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Computational Analysis of the Menu of U.S.-Japan Trade Policies

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Abstract

We have used the Michigan Computable General Equilibrium (CGE) Model of World Production and Trade to calculate the aggregate welfare and sectoral employment effects of the menu of U.S.-Japan trade policies. The menu of policies encompasses the various preferential U.S. and Japan bilateral and regional free trade agreements (FTAs) negotiated and in process, unilateral removal of existing trade barriers by the two countries, and global (multilateral) free trade. The U.S. preferential agreements include the FTAs approved by the U.S. Congress with Chile and Singapore in 2003, those signed with Central America, Australia, and Morocco and awaiting Congressional approval in 2004, and prospective FTAs with the Southern African Customs Union (SACU), Thailand, and the Free Trade Area of the Americas (FTAA). The Japanese preferential agreements include the bilateral FTA with Singapore signed in 2002 and prospective FTAs with Chile, Indonesia, Korea, Malaysia, Mexico, Philippines, and Thailand. The welfare impacts of the FTAs on the United States and Japan are shown to be rather small in absolute and relative terms. The sectoral employment effects are also generally small in the United States and Japan, but vary across the individual sectors depending on the patterns of the bilateral liberalization. The welfare effects on the FTA partner countries are mostly positive though generally small, but there are some indications of potentially disruptive employment shifts in some partner countries. There are indications of trade diversion and detrimental welfare effects on nonmember countries for some of the FTAs analyzed. Data limitations precluded analysis of the welfare effects of the different FTA rules of origin and other discriminatory arrangements.

In comparison to the welfare gains from the U.S. and Japan bilateral FTAs, the gains from both unilateral trade liberalization by the United States, Japan, and the FTA partners, and from global (multilateral) free trade are shown to be rather substantial and more uniformly positive for all countries in the global trading system. The U.S. and Japan FTAs are based on "hub" and "spoke" arrangements. We show that the spokes emanate out in different and often overlapping directions, suggesting that the complex of bilateral FTAs may create distortions of the global trading system.

Keywords: Multilateral, Regional, and Bilateral Trade Liberalization; JEL: F10; F13; F15

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Computational Analysis of the Menu of U.S.-Japan Trade Policies*

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I. Introduction

In this paper, we present a computational analysis of the economic effects of the menu of U.S.-Japan trade policies. The menu encompasses the various U.S. and Japan bilateral and regional free trade agreements (FTAs) that have been negotiated in recent years and the negotiations currently in process, unilateral removal of existing trade barriers by the United States, Japan, and their FTA partner countries, and global (multilateral) free trade. The analysis is based on the Michigan Model of World Production and Trade. The Michigan Model is a multi-country/multi-sector computable general equilibrium (CGE) model of the global trading system that has been used for about three decades to analyze the economic effects of multilateral, regional, and bilateral trade negotiations and a variety of other changes in trade and related policies.

In Section II following, we present a brief description of the main features and data of the Michigan Model. The results of the computational analysis of the U.S. and Japan FTAs are presented in Sections III and IV. In Section V, we consider the cross-country patterns of the welfare effects of the various FTAs. In Section VI, we provide a broader perspective on the FTAs that takes into account the effects of the unilateral and multilateral removal of trade barriers by the United States and Japan, their FTA partner countries, and other countries/regions in the global trading system. Section VII provides a summary and concluding remarks.

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II. The Michigan Model of World Production and Trade

Overview of the Michigan Model

The version of the Michigan Model that we use in this paper covers 18 economic sectors, including agriculture, manufactures, and services, in each of 22 countries/regions. The distinguishing feature of the Michigan Model is that it incorporates some aspects of trade with imperfect competition, including increasing returns to scale, monopolistic competition, and product variety. Some details follow.[1] A more complete description of the formal structure and equations of the model can be found on line at www.Fordschool.umich.edu/rsie/model/.

Sectors and Market Structure

As mentioned, the version of the model to be used here consists of 18 production sectors and 22 countries/regions (plus rest-of-world). The sectoral and country/region coverage are indicated in the tables below. Agriculture is modeled as perfectly competitive with product differentiation by country of origin, and all other sectors covering manufactures and services are modeled as monopolistically competitive. Each monopolistically competitive firm produces a differentiated product and sets price as a profit-maximizing mark-up of price over marginal cost. Free entry and exit of firms then guarantees zero profits.

Expenditure

Consumers and producers are assumed to use a two-stage procedure to allocate expenditure across differentiated products. In the first stage, expenditure is allocated across goods without regard to the country of origin or producing firm. At this stage, the utility function is Cobb-Douglas, and the production function requires intermediate inputs in fixed proportions. In the second stage, expenditure on monopolistically competitive goods is allocated across the competing varieties supplied by each firm from all countries. In the perfectly competitive agricultural sector, since

[1] See also Deardorff and Stern (1990, esp. pp. 9-46) and Brown and Stern (1989a,b).

individual firm supply is indeterminate, expenditure is allocated over each country's sector as a whole, with imperfect substitution between products of different countries.

The aggregation function in the second stage is a Constant Elasticity of Substitution (CES) function. Use of the CES function and product differentiation by firm imply that consumer welfare is influenced both by any reduction in real prices brought about by trade liberalization, as well as increased product variety. The elasticity of substitution among different varieties of a good is assumed to be three, a value that is broadly consistent with available empirical estimates. The parameter for the sensitivity of consumers to the number of product varieties is set at 0.5.[2]

Production

The production function is separated into two stages. In the first stage, intermediate inputs and a primary composite of capital and labor are used in fixed proportion to output.[3] In the second stage, capital and labor are combined through a CES function to form the primary composite. In the monopolistically competitive sectors, additional fixed inputs of capital and labor are required. It is assumed that fixed capital and fixed labor are used in the same proportion as variable capital and variable labor so that production functions are homothetic. The elasticities of substitution between capital and labor vary across sectors and were derived from a literature search of empirical estimates of sectoral supply elasticities. Economies of scale are determined endogenously in the model.

Supply Prices

To determine equilibrium prices, perfectly competitive firms operate such that price is equal to marginal cost, while monopolistically competitive firms maximize profits by setting price as an optimal mark-up over marginal cost. The numbers of firms in sectors under monopolistic

[2] If the variety parameter is greater than 0.5, it means that consumers value variety more. If the parameter is zero, consumers have no preference for variety. This is the same as the Armington assumption according to which consumers view products as distinguished by country of production. Sensitivity tests of alternative parameter values are included in an appendix below.

[3] Intermediate inputs include both domestic and imported varieties.

competition are determined by the zero profits condition. The free entry condition in this context is also the basic mechanism through which new product varieties are created (or eliminated). Each of the new entrants arrives with a distinctly different product, expanding the array of goods available to consumers.

Free entry and exit are also the means through which countries are able to realize the specialization gains from trade. In this connection, it can be noted that in a model with nationally differentiated products, which relies on the Armington assumption, production of a particular variety of a good cannot move from one country to another. In such a model, there are gains from exchange but no gains from specialization. However, in the Michigan Model with differentiated products supplied by monopolistically competitive firms, production of a particular variety is internationally mobile. A decline in the number of firms in one country paired with an expansion in another essentially implies that production of one variety of a good is being relocated from the country in which the number of firms is declining to the country in which the number of firms is expanding. Thus, we have both an exchange gain and a specialization gain from international trade.[4]

Capital and Labor Markets

Capital and labor are assumed to be perfectly mobile across sectors within each country. Returns to capital and labor are determined so as to equate factor demand to an exogenous supply of each factor. The aggregate supplies of capital and labor in each country are assumed to remain fixed so as to abstract from macroeconomic considerations (e.g., the determination of investment), since our microeconomic focus is on the inter-sectoral allocation of resources.

[4] The international relocation of a particular variety of a good can be understood in the context of the ongoing outsourcing debate. Domestic firms require intermediate inputs, in addition to capital and labor. To the extent that tariff reduction leads a firm to substitute toward traded intermediate inputs, domestic firms can be thought of as outsourcing some component of production. This is particularly the case if there is a decline in the number of domestic firms in the sector from which intermediate inputs are purchased and an expansion in the supplier country.

World Market and Trade Balance

The world market determines equilibrium prices such that all markets clear. Total demand for each firm or sector's product must equal total supply of that product. It is also assumed that trade remains balanced for each country/region, that is, any initial trade imbalance remains constant as trade barriers are changed. This is accomplished by permitting aggregate expenditure to adjust to maintain a constant trade balance. Thus, we abstract away from the macroeconomic forces and policies that are the main determinants of trade imbalances. Further, it should be noted that there are no nominal rigidities in the model. As a consequence, there is no role for a real exchange rate mechanism.

Trade Policies and Rent/Revenues

We have incorporated into the model the import tariff rates and export taxes/subsidies as policy inputs that are applicable to the bilateral trade of the various countries/regions with respect to one another. These have been computed using the "GTAP–5.4 Database" provided in Dimaranan and McDougall (2002). The export barriers have been estimated as export-tax equivalents. We assume that revenues from both import tariffs and export taxes, as well as rents from NTBs on exports, are redistributed to consumers in the tariff- or tax-levying country and are spent like any other income.

Tariff liberalization can affect economic efficiency through three main channels. First, in the context of standard trade theory, tariff reductions both reduce the cost of imports for consumers and for producers purchasing traded intermediate inputs, thus producing an *exchange* gain. Second, tariff removal leads firms to direct resources toward those sectors that have the greatest value on the world market. That is, we have the standard *specialization* gain. Third, tariff reductions have a pro-competitive effect on sellers. Increased price pressure from imported varieties force incumbent firms to cut price. Surviving firms remain viable by expanding output, thereby moving down their

average total cost (ATC) curve. The consequent lower ATC of production creates gains from the *realization of economies of scale*.

Model Closure and Implementation

We assume in the model that aggregate expenditure varies endogenously to hold aggregate employment constant. This closure is analogous to the Johansen closure rule (Deardorff and Stern, 1990, pp. 27-29). The Johansen closure rule consists of keeping the requirement of full employment while dropping the consumption function. This means that consumption can be thought of as adjusting endogenously to ensure full employment. However, in the present model, we do not distinguish consumption from other sources of final demand. That is, we assume instead that total expenditure adjusts to maintain full employment.

The model is solved using GEMPACK (Harrison and Pearson, 1996). When policy changes are introduced into the model, the method of solution yields percentage changes in sectoral employment and certain other variables of interest. Multiplying the percentage changes by the absolute levels of the pertinent variables in the database yields the absolute changes, positive or negative, which might result from the various liberalization scenarios.

Interpreting the Modeling Results

To help the reader interpret the modeling results, it is useful to review the features of the model that serve to identify the various economic effects to be reflected in the different applications of the model. Although the model includes the aforementioned features of imperfect competition, it remains the case that markets respond to trade liberalization in much the same way that they would with perfect competition. That is, when tariffs or other trade barriers are reduced in a sector, domestic buyers (both final and intermediate) substitute toward imports and the domestic competing industry contracts production while foreign exporters expand. Thus, in the case of multilateral liberalization that reduces tariffs and other trade barriers simultaneously in most sectors and countries, each country's industries share in both of these effects, expanding or

contracting depending primarily on whether their protection is reduced more or less than in other sectors and countries.

Worldwide, these changes cause increased international demand for all sectors. World prices increase most for those sectors where trade barriers fall the most.[5] This in turn causes changes in countries' terms of trade that can be positive or negative. Those countries that are net exporters of goods with the greatest degree of liberalization will experience increases in their terms of trade, as the world prices of their exports rise relative to their imports. The reverse occurs for net exporters in industries where liberalization is slight – perhaps because it may already have taken place in previous trade rounds.

The effects on the welfare of countries arise from a mixture of these terms-of-trade effects, together with the standard efficiency gains from trade and also from additional benefits due to the realization of economies of scale. Thus, we expect on average that the world will gain from multilateral liberalization, as resources are reallocated to those sectors in each country where there is a comparative advantage. In the absence of terms-of-trade effects, these efficiency gains should raise national welfare measured by the equivalent variation for every country,[6] although some factor owners within a country may lose, as will be noted below. However, it is possible for a particular country whose net imports are concentrated in sectors with the greatest liberalization to lose overall, if the worsening of its terms of trade swamps these efficiency gains.

On the other hand, although trade with imperfect competition is perhaps best known for introducing reasons why countries may lose from trade, actually its greatest contribution is to expand the list of reasons for gains from trade. Thus, in the Michigan Model, trade liberalization permits all countries to expand their export sectors at the same time that all sectors compete more

[5] The price of agricultural products supplied by the rest of the world is taken as the numeraire in the model, and there is a rest-of-world against which all other prices can rise.

[6] The equivalent variation is a measure of the amount of income that would have to be given or taken away from an economy before a change in policy in order to leave the economy as well off as it would be after the policy change has taken place. If the equivalent variation is positive, it is indicative of an improvement in economic welfare resulting from the policy change.

closely with a larger number of competing varieties from abroad. As a result, countries as a whole gain from lower costs due to increasing returns to scale, lower monopoly distortions due to greater competition, and reduced costs and/or increased utility due to greater product variety. All of these effects make it more likely that countries will gain from liberalization in ways that are shared across the entire population.[7]

The various effects just described in the context of multilateral trade liberalization will also take place when there is unilateral trade liberalization, although these effects will depend on the magnitudes of the liberalization in relation to the patterns of trade and the price and output responses involved between the liberalizing country and its trading partners. Similarly, many of the effects described will take place with the formation of bilateral or regional FTAs. But in these cases, there may be trade creation and positive effects on the economic welfare of FTA-member countries together with trade diversion and negative effects on the economic welfare of non-member countries. The net effects on economic welfare for individual countries and globally will thus depend on the economic circumstances and policy changes implemented.[8]

In the real world, all of the various effects occur over time, some of them more quickly than others. However, the Michigan Model is static in the sense that it is based upon a single set of equilibrium conditions rather than relationships that vary over time.[9] The model results

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[7] In perfectly competitive trade models such as the Heckscher-Ohlin Model, one expects countries as a whole to gain from trade, but the owners of one factor – the "scarce factor" – to lose through the mechanism first explored by Stolper and Samuelson (1941). The additional sources of gain from trade due to increasing returns to scale, competition, and product variety, however, are shared across factors, and we routinely find in our CGE modeling that both labor and capital gain from multilateral trade liberalization.

