

North American Trade Liberalization and Intra-Industry Trade

By

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I. Introduction

Formal trilateral free trade negotiations involving Canada, Mexico and the United States began in the spring of 1991. As anticipated, American and Canadian trade union leaders argued that there will be a substantial loss of jobs to Mexico as capital migrates to Mexico in search of cheaper labour. Ironically, some Mexican labour leaders cautioned against the risks to Mexican businesses in competing against capital- and technology-intensive companies in the United States and Canada.

The relative immobility of labour within and between domestic industries underlies concerns that “transitory” unemployment associated with trade liberalization will be significant and prolonged, notwithstanding price adjustments (including exchange rate adjustments) that should mitigate overall excess supply in national labour markets. Moreover, labour immobility could constrain the expansion of comparative advantaged sectors in Canada and the United States, thereby reducing the income gains associated with reallocating resources from lower productivity to higher productivity sectors. In short, the mobility of domestic factors of production, especially labour, is a critical determinant of the income gains and unemployment costs associated with trade liberalization.

To date, trade liberalization has primarily involved developed countries. In this context, factor price differences are relatively small. Moreover, competition within domestic markets reflects product differentiation which is stimulated both by higher incomes and by oligopolistic market structures. As a consequence, increased intra-industry

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trade (IIT) is a prominent feature of trade liberalization involving developed countries.¹ This prominent IIT response has arguably mitigated transitory unemployment increases, as resources are seen to be more mobile within industrial sectors than across sectors.²

To the extent that trade liberalization involves developing as well as developed countries, the impact could involve significantly more inter-industry trade adjustments than has hitherto been the case. As a consequence, transitional unemployment of resources could be a much more substantial problem than would be anticipated from historical experience.

The purpose of this study is to evaluate the likely consequences of trade liberalization involving Mexico. In particular, the study assesses the likelihood that increased trade between the U.S. and Mexico will be primarily IIT in nature. In the second section, a set of theoretical considerations relevant to this issue is raised and discussed. The third section presents an empirical overview of U.S.-Mexico trade patterns and compares them to Canada-U.S. patterns. In particular, the degree to which increases in trade have been IIT in nature is assessed. The fourth section presents conclusions and policy implications.

II. The MNE Production Decision

The bulk of international trade is carried out by multinational enterprises (MNEs). In attempting to maximize shareholders' wealth, MNE managers allocate resources across business activities and geographical locations. Altering the international trade regime facing the "representative" MNE should, in principle, encourage specific economic activities to be relocated from one country to another. The nature of the relevant adjustments will strongly condition the resulting change in trade patterns.

In the conventional Heckscher-Ohlin model, trade flows are primarily driven by national differences in comparative advantage. Moreover, the public choice literature suggests that tariffs will be imposed to protect labour-intensive, comparatively disadvantaged sectors in developed countries.³ On the margin the presence of tariffs

¹ For a review of recent trends in intra-industry trade and an overview of the literature, see Globerman and Dean [1990].

² This perspective is argued in Eden and Malot [1991], among other places.

³ See Baldwin [1988]. Arguably, tariffs, quotas and restrictions on inward direct investment in developing countries reflect protection of domestic owners of capital.

and other barriers to trade will encourage direct investment in specific sectors within countries that would not otherwise take place. Similarly, investment will be discouraged in specific industries within countries that would be made under a regime of free trade. The removal of trade barriers should therefore encourage a reallocation of direct investment capital more consistent with international differences in relative factor prices.

The implication of Heckscher-Ohlin dominated trade flows is that trade liberalization could lead to potentially substantial inter-industry reallocations of resources within countries and cross-border flows of foreign direct investment, as economic activity is geographically rationalized to more closely conform to patterns dictated by differences in relative factor prices. The relevance is that labour market dislocations may be quite pronounced.

To the extent that MNEs compete primarily on the basis of product differentiation, an alternative view emerges of the likely response of MNEs to trade liberalization. If MNE "rents" are created by the ownership of unique intangible assets which are most profitably exploited by "internalizing" transactions within the global organization, differences in relative factor prices may have an insignificant influence on the geographical distribution of economic activity. In this context, the existence of trade barriers might be seen as providing an additional source of rent for MNEs which would serve the protected markets through foreign affiliates in any event.

