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# THE EFFECTS OF U.S. MFN STATUS ON CHINA

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# The Effects of U.S. MFN Status on China[1]

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**Abstract**: *This paper focuses on the effects of the United States withdrawing Most Favored Nation (MFN) trade status from Chinese imports. An applied general equilibrium model is used to simulate the increase in tariffs from the column 1 (MFN) to the column 2 (non-MFN) duty level. The results show that Chinese exports to the United States would drop by approximately$11 billion and Chinese GDP would contract by 3.6 percent in value terms. The United States and China both experience a decline in welfare; however, the U.S. welfare decline is less than one-tenth the size of the decrease in Chinese welfare.*

**JEL Classification**: C68, F13, F17
**Keywords**: Commercial Trade Policy, United States, China, Most-Favored-Nation, Applied General Equilibrium

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[1] The authors are economists at the United States International Trade Commission. Views and opinions expressed in this paper are solely those of the authors and should not be interpreted as reflecting the views of the United States International Trade Commission, any of its individual Commissioners, or other members of the staff. We would like to thank Linda Linkins, Keith Hall and participants at the January 1997 ASSA meetings for their comments on this paper.

# THE EFFECTS OF U.S. MFN STATUS ON CHINA

## I. INTRODUCTION

A perennial, high-profile issue in United States-China trade relations since 1989 has been whether the United States should link the renewal of China's status for Most-Favored-Nation (MFN) duty treatment to its human rights record. Each year since 1989, the year that the Government of China harshly cracked down on dissidents during and after the Tianamen Square incident, the United States has renewed this status; however, each time the process for the renewal has occurred under strenuous discussion and debate between U.S. policy makers. It is likely that these discussions will receive even more attention and that their intensity will escalate as China becomes a larger and more important trading partner for the United States.

The recognition of MFN status between trading partners is one of the underlying principles and requirements of the General Agreement on Tariffs and Trade (GATT).[2] The GATT requires that member countries of the World Trade Organization (WTO) apply their tariffs on an equal and nondiscriminatory basis to all other WTO members. Under the GATT, extension of MFN status to nonmember countries such as China is left to the discretion of each WTO member. The United States currently grants MFN status to almost all of its WTO and non-WTO trading partners, and China has benefited from this nondiscriminatory status since 1980.

If China is allowed to accede to the WTO in the near future -- an outcome which is highly likely -- the annual renewal of China's U.S. MFN status does not automatically disappear. Because China would be acceding as a new member of the WTO, the United States as an existing member would be allowed to

[2]The provisions pertaining to MFN status are contained in Articles I and II of the GATT.

invoke the "nonapplication clause" of the GATT to deny China automatic MFN status.[3] Conceivably, such a situation might arise because of current U.S. legislation, the so-called Jackson-Vanik amendment. This legislation requires the President to conduct the ongoing annual review of China's MFN status. Therefore, short of revoking Jackson-Vanik, the most plausible alternative would be for the United States to invoke the nonapplication clause of the GATT with respect to China to achieve compliance with U.S. law.

Even though the trade policy community recognizes that the consequences of the United States not renewing MFN status for China would be large and highly disruptive, only a scant number of measures of this effect have been made to date. This is primarily due to the difficulty in calculating the potential increase in tariffs on all of China's exports to the United States. For instance, in a 1994 study, the World Bank (1994) estimated that the decline in Chinese exports to the United States could range between $7.0 to $15.2 billion. However, because of the difficulty in estimating the potential increase in tariffs on all U.S. imports from China, the World Bank's estimates of the total effect on exports are extrapolations from a partial analysis. Therefore, this paper develops the first comprehensive estimates of these effects using a complete list of U.S. imports from China and applying the tariff changes to a global applied general equilibrium model (AGE).

This paper is divided into the following sections: section II presents a background discussion of the recent history of China's MFN status, the composition of U.S. imports from China, and a brief summary of the literature that has examined this question. Section III describes the AGE model that was used to conduct the simulation and the data, and section IV provides simulation results. Conclusions are discussed in Section V.

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[3]The nonapplication clause is contained in Article XXXV of the GATT.

## II. BACKGROUND

Recent History of China's MFN Status

Since the arrest and abrupt repression of Chinese dissidents in Beijing's Tianamen Square in June of 1989, the annual MFN review process has been a highly contentious and highly debated issue within the U.S. trade policy community as well as a major sore point in United States-China trade relations. However, China's MFN status has always been contingent upon an annual review and certification by the President. Beginning in 1980, the first year that U.S. MFN status for China became fully effective, the President has been required under section 402 of the 1974 Trade Act (the Jackson-Vanik amendment) to annually review and certify China's compliance with the freedom-of-emigration requirements of the Act. Up until 1989, the renewal of MFN status under the Jackson-Vanik amendment was accomplished annually as a relatively low profile event.

The United States generally applies the MFN rate, also known as the "column 1" duty rate in the U.S. tariff schedule, to almost all of its trading partners. Countries that do not receive U.S. MFN status are subject to the higher "column 2" duties in the U.S. tariff schedule. These rates serve as an absolute ceiling for the United States if trade concessions are ever withdrawn. The column 2 or non-MFN duty rates are for the most part the original statutory tariffs rates that were applied to all U.S. imports under the Tariff Act of 1930 (also known as the Smoot-Hawley Act). After the trade liberalization of the various GATT Rounds beginning in 1947, the United States retained the column 2 rates primarily against Communist countries. Currently, the U.S. column 2 rates are applied only to a handful of countries.[4]

Prior to full U.S. MFN status in 1980, China was subject to the "column 2" duty rates. As discussed above, the column 2 duty rates are typically much higher than the MFN (or column 1) rates.