[8] It may be noted that, in a model of perfect competition, bilateral trade liberalization should have the effect of contracting trade with the excluded countries, thereby improving the terms of trade for the FTA members vis-à-vis the rest of world. But in a model with scale economies, the pro-competitive effect of trade liberalization can generate a cut in price and increase in supply to excluded countries. The terms of trade of FTA members may therefore deteriorate in this event.

It should also be mentioned that rules of origin may offset some of the potential welfare benefits of FTAs insofar as they may lead to higher input costs and consequent reduction of FTA preference margins. In this connection, see Krishna (2004).

[9] As noted above, macroeconomic closure in the model involves the equivalent of having expenditure equal to the sum of earned incomes plus redistributed net tax revenues. However, the actual solution is attained indirectly, but equivalently, by imposing a zero change in the trade balance. Since the model allows for all

therefore refer to a time horizon that depends on the assumptions made about which variables do and do not adjust to changing market conditions, and on the short- or long-run nature of these adjustments. Because the supply and demand elasticities used in the model reflect relatively long-run adjustments and it is assumed that markets for both labor and capital clear within countries,[10] the modeling results are appropriate for a relatively long time horizon of several years – perhaps two or three at a minimum. On the other hand, the model does not allow for the very long-run adjustments that could occur through capital accumulation, population growth, and technological change. The modeling results should therefore be interpreted as being superimposed upon longer-run growth paths of the economies involved. To the extent that these growth paths themselves may be influenced by trade liberalization, therefore, the model does not capture such effects.

Benchmark Data

Needless to say, the data needs of this model are immense. Apart from numerous share parameters, the model requires various types of elasticity measures. Like other CGE models, most of our data come from published sources.

As mentioned above, the main data source used in the model is "The GTAP-5.4 Database" of the Purdue University Center for Global Trade Analysis Project (Dimaranan and McDougall, 2002). The reference year for this GTAP database is 1997. From this source, we have extracted the following data, aggregated to our sectors and countries/regions:[11]

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net tax and tariff revenues to be redistributed to consumers, when tariffs are reduced with trade liberalization, the model implicitly imposes a non-distorting tax to recoup the loss in tariff revenues.

[10] The analysis in the model assumes throughout that the aggregate, economy-wide, level of employment is held constant in each country. The effects of trade liberalization are therefore not permitted to change any country's overall rates of employment or unemployment. This assumption is made because overall employment is determined by macroeconomic forces and policies that are not contained in the model and would not themselves be included in a negotiated trade agreement. The focus instead is on the composition of employment across sectors as determined by the microeconomic interactions of supply and demand resulting from the liberalization of trade.

[11] Details on the sectoral and country/region aggregation are available from the authors on request.

- Bilateral trade flows among 22 countries/regions, decomposed into 18 sectors. Trade with the rest-of-world (ROW) is included to close the model.
- Input-output tables for the 22 countries/regions, excluding ROW
- Components of final demand along with sectoral contributions for the 22 countries/regions, excluding ROW
- Gross value of output and value added at the sectoral level for the 22 countries/regions, excluding ROW
- Bilateral import tariffs by sector among the 22 countries/regions
- Elasticity of substitution between capital and labor by sector
- Bilateral export-tax equivalents among the 22 countries/regions, decomposed into 18 sectors

The monopolistically competitive market structure in the nonagricultural sectors of the model imposes an additional data requirement of the numbers of firms at the sectoral level, and there is need also for estimates of sectoral employment.[12] The employment data, which have been adapted from a variety of published sources, will be noted in tables below.

The GTAP-5.4 1997 database has been projected to the year 2005, which is when the Uruguay Round liberalization will have been fully implemented. In this connection, we extrapolated the labor availability in different countries/regions by an average weighted population growth rate of 1.2 percent per annum. All other major variables have been projected, using an average weighted growth rate of GDP of 2.5 percent.[13] The 2005 data have been adjusted to take into account two major developments that have occurred in the global trading system since the mid-1990s. These include: (1) implementation of the Uruguay Round negotiations that were completed in 1993-94 and were to be phased in over the following decade;

[12] Notes on the construction of the data on the number of firms and for employment are available from the authors on request.

[13] The underlying data are drawn from World Bank sources and are available on request. For a more elaborate and detailed procedure for calculating year 2005 projections, see Hertel and Martin (1999) and Hertel (2000).

and (2) the accession of Mainland China and Taiwan to the WTO in 2001.[14] We have made allowance for the foregoing developments by readjusting the 2005 scaled-up database for benchmarking purposes to obtain an approximate picture of what the world may be expected to look like in 2005. In the computational scenarios to be presented below, we use these re-adjusted data as the starting point to carry out our liberalization scenarios for the U.S. bilateral FTAs and for the accompanying unilateral and global free trade scenarios.

The GTAP 5.4 (1997) base data for tariffs and the estimated tariff equivalents of services barriers are broken down by sector on a global basis and bilaterally for existing and prospective FTA partners of the United States and Japan in Tables 1-2. The post-Uruguay Round tariff rates on agriculture, mining, and manufactures are applied rates and are calculated in GTAP by dividing tariff revenues by the value of imports by sector.

The services barriers are based on financial data on average gross (price-cost) margins constructed initially by Hoekman (2000) and adapted for modeling purposes in Brown, Deardorff, and Stern (2002). The gross operating margins are calculated as the differences between total revenues and total operating costs. Some of these differences are presumably attributable to fixed costs. Given that the gross operating margins vary across countries, a portion of the margin can also be attributed to barriers to FDI. For this purpose, a benchmark is set for each sector in relation to the country with the smallest gross operating margin, on the assumption that operations in the benchmark country can be considered to be freely open to foreign firms. The excess in any other country above this lowest benchmark is then taken to be due to barriers to establishment by foreign firms.

[14] The tariff data for the WTO accession of China and Taiwan have been adapted from Ianchovichina and Martin (2004). In addition to benchmarking the effects of the Uruguay Round and China/Taiwan accession to the WTO, Francois et al. (2003) benchmark their GTAP 5.4 dataset to take into account the enlargement of the European Union (EU) in 2004 to include ten new member countries from Central and Eastern Europe and some changes in the EU Common Agricultural Policies that were introduced in 2000. Our EU and EFTA regional aggregate includes the 25-member EU, but the benchmark data were not adjusted to take into account the adoption of the EU common external tariffs by the new members. Because of data constraints, we have not made allowance for the Information Technology Agreement and agreements for liberalization of financial and telecommunication services following conclusion of the Uruguay Round.

That is, the barrier is modeled as the cost-increase attributable to an increase in fixed cost borne by multinational corporations attempting to establish an enterprise locally in a host country. This abstracts from the possibility that fixed costs may differ among firms because of variations in market size, distance from headquarters, and other factors. It is further assumed that this cost increase can be interpreted as an ad valorem equivalent tariff on services transactions generally. It can be seen in Tables 1 and 2 that the constructed services barriers are considerably higher than the import barriers on manufactures. While possibly subject to overstatement, it is generally acknowledged that many services sectors are highly regulated and thus restrain international services transactions.

For the United States, the highest import tariffs for manufactures are recorded for textiles, wearing apparel, and leather products & footwear, both globally and bilaterally. For Japan, the highest import tariffs are noted in agriculture, food, beverages & tobacco, textiles, wearing apparel, and leather & leather products. The values and shares of U.S. and Japanese exports and imports are broken down by sector according to origin and destination in Tables 3-6 on a global basis as well as for FTA partners. Employment by sector is indicated for the United States and for Japan and their FTA partners in Table 7.

III. Computational Analysis of U.S. Free Trade Agreements

As already noted, both the United States and Japan have signed or are currently in the process of negotiating bilateral FTAs. For the United States, these include the agreements with Chile and Singapore approved by the U.S. Congress in 2003, agreements with Central America and the Dominican Republic (CAFTA), Australia, and Morocco to be submitted for Congressional approval in 2004, and ongoing negotiations with the Southern African Customs Union (SACU), Thailand, and the Free Trade Area of the Americas (FTAA).[15] The Japanese

[15] FTA negotiations are being concluded with Bahrain and will be initiated in the near future with Colombia and some other countries in Latin America. See the USTR website for more information.

bilateral FTAs will be analyzed below and include the agreement with Singapore signed in 2002 and the prospective agreements with Chile, Korea, Malaysia, Mexico, Philippines, and Thailand.

As we note in Brown, Kiyota, and Stern (2004a,b,c), the United States has a myriad of objectives in pursuing FTAs, including increased market access and shaping the regulatory and political environment in FTA partner countries to conform to U.S. principles and institutions. By the same token, the FTA partners are attracted by the preferential margins for U.S. market access and opportunities to improve their economic efficiency and to design and implement more effective domestic institutions and policies. Similarly, Japan and its FTA partners are motivated by many of these objectives.

The U.S. FTAs to be analyzed are denoted as follows:

USCHFTA	*U.S.-Chile FTA*
USSGFTA	*U.S.-Singapore FTA*
USCAFTA	*U.S.-Central America FTA*
USAUSFTA	*U.S.-Australia FTA*
USMORFTA	*U.S.-Morocco FTA*
USSACUFTA	*U.S.-Southern African Customs Union FTA*
USTHFTA	*U.S.-Thailand FTA*
FTAA	*Free Trade Area of the Americas*

Our reference point is the post-Uruguay Round 2005 database together with the post-Uruguay Round tariff rates on agricultural products and manufactures and the specially constructed measures of services barriers described above. Four scenarios have been carried out for each FTA: (A) removal of agricultural tariffs[16]; (M) removal of manufactures tariffs; (S) removal of services barriers; and (C) combined removal of agricultural and manufactures tariffs and services barriers. Because of space constraints, we report only the results of the combined removal of agricultural and manufactures tariffs and services barriers, denoted by **USCHFTA-C**, etc. The results for the separate removal of the agricultural, manufactures, and services barriers and for the sectoral effects on exports, imports, and gross output are available on request.

[16] The bilateral FTA scenarios in this and in the next section make no allowance for reductions in agricultural export subsidies and agricultural production subsidies, which are excluded from bilateral negotiations and fall within the scope of the multilateral negotiations.

We should emphasize that our computational analysis does not take into account other features of the various FTAs, which do not lend themselves readily to quantification. These other features cover E-commerce, intellectual property, labor and environmental standards, investment, government procurement, trade remedies, dispute settlement, and the development of new institutional and cooperative measures. By the same token, because of data constraints, we have not made allowance for rules of origin and special preferences that may be negotiated as part of each FTA and that could be designed for protectionist reasons to limit trade.

USCHFTA-C: U.S.-Chile Free Trade Agreement – The U.S.-Chile FTA was approved by the U.S. Congress in 2003. The estimated global welfare effects are indicated in Table 8. Global welfare increases by $7.9 billion, with U.S. welfare increasing by $6.9 billion (0.1% of GNP) and Chile's welfare by $1.2 billion (1.3% of GNP).[17] The sectoral results for the United States are shown in Table 9 and indicate relatively small employment declines in U.S. agriculture, food, beverages & tobacco, wearing apparel, and leather products & footwear, and employment increases in the other sectors. The sectoral employment effects for Chile are indicated in Table 10 and show employment increases in agriculture, mining, food, beverages & tobacco, leather & leather products, metal products, and trade and transport services, and employment declines in several manufacturing sectors and other services. These employment changes for Chile suggest the extent of labor market adjustments that may occur as a result of the FTA.

USSGFTA-C: U.S.-Singapore Free Trade Agreement – The welfare effects of a U.S.-Singapore FTA, which was approved by the U.S. Congress in 2003, noted in Table 8, indicate an increase in global welfare of $22.5 billion, with U.S. welfare rising by $15.8 billion (0.2% of GNP) and Singapore's welfare by $2.5 billion (2.6% of GNP). In Table 9, the sectoral employment effects for the United States are relatively small, whereas in Table 10, for Singapore, there are relatively large sectoral employment increases in textiles, wearing apparel, and services,

[17] The estimated effects on aggregate exports/imports, terms of trade, and real returns to capital and labor for this and all other FTAs to be analyzed in what follows are available from the authors on request. Changes in bilateral trade flows by country/region of origin and destination are also available.

and declines in most other sectors. These sectoral changes suggest sizable employment adjustments for Singapore that may occur in the FTA with the United States.

USCAFTA-C: U.S.-Central America Free Trade Agreement – The U.S.-CAFTA was signed in December 2003 and will be submitted for Congressional approval later in 2004. The estimated global welfare effects are shown in Table 8. Global welfare rises by $15.7 billion, U.S. welfare by $17.3 billion (0.2% of GNP) and the welfare of the aggregate of Central American and the Caribbean (CAC) by $5.3 (4.4% of GNP).[18,19] It can also be seen that the CAFTA is apparently trade diverting for most of the non-member countries/regions shown. The sectoral employment effects for the United States, noted in Table 9, indicate that. the employment declines are concentrated in textiles and wearing apparel and are comparatively small as a percent of employment in these sectors, -0.6% and -1.8%, respectively. The sectoral employment changes for the CAC are shown in Table 10. The increases are quite large in textiles, wearing apparel, and leather products & footwear, and there are employment declines in all of the other sectors, as the expansion of the relatively labor-intensive industries attracts workers from the rest

[18] The GTAP 5.4 data refer to a CAC aggregate and do not provide separate data for the five Central American countries and the Dominican Republic that comprise the CAFTA. It is noted in Brown, Kiyota, and Stern (2004) that the CAFTA countries account for a substantial proportion of CAC trade so that using CAC data may be a reasonable approximation for modeling purposes.

