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NAFTA's Implications for East Asian Exports

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NAFTA-induced trade diversion losses could cost East Asian economies between $380 million and $700 million. Losses would be concentrated in a few sectors — such as textiles, clothing, and ferrous metals — where high U.S. trade barriers exist. But the trade losses East Asian economies might incur because of NAFTA are only 1/100th of the gains they will receive from successful implementation of the Uruguay Round results.

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Summary findings

Several studies have quantified the influence of the North American Free Trade Agreement (NAFTA) and the earlier Canada–United States Free Trade Agreement on member countries. Less attention has been paid to their effects on nonmembers. Primo Braga, Safadi, and Yeats try to quantify NAFTA's third-party effects on East Asia using a partial equilibrium trade model and a gravity flow model. They identify and focus on East Asian export sectors that are especially "at risk" of trade diversion.

Their results suggest that the NAFTA-induced trade diversion losses could range from $380 million to $700 million. The larger figure represents less than 1 percent of East Asia's nonoil exports to the United States.

Their analysis also indicates that losses would be concentrated in a few sectors — such as textiles, clothing, and ferrous metals — where high U.S. trade barriers exist. A larger share of Hong Kong and Macau trade would be diverted than trade in other East Asian economies because textiles and clothing represent a larger share of their exports. Economies specializing in such products as machinery and equipment (Singapore) would have relatively little trade diverted.

East Asia's trade losses might be reduced by roughly half once the results of the Uruguay Round are implemented because that will lower the preference margins NAFTA members can extend to each other.

To put things in perspective: the trade losses East Asian economies might incur because of NAFTA are roughly 1 percent of the gains they will receive from successful implementation of the Uruguay Round results.

This paper — a product of the International Trade Division, International Economics Department — is part of a larger effort in the department to understand new regionalism in trade policy. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Anna Kim, room R2-042, extension 33715 (52 pages). August 1994.

Implications of NAFTA For East Asian Exports

by

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I. Introduction

Most analyses of developing countries' export performance over the last two or three decades recognize the importance of the United States as a market for their manufactures exports. According to UNCTAD (1990, Table A13), approximately one-half of all developing countries' exports of manufactured goods destined for OECD markets make their way to the United States, with the European Community (EC) and European Free Trade Association (EFTA) combined receiving only about one-third.[1] The capacity of the US market to absorb imports is remarkable, especially when one notes that most measures of market size favor OECD Europe; *i.e.*, the latter's population is about one-third greater than that of the United States and its gross domestic product is about 15 percent larger.[2] Viewed in a historical perspective, the United States was the "springboard" that newly industrialized Asian economies (NIEs) used in order to gain access to international markets. During the 1960s, for example, approximately three-quarters of manufactures exported from the Republic of Korea and Taiwan (China) to the OECD went to the United States. Although this proportion declined in the last two decades, it still stands at about 50 percent for the four Asian NIEs combined (Korea, Hong Kong, Singapore, and Taiwan (China)) as well as for all the developing economies of the East Asian

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[1] With the entry into force of the Maastricht Treaty on November 1, 1993, the European Community (EC) became part of the European Union (EU). EU is now the term of choice for references to EC activities. In this text, however, the conventional acronym (EC) is used.

[2] In 1988, UNCTAD (1990, Table 7.1) estimated that US imports of manufactures from developing countries were about 4.1 percent of apparent consumption (production minus exports plus imports) compared to about 2.9 percent in the EC. For key product groups like clothing, 28 percent of US apparent consumption originated in developing countries as opposed to 19 percent for the EC. Yeats (1989) found that the United States imports over 40 percent of all labor-intensive manufactures from developing countries while the corresponding share for the EC was 12 percent. As a result, US per capita imports from developing countries were about $250 as opposed to $100 for the EC.

region. In terms of all products shipped from countries in this region (manufactures, foods, energy, etc.), the United States is the second most important destination (East Asian intra-trade ranks first) accounting for one-quarter of total East Asia's exports--see Appendix I, Table A1.

In view of the key role that the United States has played as an outlet for East Asian and other developing economies' exports, there are clearly reasons for concern with regard to North American regional integration initiatives. The recently-concluded North American Free Trade Area (NAFTA), for example, combines the United States, Canada, and Mexico into a single market whose trade restrictions will displace (divert) exports from third countries.[3] There are also discussions about extending the arrangement throughout the Americas.[4]

A frequent deficiency with much of the discussion and analyses of the (adverse) third country effects of arrangements like NAFTA is that it lacks empirical information on the magnitude of trade changes that could result. Our goal in this investigation is to summarize and evaluate the empirical information that exists on NAFTA's impact on nonmembers. In addition,

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[3] See Erzan and Yeats (1992) for estimates of the increases in exports Latin American countries could experience from free trade arrangements (FTAs) with the United States. It should be noted that the US emphasis has been on the establishment of free trade areas and not customs unions. The latter involves two or more countries which abolish all, or nearly all, trade restrictions among themselves and set up a common barrier against outsiders. The EC is an example of this type of arrangement. Once the arrangement expands beyond trade in goods, encompassing trade in services and the movement of factors of production, it is referred to as a common market--e.g., the 1992 European Single Market program. In a free trade area, trade among member countries is completely liberalized, or nearly so, but there is not a common trade barrier against nonmember countries; each country is free to impose its own trade restrictions against third parties. The EFTA is an example of this latter type of arrangement. Primo Braga and Yeats (1992) estimate that FTAs, customs unions and common markets already covered approximately 46 percent of world trade and 50 percent of world trade in manufactures by the late 1980s.

[4] The Enterprise for the Americas Initiative (EAI) of the Bush Administration was interpreted in Latin America and the Caribbean as suggesting that NAFTA would be a first step towards hemispheric integration. In reality, however, the accession clause of NAFTA (Article 2205) does not confine eligibility for membership to countries in the Western Hemisphere. Moreover, it seems that an eventual widening of NAFTA will at best be a slow moving process.

using a trade projection model developed jointly by the World Bank and UNCTAD (1989) and a gravity flow model developed for this project, we produce additional information about the likely impact on the developing economies of East Asia. East Asia was chosen for study due to its heavy reliance on the North American market, and the fact that the region produces a relatively wide range of labor-intensive manufactures that often face important North American trade barriers. High trade barriers are one precondition for NAFTA to divert third countries' exports.

II. Quantitative Analysis of NAFTA's Third Country Effects

NAFTA's economic impacts on non-member countries broadly include: trade diversion, terms-of-trade changes, investment diversion, and the positive externalities associated with the "growth dividend." Several quantitative studies focusing on the NAFTA have appeared lately and they extend the findings of analyses produced during the debate on the United States-Canada FTA.[5] This section summarizes the aggregate and sectoral level results derived from some of these models and also evaluates the findings of several studies that employed partial equilibrium trade models.

A. Partial Equilibrium Analyses: The Aggregate Picture

Partial equilibrium analyses of the NAFTA suggest that it will not generate significant trade diversion from non-member countries. Laird (1990) for instance, employs 1983

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[5] Brown and Stern (1991) provide a useful review of studies which analyzed the impact of the Canada-US FTA. See Hufbauer and Shott (1993) for a summary of the potential effects of NAFTA. Section II here relies on Primo Braga (1992).

trade flows and calculates that NAFTA (modeled as simply entailing tariff removal among member countries) would result in a reduction of less than three-quarters of one per cent in the value of exports to the United States from the other countries in the Western Hemisphere. For all industrialized countries, a NAFTA limited to tariff elimination would result in a reduction of only one half of one per cent of their exports to the United States.

Laird also estimates NAFTA's trade expansion effect (i.e., the summation of trade creation and trade diversion) under the assumption that the agreement would be implemented in tandem with a liberalization in trade barriers achieved by the Uruguay Round negotiations. His assumptions concerning the results of the Round were: a 20 per cent reduction in tariffs and NTBs affecting agriculture; the elimination of MFA quotas, while textile and clothing tariffs remain at present levels; and tariffs for all other products are reduced by 30 per cent with remaining NTBs being left untouched. Under these conditions, trade creation (magnified by the MFN Uruguay Round liberalization) completely dominates trade diversion resulting from NAFTA. The developing countries in the Western Hemisphere would experience a 1.8 per cent increase in their exports to the United States while there would be a 2.4 per cent increase for all industrialized countries. If the results of the Uruguay Round are estimated in connection with a NAFTA that encompasses the complete removal of both tariffs and NTBs among its member countries, the final outcome is marginal: exports to the United States would decline by only 0.07 per cent in the case of the Western Hemisphere developing countries (and would expand by 1.6 percent for industrial countries).

A second aggregate partial equilibrium study also confirms NAFTA's limited potential for trade diversion with respect to other Western Hemisphere countries and that the

total amount of all countries' trade diverted is likely to be small. Focusing on an FTA between Mexico and the United States, Erzan and Yeats (1992) find that 94 percent of the total trade diversion would affect countries outside the Western Hemisphere. They also conclude that the total amount of trade diversion by NAFTA (estimated to be around US$441 million in terms of 1986 trade flows) amounts to about one-half a percent of US imports from the non-members. Over 85 percent of the diverted trade consists of manufactured goods with about $35 million (8 percent) classified as foods and feeds. These projections were based on the assumption of zero duties in all tariff lines and the adjustment of NTBs to accommodate the (tariff preference-induced) trade expansion.

In a third partial equilibrium study that examined NAFTA's impact on South Asian exporters, Safadi and Yeats (1992) conclude that exports from the latter might decline by a maximum of one percent and that, due to the very different composition of Canada-Mexico and South Asia's exports to the United States, most of the trade losses would be concentrated in textiles and clothing. Safadi and Yeats also uncover evidence of Mexican supply constraints in these sectors--like a history of unfilled MFA quotas--that suggests Mexico may not be able to fully utilize the competitive advantages associated with NAFTA's trade preferences (Safadi and Yeats' analysis is based on a preferential removal of all tariffs and NTBs). The authors also concluded that a successful completion of the Uruguay Round would significantly reduce the (already small) South Asian trade losses since the MTN would cut the preferential margins NAFTA could provide member states.

B. Computable General Equilibrium (CGE) Analyses

The results of studies using CGE models for analysis of the third country effects of NAFTA are quite sensitive to model specifications (particularly, elasticities of demand and supply, market structures, pricing behavior of firms, and assumptions about capital flows). It is also important to note that assumptions concerning the nature of the preferential liberalization NAFTA will achieve vary significantly from study to study.[6]

Available CGE studies--for a detailed review, see Brown (1992)--typically find (as expected) that trade expands among the NAFTA member countries as a consequence of the preferential arrangement. Welfare effects are also found to be positive for the participating countries, tending to be larger in models which adopt assumptions of increasing returns to scale vis-a-vis those based on constant returns to scale.

The impact on non-member countries, in turn, may be either negative or positive depending on how the model treats the interplay between trade diversion, capital flows and changes in the terms-of-trade for the rest of the world. It is worth mentioning that the latter is usually introduced in these models via postulated export supply and import demand functions based on relative prices. Table 1 summarizes the main results for the "rest of the world" (ROW) as established in the models developed by Brown, Deardorff, and Stern (BDS) (1992), Sobarzo (1992), and Cox and Harris (1992). These models allow for increasing returns to scale and assume that imperfectly competitive firms set prices either through a combination of focal

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[6] This section focuses on CGE models which explicitly address the NAFTA. There are numerous other CGE exercises which focus, for instance, on a US-Mexico FTA. Their results, however, are not at odds with the main conclusions presented here, as far as the economic implications for the third countries are concerned. See, for instance, Hinojosa-Ojeda and Robinson (1991) or Bachrach and Mizrahi (1992).

pricing and monopolistic competition (Sobarzo, Cox and Harris) or in a pure monopolistic competitive fashion (BDS).

Preferential liberalization without international factor mobility reduces the trade volumes between NAFTA and third countries, and as illustrated by Case 1 of the BDS model, this may result in deterioration in the terms of trade of the latter. NAFTA's demand for imports from non-member countries and the supply of exports from NAFTA to the rest of the world fall as a result. The cases summarized in Table 1, however, show that the size of these changes is not likely to be significant. The exceptions occur in scenarios in which international capital mobility is allowed for (case 2, both in BDS and in Sobarzo) or in which the preferential liberalization is complemented by additional trade barriers against non-participants (case 3 in Cox and Harris).

