4.4	10.2	5.6	9.7	11.6	13	2.6	11.8	1.9	6.2	9.6	6.5	16.8	9.2	10	15.5
AVE	3.3	0	0	0	3	4.2	3.8	4.5	4.7	1.5	5.3	5.3	14.6	10.5	6.2	6.5	10.8	12.9	19.5	6.8	12	10.8	11.7	7.1	14.1	9	15.2	16.6	10.3	11.2	7.3

Bilateral Tariff Rate Matrix in 1994
Upper Right Panel
(In percentage)

	TUR	POL	ECU	ALG	TUN	PER	DOM	GUA	PHI	PAR	JAM	CHN	MOR	INE	BOL	EGY	SAL	SRI	HON	CAM	NIC	COT	INA	CER	CON	KEN	BAN	MAD	CHA	MAL	ROW	AVE
USA	6.3	18.6	11.5	10.6	21.6	12.4	14.4	9.3	22.6	8.9	24.9	11.5	6.7	8.8	15.4	12.2	9.4	17.3	12	11.8	15.2	15.5	24.1	10.7	12.6	21.2	50.4	22.4	15.8	11.9	18.6	8
SIN	7.4	14	16.5	50.3	23.7	12	11.9	9.3	24	6.6	13.9	6.8	7.3	0	8.9	21.1	3.3	19.4	6.6	12.4	0	19.6	31.1	0	0	31.8	87.3	21	0	0	20.3	6.8
SWI	6.7	13.9	8.7	17.1	29.7	12.2	13.9	6	22.6	9.3	13.3	15.4	6.4	9.1	19.2	16.7	2.8	13.3	3.7	12	12.9	16.1	28.4	9.6	13.1	22.3	81.7	18.7	19	18.6	14.4	5
HK	10.8	18.1	20.7	31.2	33.4	12.6	13.4	14.6	33.9	10.4	17.1	21.5	18.4	9.1	10.2	51.8	15	24.9	14.3	24.3	27.1	26.2	22.7	24.7	28.5	43	97.7	23.9	21.7	34.6	21.5	12
JAP	6.8	12.6	25.6	23.7	25.1	11.6	18.7	8.6	21.9	11.2	14.6	19	11.2	8.9	24.8	25.2	10.2	21.1	9.5	18.9	13.3	15.1	29.2	14	22.6	25.3	85.9	19.6	16.9	24.6	16.1	6.5
NOR	4.7	7.8	6.5	24.8	20.8	12	6.9	5.6	25	0.8	9.5	6.7	4	8.9	13.7	15.2	10.3	11.5	12	18.2	0	10.7	16	10	17.6	32.7	73.1	9.3	10.2	10.3	14.7	2.8
ICE	21.4	14.4	0	0	0	12	0	0	19	0	23.1	0	6	0	0	7.5	0	0	0	0	0	12.6	21.9	0	0	31	85	0	0	33.6	10.5	7.7
CAN	4.5	15	9.7	3	18.3	13.6	9.9	6.1	21.3	6.2	48	8.9	5	9	10.5	13	2.3	17.9	8.2	10	11.7	9.6	18.8	11.6	10.6	26.9	58.3	20.7	4.2	7.5	19.5	3.7
AUS	2.1	16.2	8.9	3.1	3.5	14.8	4	8.9	26.5	5.1	15.5	10.6	6	8	6.3	9.1	8.9	20.8	5.9	19.2	0	23.1	16.8	7.2	22.2	33.5	70.5	18.2	12	27.4	18.6	6.4
EU	7.2	14	11.4	18.2	29.3	12.4	12.9	7.6	23.8	12.7	18.6	20.8	9.7	9.1	13.1	21.7	6	16	3.3	14.6	14.9	14.3	20.7	14.8	18.4	25.4	76.2	20	16.2	21.4	18	3.6
ISR	7.8	14.5	12.6	0	19.4	12	9.1	6.6	20.2	7.5	9.6	12.8	7.5	9.4	11.9	21.1	2.4	19.3	5.9	17.3	11.7	17	10	5	0	24.7	84.6	19.9	10.2	10	17.1	4.8
NEW	0.7	26.5	14.1	5.2	27.5	24.7	5.3	18.2	26	3.6	13.8	14.1	7.9	10	7.6	13.3	15.6	24.9	1.2	0	26.7	12	15.3	0	0	31.1	69	0	0	13.4	18.4	7.1
KOR	10.6	17.5	27.4	30.8	28.2	13.3	10.7	15.8	25.3	8.7	16.8	22.9	11.2	8.9	17.3	40.4	14.4	25.8	16.5	21	16.7	14.2	30.7	17.3	25.3	31.5	94.4	23.7	18.8	28.8	19.4	8.3
CHI	0.4	6.3	12.6	32.1	37.3	14	8.3	12.7	19.7	12.1	1.6	18.5	1.3	9.3	14.7	9	10.8	10.1	10.1	25.5	15.9	25.9	32.7	0	22	0	0	25.4	0	40	16.2	4.9
CZE	8.7	12.2	33.6	14	23.1	11.8	29.7	9.5	22.2	0	33.1	34	6.3	7.8	6.6	32.3	7.1	13.3	12.5	20.1	8.4	20.4	29.5	0	20.8	23.2	31.2	10	29.9	0	18	6.9
MAL	4.8	9.9	10.9	25.3	20.3	12	18.4	9.6	25.8	8.1	19.9	10.6	5	7.7	9.5	17.2	10.4	27.1	4.9	12.1	18.1	17.7	29.5	10	17.8	33.6	83.6	15.1	14.7	22.8	19	4.5
SAU	8.9	11.2	7.5	16.4	19.4	12	0	14.6	19	0	9.6	1.9	3.7	0	0	20.4	0	14.3	8.1	13.7	5	0	0	0	0	0	0	10.1	0	0	1.4	2.4
ARG	3.6	12.7	12.6	8.5	16.8	14.1	28.1	6.9	28.8	9.7	64.5	8.9	1.7	9.6	11.1	9.6	5.4	29.6	5.5	20.9	12.1	15.6	29.3	0	28.2	9.7	64.1	30	10.2	0	24.6	11.4
MAU	12.3	26.6	0	0	27.9	0	0	0	19	9.8	19.3	0	22.6	0	0	19.3	0	21.7	0	0	0	12.6	30.5	0	0	20	105	25	0	10.8	17.5	9.2
OMA	3.7	27.4	0	34	18.4	0	0	0	19	0	0	3.9	5.3	0	0	38.3	0	2.7	0	23	0	7.6	36.3	0	26.5	27.8	26.2	0	0	0	22.6	6.3
VEN	5	15	16.7	30.1	0	12.2	7.2	7.5	31.3	10.8	0	36.9	8	9	3.8	0	4.5	0	12.5	0	8.6	28.6	35	0	0	0	0	0	0	0	12	4.6
URU	3.9	9.5	9.3	40	29.6	22	0.6	10.1	19.2	12.4	18	7.8	3.2	9.1	20	30.5	9.7	0	9.7	0	10	0	13.2	0	22	0	65.7	0	0	0	22.1	10.6
MEX	9.9	11.5	16.2	7.7	17.4	11.6	7.3	9.8	33.4	12.3	15.2	15.9	2	8.6	3	16.3	7.7	24.5	8.6	17.6	18.4	15.8	21.1	0	0	30.9	35.2	0	17.8	23.1	14.9	4.3
SOU	4	2.8	9	19.9	22.2	11.9	8.5	6.3	18.6	15.2	23.7	3.6	1.3	8.4	12.1	22.6	6.6	16.6	5.6	12.4	0	15.9	26.1	18	19.2	23.6	87.7	15.7	23.8	19	28.5	12.9
HUN	6.8	18.1	15.7	32	33.9	21.4	10.5	21.5	36.4	8.9	40	17.2	5.5	9.7	13.9	41.3	9.2	19.9	13.6	18	21.6	22.5	28.1	28.3	23.5	38.2	81.4	25.8	27.1	28.4	18.6	7.6
COL	29.9	21.2	13.1	40.1	43	12	13.8	12.2	24	10.9	29.8	29.3	0	9.7	16	0	10.1	12.9	10.1	16.5	19	28.5	18	0	0	0	0	0	0	0	17	6.9
THA	5.1	16.4	16.8	11.5	20.3	12	14.9	6.8	24.4	12.7	65.4	12.7	4.7	9.2	13.2	13.2	6.4	34.1	8.3	14.5	15.2	13.9	17.9	10.6	21.1	15.8	66.1	21.1	10.2	20.9	21.3	9.7
COS	0	5.9	0	7	17	0	0	5	14	0	1.1	3.7	0.1	0	0	7.4	0	0	0	12.3	0	0	0	24.5	0	0	0	0	0	0	9.6	0.9
BRA	6.3	16.6	8.3	4.2	25.7	12	0	0	31.3	0	15.4	16.2	3.4	10	25	16.1	0	15.4	5.1	10.5	0	0	30.4	0	0	44.7	0	16.7	0	0	14.7	6.8
GAB	11.6	14.5	15.1	19.2	15.6	12.2	16.3	8.3	26.5	11	24.7	5.9	9.3	9	21.1	16.4	8	12.8	6.8	20.4	15.2	10.1	27.7	20	26.7	27.1	0	10	0	0	14	6.6
TRI	2.5	10.9	8.6	0	35.6	12	5	6	0	9	0	0	8.4	10	15	0	2.2	0	5.9	0	11.2	0	35	0	0	45.7	78.9	20	0	20	12.6	6.8

Bilateral Tariff Rate Matrix in 1994
Lower Right Panel
(In percentage)

