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A GLOBAL PERSPECTIVE ON REGIONAL INTEGRATION IN NORTH AMERICA

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INTRODUCTION

The goal of this paper is to contribute to an evaluation of the degree of regional integration that has taken place in North America in the wake of the North American Free Trade Agreement (NAFTA). The most natural way to do this is to examine what has happened to agricultural trade flows among the three partner countries, before and after implementation of NAFTA on January 1, 1994. In their background paper on North American agricultural trade flows over the 1975-98 period, Steven Zahniser and Mark Gehlhar of the Economic Research Service, USDA, do a nice job reviewing this evidence. The new bilateral trade database developed by Gehlhar, and nicknamed "IBAT", is essential to this exercise. This unique resource reports reconciled bilateral trade flows over time, where the reconciliation is based on a country's historical reliability in reporting bilateral flows for any given commodity (Gehlhar, 1998). Such reconciliation is an essential precondition to any analytic exercise since it is very difficult to come to general conclusions about changes in regional trade flows based on reported bilateral trade data, which often differ dramatically between reporters.

Zahniser and Gehlhar conclude that growth in bilateral agricultural trade flows among the NAFTA partners has indeed accelerated in recent years. How-

ever, the timing of this growth departs quite significantly from the timing of the two free trade accords in the region - - Canada/ United States (CUSFTA) in 1989, and NAFTA in 1994. Indeed, the stronger growth in U.S. exports to Canada dates back to the mid-1980s, while the acceleration in Canada-U.S. exports doesn't kick in until the early 1990's. Acceleration of Mexico-U.S. agricultural exports begins before NAFTA, in 1992, while U.S.-Mexico exports seem to be largely a function of overall growth in the Mexican economy. Clearly these free trade agreements are just one factor determining agricultural trade flows in North America.

In an effort to control for macro-economic fluctuations, which in turn lead to fluctuation in the overall levels of imports and exports, Zahniser and Gehlhar also look at trade shares. For example, even though total agricultural imports into Mexico fell due to the recession in 1995, NAFTA's share of these imports rose from 1994 to 1995. This might be viewed as evidence of NAFTA's success in promoting intra-regional trade. Overall, the authors conclude that intra-NAFTA trade now comprises a larger share of imports into the United States and Canada than it did in the late 1970s and 1980s. However, when averaged over a five-year period, NAFTA's share of Mexican imports in the 1994-98 period was about the same as its share over the 1984-88 period. Furthermore, as the authors point out, some of the recent prominence of intra-NAFTA trade may be due to the diminished attractiveness of the Asia markets as an export destination. These difficulties associated with disentangling the determinants of regional integration provide the starting point for my comments.

DETERMINANTS OF REGIONAL TRADE SHARES

An individual country c's share of exports to a region "r" — $xshr_{cr}$ — can be viewed as the product of four factors (Anderson and Norheim, 1993; Drysdale, 1988):

$$xshr_{cr} = gdpshr_r * openness_r * composition_{cr} * transcostcr \quad (1)$$

The first determinant of export share is the *size of the destination market*, relative to the world economy. When incomes in Southeast Asia fell, following the Asian financial crisis, the *relative size* of the NAFTA market (measured by

GDP) increased. This led to an increase in the NAFTA's relative importance as an export destination for country's within NAFTA. But it also made NAFTA a more important export destination for countries outside the region. In short, some of the increased intra-NAFTA trade following the Asian crisis can be attributable, not to the free trade agreement, but rather to this macroeconomic shock in Asia. The "$gdpshr_r$" term captures this determinant of export shares to region r.

The second determinant of region r's importance as a destination for country c's exports is the *relative openness* of the region. To the extent that Mexico's unilateral reforms in the late 1980s increased Mexico's import/GDP ratio, relative to the world import/GDP ratio, we would expect Mexico to become a more attractive destination for all exporters, not just her NAFTA partners. The openness measure captures this effect, which once again is not attributable to the free trade agreement.