Case 2 in BDS assumes that, in parallel with NAFTA's preferential trade liberalization, Mexico relaxes its capital import constraints and as a consequence receives a capital inflow from the ROW (which expands its capital stock by 10 per cent). The model assumes that current account balances remain at the prevailing level in the base period. Accordingly, the need to finance interest payments from Mexico to the ROW dictates that Mexico should run a substantial surplus in its balance of trade --an outcome which is basically accommodated by the ROW. In this scenario, third countries experience an improvement in their terms-of-trade, a phenomenon related to the large expansion of Mexican exports.

Table 1: Summary of CGE Results on the Economic Implications of NAFTA for the Rest of the World (ROW)
(Percentage changes except where noted)

	Brown, Deardorff and Stern a/		Sobarzo b/		Cox and Harris c/		
	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2	Case 3
Exports from the ROW							
To NAFTA countries	-0.06	-0.53					
To the US					-0.65	-0.64	-10.9
To Canada					0.08	0.07	-2.4
Net Exports from the ROW d/							
To NAFTA countries	0.35 e/	-10.88 e/					
To Mexico			2.1	17.1			
Terms of Trade for the ROW	-0.0	0.2					
Welfare f/							
ROW	-0.0	-0.0					
Canada	0.7	0.7			0.003	0.936	-0.117
Mexico	1.6	5.0	2.3	2.4			
US	0.1	0.3					

a/ The Brown, Deardorff and Stern model (29 sectors of which 23 are tradable goods sectors) assumes that technology in most tradeable sectors is characterized by increasing returns to scale and the market structure is monopolistically competitive. Case 1 (BDS' experiment A) assumes complete removal of tariffs among NAFTA members and a 25 percent increase of US import quotas which restrain Mexican exports of agriculture, food, textiles and clothing. Case 2 (BDS' experiment B) maintains the same assumptions plus the liberalization of Mexico's capital import controls, resulting in a 10 percent increase in Mexico's capital stock.

b/ The Sobarzo model identifies 27 production sectors and assumes imperfect competition in most of its 21 tradeable sectors. The model only addresses the impact of a complete removal of tariffs among NAFTA countries. In case 1 (Sobarzo's version 2), a fixed quantity of capital in Mexico is assumed. Case 2 (Sobarzo's version 3), in turn, assumes that capital is mobile between countries.

c/ The Cox and Harris model identifies 19 sectors with ten of them presenting increasing returns to scale. The trade results reported reflect absolute changes in the market share of the ROW in total imports of the United States and Canada. The base for comparison is provided by the Canada-US free trade area (CUSFTA) situation. Case 1 compares a hub-and-spoke format (with the United States as the hub and Canada and Mexico as the spokes) with CUSFTA. Case 2 compares the NAFTA with CUSFTA. Case 3 compares a NAFTA combined with an increase of 10 percent of member countries' *ad valorem* tariffs against the ROW with CUSFTA. Preferential trade liberalization in all cases reflects only tariff removal.

d/ Net exports are defined as exports minus imports.

e/ Values in US$ billions.

f/ Welfare changes are measured in terms of the so-called equivalent variation --i.e., they reflect the change in income valued at base prices that would lead to the same change in utility level associated with the liberalization.

Sources: Brown, Deardorff and Stern (1992), H. Sobarzo (1992) and Cox and Harris (1992).

Sobarzo's "Case 2" scenario assumes a perfectly elastic supply of foreign capital. The Mexican economy experiences a much larger GDP increase than in Case 1, which has a fixed capital stock assumption (8.0 per cent GDP increase versus 1.9 per cent in Case 1).[7] This higher level of growth, in turn, translates into a significant deterioration in Mexico's trade balance with the ROW, given Sobarzo's *ad hoc* export supply and import demand functions used to model Mexico's trade relations with North America and the ROW.[8]

Case 3 in Cox and Harris illustrates the negative externalities of the NAFTA if it becomes an inward-oriented bloc. In this analysis, the elimination of tariffs among member countries is combined with a 10 per cent increase in ad valorem tariffs applied by Canada, Mexico, and the United States against third country imports. Table 1 shows this would reduce trade volumes between NAFTA and non-members significantly via direct trade suppression. An explicit movement toward an inward-oriented trade bloc in North America seems unlikely. After all, as illustrated by the Canadian welfare results, participating countries would also be negatively affected. Still, these results highlight the dangers for the ROW of such a development.

Perhaps, the main message of these analyses concerns the importance of capital flows in determining the final outcome of NAFTA from the perspective both of member and third countries. Specifically, CGE results suggest that barriers to capital flows, as well as the

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[7] See Sobarzo (1992). Note that the welfare impact of both scenarios is approximately the same (see Table 1); the explanation being that despite the larger expansion of the Mexican economy in case 2, the additional income generated by the use of foreign capital does not belong to Mexican nationals.

[8] Mexico's overall trade balance experiences a 18.3 per cent deterioration, reflecting an 18.9 per cent deterioration *vis-a-vis* the rest of North America (United States and Canada) and a 17.1 per cent deterioration *vis-a-vis* the ROW.

cost of international financing, will play a much larger role in determining NAFTA's welfare effects than its preferential trade liberalization component.

C. Alternative Modeling of NAFTA's Influence

The introduction of imperfect competition in CGE models has contradicted the conventional wisdom that welfare results associated with trade liberalization are insignificant (a usual outcome of CGE modeling with constant returns to scale). These models cannot, however, adequately account for the impact of trade liberalization on growth rates. The influence of liberalization on capital formation and consumers' savings decisions, industry specialization, and capacity to import specialized inputs are some of the variables emphasized in attempts to model the dynamic implications of FTAs (See Young and Romero, 1991 or Kehoe, 1992). As a general rule, these "imperfect competition" models suggest that the dynamic benefits of liberalization are much higher than the conventional static benefits. Accordingly, one could argue that they strengthen the case for FTA arrangements to the extent that the "growth dividend" more than offsets distortions associated with the preferential liberalization.

Detailed calculations of the dynamic effects of NAFTA upon nonmembers are not (to our knowledge) available. The only "dynamic" exercise that explicitly addresses the evolution of trade between NAFTA and third countries is provided by Hufbauer and Schott (1992). Their model introduces dynamic considerations by imposing an exogenously determined increase in the rate of Mexican export growth. Linking the success of the NAFTA negotiations to further liberalizing reforms in Mexico, including "sweeping privatization, significant liberalization of the Mexican oil sector, [and continuity of] fiscal and monetary restraints," the

authors assume that, under these circumstances, Mexican exports of goods and non-factor services will grow at an annual rate of 11.2 per cent, a figure which reflects the historical experience of successful liberalization by inward-oriented countries. The failure of the NAFTA negotiations, in turn, is assumed to imply a smaller rate of growth for Mexican exports (7.9 per cent), given the authors' assumption that it would foster "policy retrogression" in Mexico. This lower rate of growth is based on historical data for "collapsed liberalizations" and provides the counterfactual scenario utilized by Hufbauer and Schott in estimating the economic impact of the NAFTA.[9]

Their estimates of NAFTA's influence on trade among member countries are much larger than those from conventional CGE models. Hufbauer and Schott (1992, p.60) indicate their "Mexico export gain is 50 percent larger than the most optimistic alternative model, while the US export gain is more than twice as large." The impact of NAFTA on nonmember countries, however, remains marginal (US net exports to third countries are unaffected by NAFTA, while Mexican net exports decline by US$ 3 billion). Unfortunately, the assumptions utilized in their calculations (Mexican export and import shares *vis-a-vis* the United States are fixed at 75 per cent) limit the utility of their results for estimating trade diversion.

D. Sectoral Analyses

Sectors with relatively high levels of protection in the United States are natural candidates for analyses concerned with trade and investment diversion from the perspective of the non-NAFTA countries. Statistics tabulated in this study (See Tables 2 and 4) indicate that

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[9] Historical data on liberalization experiments is derived from Papageorgiou *et.al.* (1991).

agriculture (specific products), textiles, clothing, ferrous metals and automobiles are the key sectors where such diversion may occur since they have higher than average levels of protection.

(i) Agriculture

Some CGE models focus on the implications of an FTA between Mexico and the United States for the agricultural sector. Robinson *et.al.* (1991), for instance, analyze different combinations of trade liberalization cum reform of agricultural policies in Mexico and in the United States (including liberalization limited to non-agricultural activities). Their basic conclusion is that, in the aggregate, an FTA expands bilateral trade under all scenarios. Mexico experiences some trade diversion as imports from third countries decline by 2 to 3 percentage points -- the exception being the scenario with capital growth in Mexico; in this case, the "growth dividend" generates a net increase in imports from the ROW. With respect to the United States, the FTA in almost all scenarios implies an increase in imports from non-FTA members. The results reflect the high level of protection given Mexican agriculture before the liberalization. Accordingly, they recommend gradualism in the liberalization of Mexican agriculture in order to avoid "large rural outmigration from Mexico" (Robinson, *et.al.*, 1991, p.33).

Once the focus of analysis becomes more product specific, however, one can find cases of trade diversion from third countries in the US market. Grennes *et.al.* (1991), for instance, use a partial equilibrium model to analyze the impact of preferential liberalization in the Western Hemisphere on agricultural products. They show that an FTA between the United States and Mexico, by removing restrictions to Mexican exports of frozen-concentrated orange

juice (FCOJ) --which had an estimated tariff equivalent of 28 per cent in 1988 -- would divert trade primarily from Brazil. Despite the significant growth of Mexican exports of FCOJ to the US market (32 per cent), US imports from third countries would decline by only 0.5 per cent. The situation changes, however, once one assumes that in addition to the tariff removal the NAFTA (and Mexican domestic reforms) stimulates significant new investments in Mexican citrus. Assuming a doubling of the rate of growth of Mexican FCOJ output, Spreen *et.al.* (1992) show--using a long-term model of the world citrus industry--that by the year 2000 this scenario implies a reduction of 4.5 per cent in Brazilian production of citrus (a decline of 14.4 per cent in terms of on-tree revenues) *vis-a-vis* the baseline and a much smaller impact on the Florida citrus sector (a decrease of 0.61 per cent in terms of orange production and of 6.34 per cent with respect to on-tree revenue).

Analyses of agricultural products heavily affected by US quantitative restrictions provide several interesting insights concerning the potential implications of the NAFTA for third countries. Sugar provides the best example in this context. Borrell and Coleman (1991) show that bilateral negotiations concerning trade in sugar and corn syrup between the United States and Mexico may have significant effects for other countries. If, for instance, under an FTA Mexico harmonizes its pricing policy with the one prevailing in the United States and both countries administer a joint quota scheme *vis-a-vis* the ROW, this arrangement would impose significant welfare losses upon net exporters (the Caribbean, for instance, would experience a net welfare loss of US$ 128 million; world welfare would fall by US$ 241 million). An even worse scenario can be imagined if the negotiations lead to an exchange of quota rights between Mexican sugar producers (expanding their access to the US market) and US corn syrup

producers (who would gain greater access to the Mexican market). Under these conditions, US corn syrup would displace sugar in the Mexican market, which could end up in the United States, fostering additional trade diversion (in this case world welfare would fall by US$ 256 million).

(ii) Textiles and Apparel

Trela and Whalley (1992) analyze the implications of the elimination of MFA quotas for the NAFTA countries (*i.e.*, quotas imposed by the United States and Canada against Mexico) and the influence of this action on the remaining MFA-restricted countries (which are identified as the ROW). They use a sector-specific CGE model with constant returns to scale, encompassing four textile and apparel product categories and a composite product. Goods are treated as homogeneous across regions, trade in textiles and apparel between exporting countries (Mexico and the other 33 MFA-restricted countries) is assumed away, and MFA quotas are presumed to be binding. This latter assumption is at considerable odds with reality, however, since Safadi and Yeats (1992) show that Mexico has consistently underutilized (by about 25 percent on average) its MFA quotas over the 1980s.