	TUR	POL	ECU	ALG	TUN	PER	DOM	GUA	PHI	PAR	JAM	CHN	MOR	INE	BOL	EGY	SAL	SRI	HON	CAM	NIC	COT	INA	CER	CON	KEN	BAN	MAD	CHA	MAL	ROW	AVE
TUR	0	23.5	9.1	22.4	30.9	12	13.9	11.2	30.6	7.6	11.7	12	7.8	9.7	16.5	36.1	4.8	33.5	10.1	19.2	0	25.2	29.7	12.5	27.7	35.2	97.7	16.4	0	17.7	19.1	12
POL	7.9	0	5.7	13.1	20.4	11.4	4.5	8.6	20.1	15.6	12.7	4.6	10.4	9.8	14.2	20	5.2	11.6	6.9	11.7	6.1	16.9	24.7	22.9	23.1	19.3	68	28.2	0	0	15.5	7
ECU	37.8	19.6	0	41.3	40.4	13.7	0	9.2	17.9	0	26.8	42.5	10	8.5	0	56.7	0	0	13.1	0	17.9	0	0	0	0	0	0	0	0	0	10.2	7.3
ALG	5.4	0	7.5	0	2	12	0	0	0	0	0	4.3	0.2	0	0	16.9	0	0	0	0	0	0	15.5	0	0	0	65	10	10.2	0	13.3	1.8
TUN	7.6	5.8	17.8	25	0	0	0	0	0	0	7	19.1	5.3	0	25	15.9	0	0	0	12.4	0	14.9	35	30	19.8	0	0	29	10.6	0	17.4	10.4
PER	2.4	8.4	12.5	3.8	33.6	0	5.9	7.3	12.1	13.4	3.4	3.3	0.8	9.6	22.6	0	6.3	10.4	9.6	27.1	17.8	21.2	6.7	0	32	49.8	39.9	23.9	29.9	0	8	4.3
DOM	9.4	11.5	8.5	0	43	14.1	0	9.1	20.9	0	9.4	2.9	16.7	10	0	0	0	0	8.8	5	10.9	0	0	0	0	0	0	0	0	0	0.6	9
GUA	8.9	9.8	8.6	3	0	14.3	18.1	0	0	0	30	14.1	4.4	0	16.9	9.3	11.8	35	11.4	0	19.7	0	35	0	0	50	105	0	0	0	16.3	8
PHI	7.3	14	11.3	13.3	43	12.3	9.8	8.4	0	9.3	10.1	4.8	7.3	0.2	24.4	6.3	10.4	11.1	5	0	0	22.9	34.4	11.1	0	25	66.9	10	0	15.1	19.7	4
PAR	0	8.4	6.5	0	27	12	0	5	19.2	0	3.7	2.5	0.1	10	15.6	0	1.1	0	1.2	0	10	22.6	0	0	0	0	0	10	0	0	27.6	5.5
JAM	9.6	16.3	16.7	30.8	27.1	12.5	5.9	9.2	31.2	11.9	0	21.3	9.7	8.8	9.2	21.8	15.4	10.5	9.2	22.4	18.7	23.2	28.9	27.4	28.3	40.1	85.2	23.2	20.2	38.3	19.7	6.7
CHN	6.6	3.9	1.5	18.4	23.8	16.6	37.2	0	21.4	0	3.5	0	0.6	10	0	32.2	20	0	20	22.1	0	21.5	33	26	22.5	38.7	0	22.4	30.2	0	17.2	10.5
MOR	7	11	13.2	52.8	29.6	13.3	0	12.6	23.4	12.6	10.9	20.3	0	9.2	0	29.2	25	16.7	13.6	23.2	35.2	13.7	21	25.9	30	37.8	94.6	24.5	27.9	31.8	19.5	7.1
INE	0.1	9.8	14.4	27.1	0	12.9	11.7	5	0	7.7	0	0	0	0	20	0	0	0	0	0	9	0	1.8	0	0	0	0	0	0	0	21.7	5.1
BOL	19.6	17	14.2	40.1	42.3	16.5	0	8.9	0	0	17	0	73.1	0	0	0	0	29.7	5	0	12	0	0	0	0	0	0	0	0	0	1.9	6.4
EGY	7.1	5.4	0	21.8	20.7	12	15	0	22.8	21.1	4.4	16.3	6.3	0	0	0	0	1.4	0	25.1	0	12.9	13.5	0	12.1	26.3	64.1	30	30.2	20	15	7.5
SAL	0	12.7	10.7	54.9	0	13.8	0	13.3	27.5	0	30	0	0	10	0	0	0	13.2	11.9	0	19.9	0	0	0	0	0	0	0	0	0	0.4	8.4
SRI	10.5	14.7	13.1	40	15.2	12.2	23	10.1	20.6	10.9	21.1	24.9	5.5	10	0	33.3	9	0	10	0	17	27.6	30.1	0	0	37.6	84.1	0	0	22.9	22.5	11.3
HON	0	10.4	7.5	0	0	12	13.7	12.9	0	0	0	25.1	0	0	25.8	0	12.1	0	0	0	24.3	0	45	0	0	0	0	0	0	0	21	4.7
CAM	0	9.8	0	52.5	17.3	0	0	0	14	0	2.2	12.7	0	0	0	0	0	10	0	0	0	18.9	0.7	21.8	29.8	19.4	105	10	19.9	0	17.9	4.1
NIC	0	0	13.9	0	0	23.2	16.9	11.1	0	0	0	25.1	0	8.3	30	0	15.4	0	13.1	0	0	0	33.9	0	0	0	0	0	0	0	14.6	5.8
COT	5.4	15.5	24.2	58.8	25.8	0	0	0	18.5	0	6.4	12.4	0.2	0	0	24.7	0	0	0	16.6	0	0	0	15.6	0	0	0	23.7	0	0	0.1	3.9
INA	6.8	14.8	10.1	18.6	26	12.4	0	8.2	26.5	0	9.3	17.6	4.2	9.5	0	19.1	0	19.3	6	18.6	13.2	0	0	15.4	0	0	0	20.2	0	0	1.3	5
CER	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.9	0	0	0	0	7.7	0	0	0	27.2	0	17.2	2
CON	0.2	10.8	0	0	22.2	0	0	0	0	0	0	7.5	0	0	0	0	0	0	0	29.3	0	0	0	29.8	0	0	0	0	0	0	0.1	0.5
KEN	5.5	10.8	10.6	60	15.1	0	0	0	17.5	0	11.8	3.5	5	5	0	31.4	0	16.8	0	10.5	0	0	0	0	0	0	0	14.4	0	0	3.9	6.3
BAN	6	14.4	0	40.5	34.3	16.3	0	24.6	11.7	0	9.7	7	3.4	10	0	29.7	0	27.5	25	10.1	10	0	0	0	0	0	0	0	0	0	1.6	10.4
MAD	14.1	9.3	0	59.8	17.6	12	40	0	0	0	4.5	13.7	0	0	0	8.1	0	25.3	0	0	0	0	43.3	0	0	31	105	0	0	19.2	22	8
CHA	0.1	0.7	0	3	27.8	0	0	0	0	0	1	2.5	0	0	0	40.8	0	0	0	8.6	0	0	0	23.8	0	0	0	0	0	0	0.1	0.7
MAL	25	31	0	15	39.1	12	0	0	59	0	0	18.5	10	0	0	0.2	0	0	0	10	0	0	0	0	0	0	0	12.3	0	0	8.1	7.9
ROW	7.5	10.6	9.9	18.9	18.2	13.6	6.7	9	20.8	11.7	13	7.7	3.6	9.4	18.4	18.6	16.5	23.7	13.5	12.8	19.4	19.3	25.1	17	17.9	25.4	76.2	13.8	26.2	14.4	0	4.2
AVE	7.2	14	14.1	17.8	27.4	12.7	13.7	9.5	24.3	10.8	18.5	17.4	9.3	9.1	14.7	20.9	9.4	20.1	10.2	14.7	15.6	15	23.8	15.7	18.7	26.4	81.7	19.6	16.6	19.5	17.3	5.4

