

# North American Integration in Agriculture: A Survey

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## INTRODUCTION

Integration of the Canadian, US, and Mexican agricultural sectors has proceeded rapidly over the past decade and shows potential to continue apace for the foreseeable future. For some products, the significance of international borders has declined to such an extent that one North American market can be said to exist.

The word “integration”, as used in this chapter, is synonymous with the term “market integration.” Market integration is the combination of two formerly separated national or regional markets. The level of integration varies greatly among trade partners, across sectors, and over time. Hence, one can think of a continuum ranging from completely segmented to perfectly integrated area markets. An integrated market consists of two or more economically interdependent but spatially separate markets in which there are no barriers that distort trade and investment activities across borders.

In the real world, national markets are seldom so perfectly integrated, but there is definitely a sense that the agricultural markets of Canada, the US, and Mexico are more integrated than they were ten to fifteen years ago. Through the Canada-US Free Trade Agreement (CUSTA) and the North American Free Trade Agreement (NAFTA), the three

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countries have swept away numerous barriers to trade and established clear standards for the treatment of investors, among other accomplishments. Economic linkages among the three economies have increased dramatically – taking the form of trade in goods and services, portfolio and direct investment, more elaborate contractual relationships, and price co-movements among national markets for identical commodities and products.

This chapter surveys the economic literature about North American integration in the agrifood sector. The purpose of this survey is twofold: to summarize the lessons learned so far and to identify areas where further research could be valuable to policy discussions. As the integration of North American agriculture progresses, the range of agrifood policies with strictly domestic effects will become increasingly narrow. Thus, policymakers in North America need to consider the effects that their decisions will have on other NAFTA countries, as well as the impact that decisions by other NAFTA governments will have at home.

The chapter is organized as follows. The second section identifies the major factors contributing to integration and comments on their relative importance. The third section summarizes research into the indicators of integration. These studies focus on price co-movements and trade flow data. The fourth section outlines the state of current knowledge regarding foreign direct investment in the agrifood sector, while the fifth section assesses the impact of integration on the structure and performance of the sector. The sixth section discusses opportunities for further integration in the sector, and the final section concludes the chapter. Throughout the chapter, gaps in the knowledge base are highlighted, along with suggested areas for further research.

## **FACTORS CONTRIBUTING TO INTEGRATION**

Many factors contribute to the integration of the North American agrifood sector, some of which are under the direct control of policymakers and some of which are not.

### **Geography and Culture**

Numerous gravity models have confirmed that geographic and cultural factors such as proximity, a common language, and a shared border positively influence the level of international trade among countries (Diao, Roe, and Somwaru). In the case of the NAFTA countries, trade and investment liberalization has helped them to take better advantage of their geographic proximity and cultural similarities. Although the countries of North America lack a common language, this seems to be

less of an obstacle than in the past, due in part to the expanded use of Spanish in the US and of English in Mexico.

### **Advances in Transportation, Storage, and Communication**

Improvements in transportation, storage, and communication over the past four decades have made international trade possible in a much broader range of agricultural products, a point emphasized by Wang et al. Examples of such improvements include: detailed, “real-time” tracking and monitoring of shipments; greater use of intermodal transportation systems, such as tractor-trailer containers that can also be shipped by rail or by sea; and developments in climate control, packing, and bioengineering that reduce the spoilage and deterioration of food products during transit. In a gravity-model analysis of US agricultural exports, the authors conclude that such improvements have a commodity-specific influence, with the impact of distance on trade declining over time for certain perishable and processed products.

### **Macroeconomic Factors**

Research shows that the GDP growth rate and the exchange rate have large impacts on agricultural trade (Ndayisenga, Orden). Economic growth is often the driving factor behind increased regional integration, as firms seek to take advantage of economic opportunities in neighboring countries. Moreover, unexpected economic downturns, such as those that occurred in Mexico in late 1994 and 1995 and in the US in 2000 and 2001, can have a negative influence on market integration and trade insofar as they disrupt the profitability of investments that might have been reflective of greater integration over the long term. Fluctuations in exchange rates can be an impediment to economic integration, as they increase risks associated with international transactions. Research suggests that exchange rate variability has a significant negative impact on growth of agricultural trade (Cho, Sheldon, and McCorriston).

### **Domestic Policy Changes**

Agricultural trade within North America began to increase much more rapidly than extra-regional trade in the mid-1980s (Vollrath, 2001). This predates the implementation of both CUSTA and NAFTA, which implies that other factors have helped to stimulate continental integration. Empirical evidence shows that unilateral trade reforms made by Mexico during the early 1990s greatly stimulated US agricultural exports to Mexico. Using a modified gravity model, Zahniser et al. (2004) find that these reforms accounted for an estimated 39 percent of US agricultural exports to Mexico during 1990 to 1998.

Another action that has stimulated integration is the adoption of more market-oriented farm supports by the NAFTA countries. The 1990s featured a burst of activity in this area, with many support programs being designed so that they have minimal impacts on international trade. In 1994, Mexico started a program of direct payments to farmers (PROCAMPO), and it ended its system of guaranteed producer prices during the course of the 1990s. Through the Federal Agriculture Improvement and Reform (FAIR) Act of 1996, the US weakened the link between farm supports and commodity prices and gave producers much greater planting flexibility. The Farm Security and Rural Investment Act of 2002, which provides the legal framework for most US farm programs through 2007 crops, generally retains this market orientation. Canada introduced both the Gross Revenue Insurance Program (GRIP) and the Net Income Stabilization Accounts (NISA) in 1991, but began to phase out the GRIP in 1996. The movement away from production and price-linked support has helped to reduce the distorting effects of government support for agriculture, and many believe that they have favored intra-regional trade (Diao, Roe, and Somwaru; Burfisher, Robinson, and Thierfelder).

### **Regional Trade Agreements**

CUSTA and NAFTA have eliminated numerous tariff and quantitative restrictions on agricultural and food trade among Canada, Mexico, and the US. Implementation of CUSTA's tariff-elimination schedule was completed on 1 January 1998, and just a handful of agricultural commodities in NAFTA's tariff and quota-elimination schedule remain to be liberalized, with the transition to free trade ending on 1 January 2008. In addition, CUSTA prohibited the use of export subsidies on Canada-US trade, while NAFTA included rules which are intended to facilitate foreign direct investment in the region. Trade and investment liberalization under NAFTA serves not only to increase the volume of cross-border economic activities; it also reduces the risks associated with these activities by "locking in" a sweeping set of policy reforms in the three participating countries.