[4]In the beginning of 1997, the column 2 duty rates were only applied to five countries: Afghanistan, Cuba, Laos, North Korea, and Vietnam.

For instance, in 1995, the average trade-weighted MFN duty rate applied to all U.S. imports from China was approximately 6 percent. Under the column 2 rates, the trade-weighted tariff rate would rise to 44 percent. If China's MFN status were rescinded, it would again face these higher tariffs.

Each year since 1989, and under considerable political pressure to rescind China's MFN status, both the Bush and Clinton administrations have decided to continually renew MFN privileges on the basis that maintaining trade ties with China provided the best opportunity to foster and improve human rights conditions. In 1994, President Clinton announced that he would delink China's MFN status from human rights abuses. However, because of the political volatility of the issue and the continuation of human rights abuses by the Government of China, less stringent sanctions were imposed by both administrations. In 1989, President Bush imposed a number of sanctions suspending U.S. weapons deliveries, certain export licenses, export promotion grants, and support for World Bank loans. The sanctions imposed by President Bush were continued by the Clinton administration. In addition, in 1994, President Clinton announced a number of non-punitive, "moral suasion" initiatives to encourage human rights in China.[5]

Composition of U.S. Imports from China

Briefly setting aside the issue of MFN status and human rights issues, U.S.-China trade relations are likely to remain a contentious topic in U.S. foreign policy simply because of the rapid increase in trade between the two countries, especially U.S. imports from China. Between 1985 and 1995, imports from China rapidly increased by eleven-fold to approximately $45 billion. (See figure 1.) In comparison, U.S. imports from the rest of the world doubled during this same period. In terms of total trade, China was the fifth largest trading partner for the United States after Canada, the E.U., Japan, and Mexico in 1995;

[5]Tsao and Whistler (1995) provide a comprehensive discussion of the sanctions and measures taken by both the Clinton and Bush administrations during this period.

however, during the same year China had, after Japan, the second largest negative trade balance with the United States..

During the last half of 1996, China's negative trade balance with the United States exceeded the negative U.S. balance with Japan during two months. This jump over Japan's surplus with the United States has provoked some observers in the trade policy community to speculate the China will replace Japan as the number one focus of U.S. interest groups that favor protectionist policies. To provide some perspective on China's position as a trading partner, Figures 2 and 3 compare the magnitude of U.S. imports from China and the U.S. trade balance with China relative to the magnitudes of those the United States faces with Canada and Japan.

The market share and composition of leading U.S. imports from China are presented in table 1. In 1995, China accounted for approximately 6 percent of total U.S. imports. In general, the majority of these imports were concentrated in manufactured consumer items. Table 1 describes these imports according to 2-digit SITC categories. Approximately two-thirds of these imports were comprised by four of the 2-digit SITC categories: miscellaneous manufactured articles (largely toys), articles of apparel and clothing, footwear, and telecommunication and sound equipment. In addition, for these individual leading sectors, China also accounted for a large market share of all U.S. imports. For instance, approximately half of all U.S. footwear imports come from China. In the analysis presented later in this paper, most of the effects of our experiment were also concentrated in these particular sectors.

## Review of Literature

As noted in the introduction, few studies have examined the costs of the United States revoking China's MFN status. To date, the only comprehensive and rigorous study was conducted by the World

Bank (1994). In general, the Bank's analysis found that China's total export losses to the U.S. market could range between $7.0 to $15.2 billion, or approximately between 42 and 96 percent of total Chinese exports to the U.S.

These results were obtained by first estimating tariff changes that would result from removing MFN status for fifteen 4-digit SITC core products or sectors. The estimates of export losses were obtained by applying a partial equilibrium analysis to each of the sectors. The summation of export losses for the 15 individual sectors ranged from $3.7 to $8.5 billion. The Bank found that half of the reductions in exports occurred in two groups, the clothing group and toys and indoor games. Because of the difficulty of deriving the required change in all U.S. tariffs under col. 2 rates (there are approximately 18,000 tariff items or lines in the U.S. tariff schedule), the Bank estimated the effect on total exports by assuming that all goods would experience the same proportional decline as the 15 major products.

## III. THE MODEL

A multi-country applied general equilibrium model, the GTAP model [Hertel (1996)], is used to simulate the effects of the United States removing MFN treatment for imports from China.[6] This analysis uses a static model with perfectly competitive product markets and, therefore, constant returns to scale production functions. Consumption in the household sector is determined by a constant demand elasticity (CDE) expenditure function. Public and private sector consumption is determined from an overall Cobb-Douglas utility function. Sector production is determined by global demand and supply of the product and zero economic profit for firms. Traded goods are classified by country of origin and enter the

[6]Two similar GTAP based models or data have been used by Bach, Martin, and Stevens (1996) and Wang and Tuan (1996) to examine the economic effects of WTO accession by China and Taiwan.

production and consumption function as imperfect substitutes using the standard Armington assumptions. Investment is distributed by region on a fixed proportion basis.

The model uses the version 3 GTAP database. The base year of this data set is 1992. The economy is divided into 37 industrial sectors. The data set includes inputs used in these sectors, both foreign and domestic, and the outputs from these sectors. There are data on 30 separate economic regions. Twenty of these regions are individual countries while the other ten are groups of countries.

A sectoring scheme of the industries and regions was chosen to show the impact of MFN removal on the United States and China, the differential effects on industries, and the trade diversion from China to other U.S. trading partners. The sectoring scheme is shown on Table 2. The data were aggregated into 13 regions/countries and 22 industries. The industrial sectors were left disaggregated except for agriculture and services to allow the main U.S. imports from China to be separated. A brief description of the SITC industries included in each of the 22 industrial sectors is presented in appendix A.[7] The countries and regions were grouped to leave the United States and China as separate regions. The remaining countries were grouped by the level of development and the type of exports to the United States.