In the seminal model of the protected oligopoly, the potential rents created by domestic barriers to trade are dissipated through inefficient production on the part of producers [see Eastman and Stykholt, 1967]. In particular, oligopolists compete by offering differentiated products which increases costs of production by sacrificing economies of scale at the product level. As well, the entry encouraged by trade barriers results in domestic producers operating plants of less than optimal scale. Within the context of the protected oligopoly model, trade liberalization leads to product rationalization within domestic industries. Such rationalization can take the form of increased product specialization and/or a reduction in numbers of plants leading to increased numbers of plants of optimal size. In this scenario, the reallocation of resources pursuant to trade liberalization will take place primarily within industries in those countries lowering trade barriers. Labour market dislocations under these IIT-type trade adjustments are likely to be smaller than those associated with inter-industry trade adjustments.

The existence of sunk costs is suggested to blunt incentives to re-allocate resources in a trade liberalized environment. Specifically, the long-run variable cost savings from reallocating resources (either within or across industries) must be sufficiently large so that they more than pay for the capital costs associated with starting up production in the new location.⁴ A number of scholars have argued in the Canada-U.S. context that the transaction costs associated with relocating production facilities are relatively large and account, in part, for the fact that inter-industry adjustments to North American trade liberalization have been relatively limited to date [see, for example, Rugman, 1988].

In summary, trade liberalization will have impacts on MNE production which depend upon the importance of factor-price differences as determinants of trade relative to the importance of economies of specialization at the product and plant levels. The existence of sunk costs conditions the response of MNEs to changes in relative prices.

Against this background, differences in relative factor prices are likely to be greater in a sample of countries at different stages of development than in a sample of countries at similar stages of development. For example, Mexico's industrial wage rate averaged less than U.S.\$1 per hour in 1989, whereas in the United States and Canada, average hourly manufacturing wages averaged approximately U.S.\$ 10.50 and U.S.\$ 11.60, respectively.⁵ On the other hand, real interest rates in Mexico are arguably substantially above those in Canada and the United States given the large amount of exchange rate risk and default risk embodied in peso-denominated debt. Hence, one would expect inter-industry trade effects to be greater in a free trade area encompassing Mexico, the United States and Canada than in a free trade area encompassing only Canada and the United States, all other things constant. Equivalently, one would expect industrial relocation costs to be proportionately greater when trade barriers are reduced in a trilateral context than when they are reduced in a bilateral (Canada-U.S.) context.

Given Mexico's relatively low real income level, the demand in Mexico for differentiated products is presumably lower than in the U.S. and Canada. Demand for differentiated products is an important

⁴ Obviously, if the relocation merely involves a rebalancing of production, e.g. plants already exist in the relevant countries, the associated capital costs will be lower.

⁵ Obviously, unit labour costs are much closer given much lower levels of labour productivity in Mexico.

stimulus to IIT given trade liberalization.⁶ This consideration further suggests that trade liberalization involving Mexico is more likely to be characterized by inter-industry adjustments; however, it can be argued that industrial concentration ratios are higher in Mexico than in the U.S. and Canada, while unexploited economies of scale are also much greater. Consequently, trade liberalization can be expected to be a particularly strong stimulus to production rationalization (and increased IIT) in Mexico.

In summary, there are conflicting forces at work such that it is unclear whether trade liberalization involving Mexico is more likely to be characterized by inter-industry trade adjustments than has hitherto characterized adjustments to free trade primarily involving developed countries. Specifically, relatively large factor price differences between Mexico and the U.S. suggest that bilateral trade liberalization will be primarily associated with increased inter-industry trade. On the other hand, the impact of increased competition on Mexican companies will arguably encourage a strong response to rationalize production through increased product specialization. This latter effect is a traditional stimulus to IIT.