The third determinant of regional export share is also largely independent of the NAFTA accord. It measures the *difference in composition of trade* between country c and region r. If c specializes in exports of products which region r specializes in importing, then we can expect a larger value of the export share, $xshr_{cr}$. Within the agricultural sector, this would be the case for winter vegetables imported by Canada from Mexico. On the other hand, if country c tends to export products that the destination region r also tends to export (e.g., grains exported from Canada to the US), we would expect the export share to be diminished by the composition effect. Of course, by altering relative prices, a free trade agreement such as NAFTA could also change the composition of trade in the region. However, this is a "second-order" effect. Most of the compositional differences will be due to differences in endowments, including climate, which remain unaffected in the wake of the free trade accord.

The final determinant of regional export share is the one that is directly affected by the NAFTA. This captures the *relative transactions costs* associated with delivering products from country c to region r. This is the residual term in relationship (1) and includes the effects of tariffs, non-tariff barriers, and transportation costs. NAFTA aims to reduce these transactions costs on a bilateral basis and, to the extent it is successful, it will increase the share of the NAFTA market in NAFTA countries' exports. Ideally, we would like to isolate

this term and see how it has changed in light of the North American Free Trade Agreement. This could be done by computing the composition effect in (1) and isolating the transactions cost term on the left-hand side of this equation. However, this represents a substantial computational exercise that deserves to be undertaken in the context of an independent research project. For the present, discussion will simply focus on the product of the last two terms in (1), which has been described as the intensity of country c's export trade with region r (Anderson and Norheim, 1993; Brown, 1949). Since the composition of trade tends to change relatively slowly, most of the variation in this index may be attributed to changes in the transactions cost component, which is the main focus of our attention.

Analysis of the Intensity of Intra-NAFTA Trade

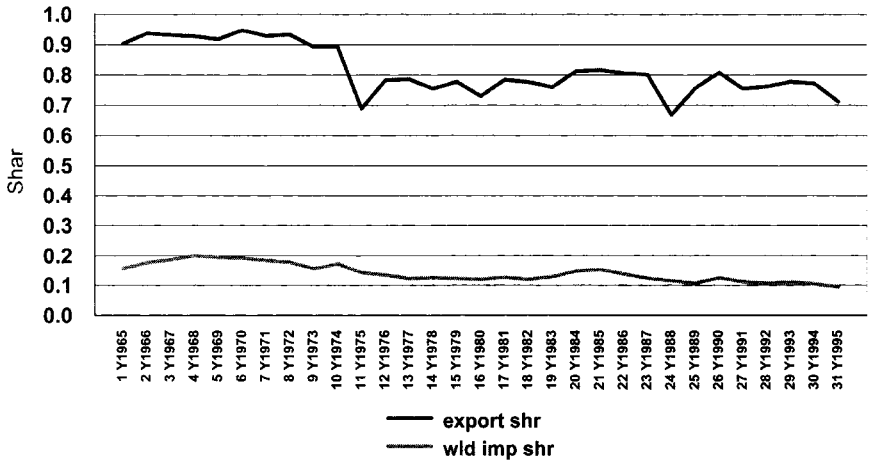
Combining the composition and transactions cost terms from (1) into a single index of the intensity of exports from country c to region r, $I_{cr,}$ canceling the GDP components of the first two terms on the right-hand side of (1), and rearranging terms, we can isolate the intensity of trade as follows:

$$I_{cr} = xshr_{cr} / mshr_{r} \qquad (2)$$

In this expression, $mshr_r$ represents the share of region r in world imports. Thus the index in (2) compares region r as a destination for country c's exports, with region r as an export destination for the world as a whole. In order to ensure that this index equals 1 in the absence of compositional and transactions cost effects, we must remove country c from the computation of world imports in the denominator of $mshr_r$. This is because a country cannot export to itself. Finally, since we are interested in the case where country c (e.g., Mexico) is itself a part of the destination region r (NAFTA), we must also remove c's imports from the numerator of the import share expression. Thus, in computing Mexico's intensity of exports to NAFTA, we would divide the share of Mexico's exports to the United States and Canada by the share of the U.S. and Canada's imports in world imports (the latter being net of Mexico).