### **Uruguay Round Agreement on Agriculture**

Of the three pillars of trade liberalization identified by the World Trade Organization (WTO) – market access, domestic support, and export subsidies – CUSTA and NAFTA focus almost exclusively on market access. Thus, it is important to consider the impact of multilateral agreements – in particular, the Uruguay Round Agreement on Agriculture (URAA) on agricultural policies and regional integration. The URAA came into force on 1 January 1995, just one year after NAFTA. It contains binding commitments on market access, domestic support,

and export subsidies that were implemented by 2001.<sup>2</sup> Perhaps the URAA's strongest provisions concern export subsidies. These disciplines resulted in significant changes to Canada's grain transportation and marketing policies, changes that helped to further North American integration. Internal transport subsidies that apply to exports only, such as the subsidies provided (as part of the Western Grain Transportation Act, or WGTA) to Canadian railways for the movement of grain to ocean ports, were deemed to be export subsidies and were therefore subject to reduction commitments. In response to WTO disciplines, as well as fiscal pressures at the federal level, the Canadian government repealed the WGTA in 1995. The elimination of grain transportation subsidies favored continental trade in grain and livestock. It also encouraged western Canadian producers to keep more grain in the prairies for livestock production, much of which is exported to the US in the form of either live animals or meat (Doan, Paddock, and Dyer).

Another important aspect of the URAA is the restrictions that it places on trade-distorting forms of domestic support to agriculture. This has led many of the signatory countries to design farm programs that have a minimal influence on production and trade. In North America, PROCAMPO, the Canadian Agricultural Income Stabilization (CAIS) program, and the US direct-payment program are all examples of this effort.

## **INDICATORS OF PRODUCT-MARKET INTEGRATION**

Studies that quantify the integration of North American product markets may be divided into two categories: those that are based on the value and composition of trade flows, and those that are based on price data.

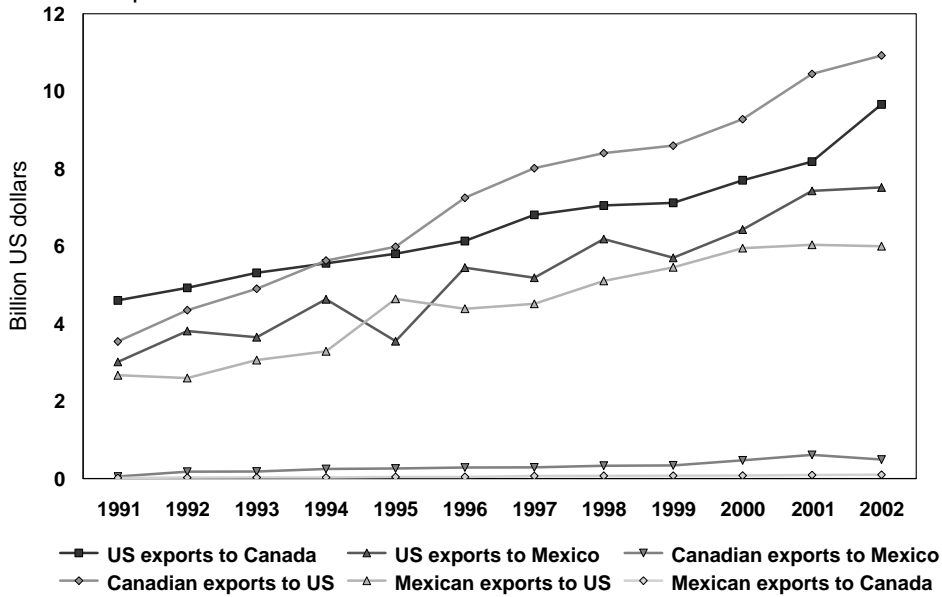
### **Trade Data**

The dramatic growth of agricultural trade within North America during the CUSTA-NAFTA period is one indication of increased market integration within the sector. Each NAFTA partner has participated in this expansion of trade (Figures 4.1-4.2), which has occurred across a broad range of commodities. Generally speaking, North American producers are devoting proportionately greater attention to the continental market (Figure 4.3). During the period 2000 to 2002, almost two-thirds (66 percent) of Canada's agricultural exports were destined for North American markets, compared with just 46 percent during 1991 to 1993. Similarly, North America's share of US agricultural exports rose from 20 to 29 percent across the same two periods, while its share

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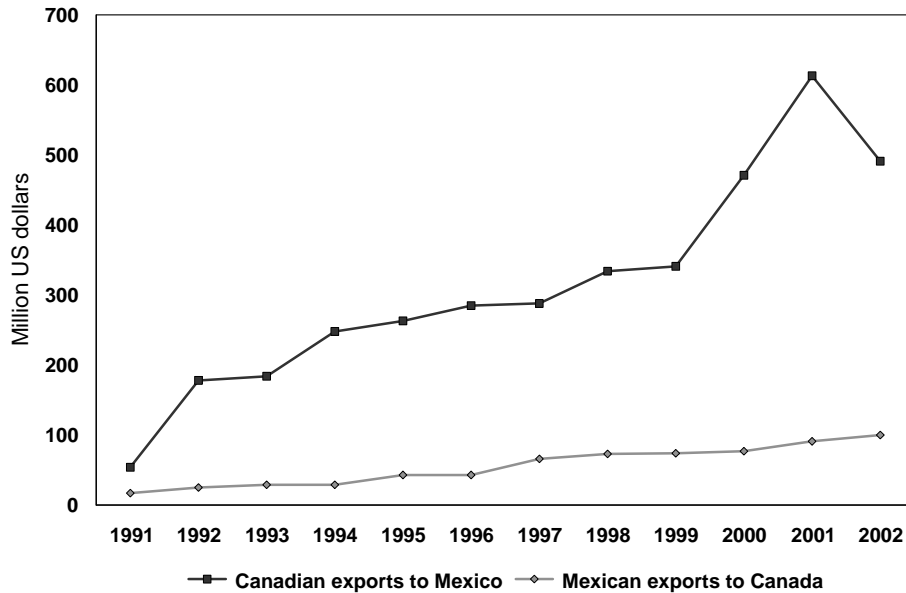
<sup>2</sup> Developing countries, including Mexico, have an additional 4 years to implement their URAA commitments.