Bilateral NTB Coverage Ratio in 1994
Upper Left Panel

	USA	SIN	SWI	HK	JAP	NOR	ICE	CAN	AUS	EU	ISR	NEW	KOR	CHI	CZE	MAL	SAU	ARG	MAU	OMA	VEN	URU	MEX	SOU	HUN	COL	THA	COS	BRA	GAB	TRI
USA	0	0.7	0	0	1.7	0.3	2.5	0	0.5	2.9	0	0.2	0	1.3	0	3.1	0	4.4	0	3.6	9.1	3.8	0	0	0	0	9.5	0	9.2	0	0
SIN	21.2	0	0	0	1.2	1	0	5	0.4	3.4	0	0.5	0	0.1	0	4.9	0	8.5	0	23.4	2.3	0	11.3	0	0	0	20	0	12.5	0	0
SWI	6.4	0.2	0	0	1.8	0.8	0.5	2	0.2	4.6	0	0.2	0	0.1	0.1	5.4	0	0.9	0	2.6	0.1	0.1	3.1	0	0	0	0.5	0	12.8	0	0
HK	32.6	0.4	0	0	0.8	25.2	1	19.8	0.6	22.6	0	2.1	1.3	0	0	4.4	0	4.3	0	5.7	4.1	0.3	51.9	0	0	0	1.5	0	17.9	0	0
JAP	14.5	0.7	0	0	0	0	2.6	0.7	0.2	1.4	0	0.1	0	0.1	0	10	0	22.8	0	1.9	54.5	21.9	9.8	0	0	0	7.2	0	14.4	0	0
NOR	4	0	0	0	8.7	0	1	0.1	0.6	5.8	0	0.1	0	0	0	3.4	0	0.3	0	14	1.1	0	2.4	0	0	0	0	0	27.7	0	0
ICE	5.7	0	0	0	15	1.6	0	0.4	0.3	13.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAN	0	0.7	0	0	1.9	0.1	6.4	0	1.2	4.5	0	0.1	0.3	5.1	1.1	3.6	0	3.2	0	18.3	22.6	0.6	0	0	0	0	12.6	0	6.3	0	0
AUS	9.2	0.5	0	0	1.4	0	0	2.4	0	10.8	0	2.2	0.5	0	0	12.6	0.2	0.1	0	1.3	0.4	0.8	9.7	0	0	0	0.4	0	18.4	0	0
EU	11.3	0.9	0	0	3.3	2.5	2.2	3.6	0.6	0	0	0.3	0.1	0.1	0.5	9.6	0.2	11.4	0	15.1	5	7.6	10	0	0	0	9.9	0	9.9	0	0
ISR	12.1	0	0	0	0.1	1.6	0.9	4.1	2	11.2	0	0.3	0	0	0	0	0	0.9	0	0	1.5	0	9.5	0	0	0	19.6	0	12.5	0	0
NEW	6.9	0.4	0	0	2.6	0.1	19.9	12.3	1.2	10.2	0	0	0	0	0	1.4	1.8	0.7	0	1	1.5	0	25	0	0	0	5.6	0	0.1	0	0
KOR	33.6	0.3	0	0	2.8	1.5	3.1	10	0.5	7.9	0	1.1	0	0	0	3.4	0	15.3	0	6.8	46.1	15.7	26.7	0	0	0	6.1	0	29.2	0	0
CHI	5.1	0	0	0	11	0	0	1.3	0.8	5.9	0	0	0	0	0	0	0	7.3	0	0	0.7	0.9	5	0	0	0	3.7	0	19.1	0	0
CZE	16.6	0.3	0	0	1.5	3.7	0.4	11.3	0.9	10.9	0	0.4	0	0	0	5.8	0	12	0	0	0.5	0.2	4.9	0	0	0	4.2	0	3.2	0	0
MAL	30.5	0.5	0	0	0.4	10.4	0	8.4	0.4	5.8	0	0.5	0	0.1	0	0	0	4.9	0	11.9	14.5	0.1	31.2	0	0	0	9.8	0	6.6	0	0
SAU	0.4	0	0	0	0	0	0	0.1	0.3	0.1	0	0	0	0	0	4.2	0	0	0	0.6	0.8	0	10	0	0	0	99.3	0	0	0	0
ARG	16.1	0	0	0	3.5	0	0	1.6	19.5	8.1	0	0	0	9.8	0	0	0	0	0	0	61.4	5.1	3.5	0	0	0	36.5	0	0.2	0	0
MAU	0	0	0	0	5.6	38.5	0	97.7	0	58.7	0	34.1	0	25.6	0	2.8	0	64.1	0	0	0	0	100	0	0	0	0	0	43.7	0	0
OMA	34.7	0	0	0	0.2	0	0	33.6	0	9	0	0	0	0	0	2	0	0	0	0	0	0	30.4	0	0	0	0	0	0	0	0
VEN	1.8	0.1	0	0	0.2	0	0	0	0	7	0	0	0	0	0	0	0	0.3	0	0	0	0	8.4	0	0	0	91.4	0	0	0	0
URU	32.8	0	0	0	7.9	0	0	17.2	0	16.6	0	0	0	0	0	0	0	18	0	0	2.4	0	6.2	0	0	0	19.1	0	8.8	0	0
MEX	0	0.5	0	0	0.9	0.6	0	0	0.6	6.3	0	0.1	0	0	0	0.3	0	12.1	0	0	5.3	7.6	0	0	0	0	15	0	22.3	0	0
SOU	13.6	0.5	0	0	3.6	0	0	1.5	0.3	13.8	0	0.1	0.5	0	0	3	0	2.5	0	1.9	1.1	0	7.5	0	0	0	11.5	0	14.7	0	0
HUN	30.9	2.2	0	0	2.4	18.8	0.3	14.4	0.8	15.9	0	1.6	0	0.2	0	10.8	0	3.4	0	1.3	0.7	1.3	38.3	0	0	0	10.1	0	27.9	0	0
COL	10.3	4.7	0	0	1.2	0	0.1	2.8	0	48.2	0	0	0	0	0	0	0	0	0	0	0	0	7.7	0	0	0	0	0	0	0	0
THA	17.3	2.5	0	0	1.1	2.4	0	6.1	2	18.4	0	2.2	0	0.5	0	21.4	0	12	0	0.3	13.2	8.1	16	0	0	0	0	0	3.2	0	0
COS	0	0	0	0	0.2	0	0	10.1	0	0.3	0	0	0	0	0	98.9	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
BRA	30.6	0	0	0	2.4	3	0	8	1	17.3	0	0	0	0	0	6.5	0	11.1	0	0	0	0	3.2	0	0	0	0.2	0	0	0	0
GAB	17.6	4.3	0	0	0.5	0	0	2.1	0.2	60.3	0	0	0	0.1	0	31.1	0	9.8	0	0	10.5	0.3	15.2	0	0	0	2.7	0	1.1	0	0
TRI	9.2	0	0	0	1.9	0	0	4	0	2.3	0	0	0	0	0	0	0	0	0	0	6.8	0	4.7	0	0	0	59.8	0	0	0	0

Bilateral NTB Coverage Ration in 1994
Lower Left Panel
(In percentage)

	USA	SIN	SWI	HK	JAP	NOR	ICE	CAN	AUS	EU	ISR	NEW	KOR	CHI	CZE	MAL	SAU	ARG	MAU	OMA	VEN	URU	MEX	SOU	HUN	COL	THA	COS	BRA	GAB	TRI
TUR	54.5	0.2	0	0	1	18	1.4	35	10.8	48.8	0	0	0	0	1.2	39.6	0	2.1	0	0	0.1	0.3	26.1	0	0	0	5.3	0	17.8	0	0
POL	24.6	0	0	0	5.2	5.4	0	5.7	1.4	19.7	0	0	0	0	1.1	3	0	1.9	0	0	0.4	6.7	0.9	0	0	0	0.1	0	5.1	0	0
ECU	4.1	79.8	0	0	3.3	0	0	2.7	0	25	0	0	0	0	0	0	0	0	0	0	17.9	0	22.9	0	0	0	54.9	0	0	0	0
ALG	0	0	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
TUN	35.3	0	0	0	5.6	11.5	0	49.2	0	53.5	0	0	0	0	1.8	0	0	2.3	0	0	0	0	84.1	0	0	0	0	0	18.2	0	0
PER	18.7	0	0	0	22	0	0	8.4	0	14.3	0	0.1	0	0	0	0.4	0	0.6	0	0	2.1	0	9.7	0	0	0	0.2	0	0.2	0	0
DOM	53.1	0	0	0	6.7	10.9	0	17.7	4.8	21.2	0	0	0	1.3	0	0	0	0.1	0	0	11.1	0	59.1	0	0	0	0.3	0	0	0	0
GUA	11.6	0	0	0	0	0	0	1.8	0	76.6	0	0	0	95.5	0	0	0	0.2	0	0	65.3	0	3.8	0	0	0	0.3	0	0	0	0
PHI	20.9	0.5	0	0	2.9	18.6	0.5	13.6	1.1	9.4	0	0.6	0.1	0	0	0.9	0	1.2	0	0.2	55	6.7	12.5	0	0	0	0.3	0	62.2	0	0
PAR	22.7	15.2	0	0	0.4	0	0	9.7	0	1.7	0	0	0	0.4	0	0	0	8.4	0	0	53.3	0	0	0	0	0	46.5	0	0	0	0
JAM	26.7	0.8	0	0	3	20.7	0.2	20	0.6	18.2	0	1.9	1	0	0	3.4	0	8.3	0	1.7	0	4.5	25.5	0	0	0	3.6	0	31.4	0	0
CHN	15.7	0	0	0	5.2	0.6	0	4.3	0.3	31.3	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0.2	0	65.1	0	0
MOR	35.3	0.2	0	0	1.3	33.9	0	26.9	0.9	33.9	0	1.8	0	0	0	4.4	0	1.4	0	0.7	0	2.5	30.9	0	0	0	1.7	0	10.3	0	0
INE	11	0	0	0	0.1	0	0	2.2	0	4.4	0	0	0	17.1	0	0	0	2.4	0	0	49.2	0.9	4.2	0	0	0	10.2	0	100	0	0
BOL	59.3	0	0	0	2.2	0	0	4.1	0	16.6	0	0	0	0	0	0	0	35.4	0	47.8	0.3	0	5.2	0	0	0	0.1	0	0	0	0
EGY	41.6	0	0	0	0.5	0.2	0	60.6	0.2	32.5	0	0	0	0	16.3	0	0	0.4	0	4.4	0	0	30.6	0	0	0	21.5	0	25.6	0	0
SAL	76.4	50.8	0	0	0	0.1	0	14.2	0	95.5	0	0	0	42.8	0	13.8	0	1.4	0	0	94.7	0	22.7	0	0	0	55.2	0	0	0	0
SRI	78.9	6.2	0	0	1.5	34.6	0	58.9	0.2	49.7	0	1.8	0.9	0	0	0.1	0	0	0	1.3	0	0	3.5	0	0	0	16	0	1	0	0
HON	5.6	0	0	0	0	0	0	0.1	0	86.7	0	0	0	0	0	0	0	0	0	0	59.7	0	0	0	0	0	0	0	0	0	0
CAM	0.1	0	0	0	0	0	0	0	0	20.6	0	0	0	0	0	0	0	0	0	0	0	0	96.8	0	0	0	99.1	0	0	0	0
NIC	3.8	0	0	0	0.3	0	0	0	0	66.4	0	0	0	14.9	0	0	0	0	0	0	49.7	0	4.8	0	0	0	0	0	0	0	0
COT	0.7	16.7	0	0	0.8	0	0	0.3	0	14.6	0	0	0	0	0	0.1	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0
INA	35.3	0.8	0	0	2.9	18.6	0.8	43.1	0.2	36.1	0	1.2	0.1	0	0	4	0	20.8	0	3.2	0.9	27.7	29.4	0	0	0	14.1	0	56	0	0
CER	10.5	0	0	0	0	0	0	0	0	2.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CON	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KEN	35.2	2.1	0	0	4.3	0.5	0	14	0	39.4	0	0.2	0.2	0	0	9.8	0	0	0	3.3	0	0	21.9	0	0	0	0	0	0	0	0
BAN	82.4	0	0	0	7.2	54.4	0	89.3	0	79.3	0	0	4.7	0	0	0	0	20	0	2.5	0	0	81.6	0	0	0	3	0	0	0	0
MAD	14.7	0.1	0	0	4.5	0	0	2.8	0	42.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHA	0	0	0	0	0	62.3	0	4.9	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MAL	5.9	0	0	0	0	0	0	35.7	0	11.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROW	15.8	2.3	0	0	1.3	3.5	0.4	10.2	0.2	16.5	0	1.6	0	0	0.5	10.5	0	2.9	0	1.8	5	1.1	32.6	0	0	0	78.9	0	12.4	0	0
AVE	15.9	0.8	0	0	2.1	2.9	2	2.8	0.6	3.7	0	0.9	0.1	1.6	0.4	6.8	0.1	9.3	0	7.4	12.7	6.4	12	0	0	0	19.6	0	10.7	0	0