[19] Andriamananjara and Tsigas (2003) use the standard GTAP model to analyze the welfare effects of bilateral U.S. FTAs with 65 countries/regions. This version of the GTAP model assumes constant returns to scale, perfect competition, and product differentiation by country of origin (the so-called Armington assumption). The Armington assumption implies that countries have monopoly power in their trading relationships, and that trade liberalization may thus have sizable terms-of-trade effects, depending on the structure and pattern of trade. There is reason to believe accordingly that welfare changes in this version of the GTAP model may reflect strong terms-of-trade effects. This is evident in the results of a U.S.-CAC FTA, which is estimated to increase U.S. economic welfare by $1.6 billion (.02% of GDP) and CAC welfare by $2.2 billion (2.4% of GDP). The decomposition of the results by the authors in their Appendix Table indicates that a substantial proportion of these welfare changes is due to changes in terms of trade. DeRosa and Gilbert (2004) also use the standard GTAP model to analyze U.S. bilateral FTAs with 13 prospective partner countries, and their results similarly suggest the predominance of terms of trade effects. In contrast, in the Michigan Model, manufactures and services products are differentiated by firm, so that countries have much less leverage over their terms of trade.

It should also be noted that, while the GTAP framework is structured to take shifts of productive resources into account and generates results for effects on real wages and the return to capital, the GTAP framework does not permit calculation of shifts in the sectoral employment of workers as is done in the Michigan Model.

of the economy. These results thus suggest that the CAFTA may result in significant worker displacement in the process of adjustment brought about by elimination of the import barriers.

USAUSFTA-C: U.S.-Australia FTA – The U.S.-Australia FTA was signed in February 2004 and will be submitted for Congressional approval later in 2004. It can be seen in Table 8 that global welfare rises by $23.1 billion, U.S. welfare by $19.4 billion (0.2% of GNP), and Australian welfare by 5.4 billion (1.1% of GNP). There are many instances of trade diversion for non-partner countries. The sectoral effects for the United States in Table 9 and for Australia in Table 10 indicate that the U.S.-Australia FTA will have fairly small effects on the sectoral employment in the two countries.

USMORFTA-C: U.S.-Morocco FTA – As noted in Tables 3-4 above, U.S. trade in goods and services with Morocco is rather small. By far the largest proportions of Morocco's trade are with the EU and EFTA. The global welfare increase from the U.S.-Morocco FTA indicated in Table 8 is $7.5 billion, $6.0 billion (0.1% of GNP) for the United States, and $0.9 billion (2.0% of GNP) for Morocco.[20] The U.S. sectoral employment changes noted in Table 9 are negligible. For Morocco, in Table 10, the largest employment increases are in trade & transport, textiles, and wearing apparel, and the largest declines in agriculture, food, beverages & tobacco, and government services. The welfare and employment effects of the U.S.-Morocco FTA are thus seen to be fairly small.

USSACUFTA-C: U.S.-Southern African Customs Union – The effects of the U.S.-SACU FTA, which is currently being negotiated, are indicated in Table 8, indicate an increase of $11.8 billion in global welfare, $9.6 billion (0.1% of GNP) for the United States, and $2.2 billion (1.2% of GNP) for the SACU members combined. In Table 9, there are indications of negligible sectoral employment impacts for the United States. In Table 10, the employment increases for

[20] Andriamananjara and Tsigas (2003, p. 16) estimate that the U.S.-Morocco FTA will reduce Morocco's economic welfare by $108 million (-0.3% of GDP) and will increase U.S. welfare by $161 million (.002% of GDP). Terms-of-trade effects are again evidently dominant, and, in any event, the overall welfare effects are much lower than the results based on the Michigan Model.

SACU are concentrated in textiles and wearing apparel and are negative across the remaining sectors as labor is attracted towards the labor-intensive sectors.

US-THFTA-C: U.S.-Thailand FTA – In Table 8, the global welfare increase for the U.S.-Thailand FTA is $21.9 billion, $17.1 billion (0.2% of GNP) for the United States, and $5.6 billion (2.8% of GNP) for Thailand. There is evidence of pervasive trade diversion. The sectoral employment changes for the United States noted in Table 9 are negligible. For Thailand, in Table 10, the largest employment increases are concentrated in food, beverages & tobacco, textiles, wearing apparel, leather & leather products, other manufactures, and trade & transport, and there are employment declines especially in agriculture, mining, several capital-intensive manufactures, construction, other private services, and government services.

FTAA-C: Free Trade Area of the Americas – Discussions have been ongoing for several years to create a Free Trade Area for the Americas (FTAA).[21] Since the country detail in our model does not include the individual members of the FTAA, we have chosen to approximate it by combining the United States, Canada, Mexico, and Chile with an aggregate of Central American and Caribbean (CAC) and an aggregate of other South American nations. The welfare effects of the FTAA are indicated in column Table 8 and amount to $109.5 billion globally, $67.6 billion (0.7% of GNP) for the United States, $5.8 billion (0.7% of GNP) for Canada, $3.4 billion (3.6% of GNP) for Mexico, $3.4 billion (3.6% of GNP) for Chile, $7.8 billion (6.5% of GNP) for the CAC, and $27.6 billion (1.5% of GNP) for the aggregate of other South American countries. There is some evidence of trade diversion, in particular for Japan and the EU/EFTA. The sectoral employment effects for the United States, indicated in Table 11, show relatively small employment declines in agriculture, mining, food, beverages & tobacco, and other private and government services, and increases in all other sectors. In Table 11, the sectoral employment effects for Canada are also small, whereas the employment increases for Mexico, Chile, the CAC,

[21] For details on the FTAA negotiations, see the website of the Office of the United States Trade Representative [www.ustr.gov].

and other South America are noteworthy. This suggests that the developing countries covered in the FTAA would experience more employment adjustments than the United States and Canada.

IV. Computational Analysis of Japan's Free Trade Agreements

In this section, we consider the welfare and sectoral employment effects of the Japan-Singapore FTA that was concluded in 2002 and the FTAs in process with Chile, Indonesia, Korea, Malaysia, Mexico, Philippines, and Thailand. These are designated as follows:

JSGFTA	*Japan-Singapore FTA*
JCHFTA	*Japan-Chile FTA*
JINDFTA	*Japan-Indonesia FTA*
JKFTA	*Japan-Korea FTA*
JMAFTA	*Japan-Malaysia FTA*
JMXFTA	*Japan-Mexico FTA*
JPHFTA	*Japan-Philippines FTA*
JTHFTA	*Japan-Thailand FTA*

As was the case for the U.S. FTAs analyzed in the previous section, we have undertaken separate computations for (A) removal of agricultural tariffs; (M) removal of manufactures tariffs; (S) removal of services barriers; and (C) combined removal of agricultural and manufactures tariffs and services barriers. In what follows, we report only the results of the combined removal of agricultural and manufactures tariffs and services barriers, denoted by **JSGFTA-C**, etc. The results for the separate removal of the agricultural, manufactures, and services barriers are available on request.

JSGFTA-C: Japan-Singapore Free Trade Agreement – As shown in Table 12, the combined removal of bilateral tariffs on agricultural products and manufactures and services barriers would increase global economic welfare by $6.7 billion. Japan's welfare rises by $5.0 billion (0.1% of GNP) and Singapore by $0.6 billion (0.7% of GNP). A JSGFTA appears to be trade diverting to a small extent. The other industrialized countries besides Japan show increases

in welfare.[22] The sectoral results, which are shown Table 13, indicate negligible shifts in Japan's employment. For Singapore, as indicated in Table 14, there are employment increases especially in wearing apparel, leather & leather products, and trade & transport, and declines in many other manufacturing sectors and other private services. A Japan-Singapore FTA thus appears to have relatively small effects on Japan's welfare and results in sectoral employment shifts in Singapore away from capital-intensive towards relatively more labor-intensive sectors.

JCHFTA-C: Japan-Chile Free Trade Agreement – In Table 12, a JCHFTA indicates increases in global welfare of $3.5 billion. Japan's welfare rises by $2.8 billion (0.1% of GNP), and Chile's welfare rises by $0.9 billion (1.0% of GNP). There are negative welfare effects for the United States, Canada, and several developing countries. The sectoral results for Japan, in Table 13, indicate negligible sectoral shifts. For Chile, as indicated in Table 14, there are employment increases in agriculture and food, beverages & tobacco and declines in mining and all of the manufactures and services sectors as resources are shifted away from these sectors.

JINDFTA-C: Japan-Indonesia Free Trade Agreement – As indicated in Table 12, a JINDFTA increases global welfare by $11.1 billion, Japan's welfare by $18.7 billion (0.2% of GNP), and Indonesia's welfare by $1.7 billion (0.7% of GNP). There are indications of trade diversion and negative welfare effects for most of the non-member countries/regions. The sectoral results for Japan in Table 13 show small negative employment effects on Japanese agriculture and labor-intensive manufactures and positive effects on most other sectors. For Indonesia, the sectoral employment effects mirror those in Japan, with employment expansion in Indonesian agriculture, food, beverages & tobacco, and labor-intensive manufactures and employment declines in all other sectors.

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[22] See Hertel, Walmsley, and Itakura (2001) for a GTAP model-based analysis of the Japan-Singapore FTA that takes into account the proposed bilateral tariff reductions, implementation of uniform standards for e-commerce, services liberalization, the impact of automating customs procedures in Japan, and changes in foreign direct investment. They find that customs automization plays the most important role in driving increases in merchandise trade. They estimate global welfare gains of over $9 billion, most of these gains accruing to Japan. They find no evidence of trade diversion.

JKFTA-C: Japan-Korea Free Trade Agreement – In Table 12, a JKFTA increases global welfare by $19.7 billion, Japan's welfare by $18.7 billion (0.4% of GNP), and Korea's welfare increases by $2.2 billion (0.4% of GNP). There is some evidence of trade diversion for the United States, EU/EFTA, and for some developing countries. The sectoral results, shown in Table 13, indicate relatively small employment declines in Japan in agriculture and labor-intensive manufactures, and increases in employment in durable manufactures and services. For Korea, as shown in Table 14, employment falls in many capital-intensive manufactures sectors and in services and rises in Korea's agriculture and labor-intensive manufactures.[23]

JMAFTA-C: Japan-Malaysia Free Trade Agreement – Global economic welfare is shown in Table 12 to increase by $10.1 billion, Japan's welfare by $10.5 billion (0.2% of GNP), and Malaysia's welfare by $0.3 billion (0.2% of GNP). In Table 13, sectoral employment declines in Japan's agriculture, food, beverages & tobacco, labor-intensive sectors, machinery & equipment, and other manufactures, and there are employment increases in the other manufactures sectors and construction, other private services, and government services. For Malaysia, in Table 14, the employment increases are concentrated in agriculture, food, beverages & tobacco, wearing apparel, wood & wood products, and trade & transport, and there are declines in capital-intensive manufactures and services except for trade & transport..

JMXFTA-C: Japan-Mexico Free Trade Agreement – As indicated in Table 12, a JMXFTA increases global welfare by $10.6 billion. Japan's welfare increases by $8.2 billion (0.2% of GNP) and Mexico's welfare by $3.4 billion (0.7% of GNP). There are indications that a JMXFTA would be trade diverting for the United States, Canada, EU/EFTA , and several developing countries. The sectoral results for Japan, shown in Table 13, indicate relatively small

[23] See McKibbin, Lee, and Cheong (2004) for an analysis of a Japan-Korea FTA, using the Asia-Pacific G-Cubed Model. The G-Cubed model incorporates rational expectations and forward-looking intertemporal behavior of individual agents. The model takes into account the induced changes in expected rates of return to capital by sector and consequent structural adjustments. Allowance is also made for short-term wage stickiness or adjustment costs in allocating capital. The authors conclude that Japan and Korea gain from a FTA, but there is trade diversion for the United States, Australia, and other countries. Their results also suggest greater benefits from a rapid liberalization rather than a more gradual phasing.

employment declines in agriculture, food, beverages & tobacco, and labor-intensive manufactures and increases especially in durable manufactures. For Mexico, in Table 14, the sectoral results show relatively small employment increases in agriculture, food, beverages & tobacco, and trade & transport and declines across the manufactures sectors and services.

JPHFTA-C: Japan-Philippines FTA – In Table 12, global welfare increases by $3.0 billion, Japan's welfare by $2.2 billion (0.1% of GNP), and the Philippines welfare by $0.5 billion (0.6% of GNP). The sectoral employment results for Japan, noted in Table 13, indicate declines in agriculture and food, beverages & tobacco, and labor-intensive manufactures and increases in the other manufactures sectors and services. For the Philippines, in Table 14, the employment shifts mirror those in Japan, with increases concentrated in agriculture, food, beverages & tobacco and labor-intensive manufactures and declines across other manufactures and services.

JTHFTA-C: Japan-Thailand FTA – In Table 12, a Japan-Thailand FTA increases global welfare by $13.5 billion and Japan's welfare by $19.5 billion (0.4% of GNP), and reduces Thailand's welfare by $0.5 billion (-0.3% of GNP). There are indications of trade diversion across most of the other countries/regions indicated. There are sectoral employment declines in Japan, noted in Table 13, in agriculture, food, beverages & tobacco, and labor-intensive sectors and employment increases in capital-intensive manufactures and services. For Thailand, in Table 14, the employment increases are concentrated in agriculture and food, beverages & tobacco and employment declines across the manufactures and services sectors. The reduction in Thailand's welfare stems from the shifts away from the manufactures sectors, which are modeled with increasing returns to scale, to the agricultural sector, which is modeled with constant returns to scale.