Examination of the export intensity index over time is quite instructive, as it reveals the combined effect of changes in the composition of trade as well as transactions costs. Since the composition of trade changes relatively

Figure 1: Determinants of Mexican Export Intensity to NAFTA, Manufactured Food Products, 1965-1995.

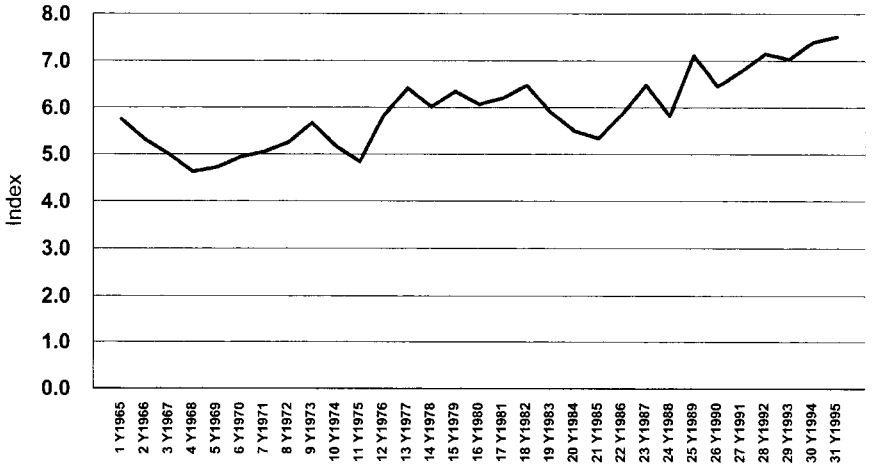


slowly, one would expect most of the change in trade intensity of NAFTA countries with the NAFTA region to be attributable to transactions costs. This is precisely what the NAFTA accord was intended to address, so I_{cr} provides an excellent basis for evaluation of the success of NAFTA, as well as other measures aimed at regional integration. Most importantly, it controls for the relative size and openness effects that trouble Zahniser and Gehlhar (2000) in their analysis of regional integration in NAFTA.

An example will illustrate the difference between the trade share approach and the intensity of trade approach.[1] Consider the case of Mexican food exports. The top line in Figure 1 reports the share of Mexican manufactured food exports destined for NAFTA. This is falling over the entire period, dropping from 90 percent in 1965 to 70 percent in 1995. From this time series, one would conclude that regional integration has been decreasing.

[1]Since I do not have access to the IBAT database, I have instead employed the time series data provided in the publicly available, GTAP version 4 database, also developed by Mark Gehlhar (1998). This is attractive in that it covers both agriculture and non-agriculture trade. However, it only extends through 1995, which limits its usefulness in assessing the impact of NAFTA, since this only encompasses the first two years of the agreement. However, this work could easily be extended when the version 5 data become available.

Figure 2: Mexican Export Intensity to NAFTA: Manufactured Food Products, 1965-1995.



However, one must consider the fact that over this same period, food imports of other regions in the world increased sharply, leading to a decline in the NAFTA (net of Mexico) share in world manufactured food imports (see the lower line in Figure 1). When this factor is taken into account, we see from Figure 2 that the index of export intensity between Mexico and NAFTA has actually risen. Thus there is value in taking a global approach to the evaluation regional integration.

Export Intensity Indexes by Sector and Country

Figures 3 and 4 offer a convenient summary of intra-NAFTA export intensities for the region as a whole.[2] The comparison between non-food manufactures and farm and food products is quite interesting. At the beginning of the period, the intra-NAFTA export intensity for non-food manufactures (3.6) is about double the index for farm (1.4) and food (2.0) products. By the end of the

[2]Here I follow Anderson and Norheim's suggestion of deducting 1/n of NAFTA's imports from the denominator and numerator of the import share term in order to control for the fact that countries cannot export to themselves, but can export to others in the region. In the spirit of the intensity index, this adjustment also gives rise to an index of one when geography places no role in trade.