**Figure 4.1:** Agricultural trade within the NAFTA region has grown tremendously during the CUSTA-NAFTA period.



**Source:** United Nations Statistical Office, as compiled by US Department of Agriculture, Foreign Agricultural Service (2004).

**Figure 4.2:** Agricultural trade between Canada and Mexico has experienced solid growth, but is still much smaller than Canada-US and Mexico-US agricultural trade.

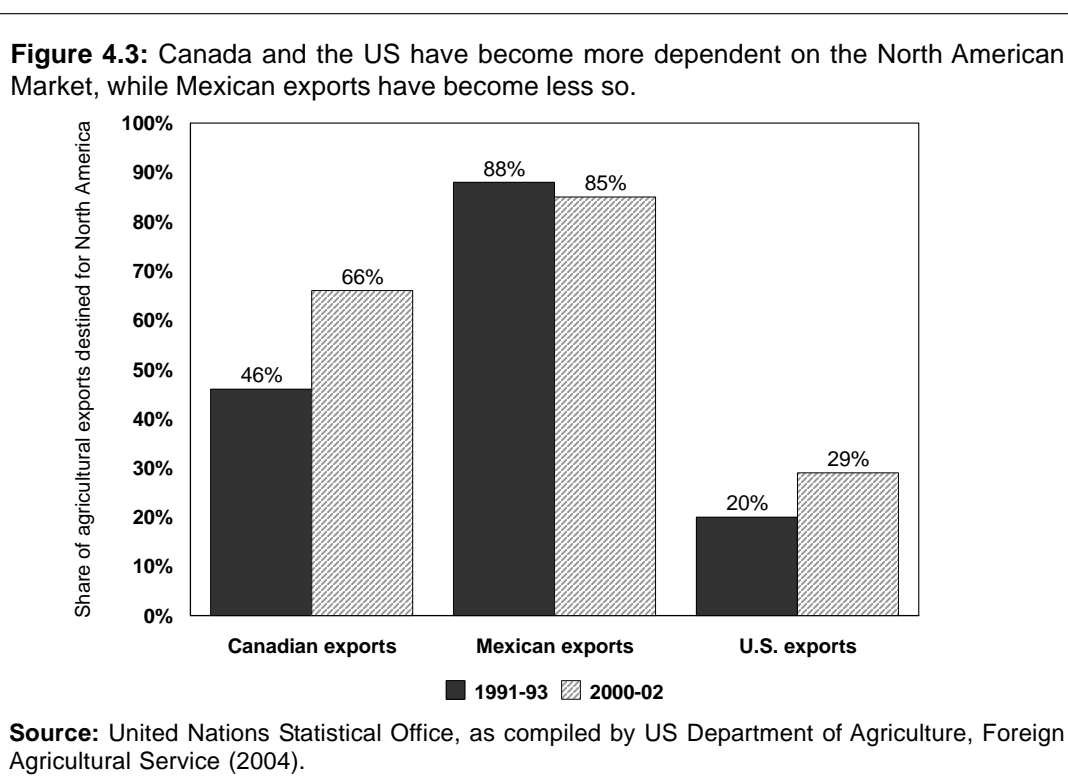


**Source:** United Nations Statistical Office, as compiled by US Department of Agriculture, Foreign Agricultural Service (2004).

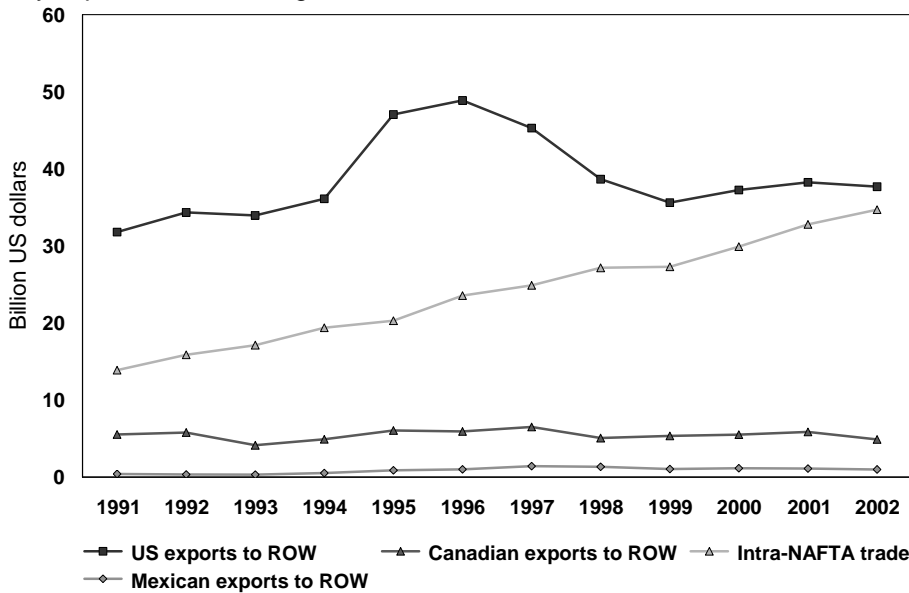
of Mexican agricultural exports fell slightly from 88 to 86 percent. Despite North America's growing share of US exports, Canada and Mexico continue to be more dependent on the US market than the US is on Canada and Mexico combined.

The expansion of agricultural trade within North America contrasts sharply with the experience of Canadian and US exports to countries outside NAFTA (Figures 4.4-4.5). Such exports actually declined during the late 1990s for a variety of reasons – including the financial crisis in Asia, the relatively weak currencies of key importing countries, and the growing competitiveness of producers in such countries as Brazil and Argentina (Jerardo; Schnepf, Dohlman, and Bolling). Mexican agricultural exports to the countries outside of NAFTA were an exception to this pattern. Such exports more than doubled during the 1990s, but Mexican exports to non-NAFTA countries still constitute a small fraction of the country's total agricultural trade.