III. Recent Trade Patterns

In this section, we consider recent trade patterns between Mexico and the U.S. and contrast them with trade patterns between the U.S. and Canada.⁷ While it is extremely difficult to identify precisely Mexico's reductions in tariffs and non-tariff barriers over the 1980s, it can be concluded that Mexico engaged in a substantial liberalization of its trade and investment laws over the 1980s. This liberalization included substantial reductions in nominal tariffs and in required import licenses. Furthermore, the system of official reference prices against which tariff rates are actually applied was largely abandoned. The significance is that reference prices significantly exceeded actual transfer prices.⁸

By joining the GATT in 1986, Mexico received the benefits of the multilateral trade regime including the associated protection against trade barriers proscribed by the GATT. In fact, Mexico was already

⁶ For a critical review of empirical models of IIT, see Gray [1988].

⁷ The absolutely and relatively small amount of trade between Canada and Mexico mitigates against drawing any reliable conclusions from that bilateral trade relationship.

⁸ For a comprehensive discussion of changes in Mexican trade laws, see Bader [1991].

enjoying Most Favoured Nation status under a bilateral treaty with the U.S. and was also covered under The Generalized Systems of Preferences for designated products. Hence, Mexico's accession to the GATT created no significant change in the tariff regime Mexico faced with respect to the U.S.⁹

The Maquiladora programme, in place since 1965, involves a significant amount of trade liberalization in that goods imported from Mexico into the U.S. can be imported duty free if they are incorporated into goods for further processing for export. The Maquiladora programme has clearly stimulated a significant increase in bilateral Mexico-U.S. trade with much of the increase taking place in the 1980s [see Draenos, 1990].

In summary, there has already been a substantial amount of trade liberalization involving Mexico and the U.S., especially during the 1980s. Examination of whether any expansion in trade was primarily inter-industry or intra-industry in nature could provide some insight into the potential consequences of further trade liberalization.

Table 1 reports trade flows between the United States and Mexico for selected years during the 1980s for a sample of 2-digit industries. From 1980–82 to 1987–88, total bilateral trade (in nominal dollars) increased by around 82 per cent. The nominal value of bilateral trade increased in 27 of the 35 industries indicating a widespread broadening as well as deepening of trade between the U.S. and Mexico over the 1980s.

The upper part of Table 2 provides estimates of IIT for the 2-digit industries for selected years during the 1980s. Specifically the Grubel-

Table 1 – *United States and Mexico Trade Totals (selected years)*

	1980	1981	1982	1987	1988
Total U.S. imports (from Mexico)	3,955,012	4,715,427	4,765,343	13,044,769	16,398,260
Total U.S. exports (to Mexico)	10,924,877	13,597,182	8,275,856	11,168,203	15,451,243
Total trade	14,879,889	18,312,609	13,041,199	24,212,972	31,849,503

Note: For 35 SITC 2-digit divisions. – All values are reported in thousands of U.S. dollars.

⁹ For a detailed description of legislation affecting Mexico-United States trade relations, see United States International Trade Commission [1990].

Table 2 – *United States and Mexico: Intra-Industry Trade Numbers for Selected Years*

	1980–82	1987–88	1980	1981	1982	1987	1988
	<i>35 selected SITC 2-digit divisions^a</i>						
Unweighted	0.440	0.615	0.432	0.436	0.445	0.593	0.628
Weighted ^b	0.468	0.745	0.430	0.434	0.537	0.720	0.760
	<i>138 SITC 3-digit groups^c</i>						
Unweighted	0.379	0.506	0.356	0.357	0.382	0.483	0.511
Weighted ^b	0.377	0.602	0.339	0.339	0.464	0.582	0.614
^a Numbered from 51 to 89. – ^b Using each division's proportion of trade, relative to the total trade, in the indicated 'base years'. – ^c Groups with unidirectional trade have not been included (i.e. where either imports or exports are zero).							

Lloyd index was calculated for each industry, and both weighted and unweighted averages were estimated across all 35 industries.¹⁰ Over the period 1980–82 to 1987–88, IIT on a trade-weighted basis increased by about 60 per cent. Hence, the bulk of the increase in bilateral trade over the 1980s was intra-industry in nature. Moreover, the calculated IIT index increased in 25 of the 35 sample industries suggesting that increased IIT is broadly representative of bilateral trade patterns.