Figure 3: NAFTA's Intra-regional Export Intensity by Sector, 1965-1995.

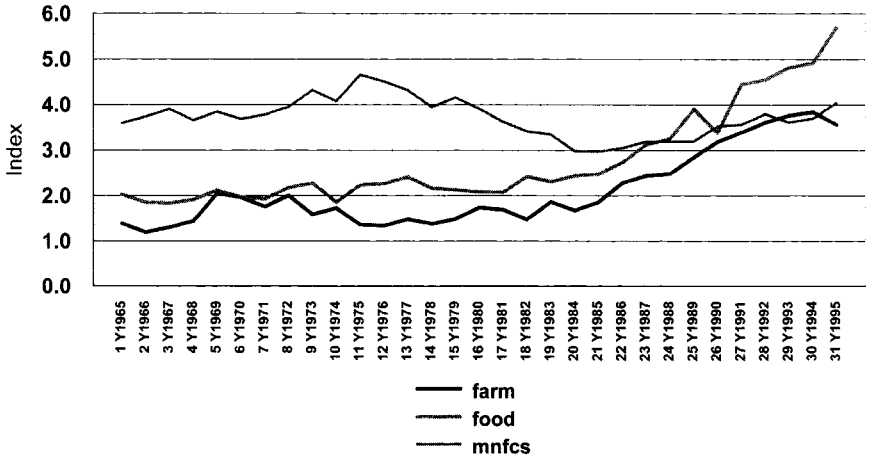
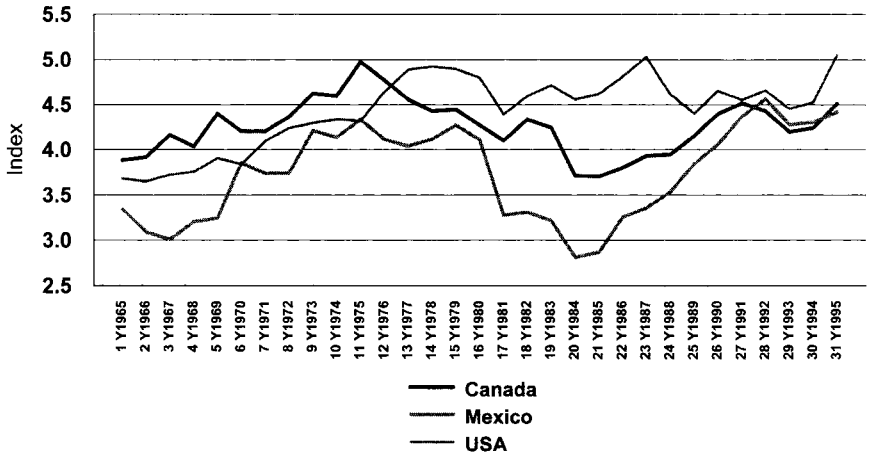
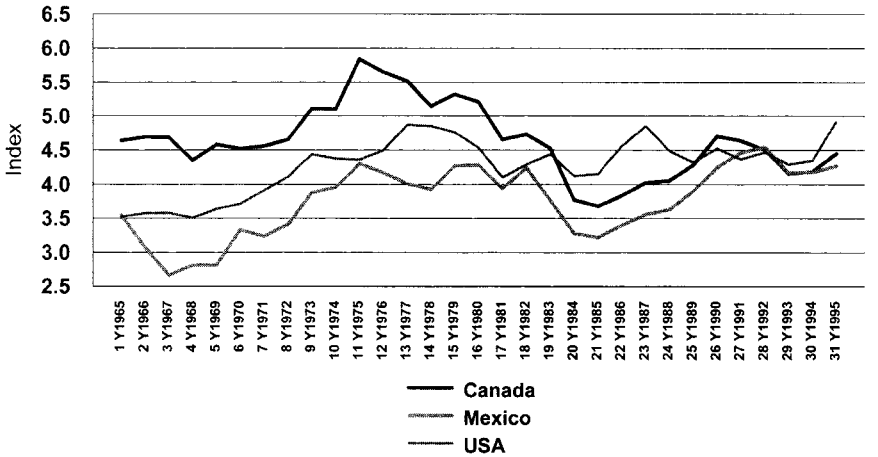