Trela and Whalley analyze several liberalization scenarios at bilateral (United States-Mexico) and NAFTA levels in their model.[10] In general, their results indicate Mexico

[10] It is important to keep in mind that the Trela-Whalley model, despite its sophistication, cannot capture an important facet of the NAFTA negotiations (those dealing with rules of origin). Rules of origin for the textiles and apparel industry are usually defined in terms of changes in tariff nomenclature headings in the productive process, so that a final product using foreign inputs can quality for "domestic" status (in practice, there is often the need to complement this procedure with a value-added test). A simple transformation rule requires a single tariff heading change. A double (triple) transformation rule demands two (three) changes in tariff classifications. In the context of clothing, for instance, a simple transformation rule requires that the product be cut and sewn in a member country to qualify as local. Double transformation (as was the case for most textile and clothing products under the Canadian-United States FTA) requires that the inputs into the final product also pass the test--i.e., that the fabric be formed in the FTA member countries. Triple transformation, in turn, requires that all productive processes from yarn forward be implemented within the FTA. The NAFTA adopted a triple transformation rule. Bannister and

and the US would gain from the liberalization, while Canada and the ROW would lose. Mexico experiences a major outward-oriented expansion with its exports to the United States increasing significantly. The United States faces a minor adjustment (most of it in its apparel sector), but lower consumer prices produce positive welfare results. Given the expansion of Mexican exports, Canada experiences major market share losses in the United States. For the ROW, the negative welfare impact of the liberalization basically reflects the erosion of their US quota rents. The NAFTA (i.e., the removal of quotas and tariffs on textiles and apparel among member countries) generates a welfare reduction of 0.03 per cent (in terms of GDP) for the ROW.

(iii) Steel Industry

The US steel industry provides another example of a sector which enjoys protection mainly in the form of quantitative restrictions--typically, voluntary restraint agreements (VRAs). Trela and Whalley (1992) also developed a sector-specific CGE model to analyze the effects of regional liberalization in North America--over a time horizon of 40 years--focusing on the steel industry. Their model identifies one importing region (the United States), three exporting regions (Mexico, Canada, and a 19-country aggregate of other VRA-affected exporting nations, which represents the ROW), and three commodities/industries (a steel-producing industry; a steel-consuming industry, which is an aggregate of non-steel manufacturing industries, and an all-other-goods industry).

Low (1992) point out that the Mexican textiles and clothing industry already displays a high level of dependence on US inputs. Accordingly, compliance with more strict rules of origin should not impose major adjustment costs for Mexico. Strict rules of origin may, however, impair investment from non-NAFTA countries in the Mexican industry, by tying its competitiveness to the efficiency of the US textile sector.

The results of steel trade liberalization at bilateral (United States-Mexico) and trilateral level (NAFTA) mirror the results obtained in their analysis of the textiles and apparel industry.[11] The main impact for the ROW is smaller quota rents, reflecting terms of trade effects. However, their analysis suggests that another important secondary effect of the preferential liberalization may occur. As a consequence of lower steel prices, US steel-consuming industries experience an increase in their competitiveness *vis-a-vis* the ROW.

(iv) The Automobile Industry

Trade in automobiles and auto parts constitutes the most important component of North American intra-trade. Most of this trade is conducted either duty-free or under preferential (low) tariffs. Accordingly, one should not *a priori* expect a major impact from the NAFTA on the ROW as far as these trade flows are concerned.

The most detailed auto industry model available is provided by Hunter, Markusen, and Rutherford (HMR) (1992). This study analyzes the production of finished autos using a four region CGE model (Canada, Mexico, United States, and the ROW) having two goods (autos and a composite of the remaining goods and services), and two factors of production, and assumes increasing returns to scale in the auto industry (with firms following Cournot behavior) and

[11] As in the case of textiles and apparel, even the most sophisticated models cannot incorporate all aspects of North American steel trade. The Trela-Whalley model, for instance, assumes that the direction of trade before and after the liberalization is from Mexico to the United States. Accordingly, trade liberalization would bring about a contraction of the US steel sector. This forecast seems to be at odds with the "qualified" support offered by the American Iron and Steel Institute to the NAFTA talks. The explanation, however, is quite simple. The United States is a net steel exporter to Mexico. Hence, the preferential liberalization of Mexican steel tariffs, as well as of government procurement policies based on a buy-Mexican provision, is probably attractive enough for the US steel industry for it to accept the preferential quota and tariff removal on the US side. This, in turn, suggests that steel exporters from the ROW will also experience trade diversion in the Mexican market as a result of the NAFTA.

homogeneous products across countries. Two interesting aspects of the HMR analysis are its explicit attempt to model the behavior of transnational corporations (TNCs) and the endogeneity in the number of auto plants.

Different liberalization scenarios (which basically involve the removal of tariffs) at bilateral and trilateral (NAFTA) level are evaluated. Two scenarios are particularly interesting: free trade at the trilateral level (Mexico-Canada-United States) for producers only (a situation which allows producers to price-discriminate across borders) and market integration (which allows free trade at the consumer level between the United States and Mexico, while free trade across the United States-Canada border remains limited to producers).

As far as welfare results are concerned, Mexico is the clear "winner" in these situations. The impact upon Canada, the United States, and the ROW are not significant in relative terms, although some trade diversion would result. In the producers' free-trade scenario, Mexican exports increase by 77,000 cars, while Canada and the ROW experience a decline in their exports of 9,000 and 32,000 cars, respectively. In the market integration scenario, Mexican exports increase by 157,000 cars, while Canadian exports fall by 37,000 cars and car exports from the ROW fall by 2,000 units *vis-a-vis* the benchmark situation.

The differences in trade diversion results from these two scenarios are explained by the assumptions made with respect to the pricing behavior of TNCs. Under market integration, TNCs in Mexico makes a significant reduction in their markups while the plants located in the United States would be expected to raise their markups in an attempt to prevent arbitrage between the two markets. This may allow the ROW to increase its exports to the United States by 10,000 units *vis-a-vis* the benchmark, thereby minimizing the trade diversion

effects of the NAFTA.

The integration scenario suggests, however, that the ROW may be affected in a different way. Although in both scenarios liberalization does not lead to significant rationalization effects in the United States and Canada, it does have a dramatic impact in Mexico, increasing the output per firm by 19.7 per cent in the producers' free-trade case and by 155 per cent in the market integration scenario.[12] In the integration scenario rationalization forces two of the five existing auto producers in Mexico to close their plants.[13] The model does not identify what type of firm would be forced out under these circumstances (there are two types of firms in the HMR model: North American firms and ROW firms), but it calls attention to the possibility that firms in Mexico may be directly affected in this process.

It can be argued that those firms that have already established a North American core network strategy (in terms of suppliers and markets) will be in a better position to expand their activities in the context of the NAFTA. This argument is even more relevant given the strict local content requirements adopted by the NAFTA. In the case of automobiles, after a ten-year transition period, they will be sold free of duty across national frontiers within NAFTA

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[12] The US and Canadian results are explained in terms of the domination of the industry by TNCs. According to the authors, imports from Mexico are not interpreted as a loss of market by the US TNCs, given the pattern of plant ownership in the industry (see Hunter, Markusen, and Rutherford 1992, p.80).

[13] The five Mexican auto producers have followed different market orientation strategies until recently. The three US auto makers (Chrysler, General Motors, and Ford) are outward oriented, exporting mainly to the North American market. Taking into account vehicles, engines, and auto parts, exports accounted respectively for 48.4 per cent, 68.4 per cent, and 81.5 per cent of the total sales by GM, Ford, and Chrysler Mexican operations in 1987. The totality of these exports in the case of Chrysler and Ford went to North America (60 per cent in the case of GM). Exports from VW and Nissan, in turn, were estimated to represent at most 35 percent of their sales, with a more diversified trade orientation (for instance, only 20 per cent of the Mexican VW exports went to North America). See UNCTC (1991).

only if at least 62.5 percent of their inputs are also made in North America.[14] The role of rules of origin in free-trade areas is reviewed in Box 1.

BOX 1: RULES OF ORIGIN

Rules of origin are the instrument used to determine which goods and services in a free trade area (FTA) or in a customs union are entitled to preferential treatment. RIAs use different methods to determine origin. Substantial transformation, change in tariff heading, minimum value added, and specified-process systems are the main methods used. In customs unions, given the existence of a common external barrier, rules of origin are equivalent to domestic content requirements, and are also used to determine quota eligibility when quantitative restrictions apply. In FTAs, however, the main role of rules of origin is to impede trade deflection schemes, by which outsiders would use the partner in the FTA with the lowest trade barriers to trans-ship their products to the more protected markets in the FTA.

Rules of origin can, however, be used for export protection. In practice, this means that one FTA partner can effectively impose its higher external barrier on another partner, which has lower restrictions on an input used to produce a good qualifying for duty-free treatment within the FTA. If transport costs are not significant, a firm in country A will be led to buy higher-cost inputs from country B in the FTA, rather than from outsiders -- if the effective rate of protection for the final good is higher in country B and the purchase is necessary to characterize origin (Kruger, 1993). For example, a producer of finished garment in A may find it profitable to buy fabric woven from B's yarn rather than from cheaper imported yarn, in order to qualify for free access to B's market.

In sensitive sectors such as textiles and clothing, and autos, "free-trade" within NAFTA came together with strict rules of origin. A cotton shirt-maker in Mexico, for example, can only sell the shirt free of duty in the United States if it is made from cotton fabric woven in the NAFTA region -- which, in turn, comes from yarn and thread spun in the region. This "triple-transformation test" is more restrictive than the one established in the CUSFTA (where a double-transformation test applied) and entails a higher level of implicit discrimination against outsiders.

Automobiles, after a ten-year transition period, will be sold free of duty across national frontiers within NAFTA only if they have at least 62.5 percent of North American content.[2] Meanwhile, Mexico's restrictive import regime will be phased out vis-a-vis its NAFTA partners. The new rules of origin seem to impose stricter conditions than those prevailing under the CUSFTA (although one should keep in mind that the change in the number of countries involved in the RIA qualifies this comparison). The required regional content is higher (62.5 percent versus 50 percent) and the calculation procedures have been changed to ensure that certain critical inputs in the manufacturing process are made in North America in order for the final product to qualify for duty free treatment.

There are no reliable estimates of the distortions introduced by restrictive rules of origin. It seems unlikely that these distortions will significantly increase the magnitude of the trade diversion effects associated with NAFTA. Yet, rules of origin may play a role in fostering investment diversion, another source of concern for outsiders with respect to trading blocs.

[14] The 62.5 percent rule will also apply to light trucks, engines and transmissions, while a 60 percent rule will be used for other vehicles and parts. The new rules of origin will be binding after an eight-year transition period for automakers already established in the region. New investments, however, will have to comply with the stricter rule after a five-year grace period, during which a 50 per cent rule will apply.

Summing up, quantitative sectoral studies tend to confirm the thesis that the NAFTA may not have a major impact on non-member countries as far as trade flows are concerned (although some specific industries of non-member countries may be significantly affected). Investment diversion is another source of concern for the ROW--particularly for East Asian NIEs and Japan. Up to now, however, there is only limited anecdotal evidence on this issue. For example, Zenith Electronics Corporation, a US company, has announced its decision to transfer a manufacturing plant from Taiwan to Mexico. This resolution has been interpreted as evidence of the role played by expectations about the NAFTA in the allocation of resources of TNCs (see UNCTC 1992, p. 78). The impact of NAFTA's (explicit or implicit) discrimination against investments from non-member countries remains an open question.

III. NAFTA and East Asian Exports: The Potential for Trade Diversion

As indicated in the sectoral studies just reviewed, there are two important preconditions for NAFTA to have major trade-diverting effects: (1) there must be competition between NAFTA member and nonmember countries; and (2) North American trade barriers must be important. The latter is required for NAFTA to extend meaningful competitive advantage to member countries (*i.e.*, these barriers will be relaxed against North American suppliers' exports but will continue to face third countries). Thus, a first assessment of the potential impact of NAFTA on East Asia can follow from an analysis of the level and structure of trade barriers that Asian exporters now encounter in North America.

A. The Potential for Tariffs to Divert Trade

Table 2 provides relevant information using summary statistics on the US tariffs that 12 East Asian economies currently face. The rates reported here are post-Tokyo Round "applied" rates that reflect the weighted average of the MFN or Generalized System of Preference (GSP) rates actually applied to each tariff line level product. Aside from totals, the tariff rates have also been computed for broad one- and two-digit SITC categories (see Appendix I, Table A2 for 1990 East Asian exports of each group). The United States was chosen as the focus for this analysis given its overwhelming importance within NAFTA.[15]

[15] In 1990 for example, 93 percent of East Asia's exports to North America went to the United States, 6 percent went to Canada, and only 1 percent went to Mexico.