Bilateral NTB Coverage Ratio in 1994
Upper Right Panel
(In percentage)

	TUR	POL	ECU	ALG	TUN	PER	DOM	GUA	PHI	PAR	JAM	CHN	MOR	INE	BOL	EGY	SAL	SRI	HON	CAM	NIC	COT	INA	CER	CON	KEN	BAN	MAD	CHA	MAL	ROW	AVE
USA	0.7	0	0	16.9	1.8	4.7	0	0	0	0	39.1	1.7	3.3	0	0	0	23.5	0	0	0	2.4	0	13.7	0	0	0	0.7	0	0	0	10.9	4.1
SIN	0.3	0	0	0.5	3.4	0.1	0	0	0	0	15.9	1.2	0.7	0	0	0	22.1	0.1	0	0	0	0	22.2	0	0	0	4.5	0	0	0	11.3	7.3
SWI	0.4	0	0	1	4.7	0.3	0	0	0	0	15	2.8	0.5	0	0	0	47.9	0	0	0	0	0	9.2	0	0	0	1.3	0	0	0	3.4	4
HK	1.6	0	0	8.2	19.8	1.9	0	0	0	0	16.1	5.6	7.1	0	0	0	13.9	0.1	0	0	0	0	36	0	0	0	27.9	0	0	0	7.8	17.6
JAP	0.6	0	0	0.1	6.6	0	0	0	0	0	16.9	33.7	2.3	0	0	0	11.4	0	0	0	0	0	8	0	0	0	1.1	0	0	0	10.6	6.8
NOR	0.5	0	0	0	0.4	0	0	0	0	0	16.4	0.6	3.1	0	0	0	19.2	0	0	0	0	0	13.4	0	0	0	0.3	0	0	0	8.5	5.3
ICE	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.4	0	0	0	0	0	0	0	4.8	11.5
CAN	0.1	0	0	5.1	0.4	8	0	0	0	0	49.4	0.4	1.2	0	0	0	67.9	0	0	0	0.1	0	3.7	0	0	0	0	0	0	0	13.1	7.4
AUS	0	0	0	0	0	0.3	0	0	0	0	30.5	0	4.9	0	0	0	29.4	0.1	0	0	0	0	2.5	0	0	0	0.4	0	0	0	13	5.5
EU	1.1	0	0	6.6	27	2.4	0	0	0	0	20.9	5.6	5.5	0	0	0	36.8	0	0	0	0.6	0	33.9	0	0	0	0.9	0	0	0	12	2.8
ISR	2	0	0	0	0	0.1	0	0	0	0	21.6	0.5	3.4	0	0	0	61.7	0	0	0	0	0	57	0	0	0	0	0	0	0	9.3	9.5
NEW	0.2	0	0	8.5	92.3	77.9	0	0	0	0	60.3	0	21	0	0	0	0.6	0	0	0	0	0	1.8	0	0	0	0	0	0	0	12.9	6.8
KOR	1.3	0	0	0.1	16.5	1	0	0	0	0	18.5	22.6	2.2	0	0	0	12.2	0	0	0	0	0	13.5	0	0	0	15.2	0	0	0	10.9	11.6
CHI	0	0	0	100	0	1.7	0	0	0	0	2.5	0	0	0	0	0	15.3	0	0	0	0	0	0.2	0	0	0	0	0	0	0	8.9	5.5
CZE	4.2	0	0	0.2	10.2	0	0	0	0	0	36	7.3	2.6	0	0	0	35.8	0	0	0	0	0	7.7	0	0	0	1	0	0	0	7.5	9.4
MAL	0.1	0	0	0.7	0.8	0	0	0	0	0	56.6	0.1	1.1	0	0	0	6	0	0	0	0	0	12.4	0	0	0	3.1	0	0	0	19.3	10.4
SAU	0.1	0	0	5.4	0.8	0	0	0	0	0	24.8	0	1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2.8
ARG	0.4	0	0	72.7	0	16.1	0	0	0	0	66.6	0	1.3	0	0	0	34.6	0	0	0	0	0	23.7	0	0	0	0	0	0	0	24.1	18.2
MAU	0	0	0	0	0	0	0	0	0	0	15.6	0	0	0	0	0	0	0	0	0	0	0	16.1	0	0	0	50	0	0	0	12.5	52.9
OMA	0	0	0	0	5.2	0	0	0	0	0	0	5.3	9.1	0	0	0	0	0	0	0	0	0	12.3	0	0	0	12.5	0	0	0	11.3	3.7
VEN	0.2	0	0	0.1	0	0.1	0	0	0	0	0	0	13	0	0	0	15.1	0	0	0	96	0	1.1	0	0	0	0	0	0	0	11.6	10.5
URU	0	0	0	100	0	72.1	0	0	0	0	28.8	0	0	0	0	0	2.9	0	0	0	0	0	0.1	0	0	0	0	0	0	0	20.6	17.5
MEX	4.6	0	0	0	0	0.7	0	0	0	0	54.9	1	0	0	0	0	27.6	0	0	0	2.5	0	4	0	0	0	0	0	0	0	10.5	15.8
SOU	0.3	0	0	10.8	0	0	0	0	0	0	27.2	0	2	0	0	0	4.7	0.3	0	0	0	0	1.8	0	0	0	0.3	0	0	0	27.8	15.7
HUN	1	0	0	8.9	23	70.6	0	0	0	0	60.1	4.1	0.4	0	0	0	29.5	0	0	0	0	0	23.4	0	0	0	4.3	0	0	0	9.7	12.5
COL	0	0	0	100	0	0	0	0	0	0	98.3	0.5	0	0	0	0	13.2	0	0	0	0.1	0	13.1	0	0	0	0	0	0	0	7.2	19.7
THA	0.4	0	0	0.2	0	0.5	0	0	0	0	63.5	1.3	0.8	0	0	0	29.5	0	0	0	0	0	6.9	0	0	0	3	0	0	0	19.5	13.3
COS	0	0	0	0	0	0	0	0	0	0	37.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.3	2.6
BRA	1.5	0	0	7.5	4.1	0.8	0	0	0	0	18.1	1.3	0.1	0	0	0	0	0	0	0	0	0	19.1	0	0	0	0	0	0	0	8.9	15.5
GAB	7.3	0	0	37.2	0	2.2	0	0	0	0	66.6	0	0.1	0	0	0	33.9	0	0	0	0.2	0	12.3	0	0	0	0	0	0	0	8.2	23.2
TRI	0	0	0	0	0	0	0	0	0	0	0	0	1.6	0	0	0	64.6	0	0	0	0	0	5.8	0	0	0	0	0	0	0	21.6	11.1

Bilateral NTB Coverage Ratio in 1994
Lower Roght Panel
(In percentage)

	TUR	POL	ECU	ALG	TUN	PER	DOM	GUA	PHI	PAR	JAM	CHN	MOR	INE	BOL	EGY	SAL	SRI	HON	CAM	NIC	COT	INA	CER	CON	KEN	BAN	MAD	CHA	MAL	ROW	AVE
TUR	0	0	0	8.5	9.8	0	0	0	0	0	34.2	2.1	0.2	0	0	0	15.3	0	0	0	0	0	2.6	0	0	0	0	0	0	0	7.4	32.7
POL	0.8	0	0	0.2	8.9	0	0	0	0	0	11.9	1	22.9	0	0	0	48.6	0	0	0	0	0	2.8	0	0	0	0	0	0	0	3.6	15.4
ECU	0	0	0	93.9	0	0.4	0	0	0	0	0	0	1.3	0	0	0	0	0	0	0	94.1	0	0	0	0	0	0	0	0	0	8.5	8.7
ALG	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0	0	0	0	0	0	0	10.5	2.9
TUN	0	0	0	8.2	0	0	0	0	0	0	38.1	10.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	44.8
PER	0	0	0	36.7	0	0	0	0	0	0	1.4	0	0	0	0	0	28.7	0	0	0	0	0	10.5	0	0	0	0	0	0	0	13	10.8
DOM	0	0	0	0	0	7.3	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	45.6
GUA	0	0	0	0	0	45.5	0	0	0	0	100	0	0	0	0	0	10.7	0	0	0	1.5	0	30.5	0	0	0	0	0	0	0	5.1	22.4
PHI	0.6	0	0	73.2	0	0	0	0	0	0	7.9	0	2.3	0	0	0	0.1	0	0	0	0	0	32.6	0	0	0	0.1	0	0	0	26.3	11
PAR	0	0	0	0	0	0	0	0	0	0	93.3	0	0	0	0	0	18.2	0	0	0	0	0	0	0	0	0	0	0	0	0	14.8	29.1
JAM	1.1	0	0	13.5	6	1.5	0	0	0	0	0	2.2	0.5	0	0	0	13.3	0	0	0	0	0	13	0	0	0	15.3	0	0	0	6.3	8.8
CHN	0	0	0	2.2	0.5	3.3	0	0	0	0	60.7	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0	0	0	0	6.2	21.7
MOR	1.5	0	0	1.1	15	1.6	0	0	0	0	22.6	1.2	0	0	0	0	0	0	0	0	0	0	28	0	0	0	12.5	0	0	0	11.7	14.1
INE	0	0	0	23.5	0	6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.5	0	0	0	0	0	0	0	9.4	6.7
BOL	0	0	0	100	97.7	0	0	0	0	0	0	0	38.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	29.6
EGY	1	0	0	6.8	3.6	0	0	0	0	0	71.7	7.1	0.1	0	0	0	0	0	0	0	0	0	15.8	0	0	0	0	0	0	0	13	24.2
SAL	0	0	0	0	0	26.4	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0.1	52.6
SRI	3.6	0	0	0	0	0	0	0	0	0	31.6	0	0	0	0	0	0	0	0	0	0	0	22.8	0	0	0	1.4	0	0	0	10.8	47.7
HON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13.1	0	0	0	0	0	50	0	0	0	0	0	0	0	10	30.6
CAM	0	0	0	0	0	0	0	0	0	0	68.9	0	0	0	0	0	0	0	0	0	0	0	0	2.7	0	0	0	0	0	0	8.2	18.6
NIC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9	22.8
COT	0	0	0	3.5	0	0	0	0	0	0	46.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.5
INA	0.2	0	0	0.4	7.3	0.3	0	0	0	0	10.8	6.6	0.3	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0.7	17.9
CER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19.6	3.4
CON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13.6	0	0	0	0	0	0	0.2	0.2
KEN	0	0	0	100	0	0	0	0	0	0	2	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	18.1
BAN	0	0	0	0	47.3	0.9	0	0	0	0	27.2	9.9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	64.7
MAD	0	0	0	0	7	0	0	0	0	0	3.1	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	9.3	29.2
CHA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.4
MAL	0	0	0	0	0	0	0	0	0	0	0	0	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.7	6.2
ROW	0.7	0	0	4.6	3.9	9.2	0	0	0	0	45.3	0.4	0.9	0	0	0	6.4	0	0	0	78.4	0	3	0.4	0	0	22.3	0	0	0	0	12
AVE	0.9	0	0	7.7	22	4.4	0	0	0	0	22.3	4.7	3.3	0	0	0	22.2	0.1	0	0	16.8	0	22.7	0.5	0	0	9.5	0	0	0	11.1	6.4