Further evidence of the close integration of the North American market may be obtained from bilateral trade-intensity indices (BTIs) (Brown). The BTI measures the relative importance of a specific exporter in

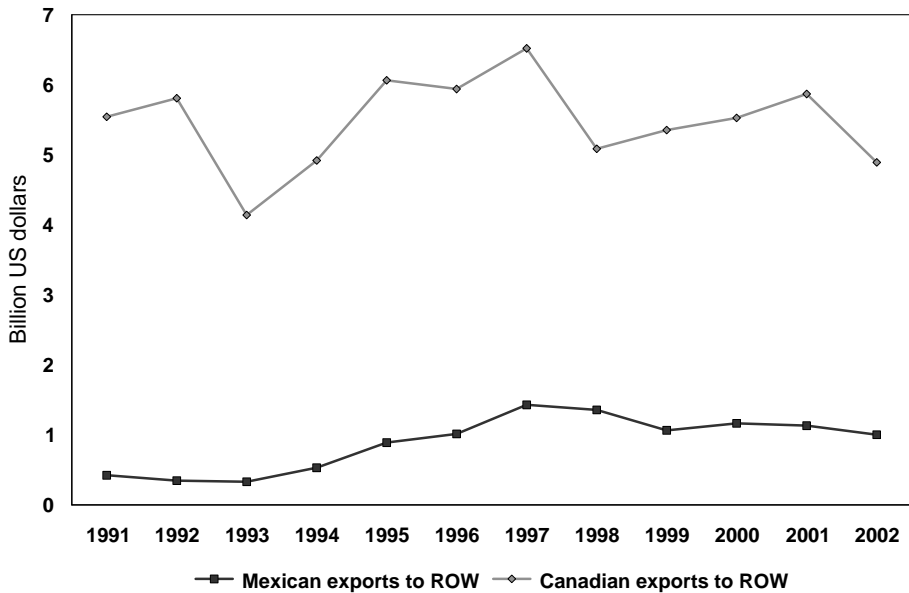


**Figure 4.4:** Agricultural exports by the NAFTA countries to the rest of the world (ROW) generally experienced limited growth in the late 1990s.



**Source:** United Nations Statistical Office, as compiled by US Department of Agriculture, Foreign Agricultural Service (2004).

**Figure 4.5:** Mexican agricultural exports to countries outside NAFTA generally increased during the 1990s, while Canada's experience was similar to that of the US.



**Source:** United Nations Statistical Office, as compiled by US Department of Agriculture, Foreign Agricultural Service (2004).



supplying imports to a particular country, compared with other supplying countries. For example, the BTI for Canadian exports to the US equals:

$$BTI_{\text{Canada-to-US}} \equiv \left( \frac{\text{Canadian exports to the US}}{\text{World exports to the US}} \right) \bigg/ \left( \frac{\text{Canadian exports to the world}}{\text{World exports to all countries but Canada}} \right)$$

BTIs for North American agricultural trade confirm what many people already sense – that intra-NAFTA trade is relatively more important to each member country than extra-NAFTA trade (Vollrath 2003). For Canada-US agricultural trade, this heightened importance is stronger for Canadian exports than it is for US exports. During 1999 to 2001, the BTI for Canadian exports to the US was about six, while the BTI for US exports to Canada was about four. This means that the Canadian share of US agricultural imports was about six times the Canadian share of the rest of the world’s agricultural imports; while the US share of Canadian agricultural imports was about four times the US share of the rest of the world’s agricultural imports. Similarly, for Mexico-US agricultural trade, the BTI for Mexican agricultural exports to the US is larger than the BTI for US agricultural exports to Mexico (seven versus five). Since the mid-1990s, the BTIs for both Canadian and Mexican exports to the US have declined due to a large increase in US imports from countries outside NAFTA.

The composition of agricultural trade within the NAFTA region also provides many insights into market integration and specialization. Many commodity producers in North America now view the entire continent as a single market for their final goods. Mexican breweries, for example, have emerged as a major force in the US and Canadian markets. In fruits and vegetables, Mexico has greatly increased its exports to the US since NAFTA’s implementation, and Canada has become an important supplier of vegetables to the US over the past 15 years. Moreover, US fruit and vegetable producers have long been active in the Canadian market and are becoming more so in the Mexican market, thanks in part to the close ties between US producer-exporters and supermarket chains operating in Mexico (Tropp et al.).

Among meat products, there is growing intra-industry trade for consumer products between Canada and the US in beef and pork. Moreover, US beef and pork exports to Mexico have roughly tripled in volume under NAFTA. Exports to Mexico include not only cuts that are popular in the US, but also “variety meats” that many Mexicans view as delicacies. Intra-industry trade in consumer agricultural products between Canada and the US includes highly processed products other than meat, such as pasta, cookies, and candy. To date, intra-industry trade in such products between Mexico and the US has been fairly limited, although this may change in the future. Qasmi and Fausti

studied changes in trade patterns between 1990 and 1995 and found that intra-industry trade between Canada and the US increased substantially over that period, while trade with Mexico remained predominantly inter-industry.

The growing trade in intermediate agricultural goods within North America is another sign that production processes for many agricultural and food products cut across international borders. This is particularly true for livestock and meat production. US grains, oilseeds, and related products are important inputs for the Mexican hog and poultry industries, and rising numbers of Canadian pigs and Mexican cattle are among the livestock that are finished and slaughtered in the US. Intermediate inputs for the processed food industry, such as mixes and dough for baked goods and odoriferous mixtures for food manufacturing, are an important aspect of Canada-US agricultural trade.

Complementarity indices (CIs) provide a framework that summarizes relationships in the composition of agricultural trade between two countries (Drysdale). Specifically, the CI links the export specialization of one country with the commodity import shares of its trading partner across the spectrum of all traded goods. Vollrath (2001) calculated CIs for partner countries in North America by dividing agricultural trade into two broad categories: field crops and high-value products. His analysis revealed that Mexico-US complementarities in field crops exceed those for Canada-US trade in field crops. This is not unexpected, given that both Canada and the US are major exporters of grains and oilseeds. On the other hand, Mexico is a major producer of tropical and labor intensive fruits, vegetables, and horticultural products. This production pattern is a reflection of the warm climate and relative labor abundance that exist in Mexico. For both the US and Canada as well as for the US and Mexico, agricultural trade complementarities have increased following the inception of CUSTA and NAFTA. This indicates that all countries are trading more in products that reflect their agricultural comparative advantages.