Table 2: Average Discriminatory US Tariff Margins East Asian Exporters Could Face Due to NAFTA

Applied US Tariffs on East Asian Exporter (%)

Product (SITC)	China	Fiji	French Polynesia	Hong Kong	Indonesia	Rep. of Korea	Macau	Malaysia	Philippines	Singapore	Taiwan, China	Thailand
All Goods (0-9)	8.7	5.3	0.1	9.8	5.1	7.5	12.7	2.6	6.2	3.6	7.3	3.9
Food & Live Animals (0)	2.7	0.0	0.9	4.6	1.4	2.4	0.1	1.3	1.7	0.7	4.3	4.3
Beverages & Tobacco (1)	4.0	--	--	3.4	1.8	6.1	--	0.0	2.1	2.5	2.6	9.9
Crude Materials (2)	2.9	0.0	0.0	1.0	0.0	2.7	0.1	0.0	0.0	0.4	2.7	0.0
Energy Products (3)	0.6	--	--	1.4	0.5	1.0	--	0.5	0.0	0.8	3.4	0.6
Animal & Vegetable Oils (4)	2.2	--	--	9.3	0.0	2.4	--	0.0	0.0	3.7	1.1	0.3
All Manufactured Goods (5-8)	9.5	10.7	0.1	9.9	13.1	7.5	12.9	3.0	7.5	3.7	7.4	4.0
Chemicals (5)	5.2	3.5	0.0	5.6	1.1	6.2	0.0	0.0	0.8	4.3	5.7	0.5
Leather Goods (61)	5.7	--	--	4.4	0.8	4.3	0.1	0.0	0.1	1.7	4.8	0.1
Rubber Manufactures (62)	4.8	--	--	5.5	1.9	4.2	0.0	0.2	1.5	4.2	5.5	1.1
Wood Manufactures (63)	5.9	0.0	--	5.8	7.2	5.6	1.9	2.1	0.7	4.6	5.4	0.0
Yarn & Fabrics (65)	8.7	0.0	--	8.7	12.2	13.7	8.5	12.3	7.2	11.8	10.3	9.7
Iron & Steel (67)	3.9	--	--	3.8	1.7	4.1	--	3.8	1.7	2.4	4.5	2.6
Nonferrous Metals (68)	0.8	--	--	2.5	0.0	2.6	--	0.0	0.0	1.5	3.0	0.0
Transport & Machinery (7)	4.9	0.0	0.0	3.4	0.4	2.7	0.8	0.6	0.2	1.9	3.8	0.3
Nonelectric Machinery (71)	3.9	--	0.0	2.2	0.4	2.8	0.0	0.0	0.0	1.1	2.9	0.1
Electric Machinery (72)	5.0	--	0.0	4.2	0.4	2.7	0.0	0.6	0.2	3.2	4.2	0.2
Transport Equipment (73)	4.7	0.0	0.0	2.6	0.1	2.6	3.8	0.0	0.1	0.7	6.0	5.3
Travel Goods (83)	15.4	--	--	13.3	13.5	14.6	3.8	7.0	13.9	12.0	18.0	11.9
Clothing (84)	14.6	15.7	9.6	17.3	22.6	17.1	20.6	16.4	18.0	24.4	22.9	19.8
Footwear (85)	14.8	--	--	12.4	8.1	11.1	9.3	22.2	12.0	7.5	8.8	10.9
Miscellaneous Manufactures (89)	6.8	0.0	0.0	4.7	0.1	5.1	0.1	1.1	0.3	2.2	5.2	0.0

Note: Two dashes (--) indicate no trade in the product group.

Source: Computed using the World Bank-UNCTAD SMART data base. The tariffs shown are the trade weighted averages of the MFN or GSP rates actually applied to each country's exports.

Overall, US tariffs would provide adverse duty margins that range from a low of one-tenth of one percent in the case of French Polynesia's exports to a high of 12.7 percent in the case of Macau. The difference is due to Macau's trade being concentrated in high tariff items like clothing while many of French Polynesia's exports consist of (duty free) items like pearls and precious stones and some agricultural products. Of the 11 East Asian economies listed in Table 2, four (French Polynesia, Malaysia, Singapore and Thailand) could face adverse NAFTA tariff margins of under 5 percent while Indonesia and Fiji have tariff differentials only slightly higher in the 5.1 to 5.3 percent range. The primary reason for these relatively low rates is that the proportion of textiles and clothing (high US duty products) in their total exports is relatively low--see Appendix I, Table A2.[16] As indicated in Table 2, the economies that would be most severely affected by NAFTA are China, Hong Kong, and Macau where import duties average between 9 and 13 percent. Textiles, clothing, footwear, and travel goods stand out as high-tariff sectors where important (NAFTA-induced) trade diversion may occur.

Table 3 allows examination of the differential tariffs individual East Asian economies could encounter due to NAFTA from a different perspective. The table shows (the two rightmost columns) total US imports from each of the 11 East Asian economies and the number of tariff line products each exports (the US custom schedule distinguishes 8,753 tariff line items).

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[16] Over three-quarters of Singapore's and 57 percent of Malaysia's exports consist of transport and machinery products (SITC 7) that face US tariffs in the one to four percent range. In contrast, 57 percent of Macau's US exports consist of clothing (SITC 84) as opposed to 7 to 12 percent for Singapore, Thailand, Taiwan (China), and Malaysia. Some of the East Asian countries, like Indonesia, Malaysia, Philippines and Thailand, also benefit from US GSP preferences which lower the adverse differential tariffs they would encounter under NAFTA.

Table 3: Profiles of East Asian Exports Affected by High, Moderate, and Low US Tariffs

Exporter	Products with tariffs over 15 percent			Products with tariffs over 10 percent			Products with tariffs over 5 percent			All 1989 Exports	
	No. of lines	Value ($ million)	% of total exports	No. of lines	Value ($ million)	% of total exports	No. of lines	Value ($ million)	% of total exports	No. of lines	Value ($ million)
EAST ASIA											
China, People's Republic	446	2,062	16.1	776	3,274	25.6	2,062	8,270	68.2	3,924	12,793
Fiji	19	4	19.9	21	4	20.9	26	6	32.1	93	19
French Polynesia	1	--	0.1	2	--	0.2	6	--	1.4	34	9
Hong Kong	416	2,937	28.9	713	3,369	33.1	1,954	6,738	66.2	3,634	10,172
Indonesia	190	580	15.0	270	679	17.5	434	1,149	29.7	1,096	3,867
Korea, Republic	471	2,654	12.9	806	4,115	20.0	2,127	9,958	48.4	3,955	20,556
Macau	131	340	49.0	171	368	53.0	259	431	62.1	540	694
Malaysia	176	394	8.0	245	483	9.8	391	763	15.5	1,299	4,906
Philippines	241	758	23.0	370	913	27.7	589	1,195	36.3	1,713	3,290
Singapore	167	604	6.6	261	693	7.6	857	1,933	21.1	1,859	9,151
Taiwan, China	513	3,007	11.8	888	4,591	18.0	2,417	13,069	51.2	4,652	25,511
Thailand	253	407	8.8	385	770	16.7	672	1,255	27.2	2,101	4,611
NAFTA MEMBERS											
Canada	471	261	0.3	785	820	2.5	2,136	3,056	3.4	6,537	88,819
Mexico	334	916	3.3	554	1,490	5.4	993	3,562	13.0	4,186	27,369

Note: The above tabulations indicate the number of items and value of trade that encounters a certain minimum tariff level (say 5 percent). By subtracting the corresponding statistics for the next highest tariff "cut-off" from these totals one can determine the trade that occurs within the tariff range. For example, 42.6 percent (68.2-25.6) of China's exports (1,286 tariff lines) face tariffs of between 5 and 10 percent.

Source: Computed using the World Bank - UNCTAD SMART data base.

The three columns (moving leftward) show the tariff lines, import values, and share of total exports that are free of duty or face a "nuisance" tariff of 5 percent or less.[17] In order to distinguish "moderate" and "high" tariffs, similar information is shown (moving leftward) for two additional groups of items. The first for US tariffs of at least 10 percent, while the second uses a 15 percent tariff cut-off.

The main message of Table 3 is that a high degree of variation exists in the vulnerability of individual East Asian economies to differential (adverse) NAFTA tariffs. Only 16 percent of Malaysia's exports encounter US tariffs of 5 percent or more (391 product lines are involved) and less than 10 percent are "high tariff products" (duties of 15 percent or more). Much the same result applies to Singapore, Thailand and Taiwan (China) where high tariff products only comprise about 10 percent of total exports. In contrast, economies with a relatively high share of textiles, clothing, or footwear in total exports (See Appendix I Table A2 for statistics identifying these traders) are far more "at risk" to NAFTA given that between one-quarter to one-half of total exports face US tariffs of 15 percent or more (Hong Kong, Macau and the Philippines fall in this latter group).

Although the point is not specifically addressed in Table 3, there is reason to believe that these tabulations may <u>overstate</u> the potential for trade conflicts between East Asia and NAFTA members because the latter's products do not appear to pose viable competition for some of the former's products (see Safadi and Yeats, 1992). In other words, Table 3 shows that

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[17] In the Uruguay Round several delegations suggested that tariffs of under 5 percent had no (or insignificant) trade effects and these duties should be abolished without negotiation. The Canadian delegation to the Tokyo Round negotiations incorporated this proposal in a general formulae designed to lower MFN tariffs. For a discussion see Laird and Yeats (1987).

NAFTA will provide Mexico and Canada with preferential tariffs of 15 percent or more for approximately one-quarter of the exports of Hong Kong and the Philippine, yet no (or little) trade displacement will occur unless the NAFTA members are able to capitalize on these tariff differentials. In several sectors, particularly chemicals and clothing, this competition appears doubtful since supply constraints seemingly are operating, or Mexico and Canada have not established an export base that would allow them to compete with the East Asian producers.[18]

B. The Potential for NTBs to Divert Trade

In identifying sectors where NAFTA may displace East Asian exporters, consideration should also be given to the effects of nontariff barriers as well as tariffs. Since many US NTBs have estimated nominal equivalents in the range of 25 to 75 percent (see Laird and Yeats, 1990) the removal of these restrictions on NAFTA intra-trade, and their continued imposition on imports from East Asia, could have major trade diverting effects. Thus, a key question is which East Asian products are primarily affected by US nontariff barriers?

Table 4 lists the shares of US imports from individual East Asian economies that are subject to one or more forms of "hardcore" nontariff barriers.[19] In addition to totals for

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[18] For example, of the 446 tariff line level products that China exports under tariffs of 15 percent or more (see Table 3) Canada and Mexico have been able to establish a minimal export base (defined as at least $100 thousand in exports to the United States) for about one-half of these items. Safadi and Yeats (1992) also show that in clothing Canada is not a factor and Mexico operates under important supply constraints-- this is a sector that is of major importance to several East Asian countries. During the last half of the 1980s, Mexico left approximately one-quarter of its US MFA quotas unfilled and thus would appear not to be in a position to fully capitalize on NAFTA preferences.

[19] The measures included in computing these trade coverage ratios are: tariff quotas, anti-dumping and countervailing duties, flexible import fees like variable levies, all quotas and prohibitions, "voluntary" export restraints, MFA quotas and consultations, and textile quotas and consultations. The measures are often referred to as "hard core" NTBs because their intent is to restrict imports. The tabulations in Table 4 do not include other

categories of all goods and all manufactures, the NTB coverage ratios have been computed at lower levels of aggregations in order to identify specific product sectors that are vulnerable to (nontariff barrier-induced) trade diversion.

As indicated in Table 4, there is considerable variation in NTB coverage indices for individual East Asian economies. For example, 61 percent of Macau's exports are subject to these measures, while none of French Polynesia's exports faces nontariff barriers. A key underlying factor accounting for these variations is the degree to which exports are concentrated in textiles (SITC 65) and clothing (SITC 84)--the higher the concentration the greater the overall NTB coverage ratio.[20] The implications of Table 4 are, however, that East Asian exporters need to be concerned with an NTB-induced trade diversion under NAFTA in a relatively few sectors like textiles, clothing, travel goods, ferrous metals, and some specific food products.[21]

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measures like health and sanitary restrictions since these may be primarily directed at some "non-trade policy" objective.

[20] US steel imports are subject to VRAs that have been negotiated on a bilateral basis. These products are often subject to antidumping duties. Such restrictions account for the relatively high NTB coverage ratios of several East Asian countries and in particular of the Republic of Korea (94 percent) in SITC 67. Several estimates (see Laird and Yeats, 1990, p. 208) indicate that these measures have NTB *ad valorem* equivalents in the range of 25 to 50 percent.