Figure 4: NAFTA Export Intenstity by Country All Merchandise Trade, 1965-1995.



period, the intra-NAFTA export intensity for farm products had risen to the level of non-food manufactures, and the index for food products in 1995 is nearly 50 percent higher! Most of these gains have been realized since the mid-

Figure 5: NAFTA Export Intensity for Non-food Manufactures, by Country, 1965-1995.



1980s. Clearly regional integration in farm and food products has been very successful over the past 15 years. It is likely that an important part of this has to do with the two regional free trade agreements.

Figure 4 compares the intra-NAFTA export intensities for total merchandise trade across the three countries. The most striking thing about this figure is the similarity in trade intensities across countries. When one simply compares export shares from each country to NAFTA they are quite different, with the U.S. share being about half the values for Canada and Mexico. This is because the United States is a very large import market, and by definition, it cannot export to itself. However, when one controls for this fact, using the simple adjustment suggested by equation (2), the United States is very similar to the other two countries in its NAFTA export intensity. The other noteworthy observation is the strong increase in intra-regional export intensity for Canada and Mexico since the mid-1980s. This offsets a ten-year decline in the intensity of Canadian and Mexican export intensities to NAFTA that began in 1975.

The increase in total export intensity from Mexico and Canada to NAFTA in the mid-80s to early 90s is mirrored in these countries' individual

Figure 6: NAFTA Export Intensity for Food Products, by Country, 1965-1995.

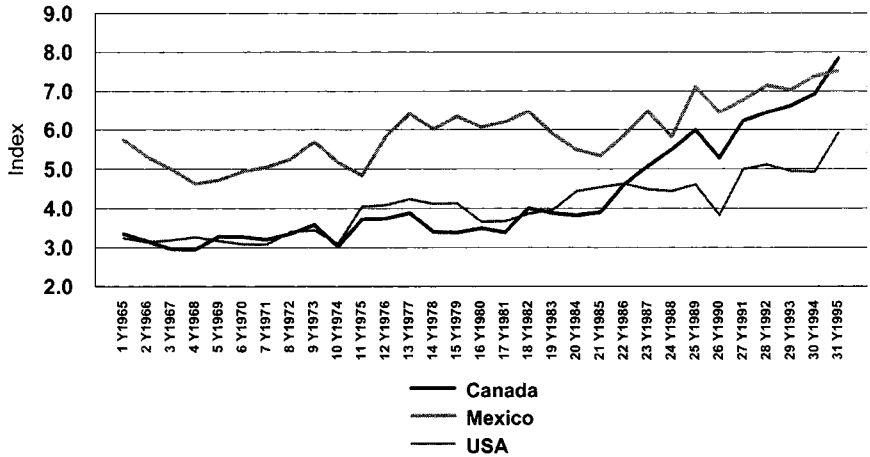
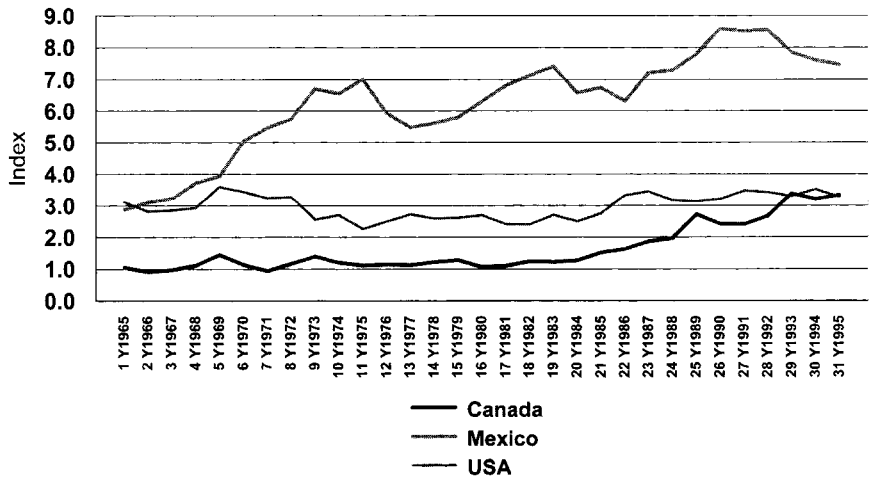