Spatial markets within each NAFTA country are more integrated than combined North American markets, despite the progress that has been made towards continental integration. Prior to CUSTA, merchandise trade among Canada's provinces was 20 times larger than Canada-US trade, according to gravity-model analysis conducted by Helliwell. Hufbauer contends that this ratio has diminished to about 12 since the implementation of CUSTA—a sign of greater integration, but also an indication that border effects are still relevant. No similar study has yet been conducted for Mexico-US trade, but numerous observers agree that the NAFTA countries have not fully realized the possibilities of integrating their markets (Courchene; Knutson and Ochoa; Vollrath 2004).

## Price Studies

One of the main indicators of cross-border market integration is the comovement of prices in different national markets. Economic theory informs us, for example, that in competitive markets, where transportation costs are insignificant and barriers to trade non-existent, identical goods sell for the same price. Arbitrage provides the mechanism for price convergence: to the extent that price differences exist, traders have an incentive to buy goods in the low-priced market and sell them in the high-priced market until prices in both markets equalize. This phenomenon is commonly referred to as the Law of One Price (LOP) (Krugman and Obstfeld).

Several empirical studies have measured the degree to which the LOP holds in Canadian and US agricultural markets. These studies have used various methodologies but come to a similar conclusion: agricultural commodity markets are integrated to varying degrees, and the degree of price integration roughly corresponds to the prevailing degree of trade liberalization. They also show that, although cross-border price relationships were strong prior to CUSTA and NAFTA, they became stronger as a result of these agreements.

Moodley, Kerr, and Gordon study CUSTA's effects on producer price integration at the aggregate level between Canada and the US using an econometric LOP model. They find that market integration existed prior to CUSTA, but that increased convergence in producer prices between the two countries followed CUSTA's implementation, providing evidence of deepening cross-border integration.

Vollrath (2003) estimates the degree of integration in Canada-US meat markets using both simple price correlations and more complex econometric models that measure the speed and the degree of price transmission. Both studies show that pork product markets are more integrated than markets for beef or whole chicken. Given that the Canadian poultry market is supply-managed with high tariffs, these results confirm expectations.

Mohanty and Langley use a cointegration and error-correction approach to measure the degree of price integration in Canada-US wheat and barley markets. They found that integration improved following the implementation of NAFTA and again after the repeal of the WGTA. Interestingly, the effect of the WGTA's elimination exceeded that of NAFTA.

More nuanced studies of price transmission differentiate between price shocks based on where they originate. Time series analysis by Vollrath

and Hallahan reveals that US price shocks affect Canadian prices in the meat and livestock markets, but Canadian price shocks do not always have a significant bearing on corresponding prices in the US. Two-way integration (US-to-Canada and Canada-to-US) was found in the markets for steers, ham, and spare ribs, while one-way integration (i.e., shocks transmitted from the US to Canada) characterizes the markets for hogs, beef loins, chuck, and whole chickens. The asymmetry in price transmission is probably due to the large size of US livestock and meat markets.

### **FOREIGN DIRECT INVESTMENT AND THE ROLE OF MULTATIONALS**

In recent decades, global consumer demand has shifted toward more high-value processed food. Between 1972 and 1993, processed food's share of global agricultural trade rose from 58 to 67 percent (Henderson, Handy, and Neff). Demand for processed and prepared foods is particularly great in high-income countries such as Canada and the US, but it is also growing rapidly in middle-income countries such as Mexico. The production, marketing, and distribution of these food products are typically capital and technology-intensive and have come to be dominated by large multinational enterprises (MNEs) – enterprises with productive assets in more than one country.

Demand for processed food is largely met by domestic industry in most developed countries, but foreign ownership is nevertheless significant. Foreign direct investment (FDI), defined as the ownership and control of assets in one country by a national of another country,<sup>3</sup> is now the dominant form of international commerce in processed foods. Sales by foreign affiliates<sup>4</sup> account for about 60 percent of total international commerce in processed foods. Exports account for 30 percent, and sales through licenses and joint ventures account for the remaining ten percent (Handy and Bamford). This phenomenon is particularly pronounced in North America, where sales by Canadian and Mexican affiliates of US companies are about two-and-a-half times the level of US processed food exports to those countries (Figure 4.6). With the rapid increase in intra-regional processed food trade, however, the ratio between affiliate sales and exports has fallen. In 1993, for instance, sales by Canadian and Mexican affiliates of US food companies were about three times the level of US processed food exports to Canada and Mexico.

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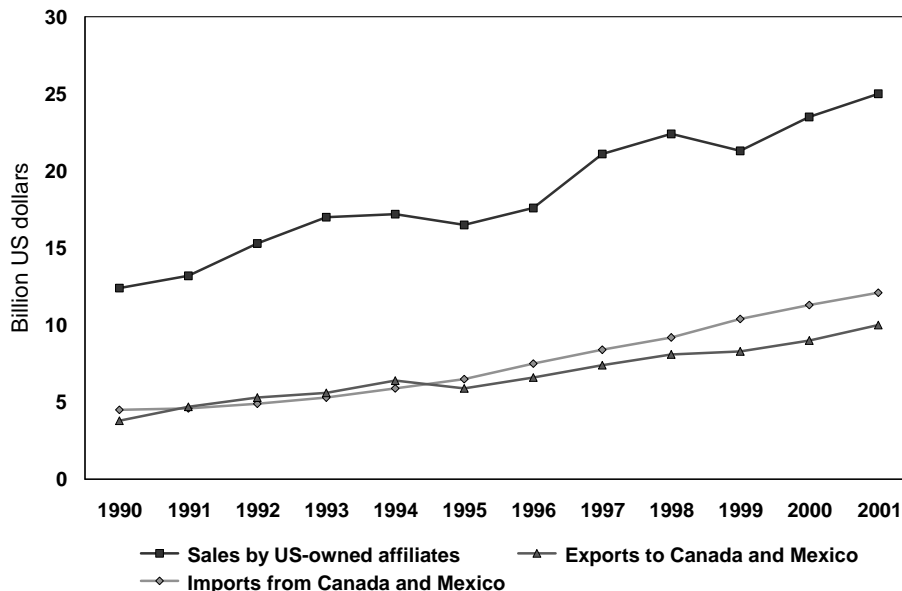
<sup>3</sup> FDI is to be distinguished from *portfolio investment*, which is characterized by a lack of management control.