The experiment conducted raised the tariffs on Chinese imports into the United States from their current column 1 (MFN) level to the column 2 (non-MFN) level. The MFN and non-MFN ad-valorem tariff rates and their differences are shown in Table 3 by industrial sector. As discussed earlier, complete estimates of the tariff changes that would result from the elimination of MFN status have been hampered by the immenseness and complexity of the U.S. tariff schedule. The tariff schedule contains approximately 18,000 tariff lines, and the rates can be either ad valorem, specific, or in many cases,

[7] For a more detailed description of the GTAP database see Hertel (1996).

combinations of a specific and ad-valorem rates. This analysis provides the only estimates that have been made to date of ad valorem tariff equivalents of MFN and non-MFN rates for almost the entire list (99.4 percent) of U.S. imports from China.

The sector-level rates in table 3 were calculated first at the finest level of detail, the 10-digit Harmonized Tariff Schedule (HTS) level. For U.S. imports from China, there were approximately 8000 HTS items or tariff lines at the 10-digit level. In those cases where HTS tariffs were stated as a specific- or combination rate, the ad-valorem equivalents were constructed using the customs value and quantity of imports and the tariff rates from the schedule. Each of the approximately 8,000 ad-valorem tariff rates were then mapped to the corresponding GTAP sectors, and sector-level tariff rates were then constructed as trade-weighted averages.

A complication of the experiment was how to account for the non-tariff barriers in the model especially the Multi-Fiber Agreement (MFA). The GTAP database contains information on some non-tariff barriers; however the MFA quota is the only non- tariff barrier that significantly affects U.S. imports from China. Furthermore, because Chinese exports of textiles and wearing apparel to the United States are large, it is important to correctly model the impact of the tariff increases on these sectors in conjunction with the MFA restrictions. The MFA is incorporated in the database and the model as an export tax since the majority of the rents from this particular restriction are judged to accrue to the exporter. The increases in the tariff on textiles and wearing apparel from MFN to non-MFN status are 42 and 55 percent respectively. These increases are substantial enough that the imports of these good would drop below the quota level. Therefore, in this experiment, the tariff equivalents for the MFA are removed concurrently with the increase in U.S. tariffs.

Since the basic scenario affects Chinese exports to the United States and their diversion and

replacement, the key parameter on which the results hinge is substitution between imports. A systematic sensitivity analysis on the impact of varying the import substitution parameters is performed using Gaussian Quadrature.[8] The estimates of the substitution parameter in the GTAP data set are used as the mean values and are allowed to vary between 1 and the symmetric upper bound. In others words if the mean estimate was 4 for a particular sector, the parameter varies between 1 and 7 in the sensitivity analysis. The model was solved 44 times and the results are extrapolated to give mean results and standard deviations for the variables. The results of the sensitivity simulations are briefly described in the results section with an emphasis on the most affected variables.

The main results focus on the effect of MFN removal on trade creation and diversion between the United States, China and the rest of the world. These trade effects also impact domestic production in both the United States and China and welfare in all countries and regions. As mentioned above, this analysis is conducted with a static model simulating a controlled experiment. The results should not be interpreted as forecasts. The actual outcome would be affected by many other factors that could change. For example, there is no modeling of a Chinese response to the United States withdrawing MFN status. In addition, as discussed earlier, trade between the United States and China has grown since 1992; therefore, the magnitude of the dollar estimates in this analysis are an underestimate of the effects of MFN removal under current conditions.

## IV. SIMULATION RESULTS AND SENSITIVITY ANALYSIS

Simulation results are presented in Tables 4 through 7. Table 4 contains results with respect to industry output in the United States and China. Table 5 shows the changes in world imports to the

[8] The specific theory of sensitivity analysis using Gaussian Quadrature is described in DeVuyst and Preckel (1997). A description of this analysis incorporated into the GTAP model is Arndt (1996).

United States and Chinese exports to the U.S. Table 6 presents the effects on welfare, GDP, exports, imports and terms of trade on a regional level. Table 7 shows the welfare effect (equivalent variation) broken into its component parts for China and the United States.

In general, the results show China is negatively effected by a decrease in exports, a decrease in the terms of trade, and a decrease in industrial output. The United States is negatively affected by increased import prices and decreased imports and positively affected by increased terms of trade. The rest of the regions of the world gain by replacing Chinese exports to the United States and by increased terms of trade. Four industrial sectors in the model account for a majority of the effects: wearing apparel, leather, other machinery and equipment, and other manufacturing. The main products or industries of these broadly-defined industrial sectors include clothing, shoes, electronics and toys.

Table 4 presents the changes in industrial output in the United States and China. The first two columns show the percentage change in output by industry. The next two columns show the changes in output in millions of 1992 U.S. dollars at pre-simulation prices. Output in the U.S. increases in 9 of the 22 industries. The industries showing the greatest output increase are textiles, wearing apparel, leather, fabricated metal products, and other manufacturing. In the case of wearing apparel, output increases by approximately $750 million. Three of these sectors are the same industries most affected in China. The output changes in Chinese industries are much greater than in the United States. In dollar terms, the industries hardest hit are leather and other manufacturing, which include toys and shoes. The large drop in these sectors occurs mainly because the United States is a major market for Chinese toys and shoes. In contrast, the effects on the other sectors are smaller due to the ability of China to easily divert exports in those sectors to the rest of the world.

