U.S. Regional Trade With Canada in the First Five Years of Free Trade

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This paper examines changes in the nature of U.S. regional trade with Canada during the early years of the U.S.-Canada Free Trade Agreement (USCAFTA). The analysis is based on data contained in the highly detailed database obtained from *Statistics Canada*. A key advantage of these data is the industrial and geographic detail provided. While U.S. state export data show 30 SIC-related industries and blur the distinction between computers and turbines by lumping them both in industrial machinery, the *Statistics Canada* data cover over 90 industries and thousands of products for each state. Of course, the big disadvantage to the Canadian data is that they relate to just one country. (Another drawback is that they only relate to merchandise trade and do not include trade in services.) Still, Canada is the nation's and the Midwest's largest single export market. In 1993 Canada accounted for over one-fifth of the country's and over 40 percent of the East North Central's merchandise exports.[1] Moreover, these data are ideal for studying the early impact of the USCAFTA.

Obviously, an episode of trade liberalization represents a shock to the existing trading system, and policy makers need to be able to trace the impact of that shock on the level and distribution of output, employment, and incomes in and within the affected countries. For example, falling trade barriers might be expected to encourage the production of specific goods and services to consolidate on one side of the border or the other. The outcome could reflect relative resource endowments or firms' efforts to reap economies of scale and specialization. On the other hand, firms also want to minimize transportation costs and delivery times, a need that militates against consolidation. Given the tension between these goals, how has the USCAFTA affected the nature of bilateral trade and investment flows? Have U.S. and Canadian firms increased their reliance on trade versus investment, for instance? Have they changed the role of existing foreign subsidiaries or the placement of new ones?

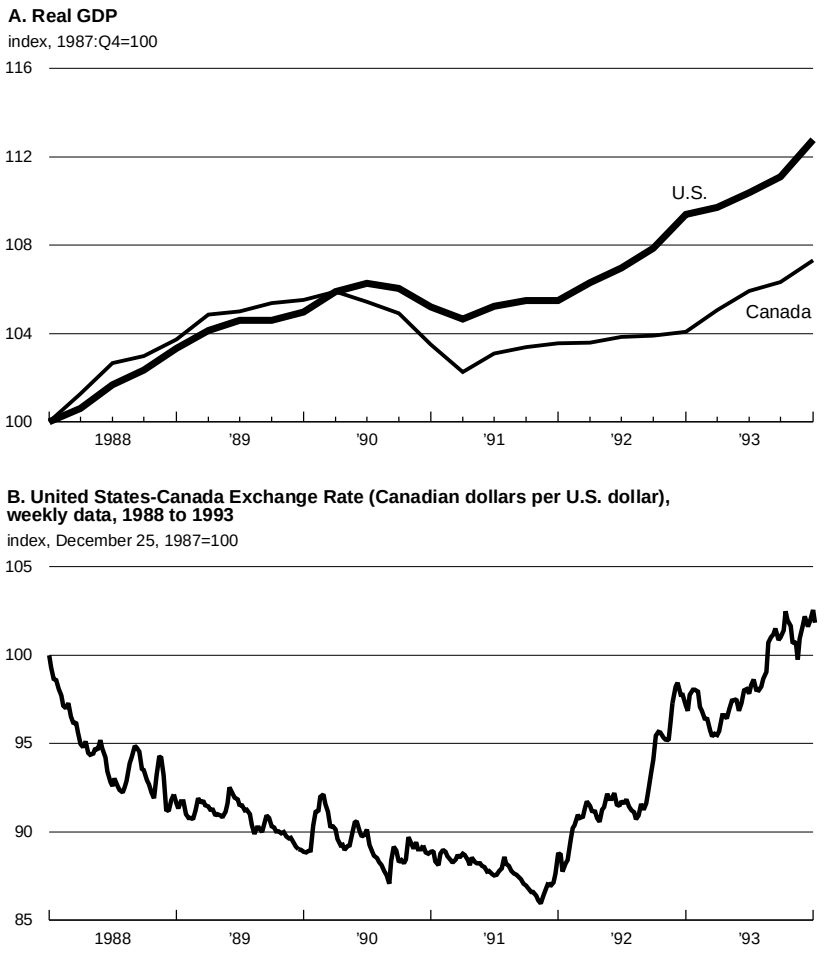
A related question asks how trade expands following a move to free trade. In the case of the USCAFTA, was this growth based on comparative resource endowments or did it take the form of increased intra-industry trade, or two-way trade in very similar products? The answer matters because expansion based on comparative advantage can produce some losers (the owners of the relatively scarce resources in the pre-trade era) among the many winners, whereas growing intra-industry trade (IIT) brings efficiency gains to producers in both countries and is thought to be less disruptive. Students of European integration usually conclude that the formation of the single European market has led to a big increase in two-way trade, a response that is widely credited for Europe's smooth adjustment to trade liberalization. Are the United States and Canada replicating the European experience?