<sup>4</sup> *Parent firms* are located in the home country, while *foreign affiliates* are located in the host country. Foreign affiliate sales refer to sales by foreign-owned companies in the host country market.

Given that an increasing share of the agrifood sector is organized under the auspices of the firm, the business strategies adopted by food processing companies are a critical component of the analysis of economic integration. Nevertheless, agricultural trade continues to receive more attention from agricultural economists than does the industrial organization of food processing. Empirical studies of investment and firm behavior are hampered by the scarcity of detailed data, particularly at the firm level, as well as the complexities associated with measuring variables that are hypothesized to affect investment strategies.

Six of the ten largest food processing firms in the world are headquartered in the US, so it should be no surprise that most FDI in the North American processed food sector is undertaken by US firms. In 2002, the stock of US direct investment in the Canadian and Mexican food industries equaled US\$3.7 billion and US\$1.4 billion, respectively (US Department of Commerce). In contrast, the stock of Canadian and Mexican direct investment in the US processed food industry equaled US\$1.1 billion and US\$1.2 billion, respectively. US authorities do not routinely report similar statistics for the beverage industry and production agriculture, mainly to protect the confidentiality of the respondents. Roughly speaking, the stock of intra-NAFTA direct investment runs in the billions of dollars for the beverage industry and in the hundreds of millions of dollars for crop and livestock production.

**Figure 4.6:** Processed food sales of US-owned affiliates in Canada and Mexico versus processed food trade with Canada and Mexico, 1999-2001.



**Source:** US Department of Commerce, Bureau of Economic Analysis (2004) [affiliate sales] and US Department of Agriculture, Economic Research Service (2004) [exports and imports].

Both CUSTA and NAFTA contain provisions designed to facilitate foreign investment, including the equal treatment of domestic and foreign investors and the prohibition of applying certain performance requirements to foreign investors, such as a minimum amount of domestic content in productions. Some researchers have questioned whether these reforms have affected the level of FDI between Canada and the US (Sparling and Cook; Vaughn; Worth). While the stock of US direct investment in the Canadian processed food industry has nearly tripled during the CUSTA-NAFTA period, the stock of Canadian direct investment in the corresponding US industry has fluctuated in recent years, in part due to large transactions such as the Bronfman family's liquidation of its assets in Seagram's (Bolling and Jerardo).

Many observers believe that NAFTA was a particularly important catalyst for foreign investment in Mexico, insofar as the agreement signaled that the economic liberalization of the late 1980s and early 1990s represented a permanent policy shift (Burfisher, Robinson, and Thierfelder; Worth; Vollrath 2001). The stock of US direct investment in the Mexican processed food industry has tripled since NAFTA's implementation. As recently as 1997, Mexican direct investment in the US processed food industry was just US\$304 million (Bolling and Jerardo).

Nevertheless, it is important to remember that there was substantial US direct investment in the Mexican agrifood sector long before NAFTA. As early as 1948, US companies attempted to develop frozen strawberry enterprises in Mexico (Cook et al.). Eventually, these enterprises shifted to Mexican ownership. Later, the fruit and vegetable freezing industry left California for Mexico. Major companies like Birdseye and Green Giant established freezing facilities in Mexico, particularly in frozen broccoli and cauliflower. In addition, the Mexican government implemented numerous reforms during the course of the 1980s to attract additional foreign investment, not just in the agrifood sector but in the economy as a whole (Robertson).

### **The Motivation for FDI**

Switching from analyses of trade and investment flows to an examination of the role of MNEs necessitates a subtle change in perspective. Instead of simply quantifying the movement of prices, capital, and goods, it is necessary to examine the decision-making criteria used by corporate management, as well as the industrial organization of particular industries.

Executives in the agrifood sector identify several reasons for undertaking FDI: to gain access to raw materials, to get around trade barriers, to

respond to an opportunity for market expansion, or to expand production when existing facilities are at capacity (Createc +; West and Vaughan). The overriding concern is the return-on-investment of any new venture. Consequently, detailed analyses of cost competitiveness, market opportunities, and profitability form the basis for investment decisions. Taxation is a secondary, though not insignificant, concern. The characteristics of the product also help to determine the most profitable location for investment. When raw inputs are bulky or perishable, it may be unprofitable to transport them more than a couple of hundred miles, and processing and packaging operations are located near to the site of production.

Firm-specific advantages are also important to multinational food companies. The most important factor influencing this decision is the ability to control and exploit intangible assets. In the food industry, this is especially true for intangible assets such as brand names and marketing skills (West and Vaughan). Innovations in food processing and packaging are important elements of competitive advantage, and firms wish to retain control over the use of these assets. Finally, firms noted the advantages of FDI in terms of reduced transaction costs and achieving economies of size in the use of marketing and research and development resources.

### **Preference for Majority Ownership, Yet Cross-Border Relationships Take on Many Forms**

The desire for control over brand, technology, and market development usually translates into a preference for 100 percent ownership of foreign affiliates in the processed food industry. Companies may decide to test the waters using exports, and then progress gradually from licensing to joint ventures to FDI, but there is widespread agreement that majority ownership of foreign assets is, in most cases, ultimately preferable to any other form of organization (West and Vaughan). When ownership is chosen, acquisition of an existing business is typical. An acquisition provides rapid access to the facilities, people, knowledge, and market share of the acquired firm.

When majority ownership is not desired or not possible, cross-border business relationships take on other forms. Joint ventures are fairly common in the North American agrifood sector, and in some instances, they may be more agreeable to antitrust officials than majority ownership. For instance, in 1996, Archer-Daniels-Midland (ADM) and the Mexican firm Gruma abandoned their intention to merge their six masa flour mills in the US into a single company in order to satisfy US antitrust authorities at the Federal and State levels (US Department of Justice). Instead, the two companies agreed to an arrangement in which



ADM acquired 22 percent of Gruma, Gruma sold one of its US mills, and Gruma and ADM teamed up to operate their remaining US mills. In Mexico, ADM also embarked with Gruma on numerous joint ventures related to corn flour.