Table 5 reports the effects on U.S. imports from the world and Chinese exports to the U.S., for

the tariff changes on goods from China. The first column shows the overall effects on total U.S. imports for each of the categories. Most sectors show modest decreases or slight increases in imports except for sizeable decreases in the imports of textiles, wearing apparel, leather, non-metallic minerals, fabricated metal products, and other manufacturing. China showed sharp decreases in exports to the United States as expected. Specifically, Chinese exports in 13 of the 22 sectors declined by at least 50 percent. The largest declines occurred primarily in the manufacturing sectors. Referring to table 3, the sectors with the most sizeable tariff increases were also these sectors. The remaining agricultural and energy sectors all showed much smaller tariff changes and smaller trade effects.

Table 5 also shows changes in millions of U.S. dollars. Total U.S. imports decreased by approximately $4.5 billion.[9] There are small increases in imports of some agricultural and energy goods, but otherwise imports decrease. The two sectors experiencing the largest decreases are wearing apparel, leather and other manufactured goods. The changes in U.S. imports from China are more dramatic. U.S. imports from China drop by $11 billion, or slightly over 50 percent.[10] The largest effects are seen in the wearing apparel, leather, other machinery and equipment and the other manufacturing sectors. Those four sectors account for approximately 90 percent of the decrease in trade. Examining the change in total U.S. imports, approximately 60 percent of the value of the trade decrease with China is replaced by trade with other countries (trade diversion).

Table 6 shows aggregate results by region. In terms of Gross Domestic Product (GDP), all of the regions except China and Australia/New Zealand (ANZ) show modest gains ranging from 0.1 to 0.5

[9] This is measuring U.S. imports at market prices, including tariffs and non-tariff barriers. Measured at world prices the quantity of imports drops by approximately $1 billion.

[10]This estimate is within the range of effects found by the World Bank study, slightly above the mid-point of its range of $7 to $15 billion.

percent in the value of GDP, some of this change is due to prices changes. China has a 3.55 percent contraction of GDP. The ANZ region has a small contraction of output mainly driven by a decrease in their terms of trade. The United States has an increase in nominal GDP which is mostly an increase in prices. Except for the United States, all regions show import and export changes that are of the same magnitude and sign as the output changes. In the U.S. products that were formerly exported are consumed or used as intermediate inputs in industry. These import and export changes are in terms of values and, consequently, include price changes as well.

Changes in exports to the United States are revealing when viewed next to the welfare effects and the terms of trade effects.[11] All of the regions, with the exception of China, show an increase in exports to the United States. The magnitude of the change in exports to the U.S. gives a very good indication of the overall welfare effects on the region. The ordering of the countries/regions by welfare effect and increase in trade is very similar. Terms of trade increase for all countries' products with the exception of Australia/New Zealand and China. The terms of trade increases are relatively minor with the exception of the increase for Hong Kong.

The second to last column in table 6 shows where Chinese exports are diverted. The regions that experience the greatest increase in imports from China are the European Union and Japan. The newly industrialized Asian economies (NIE) significantly increase imports from China as well.

The welfare effects show the equivalent variation (EV) of the policy in dollar terms, i.e., the dollar equivalent impact of the policy change. China has a negative welfare effect of approximately $6.1 billion. The effects on China are mainly caused by the loss of an important market. The shift in exports to other markets causes a negative terms of trade effect and a loss of output. The welfare effect on the United

[11] These exports and imports are measured in world prices.

States is negative $422 million. In the case of the United States, there are offsetting effects, increased tariff revenues, and terms of trade verses increased prices for imports and the drop in imports. All of the other regions, except Australia/New Zealand, show positive welfare effects from increased exports to the U.S. and an increase in the terms of trade.

Table 7 shows the decomposition of the equivalent variation for the United States and China.[12] The two main effects with respect to the United States are the drop in imports which contributes a negative $2.3 billion and the increase in the terms of trade of $1.8 billion. There are some small changes with respect to a slight increase in output and the smaller use of inputs both imported and domestic. China's negative welfare effect is mainly explained by a sizeable drop in the terms of trade. However, a decrease in exports coupled with a sizeable decrease in imports also contributes to the negative welfare effects on China.

In terms of the sensitivity of the import substitution parameters, bounds for the variable estimates were calculated. Rather than presenting these separately, it is sufficient to describe them briefly. The main changes to the results were seen in the Chinese exports to the United States, the price and quantity of U.S. imports, and the welfare effects.

The standard deviations on the estimates of the effect on Chinese output with three exceptions were relatively small. Wearing apparel, leather goods, and other manufactured goods showed sizeable standard deviations on the output estimates of 0.7, 3.15 and 1.9 percent respectively. In other words if other countries exports are worse or better substitutes for Chinese exports than in the base case, these three sectors would be most affected. In terms of U.S. output, wearing apparel and leather products would be most affected, 0.3 and 1.5 percent respectively.

[12] For more information on the technical aspects of the welfare decomposition used see Huff and Hertel (1996).

Chinese exports to the U.S. are more uniformly affected with the sectors showing a 10 percent standard deviation by varying the degree of substitutability. The standard deviations on the base estimates of total imports into the United States were less than 0.5 percent with the exception of leather and other manufactured goods. This is not unexpected since the sensitivity test was for substitution between import suppliers.

The welfare effect on China showed only minor variation in the analysis. Two standard deviations away from the mean in making imports worse substitutes for Chinese goods give a welfare effect of negative 5.6 billion dollars. The variation in the welfare effect on the U.S. was much more dramatic. As other countries' imports become worse substitutes for Chinese imports to the United States, the welfare effect on the U.S. would exceed negative $1 billion.