A review of the basic facts about the USCAFTA will help place the following discussion in perspective. The pact ends all tariffs and removes or moderates many other barriers to the free flow of goods, services, and capital over a 10-year period starting on January 1, 1989. Products were divided into three tranches according to their perceived readiness for free trade. For the first tranche, covering about 15% of goods traded bilaterally and including computers and related equipment, tariffs were eliminated at the start of the pact. For the second tranche, covering another 35% of traded goods and including most machinery and telecommunications equipment, duties were scheduled to be reduced in five equal steps between January 1989 and January 1993. For the rest, tariffs were scheduled to be phased out in 10 equal installments.

Because Canada is the smaller economy and had the higher trade barriers when the agreement went into effect, analysts generally assumed that – other things equal – Canada would gain (and risk) more from free trade than the United States. Between 1988 and 1993, both countries' bilateral exports grew faster than did their nominal GDP. But, because Canadian exports to the United States were larger at the start and grew slightly faster than did U.S. exports to Canada, the United States' traditional merchandise trade deficit with Canada deteriorated modestly.

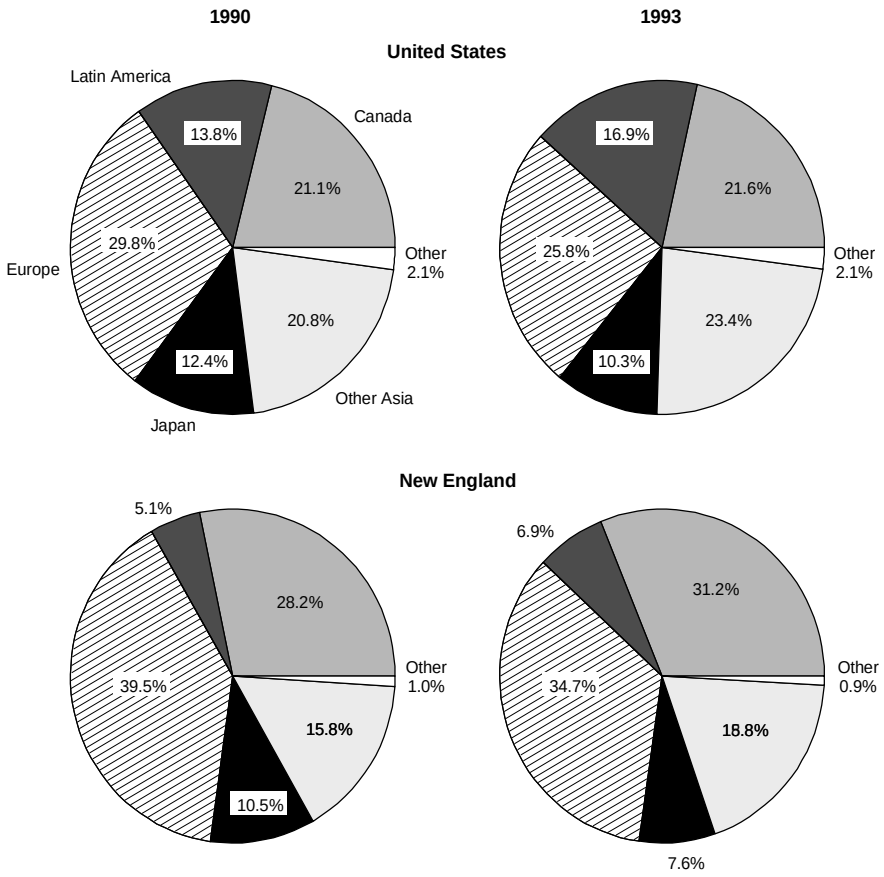
Actually, the deterioration was notably small, given the macroeconomic setting. As figure 1-panel A, shows, within a year after the start of the USCAFTA, both countries had tumbled into a recession that pummeled Canada harder than the United States. Thereafter, through 1993, the U.S. recovery outpaced the Canadian upturn. In addition, on balance, the U.S. dollar appreciated slightly against the Canadian dollar during this period (figure 1-panel B). Although these developments worked to discourage U.S. exports to Canada, as figure 2 shows, Canada was the one part of the industrial world to absorb a growing share of U.S. exports.

Figure 1 Real GDP, United States and Canada, Quarterly Data, 1988 to 1993



Source: Federal Reserve Board.

Figure 2 United States and New England Merchandise Exports by Region, 1990 and 1993 (percent)