V. Hub and Spoke Effects of the U.S. and Japan FTAs

In the discussion of the U.S. and Japan bilateral FTAs in the preceding sections, it was noted that there were indications of negative welfare effects for a number of non-member countries/regions. It is well known theoretically that preferential trading arrangements may result in both trade creation, which is welfare enhancing, and trade diversion, which will reduce welfare as trade is shifted from lower to higher cost sources of supply. But there is another consideration, which is that bilateral FTAs are based on the "hub-and-spoke" arrangement, with the United States or Japan representing the hub and with separate spokes connecting the bilateral FTA partners to the hub. In negotiating these bilateral FTAs, no account is taken of the effects that they may have on non-members, even though there may be a bilateral FTA with one or more of the non-members. As more and more bilateral FTAs are negotiated, the spokes of the FTAs may thus emanate out in many different and overlapping directions, with resulting distortions of global trade patterns. That is, this combination of varying preferences among different and overlapping FTAs may lead to greatly increased transactions costs for firms and the undermining of the most-favored-nation (MFN) principle of non-discrimination that is at the heart of the multilateral trading system. These effects of the proliferation of FTAs are what Bhagwati and Panagariya (2002) refer to as "spaghetti-bowl" effects.

An indication of the trade diversion associated with the U.S. and Japan FTAs and the overlapping of the spokes involved is shown in the top half of Table 15, which has shaded cells indicating cases of positive welfare effects and white cells indicating cases of negative welfare effects. Altogether, 16 FTAs are shown, although there is some double counting insofar as the U.S.-CAC and U.S.-Chile bilateral FTAs are encompassed in the FTAA. In any event, it seems evident from Table 15 that trade diversion and negative welfare effects are pervasive. Thus, while partner-FTA countries may gain directly from their FTAs, as indicated by "X" in the table, they may be adversely affected by other FTAs that have been negotiated.

The global results of the bilateral FTAs in Tables 8 and 12 above for the United States and Japan suggest that the negative welfare effects on non-members may be rather small in both absolute terms and as a percent of GNP. But, as mentioned in our earlier discussion, because of data limitations, our results do not reflect the potential welfare declines due to rules of origin and other discriminatory arrangements built into the bilateral FTAs. On the other hand, we do not allow for increased inflows of foreign direct investment into the partner countries or the effects of improvements in productivity and increased capital formation. Unfortunately, we are not in a position to assess these potential benefits. But it seems clear from our computational results that the welfare increases from the FTA removal of trade barriers are fairly small on the whole. Pending further analysis, we therefore conclude that there is reason to be concerned about the trade diversion and overlapping spoke effects of bilateral FTAs.

VI. Welfare Effects of Unilateral Free Trade and Global Free Trade

In this section, we ask how the welfare of the United States, Japan, their FTA partners, and other countries/regions in the global trading system would be affected if it were feasible to adopt unilateral free trade or global free trade on a non-discriminatory (MFN) basis. as compared to the adoption of discriminatory bilateral FTAs. The results are indicated in Table 16. Unilateral free trade adopted by the United States would increase U.S. welfare by $320.2 billion (3.2% of GNP), which is about three times greater than the U.S. welfare gains from the bilateral FTAs combined. If there were global (multilateral) free trade, U.S. welfare would be increased by $401.8 billion (5.4% of GNP). Japan's welfare would increase with unilateral free trade by $200.3 billion (3.7% of GNP) and with global free trade by $542.5 billion (7.4% of GNP), as compared to the $66.9 billion to be gained from Japan's bilateral FTAs combined. There are also clear indications that the FTA partner countries would generally gain more from the adoption of unilateral free trade by the United States and Japan as compared to the partner-country gains from

their bilateral FTAs. Furthermore, the FTA partner countries would generally gain even more if they adopted unilateral free trade and especially if there were global free trade.[24]

VII. Summary and Conclusions

In this paper, we have used the Michigan Model of World Production and Trade to calculate the aggregate welfare and sectoral employment effects of the menu of U.S.-Japan trade policies. The menu of policies encompasses the various preferential U.S. and Japan bilateral and regional FTAs negotiated and in process, unilateral removal of existing trade barriers by the United States, Japan, and the FTA partner countries, and global (multilateral) free trade. The welfare impacts of the FTAs on the United States and Japan have been shown to be rather small in absolute and relative terms. The sectoral employment effects are also generally small for both countries, but vary across the individual sectors depending on the patterns of bilateral liberalization.

The welfare effects on the FTA partner countries are shown to be mostly positive though generally small, but there are some indications of potentially disruptive employment shifts in some partner countries. The results further suggest that there would be trade diversion and detrimental welfare effects in some non-member countries/regions. It also appears that, while FTA partners may gain from the bilateral FTAs, they may be adversely affected because of

[24] In commenting on an earlier version of our paper, Juan Carlos Hallak asked why there are larger absolute welfare gains and smaller percent changes in welfare for the large countries as compared to the small countries in our computational results. In this connection, the expectation is that, under conditions of perfect competition, a small country may appropriate a large share of the absolute gains from trade liberalization because the prices of the small country will tend to move towards the prices in the large country. Since large price changes give rise to large gains from trade, the small country may be expected therefore to realize greater gains from liberalization than the large country.

But when scale effects are present, as in the Michigan Model, the foregoing distributional logic may not hold. That is, scale gains will be substantial for countries that specialize in sectors with significant unrealized scale economies, and it may well be that large countries are in a better position to realize big scale gains. Also, the pro-competitive effects resulting from liberalization may produce efficiency gains throughout an industry. As a consequence, the absolute gain will be proportional to the industry's/country's size. With regard to percent changes, however, there is reason to believe that a large country will exert stronger pro-competitive forces on a small country, than vice versa. We might therefore expect to observe larger percent changes in scale in small as compared to large countries. This is borne out in our calculations of scale effects for the countries/regions in the various liberalization scenarios that we have run, the results of which are available on request.

overlapping "hub-and-spoke" arrangements due to other discriminatory FTAs that have been negotiated.

The welfare gains from both unilateral trade liberalization by the United States and Japan and from global (multilateral) trade liberalization are shown to be rather substantial and more uniformly positive for all countries/regions in the global trading system as compared to the welfare gains from the bilateral FTAs analyzed.[25] The issue then is whether and when the WTO member countries will be able to overcome their divisiveness and indecisions and put the multilateral negotiations back on track. The menu choice appears to be clear.

[25] See the appendix below for sensitivity analysis of introducing alternative parameters in the model and the resulting welfare impacts of global free trade.

Appendix

Sensitivity Analysis

This appendix reports on sensitivity analysis of the Michigan Model. There are three key elasticities/parameters in the Model: the elasticity of substitution among varieties, which is exogenously set at three; the parameter that measures the sensitivity that consumers have to the number of varieties, which is set at 0.5; and the elasticities of supply that are taken from the literature.

The variety parameter can take on values between zero and one. The larger it is, it means that consumers value variety more. If the parameter is set at zero, consumers have no preference for variety. This would correspond to the Armington assumption, according to which consumers view products depending on their place of production..

To analyze the sensitivity of our model results, we have experimented with different values of the elasticity of substitution among varieties and the consumer sensitivity to the number of varieties. The following tests were conducted: (1) increase the elasticity of substitution among varieties by 10 percent, holding other parameters constant; (2) decrease the elasticity of substitution by 10 percent, holding other parameters constant; (3) increase the consumption varieties parameter by 10 percent, holding other parameters constant; and (4) decrease the consumption varieties by 10 percent, holding other parameters constant.

The results, which are available on request, are not very sensitive to the alternative parameters of the consumption varieties. That is, a 10 percent increase (decrease) in these parameters yields only 2 percent larger (smaller) welfare effects compared to the baseline model. The sensitivity to the changes in the elasticity of substitution is large compared with the results of differences in the variety parameters. For some countries, the differences are greater than 10 percent

In Brown, Deardorff, and Stern (2000), sensitivity tests reveal that the model may exaggerate the likely gains from economies of scale due to trade liberalization in the context of expansion of the NAFTA. But the error is small in this context because the impact of trade liberalization is small. When econometric estimates of scale economies are incorporated into the model, the welfare gains due to capital flows are shown to remain robust.

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Table 1. Post-Uruguay Round Tariff Rates by Sector for the United States

(Percent)

	Global	Singapore	Australia	Morocco	SACU	Thailand	FTAA				
							Canada	CAC	Chile	Mexico	South America
Agriculture	2.7	0.1	4.0	0.1	1.3	0.3	0.4	1.0	0.8	1.9	3.2
Mining	0.2	0.0	0.3	0.0	0.1	0.0	0.0	0.3	0.1	0.0	0.1
Food, Beverages & Tobacco	3.5	1.2	3.4	2.8	2.8	1.4	1.5	3.0	1.3	1.1	1.8
Textiles	5.7	9.3	6.5	7.1	6.3	8.7	0.0	6.8	14.0	0.0	7.7
Wearing Apparel	11.0	15.5	9.7	10.5	12.4	14.2	0.0	11.6	11.5	0.0	13.6
Leather Products & Footwear	7.2	5.6	4.1	3.6	2.3	7.7	0.0	4.6	7.7	0.0	6.3
Wood & Wood Products	0.3	0.4	0.8	0.7	0.3	0.2	0.0	0.5	0.2	0.0	0.4
Chemicals	1.9	3.2	1.0	1.0	0.7	1.8	0.0	0.8	0.0	0.0	0.9
Non-metallic Min. Products	3.2	4.0	2.9	0.9	0.0	2.8	0.0	3.8	0.6	0.0	2.3
Metal Products	1.4	2.3	0.2	1.4	0.6	0.9	0.0	0.5	0.5	0.0	0.6
Transportation Equipment	1.2	1.0	1.5	0.3	1.7	0.1	0.0	1.3	1.4	0.0	0.2
Machinery & Equipment	1.0	0.8	1.6	0.0	0.1	0.1	0.0	0.3	0.2	0.0	0.4
Other Manufactures	1.3	1.3	0.9	0.0	0.4	0.4	0.0	2.2	0.1	0.0	1.5
Elec., Gas & Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Trade & Transport	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Other Private Services	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
Government Services	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0

Note: Central America and Caribbean (CAC) members include Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua, an
are to be included in the FTAA.

Sources: Adapted from Francois and Strutt (1999); Brown, Deardorff and Stern (2002); and Diamaranan and McDougall (2002).

Table 2. Post-Uruguay Round Tariff Rates by Sector for Japan

(Percent)

	Global	Singapore	Chile	Korea	Indonesia	Malaysia	Mexico	Philippines	Thailand
Agriculture	38.1	1.3	2.9	5.3	6.7	0.3	6.1	11.5	1.7
Mining	-0.2	0.0	0.0	0.0	-0.7	-0.6	-1.7	0.0	-1.8
Food, Beverages & Tobacco	25.2	20.8	4.3	18.9	3.2	2.2	44.2	4.6	17.3
Textiles	2.8	7.4	0.0	2.9	1.1	0.2	0.1	1.7	1.5
Wearing Apparel	6.5	5.8	7.0	5.8	5.4	5.7	5.1	4.9	4.9
Leather Products & Footwear	8.9	6.1	0.0	8.4	4.5	9.1	10.3	8.0	8.4
Wood & Wood Products	0.4	0.3	0.1	0.2	0.0	0.3	0.5	0.0	0.0
Chemicals	1.8	0.9	0.0	0.9	1.1	0.3	0.6	0.4	0.6
Non-metallic Min. Products	1.0	0.2	0.0	0.7	1.4	0.4	0.9	0.6	1.4
Metal Products	0.5	0.3	0.1	1.0	0.3	0.3	0.1	0.3	0.4
Transportation Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Machinery & Equipment	0.0	0.0	0.3	0.1	0.2	0.0	0.1	0.1	0.1
Other Manufactures	0.7	0.0	1.8	0.3	2.8	0.0	0.0	0.8	0.1
Elec., Gas & Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	3.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0
Trade & Transport	15.0	15.0	15.0	15.0	0.0	15.0	15.0	15.0	15.0
Other Private Services	12.0	12.0	12.0	12.0	0.0	12.0	12.0	12.0	12.0
Government Services	28.0	28.0	28.0	28.0	0.0	28.0	28.0	28.0	28.0

Sources: Adapted from Francois and Strutt (1999); Brown, Deardorff and Stern (2002); and Diamaranan and McDougall (2002).