## V. CONCLUSIONS

If the United States were to remove MFN status from China, Chinese exports to the United States would drop by approximately $11 billion and Chinese GDP would contract by approximately 3.55 percent. The United States and China both experience a decline in welfare; however, the U.S. welfare decline would be smaller than the decrease in Chinese welfare. Other countries would gain by replacing China's exports to the United States. The main effects of our analysis are concentrated in four industrial sectors: wearing apparel, shoes, toys, and electronics. The tariff changes in these sectors generated most of the effects. Primarily because of the size of the U.S. market relative to the world market, there are a limited number of alternative markets to which China can divert this output.

Under the current U.S. legislation of the Jackson-Vanik amendment, the annual renewal of U.S. MFN status for China will continue to remain an important issue for United States-China relations into the indefinite future. Such a situation is likely to continue even if China accedes to the WTO. The

paper provides trade-policy scholars and policy makers with the first comprehensive estimates of the costs of revoking China's U.S. MFN privileges. The results of this analysis are the first to be estimated using a global applied general equilibrium model and complete tariff and trade information for U.S. imports from China. The results suggest that, because of the relative importance of the U.S. market to Chinese exports, the short-run effects of MFN revocation would be costlier for China than the United States.

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**Figure 1**

U.S. Imports from China, 1985-1995

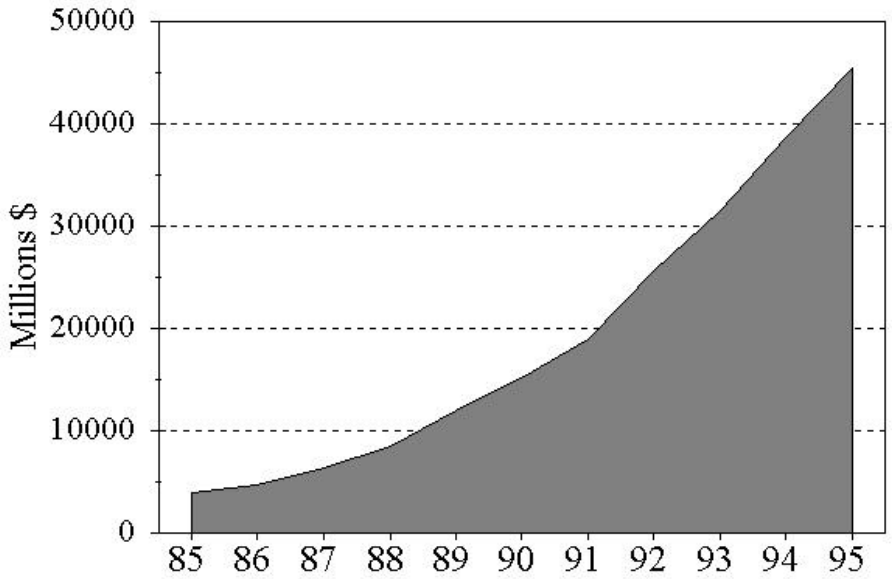


**Figure 2. US Imports, 1990-95**

Partners: China, Canada, Japan

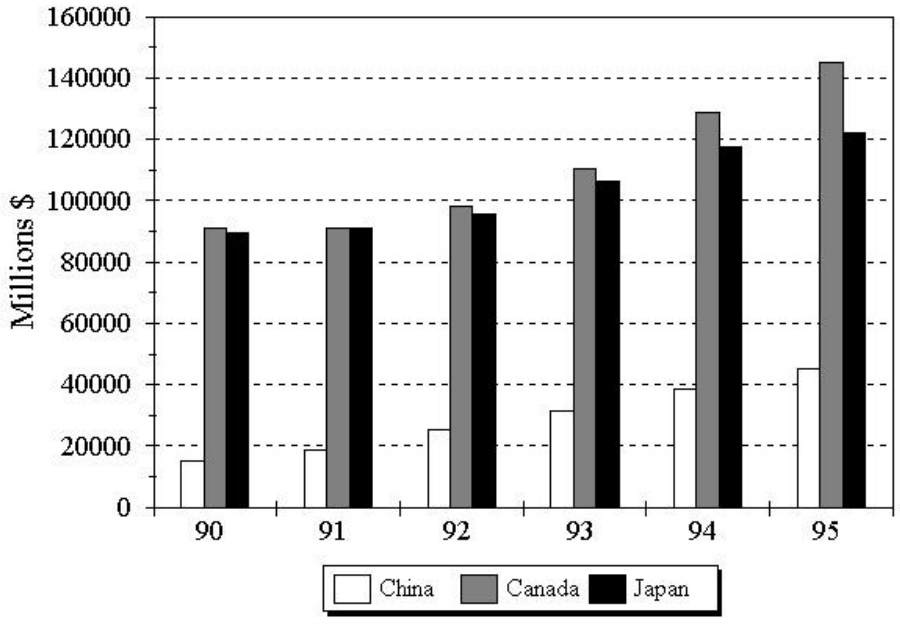

**Fig 3. US Trade Balance, 1990-95**
Partners: China, Canada, Japan

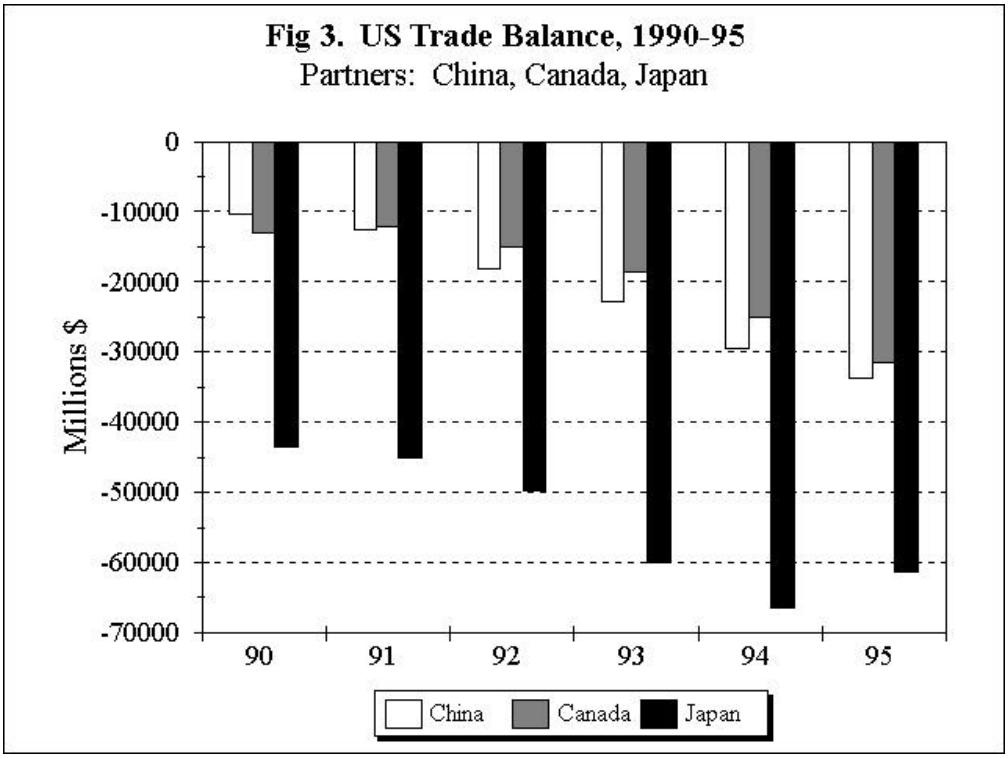

Table 1 - Leading U.S. Imports from China, 1995