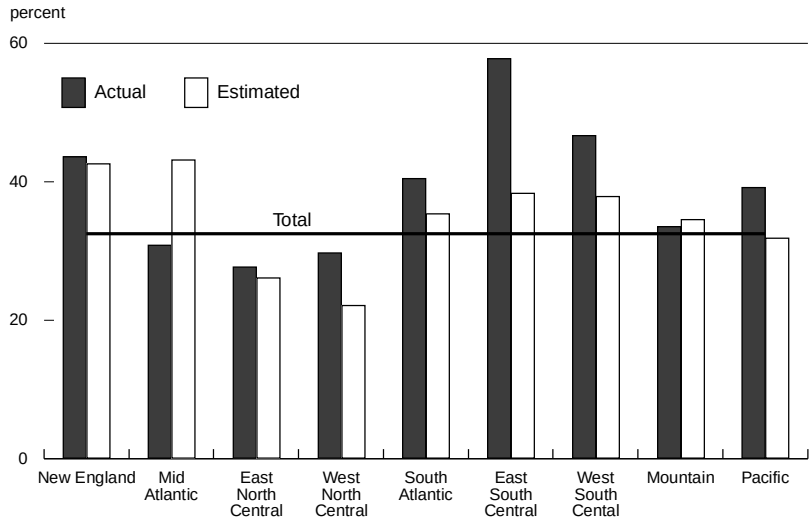


Source: Massachusetts Institute for Social and Economic Research.

Which U.S. regions enjoyed relatively fast bilateral export growth over this period? The shaded bars in figure 3, indicate that three regions, the East South Central, the West South Central, and New England met this condition. What explains the regional variations? One possible answer is differences in export product mix. Product mix matters because industries vary in their sensitivity to cyclical developments and in their level of maturity within the product cycle. In addition, since regional trade data (from U.S. or Canadian sources) are reported in nominal terms, differences in price developments across industries also affect regional export and import growth. Even within industrial sectors, price trends can vary markedly. In addition, with the USCAFTA, tariffs are falling at different rates across industries. Accordingly, failure to consider differences in product mix could lead to distorted impressions of relative export performance.

Figures 4 and 5 illustrate the big differences in export and import product mix for the United States and three U.S. regions. At this level of aggregation, transportation, industrial machinery, and electric machinery accounted for close to half of

Figure 3 Actual and Estimated* Growth in U.S. Exports to Canada, 1988 and 1993



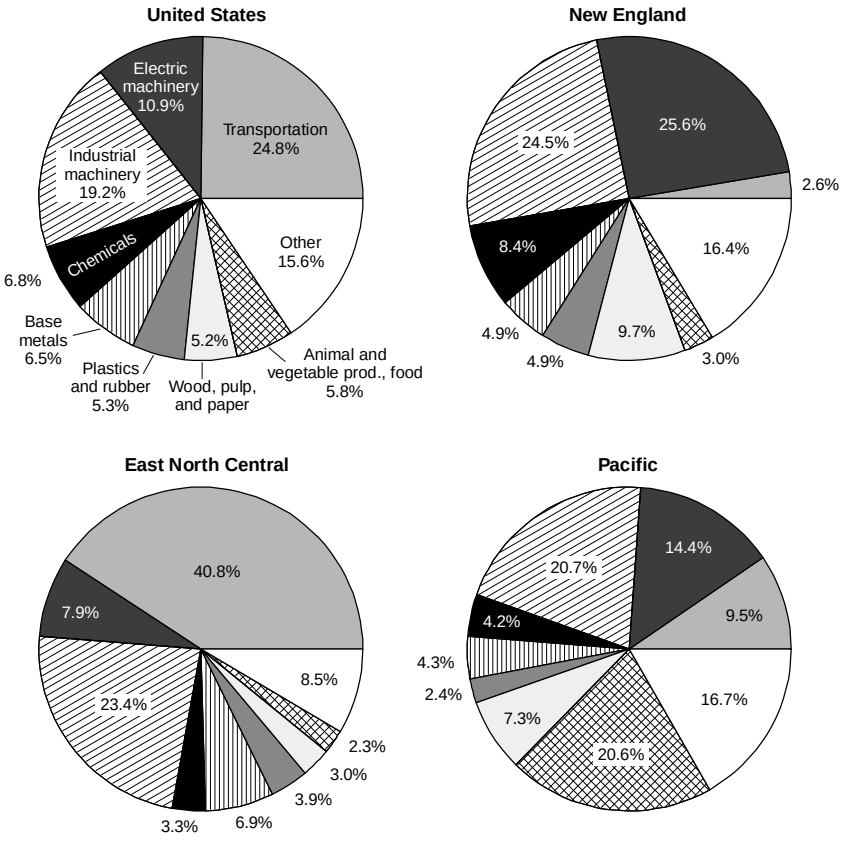
*Averages of indexes calculated at the 2- or 4-digit levels, weighted by each industry's share of total trade between the United States and Canada. Calculations for industries in Harmonized Codes 84 through 90 were based on 4-digit data. All other calculations were based on 2-digit data.

Source: Statistics Canada.

all U.S. merchandise exports to Canada in 1993. Yet, the regional variation from this national norm is considerable. For example, dependence on transportation alone ranges from over 40% of total merchandise exports in the East North Central to 3% in New England. Likewise, industrial and electric machinery account for over half of New England's merchandise exports to Canada but for about 30% of exports from the East North Central.