Bilateral Trade Flow Matrix in 1994
Upper Left Panel
(In ten thousands of U.S. dollars)

	USA	SIN	SWI	HK	JAP	NOR	ICE	CAN	AUS	EU	ISR	NEW	KOR	CHI	CZE	MAL	SAU	ARG	MAU	OMA	VEN	URU	MEX	SOU	HUN	COL	THA	COS	BRA	GAB	TRI
USA	0	165336	67730	146271	694954	18130	1696.2	1E+06	121915	1E+06	53717	23126	285276	45232	6099.2	112168	66115	49684	61.5	2762.4	56283	3861.9	585594	31368	75210	18799	142817	589.6	4271.2	53229	9966
SIN	211220	0	3519.9	105967	91022	1836.3	0	10472	22860	158346	3000.1	3799.3	29438	758.6	721.1	207875	3347.7	1663.9	864	509.7	236.9	286.5	3132	4770.5	66759	78.1	5873.3	98	429.5	184.8	32.6
SWI	76631	14249	0	23325	35893	4871	254.9	6564.7	7987.9	560519	13928	1344.4	10737	1332.1	5861.5	6855.8	10934	2437.7	366.6	520.1	1058.6	363.6	4028.9	6531.5	9028	306.4	9264.5	21.2	4258.9	1989	105.9
HK	387322	52970	10805	0	107056	4193.8	104.2	27133	24688	265109	3870.5	3428.9	27961	6256.6	1330.1	18355	5303.4	3687.5	1274.7	309.7	1216.9	738	4407.9	8616.7	16571	393.1	13327	170	957.4	656.3	129
JAP	1296870	246397	25121	284491	0	10033	617.2	74839	86380	733262	10180	17933	314462	8784.1	3028.1	180646	27398	5669	863.3	6048.7	4500.4	768.8	27150	27550	211802	1018.8	26391	411.1	3274.8	6495.7	518.1
NOR	28740	4898.7	2532.5	1604.6	8149.2	0	1886.9	16746	1065.2	349627	1499.8	349.1	2016.6	357.8	858.4	590.3	1420.9	671.8	5	30.3	191.7	15.8	214.1	346.9	1710.1	50	2662.7	18.8	239	232.5	30.9
ICE	2380.5	1.5	464.3	7	2237	633.4	0	363.4	9.4	12166	4.2	77.1	74.1	7.2	9.6	0.5	3.5	0.2	0.3	0	0.2	0	2	35.3	13.8	0	83.6	0	0.8	2.7	0
CAN	1644230	4213.2	4636.5	13459	95589	6352.8	129.9	0	9549.8	130815	2151.7	1975.5	22409	3693.5	588.8	4102.9	4124.6	3039	26.8	147.5	8557.8	224.3	15062	2583.6	4440.2	364.6	11974	15.4	380.7	5501.4	1017.4
AUS	35047.5	27707	2765.6	19809	119816	577.4	540	9301.4	0	57273	385	37025	47317	1237.5	182.7	17754	2129.5	1202.5	612	767.4	91.1	32.5	718.6	5096	13024	4.4	2371.2	0.2	34.2	160.1	48.6
EU	1471595	170672	726483	221529	473480	257292	12332	167435	149018	1E+07	156818	30155	179991	31775	198500	113559	108736	67245	8397.8	16595	22303	8013.5	72798	126794	118740	4616.4	164876	6083.9	96747	27223	3824.9
ISR	64699	2392.6	3491.8	10321	14358	438.5	4.9	1768.6	2847.5	71471	0	314.2	3310.7	1131.3	418.6	47.8	0	854.9	52.9	0	210.6	139.1	502.4	2189.6	2634	89	1465.8	3.7	509.1	740.7	13.4
NEW	14093.8	1942	504.7	4334.8	22732	96.4	1.5	2291.2	27991	21340	20	0	7195.6	586.9	43	2952.3	1070.5	271.9	203.3	91	514.8	12.4	738.5	394.6	1949.8	41.2	465.2	0	12.7	24.1	73.2
KOR	243750	65098	4331.7	106313	172784	6254	192	23686	16733	166477	4235.4	2343	0	6023.8	1597.6	32503	11172	4143.4	273.4	1123.2	1090.3	566.8	8851.8	6043.1	24912	610.7	14695	79.6	1653.7	2618.5	329.8
CHI	24358.2	1477	697.9	918.1	30357	492.4	2.4	1317.3	671.9	39940	41.9	173.1	9897.2	0	20.5	1193	604.4	5810.4	9.9	119.6	1296.1	555.3	2381.8	1041.8	1722.2	151.5	11977	0	10.3	2008.3	10.7
CZE	4753.9	1277.9	3570.2	669.1	1530.2	798.9	58.1	614.3	462.2	155941	455.3	61.6	561.6	54.1	0	127.8	194.5	235.6	3.2	5.2	12.6	40.2	131.5	257.9	623.2	37.4	193.4	3.4	511.3	333.3	18.6
MAL	155839	162960	1352.2	37384	88381	632.6	12.8	6487.8	10801	103598	0	2094.1	21774	715.9	341.6	0	3380.5	730.8	393.3	454.6	181.4	63	2666.7	2575	29544	7.8	2305.3	6	253.4	149.8	27.8
SAU	88980.4	30621	2354.4	3641.2	97303	59.3	0	3656.9	3272.8	97114	0	1807.2	48763	49.8	12.6	2270.3	0	165.3	42.3	1518.3	6.7	236	39.2	2087.7	5771	0	12667	0	0	10.8	0.7
ARG	20351.7	910.6	1877.1	2954.4	4939.1	312.7	0.1	1073.6	436.3	47377	577.2	127.1	1481.6	14790	94.2	2426.6	102.3	0	160.6	58.1	3206.6	6784	1859.3	3104	1378.8	289.8	60941	9.5	98.7	2524.6	53.3
MAU	0	49.7	183.4	114.6	98.4	12.3	0.5	97	28.6	13548	1	2.7	4.9	2.3	0.6	5.6	1.2	1.9	0	0	0	0.3	1.2	63.9	11.9	0	0.1	0.7	2.6	0	0
OMA	2179.6	2265.8	9.8	1275.9	18532	0.5	0	4.6	63.8	636.8	0	469.5	9388.3	0	0	22.6	633.9	0	0	0	0	2.3	0	0.2	77.3	6879.1	0	0	0	0	0	0
VEN	100600	5.9	11.6	67.1	3205	86.5	0	4400.7	3.5	18100	14.9	0	375	1660.9	0	10.7	1.8	389.8	0	0	0	133.2	1971.5	10.5	23.7	993	14712	0	0	14832	270.6
URU	1371.8	60.1	102.4	597.3	238.6	70.1	0.5	210.1	45.8	4871.1	587.1	0.2	117.2	412.6	47.6	73.5	120.2	2774.2	0	0	111.9	0	171.7	41.9	60.3	7.7	8327.6	0.5	6.2	274.2	1.2
MEX	718162	1018.6	3282.9	2242	9894.8	188.9	4.8	40147	803.4	39913	88.4	79.7	1854.6	6627.6	55.1	160.7	158.3	4326.3	0.7	14.9	3738.4	733	0	150.8	994.1	1460.1	9683.1	0	12.5	5510.7	117.7
SOU	18106.9	2356.4	7823.8	5288.5	16033	1445.7	21.6	1824.8	3720	81682	1931.8	524	5516.2	621.6	182.6	1900.7	879.1	1183	1757.5	44.4	201	77.1	331.8	0	1908.5	9.4	2288.8	66.7	65.6	127.9	20.4
HUN	103039	80537	4766.6	29075	98876	889.5	46	6161.6	8225	89248	1541.2	1157.3	9062.1	421	766.8	19373	5747.2	452.4	240.6	244.3	58.9	28.7	936.3	2208.1	0	43.6	1070.8	359.5	290.9	141.8	31.9
COL	14030.1	40.1	408.4	204.8	314.3	97.7	5.7	456.1	15	8374.9	61	0.8	21.9	166.6	119.8	1.5	2.4	39.9	0	7	120.6	0	151.5	7.8	6	0	77.4	0	20.5	93.3	11
THA	98596.9	3380.1	4310.6	4066.9	34349	1511.2	20.6	6698.7	3329.2	138473	373.3	553.9	9570.7	13301	704.2	2912.7	3880.6	45429	189.2	156.9	4743.2	8417.2	6104.9	2675.6	4702.1	915.8	0	26.5	1407.1	4889.7	697
COS	15575.4	157.4	2.6	105.4	1147.4	69.3	0	3.5	93.2	5699.1	136	0	1146.7	0	0.1	26.2	0	0.3	0	0	0	0	7.3	15.2	52.9	0	162.1	0	0	0.8	0
BRA	4603	105.3	1858.7	153.3	859.6	371	10.6	258	223.8	74770	423.9	14.8	105.5	29.5	52	89	0.9	83.3	6.4	10.1	12.9	14	46.1	176.1	104.1	0	294.4	0	0	19	1
GAB	39492.2	76.2	628.5	951.4	3981.6	412.1	7.3	2125.2	119.8	27266	110.2	18.5	542.3	1818.4	133.7	25.1	53.4	606.1	1.5	0	9621.7	101	1125.4	18.1	103.1	1010.1	1546	0.7	15	0	107.5
TRI	11166.4	22.2	0.7	8.3	22	16.8	0	237.1	5.7	2686.7	0	11.5	82.7	200.7	0.3	0	0.7	29.7	0	0.2	296.8	0.3	589.6	1.7	0.1	45.5	489.9	0	0	594.1	0