[21] For example, the 20 percent coverage ratio on the Philippines' food exports (SITC 0) is due to US flexible import fees on sugar. These measures, which operate in the same manner as EC variable import levies, have nominal equivalents that often exceed 100 percent. The relatively high NTB coverage ratios for travel goods (SITC 83) are due to various forms of restrictions with MFA quotas being among the most prevalent (special textile quotas outside the MFA are also fairly widely applied). Antidumping and countervailing duties are also imposed frequently in SITC 83 and 89 and there are some VARs--a few of which are directed specifically against the Republic of Korea.

Table 4: US Hard Core NTB Coverage Ratios for Imports from East Asian Economies

Product (SITC)	China	Fiji	French Polynesia	Hong Kong	Indonesia	Rep. of Korea	Macau	Malaysia	Philippines	Singapore	Taiwan, China	Thailand
All Goods (0 to 9)	29.6	48.0	0.0	41.6	18.3	26.5	61.0	10.1	29.5	9.8	16.8	19.3
Food & Live Animals (0)	0.5	51.3	0.0	10.8	6.4	3.8	0.0	4.8	28.8	3.4	15.4	37.7
Beverages & Tobacco (1)	0.0	--	--	0.0	0.0	0.0	--	0.0	0.0	0.0	0.0	0.0
Crude Materials (2)	15.5	0.0	0.0	5.4	0.0	0.3	30.8	0.1	0.0	1.5	6.4	0.1
Energy Products (3)	0.0	--	--	0.0	0.0	0.0	--	0.0	0.0	0.0	0.0	0.0
Animal & Vegetable Oils (4)	0.0	--	--	0.0	0.0	0.0	--	0.0	0.0	0.0	0.0	0.0
All Manufactured Goods (5 to 8)	32.9	46.9	0.0	42.1	48.3	26.8	61.5	11.8	32.1	10.1	16.8	16.1
Chemicals (5)	0.8	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.0
Leather goods (61)	0.3	--	--	1.4	0.0	3.0	0.0	0.0	0.0	0.0	4.9	0.1
Rubber Manufactures (62)	0.0	--	--	0.2	0.0	0.0	0.0	0.0	0.0	62.2	0.1	0.8
Wood Manufactures (63)	0.0	0.0	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yarn & Fabrics (65)	90.9	0.0	--	92.6	97.0	63.1	92.2	98.9	72.6	91.5	92.5	43.2
Iron & Steel (67)	20.2	--	--	1.2	5.2	93.8	--	27.2	0.1	28.5	39.6	82.6
Nonferrous Metals (68)	0.0	--	--	0.0	0.0	0.2	--	0.0	0.0	0.0	0.0	0.0
Transport & Machinery (7)	0.8	0.0	0.0	0.0	0.0	11.6	0.0	0.0	0.0	3.0	6.5	0.5
Nonelectric Machinery (71)	6.3	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.9	1.0
Electric Machinery (72)	0.0	--	0.0	0.0	0.0	20.9	0.0	0.0	0.0	5.4	11.6	0.0
Transport Equipment (73)	0.2	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	7.2	0.0	3.5
Travel Goods (83)	32.0	--	--	23.7	40.6	31.4	6.9	34.0	72.6	17.9	64.9	74.7
Clothing (84)	93.2	68.7	0.0	94.9	98.3	70.9	99.6	77.2	80.6	58.9	92.0	88.4
Footwear (85)	0.0	--	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Misc. Manufactures (89)	0.3	0.0	0.0	0.9	0.0	23.1	0.0	0.0	0.0	0.0	0.0	0.0

1/ Hard Core NTBs include: tariff quotas; anti-dumping and countervailing duties; flexible import fees (variable levies); all quotas and prohibitions; voluntary export restraint; MFA quotas and consultations; and textile quotas and consultations.

Source: Computed using the World Bank - UNCTAD SMART data base.

IV. Simulations of NAFTA's Effects on East Asia

Analysis in the previous section focused on the identification of specific sectors where East Asian exports were especially "at risk" to a NAFTA-induced trade diversion, but did not provide any indication as to the magnitude of the displacement that might occur. In this section we attempt to provide such information through the use of alternative trade simulation models; the first is based on a partial equilibrium approach, while the second utilizes a gravity flow model that, along with other features, incorporates the experience of countries like the EC or EFTA that previously had formed preferential trading arrangements. This latter (gravity flow) approach is particularly useful for assessing the longer-term implications of NAFTA when such important variables as investment flows, exchange rates, or the terms of trade have fully adjusted to the agreement. In contrast, the partial equilibrium model is better able to capture the short to medium term effects (say three to five years) and has the advantage of providing estimates at very low levels of product detail. See Appendix II for a description of both trade projection models.

A. Partial Equilibrium Estimates of NAFTA's Effects

Table 5 summarizes the "NAFTA effect" simulations for East Asia as a group and also presents individual country results. The table shows the 1990 value of US imports from each East Asian economy and then indicates the value of trade that could be displaced by NAFTA. Although the underlying trade diversion projections are made at the tariff line level, they have been aggregated in Table 5 to six broad product categories like foods and feeds, total manufactures, and clothing.

Table 5: Simulation Results of the Impact of NAFTA on East Asian Exports to the United States

Exporter	1990 Value of US Imports (US$ million)						NAFTA-Induced Trade Losses (US$ million)					
				of which						of which		
	All Items	Foods and Feeds	All Manufactures	Transport and machinery	Clothing	Misc. Manufactures	All Items	Foods and Feeds	All Manufactures	Transport and Machinery	Clothing	Misc. Manufactures
China, People's Republic of	16,260	591	14,475	2,353	3,724	3,696	71.5	0.2	67.3	8.2	16.6	2.7
Fiji	38	21	16	--	14	--	0.2	--	0.2	--	0.2	--
French Polynesia	11	1	9	--	--	7	--	--	--	--	--	--
Hong Kong	9,934	128	9,463	2,197	4,224	1,449	80.7	0.7	77.0	9.2	52.6	2.0
Indonesia	3,681	388	1,731	51	704	48	16.8	--	16.6	0.1	16.3	--
Korea, Republic of	19,287	194	18,872	7,281	3,500	2,028	59.6	--	58.5	24.3	11.9	2.7
Macau	777	6	768	4	443	283	5.7	--	5.7	--	5.4	--
Malaysia	5,495	251	4,603	3,133	640	453	10.2	--	9.2	5.8	0.6	1.6
Philippines	3,622	564	2,973	1,061	1,175	256	2.9	0.1	2.7	--	1.9	--
Singapore	10,094	136	9,305	7,691	656	284	28.8	--	26.8	16.5	1.5	--
Taiwan, China	23,829	339	23,110	9,269	2,599	3,405	105.3	0.1	102.4	40.3	42.8	15.3
Thailand	5,589	1,045	4,209	1,521	518	987	2.6	0.1	2.4	1.1	1.2	--
All Above Economies	98,617	3,664	89,534	34,561	18,197	12,896	384.3	1.2	368.8	105.5	151.0	24.3

Source: The 1990 trade data were obtained from the United Nations COMTRADE data base. The extent of trade diversion was calculated using the World Bank-UNCTAD SMART data base.

In aggregate, Table 5 suggests that NAFTA should have only a relatively minor influence on East Asian exporters--a finding that closely conforms to other investigations which focussed on different regions (see Section II). For the East Asia region as a whole, trade losses of about $384 million are projected with China, Hong Kong, and Taiwan (China) accounting for almost 70 percent of the total.[22] The projected losses represent less than one-half of one percent of total 1990 East Asian exports to the United States although this ratio rises to about three-quarters of one percent in the case of some individual economies like Macau and Hong Kong.[23]

Sectoral analysis of the projected losses indicates that approximately one half of the East Asian trade diversion occurs in the textiles and clothing sector (SITC 65 and 84), with clothing alone accounting for roughly 40 percent ($151 million) of the total. Aside from the manufacturing sector, only about $6 million in East Asian trade losses are projected with about half this total occurring in the crude materials (SITC 2) sector –particularly in component products like vegetable fibers, and synthetic and regenerated fibers.

Although the East Asian trade losses look modest, there are several reasons to

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[22] There are two main reasons why the projected trade losses are relatively small. First, Canada is simply not a viable competitor for many of the labor intensive manufactures that East Asian countries specialize in with the result that Canada's capacity for trade diversion is limited. As an example, in 1991 US imports of clothing and footwear from Canada were only $306 million and $31 million, respectively, while those from East Asia were $18.4 and $6.7 billion. Second, Mexico still plays a relatively small role in US trade--in 1991 only about 6 percent of all US imports came from Mexico--and does not have either the size or the capacity to divert a large share of non-NAFTA countries' trade in the short-run.

[23] The relatively high losses for Macau and Hong Kong are, as previously noted, expected due to concentration by exporters in textiles and clothing (see Appendix I, Table A2). The results for Taiwan (China) are somewhat different in that trade losses of about $15 million are projected for miscellaneous manufactures (SITC 89), a total for this group that is more than five times higher than that for any other East Asian exporter. The underlying tariff line level data shows that Taiwan's losses are concentrated in about four product lines like stuffed toys and dolls, Christmas decorations, and children's toys where it has a relatively high market share and US tariffs average over 10 percent.

believe that they might be overstated. First, the estimates are based on the assumption of infinitely elastic supply conditions in Mexico and Canada, *i.e.*, these countries are assumed to be able to increase exports with no corresponding rise in unit costs. If these costs do in fact rise, then the value of East Asian trade that would be diverted could become lower.[24] Some evidence suggests that supply constraints may be of particular importance in the clothing sector. During the most part of the 1980s. Mexico has systematically left unfilled approximately one-quarter of its US MFA quotas (see Safadi and Yeats, 1992). Second, certain provisions in NAFTA's "rules of origin" may prevent North American exporters from using low cost non-NAFTA raw material sources with the result that intra-North American trade may not be able to fully capitalize on some preferences. Third, the projections assume that all NTBs (and tariffs) on North American trade are removed, yet experience with the Canada-United States FTA shows that barriers are likely be retained in some "sensitive" sectors (like restrictions on wood shingle imports by the United States). Finally, the simulation results reported in Table 5 are based on the margins of preference that existing tariffs and NTBs could provide NAFTA members. A successful completion of the Uruguay Round would lower these trade barriers (and the preference margins that could be granted to NAFTA members) which would also lower the total value of East Asia's exports that would be diverted.[25]

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[24] In order to test the sensitivity of our projections to assumptions concerning supply condition in Mexico and Canada's we substituted several different supply elasticities in our simulation model. When a supply elasticity of unity was assumed for all products (a situation in which unit production costs increase by the same proportion that exports expand) the East Asian trade losses total about $280 million as opposed to $375 million under infinitely elastic supply assumptions. If an intermediate elasticity is assumed (one having a value of three) the East Asian losses are approximately $335 million.

[25] Our projections, as well as the summary statistics on trade barriers reported in Tables 2 and 4 indicate that a global liberalization of textile and clothing trade would greatly reduce the potential for East Asian trade diversion due to NAFTA, so related developments in the Uruguay Round are of particular importance. The Uruguay Round agreement, for example, establishes a four-stage phase-out of the quotas that exist under the Multifiber Arrangement

B. Gravity Flow Analysis of NAFTA's Effects

The possibility exists that the (partial equilibrium) trade simulations analyzed in the previous section may not adequately incorporate the longer term trade changes that may result from NAFTA. This would be true if NAFTA were to induce important changes in international or domestic investment patterns, if it were to create new opportunities for some industries to achieve substantial economies of scale, or if the arrangement were to change other key variables like exchange rates or the terms of trade -- all of which are factors that cannot be incorporated in a partial equilibrium analysis. To assess the potential importance of these effects, we employ a modified version of a gravity flow model.[26] The model, which was developed using data drawn from 95 industrial and developing countries, incorporates the experience of other nations when customs unions or free trade arrangements like the EC or EFTA were formed. In addition, it also allows one to incorporate the influence of factors like distance, level of economic development, height of trade barriers when each arrangement was formed, or the sharing of a common language or border. Appendix II provides a full technical description of the model and its specification along with the empirical estimates. Table 6 summarizes the model's projections for the NAFTA-induced increase in non-oil exports from Canada and Mexico to the United States as well as the value of trade of East Asia and other country groups that could be displaced.

(MFA) over a 10 years period.

[26] For a technical discussion of gravity-type models and their use in trade simulation exercises, see Anderson (1979).