Although these graphs give some local texture to the national trade picture, they still hide important regional differences in the composition of trade. Using Statistics Canada data allows examination of regional differences in product mix at a more satisfactory level. One finds, for instance, that within industrial machinery, computer disk drives and related products account for over half of this sector's exports from New England, the Pacific, and the Mountain states, compared with just 20% for the nation. By contrast, in the East North Central region, the major industrial machinery exports are spark ignition engines and parts, followed by air conditioners. In electric and electronic equipment, integrated circuits make up almost 60 percent of New England's total, compared with just 14% for the nation. But in the East North Central, insulated wire and cables and internal combustion engines are the top electric equipment exports. In transportation, the bulk of the nation's trade with Canada is in cars, trucks, and parts – naturally, because the Auto Pact established free trade in autos between the United States and Canada in 1965. By exception, aircraft and parts account for almost 40 percent of transportation exports from New England (and an even higher share in the Pacific). In sum, this litany underscores the

Figure 4 Industry Share of U.S. Exports to Canada, 1993



Source: Statistics Canada.

need to adjust U.S. regional export growth rates for differences in industry mix.all U.S. merchandise exports to Canada in 1993. Yet, the regional variation from this national norm is considerable. For example, dependence on transportation alone ranges from over 40% of total merchandise exports in the East North Central to 3% in New England. Likewise, industrial and electric machinery account for over half of New England's merchandise exports to Canada but for about 30% of exports from the East North Central.

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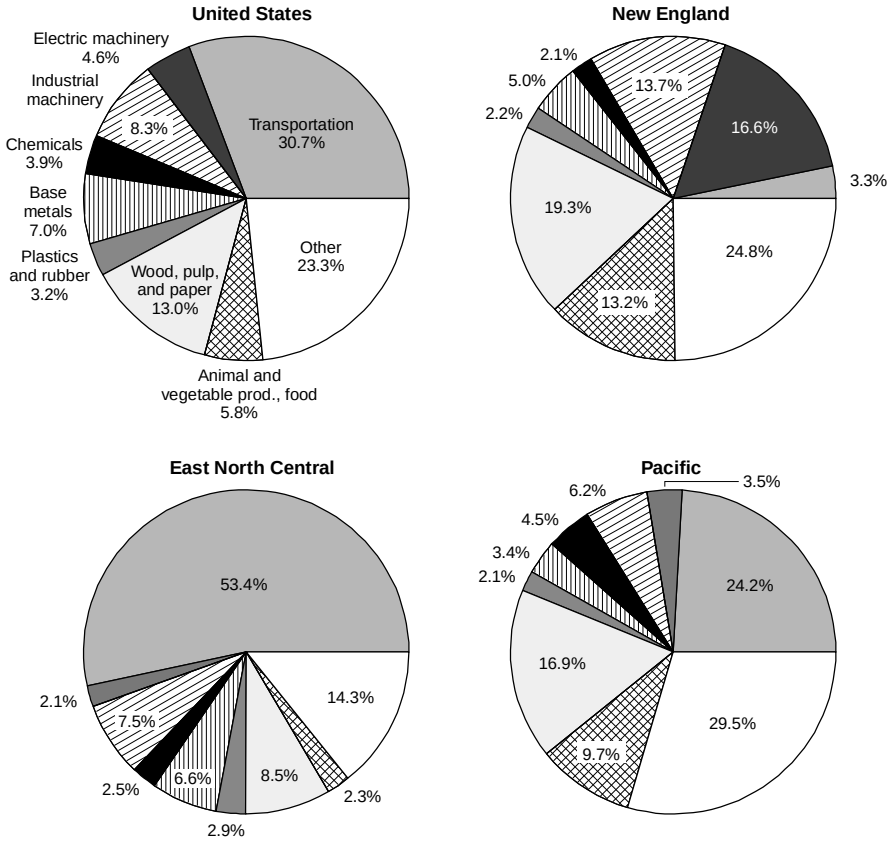
Figure 5 Industry Share of U.S. Imports from Canada, 1993



Source: Statistics Canada.

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Accordingly, figure 3 compares the actual export growth rate (shaded bars) for each U.S. region with its expected export growth rate, given its industry mix at the 2- or 4-digit level (unshaded bars). More precisely, the unshaded bars show estimates of each region's export growth assuming that each industry's exports from that region had grown at its U.S. average pace. Seemingly, the Mid-Atlantic, New England and the East South Central had the most favorable export mix for Canada, while the East

and West North Central regions had the least favorable export base, undoubtedly because autos loom large in those regions. Auto-related trade grew relatively slowly because that sector has enjoyed free trade since 1965 and the recession on both sides of the border had its usual adverse cyclical impact.

The data in figure 3 also suggest that actual and expected growth rates often differ considerably. The regions that performed about as well as or worse than expected were New England, the East North Central, the Mid-Atlantic, and the Mountain states, mostly mature manufacturing areas. Actual performance generally exceeded expectation in the South and West. What explains the size of these gaps? As figure 6 shows,the Frost Belt's share of production worker jobs and value added has fallen quite sharply during the latter years of the period examined, as manufacturers have shifted production west and south. This shift in domestic manufacturing activity has most likely carried export activity with it.