The use of broad SITC categories as a basis for calculating IIT indices raises a concern that the calculated indices are statistical artifacts. In this regard, the lower part of Table 2, reporting weighted and unweighted average IIT indices for 138 3-digit SITC groups, confirms the pattern described in the upper part. The 3-digit SITC groups correspond to the 2-digit industry groups underlying the upper part of Table 2. As might be expected, the IIT indices are lower for the 3-digit groupings; however, relative increases over the 1980s are quite comparable to those calculated at the 2-digit level.

The growing importance of IIT in U.S.-Mexico bilateral trade over the 1980s is further attested to by the following regression results.

¹⁰ The IIT values for each 2-digit SITC division is calculated using the following formula:

$$IIT_i = 1 - \frac{EX_i - IM_i}{EX_i + IM_i},$$

where EX_i are U.S. exports to Mexico in the i th division and IM_i are U.S. imports from Mexico. For the weighted average IIT, the weight for each division is that division's proportion of total trade for all sample divisions.

For the period 1980–82 and 1987–88, two variables were constructed:

- (i) *IRA* measured as U.S. imports from Mexico in the *i*th industry divided by total U.S. imports from Mexico and
- (ii) *ERA* measured as U.S. exports to Mexico in the *i*th industry divided by total U.S. exports to Mexico.

The *IRA* variable was then regressed against the *ERA* variable across our set of 3-digit SITC groups for the two sample periods. Equation (1) reports the results of a simple linear regression for the period 1980–82, while equation (2) reports comparable results for the period 1987–88.¹¹

$$IRA = 0.004 + 0.419 ERA \quad R^2 = 0.103, \quad (1)$$

(2.905) (4.096)

$$IRA = 0.003 + 0.613 ERA \quad R^2 = 0.353. \quad (2)$$

(2.540) (8.924)

In both periods, higher import “intensity” is associated with higher export intensity over the sample groups; however, the relationship is markedly stronger in the later period than in the earlier period. This strengthening of the empirical relationship between import and export intensities is consistent with the increasing importance of IIT over the sample period.

To place the Mexico-U.S. bilateral trade flows in a broader perspective, Tables 3 and 4 report data for Canada-U.S. bilateral trade flows comparable to those provided in Tables 1 and 2. Specifically, Table 3 reports U.S. imports from Canada and U.S. exports to Canada for the same 35 2-digit SITC divisions as in Table 1. The growth in bilateral U.S.-Canada trade is quite comparable to that for bilateral U.S.-Mexico trade. Specifically, over the period 1980–82 to 1987–88, trade between the U.S. and Canada, in nominal dollars, increased by approximately 79 per cent (Table 3).

IIT indices for Canada-U.S. bilateral trade flows, comparable to those in Table 2, are given in Table 4. Comparing the upper parts of Tables 2 and 4, it is seen that the unweighted and weighted IIT values for U.S.-Mexico bilateral trade are substantially below these for U.S.-Canada bilateral trade in the first sample period; however, U.S.-Mexico IIT is quite comparable to that for Canada-U.S. trade flows

¹¹ A *t*-statistic is shown in parenthesis below each coefficient.

Table 3 – *Canada and United States Trade Totals (selected years)*

	1980	1981	1982	1987	1988
Total U.S. imports (from Canada)	24,616,550	28,361,479	28,763,697	50,356,862	59,304,391
Total U.S. exports (to Canada)	26,328,854	30,583,188	25,967,458	40,386,967	46,204,157
Total trade	50,945,404	58,944,667	54,731,155	90,743,829	105,508,548

Note: For 35 SITC 2-digit divisions numbered from 51 to 89. – All values are reported in thousands of U.S. dollars.

Table 4 – *Canada and United States: Intra-Industry Trade Numbers for Selected Years*

	1980–82	1987–88	1980	1981	1982	1987	1988
	<i>35 selected SITC 2-digit divisions^a</i>						
Unweighted	0.581	0.649	0.570	0.583	0.581	0.635	0.661
Weighted ^b	0.686	0.726	0.688	0.698	0.663	0.728	0.725
	<i>140 selected SITC 3-digit groups^c</i>						
Unweighted	0.495	0.581	0.487	0.493	0.502	0.577	0.577
Weighted ^b	0.579	0.678	0.582	0.587	0.558	0.678	0.674

^a Numbered from 51 to 89. – ^b Using each division's proportion of trade, relative to the total trade, in the indicated 'base years'. – ^c Numbered from 517 to 899. Groups with unidirectional trade have not been included (i.e. where either imports or exports are zero).

in 1987–88. A similar pattern for a virtually identical sample of 3-digit SITC groups is apparent in comparing the lower parts of these Tables. In the 3-digit group case, U.S.-Mexico IIT values are consistently below comparable Canada-U.S. values; however, the differences are relatively small in the 1987–88 period.