Table 6: A Gravity Flow Model Projections of the Influence of NAFTA on US Non-Oil Imports

Exporter	1989 Actual U.S. Imports ($ Mill.)	Predicted Imports Under NAFTA Value ($ Mill.)	Percentage Change (%)
NAFTA Members	103,623	113,696	9.7
Canada	80,632	88,130	9.3
Mexico	22,991	25,566	11.2
East Asia and Pacific 1/	80,400	79,722	-0.8
Hong Kong	10,237	10,062	-1.7
Indonesia	2,431	2,414	-0.7
Rep. of Korea	20,557	20,416	-0.7
Malaysia	4,688	4,649	-0.8
Taiwan, China	25,626	25,433	-0.8
Philippines	3,307	3,288	-0.6
Papua New Guinea	32	32	-0.3
Singapore	8,987	8,927	-0.7
Thailand	4,536	4,500	-0.8
South Asia	4,735	4,611	-2.6
Bangladesh	475	471	-0.7
Myanmar	18	18	-3.1
India	3,186	3,074	-3.5
Sri Lanka	491	487	-0.8
Pakistan	565	561	-0.6
Others			
EFTA	13,360	13,146	-1.6
European Community	84,762	83,562	-1.4
Japan	96,949	96,377	-0.6
Other Industrial 2/	9,623	9,527	-1.0
North Africa & Middle East	711	695	-2.3
South & Central America 3/	21,027	20,821	-1.0

1/ China was excluded from the East Asian totals due to the centrally planned nature of this country's trade regime.
2/ Australia, New Zealand, Israel and Turkey.
3/ Excludes Mexico.
Note: The 1989 US imports were obtained from the UN COMTRADE data base.

The gravity flow model suggests that East Asia's aggregate trade diversion losses will be in the order of $680 million annually --close to the partial equilibrium model's projection of $384 million.[27] For East Asia as a whole, this translates into a loss of about four-fifths of

[27] There is one important difference between the two models. China was excluded from the gravity flow projections. Due to the centrally planned nature of their trade regimes, data for all the (present and former) socialist countries were excluded from the gravity model estimation as the incorporation of these countries in the analysis would have severely biased our results (see Appendix II).

one percentage point of its exports to the United States. These losses are at the lower end of the range for all countries (*i.e*, East Asia plus others) reflected in Table 6 and are roughly one-third those projected for South Asia.[28]

Thus, the main message that emerges from the results from the gravity flow and partial equilibrium trade models is that the aggregate impact of NAFTA on East Asia's trade is likely to be small with less than one percent of total exports to the United States diverted.[29]

V. Summary and Conclusions

While there has been considerable apprehension among many non-member countries about NAFTA's trade diverting effects, the evidence reported in this study suggests that the impact on East Asian exporters might be small. Under current (pre-Uruguay Round) trade restrictions, East Asia's trade diversion is projected to be between $384 and $680 million annually with the latter figure representing approximately four-fifths of one percent of the region's total exports to the United States. These loss projections are probably upwardly biased since they do not incorporate any supply constraints on the capacity of Mexico or Canada to expand exports, nor do they reflect the influence of NAFTA's rules of origin that could limit

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[28] Several of the projections reported in Table 6 are in close agreement with results from other studies. Using a partial equilibrium model Erzan and Yeats (1992, Table 11) forecast an increase of 9.6 percent in Mexico's exports to the United States following a NAFTA agreement while Table 6 shows an increase of less than 2 percentage points higher. Safadi and Yeats (1992) focus on the implications of NAFTA for South Asian countries and conclude that their potential losses might approach one to one and a half percent of total annual exports to the United States.

[29] The trade barrier parameters of the gravity model can be scaled to indicate the influence of changes in North America's tariffs and NTBs on trade of NAFTA members and other countries. This exercise allows one to analyze the impact of a successful completion of the Uruguay Round on trade patterns. For example, if the implementation of the Uruguay Round results reduce US trade barriers by about 40 percent on average, East Asia's trade losses would be about $410 million as opposed to $680 billion under the existing pre-Uruguay Round barriers.

members' ability to fully capitalize on the agreement's trade preferences.

One way of placing the importance of NAFTA in perspective is to compare the projected East Asian NAFTA-induced losses with estimates of the export gains this region should achieve as a result of a successful completion of the Uruguay Round. The World Bank (1992, p. 52) estimates that exports from East Asian low- and middle-income economies (i.e., all East Asia less Hong Kong, Singapore, Taiwan (China) and OECD Asia) would increase by $16.3 billion annually under a 30 percent Uruguay Round reduction in trade barriers; an increase of $27.1 billion is forecast for a 50 percent liberalization. For these East Asian economies, the gains from the Uruguay Round results (which are estimated to fall in the above mentioned range) are 60 to more than 100 times the NAFTA-induced losses estimated in this study.[30]

Finally, two qualifications should be noted concerning the results that are reported in this study. We have assumed that NAFTA does not raise trade barriers against third countries. In other words, we assumed that the member countries comply with GATT Article XXIV that requires "the general incidence of duties and regulations affecting third parties is no higher after than it was before the establishment of the agreement."[31] If this is not the case (as the adoption of more restrictive rules of origin suggests), then the third country impact could be more important than indicated by our findings. Second, it should be noted that we have analyzed the influence of NAFTA in isolation of potentially related developments, and in

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[30] Actually, these comparisons overstate the relative importance of NAFTA since the implementation of the Uruguay Round results will lower North American trade barriers and the preferences that can be extended to NAFTA members. This will, in turn, reduce the value of third countries' exports that might be diverted.

[31] Article XXIV contains two other important provisions relating to the formation of FTAs: "... duties and other restrictive regulations are eliminated on substantially all trade between partner countries; and the agreement contains a plan and schedule for its complete formation within a reasonable length of time."

particular have not attempted to speculate about how it may influence initiatives for regionalism elsewhere. If NAFTA does accelerate such new initiatives, its overall trade impact could be more important than suggested by our analysis.

REFERENCES

Anderson, James E. (1979), "A Theoretical Foundation for the Gravity Equation," American Economic Review, Vol. 69, pp. 106-116.

Aitken, Norman D. (1973), "The Effects of the EEC and EFTA on European Trade: A Temporal Cross-Section Analysis," American Economic Review, Vol. 63, pp. 881-892.

Bachrach, Carlos and Lorris Mizrahi (1992), The Economic Impact of a Free Trade Agreement Between the United States and Mexico: A CGE Analysis, (Washington: KPMG Peat Marwick, February).

Bannister, G. and Patrick Low (1992), "Textiles and Apparel in NAFTA," PRE Working Papers Series, No. 994, The World Bank, Washington, D.C.

Bergstrand, Jeffrey H. (1985), "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence," Review of Economics and Statistics, Vol. 67, pp. 474-481.

Bergstrand, Jeffrey H. (1989), "The Generalized Gravity Equation, Monopolistic Competition, and the Factor Proportions Theory in International Trade," Review of Economic and Statistics, Vol. 56, pp. 143-153.

Borrell, Brent and Jonathan R. Coleman (1991), "Gains from Trade in Sugar and the US-Mexico Free Trade Agreement," Working Paper of the Center for International Economics, Canberra.

Brada, Josef and Jose Mendez (1983), "Regional Economic Integration and the Volume of Intra Regional Trade: A Comparison of Developed and Developing Country Experience," Kyklos, Vol. 36, pp. 589-603.

Brada, Josef and Jose Mendez (1985), "Economic Integration Among Developed, Developing and Centrally Planned Economies: A Comparative Analysis," Review of Economic and Statistics, Vol. 67, pp. 549-556.

Brown, Drusilla, Alan Deardorf and Robert Stern (1992), "A North American Free Trade Agreement: Analytical Issues and a Computational Assessment," The World Economy, 15, January.

Brown, Drusilla and Robert Stern (1991), "Some Conceptual Issues in the Modelling and Computational Analysis of the Canada-United States Free Trade Agreement," paper presented at the 1991 Annual Meeting of the International Agricultural Trade Research Consortium (New Orleans: December).

Cline, William *et. al.* (1978), Trade Negotiations in the Tokyo Round: A Quantitative Assessment, The Brookings Institute, Washington, D.C.

Cox, David and Richard Harris (1992), "North American Free Trade and its Implications for Canada: Results from a CGE Model of North American Trade," The World Economy, 15, January.

Deardoff, Alan (1984), "Testing Trade Theories and Predicting Trade Flows," in R. W. Jones and P. R. Kenen (eds.), Handbook of International Economics, Vol. 1, (Amsterdam, North-Holland).

Erzan, Refik and Raed Safadi (1992), "How Changes in the Former CMEA Area May Affect International Trade in Manufactures," PRE Working Papers Series, No. 973, The World Bank, Washington, D.C.

Erzan, Refik and Alexander Yeats (1992), "Free Trade Agreements with the United States: What's in it for Latin America?", PRE Working Papers Series, No. 827, The World Bank, Washington, D.C.

Havrylyshyn, Oleh and Lant Pritchett (1991), "European Trade Patterns After the Transition," PRE Working Papers Series, No. 748, The World Bank, Washington, D.C.

Heckman, J. (1976), "The Common Structure of Statistical Models of Truncation, Sample Selection and Limited Dependent Variables and a Simple Estimator of Such Models," Annals of Economic and Social Measurement, Vol. 5, pp. 475-492.

Heckman, J. (1979), "Sample Bias as Specification Error," Econometrica, Vol. 47, pp.153-162.

Hewett, Edward A. (1976), "A Gravity Model of CMEA Trade," in Brada, J.C. (ed.), Quantitative and Analytical Studies in East-West Economic Relations, (Bloomington, International Development Research Center).

Hinojosa-Ojeda, Raul and Sherman Robinson (1991), "Alternative Scenarios of US-Mexico Integration: A Computable General Equilibrium Approach," (Berkeley: University of California Department of Agricultural and Resource Economics, April).

Hufbauer, Gary and Jeffrey Schott (1992), *North American Free Trade*, Institute for International Economics, Washington, D.C.

Hufbauer, Gary and Jeffrey Schott (1993), *NAFTA: An Assessment*, Institute for International Economics, Washington, D.C.

Hunter, Linda et. al (1992), "US-Mexico Free Trade and the North American Auto Industry: Effects on the Spatial Organization of Finished Autos," The World Economy, 15, January.

International Monetary Fund (1984), "Effects of Increased Market Access on Selected Developing Countries' Export Earnings: An Illustrative Exercise," (Washington: IMF).

Grennes, Thomas *et.al.* (1991), "An Analysis of a United States-Canada-Mexico Free Trade Agreement," Working paper of the International Agricultural Trade Research Consortium, November.

Kehoe, Timothy J. (1992), "Modelling the Dynamic Impact of North American Free Trade," (Minneapolis: Federal Reserve Bank of Minneapolis).

Krueger, A. O. (1993), "Free Trade Agreements as Protectionist Devices: Rules of Origin," NBER Working Paper No. 4352. Cambridege, NBER.

Laird, Sam (1990), "US Trade Policy and Mexico: Simulations of Possible Trade Regime Changes," Background paper of the International Trade Division, The World Bank, Washington, D.C.

Laird, Sam and Alexander Yeats (1990), Quantitative Method for Trade Barrier Analysis, (London: Macmillan Press).

Laird, Sam and Alexander Yeats (1987), "Tariff-Cutting Formulas and Implications," in J. Michael Finger and Andrzej Olechowski (eds.), The Uruguay Round: A Handbook for the Multilateral Trade Negotiations, (Washington, The World Bank).

Laird, Sam and Alexander Yeats (1986), "The UNCTAD Trade Policy Simulation Model: A Note on the Methodology, Data and Uses," UNCTAD Discussion Paper, No. 19, UNCTAD, Geneva.

Leamer, Edward and Robert Stern (1970), Quantitative International Economics (Chicago: Aldine Publishing Company).

Linder, Stefan B. (1961), An Essay on Trade and Transformation, (New-York: John Wiley and Sons).

Linnemann, Hans (1966), An Econometric Study of International Trade Flow, (Amsterdam, North-Holland).

Maddala, G. S. (1983), Limited-Dependent and Qualitative Variables in Econometrics, (Econometric Society Monographs No. 3, Cambridge University Press).

McDonald, John and Robert A. Moffit (1980), "The Uses of Tobit Analysis,"Review of Economics and Statistics, Vol. 62, pp. 318-321.

Nogues, Julio and Rosalinda Quintanilla (1992), "Latin America's Integration and the Multilateral Trading System," paper presented at The World Bank/Center for Policy Research Conference, The World Bank, Washington, D.C.

Papageorgio, Demetris, Michael Michaely and Armeane Choksi (1991), Liberalizing Foreign Trade, (Cambridge, Mass.: Basil Blackwell).