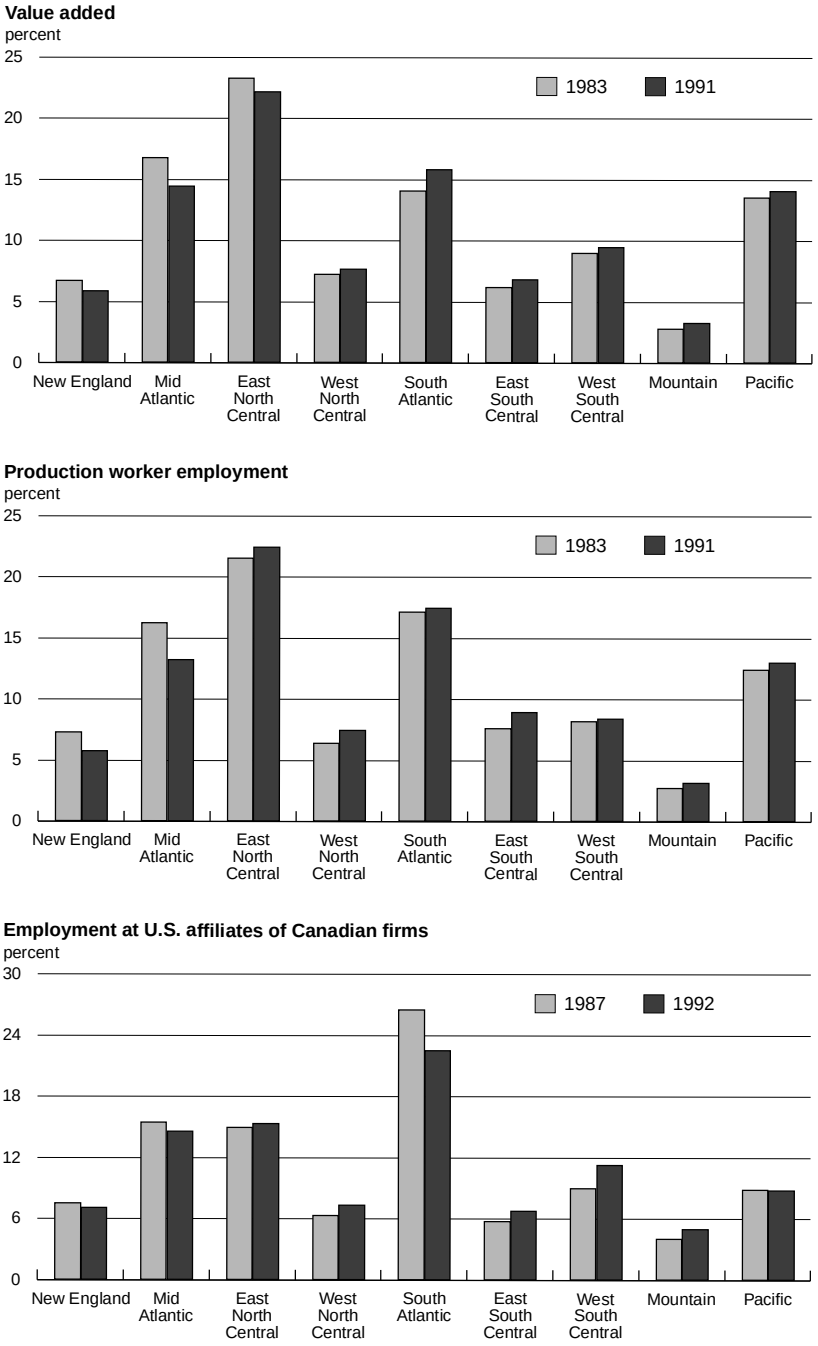
Changes in the location of Canadian direct investments might also affect regional export growth, because intra-firm transactions account for about one-third of all U.S. merchandise trade. And again, Canadian firms are increasing affiliate activity in the middle and western parts of the country. By contrast, in the East Coast regions, which once attracted a relatively large share of Canadian affiliate jobs, that share has fallen. These investment shifts may simply reflect the relocation of domestic activity. But, with the USCAFTA, Canadians can serve much of the single market from Canadian plants or from early, tariff-jumping affiliates, which were often located close to the Northeast border. Now new facilities can be placed to minimize transportation costs and delivery times in other parts of the market. The transformation of the USCAFTA into NAFTA may also have added to the allure of locations in the Southwest.

U.S. and Canadian firms also appear to have responded to increased integration by changing the role of their foreign affiliates. In theory, declines in trade barriers are likely to encourage firms to maximize plant scale economies. Thus, firms may consolidate production in locations determined by comparative advantage. Alternatively, firms may seek to restructure existing plants in order to supply specialized products to the integrated market–especially if firms have sunk costs in affiliates created to avoid trade barriers.