Licensing is another important type of arrangement. The soft drink and brewing industries, in particular, are built solidly on licensing. On the basis of licensing, soft drink bottlers in Mexico have built regional fiefdoms that extend to many South American countries. Similarly, certain US brewing companies are licensed to brew specific brands of Mexican beer. Licensing is also prevalent in other parts of the processed food industry. For example, the Mexican firm GIBSA has licensing agreements to sell Wrigley chewing gum products in Mexico and to produce Hostess snack food products in its Mexican facilities. Because of its large distribution network, GIBSA also serves as distributor for many US products in Mexico. Such arrangements are fairly common in the NAFTA region, as the distribution systems developed by the major companies now offer a suite of products that are from more than one NAFTA country. For instance, Mexico's Grupo Herdez works with Hormel so that Herdez products are distributed to US supermarkets.

Contracting is a common organizational form in production agriculture, where the preference for majority ownership may be less strong than in the processed food sector. In US agriculture, contracting dates back at least to the 1960s (Zahniser et al. 2002), and it also takes place across borders among the NAFTA countries. For example, major US and Canadian meat processors are contracting directly with Canadian hog producers and specifying both the production methods and the record-keeping requirements to be implemented on the farm (Agriculture and Agri-food Canada). In return, the producer receives a guaranteed price that covers the cost of production as well as technical assistance. In addition, it is becoming common for US companies with processing or packing facilities in Mexico to enter into contracts with Mexican producers. In a growing but small number of cases, US firms have actually acquired a controlling stake in Mexican farm operations. Vertical coordination of this type is particularly prevalent in the Mexican poultry and tomato industries (Bolling, Elizalde, and Handy).

Contracting has certain advantages to the buyer of farm output, in that the risks regarding the variability of production are borne entirely by the producer. In addition, long-standing attitudes against foreign and corporate ownership of farmland may encourage the use of contracting instead of direct ownership, even with the removal of legal restrictions to such types of land tenure. A large amount of contracting also takes place in the multinational fast food industry. Many products that



McDonalds and Kentucky Fried Chicken serve in Canada and Mexico are produced in the country where the restaurant is located.

Whatever the organizational form, business relationships in the North American agrifood sector tend to be fluid over the long run, just as they are in the economy as a whole. With the passage of time, some operations change hands many times. For instance, the US company Green Giant was once part of Pillsbury, later became a part of Grand Metropolitan of the UK, and recently returned to US ownership. Similarly, Schneider Foods, a well-known Canadian pork processor, has gone from being an independent company to being a subsidiary of a US firm (Smithfield Foods) to once again being part of a Canadian company – Maple Leaf Foods.

### **“Market Servers” versus “Exporters”**

Two main types of foreign direct investors are identified in the literature (Trebilcock and Howse, Shatz). The first undertakes FDI in order to serve a foreign market. “Market servers” look for high-growth markets and choose to serve them via FDI rather than exports due to high tariff or nontariff barriers, or because of high transportation costs. The second type of investor seeks to secure foreign supplies to sell in the home country market or another foreign market. In the case of fruits and vegetables, many “exporters” are seeking locations with growing seasons that complement those of other markets. In general, “exporters” look for sites with low costs of production and few export restrictions. Reliable transportation for the final product and any required inputs is a must.

The existence of two different types of investors, market-servers and exporters, makes the relationship between trade policy and investment more complex than it might seem. It is not always the case, for example, that a reduction in tariff barriers will lead to increased investment. For a market server who has invested abroad in order to gain access to a highly protected market, a tariff reduction may well result in the abandonment of the foreign subsidiary. On the other hand, if a particular country is well endowed with factors of production (including agricultural land and labor), the reduction of tariffs may encourage FDI by “exporters.” Burnham and Epperson studied the investment decisions of US fruit and vegetable firms in Latin America and found that the reduction of trade barriers has strongly encouraged FDI in this sector. FDI by US firms into fruit and vegetable production is, by and large, for the purpose of securing year-round supplies for the US market.

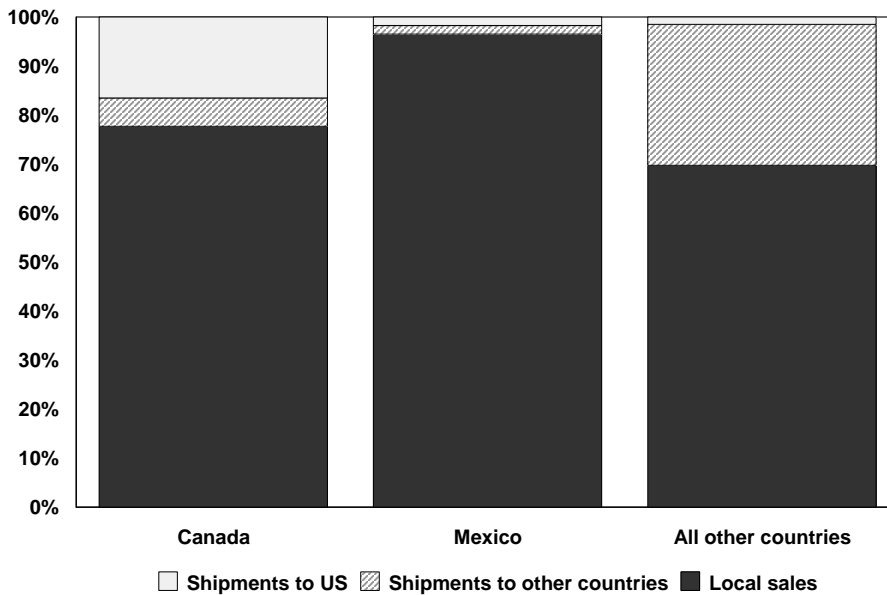
Most food multinationals operating in North America are market servers. Factors such as perishability, regionalized food preferences, and high transportation costs force food companies to buy or build food

manufacturing facilities in close proximity to their intended markets. Foreign affiliates are frequently oriented much more toward their host country markets, rather than globally integrated with an export-orientation (Vaughan). In 2001, Canadian affiliates of US processed food companies (excluding the beverage industry) sold 78 percent of their product in Canada, exported 17 percent to the US, and exported only about six percent to the rest of the world (Figure 4.7). Many US affiliates in Canada have product mandates, often importing intermediate food products, processing these further, and then selling them in both Canada and the US. This phenomenon helps to account for the relatively high proportion of affiliate sales exported to the US. In the case of Mexican affiliates of US processed food companies, 96 percent of sales were domestic, with the remainder being fairly evenly divided between exports to the US and exports to the rest of the world. To date, very few US MNEs in the processed food sector have used their Mexican facilities as export platforms.