Pelzman, Joseph (1977), "Trade Creation and Trade Diversion in the CMEA, 1954-70," American Economic Review, Vol. 67, pp. 713-722.

Pöyhönen, Pentti (1963a), "A Tentative Model for the Volume of Trade Between Countries," Welwirtschaftliches Archiv, Band 90, Heft 1, pp. 93-100.

Pöyhönen, Pentti (1963b), "Toward a General Theory of International trade," Economiska Samfundets Tidskrift, Vol. 16, pp. 69-77.

Primo Braga, C.A. and Alexander Yeats (1992), "How Minilateral Trading Arrangements May Affect a Post-Uruguay Round World," PRE Working Paper Series, No.974, The World Bank, Washington, D.C.

Primo Braga, C.A. (1992), "NAFTA and the Rest of the World," in Nora Lustig, Barry P. Bosworthy, and Robert L. Lawrence, eds., North American Free Trade: Assessing the Impact, The Brookings Institution, Washington, D.C.

Robinson, Sherman *et. al.* (1991), "Agricultural Policies and Migration in a US-Mexico Free Trade Area: A Computable General Equilibrium Analysis," Working Paper No. 617, (Berkeley: Dept. of Agricultural and Resource Economics).

Safadi, Raed and Alexander Yeats (1992), "Assessing the Global Implications of NAFTA: Empirical Evidence Concerning the Impact on South Asian Countries," PRE Working Paper Series, The World Bank, Washington, D.C. (in preparation).

Sapir, Andre and Robert Baldwin (1983), "India and the Tokyo Round," World Development, Vol. 2, No. 2, pp. 30-46.

Sapir, Andre (1981), "Trade Benefits Under the EEC Generalized System of Preferences," European Economic Review, Vol. 15, pp. 339-355.

Sobarzo, Horacio (1992), "A General Equilibrium Analysis of the Gains from Trade for the Mexican Economy of a North American Free Trade Agreement," The World Economy, 15, January.

Spreen, Thomas *et. al.* (1992), NAFTA Effects on Agriculture, (Park Ridge: Illinois, American Farm Bureau Federation).

Srivastava, Rajendra and Robert T. Green (1986), "Determinants of Bilateral Trade Flows," Journal of Business, Vol 59, pp. 623-640.

Stern, Robert *et. al.* (1976), Price Elasticities in International Trade, (London: Macmillan Press).

Tinbergen, Jan (1962), Shaping the World Economy: Suggestions for an International Economic Policy, (New-York: 20th Century Fund).

Tobin, James (1958), "Estimation of Relationships for Limited Dependent Variables," Econometrica, Vol. 26, pp. 24-36.

Trela, Irma and John Whalley (1992), "Trade Liberalization in Quota Restricted Items: US and Mexico in Textiles and Steel," The World Economy, 15, January.

UNCTAD (1990), Handbook of International Trade and Development Statistics, (New York: United Nations).

UNCTC (1991), World Investment Report 1991, The Triad in Foreign Direct Investment, (New York: United Nations).

UNCTC (1992), FDI and Industrial Restructuring in Mexico, (New York: United Nations).

Young, Leslie and Jose Romero (1991), "A Dynamic Dual Model of the Free Trade Agreement," paper presented at the conference "North American Free Trade, (Dallas: Federal Reserve Bank of Dallas, June).

The World Bank and UNCTAD ((1989), "SMART: A User's Manual," The World Bank, Washington, D.C.

The World Bank (1992), Global Economic Prospects, 1992, The World Bank, Washington, D.C.

Yeats, Alexander (1989), "Shifting Patterns of Comparative Advantage: Manufactured Exports of Developing Countries," PRE Working Paper Series, No. 165, The World Bank, Washington, D.C.

Appendix I

Statistical Tables on East Asian Trade with NAFTA Members

Table A1: Destination of East Asian Exports, 1990.

Destination of Exports	China	Fiji	French Polynesia	Hong Kong	Indonesia	Rep. of Korea	Macau	Malaysia	Philippines	Singapore	Taiwan, China	Thailand	All East Asia
(Value of 1990 reported total exports in terms of US$ million)													
World	62,091	342	75	29,002	25,675	65,015	1,694	29,455	7,747	52,730	67,041	23,004	363,871
(Destination's share in total exports - %)													
World	100	100	100	100	100	100	100	100	100	100	100	100	100
North America	9	9	23	32	14	33	38	18	42	22	34	24	25
EEC (12)	9	40	40	20	12	14	34	15	19	14	16	22	14
EFTA countries	1	--	3	4	--	3	4	1	1	1	2	2	2
OECD Asia	15	37	23	7	45	21	5	18	21	12	15	19	18
East Asia	52	14	1	32	24	16	18	41	16	37	25	21	30
Latin America & Caribbean	1	--	--	2	--	3	--	1	--	1	2	1	2
South Asia	2	--	--	1	1	2	--	3	--	5	1	1	2
Middle East	2	--	--	1	3	3	--	2	1	2	2	5	2
Sub-Saharan Africa	1	--	--	--	--	1	--	--	--	1	1	2	1
Other countries	8	--	10	1	1	4	1	1	--	5	2	3	4

Note: Statistics for Fiji and French Polynesia are for 1988 while those for the Philippines are for 1989.
Two dashes (--) indicate zero or negligible.

Table A2: The 1990 Structure of East Asian Exports to the United States

Product (SITC)	China	Fiji	French Polynesia	Hong Kong	Indonesia	Rep. of Korea	Macau	Malaysia	Philippines	Singapore	Taiwan, China	Thailand	All East Asia
						(Value of 1990 US imports in terms of US$ million)							
All goods (0 to 9)	16,260	38	11	9,934	3,681	19,287	777	5,495	3,622	10,094	23,829	5,589	98,616
						(Product share in the total - %)							
All goods (0 to 9)	100	100	100	100	100	100	100	100	100	100	100	100	100
Food & Live Animals (0)	4	56	11	1	9	1	1	2	11	1	1	18	3
Beverages & Tobacco (1)	--	--	--	--	--	--	--	--	--	--	--	--	--
Crude Materials (2)	2	1	--	--	14	--	--	4	1	--	--	2	1
Energy products (3)	4	--	--	--	27	--	--	6	--	2	--	2	2
Animal & Vegetable Oils (4)	--	--	--	--	1	--	--	2	4	--	--	--	--
All Manufactured Goods (5 to 8)	90	42	83	95	48	98	99	84	82	92	97	75	91
Chemicals (5)	2	--	1	1	1	1	--	1	1	4	1	--	2
Leather Goods (61)	--	--	--	--	--	--	--	--	--	--	--	1	--
Rubber Manufactures (62)	-	--	--	--	--	1	--	--	--	--	1	1	1
Wood Manufactures (63)	--	4	--	--	11	--	--	1	1	--	1	1	1
Yarns & Fabrics (65)	4	--	--	2	2	3	--	1	2	--	2	2	2
Iron & Steel (67)	1	--	--	--	--	3	--	--	--	--	1	1	1
Nonferrous Metals (68)	1	--	--	--	1	--	--	1	--	-	--	--	--
Transport & Machinery (7)	14	--	1	22	1	38	1	57	29	76	39	27	35
Nonelectric Machinery (71)	2	--	--	8	--	10	--	6	3	47	18	10	13
Electrical Machinery (72)	12	--	--	13	1	20	--	51	26	28	17	17	19
Transport Equipment (73)	1	--	1	--	--	7	--	--	1	1	4	--	3
Travel Goods (83)	5	--	--	1	--	2	1	--	1	--	2	1	2
Clothing (84)	23	37	--	43	19	18	57	12	32	7	11	9	18
Footwear (85)	9	--	--	1	7	14	1	--	1	--	6	5	7
Misc. Manufactures (89)	23	--	65	15	1	11	36	8	7	3	14	18	13

Table A3: The Thirty Largest Three-Digit SITC Products Exported by East Asia to NAFTA

	Share of NAFTA's Imports from East Asia (%)			Value of NAFTA Reported Imports ($million)		
Product (SITC)	1970	1980	1990	1970	1980	1990
Clothing not of fur (841)	20	17	18	648	5,608	19,667
Office Machinery (714)	1	1	12	25	448	11,268
Electrical Machinery (729)	4	8	8	143	2,773	8,348
Telecommunications Equipment (724)	5	7	7	174	2,233	7,316
Footwear (851)	2	5	6	72	1,625	6,783
Toys and Sporting Goods (894)	3	4	6	111	1,337	6,065
Sound Recorders (891)	2	1	2	8	274	2,449
Nonelectrical Machinery N.E.S. (719)	--	1	2	2	353	2,090
Road Motor Vehicles (732)	--	--	2	5	35	2,011
Travel Goods (831)	1	2	2	39	564	2,005
Articles of Plastic (893)	3	1	2	101	357	1,991
Domestic Electrical Equipment (725)	--	1	2	2	300	1,989
Furniture (821)	1	1	2	18	382	1,904
Electric Power Machinery (722)	--	1	2	10	283	1,722
Crude Petroleum (331)	2	14	2	53	4,720	1,685
Other Manufactures, N.E.S. (899)	7	2	1	227	497	1,515
Scientific Instruments (861)	--	1	1	8	246	1,401
Jewellery & Silverware (897)	1	1	1	20	211	1,150
Metal Manufactures, N.E.S. (698)	--	1	1	8	210	942
Plumbing & Heating Fixtures (812)	--	--	1	8	86	880
Woven Textile Fabrics (653)	--	--	1	12	133	836
Nonmotor Road Vehicles (733)	--	--	1	1	113	830
Watches & Clocks (864)	--	2	1	7	545	821
Base metal Household Appliances (697)	--	1	1	15	241	697
Steel & Copper Nails, Bolts, etc. (694)	--	--	1	2	130	696
Made-up Textile Articles (656)	1	--	1	22	137	676
Cotton Fabrics (652)	1	1	1	48	247	641
Pottery (666)	--	1	1	3	169	636
Rubber Articles (629)	--	1	1	2	222	614
Electrical Distribution Equipment (723)	-	--	1	14	95	613
All Above Products	56	74	84	1,808	24,574	90,241
Remaining Products	44	26	16	1,417	8,486	16,769
Total Trade	100	100	100	3,225	33,060	107,010

Appendix II

Description of the Partial Equilibrium Trade and Gravity Flow Models Used to Simulate the Impact of NAFTA on East Asian Exporters

I The Partial Equilibrium Trade Model

The model, which is described in Laird and Yeats (1986), is a partial equilibrium model similar to that used by Cline (1978) for evaluating the Tokyo Round. Two reduced form equations are estimated to calculate trade diversion separately for each market at the most detailed tariff-line level.[1]

In a most-favored-nation (MFN) based liberalization, exporters which previously enjoyed preferences suffer an erosion in tariff margins, while other exporters enjoy improved market access. Conversely, as in the current exercise, the preferential (FTA) liberalization diverts trade away from those suppliers enjoying only MFN treatment. Furthermore, the preference margins of developing countries other than Mexico, *e.g.*, the Generalized System of Preferences (GSP) and other special schemes, are eroded.

A. Elasticities

The key inputs to the model--besides trade flows, tariffs, and non-tariff barriers (NTBs)--are three sets of elasticities: (i) import (price) demand elasticities, (ii) elasticities of supply, and (iii) the cross (price) elasticities of substitution.

For import demand elasticities, we used what we judged to be the best estimates available.[2] These are not a consistent set in terms of estimation methods, and the markets and specific years they pertain to. Despite these shortcomings, the elasticities broadly reflect the differences across products. Nevertheless, we tested the sensitivity of our results by modifying the vector of elasticities to reflect low and high case assumptions.

In the main (best case) scenario, we used an infinite elasticity of supply across the board. As long as increases in exports are incremental, this may be a reasonable assumption. For large increases, especially in the case of small countries, obviously this is not realistic. In the absence of any reasonable estimate for these cases, our check of this assumption was to do sensitivity analysis with a unitary and a finite elasticity within generally accepted ranges (see tables to this annex).

A critical input is the cross elasticity of substitution, which determines the scope of trade diversion. This elasticity was assumed to be 1.5 for all products. Estimates of this elasticity are extremely sparse, and in any case, as any estimate is specific to the product and the pairs of countries (or groups of countries) in question, there are an immense number of possible combinations. In adopting a value for the main scenario, we based our judgment on our survey of the literature and in particular the work by Cline (1978).[3]

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[1] See also IMF (1984) and Sapir and Baldwin (1983) for similar model applications. In these specification, trade creation is the increase in total trade due to lower prices from reduced protection. Trade diversion is the substitution among suppliers as a result of changes in prices. The summation of trade creation and trade diversion gives the net trade effect for each market.