So far, the evidence suggests that U.S. and Canadian firms, like the Europeans, are choosing to stress plant scale economies and, thus, trade. Tables 1 and 2 show that U.S. and Canadian firms have begun to refocus and downplay foreign affiliate activities. Many U.S. firms first established Canadian subsidiaries to avoid trade barriers. Now these Canadian affiliates are beginning to serve the entire integrated market – instead of the Canadian part – to a greater extent than before. As table 1 indicates, sales to the U.S. market rose as a share of total Canadian affiliate sales, while sales to Canadians fell as a share of that total. For affiliates of U.S. firms located in other areas included in table 1, the pattern was reversed, with the host country share rising and the U.S. share falling. In addition, U.S. and Canadian affiliates have grown at a comparatively slow pace, whether that expansion is measured by number of affiliates, assets, sales, or employment (table 2). Indeed, affiliate jobs (at Canadian affiliates of U.S. firms or U.S. affiliates of Canadian firms) actually fell, unlike employment at affiliates in/from other industrial countries. Since U.S.-Canadian trade has grown relatively fast, the comparatively slow growth of their affiliates suggests that U.S.

Figure 6

Regional Shares of U.S. Value Added, Production Worker Employment, and Employment at U.S. Affiliates of Canadian Firms



Source: U.S. Bureau of the Census, U.S. Bureau of Economic Analysis.
Note: Percentages will not add to 100 because nonallocated is not included.

Table 1 Sales of Majority-Owned Foreign Affiliates* of U.S. Firms*, by Selected Customer, 1987 and 1992 (percent)

	Sales to U.S.		Sales to Host Country	
	1987	1992	1987	1992
All Countries	10.9	10.1	66.1	65.9
Canada	23.1	26.1	73.6	71.1
Europe	4.6	3.8	63.4	64.0
Latin America	20.3	19.7	62.6	64.2
Mexico	29.4	24.7	64.6	72.6
Asia Pacific	28.0	11.3	40.6	70.8
Japan	6.5	4.7	86.6	89.0

*Nonbank
Source: U.S. Bureau of Economic Analysis.

Table 2 Growth in Foreign Affiliates* of U.S. Parents*, 1987 to 1992 (percent)

	Sales	Employment
All Countries	50.0	7.3
Canada	26.9	-3.9
Europe	52.5	7.0
France	47.8	13.3
Germany	56.4	5.2
United Kingdom	48.1	15.1
Japan	42.7	14.7

* Nonbank
Source: U.S. Bureau of Economic Analysis.

Growth in U.S. Affiliates* of Foreign Parents*, 1987 to 1992 (percent)

	Sales	Employment
All Countries	64.2	45.9
Canada	24.7	–0.8
Europe	65.3	48.9
France	110.4	91.0
Germany	61.0	41.7
United Kingdom	52.2	48.5
Japan	79.2	104.2

* Nonbank
Source: U.S. Bureau of Economic Analysis.

and Canadian firms are shifting the focus of their bilateral activities from direct investment to trade. The fall in affiliate trade as a share of total trade is consistent with this hypothesis (table 3).

If U.S. and Canadian firms are addressing their increasingly integrated market by emphasizing trade rather than investment, is this trade based on comparative advantage or has the share of IIT also increased? When trade expansion is based on the uneven distribution of resources, welfare improves overall, but the transition can be disruptive. When two-way trade expands, firms on both sides of tariff reductions make efficiency gains by focusing on different, complementary parts of their previous set of products – fine paper versus newsprint, for example, or different types of semiconductors. This type of adjustment is generally seen as less disruptive, and economists often claim that European adjustment to free trade has been relatively easy because integration led to a big rise in IIT.

Will trade liberalization produce the same outcome in North America? The verdict is not yet in. But judging from the data in table 4, at the national level, U.S.-Canadian trade has generally expanded on a net basis as comparative advantage would suggest. Interpreting a trade surplus in a given industry as revealing comparative advantage, table 4 indicates that the United States enjoyed an advantage over Canada in nine industries in 1988: vegetable products; chemicals; rubber and plastics; textiles; stone, clay and glass; industrial machinery; electrical machinery; instruments; and arms. As table 4 also shows, these U.S. industries generally had an even bigger surplus in 1993, while most Canadian industries with a comparative advantage over their U.S. competitors in 1988 also enjoyed net gains.

Regionally, however, it is less clear that net trade expanded according to comparative advantage. In New England, for example, in over half the industries examined, a trade surplus observed in 1988 had either shrunk or shifted to the other side of the border by 1993. The East North Central had an experience similar to New

Table 3 Affiliate Trade as a Share of Total Trade with Canada (percent)

	1988	1992
	U.S. Exports to Canada	
U.S. Affiliates to Canadian Parent Group	1.5	1.6
U.S. Parent to Canadian Affiliates	42.7	36.8
Other U.S. to Canadian Affiliates	17.2	16.5
Other Unaffiliated Trade	38.6	45.1
	U.S. Imports from Canada	
Canadian Parent Group to U.S. Affiliates	8.2	7.0
Canadian Affiliates to U.S. Parent	7.1	6.5
Canadian Affiliates to Unaffiliated U.S.	35.9	36.2
Other Unaffiliated Trade	48.8	50.3

Source: U.S. Bureau of Economic Analysis.