Bilateral Trade Flow Matrix in 1994
Lower Left Panel
(In ten thousands of U.S. dollars)

	USA	SIN	SWI	HK	JAP	NOR	ICE	CAN	AUS	EU	ISR	NEW	KOR	CHI	CZE	MAL	SAU	ARG	MAU	OMA	VEN	URU	MEX	SOU	HUN	COL	THA	COS	BRA	GAB	TRI
TRI	11166	22.2	0.7	8.3	22	16.8	0	237.1	5.7	2687	0	11.5	82.7	200.7	0.3	0	0.7	29.7	0	0.2	296.8	0.3	589.6	1.7	0.1	45.5	489.9	0	0	594.1	0
TUR	17220	1759	2421	2382.8	2156.1	679.7	26.1	1339	485.9	1E+05	2691	117.9	1129	89.3	951.8	1167	5088	78	43	187.9	187.9	26.5	95.6	700.1	622.8	6.8	313	15.4	1500	42.4	12.6
POL	6670.5	713.9	1997	471.5	493.9	1876	213.3	798.7	181.7	2E+05	201.5	44.4	716	66.6	10248	359.6	419	216.9	0.8	10.1	83.7	43.5	290.8	159	987.1	58.2	1391	0.7	2767	201.5	9.8
ECU	21586	15.4	177.2	44.3	1948.1	64	3.4	1005	17.1	10561	32.8	218.3	3119	2095	223.1	23.3	0	1010	0.9	0	297.8	184	743	18	10.4	0	526.4	0	0	2750	2.2
ALG	15566	214	541.9	0	717.1	159	0	2351	0	59300	0	0	1337	0	0.5	0.3	1.3	185.3	0	0.6	0	0	0	0	0	0	2237	0	0	0	0
TUN	750.9	12.2	495.9	3.7	178.2	48	7.9	27.4	26.6	47409	0	0.5	41.7	0	10.8	36.5	169.4	6.1	0.4	8.5	52.5	22.3	2.7	44.9	0	0	164.1	6	13.2	0.4	0
PER	10901	146.5	1832	346.6	4998.4	324.6	0.1	849.4	117	17322	83.9	23	1197	1572	151.9	882.4	33.2	356.2	1.3	0	1676	32.1	1015	208.4	171.5	103.4	2210	0	179.1	1322	5.5
DOM	35512	5.1	43.1	14.6	374.7	6.1	0.5	532.1	7.5	3287	0.3	1.8	61.6	2.6	27.4	0.3	0	10.3	0	0	33	0	25.2	2.2	3	0	16.1	0	0	25.9	31.7
GUA	7303	48.3	120.5	3.3	608.5	28.3	0	288	15.3	3291	7.7	5.3	17	211.9	11.2	3.5	213.2	10.9	0	0	417.6	0.3	479.8	44	1.4	1101	8.6	0	1.5	75.3	15.1
PHI	63249	9724	363.2	7570.1	28150	114.2	1.2	2031	1498	30262	90.2	245.9	4540	226.3	17.1	3269	647.4	67	34.7	38.1	20.8	10.3	337.9	239.9	7982	1.5	176.6	0	30.8	16.5	1.8
PAR	378	4	25	54.3	44.2	0	0	3.8	0.2	1837	25.6	0.2	18.4	354.1	0.9	10.1	2.4	1184	0	0	384.3	103.8	11	22.2	35.1	0	4337	0	0	78.9	0.8
JAM	264247	31601	4411	377460	286966	2705	77.9	17197	17450	2E+05	1439	2584	63796	3559	1243	13039	7417	3051	543.3	258.7	49.4	345.3	2118	5910	18210	227.3	3823	28.1	1097	643.1	121.9
CHN	1514.9	8.6	403.1	16	3874.4	163.2	0.3	366.7	81.9	33216	2	206.3	166.6	11.7	26.1	1.5	659.1	58.6	21.4	1	3.9	14.3	650.1	15.6	57.8	0.9	552.8	77.5	10.1	5.4	0
MOR	74298	21406	693.9	19150	130551	413	6.8	3881	9987	75350	0	1661	30214	781.4	299.7	12757	4507	508.9	131.9	146.6	147.5	23.5	1125	863.2	7742	0.1	1292	17.2	206.1	226.7	15.9
INE	3460.2	0	509.2	0.9	42.3	0.3	0	63.5	5.7	3168	0.6	0.2	12.7	274.6	3.8	29.7	14.9	1495	0	2.4	104.1	20.4	24.8	0.9	0.2	0.1	286.2	0	0.2	656.9	0
BOL	8946.9	6.3	22.7	9.4	361.4	1471	0.5	1458	4.2	4495	0	38.9	6.3	7.5	0.1	1	0	0.5	0	0.2	17.6	0.3	45.2	50.7	1.5	0	118.3	0	0	40.2	207.2
EGY	5661.2	833.9	80.1	26.8	563.1	50.6	0.2	96.4	28.3	17816	1748	1.4	742.1	13.1	62.9	101.8	1234	10.6	2.6	24.7	0.8	0.8	1.1	124.7	45	0.2	82.8	1.5	34.7	8.2	0.6
SAL	8443.3	2.9	14.7	7.9	164	44.4	0	317.8	6.6	3444	0	0	1.4	11.4	27.4	0.8	0	0.4	0	0	103.8	0.7	80.9	0.6	3.4	0	3.5	0	0	10.7	0.1
SRI	8710.2	386.4	104.3	234.4	1429.9	63.3	3	299.5	198.2	7760	43	32.7	244.7	52.4	5.4	135.9	123.6	25.3	4.4	25.9	0	6.8	120.7	116.6	153.4	0.5	8.8	0	23.6	16.6	2.8
HON	3817.5	0	65.8	1.3	478.1	2.3	0	129.8	3.5	2558	0	0	120	0.1	37	0	0	0	0	0	2.7	0	11.7	0	0	62	0	0	6.1	15.6	24.5
CAM	181.2	35	0.7	81.7	123.6	0.1	0	69.4	2.3	11656	0	0.9	512.5	0	0	10.7	9.5	0	49.1	0	2.4	0	44.4	36.1	163.4	0	94.5	244.1	0	0	0
NIC	2471.9	0.7	78.5	9.2	80.9	15.1	0	60.6	0.4	1716	0	0	36.5	0.9	1.4	0	0	6.5	0	0	25.2	0	95.4	0.6	3.2	187.2	0.4	0	0	13.3	0
COT	2313.3	45.9	189.1	46.6	163.4	1.8	0.1	207.1	40.9	28129	52.8	1.1	32.2	3.8	110.7	221.1	0	218.8	3.6	0	0	0	12.3	382.5	476.7	0	14.4	0	0	0.5	0
INA	61188	9131	2851	18801	29253	1092	50.8	4020	4120	99951	1868	760.2	5902	345.3	610.1	5530	0	626.2	1698	1422	128.5	164.8	1280	1981	6380	0	1404	0	40.7	354.9	63.8
CER	2.2	0	2.4	5.4	9	0.4	0	3	0	896.7	0	0	0	0	0	0	0	0	0	0	0	0	0	2.8	0	0	0	0	0	0	0
CON	2235.1	0	1.4	10.2	145.4	85.9	0	6.7	0.6	9528	0.7	0	150	0	3.2	7.6	0	0.9	6.7	0	0.3	0	0.4	8.6	30	0	0	0	0	0	0
KEN	1081.8	89.1	191.1	187.6	312.3	61.8	0.2	139.3	87	7956	131.5	16.4	48.5	1.1	1	65.7	0	5.8	169.1	6.8	0	0	11.9	310.6	140.5	0	15.6	0	0	1	0.3
BAN	13453	177.5	104.5	997.4	1456.7	216.5	6.8	735	182.9	16867	0	45.8	86.3	11.1	13.8	90.6	0	35.1	0.2	12.2	0	15	72.7	65.3	199.9	0	107.5	0	0	1.1	0.2
MAD	237.4	84.5	46.1	25.4	225.5	0.4	0	2.7	3	2145	1.1	0	1.9	0.7	4.3	0.1	1	0.2	92.1	0	0.1	0	0.6	22	5.3	0	0.4	0	0	0	0
CHA	34.1	0	5.7	0	35.9	0.2	0	0.7	0	1045	0	0	0.4	0	10.2	3.3	0	0	0	0	0	0	0.2	30.8	23.9	0	0	0	0	0	0
MAL	436.3	0	94.2	0.1	515.6	6.1	0	18.2	66.6	1661	0	21.6	0	0.7	47.1	2.1	0	14.5	1.3	1	0	0.3	0	568.8	2.5	0	0	0	0	0	0.7
ROW	177058	42063	14574	17521	238267	10771	369.7	16924	19882	7E+05	2657	2111	57631	3336	6470	7320	5134	1699	599.3	11261	848.8	793.9	3481	22832	27936	808.2	20703	8.6	4101	1680	440.2

Bilateral Trade Flow Matrix in1994
Upper Right Panel
(In ten thousands of U.S. dollars)