[2] See Cline (1978), Laird and Yeats (1986), and Stern (1975).

[3] The model estimates trade creation (TC_{ij}) for product i from country j using the following expression,

$$TC_{ij} = M_i \cdot e_d \cdot dt/((1 + t_i)(1 - e_d/e_s))$$

where M_i is the initial level of imports before the tariff cut and t is the initial tariff. In this equation e_d is the import demand elasticity while e_s is the elasticity of export supply. Trade diversion (TD_{ij}) is sometimes estimated using,

$$TD_{ij} = TC_{ij} \cdot (M_{ij}/V_{ij})$$

where the term in parentheses is the share of imports from non-preference receiving countries in domestic consumption of product i. We use a slightly different formulation developed by Cline (1978) which utilizes a constant elasticity of substitution between imported products.

B. The Treatment of NTBs

For the NAFTA preferential liberalization scenarios, we incorporated estimates of the *ad valorem* equivalents of NTBs directly in our data base and removed these restrictions on NAFTA members' exports. The primary source of data on NTB *ad valorem* equivalents was the survey by Laird and Yeats (1990) supplemented by information drawn from several US International Trade Commission studies.

C. Time Horizon

A static model measures the impact of an exogenous change--in this case a preferential liberalization--in terms of short-term adjustments. These adjustments typically exclude instalment of new capacity and efficiency gains in existing production activities as well as the development of new exports. It is customary to assume that the time horizon for these shorter-term adjustments is not much longer than a year.

D. Shortcomings of the Model

It is useful to keep in mind the following shortcomings of the partial equilibrium model used while interpreting the results.

- It is a partial equilibrium model, it omits economy-wide and international interactions through production activities.
- It is a static framework, excluding investment, technological changes, and new product lines. The counter-factual for the model is that the pre-NAFTA trading environment is fundamentally unchanged (the same counter-factual applies to the gravity flow analysis.
- Because of the static nature of the model, it is a relevant only to the short term.
- The crucial elasticities used are rough estimates.
- It essentially deals only with tariff cuts; the impact of changes in NTBs are incorporated only in a rudimentary fashion.

Given these limitations, one might ask what is the usefulness of the exercise? While the computation is basically an accounting--or summing up--exercise, it does provide orders of magnitude of the short-term impact of a FTA. This is of value, given the large number of products involved and the diversity of tariff rates and preference margins.

II The Gravity Flow Trade Model

In order to quantify the effects of NAFTA on the exports of the East Asian economies, we also rely on a gravity-type equation . Gravity models have been applied successfully to different types of flows, such as migration, commuting, recreational traffic, and interregional and international trade. Typically, the log-linear equation specifies that a flow from origin i to destination j can be explained by supply conditions at the origin, by demand conditions at the destination, and by economic forces either assisting or resisting the flow's movement.[4]

In its basic form, the equation is written as:

---

[4] Tinbergen (1962) and Pöyhönen (1963a,1963b) were the first to apply the gravity equation to models of bilateral trade flows (see Deardoff (1984) for a survey). Their model was later extended and applied to different contexts in bilateral trade by Linnemann (1966), Aitken (1973), Hewett (1976), Pelzman (1977), Sapir (1981), and Brada and Mendez (1983,1985). The equation has been justified theoretically by Leamer and Stern (1970), Anderson (1979), and Bergstrand (1985, 1989). In fact, Linnemann (1966) asserts that the gravity equation can be derived from a four-equation partial equilibrium model of export supply and import demand, where prices are excluded since they merely adjust to equate supply and demand. This approach, however, has been criticized by Anderson (1979) and Leamer and Stern (1970).

$$T_{ij} = \beta_0 (Y_i)^{\beta_1} (Y_j)^{\beta_2} (D_{ij})^{\beta_3} (A_{ij})^{\beta_4} \epsilon_{ij} \quad (1)$$

where T_{ij} is the US$ value of the flow from country i to country j, Y_i and Y_j are, respectively, nominal GDP in country i and country j expressed in US$, D_{ij} is the distance from the economic center of i to that of j, A_{ij} is any other factor either assisting or resisting trade between i and j, and ϵ_{ij} is a log-normally distributed error term with $E(\ln \epsilon_{ij}) = 0$.

The most relevant applications of the gravity equation in the present context are those that used it to quantify the trade effects of integration. [5] Our approach is closely related to that of Pelzman (1977), and Brada and Mendez (1985). Pelzman investigated the trade-creation and trade-diversion effects of the creation of the Council for Mutual Economic Assistance (CMEA). He chose a pre-integration period on the basis of which equation (1) was estimated. The estimated parameters were then used to predict intra-CMEA trade during the post-integration period. The excess of actual intra-CMEA trade over the predicted volume of trade is attributed to the effect of integration. Brada and Mendez attempted to measure the effectiveness of existing integration schemes in promoting inter-member trade.

While Pelzman's approach is acceptable when analyzing integration schemes among countries of similar characteristics; it breaks down when one is confronted with a heterogeneous sample of countries. Brada and Mendez reformulated equation (1) by further decomposing the trade effects of an FTA into environmental and policy effects. Environmental effects refer to the physical and economic characteristics of the integrating countries and their relations with the rest of the world, while policy effects refer to the degree of trade liberalization an FTA engenders among its members. In order to capture these effects, Brada and Mendez respecified equation (1) as:

$$\begin{aligned} \log T_{ij} = A &+ \alpha_1 \log Y_i + \alpha_2 \log Y_j + \alpha_3 \log N_i \\ &+ \alpha_4 \log N_j + \alpha_5 \log D_{ij} + \beta \log Q_{ij} \\ &+ \gamma_1 P_{ij} \log(Y_i/N_i)(Y_j/N_j) \\ &+ \gamma_2 P_{ij} \log D_{ij} + \log e_{ij} \end{aligned} \quad (2)$$

where T_{ij} = bilateral trade flows between countries i and j
Y_i, Y_j = income in the exporting and importing countries
N_i, N_j = population in the exporting and importing countries
D_{ij} = distance between countries i and j
Q_{ij} =2 and P_{ij} =1 if countries i and j belong to the same preference area and 1 and 0 respectively otherwise and,
ϵ_{ij} is a log-normally distributed error term with $E(\ln \epsilon_{ij}) = 0$.

Since our focus in the present analysis is on the trade-diverting effects of the NAFTA, rather than just its trade-creating effects, we ewrite Brada and Mendez' equation (2) above as:

where T_{ij} refers to bilateral non-fuel import values in US$. The US$ per capita GDPs at purchasing power parity for the reporter and the partner countries are included in order to capture the effects of each country's level of development. The two variables distance between countries (D_{ij}) and the corresponding absolute difference in per capita GDPs (at purchasing power parity)-- capture the Linder hypothesis (1961) that the intensity of bilateral trade

[5] These applications include Tinbergen (1962), Aitken (1973), Hewett (1976), Havrylyshyn and Pritchett (1991), Pelzman (1977) and Erzan and Safadi (1992).

$$
\begin{aligned}
T_{ij} = {} & A + \alpha_1 \log GDP_i + \alpha_2 \log GDP_j + \alpha_3 \log GDPPC_i \\
& + \alpha_4 \log GDPPC_j + \alpha_5 \log \{ |GDPPC_i - GDPPC_j| \} \\
& + \alpha_6 P_{ij} \log(GDPPC_i)(GDPPC_j) + \beta_1 Area_i \\
& + \beta_2 Area_j + \beta_3 D_{ij} + \beta_4 Border_{ij} \\
& + \beta_5 P_{ij} \log D_{ij} + \gamma_1 \log Q_{ij} + \gamma_2 Lang_{ij} + \log \varepsilon_{ij}
\end{aligned}
\tag{3}
$$

is determined by similarities in demand structures, and geographical distance between importing and exporting countries. The former refers to the distance between the economic centers of the two countries, and the latter is a proxy for economic similarity. The size of each country is measured by area in square kilometers, and a separate dummy variable is included for the existence of a common border. Again, $Q_{ij} = 2$ and $P_{ij} = 1$ whenever countries i and j belong to a common trading arrangement, and 1 and 0, respectively, otherwise. The trading arrangements included are the EC, EFTA, Latin America Free Trade Area (LAFTA), and Caribbean Common Market (CACM).[6] The coefficient γ_1 measures the effect of per capita income on the effectiveness of integration. The coefficient γ_2 measures the effect of distance on the trade augmenting power of an FTA. Finally, a language dummy variable ($Lang_{ij}$) is included as a proxy for cultural similarities. It assumes the value of one if the countries share a common language, otherwise its value is set to zero; the languages included are English, Spanish, French and Arabic.

In order to estimate equation 3, we rely on the experience of total non-fuel imports (SITC 0 through 9 - 3) of 95 countries from each other during the year 1989 (the latest year for which comprehensive trade data are available). The estimated coefficients are then used to project the impact of NAFTA on the level as well as the origins of the US imports. In this exercise, the values of Q_{ij} and P_{ij} are set to 2 and 1 respectively, whenever the import partner is either Canada or Mexico, and 1 and 0 otherwise. Moreover, and in order to account for the fact that the benchmark integration schemes (EC, EFTA, LAFTA and CACM) had an average tariff of over 10% prior to their formation, while the existing average tariff of US imports from Canada and Mexico is 1.5%, the estimated integration elasticities were scaled down by a factor of six. Parameter estimates of the gravity model are presented in Table 1 below.

The empirical performance of the model is quite good. Nearly all the variables (except for the per capita GDP of the reporter, α_3, and the FTA distance dummy, β_5 [7]) have the expected sign and are strongly significant. Imports increase with the level of GDP of the reporter and partner (α_1 and α_2), and decrease with size (β_1 and β_2). Imports also decrease with distance (β_3) and increase with a common border (β_5). Sharing a common free trading area (γ_1) enhances trade significantly, and so does sharing a common language (γ_2). Finally, α_6, the coefficient that measures the effect of per capita income on the effectiveness of integration, is positive. This indicates that inter-member trade increases with the level of development of the integrating countries, thus reflecting the higher proportion of tradeables in their output.

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[6] For example, Aitken (1973) found European trade to be significantly influenced by membership in the EC or EFTA and by being neighbors. Srivastava and Green (1986) found cultural similarity, political circumstances, economic union and former colonial status to be significant determinants of trade between economies.

[7] This coefficient measures the effect of distance on the trade-augmenting power of a free trade area.

Table 1: Gravity Model Estimates

Variable	Parameter Estimate	Standard Error	T for H0, Parameter = 0	Probability >0
Intercept	-26.38	1.77	-14.87	0.00
GDP_i	1.35	0.03	38.68	0.00
GDP_j	1.54	0.03	47.96	0.00
$GDPPC_i$	-0.03	0.05	-0.58	0.56*
$GDPPC_j$	0.10	0.04	2.50	0.01
Per Capita Difference	0.27	0.03	8.17	0.00
Per Capita Product	0.37	0.09	4.02	0.00
$Area_i$	-0.03	0.02	-14.35	0.00
$Area_j$	-0.29	0.02	-13.14	0.00
$Distance_{ij}$	-0.25	0.01	-19.26	0.00
$Border_{ij}$	1.44	0.25	5.80	0.00
Border Dummy	0.05	0.11	0.43	0.67*
FTA Dummy	7.12	1.70	4.18	0.00
Language	1.59	0.12	12.87	0.00

(*) Not significant at the 1%.

Finally, since the values of bilateral trade are only observed for nonnegative values, ordinary least squares estimates will be inconsistent.[8] Therefore, we use the Tobit maximum likelihood estimation technique.[9] Furthermore, in predicting the trade effect of NAFTA, we follow McDonald and Moffit's (1980) methodology in interpreting and using the estimated Tobit coefficients. They show that:

$$E(y_i) = \Phi_i \beta' x_i + \sigma \phi_i \quad (4)$$

where ϕ_i and Φ_i are the density and distribution functions, respectively, of the standard normal evaluated at $\beta' x_i/\sigma$, and σ is the standard error of estimation. Table 6 in the main text presents the results.

[8] See for example Maddala (1983) for a discussion of the bias in OLS estimates in models with limited dependent variables.

[9] See Tobin (1958) and Heckman (1976,1979) for a discussion and application of this technique.

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