Table 4 U.S. Trade Balance with Canada by Industry Category, 1988 and 1993
(millions of Canadian dollars)

Code	Description	1988	1993
1-5	Animal Products	–1,826.1	–2,585.0
6-14	Vegetable Products	1,279.3	1,223.4
15	Fats, Oils, and Waxes	–15.5	–141.3
16-24	Prep Foodstuffs, Beverages, Tobacco	–129.1	–626.8
25-27	Minerals	–9,009.5	–16,098.2
28-38	Chemicals and Allied Products	109.8	1,862.9
39-40	Plastic and Rubber	1,110.7	1,141.7
41-43	Hides, Skins, Leather, etc.	–35.4	–68.1
44-46	Wood and Articles	–3,605.3	–7,098.5
47-49	Pulp and Paper	–7,948.2	–6,568.2
50-63	Textiles	816.0	1,033.9
64-67	Footwear	–14.5	–38.1
68-70	Stone, Ceramics, Glass	350.8	582.5
71	Pearls, Stones, Jewelry	–102.4	–1,134.4
72-83	Base Metals and Articles	–4,224.5	–3,195.8
84	Industrial Machinery	8,475.7	9,296.1
85	Electric and Electrical Machinery	4,408.1	5,458.1
86-89	Transportation	–6,823.7	–18,026.9
90	Instruments, Scientific and Measuring	1,610.8	2,451.0
91-92	Instruments, Photographic and Musical	54.6	41.6
93	Arms	125.0	212.5
Total*		–14,830.2	–36,669.1

*Including industries not shown.

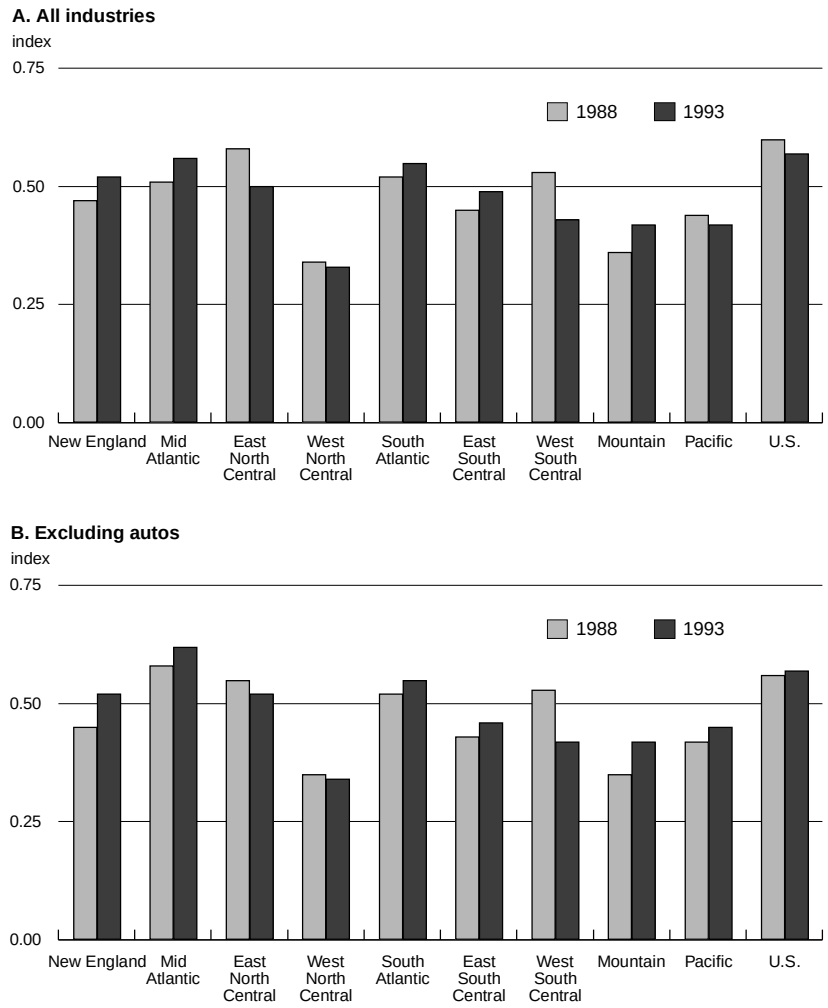
Source: Statistics Canada.

England's, with, for example, a surplus in rubber and plastics and a deficit in chemical products both declining. By contrast, in the Pacific, East South Central and West South Central regions, the comparative advantages demonstrated in 1988 generally became more pronounced.

Of course, even where net trade expanded according to comparative advantage, the proportion of two-way trade could also have grown. But did it? In 1988, prior to USCAFTA, over half of U.S.-Canadian trade was intra-industry, according to a weighted-average index of IIT measured nationally (figure 7). Naturally, however, at the regional level, the share of two-way trade was lower than that found nationally, since geographic aggregation, like industry aggregation, increases measured IIT. In 1988 the regional indexes of IIT ranged from 0.34 in the West North Central to 0.58 in the East North Central.