Table 3. Value of U.S. Sectoral Exports by Destination and Origin, 1997 (Millions of U.S. Dollars)

	Global	Singapore	Australia	Morocco	SACU	Thailand	FTAA				
							Canada	CAC	Chile	Mexico	South America
Value											
Agriculture	35,176	121	109	128	65	394	2,815	1,098	47	3,242	1,547
Mining	6,421	15	22	6	38	6	1,416	26	39	214	434
Food, Beverages & Tobacco	30,541	293	281	75	145	171	3,964	1,464	83	2,065	982
Textiles	11,485	113	159	11	36	56	2,538	1,362	90	2,055	565
Wearing Apparel	6,847	45	35	4	8	12	423	2,428	21	1,623	213
Leather Products & Footwear	2,280	24	24	0	16	37	185	213	6	323	59
Wood & Wood Products	29,386	284	542	8	165	182	7,717	1,094	151	3,415	1,371
Chemicals	90,569	3,236	2,129	26	524	1,109	15,886	2,737	665	10,405	6,752
Non-metallic Min. Products	11,921	168	318	20	96	68	2,703	269	93	922	745
Metal Products	34,238	511	312	1	97	384	10,460	712	223	5,089	1,447
Transportation Equipment	102,640	1,899	1,800	89	349	1,337	33,595	953	607	8,130	3,713
Machinery & Equipment	269,892	11,075	5,440	77	1,367	3,455	44,683	3,795	1,860	27,568	17,262
Other Manufactures	11,322	254	210	2	55	49	1,400	273	69	794	526
Elec., Gas & Water	751	19	4	0	2	4	113	2	2	9	60
Construction	4,023	2	3	0	4	32	5	32	0	2	9
Trade & Transport	81,445	879	1,675	60	549	602	2,401	514	308	744	3,069
Other Private Services	81,707	1,280	1,047	66	315	975	3,889	588	151	928	2,195
Government Services	42,165	366	574	321	250	309	826	282	139	722	1,759
Total	852,808	20,583	14,686	894	4,080	9,183	135,019	17,843	4,554	68,250	42,708

	Global	Singapore	Australia	Morocco	SACU	Thailand	FTAA				
							Canada	CAC	Chile	Mexico	South America
Percent											
Agriculture	100.0	0.3	0.3	0.4	0.2	1.1	8.0	3.1	0.1	9.2	4.4
Mining	100.0	0.2	0.3	0.1	0.6	0.1	22.0	0.4	0.6	3.3	6.8
Food, Beverages & Tobacco	100.0	1.0	0.9	0.2	0.5	0.6	13.0	4.8	0.3	6.8	3.2
Textiles	100.0	1.0	1.4	0.1	0.3	0.5	22.1	11.9	0.8	17.9	4.9
Wearing Apparel	100.0	0.7	0.5	0.1	0.1	0.2	6.2	35.5	0.3	23.7	3.1
Leather Products & Footwear	100.0	1.0	1.0	0.0	0.7	1.6	8.1	9.3	0.3	14.2	2.6
Wood & Wood Products	100.0	1.0	1.8	0.0	0.6	0.6	26.3	3.7	0.5	11.6	4.7
Chemicals	100.0	3.6	2.4	0.0	0.6	1.2	17.5	3.0	0.7	11.5	7.5
Non-metallic Min. Products	100.0	1.4	2.7	0.2	0.8	0.6	22.7	2.3	0.8	7.7	6.3
Metal Products	100.0	1.5	0.9	0.0	0.3	1.1	30.6	2.1	0.7	14.9	4.2
Transportation Equipment	100.0	1.9	1.8	0.1	0.3	1.3	32.7	0.9	0.6	7.9	3.6
Machinery & Equipment	100.0	4.1	2.0	0.0	0.5	1.3	16.6	1.4	0.7	10.2	6.4
Other Manufactures	100.0	2.2	1.9	0.0	0.5	0.4	12.4	2.4	0.6	7.0	4.6
Elec., Gas & Water	100.0	2.5	0.6	0.0	0.2	0.5	15.1	0.3	0.2	1.3	8.0
Construction	100.0	0.1	0.1	0.0	0.1	0.8	0.1	0.8	0.0	0.0	0.2
Trade & Transport	100.0	1.1	2.1	0.1	0.7	0.7	2.9	0.6	0.4	0.9	3.8
Other Private Services	100.0	1.6	1.3	0.1	0.4	1.2	4.8	0.7	0.2	1.1	2.7
Government Services	100.0	0.9	1.4	0.8	0.6	0.7	2.0	0.7	0.3	1.7	4.2
Total	100.0	2.4	1.7	0.1	0.5	1.1	15.8	2.1	0.5	8.0	5.0

Source: GTAP 5.4 adapted from Dimaranan and McDougall (2002).

Table 4. Value of U.S. Sectoral Imports by Destination and Origin, 1997 (Millions of U.S. Dollars)

	Global	Singapore	Australia	Morocco	SACU	Thailand	FTAA				
							Canada	CAC	Chile	Mexico	South America
Value											
Agriculture	18,602	41	181	15	53	207	3,984	2,280	716	2,956	3,585
Mining	69,939	0	413	72	133	13	17,060	664	74	8,324	12,894
Food, Beverages & Tobacco	28,813	115	898	41	138	1,672	5,553	1,421	534	1,957	2,427
Textiles	21,514	132	169	4	101	389	1,803	1,725	9	2,640	365
Wearing Apparel	38,335	186	45	62	139	1,212	1,050	5,443	17	3,974	612
Leather Products & Footwear	21,842	9	28	5	25	782	219	438	5	607	1,572
Wood & Wood Products	43,785	211	85	4	81	353	25,258	165	352	2,956	1,216
Chemicals	77,142	864	302	11	259	702	15,449	879	159	2,747	4,414
Non-metallic Min. Products	14,071	17	40	2	44	161	2,572	369	18	1,365	607
Metal Products	56,001	83	998	5	1,417	276	15,648	429	573	4,180	3,592
Transportation Equipment	128,874	169	613	0	69	90	43,993	21	3	14,064	1,314
Machinery & Equipment	307,001	17,834	549	94	117	6,053	32,119	1,128	13	38,411	1,726
Other Manufactures	39,851	38	80	3	219	962	988	289	7	1,400	491
Elec., Gas & Water	2,230	2	2	1	22	2	1,445	5	0	2	117
Construction	1,268	3	3	2	3	3	4	18	0	2	7
Trade & Transport	75,050	919	2,084	163	578	1,381	1,696	873	296	1,270	1,522
Other Private Services	59,724	1,996	1,034	77	216	642	2,111	522	94	741	1,096
Government Services	18,838	125	501	222	158	115	466	335	54	144	699
Total	1,022,879	22,743	8,025	782	3,771	15,017	171,418	17,004	2,924	87,739	38,256

	Global	Singapore	Australia	Morocco	SACU	Thailand	FTAA				
							Canada	CAC	Chile	Mexico	South America
Percent											
Agriculture	100.0	0.2	1.0	0.1	0.3	1.1	21.4	12.3	3.9	15.9	19.3
Mining	100.0	0.0	0.6	0.1	0.2	0.0	24.4	0.9	0.1	11.9	18.4
Food, Beverages & Tobacco	100.0	0.4	3.1	0.1	0.5	5.8	19.3	4.9	1.9	6.8	8.4
Textiles	100.0	0.6	0.8	0.0	0.5	1.8	8.4	8.0	0.0	12.3	1.7
Wearing Apparel	100.0	0.5	0.1	0.2	0.4	3.2	2.7	14.2	0.0	10.4	1.6
Leather Products & Footwear	100.0	0.0	0.1	0.0	0.1	3.6	1.0	2.0	0.0	2.8	7.2
Wood & Wood Products	100.0	0.5	0.2	0.0	0.2	0.8	57.7	0.4	0.8	6.8	2.8
Chemicals	100.0	1.1	0.4	0.0	0.3	0.9	20.0	1.1	0.2	3.6	5.7
Non-metallic Min. Products	100.0	0.1	0.3	0.0	0.3	1.1	18.3	2.6	0.1	9.7	4.3
Metal Products	100.0	0.1	1.8	0.0	2.5	0.5	27.9	0.8	1.0	7.5	6.4
Transportation Equipment	100.0	0.1	0.5	0.0	0.1	0.1	34.1	0.0	0.0	10.9	1.0
Machinery & Equipment	100.0	5.8	0.2	0.0	0.0	2.0	10.5	0.4	0.0	12.5	0.6
Other Manufactures	100.0	0.1	0.2	0.0	0.6	2.4	2.5	0.7	0.0	3.5	1.2
Elec., Gas & Water	100.0	0.1	0.1	0.0	1.0	0.1	64.8	0.2	0.0	0.1	5.2
Construction	100.0	0.2	0.2	0.1	0.2	0.2	0.3	1.4	0.0	0.1	0.5
Trade & Transport	100.0	1.2	2.8	0.2	0.8	1.8	2.3	1.2	0.4	1.7	2.0
Other Private Services	100.0	3.3	1.7	0.1	0.4	1.1	3.5	0.9	0.2	1.2	1.8
Government Services	100.0	0.7	2.7	1.2	0.8	0.6	2.5	1.8	0.3	0.8	3.7
Total	100.0	2.2	0.8	0.1	0.4	1.5	16.8	1.7	0.3	8.6	3.7

Source: GTAP 5.4 adapted from Dimaranan and McDougall (2002).

Table 5. Value of Japan's Sectoral Exports by Destination and Origin, 1997 (Millions of U.S. Dollars)

Value	Global	Singapore	Chile	Indonesia	Korea	Malaysia	Mexico	Phlippines	Thailand
Agriculture	493	13	1	8	49	4	3	5	14
Mining	188	2	0	13	25	7	4	3	7
Food, Beverages & Tobacco	2,803	131	3	25	200	41	6	57	118
Textiles	7,581	177	2	245	543	130	22	126	186
Wearing Apparel	1,054	14	1	4	50	5	5	4	7
Leather Products & Footwear	315	9	0	4	36	2	1	10	12
Wood & Wood Products	3,356	146	10	97	218	157	19	55	111
Chemicals	42,360	1,851	87	1,239	4,105	1,117	283	640	1,542
Non-metallic Min. Products	6,763	434	4	140	896	320	51	215	325
Metal Products	29,106	1,638	26	1,206	3,307	1,817	296	498	2,063
Transportation Equipment	92,470	1,834	390	1,961	730	1,702	666	1,156	2,001
Machinery & Equipment	233,236	14,234	560	4,865	15,742	9,136	2,338	6,335	8,211
Other Manufactures	7,648	228	9	74	342	161	40	34	116
Elec., Gas & Water	78	1	0	0	1	0	1	0	1
Construction	6,658	1	0	1	2	1	1	147	74
Trade & Transport	33,227	356	131	171	1,045	189	287	98	205
Other Private Services	18,131	219	27	142	249	126	364	40	163
Government Services	4,999	42	9	26	57	20	46	14	28
Total	490,466	21,329	1,260	10,219	27,597	14,936	4,430	9,438	15,184
Percent	Global	Singapore	Chile	Indonesia	Korea	Malaysia	Mexico	Phlippines	Thailand
Agriculture	100.0	2.7	0.1	1.6	10.0	0.9	0.5	1.0	2.7
Mining	100.0	1.0	0.2	6.9	13.1	3.8	2.1	1.5	3.5
Food, Beverages & Tobacco	100.0	4.7	0.1	0.9	7.1	1.5	0.2	2.0	4.2
Textiles	100.0	2.3	0.0	3.2	7.2	1.7	0.3	1.7	2.5
Wearing Apparel	100.0	1.3	0.1	0.4	4.8	0.5	0.4	0.4	0.7
Leather Products & Footwear	100.0	2.7	0.1	1.4	11.5	0.6	0.2	3.1	3.9
Wood & Wood Products	100.0	4.3	0.3	2.9	6.5	4.7	0.6	1.7	3.3
Chemicals	100.0	4.4	0.2	2.9	9.7	2.6	0.7	1.5	3.6
Non-metallic Min. Products	100.0	6.4	0.1	2.1	13.3	4.7	0.8	3.2	4.8
Metal Products	100.0	5.6	0.1	4.1	11.4	6.2	1.0	1.7	7.1
Transportation Equipment	100.0	2.0	0.4	2.1	0.8	1.8	0.7	1.3	2.2
Machinery & Equipment	100.0	6.1	0.2	2.1	6.7	3.9	1.0	2.7	3.5
Other Manufactures	100.0	3.0	0.1	1.0	4.5	2.1	0.5	0.4	1.5
Elec., Gas & Water	100.0	1.5	0.2	0.6	1.7	0.6	1.0	0.5	0.9
Construction	100.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	1.1
Trade & Transport	100.0	1.1	0.4	0.5	3.1	0.6	0.9	0.3	0.6
Other Private Services	100.0	1.2	0.1	0.8	1.4	0.7	2.0	0.2	0.9
Government Services	100.0	0.8	0.2	0.5	1.1	0.4	0.9	0.3	0.6
Total	100.0	4.3	0.3	2.1	5.6	3.0	0.9	1.9	3.1

Source: GTAP 5.4 adapted from Dimaranan and McDougall (2002).

Table 6. Value of Japan's Sectoral Imports by Destination and Origin, 1997 (Millions of U.S. Dollars)

Value	Global	Singapore	Chile	Indonesia	Korea	Malaysia	Mexico	Phlippines	Thailand
Agriculture	21,409	84	104	332	470	514	149	299	206
Mining	50,163	3	1,074	5,304	33	1,498	466	314	8
Food, Beverages & Tobacco	31,690	166	797	1,012	1,321	387	209	257	2,161
Textiles	10,216	11	3	412	792	172	19	33	261
Wearing Apparel	12,503	24	3	239	497	79	14	122	295
Leather Products & Footwear	5,835	17	1	214	401	3	9	22	78
Wood & Wood Products	19,128	121	445	2,503	188	1,386	12	137	530
Chemicals	35,097	872	40	650	2,897	634	134	146	1,005
Non-metallic Min. Products	5,436	43	2	58	289	101	38	36	236
Metal Products	21,098	193	465	576	2,430	285	67	157	408
Transportation Equipment	17,723	22	0	71	155	50	17	77	99
Machinery & Equipment	78,030	5,413	1	944	5,064	4,049	197	2,755	3,906
Other Manufactures	9,686	35	0	102	359	94	37	88	403
Elec., Gas & Water	732	2	0	6	1	2	4	1	1
Construction	6,918	2	0	1	2	1	1	6	10
Trade & Transport	51,819	814	180	819	559	602	1,149	296	1,048
Other Private Services	30,411	392	40	82	322	104	242	22	115
Government Services	10,323	62	5	35	145	23	41	15	33
Total	418,217	8,275	3,161	13,358	15,926	9,985	2,807	4,782	10,805
Percent	Global	Singapore	Chile	Indonesia	Korea	Malaysia	Mexico	Phlippines	Thailand
Agriculture	100.0	0.4	0.5	1.5	2.2	2.4	0.7	1.4	1.0
Mining	100.0	0.0	2.1	10.6	0.1	3.0	0.9	0.6	0.0
Food, Beverages & Tobacco	100.0	0.5	2.5	3.2	4.2	1.2	0.7	0.8	6.8
Textiles	100.0	0.1	0.0	4.0	7.8	1.7	0.2	0.3	2.6
Wearing Apparel	100.0	0.2	0.0	1.9	4.0	0.6	0.1	1.0	2.4
Leather Products & Footwear	100.0	0.3	0.0	3.7	6.9	0.1	0.2	0.4	1.3
Wood & Wood Products	100.0	0.6	2.3	13.1	1.0	7.2	0.1	0.7	2.8
Chemicals	100.0	2.5	0.1	1.9	8.3	1.8	0.4	0.4	2.9
Non-metallic Min. Products	100.0	0.8	0.0	1.1	5.3	1.9	0.7	0.7	4.3
Metal Products	100.0	0.9	2.2	2.7	11.5	1.3	0.3	0.7	1.9
Transportation Equipment	100.0	0.1	0.0	0.4	0.9	0.3	0.1	0.4	0.6
Machinery & Equipment	100.0	6.9	0.0	1.2	6.5	5.2	0.3	3.5	5.0
Other Manufactures	100.0	0.4	0.0	1.1	3.7	1.0	0.4	0.9	4.2
Elec., Gas & Water	100.0	0.2	0.1	0.8	0.1	0.3	0.5	0.1	0.2
Construction	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Trade & Transport	100.0	1.6	0.3	1.6	1.1	1.2	2.2	0.6	2.0
Other Private Services	100.0	1.3	0.1	0.3	1.1	0.3	0.8	0.1	0.4
Government Services	100.0	0.6	0.0	0.3	1.4	0.2	0.4	0.1	0.3
Total	100.0	2.0	0.8	3.2	3.8	2.4	0.7	1.1	2.6

Source: GTAP 5.4 adapted from Dimaranan and McDougall (2002).