On balance, U.S.-Mexico patterns of bilateral trade parallel U.S.-Canada patterns. In particular, IIT increased significantly over the period of the 1980s. By the latter part of the 1980s, the IIT-intensity of U.S.-Mexico bilateral trade was quite comparable to that of U.S.-Canada trade.

IV. Conclusions

A major concern surrounding the inclusion of Mexico in a North American Free Trade Agreement is that major differences across countries in factor prices along with Mexico's low level of economic development will lead to significant levels of transitional unemployment in the free trade area. The specific concern is that trade adjustments involving Mexico will primarily be inter-industry in nature thereby accentuating costs and frictions associated with reallocating resources.

While there are a priori reasons to expect stronger inter-industry trade adjustment effects associated with freer trade with Mexico, there are also grounds for arguing that U.S.-Mexico trade patterns will parallel those of developed countries, i.e. the predominant trade effect will be increased IIT. Examination of U.S.-Mexico trade patterns over the 1980s actually supports the conclusion that freer trade between the two countries increased IIT. To this extent, it is probably inappropriate to assume that the accession of Mexico to a North American free trade agreement will necessarily lead to significantly greater structural adjustments in the U.S. than has been true for trade liberalization agreements with developed countries, including Canada.

To be sure, the marginal effects of future trade liberalization may differ from the observed average effects of past trade liberalization efforts. However, there is no particular reason to believe that the bulk of increased trade flows associated with a North American free trade area will "look different" from those of the 1980, i.e. primarily IIT in nature.

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Zusammenfassung: Handelsliberalisierung in Nordamerika und der intra-industrielle Handel. – Der Verfasser untersucht die Handelsbeziehungen zwischen Mexiko und den Vereinigten Staaten in den 80er Jahren und vergleicht sie mit den Handelsbeziehungen zwischen Kanada und den USA im gleichen Zeitraum. Er stellt fest, daß der intra-industrielle Handel in den Beziehungen zwischen Mexiko und den USA an Bedeutung gewonnen hat, was vermutlich auf die zunehmende Handelsliberalisierung Mexikos zurückzuführen ist. In der Tat waren in den späten 80er Jahren die relativen Niveaus des intra-industriellen Handels ähnlich hoch, wenn man die bilateralen Handelsströme zwischen Mexiko und den USA mit denen zwischen Kanada und den USA vergleicht.

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Résumé: La libération des échanges nord-américains et les échanges intra-industriels. – Dans cette étude l'auteur examine les tendances du commerce bilatéral entre le Mexique et les Etats Unis pendant les années quatre-vingts. Il les compare aux tendances du commerce bilatéral entre le Canada et les Etats Unis pendant la même période. Il trouve que les échanges intra-industriels sont particulièrement augmentés en ce qui concerne le commerce entre le Mexique et les Etats Unis. Cela montre que la libéralisation commerciale prend place principalement de la part du Mexique. En effet dans les années quatre-vingts, les niveaux relatifs des échanges intra-industriels ont été assez similaires si l'on compare les échanges bilatéraux entre le Mexique et les Etats Unis d'une part et le Canada et les Etats Unis d'autre part.

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Resumen: La liberalización del comercio en América del Norte y el comercio intrasectorial. – En este trabajo se examina el perfil del comercio bilateral entre México y los EE UU en los años ochenta y se lo compara con el perfil del comercio bilateral entre el Canadá y los EE UU en el mismo período. Se encuentra que la importancia del comercio intrasectorial aumentó en el comercio entre México y los EE UU durante el período estudiado, reflejando ante todo avances en la liberalización del comercio por parte de México. En efecto, hacia fines de los años ochenta, los niveles relativos de comercio intrasectorial eran bastante similares en ambos casos, México-EE UU y Canadá-EE UU.