| SITC categories | Customs Value (Million $) | Share of Total U.S. Imports from China (%) | Share of Total U.S. Imports by SITC category (%) |
|---|---|---|---|
| Total all commodities | $45,370.0 | 100.00 | 6.13 |
| 89--Miscellaneous manufactured articles, nes | $10,319.2 | 22.74 | 28.40 |
| 84--Articles of apparel and clothing accessories | $5,850.0 | 12.89 | 14.83 |
| 85--Footwear | $5,817.0 | 12.82 | 48.09 |
| 76--Telecommun & sound record & reproduce app & equip | $4,214.5 | 9.29 | 12.46 |
| 77--Electrical machry, apparatus & appliances, n.e.s. | $3,093.8 | 6.82 | 4.15 |
| 75--Office machs and automatic data processing machs | $2,879.2 | 6.35 | 4.59 |
| 83--Travel goods, handbags and similar containers | $1,606.7 | 3.54 | 48.21 |
| 69--Manufactures of metals, n.e.s. | $1,226.7 | 2.70 | 9.12 |
| 65--Textile yarn, fabrics, made-up articles, n.e.s. | $1,154.6 | 2.54 | 11.65 |
| 88--Photo appt, equip & optical goods nes; watch & clk | $912.5 | 2.01 | 9.12 |
| 82--Furniture & pts; bedding, mattresses, etc. | $877.3 | 1.93 | 10.53 |
| 66--Nonmetallic mineral manufactures, n.e.s. | $824.4 | 1.82 | 5.76 |
| 81--Prefab buildings; sanitary, plumb etc fix nes | $813.1 | 1.79 | 35.68 |
| 74--General industrial machry & equipmt, n.e.s. & pts | $810.6 | 1.79 | 3.46 |
| 78--Road vehicles (inc air-cushion vehicles) | $412.4 | 0.91 | 0.39 |
| 87--Professional scient & control inst & apparatus nes | $390.0 | 0.86 | 3.50 |
| 33--Petroleum, petroleum products & related materials | $316.8 | 0.70 | 0.61 |
| 03--Fish (excpt marine mammal) crustaceans, etc, preps | $306.2 | 0.67 | 4.54 |
| 71--Power generating machinery and equipment | $273.3 | 0.60 | 1.60 |
| 67--Iron and steel | $242.2 | 0.53 | 1.71 |
| 64--Paper, paperboard and articles thereof | $240.0 | 0.53 | 1.93 |
| 51--Organic chemicals | $229.4 | 0.51 | 1.72 |
| 52--Inorganic chemicals | $227.4 | 0.50 | 4.81 |
| 63--Cork and wood manufactures other than furniture | $224.3 | 0.49 | 5.90 |
| Subtotal of SITC items show above | $43,261.5 | 95.35 | NA |
| Subtotal of SITC items not shown above | $2,108.5 | 4.65 | NA |

Source: U.S. Department of Commerce.