Table 7. Employment by Sector, 1997: United States, Japan and FTA Partners

(Number of Workers and Percent of Employment)

Workers (thousand)	United States	Japan	Singapore	Korea	Indonesia	Malaysia	Phlippines	Thailand	Australia	Morocco	SACU	FTAA				
												Chile	Canada	CAC	Mexico	South America
Agriculture	3,538	3,518	2,385	5	35,850	1,481	11,262	16,696	431	552	4,686	776	1,058	4,074	9,023	18,636
Mining	634	70	26	1	897	39	124	47	75	93	308	88	365	97	108	1,021
Food, Beverages & Tobacco	2,145	1,789	317	17	2,149	153	609	622	208	568	201	277	544	725	1,556	3,657
Textiles	949	630	384	2	1,683	67	190	710	41	383	68	46	143	179	495	1,119
Wearing Apparel	797	460	260	9	1,050	92	459	1,241	45	653	117	40	160	513	162	1,104
Leather Products & Footwear	111	106	96	1	875	7	65	80	13	84	30	28	32	64	172	456
Wood & Wood Products	2,218	1,725	363	36	1,938	352	274	234	215	158	201	134	902	207	586	1,587
Chemicals	2,667	1,431	490	45	1,295	254	286	276	113	264	162	121	462	261	1,042	2,172
Non-metallic Min. Products	690	592	187	8	502	93	106	208	48	220	73	35	116	88	325	887
Metal Products	3,054	1,760	489	42	570	152	175	363	189	140	202	107	553	118	493	1,336
Transportation Equipment	2,244	1,292	543	41	354	83	75	135	97	66	84	26	534	28	583	523
Machinery & Equipment	5,441	4,425	1,276	209	607	718	434	305	151	113	175	44	719	123	790	859
Other Manufactures	519	287	78	4	193	31	80	119	16	3	24	4	69	34	62	169
Elec., Gas & Water	1,493	362	77	12	233	51	139	178	66	97	131	31	256	138	188	213
Construction	8,302	6,886	2,004	126	4,200	793	1,641	2,021	580	959	1,362	489	1,478	982	1,759	6,974
Trade & Transport	34,466	18,968	6,967	609	21,360	2,001	5,989	5,583	2,674	2,757	3,024	1,377	8,541	3,800	9,550	23,466
Other Private Services	14,768	5,780	1,900	274	657	447	680	882	1,197	244	1,354	377	3,906	405	1,513	3,661
Government Services	45,521	15,500	3,265	389	12,637	1,755	5,297	3,461	2,229	3,319	6,304	1,382	8,043	3,925	8,951	35,062
Total	129,557	65,580	21,106	1,831	87,050	8,569	27,888	33,162	8,387	10,675	18,508	5,380	27,880	15,761	37,360	102,901

Percent	United States	Japan	Singapore	Korea	Indonesia	Malaysia	Phlippines	Thailand	Australia	Morocco	SACU	FTAA				
												Chile	Canada	CAC	Mexico	South America
Agriculture	2.7	5.4	11.3	0.3	41.2	17.3	40.4	50.3	5.1	5.2	25.3	14.4	3.8	25.8	24.2	18.1
Mining	0.5	0.1	0.1	0.0	1.0	0.4	0.4	0.1	0.9	0.9	1.7	1.6	1.3	0.6	0.3	1.0
Food, Beverages & Tobacco	1.7	2.7	1.5	0.9	2.5	1.8	2.2	1.9	2.5	5.3	1.1	5.2	2.0	4.6	4.2	3.6
Textiles	0.7	1.0	1.8	0.1	1.9	0.8	0.7	2.1	0.5	3.6	0.4	0.8	0.5	1.1	1.3	1.1
Wearing Apparel	0.6	0.7	1.2	0.5	1.2	1.1	1.6	3.7	0.5	6.1	0.6	0.7	0.6	3.3	0.4	1.1
Leather Products & Footwear	0.1	0.2	0.5	0.1	1.0	0.1	0.2	0.2	0.1	0.8	0.2	0.5	0.1	0.4	0.5	0.4
Wood & Wood Products	1.7	2.6	1.7	1.9	2.2	4.1	1.0	0.7	2.6	1.5	1.1	2.5	3.2	1.3	1.6	1.5
Chemicals	2.1	2.2	2.3	2.5	1.5	3.0	1.0	0.8	1.3	2.5	0.9	2.2	1.7	1.7	2.8	2.1
Non-metallic Min. Products	0.5	0.9	0.9	0.4	0.6	1.1	0.4	0.6	0.6	2.1	0.4	0.6	0.4	0.6	0.9	0.9
Metal Products	2.4	2.7	2.3	2.3	0.7	1.8	0.6	1.1	2.3	1.3	1.1	2.0	2.0	0.7	1.3	1.3
Transportation Equipment	1.7	2.0	2.6	2.2	0.4	1.0	0.3	0.4	1.2	0.6	0.5	0.5	1.9	0.2	1.6	0.5
Machinery & Equipment	4.2	6.7	6.0	11.4	0.7	8.4	1.6	0.9	1.8	1.1	0.9	0.8	2.6	0.8	2.1	0.8
Other Manufactures	0.4	0.4	0.4	0.2	0.2	0.4	0.3	0.4	0.2	0.0	0.1	0.1	0.2	0.2	0.2	0.2
Elec., Gas & Water	1.2	0.6	0.4	0.7	0.3	0.6	0.5	0.5	0.8	0.9	0.7	0.6	0.9	0.9	0.5	0.2
Construction	6.4	10.5	9.5	6.9	4.8	9.3	5.9	6.1	6.9	9.0	7.4	9.1	5.3	6.2	4.7	6.8
Trade & Transport	26.6	28.9	33.0	33.3	24.5	23.4	21.5	16.8	31.9	25.8	16.3	25.6	30.6	24.1	25.6	22.8
Other Private Services	11.4	8.8	9.0	15.0	0.8	5.2	2.4	2.7	14.3	2.3	7.3	7.0	14.0	2.6	4.1	3.6
Government Services	35.1	23.6	15.5	21.3	14.5	20.5	19.0	10.4	26.6	31.1	34.1	25.7	28.8	24.9	24.0	34.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: ILO webiste (2003); Taiwan government website (2003); UNIDO (2003); and World Bank (2003).

Table 8. Global Welfare Effects of Bilateral Negotiating Options for the United States

(Billions of Dollars and Percent of GNP)

Billions of Dollars	US-Chile	US-Singapore	US-CAC	US-Australia	US-Morocco	US-SACU	US-Thailand	FTAA
Japan	0.0	1.0	-1.4	-0.6	0.1	-0.0	-0.2	-1.6
United States	6.9	15.8	17.3	19.4	6.0	9.6	17.1	67.6
Canada	0.1	0.1	-0.2	-0.1	0.0	0.0	0.0	5.8
Australia	-0.0	0.1	-0.1	5.4	0.0	0.0	-0.0	-0.2
New Zealand	-0.0	0.0	-0.0	0.0	0.0	0.0	-0.0	-0.0
EU and EFTA	-0.2	2.3	-3.4	-0.4	0.3	-0.0	-0.3	-6.2
Hong Kong	0.0	-0.0	-0.1	-0.0	0.0	0.0	0.0	0.0
China	-0.0	0.1	-0.5	-0.1	0.0	-0.0	-0.1	-0.4
Korea	-0.0	0.2	-0.2	-0.1	0.0	-0.0	-0.0	-0.4
Singapore	0.0	2.5	-0.0	-0.0	0.0	0.0	0.0	-0.0
Taiwan	0.0	0.1	-0.2	-0.1	0.0	-0.0	-0.0	-0.2
Indonesia	0.0	0.1	-0.1	0.0	0.0	-0.0	-0.0	-0.1
Malaysia	0.0	0.1	-0.0	-0.0	0.0	-0.0	-0.0	0.0
Philippines	0.0	0.0	-0.1	-0.0	0.0	0.0	-0.0	-0.0
Thailand	0.0	0.1	-0.1	-0.0	0.0	-0.0	5.6	-0.0
Rest of Asia	0.0	0.1	-0.2	-0.1	0.0	-0.0	-0.0	-0.2
Chile	1.2	0.0	-0.0	0.0	0.0	0.0	-0.0	3.4
Mexico	-0.0	-0.0	-0.2	-0.0	0.0	0.0	-0.0	6.6
Central America and the Carribean (CAC)	0.0	0.0	5.3	-0.0	0.0	-0.0	-0.0	7.8
South America	-0.2	0.1	-0.1	-0.0	0.0	0.0	0.0	27.6
Morocco	0.0	0.0	-0.0	-0.0	0.9	-0.0	-0.0	-0.0
Southern African Customs Union (SACU)	-0.0	0.0	-0.0	0.0	0.0	2.2	-0.0	-0.1
Total	7.9	22.5	15.7	23.1	7.5	11.8	21.9	109.5

Percent	US-Chile	US-Singapore	US-CAC	US-Australia	US-Morocco	US-SACU	US-Thailand	FTAA
Japan	0.0	0.0	-0.0	-0.0	0.0	0.0	-0.0	-0.0
United States	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.7
Canada	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.7
Australia	0.0	0.0	-0.0	1.1	0.0	0.0	-0.0	-0.0
New Zealand	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	-0.1
EU and EFTA	0.0	0.0	-0.0	0.0	0.0	0.0	-0.0	-0.1
Hong Kong	0.0	-0.0	-0.0	-0.0	0.0	0.0	0.0	0.0
China	0.0	0.0	-0.1	-0.0	0.0	0.0	-0.0	-0.0
Korea	-0.0	0.0	-0.0	-0.0	0.0	0.0	-0.0	-0.1
Singapore	0.0	2.6	-0.0	-0.0	0.0	0.0	0.0	0.0
Taiwan	0.0	0.0	-0.1	-0.0	0.0	0.0	-0.0	-0.1
Indonesia	0.0	0.0	-0.1	0.0	0.0	0.0	-0.0	-0.1
Malaysia	0.0	0.1	0.0	-0.0	0.0	0.0	-0.0	0.0
Philippines	0.0	0.0	-0.1	-0.0	0.0	0.0	-0.0	-0.0
Thailand	0.0	0.0	-0.0	-0.0	0.0	0.0	2.8	-0.0
Rest of Asia	0.0	0.0	-0.0	-0.0	0.0	0.0	-0.0	-0.0
Chile	1.3	0.0	-0.0	0.0	0.0	0.0	-0.0	3.6
Mexico	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	1.3
Central America and the Carribean (CAC)	0.0	0.0	4.4	-0.0	0.0	0.0	-0.0	6.5
South America	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Morocco	0.0	0.0	-0.0	0.0	2.0	0.0	0.0	-0.0
Southern African Customs Union (SACU)	-0.0	0.0	-0.0	0.0	0.0	1.2	-0.0	-0.0

Table 9. Sectoral Employment Effects of Bilateral Negotiating Options for the United States

(Number of Workers and Percent of Employment)

Number of Workers	US-Chile	US-Singapore	US-CAC	US-Australia	US-Morocco	US-SACU	US-Thailand
Agriculture	-1,427	1,335	2,173	94	1,314	973	2,458
Mining	-58	358	596	504	-44	27	129
Food, Beverages & Tobacco	-548	52	495	-756	542	353	-1,077
Textiles	73	-102	-5,133	810	-32	-109	-1,230
Wearing Apparel	-118	-227	-14,006	619	-129	-211	-2,530
Leather products & Footwear	-28	112	1,512	207	-8	202	-395
Wood & Wood Products	-16	143	1,761	394	-10	163	41
Chemicals	355	617	2,667	1,555	-55	127	1,384
Non-metallic Min. Products	86	210	666	539	29	76	62
Metal Products	87	1,358	2,218	1,957	-138	33	1,175
Transportation Equipment	321	959	1,069	1,741	-50	369	351
Machinery & Equipment	1,769	5,309	3,626	6,229	-367	1,230	2,054
Other Manufactures	48	526	1,558	653	-52	77	-784
Elec., Gas & Water	-30	-56	156	15	2	13	-10
Construction	-5	-519	31	-257	-57	-13	16
Trade & Transport	-849	-4,192	640	-11,719	-1,140	-2,101	-4,272
Other Private Services	-42	-4,255	1,362	-2,188	-194	11	932
Government Services	383	-1,628	-1,390	-398	389	-1,221	1,696