Figure 7: NAFTA Export Intensities for Farm Products, by Country, 1965-1995.



series of intensity indices is remarkably flat. This is especially true for Canada, which ends the period with a slightly lower intensity of exports to NAFTA (4.4) than at the beginning (4.6). In general the intensity of intra-NAFTA exports is quite similar across regions, ending the period in the 4.3-4.9 range. The free trade agreements appear to have had only a modest effect here.

By contrast, the intensity of NAFTA exports for the processed food sector in the three countries rises for all regions over the 1965-95 period. The increase is particularly striking for Canada, where the intensity of exports to NAFTA doubles over the 1985-95 period. This suggests a high grade on the "report card" for the Canada/United States and North American free trade agreements. Based on informal discussions at the workshop, it appears that much of this increase in trade intensity has come about due to rationalization in the Canadian food manufacturing sector. Prior to the CUSFTA and NAFTA, substantial tariffs still existed for many of these products (in contrast to non-food manufactures) thereby encouraging local production of the full range of products for the domestic market. In the wake of the free trade agreements, small-scale production was no longer viable and many of these product lines were dropped. By producing fewer varieties of food products at a much greater scale, Canadian manufactures have survived, and in some cases thrived, by exporting a large share of their production. The free trade agreement has turned these domestic producers into North American operations.

Figure 7 shows the evolution of the NAFTA export intensities for the three countries' farm sectors. Here the convergence evident in the previous two figures is absent. Mexico's export intensity starts out at a much higher level than Canada. (This is evidence of the compositional effect whereby Mexico specializes in exports of products, such as winter fruit and vegetables, for which Canada is a natural importer). Furthermore, Mexico's intensity index triples over this period. Canada's export intensity to NAFTA also rises strongly since the mid-1980s, whereas the U.S. export intensity to NAFTA ends the period about where it began.

CONCLUSIONS

Like many other controversial trade agreements, NAFTA is blamed for many sins — and credited with many successes — that it does not deserve. Macro-economic events such as the Mexican peso-crisis of 1995 and the Asian financial crisis of 1997/8 have buffeted trade flows in the North American economy. One goal of this paper is to control for these effects, thereby providing a more objective assessment of the impact of free trade agreements in the

region on trade flows. The share of NAFTA in Canadian/Mexican/U.S. exports has been shown to be a function of the size of the NAFTA market, relative to the world economy, the relative openness of this market, the degree of natural complementarity in trade composition, and finally, transactions costs. The North American Free Trade Agreement only directly affects the latter. Changes in these costs are expected to be reflected in changes in export intensities, and it is these intensities that are the focus of my analysis.

Taking advantage of the bilateral trade databases produced by Mark Gehlhar at ERS/USDA, I find a strong change in the intensity of farm and food exports from the NAFTA member countries to NAFTA as a whole since the mid-1980s. This stands in sharp contrast to the evolution of trade intensities for non-food products that find themselves little higher in 1995 than they were in 1965. The most striking growth in export intensity has been for manufactured food products. The export intensity of Canadian food products to NAFTA doubled over the 1985-95 period. Mexico's export intensity is also up sharply, and the U.S. export intensity has recently been on the rise as well. This provides strong evidence of falling transactions costs and increasing integration in the North American market. The recent free trade agreements have most certainly played an important role in this process.

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