TABLE 2 - GTAP Aggregation

| | |
|---|---|
| AGR | Agriculture - Paddy Rice, Wheat, Grains, Non-grain Crops, Wool, Other Livestock, Processed Rice |
| FOR | Forestry |
| FSH | Fishing |
| ENR | Energy |
| OMN | Other Minerals |
| OFP | Other Food Products - Meat, Milk and Other Food Products |
| B_T | Beverages and Tobacco |
| TEX | Textiles |
| WAP | Wearing Apparel |
| LEA | Leather |
| LUM | Lumber |
| PPP | Pulp and Paper |
| CRP | Chemicals, Rubber, and Plastic |
| NMM | Non-Metallic Minerals |
| I_S | Iron and Steel |
| NFM | Nonferrous Metals |
| FMP | Fabricated Metal Products |
| TRN | Transport |
| OME | Machinery and Equipment |
| OMF | Other Manufacturing |
| SER | Services - Electricity, Water and Gas, Construction, Other Services, Private and Government, and Dwellings |
| T_T | Trade and Transport |
| | |
| ANZ | Australia, New Zealand |
| JPN | Japan |
| NIE | Newly Industrialized Economies of Asia - Korea, Singapore, Taiwan |
| ASA | ASEAN - Indonesia, Philippines, Malaysia, Thailand |
| SOA | Rest of South Asia - India, Rest of South Asia |
| CAN | Canada |
| USA | United States |
| MEX | Mexico |
| CSA | Central/South America - Central America and Caribbean, Argentina, Brazil, Chile |
| HKG | Hong Kong |
| E_U | European Union - E_U, E_U3 |
| CHN | China |
| ROW | Rest of World - Central European Associates, Former Soviet Union, Middle East and North Africa, European Free Trade Area, Rest of World |

TABLE 3 - U.S. Tariffs on Chinese Trade

| GTAP Sectors | Duty Col 1 | Duty Col 2 | Change in Duty |
|---|---|---|---|
| AGR | 0.83 | 8.53 | 7.70 |
| FOR | 0.00 | 7.34 | 7.34 |
| FSH | 0.02 | 0.10 | 0.08 |
| ENR | 0.46 | 0.92 | 0.46 |
| OMN | 1.59 | 7.81 | 6.22 |
| OFP | 2.85 | 14.31 | 11.46 |
| B_T | 5.93 | 22.66 | 16.73 |
| TEX | 8.03 | 50.12 | 42.09 |
| WAP | 12.78 | 67.76 | 54.98 |
| LEA | 10.26 | 30.02 | 19.76 |
| LUM | 3.34 | 41.39 | 38.05 |
| PPP | 3.02 | 24.29 | 21.27 |
| CRP | 7.07 | 44.30 | 37.23 |
| NMM | 7.03 | 53.18 | 46.15 |
| I_S | 4.95 | 22.87 | 17.92 |
| NFM | 2.43 | 28.83 | 26.49 |
| FMP | 4.98 | 43.15 | 38.17 |
| TRN | 5.77 | 32.26 | 26.49 |
| OME | 3.87 | 37.55 | 33.68 |
| OMF | 3.41 | 59.82 | 56.41 |

TABLE 4 - Domestic Output

| GTAP Sectors | USA- % Change in Quantity | CHN- % Change in Quantity | USA-Change* Millions $US | CHN-Change* Millions $US |
|---|---|---|---|---|
| AGR | -0.18 | 0.06 | -378 | 100 |
| FOR | 0.00 | 0.53 | 0 | 51 |
| FSH | -0.57 | 2.46 | -39 | 194 |
| ENR | -0.63 | 3.5 | -159 | 949 |
| OMN | -0.10 | 4.68 | -25 | 178 |
| OFP | -0.03 | 0.55 | -92 | 167 |
| B_T | -0.08 | -0.01 | -68 | -2 |
| TEX | 0.48 | 1.42 | 495 | 448 |
| WAP | 1.05 | -0.57 | 747 | -117 |
| LEA | 5.17 | -20.79 | 546 | -2295 |
| LUM | 0.11 | -2.14 | 131 | -140 |
| PPP | -0.01 | 0.40 | -24 | 52 |
| CRP | 0.03 | 0.25 | 133 | 100 |
| NMM | 0.11 | 0.33 | 85 | 83 |
| I_S | -0.02 | 2.44 | -18 | 431 |
| NFM | 0.00 | 2.60 | 0 | 92 |
| FMP | 0.07 | -1.12 | 133 | -151 |
| TRN | -0.17 | 2.98 | -700 | 198 |
| OME | -0.07 | 0.71 | -429 | 408 |
| OMF | 1.68 | -27.57 | 714 | -2403 |
| SER | -0.01 | 0.39 | -402 | 709 |
| T_T | -0.02 | -0.78 | -413 | -520 |

* The dollar value quantity changes are calculated holding prices constant.

Table 5 - Quantity Changes in Trade with the United States

| GTAP Sectors | Total-Change in % Imports -World | CHN-Change in % Export to U.S. | Total-Change In Imports Millions $US* | CHN-Change In Exports Millions $US* |
|---|---|---|---|---|
| AGR | 0.09 | 12.39 | 15 | 21 |
| FOR | 0.01 | -21.12 | 1 | 1 |
| FSH | 0.26 | 14.75 | 14 | 46 |
| ENR | 0.07 | 10.83 | 41 | 58 |
| OMN | 0.05 | -17.84 | 4 | -16 |
| OFP | -0.01 | -29.09 | -1 | -38 |
| B_T | 0.07 | -55.16 | 4 | -11 |
| TEX | -1.75 | -53.74 | -176 | -311 |
| WAP | -2.76 | -70.00 | -1026 | -1660 |
| LEA | -4.95 | -70.23 | -920 | -3036 |
| LUM | -1.08 | -81.31 | -158 | -282 |
| PPP | -0.02 | -45.92 | -3 | -13 |
| CRP | -0.60 | -66.93 | -287 | -531 |
| NMM | -1.67 | -86.12 | -116 | -203 |
| I_S | -0.05 | -55.43 | -5 | -47 |
| NFM | -0.03 | -69.57 | -3 | -45 |
| FMP | -1.93 | -81.18 | -230 | -365 |
| TRN | 0.07 | -89.23 | 10 | -359 |
| OME | -0.31 | -78.47 | -616 | -1692 |
| OMF | -4.09 | -89.91 | -1263 | -2809 |
| SER | 0.34 | 10.38 | 228 | 238 |
| T_T | 0.07 | 11.19 | 12 | 1 |
| TOTALS | | | -4475 | -11055 |

* The dollar value quantity changes are calculated holding prices constant.