Percent	US-Chile	US-Singapore	US-CAC	US-Australia	US-Morocco	US-SACU	US-Thailand
Agriculture	-0.0	0.0	0.1	0.0	0.0	0.0	0.1
Mining	-0.0	0.1	0.1	0.1	-0.0	0.0	0.0
Food, Beverages & Tobacco	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.1
Textiles	0.0	-0.0	-0.6	0.1	0.0	-0.0	-0.1
Wearing Apparel	-0.0	-0.0	-1.8	0.1	-0.0	-0.0	-0.3
Leather products & Footwear	-0.0	0.1	1.5	0.2	-0.0	0.2	-0.4
Wood & Wood Products	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Chemicals	0.0	0.0	0.1	0.1	0.0	0.0	0.1
Non-metallic Min. Products	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Metal Products	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Transportation Equipment	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Machinery & Equipment	0.0	0.1	0.1	0.1	-0.0	0.0	0.0
Other Manufactures	0.0	0.1	0.3	0.1	-0.0	0.0	-0.2
Elec., Gas & Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	0.0	-0.0	0.0	0.0	0.0	0.0	0.0
Trade & Transport	0.0	-0.0	0.0	-0.0	0.0	-0.0	-0.0
Other Private Services	0.0	-0.0	0.0	-0.0	0.0	0.0	0.0
Government Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 10. Sectoral Employment Effects for the US FTA Partner Countries

(Number of Workers and Percent of Employment)

Number of Workers	US-Chile	US-Singapore	US-CAC	US-Australia	US-Morocco	US-SACU	US-Thailand
Agriculture	9,652	-27	-23,731	-300	-3,124	-6,495	-70,515
Mining	811	-20	-12,650	-1,390	992	-961	-1,468
Food, Beverages & Tobacco	1,852	29	-14,061	564	-9,562	-820	3,294
Textiles	-255	115	53,741	-244	5,431	799	23,608
Wearing Apparel	-90	1,476	230,663	-145	8,580	14,668	62,579
Leather products & Footwear	31	-7	9,518	-121	-376	-145	6,806
Wood & Wood Products	-118	-396	-18,415	-648	236	-801	-1,692
Chemicals	-1,677	-1,123	-19,202	-1,612	534	-427	-6,524
Non-metallic Min. Products	-273	-105	-6,720	-437	-995	-224	-1,545
Metal Products	997	-1,178	-11,865	-2,912	889	-999	-5,548
Transportation Equipment	-747	-410	-2,310	-1,196	-353	-694	-1,324
Machinery & Equipment	-2,171	-6,944	-12,126	-3,490	963	-2,068	1,106
Other Manufactures	-81	-64	-2,361	-390	2	-236	2,025
Elec., Gas & Water	64	34	-518	-67	113	-261	116
Construction	-528	251	-13,873	-599	-1,097	-1,185	-2,983
Trade & Transport	732	4,673	-71,515	11,593	13,729	1,046	29,809
Other Private Services	-38	4,283	-11,273	3,160	207	-1,233	-5,628
Government Services	-8,161	-588	-73,302	-1,764	-16,168	35	-32,116

Percent	US-Chile	US-Singapore	US-CAC	US-Australia	US-Morocco	US-SACU	US-Thailand
Agriculture	1.2	-0.5	-0.6	-0.1	-0.6	-0.1	-0.4
Mining	1.0	-3.1	-13.6	-1.9	1.1	-0.3	-3.3
Food, Beverages & Tobacco	0.6	0.2	-1.9	0.3	-1.7	-0.4	0.5
Textiles	-0.6	5.8	27.9	-0.6	1.3	1.2	3.5
Wearing Apparel	-0.2	15.8	42.2	-0.4	1.2	12.8	5.2
Leather products & Footwear	0.1	-0.5	14.6	-1.0	-0.5	-0.5	8.7
Wood & Wood Products	-0.1	-1.1	-9.0	-0.3	0.2	-0.4	-0.8
Chemicals	-1.4	-2.4	-7.3	-1.4	0.2	-0.3	-2.5
Non-metallic Min. Products	-0.8	-1.3	-7.8	-0.9	-0.5	-0.3	-0.8
Metal Products	1.0	-2.8	-10.2	-1.5	0.7	-0.5	-1.7
Transportation Equipment	-2.9	-1.0	-8.5	-1.3	-0.6	-0.8	-1.0
Machinery & Equipment	-5.1	-3.4	-10.0	-2.3	0.9	-1.2	0.4
Other Manufactures	-2.3	-1.6	-6.9	-2.4	0.1	-1.0	1.8
Elec., Gas & Water	0.2	0.3	-0.4	-0.1	0.1	-0.2	0.1
Construction	-0.1	0.2	-1.4	-0.1	-0.1	-0.1	-0.2
Trade & Transport	0.1	0.8	-1.9	0.4	0.5	0.0	0.6
Other Private Services	-0.0	1.6	-2.8	0.3	0.1	-0.1	-0.7
Government Services	-0.6	-0.2	-1.9	-0.1	-0.5	0.0	-1.0

Table 11. Sectoral Employment Effects for the FTAA Member Countries

(Number of Workers and Percent of Employment)

Number of Workers	United States	Canada	CAC	Chile	Mexico	South America
Agriculture	-12,460	1,478	-39,042	14,744	-20,701	202,605
Mining	-3,251	-1,505	-19,685	-2,486	-553	29,499
Food, Beverages & Tobacco	-3,452	-3,049	-18,987	1,953	-3,658	16,172
Textiles	-6,028	-2,060	57,999	206	-2,251	-2,133
Wearing Apparel	-16,804	-2,089	244,675	-163	-3,687	818
Leather products & Footwear	620	-650	11,090	301	-1,000	10,500
Wood & Wood Products	2,502	-166	-19,314	561	538	-6,481
Chemicals	2,883	-1,014	-16,078	-3,018	1,334	-393
Non-metallic Min. Products	957	-52	-7,194	-749	1,372	-2,081
Metal Products	2,024	-151	-10,672	3,512	1,782	-3,014
Transportation Equipment	2,970	5,206	-2,171	114	16,633	-7,730
Machinery & Equipment	21,830	2,450	-8,320	1,611	2,489	-20,176
Other Manufactures	2,148	-149	-1,828	-20	-177	-532
Elec., Gas & Water	-228	-81	-410	293	36	179
Construction	-88	-39	-14,623	-1,306	622	-11,433
Trade & Transport	1,991	2,952	-62,175	-2,705	9,799	-74,080
Other Private Services	2,788	229	-11,146	-154	-2,190	-4,712
Government Services	1,597	-1,309	-82,120	-12,693	-387	-127,009

Percent	United States	Canada	CAC	Chile	Mexico	South America
Agriculture	-0.3	0.1	-1.0	1.9	-0.2	1.1
Mining	-0.5	-0.4	-21.2	-2.9	-0.5	2.9
Food, Beverages & Tobacco	-0.2	-0.6	-2.5	0.7	-0.2	0.4
Textiles	-0.6	-1.5	30.1	0.5	-0.5	-0.2
Wearing Apparel	-2.1	-1.3	44.8	-0.4	-2.3	0.1
Leather products & Footwear	0.6	-2.2	17.0	1.1	-0.6	2.4
Wood & Wood Products	0.1	-0.0	-9.4	0.4	0.1	-0.4
Chemicals	0.1	-0.2	-6.1	-2.5	0.1	-0.0
Non-metallic Min. Products	0.1	-0.0	-8.3	-2.2	0.4	-0.2
Metal Products	0.1	-0.0	-9.2	3.4	0.4	-0.2
Transportation Equipment	0.1	1.0	-8.0	0.4	2.8	-1.5
Machinery & Equipment	0.4	0.3	-6.8	3.8	0.3	-2.4
Other Manufactures	0.4	-0.2	-5.4	-0.6	-0.3	-0.3
Elec., Gas & Water	-0.0	-0.0	-0.3	1.0	0.0	0.1
Construction	-0.0	-0.0	-1.5	-0.3	0.0	-0.2
Trade & Transport	0.0	0.0	-1.6	-0.2	0.1	-0.3
Other Private Services	0.0	0.0	-2.8	-0.0	-0.1	-0.1
Government Services	0.0	-0.0	-2.1	-0.9	-0.0	-0.4

Table 12. Global Welfare Effects of Bilateral Negotiating Options for Japan

(Billions of Dollars and Percent GNP)

Billions of Dollars	Japan-Singapore	Japan-Chile	Japan-Indonesia	Japan-Korea	Japan-Malaysia	Japan-Mexico	Japan-Philippines	Japan-Thailand
Japan	5.0	2.8	10.7	18.7	10.5	8.2	2.2	19.5
United States	0.2	-0.1	-0.2	-0.5	-0.2	-0.7	0.1	-1.4
Canada	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	0.0	-0.1
Australia	0.0	0.0	-0.0	-0.0	0.0	0.0	0.0	-0.0
New Zealand	0.0	-0.0	-0.0	0.0	0.0	0.0	0.0	-0.0
EU and EFTA	0.5	-0.3	-0.7	-0.7	-0.3	-0.1	0.1	-2.8
Hong Kong	-0.0	-0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.0
China	0.1	0.0	-0.1	0.0	0.1	-0.0	0.0	0.1
Korea	0.0	-0.0	-0.2	2.2	-0.2	-0.0	0.0	-0.1
Singapore	0.6	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.2
Taiwan	0.0	-0.0	-0.1	-0.1	-0.1	-0.0	0.0	-0.2
Indonesia	0.0	0.0	1.7	0.1	0.0	0.0	0.0	0.1
Malaysia	-0.0	-0.0	-0.0	-0.0	0.3	-0.0	0.0	-0.2
Philippines	0.0	-0.0	-0.0	0.0	-0.0	-0.0	0.5	-0.0
Thailand	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.5
Rest of Asia	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	-0.1
Chile	0.0	0.9	0.0	0.0	0.0	0.0	0.0	-0.0
Mexico	0.0	-0.0	-0.0	-0.0	-0.0	3.3	0.0	-0.1
Central America and the Carribean (CAC)	0.0	0.0	0.0	-0.0	0.0	-0.0	0.0	0.0
South America	0.0	0.1	-0.0	0.1	0.0	-0.0	0.0	-0.2
Morocco	0.0	-0.0	-0.0	0.0	0.0	0.0	0.0	-0.0
Southern African Customs Union (SACU)	0.0	0.0	-0.0	-0.1	-0.0	0.0	0.0	-0.0
Total	6.7	3.5	11.1	19.7	10.1	10.6	3.0	13.5

Percent	Japan-Singapore	Japan-Chile	Japan-Indonesia	Japan-Korea	Japan-Malaysia	Japan-Mexico	Japan-Philippines	Japan-Thailand
Japan	0.1	0.1	0.2	0.4	0.2	0.2	0.0	0.4
United States	0.0	0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0
Canada	0.0	0.0	0.0	0.0	0.0	-0.0	0.0	-0.0
Australia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
EU and EFTA	0.0	0.0	-0.0	-0.0	0.0	0.0	0.0	-0.0
Hong Kong	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
China	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Korea	0.0	-0.0	-0.0	0.4	-0.0	0.0	0.0	-0.0
Singapore	0.7	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.2
Taiwan	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.1
Indonesia	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.1
Malaysia	-0.0	0.0	-0.0	-0.0	0.2	-0.0	0.0	-0.2
Philippines	0.0	0.0	-0.0	0.0	0.0	-0.0	0.6	-0.0
Thailand	0.0	0.0	-0.0	-0.0	-0.0	0.0	0.0	-0.3
Rest of Asia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
Chile	0.0	1.0	0.0	0.0	0.0	0.0	0.0	-0.0
Mexico	0.0	0.0	0.0	0.0	0.0	0.7	0.0	-0.0
Central America and the Carribean (CAC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South America	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
Morocco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0
Southern African Customs Union (SACU)	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	-0.0

Table 13. Sectoral Employment Effects for Japan of Bilateral Negotiating Options

(Number of Workers and Percent of Employment)

Number of Workers	Japan-Singapore	Japan-Chile	Japan-Indonesia	Japan-Korea	Japan-Malaysia	Japan-Mexico	Japan-Philippines	Japan-Thailand
Agriculture	-617	-4,478	-8,578	-9,008	-3,577	-3,000	-5,462	-19,994
Mining	60	188	196	-364	-228	-83	-106	-202
Food, Beverages & Tobacco	-688	-4,080	-6,176	-5,893	-1,757	-1,061	-1,437	-18,178
Textiles	182	176	-29	-3,080	-634	-338	311	1,095
Wearing Apparel	-2	30	-432	-1,423	-391	-86	-320	-518
Leather products & Footwear	-22	33	-732	-1,317	-145	-65	-73	-183
Wood & Wood Products	73	117	-4,489	-825	-2,684	-116	-155	-296
Chemicals	38	373	1,186	1,132	169	-1	237	3,122
Non-metallic Min. Products	91	95	246	1,016	253	83	207	987
Metal Products	460	798	2,670	2,576	1,899	512	790	4,988
Transportation Equipment	500	1,214	8,079	-3,104	9,102	926	2,165	12,379
Machinery & Equipment	2,390	3,049	2,723	14,480	-3,583	2,675	862	6,011
Other Manufactures	22	42	7	-178	-55	7	-67	63
Elec., Gas & Water	13	31	91	88	59	41	39	184
Construction	-51	109	526	490	429	302	787	1,207
Trade & Transport	-2,260	862	-515	876	-2,189	-2,329	-51	-396
Other Private Services	-146	409	1,485	1,376	602	1,052	621	2,375
Government Services	-44	1,031	3,741	3,159	2,728	1,482	1,651	7,357