	TUR	POL	ECU	ALG	TUN	PER	DOM	GUA	PHI	PAR	JAM	CHN	MOR	INE	BOL	EGY	SAL	SRI	HON	CAM	NIC	COT	INA	CER	CON	KEN	BAN	MAD	CHA	MAL	ROW
USA	34169	9279.4	15785	9454	3236	21655	32538	18291	38281	10704	1E+05	5395	37921	3190	15345	26771	12124	935.8	12107	612.6	3334	1853	36100	51.2	565.9	1246	3577	134.4	117	195.9	217689.1
SIN	1111.9	1492.3	29	235.5	226	221.4	45.1	33.1	19578	278.9	25415	244	12811	0	70.4	916.7	30.9	3221	178	72.4	0	66	16710	0	0	494.2	3522	245.8	0	0	72216.8
SWI	8913.5	5537.3	465.1	949	1084	665.2	108.2	172.1	1915	278.5	7902	1104	4401	90.8	107.6	2697	136.8	471.9	130.1	53.6	36.6	381	6067	2.7	13.4	336.5	290	55	4.1	10.2	33811.4
HK	4048.7	2514.1	540.5	134.1	279.4	681.2	491.9	526.2	20873	4303	6E+05	452.8	28448	32.4	369.5	3283	269.2	3749	184.1	90.7	92.4	310.4	8079	5.9	111.1	784.3	5203	264.9	77.2	156.1	56888.1
JAP	13536	3655.4	3493	2678	1010	4985	1327	1239	47298	2091	2E+05	1146	93230	1500	1244	5367	1354	3002	709.4	420.6	448.2	960.3	25773	332	87	2739	3544	298.9	41.9	131.9	198077.2
NOR	914.5	4229	22.1	270.2	66.2	117.3	134.1	35.3	134.2	3.2	2236	168	760.5	21.9	190.7	141	8.3	45	6.1	12.6	20.5	144.3	1098	0.4	49.1	60.1	26.4	2.7	0.7	5.2	12148.3
ICE	11.1	24.3	0	0	0	5.1	0	0	1.5	0	15.1	0	0.3	0	0	0.8	0	0	0	0	0	0.7	8.8	0	0	0.2	0.1	0	0	0.2	382.9
CAN	2452.2	1023.9	865.9	3970	680.3	1648	621	510.4	2198	111.7	25630	1477	5498	234.5	806.5	851.2	177.2	79.9	163.6	175.5	158.8	108.9	3430	1.3	6.7	149.5	596.6	7.7	11.5	52.2	19354.2
AUS	2127.2	241.6	18.7	144.1	57.2	172.3	2.2	7.8	7651	13.6	23385	15.8	19594	16.3	30.4	1212	0.7	633.9	1.3	1.1	0	3.3	7992	0.4	9.4	110.2	774.1	13.7	0.5	1.6	34968.3
EU	194490	222311	8545	70985	65948	14909	4837	4022	29335	3892	2E+05	67898	85824	3549	3247	66452	2821	6514	4008	7492	1237	16724	1E+05	1218	6628	12253	6755	3474	1074	876.9	1868199
ISR	1929.5	736.4	263.8	0	3.3	233.2	43.5	109	1710	24.2	1248	69.3	16.9	21.7	31.7	309.5	20.4	252.4	24	16.6	16	37.8	3460	0.6	0	268	1.5	3.2	1.4	0.9	12560.4
NEW	1045.1	38.4	5	687.7	43.1	548.2	71.2	89.1	1396	1.7	3559	255.5	1819	24.2	128.9	262.8	73	353.2	0.1	0	10.2	34.9	799.9	0	0	18.8	149.4	0	0	8.6	10376.1
KOR	6548.3	4303.9	1080	457.7	353.5	2293	1167	927.3	12449	1755	97282	502.3	25924	179.9	323.7	4349	544.9	2206	646.3	103.2	203.5	338.7	11317	3.3	13.5	435.8	5842	60.9	0.9	25.9	109116.2
CHI	135.4	200.8	1250	0.6	31.1	4095	129.2	124.5	550.7	823.6	2520	63	2197	1656	29.9	90.8	83.6	136.8	51.2	7.7	6.6	4.7	964.5	0	0.7	0	0.3	0.2	0	2.1	8907.6
CZE	1245	13103	95	250.9	536.1	46.9	40.6	27.6	58.9	0	1162	119.1	373.3	14.2	3.3	675.2	16	20.3	10.7	3.5	2.8	4.7	831.8	0.3	1.9	38.5	76.8	2.1	2	0	22156.4
MAL	2603.2	1034.7	43.9	105	172.5	142.8	14.4	20.8	4614	213.5	18274	188.6	8389	6.1	108.1	2616	115.4	1269	2.6	28.3	0.2	70.4	8305	0.9	3.1	158.7	571.6	82.5	0.5	5.2	31389.4
SAU	13830	23.3	81.1	146	450.3	11.1	0	1.2	17187	0	5509	4500	9528	0	0	2493	0	153.1	0.8	9.4	0.2	0	0	0	0	0	0	68.6	0	0	122520.2
ARG	1933.3	167.7	670	639.5	233.8	3473	612.9	213.8	195.8	6757	3148	458.5	1665	2070	130.8	1582	170.8	69.4	38.3	6.8	16	64	1542	0	9.6	560.3	1066	0.2	0.4	0	12533.3
MAU	1.4	0.3	0	0	0.1	0	0	0	0.3	0.1	2.5	0	7.5	0	1.5	3.5	0	1.6	0	0	0	0.9	71.6	0	0	17.3	3.8	374.8	0	5.2	706.9
OMA	1.5	0.2	0	0.5	21.4	0	0	0	899.9	0	4972	1.8	14.1	0	0	47.5	0	22.9	0	0.8	0	0.4	298.2	0	0.5	311.5	0.8	0	0	0	12049.5
VEN	61.8	0.1	2499	0.1	0	3258	1131	1634	6.8	5.2	0	0.7	19.3	91.9	487.6	0	362.5	0	219.7	0	1285	73.6	63.2	0	0	0	0	0	0	0	16937.7
URU	117.5	33.2	26.1	1	0.6	292.8	18.1	79.6	9.8	270.7	1284	24.6	18.1	26	2.8	5.6	11.9	0	5	0	0.2	0	62.3	0	0.2	0.4	2.6	0	0	0	455.6
MEX	446.9	88.3	1622	72.3	34.3	2615	1752	3647	365.2	221.8	539.3	115.1	462.9	271.6	530.8	51.2	1637	1.4	831.2	0.2	390	6.6	261.5	0	0	3.6	18.2	0	2.4	0.4	12825.8
SOU	1064.6	574	131.2	17.4	8.4	173.6	34	26.4	442.5	96.4	2737	210.4	759.5	17.4	7.6	171.4	69.8	214.8	1.8	105.2	0.2	273.8	1900	6.4	85.4	2010	18.9	248.5	1.2	1812	93237.6
HUN	636.7	4283.9	13.8	188.9	116.6	216.9	93.2	28.8	4184	76.3	17027	73.6	7852	3.4	59.4	706.1	19.6	2025	9.2	156.1	5.4	130	3008	2.7	205.7	506.6	2214	40.4	0.3	77.8	58066.1
COL	8.1	104.5	66.4	7.8	8.9	71	134.3	1023	1.7	0.7	243.2	17.5	0	4	97.5	0	1005	1.7	522.4	10.1	888.9	0.5	5.5	0	0	0	0	0	0	0	1336.3
THA	2681.6	1442.8	2047	1160	359.1	4707	713.5	595.7	2354	14108	12180	2238	4063	3703	506.5	3092	370.2	545.7	307.6	150.6	55.3	311	3458	3.9	7.7	346.1	1188	10.9	1.4	2.5	34956.7
COS	203.5	2.9	0	101.2	18.6	0	0	2.2	2.9	0	1233	533.6	3.7	0	0	12	0	0	0	21.7	0	0	0	0.4	0	0	0	0.1	0	0	247.8
BRA	692.3	3711.9	5.7	287.4	78.7	80.4	0	0	21.9	0	251	264.3	279.1	1	0.1	253.3	0	7.5	0.9	2.6	0	0	2.7	0	0	0.1	0	1.1	0	0	6435.2
GAB	105.9	246.1	4561	96.6	9.9	6277	515.9	386.9	3.8	34.4	226.7	199.9	21.3	264.5	85.3	5.2	187.2	4.7	231.5	3.5	70.2	6.5	45.2	0.4	0.5	5.6	0	0.8	0	0	4396.3
TRI	0.9	1.7	105	0	0.8	91.1	587.4	12.7	0	0.9	0	0	0.1	0.3	2228	0	27.7	0	19.6	0	19	0	7.7	0	0	0.2	0.3	0.1	0	0.1	6818.6

Bilateral Trade Flow Matrix in 1994
Lower Right
(In thousands of U.S. dollars)