Table 6 - Regional Effects

| Regions | Value of GDP % Change | Exports Value % Change | Imports Value % Change | Terms of Trade % Change | Exports to U.S. US$ Mill Change | Imports from China US$ Mill | Welfare Millions of US$ |
|---|---|---|---|---|---|---|---|
| ANZ | -0.03 | -0.02 | -0.03 | -0.04 | 76 | 149 | -21.55 |
| JPN | 0.07 | 0.25 | 0.19 | 0.08 | 1779 | 1790 | 918.96 |
| NIE | 0.22 | 0.27 | 0.21 | 0.12 | 2240 | 858 | 719.34 |
| ASA | 0.15 | 0.26 | 0.20 | 0.07 | 952 | 325 | 346.31 |
| SOA | 0.12 | 0.28 | 0.19 | 0.09 | 311 | 136 | 127.49 |
| CAN | 0.16 | 0.20 | 0.18 | 0.07 | 415 | 160 | 174.22 |
| USA | 0.16 | -0.42 | -0.41 | 0.20 | NA | -11055 | -422.21 |
| MEX | 0.27 | 0.36 | 0.31 | 0.14 | 248 | 85 | 149.29 |
| CSA | 0.16 | 0.27 | 0.24 | 0.08 | 712 | 283 | 253.78 |
| HKG | 0.42 | 0.32 | 0.23 | 0.49 | 475 | 1222 | 362.11 |
| E_U | 0.05 | 0.12 | 0.09 | 0.04 | 2314 | 2316 | 749.03 |
| CHN | -3.55 | -5.39 | -4.09 | -2.48 | -11055 | NA | -6114.09 |
| ROW | 0.01 | 0.03 | 0.02 | 0.02 | 635 | 1335 | 83.72 |

Table 7 - Decomposition of The Equivalent Variation

| Component | Contribution to EV in Millions of US$ | |
|---|---|---|
| | USA | China |
| Domestic Output | 39.65 | -39.75 |
| Imported Inputs | -8.26 | 0.00 |
| Domestic Inputs | -6.67 | 0.00 |
| Private Consumption of Imports | 1.62 | 0.00 |
| Private Consumption of Domestic Goods | 22.49 | 0.00 |
| Government Consumption of Imports | -0.12 | 0.00 |
| Government Consumption of Domestic Goods | 2.39 | 0.00 |
| Exports | 12.50 | -225.00 |
| Imports | -2278.97 | -1267.86 |
| Total of Allocative Components | -2215.37 | -1532.61 |
| Terms of Trade | 1793.15 | -4581.28 |
| Marginal Utility of Income | 0.12 | -0.20 |
| TOTAL | -422.12 | -6114.09 |

# APPENDIX A
## Concordance between GTAP and SITC Sectors

| Industry Title (GTAP) | Industry Description (SITC) |
|---|---|
| AGR - Agriculture | Grains, Fruits, Vegetables, Nuts, Oilseeds, Wool, Cattle, Pigs, Sheep, Lambs, Goats, Fur, Hides |
| FOR - Forestry | Fuel Wood, Pulpwood, Veneer Logs |
| FSH - Fishing | Fresh, Chilled and Frozen Fish |
| ENR - Energy | Coal, Oil, Gas, Kerosene, Greases |
| OMN - Other Minerals | Organic and Inorganic Fertilizer, Stone, Metal Ores, Diamonds |
| OFP - Other Food Products | Milk, Butter, Cheese, Processed Beef, Pork, Mutton, Poultry, Breakfast Food, Flour, Jams, Jellies, Coffee, Oils |
| B_T - Beverages and Tobacco | Soda, Wine, Cider, Beer, Distilled Spirits, Raw Tobacco, Cigars, Cigarettes |
| TEX - Textiles | Processed wool, Silk fiber, Natural and Synthetic Fibers, Lace, Linoleum, Carpets |
| WAP - Wearing Apparel | Textiles Clothes - Knit and Non-Knit, Clothing Accessories, Headgear |
| LEA - Leather and Leather Goods | Leather, Belting, Fur Skins, Handbags, Footwear |
| LUM - Lumber and Wood | Railway Ties, Lumber, Veneer Sheets, Boxes and Crates, Furniture |
| PPP - Pulp, Paper and Printed Material | Waste Paper, Wood Pulp, Newsprint, Cardboard, Books, Newspapers |
| CRP - Chemicals, Rubber and Plastic | Synthetic and Reclaimed Rubber, Hydrocarbons, Alcohols, Organic and Inorganic Acids and Bases, Soaps, Explosives, Tires |
| NMM - Non- Metallic Minerals | Lime, Cement, Brink, Stone, Asbestos, Ceramic, Glass |
| I_S - Primary Iron and Steel | Pig Iron, Ingots of Iron and Steel, Railway Track, Tubing |
| NFM - Primary Non- Ferrous Metals | Silver, Copper, Nickel, Aluminum, Lead, Zinc, Tin, Uranium, Magnesium, Tungsten |
| FMP - Fabricated Metal Products | Structure Parts-(Aluminum/Zinc) Wire, Hand Tools, Cutlery, Locks |
| TRN - Transport Equipment | Cars, Trucks, Trains, Planes, Ships |
| OME - Other Machinery and Equipment | Engines, Telecom Equipment, Machine Tools, Computers, Televisions, Radios, Lighting, Household Appliances, Watches |
| OMF - Other Manufacturing | Recording equipment, Toys, Pens, Pencils, Jewelry |