Percent	Japan-Singapore	Japan-Chile	Japan-Indonesia	Japan-Korea	Japan-Malaysia	Japan-Mexico	Japan-Philippines	Japan-Thailand
Agriculture	-0.0	-0.1	-0.3	-0.3	-0.1	-0.1	-0.2	-0.6
Mining	0.1	0.3	0.3	-0.5	-0.3	-0.1	-0.2	-0.3
Food, Beverages & Tobacco	-0.0	-0.2	-0.4	-0.3	-0.1	-0.1	-0.1	-1.0
Textiles	0.0	0.0	0.0	-0.5	-0.1	-0.1	0.1	0.2
Wearing Apparel	0.0	0.0	-0.1	-0.3	-0.1	-0.0	-0.1	-0.1
Leather products & Footwear	-0.0	0.0	-0.8	-1.4	-0.2	-0.1	-0.1	-0.2
Wood & Wood Products	0.0	0.0	-0.3	-0.1	-0.2	-0.0	-0.0	-0.0
Chemicals	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2
Non-metallic Min. Products	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
Metal Products	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.3
Transportation Equipment	0.0	0.1	0.6	-0.2	0.7	0.1	0.2	0.9
Machinery & Equipment	0.1	0.1	0.1	0.3	-0.1	0.1	0.0	0.1
Other Manufactures	0.0	0.0	0.0	-0.1	-0.0	0.0	-0.0	0.0
Elec., Gas & Water	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trade & Transport	-0.0	0.0	0.0	0.0	-0.0	-0.0	0.0	0.0
Other Private Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Table 14. Sectoral Employment Effects for Japan FTA Partner Countries

(Number of Workers and Percent of Employment)

Number of Workers	Japan-Singapore	Japan-Chile	Japan-Indonesia	Japan-Korea	Japan-Malaysia	Japan-Mexico	Japan-Philippines	Japan-Thailand
Agriculture	86	23,872	373,610	46,095	14,439	17,091	111,720	1,034,564
Mining	-5	-3,378	-14,970	-44	-517	-202	-1,919	-4,884
Food, Beverages & Tobacco	1,385	15,807	38,452	8,504	3,585	2,139	1,189	89,872
Textiles	-10	-768	-6,202	10,558	390	-875	1,947	-56,736
Wearing Apparel	106	-376	10,027	5,818	2,913	-279	14,455	-80,148
Leather products & Footwear	51	-317	28,661	5,820	-23	-123	2,169	-5,587
Wood & Wood Products	-145	-1,970	39,158	-868	11,665	-850	-2,565	-20,450
Chemicals	-205	-2,464	-30,953	-2,269	-4,552	-2,629	-5,869	-31,731
Non-metallic Min. Products	-48	-613	-10,341	-2,474	-1,521	-800	-3,681	-18,953
Metal Products	-430	-4,750	-29,701	-4,036	-4,579	-1,282	-4,299	-57,330
Transportation Equipment	-195	-1,544	-32,180	-1,251	-11,180	-2,074	-5,728	-23,004
Machinery & Equipment	-2,809	-2,894	-18,322	-17,068	1,832	1,165	6,758	-19,945
Other Manufactures	-18	-114	-2,901	-237	-333	-254	-70	-9,951
Elec., Gas & Water	-19	-384	-1,798	-100	-177	-101	-997	-9,851
Construction	-106	-2,293	-30,482	-5,234	-3,628	-1,506	-26,648	-120,418
Trade & Transport	2,332	-10,634	-195,924	-28,848	6,096	6,602	-38,495	-430,875
Other Private Services	-244	-2,028	-7,742	-4,533	-3,499	-4,274	-11,163	-57,822
Government Services	273	-5,153	-108,394	-9,834	-10,912	-11,749	-36,804	-176,753

Percent	Japan-Singapore	Japan-Chile	Japan-Indonesia	Japan-Korea	Japan-Malaysia	Japan-Mexico	Japan-Philippines	Japan-Thailand
Agriculture	1.6	3.0	1.0	2.0	1.0	0.2	1.0	6.0
Mining	-0.8	-4.0	-1.7	-0.2	-1.4	-0.2	-1.6	-11.0
Food, Beverages & Tobacco	7.4	5.4	1.8	2.7	2.1	0.1	0.2	13.3
Textiles	-0.5	-1.7	-0.4	2.5	0.6	-0.2	1.0	-8.4
Wearing Apparel	1.1	-1.0	1.0	2.2	3.1	-0.2	3.0	-6.7
Leather products & Footwear	3.9	-1.2	2.7	6.0	-0.3	-0.1	3.3	-7.1
Wood & Wood Products	-0.4	-1.5	2.0	-0.2	3.2	-0.2	-0.9	-9.2
Chemicals	-0.4	-2.1	-2.5	-0.5	-1.9	-0.3	-2.1	-12.0
Non-metallic Min. Products	-0.6	-1.8	-2.1	-1.3	-1.7	-0.3	-3.4	-9.5
Metal Products	-1.0	-4.6	-5.4	-0.8	-3.0	-0.3	-2.5	-17.0
Transportation Equipment	-0.5	-6.0	-9.5	-0.2	-14.3	-0.4	-7.8	-17.9
Machinery & Equipment	-1.4	-6.8	-3.1	-1.3	0.3	0.2	1.6	-7.0
Other Manufactures	-0.4	-3.2	-1.5	-0.3	-1.1	-0.4	-0.1	-8.7
Elec., Gas & Water	-0.2	-1.3	-0.8	-0.1	-0.4	-0.1	-0.7	-5.7
Construction	-0.1	-0.5	-0.7	-0.3	-0.5	-0.1	-1.6	-6.2
Trade & Transport	0.4	-0.8	-0.9	-0.4	0.3	0.1	-0.7	-8.1
Other Private Services	-0.1	-0.5	-1.2	-0.2	-0.8	-0.3	-1.7	-6.8
Government Services	0.1	-0.4	-0.9	-0.3	-0.6	-0.1	-0.7	-5.2

Table 15. Welfare Effects of Bilateral FTAs and Unilateral and Global Free Trade

Bilateral FTAs

		United States								Japan								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	No. of
		US-CHL	US-SGP	US-CAC	US-AUS	US-MOR	US-SAC	US-THA	FTAA	JPN-SGP	JPN-CHL	JPN-IDN	JPN-KOR	JPN-MYS	JPN-MEX	JPN-PHL	JPN-THA	Positive Effects
1	Japan									X	X	X	X	X	X	X	X	11
2	US	X	X	X	X	X	X	X	X									10
3	Canada								X									8
4	Australia				X													9
5	New Zealand																	9
6	EU and EFTA																	4
7	Hong Kong																	7
8	China																	8
9	Korea												X					5
10	Singapore		X							X								7
11	Taiwan																	5
12	Indonesia											X						12
13	Malaysia													X				6
14	Philippines															X		7
15	Thailand							X									X	6
16	Rest of Asia																	9
17	Chile	X							X		X							13
18	Mexico								X						X			6
19	CAC			X					X									11
20	South America								X									10
21	Morocco					X												8
22	SACU						X											8
	No. of Positive Effects	14	20	2	6	22	11	6	8	20	9	4	11	12	9	21	4	

Unilateral and Global Free Trade

		Unilateral Free Trade														Global FT	No. of
		US	JPN	AUS	KOR	SGP	IDN	MYS	PHL	THA	CHL	CAC	MEX	MOR	SAC		positive
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	effects
1	Japan		X													X	15
2	US	X														X	14
3	Canada															X	13
4	Australia			X												X	15
5	New Zealand															X	14
6	EU and EFTA															X	15
7	Hong Kong															X	14
8	China															X	13
9	Korea				X											X	15
10	Singapore					X										X	15
11	Taiwan															X	15
12	Indonesia						X									X	15
13	Malaysia							X								X	15
14	Philippines								X							X	15
15	Thailand									X						X	14
16	Rest of Asia															X	15
17	Chile										X					X	15
18	Mexico												X			X	14
19	CAC											X				X	15
20	South America															X	15
21	Morocco													X		X	15
22	SACU														X	X	14
	No. of Positive Effects	20	19	21	21	22	22	22	22	22	22	22	20	21	22	22	

Notes: 1) Shaded cells indicate countries with positive welfare effects while white cells indicate countries with negative welfare effects.
2) "X" indicates unilateral free trade countries.

Table 16. Welfare Effects of Unilateral and Global Free Trade

(Billions of Dollars and Percent of GNP)

	Unilateral Free Trade														Global
Billions of Dollars	United States	Japan	Australia	Korea	Singapore	Indonesia	Malaysia	Philippines	Thailand	Chile	Mexico	CAC	Morocco	SACU	Free Trade
Japan	21.9	200.3	4.1	7.6	0.6	8.1	5.8	5.3	11.8	1.6	2.7	4.6	1.1	2.5	401.8
United States	320.2	10.6	2.3	11.8	1.6	7.1	2.6	9.7	8.0	2.0	-5.2	9.1	1.9	3.2	542.5
Canada	-9.7	0.9	0.3	1.7	0.2	0.9	0.3	1.4	1.0	0.2	-0.6	0.8	0.2	0.3	50.1
Australia	5.4	3.0	4.6	1.0	0.2	0.4	0.5	0.6	0.9	0.0	0.4	0.3	0.1	0.2	30.1
New Zealand	1.3	1.4	-0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.0	0.2	0.1	0.1	0.1	11.5
EU and EFTA	128.9	33.4	4.0	20.8	3.4	13.6	6.7	15.1	14.9	3.1	12.2	8.3	5.3	8.5	796.2
Hong Kong	5.2	0.9	0.1	0.8	0.1	0.2	0.3	0.4	0.7	0.1	0.0	0.1	-0.0	0.2	18.1
China	5.3	-4.3	1.1	-1.0	0.1	0.7	0.4	0.5	1.5	0.2	0.3	0.3	0.1	0.4	105.0
Korea	5.0	0.5	0.8	34.9	0.1	2.3	0.4	1.1	1.1	0.3	0.6	0.5	0.1	0.8	73.2
Singapore	2.1	0.8	0.1	0.9	1.1	0.6	1.7	0.8	1.5	0.1	0.2	0.2	0.0	0.1	19.9
Taiwan	4.9	1.5	0.6	0.7	0.1	0.8	0.7	0.9	1.1	0.2	0.3	0.1	0.1	0.3	60.7
Indonesia	2.2	1.5	0.2	1.0	0.1	11.9	0.4	0.5	0.7	0.1	0.1	0.1	0.0	0.1	25.8
Malaysia	1.1	0.6	0.1	1.1	0.4	0.5	4.0	0.6	1.0	0.1	0.1	0.1	0.0	0.2	18.2
Philippines	1.6	0.6	0.1	0.7	0.1	0.4	0.2	7.5	0.4	0.1	0.0	0.0	0.0	0.1	17.0
Thailand	2.3	-0.6	0.2	0.6	0.2	0.4	0.2	0.3	14.7	0.1	0.2	0.2	0.0	0.1	27.4
Rest of Asia	3.7	1.2	0.4	1.1	0.1	0.5	0.5	0.4	0.5	0.1	0.3	0.3	0.0	0.3	40.8
Chile	0.8	0.5	0.0	0.3	0.0	0.0	0.1	0.1	0.1	5.2	0.3	0.1	0.0	0.0	10.8
Mexico	-5.6	1.1	0.1	0.7	0.1	0.3	0.0	0.2	0.2	0.3	26.4	0.4	0.1	0.3	33.6
Central America and the Carribean (CAC)	4.0	1.3	0.0	0.5	0.0	0.2	0.1	0.1	0.2	0.1	0.2	6.2	0.0	0.1	17.7
South America	4.7	2.8	0.3	2.3	0.3	0.9	0.5	0.9	1.2	1.4	1.2	1.7	0.4	1.0	96.5
Morocco	0.5	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	4.8
Southern African Customs Union (SACU)	1.1	-0.2	0.1	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.1	0.0	13.6	15.5
Total	507.0	258.0	19.3	88.0	9.0	50.0	25.6	46.8	61.9	15.2	40.0	33.7	11.3	32.3	2,417.3

	Unilateral Free Trade														Global
Percent	United States	Japan	Australia	Korea	Singapore	Indonesia	Malaysia	Philippines	Thailand	Chile	Mexico	CAC	Morocco	SACU	Free Trade
Japan	0.4	3.7	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.0	7.4
United States	3.2	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	-0.1	0.1	0.0	0.0	5.4
Canada	-1.2	0.1	0.0	0.2	0.0	0.1	0.0	0.2	0.1	0.0	-0.1	0.1	0.0	0.0	6.2
Australia	1.1	0.6	0.9	0.2	0.0	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.0	6.0
New Zealand	1.6	1.7	-0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.0	0.2	0.2	0.1	0.1	14.0
EU and EFTA	1.2	0.3	0.0	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	7.3
Hong Kong	2.9	0.5	0.0	0.5	0.1	0.1	0.2	0.3	0.4	0.0	0.0	0.1	0.0	0.1	10.2
China	0.5	-0.4	0.1	-0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	9.6
Korea	0.9	0.1	0.1	6.3	0.0	0.4	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.1	13.2
Singapore	2.3	0.9	0.1	0.9	1.2	0.6	1.8	0.8	1.6	0.1	0.2	0.2	0.0	0.1	21.0
Taiwan	1.3	0.4	0.1	0.2	0.0	0.2	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.1	15.9
Indonesia	0.8	0.6	0.1	0.4	0.0	4.5	0.2	0.2	0.3	0.0	0.1	0.0	0.0	0.0	9.7
Malaysia	0.8	0.4	0.1	0.8	0.3	0.4	3.0	0.4	0.7	0.0	0.1	0.1	0.0	0.1	13.7
Philippines	1.7	0.6	0.1	0.7	0.1	0.4	0.2	7.6	0.4	0.1	0.0	0.0	0.0	0.1	17.1
Thailand	1.2	-0.3	0.1	0.3	0.1	0.2	0.1	0.2	7.3	0.1	0.1	0.1	0.0	0.1	13.7
Rest of Asia	0.5	0.2	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	5.8
Chile	0.9	0.5	0.0	0.3	0.0	0.0	0.1	0.1	0.1	5.4	0.3	0.1	0.0	0.0	11.3
Mexico	-1.1	0.2	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	5.3	0.1	0.0	0.1	6.7
Central America and the Carribean (CAC)	3.4	1.1	0.0	0.4	0.0	0.1	0.1	0.1	0.1	0.1	0.2	5.1	0.0	0.1	14.8
South America	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	5.3
Morocco	1.2	1.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	3.5	0.1	10.9
Southern African Customs Union (SACU)	0.6	-0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	7.4	8.5