	TUR	POL	ECU	ALG	TUN	PER	DOM	GUA	PHI	PAR	JAM	CHN	MOR	INE	BOL	EGY	SAL	SRI	HON	CAM	NIC	COT	INA	CER	CON	KEN	BAN	MAD	CHA	MAL	ROW
TUR	0	2422.8	19.8	3426.4	1203.8	162.8	49.3	7.8	190.5	4.1	1072.1	866.4	357	1.1	246.5	2456.9	5.3	158.6	1.8	24.1	0	38.8	459.7	0.3	1.7	40.5	57.5	9.2	0	0.9	53255
POL	839.6	0	90.9	396.5	320.9	21.8	20.5	5.4	124.8	5.1	346.5	1297.9	307.2	4.7	23.4	587.2	2.1	7.4	9.2	21.8	26.3	57	980.6	0.3	1.9	52.6	114.9	2.1	0	0	35537
ECU	284.6	811.3	0	107.6	130.5	714.1	0	298.3	14.4	0	288.3	8.3	5.7	46.3	0	16.3	0	0	38.8	0	71.2	0	0	0	0	0	0	0	0	0	11558
ALG	4301.6	715.3	105.5	0	1770	5.5	0	0	0	131.2	0	1086.5	18.3	0	0	59.4	0	0	0	0	0	0	28.9	0	0	0	26.5	0.1	26.8	0	3246.1
TUN	449	196.4	0.2	1724.5	0	0	0	0	0	0	361.5	345.9	191.2	0	0.2	235.3	0	0	0	98.3	0	62.7	1075.9	0.8	1	0	0	0.5	0.2	0	4875.7
PER	124.5	332.2	473	7.9	2.3	0	24.5	90.5	458.8	13.9	3804.1	5.4	287.5	875.7	3.1	0	21.8	4.3	15.5	1.1	0.8	5.2	25.6	0	1.6	0.2	8.8	6.1	0.6	0	1331.4
DOM	0.8	11.9	9.7	0	6	5.9	0	6.2	7.3	0	0.3	23.7	0.1	0.3	0	0	0	0	47.5	18.6	1.9	0	0	0	0	0	0	0	0	0	3029
GUA	0.6	52.9	18.9	57.3	0	316.2	180.1	0	0	0	348.6	59.9	0.2	0	21	9.7	2907.9	74.7	1238.8	0	789.5	0	1	0	0	0.1	6.2	0	0	0	580.5
PHI	64.9	38.3	1	44.3	3.5	18.7	10.9	2.7	0	14.9	2375.7	1	1064.5	4.1	2.4	60.6	0.6	57.8	0.2	0	0	1.7	217.1	0.2	0	2.6	52.9	0.1	0	1.5	3275.8
PAR	0	9.2	15.3	0	8.2	76.8	0.3	2.3	8.8	0	361.5	4.3	33.8	6.9	0.3	0.1	0.2	0	1	0	0.5	0.1	2.7	0	0	0	0	0.8	0	0	187.8
JAM	4935.4	3177.3	280.2	1316	361.1	1499.9	383.6	42.7	6568	1073.6	0	1171.8	18363	63.6	215.1	3105.7	365	1752.8	78.4	109.2	7.3	516.5	7654.1	8.3	59.3	1040.9	6820.3	160.5	23.7	7.4	79619
CHN	508.6	317.3	1.6	547.5	623.4	0.6	5.8	0	6.5	0	414.8	0	63.4	0.4	0	36.2	3.7	0	0.5	45.9	0	215.1	3395.6	3.5	33.6	7.6	0	4.9	0.4	0	4185.1
MOR	1326.3	939.3	20.8	979.5	76.5	123.7	0	17.4	6288.9	130.7	22249	261	0	4.8	0	864.4	1	780.9	5.8	30.5	0.3	46.4	3969.5	1	28.4	172.9	916.5	5.2	4	3.5	19540
INE	5.6	2.8	52.9	0.1	0	1370	3	0.1	0	53.2	0	0	0	0	0.2	0	0.2	0	0	0	0.4	0	2.3	0	0	0	0	0	0	0	223.6
BOL	0.2	7.8	2.5	0.5	1.2	6.8	0	0.9	0	0	43.2	0	0.1	0	0	0	0	0.1	3.4	0	0.4	0	0	0	0	0	0	0	0	0	3349.6
EGY	1098.3	34.9	0	408.8	294.3	0.2	0.2	0	3.6	0.1	74.2	178.2	33.4	0	0	0	0	59.3	0	4.4	0	78.4	580.5	0	39.3	37.1	134.8	0.7	0.2	0.3	5315.6
SAL	1.8	23.6	13.7	8	0	8.7	0	1637.9	0.4	0	49.8	0	0	10.1	0	0	0	1.9	689.8	0	412.1	0	0	0	0	0	0	0	0	0	3400.6
SRI	40.7	128.1	8.1	2.5	42.1	19.3	0.8	6.8	43.1	0.4	10.4	2.9	87	0.8	0	219	1.7	0	0.2	0	2.3	0.2	167.2	0	0	10.6	84.8	0	0	0.1	2486
HON	0	37	0.2	0	0	6.1	12.2	120.8	0	0	0	3.2	0	0	1.1	0	98	0	0	0	181.3	0	0.3	0	0	0	0	0	0	0	325
CAM	51.3	69	0	4	15.9	0	0	0	20.4	0	245.8	56.6	8.8	0	0	0	0	4.6	0	0	0	90.8	25.9	126.4	175.1	4.9	1.4	2.6	57.3	0	598
NIC	0	0	12.3	0	0	8.2	33.3	97.4	0	0	0	1.4	0	2.2	8.5	0	440.6	0	149.8	0	0	0	0.5	0	0	0	0	0	0	0	64
COT	167.6	899.2	0.1	105.9	266.2	0	0	0	18.6	0	4.4	327.9	364.1	0	0	6.5	0	0	0	142.3	0	0	0	5.1	0	0	0	3.7	0	0	13631
INA	2442.5	1082.8	65.7	148.3	141.8	227.9	0	31.1	1767.2	0	3891.9	309.3	4872	16	0	1691.7	0	2653.3	14.9	90.5	7.6	0	0	1.5	0	0	0	70.9	0	0	68336
CER	0	0	0	0.2	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	16.3	0	0	0	0	13.5	0	0	0	4.8	0	40.7
CON	8.7	1.4	0	0	3.2	0	0	0	0	0	34.4	77.2	0	0	0	0	0	0	0	10.4	0	0	0	47	0	0	0	0	0	0	2419.8
KEN	18.1	31.6	1.5	0.2	23	0	0	0	43.3	0	13.8	2.1	31	0.2	0	786.7	0	12.6	0	5.7	0	0	0	0	0	0	0	0	7.5	0	7834.1
BAN	222.4	169.9	0	17.4	1.5	5.9	0	4.5	92.5	0	450.6	31.4	90.8	0.3	0	99.3	0	3.2	0.6	34.2	4.7	0	0	0	0	0	0	0	0	0	3277.8
MAD	0.2	29.5	0	53.4	18.1	1	0.3	0	0	0	16.9	3.8	0	0	0	0.9	0	1.2	0	0	0	1.5	28.8	0.2	0.2	0.9	0.4	0	0.2	0.7	380.9
CHA	2.1	9	0	0.4	0.6	0	0	0	0	0	11.9	1.8	5.8	0	0	3.2	0	0	0	0.1	0	0	0	13.8	0	0	0	0	0	0	306.6
MAL	4	62.4	0	5.3	3.5	1.5	0	0	0.6	0	0	1.8	1.4	0	0	98.8	0	0	0	1.3	0	0	0	0	0	0	0	1.2	0	0	422.7
ROW	38256	14148	699	2787.3	4049.3	447.8	64	1296.3	6901.2	26.6	33033	6260.5	12940	29.6	224.5	8075.8	152.9	1924.1	1146	909.4	386.4	41.7	3847.5	63.9	0.5	268.1	1641	751.6	0.8	528.5	0

Commodity Category Scheme

1	Unmilled cereals	61	Glass
2	Fresh fruits,vegetables	62	Cement
3	Other crops	63	Ceramics
4	Livestock	64	Non-metallic products n.e.c.
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 and eggs	79	Other power machinery
20	Preserved fruits,vegetables	80	Agricultural machinery
21	Preserved seafood	81	Construction,mining,oilfield eq
22	Vegetable&animal oils,fats	82	Metal,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 n.e.c.	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 telecomm eq
35	Floor coverings	95	Household electrical appliances
36	Wearing apparel	96	Computers
37	Leather and hides	97	Other office machinery
38	Leather products	98	Semiconductors
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,repairing
44	Newsprint	104	Warships
45	Paper products	105	Railroad equipment
46	Printing,publishing	106	Motor vehicles
47	Basic chemicals	107	Motorcycles,bicycles
48	Fertilizers	108	Motor vehicles parts
49	Synthetic resins,man-made fibers	109	Aircraft
50	Paints,varnishes,lacquers	110	Other transport eq
51	Drugs and medicines	111	Pro measurement instruments
52	Soap,other toilet preparations	112	Photographic,optical goods
53	Chemical products n.e.c.	113	Watches and clocks
54	Petroleum refineries	114	Jewellery
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,n.e.c.	119	Manufactured goods n.e.c.
60	Plastic products,n.e.c.	120	Scrap,used,unclassified

UNCTAD Coding System of Trade Control Measures

The trade control measures are classified under broad categories according to their nature. Within the broad categories, the measures are further subdivided according to their characteristics.

1000 Tariff Measures
- 1100 Statutory Customs Duties
- 1200 MFN Duties
- 1300 GATT Ceiling Duties
- 1400 Tariff Quota Duties
- 1500 Seasonal Duties
- 1600 Temporary Reduced Duties
- 1700 Temporary Increased Duties
- 1800 Preferential Duties Under Trade Agreements
- 1900 Tariff Measures N.E.S.

2000 Para-Tariff Measures
- 2100 Customs surcharges
- 2200 Additional Charges
- 2300 Internal taxes and charges leveled on imports
- 2400 Decreed customs valuation
- 2900 Para-Tariff Measures n.e.s.

3000 Price control measures
- 3100 Administrative measures
- 3200 Voluntary export price restraint
- 3300 Variable charges
- 3400 Antidumping measures
- 3500 Countervailing measures
- 3900 Price control measures n.e.s.

4000 Finance measures
- 4100 Advance payment requirement
- 4200 Multiple exchange rates
- 4300 Restrictive official foreign exchange allocation
- 4500 Regulations concerning terms of payment for imports
- 4600 Transfer delays, queuing
- 4900 Finance measures n.e.s.

5000 Automatic licensing measures
- 5100 Automatic license
- 5200 Import monitoring
- 5700 Surrender requirement
- 5900 Automatic licensing measures n.e.s.

6000 Quantity control measures
- 6100 Non-automatic licensing
- 6200 Quotas
- 6300 Prohibitions

6600 Export restraint arrangements
6700 Enterprise-specific restrictions
6900 Quantity control measures n.e.s.
7000 Monopolistic measures
7100 Single channel for imports
7200 Compulsory national services
7900 Monopolistic measures n.e.s.
8000 Technical measures
8100 Technical regulations
8200 Pre-shipment inspection
8300 Special customs formalities
8400 Obligation to return used products
8500 Obligation to recycling or reuse
8900 Technical measures n.e.s.
9000 Miscellaneous Measures
9100 Marketable permits for sensitive product categories
9200 Public procurement for sensitive product categories
9300 Voluntary instruments for sensitive product categories