Has the proportion of IIT increased since the USCAFTA went into effect? In contrast to the European experience, the data in figure 7-panel A, indicates that the share of two-way trade seen nationally fell very slightly, although IIT rose considerably in five of nine regions. The four regions with stable or declining IIT were those where resource-based goods or automotive products weigh heavily in the export base. Because the United States and Canada already enjoyed free and extensive two-way trade in autos and parts when the USCAFTA went into effect, a *relative* surge in non-auto trade in response to newly declining trade barriers (and, possibly, in response to cyclical pressures on auto sales) might explain much of the decline in IIT. Consequently, figure 7-panel B, also contains measures of IIT calculated for all industries

Figure 7 Index of U.S.-Canadian Intra-Industry Trade*



*Averages of indexes calculated at the 2- or 4-digit levels, weighted by each industry's share of total trade between the United States and Canada. Calculations for industries in Harmonized Codes 84 through 90 were based on 4-digit data. All other calculations were based on 2-digit data.

Source: Statistics Canada.

excluding autos. As expected, the special case of the U.S.-Canada Auto Pact explains the national decline in IIT, and excluding autos increases the *rise* in IIT in most regions.

Still, even excluding the auto industry, the national increase in IIT is not large. Moreover, this national aggregate hides a good deal of regional variation. While IIT rose considerably in New England and the Mountain states, for example, it fell in the West South Central and was little changed in the East and West North Central. Significantly, computer-related products and semiconductors, which are highly differentiated and labor-intensive, and might be expected to be characterized by IIT, account for a large or growing share of total trade with Canada in New England and

the Mountain states, whereas in the West South Central chemicals and other resource-based products tend to be important. Moreover, several regions with relative increases in IIT have had long-standing investment links with Canada. It seems plausible, therefore, that companies with investments on both sides of the border chose to seek economies of scale through specialization and two-way trade rather than to face the cost – financial or political – of closing existing plants. In other words, changes in measured IIT seem to reflect the relative importance of resource-based versus labor-intensive manufacturing and shifts in the location of production activity domestically as well as internationally.

Finally, table 5 contains an index of structural change for each region, a measure of changes in the industrial composition of exports and imports between 1988 and 1993. Two facts are apparent. First, structural change is much greater at the regional level than national data would suggest. Second, regions with a relatively big increase in IIT often experienced a relatively large amount of structural change in exports or imports. In other words, contrary to conventional wisdom, it is not clear that rising two-way trade necessarily smooths the transition to free trade. But, just as establishment-level data reveal that gross job flows generally far exceed net flows as employment constantly shifts from contracting to expanding businesses, so too detailed trade data suggest that a surprising amount of volatility may be part of a normal, healthy adjustment to trade liberalization.

Does this research have any implications for the East North Central or New England? Very early results from regression analysis done at the state level confirm that, holding industry mix constant, state export growth to Canada from 1988 to 1993 is positively related to growth in state population (or production worker employment) and the presence of a metro area. On the other hand, it is negatively linked to the increase in average hourly wages since 1987 and the distance from Toronto. Accordingly, if domestic economic activity continues to shift south and west, export growth in

Table 5 Index of Structural Change* in the Industrial Composition of U.S. Exports and Imports to and from Canada, 1988 to 1993

	U.S. Exports	U.S. Imports
New England	0.18	0.29
Mid-Atlantic	0.21	0.20
East North Central	0.17	0.13
West North Central	0.20	0.18
South Atlantic	0.25	0.37
East South Central	0.29	0.28
West South Central	0.18	0.39
Mountain	0.35	0.35
Pacific	0.19	0.23
United States	0.13	0.14

*Averages of indexes calculated at the 2- or 4-digit levels, weighted by each industry's share of total trade between the United States and Canada. Calculations for industries in Harmonized Codes 84 through 90 were based on 4-digit data. All other calculations were based on 2-digit data.

Source: Statistics Canada.

New England and the East North Central is likely to appear relatively subdued. Similarly, while geography is an advantage when the market is Canada, it becomes a disadvantage when markets are in rapidly growing areas in Latin America and South East Asia. More positively, the links between the large metropolitan areas and export growth emphasize the importance of Chicago and Boston to their surrounding regions. They also underscore the need to understand and nurture the agglomeration economies that make these cities attractive to multinational companies.

Note

[1]Regions used here are identified by U.S. Census Regions: New England—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; Middle Atlantic—New York, New Jersey, Pennsylvania; East North Central—Ohio, Indiana, Illinois, Michigan, Wisconsin; West North Central—Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas; South Atlantic—Delaware, Maryland, D.C., Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida; East South Central—Kentucky, Tennessee, Alabama, Mississippi; West South Central—Arkansas, Louisiana, Oklahoma, Texas; Mountain—Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada; Pacific—Washington, Oregon, California, Alaska, Hawaii.