### Big Fish from Canada and Mexico Now Swim in a Bigger Pond

Through direct investments in the other NAFTA countries, several large companies from Canada and Mexico have reinvented themselves as

**Figure 4.7:** Distribution of sales of US-owned foreign affiliates in the processed food industry, 2001.



**Note:** Does not include the beverage industry.

**Source:** US Department of Commerce, Bureau of Economic Analysis (2004).

larger, stronger, and more viable firms. In some instances, the resulting operations outside the home country rival the operations in the home country in size and importance.

McCain Foods Limited is a good example of a large Canadian firm that has ventured far from its original home base. Over the course of some 50 years, it has evolved from a small producer of frozen French fries in the province of New Brunswick to Canada's largest processed food company, supplying both retailers and food service providers. McCain Foods now accounts for about one-third of the world's French fry production. In the NAFTA region alone, the firm operates 11 processing facilities in Canada, eight in the US, and one in Mexico.

Another Canadian example is George Weston Limited, whose three reportable operating segments are food production, food distribution, and fisheries. While the food distribution segment remains largely a Canadian operation, the food-producing segment, Weston Foods, is a major actor in the US baked goods industry. Weston Foods has roughly a five percent share of the US bakery products market, and in 2003, the US accounted for about 75 percent of Weston Foods' sales.

Several Mexican food companies have histories that are broadly similar to McCain Foods and Weston Foods. For example, Gruma has emerged as the world's largest producer of corn flour and tortillas, as well as the largest such producer in the US, due in part to the joint venture mentioned earlier with ADM. For the last several years, Gruma's US operations have accounted for about half of its total corporate sales. Competition between Gruma and US tortilla producers is intense. In December 2003, the US District Court for the Southern District of Texas dismissed a lawsuit brought by 17 US tortilla manufacturers alleging, among other things, that Gruma was monopolizing shelf space at grocery stores through the payment of slotting fees.

Another Mexican food company that has expanded operations into the US is GIBSA (Grupo Bimbo), Mexico's largest baking company. It has purchased several bread-baking enterprises in the western US, including the western division of Weston Foods, Mrs. Baird's Bread in Texas, and several large firms in California. GIBSA is now the third largest baker in the world, with roughly a five percent share of the US market for bakery products.

## **PERFORMANCE OF THE AGRIFOOD SECTOR**

When evaluating the impact of integration on structural change and the performance of the North American agrifood sector, there are three main questions to address. First, what kinds of economic gains can be

expected from increased integration? Secondly, what evidence is there that these gains have been realized? Finally, how have these gains been distributed? The first question is relatively straightforward, as answers are available in economic literature, but the second and third questions have not yet been fully investigated.

### **Benefits and Costs of Integration**<sup>5</sup>

The benefits of integration can be divided into two categories. First, gains from integration through trade are realized through rationalization, specialization, economies of scale, and increased competition. Second, positive externalities across international borders arise through spillovers of know-how, technology, and managerial expertise. All of these factors contribute to growth in the agricultural economy.

**Comparative Advantage** Trade liberalization increases the gains from exchange, as countries specialize in the production of those goods and services for which they have a comparative advantage. Empirical evidence suggests that Canada, the US, and Mexico have specialized since NAFTA's implementation in those commodities for which they demonstrate a revealed comparative advantage. Research by Vollrath (2001), described earlier in this report, shows that there has been a post-NAFTA rise in commodity complementarities between trading partners. The rise in complementarities suggests that structural change and shifting trade patterns have benefited US, Canadian, Mexican, and global agriculture. Trade complementarities are greater for US-Mexico trade than for US-Canada trade because the Canadian and US agricultural sectors are very similar in structure.

Trade liberalization alone is not, however, sufficient for the realization of all of the gains that comparative advantage can generate. Appropriate domestic policies are needed in order to reap the payoffs from trade that are associated with tariff reductions. In their computable general equilibrium model of North American agriculture, Burfisher, Robinson, and Thierfelder analyze adjustment to NAFTA using two sets of domestic agricultural policies: the pre-reform policies of the 1980s and the more market-oriented policies that were adopted by the NAFTA countries during the early 1990s. The authors find that welfare gains from NAFTA trade liberalization depend on the implementation of domestic policy reforms.

**Scale economies** Cross-border integration enlarges the size of the market. As firms (and farms) enlarge the scale of production in response to new market opportunities and new technologies, they often benefit

<sup>5</sup> The theory in this section is adapted from Vaughan (Chap. 4).

from reduced per-unit costs of production. These scale economies improve the efficiency of the sector.

Notable examples of economies of scale in North America include the expansion of meat packing plants in Canada and the US and the increased size of vegetable production and marketing operations in Mexico (Vollrath 2003). Integration of the North American market is making it possible for manufacturers to process raw agricultural products into intermediate inputs in very large, centralized facilities, and then to export these inputs for further processing in facilities located throughout the world (Vaughan).

Successful exploitation of scale economies brings additional pressure to bear on smaller agrifood operations, their management, and their workers. The ever-present challenge of maintaining competitiveness is accompanied by persistent questions about the “levelness of the playing field.” Economists could help to address these concerns by explicitly identifying the impact of consolidation on efficiency within the continental agrifood sector, as well as the possible tradeoffs between scale economies and market power.

**Competition** Integration of the North American agrifood sector has the potential to increase economic competition, since the number of suppliers in the unified continental market often exceeds the number of suppliers in each formerly segmented national market. However, economic integration may also lead to increased concentration, perhaps even to the extent that certain firms are able to exert market power on a continental rather than national basis. Whether market openness actually enhances price competition in specific markets is an empirical question that can be answered unambiguously by sound applied research.

A large share of certain product markets at the local, national, and continental levels is held by a small number of firms. Many subsectors of Canadian food manufacturing, for example, have concentration ratios exceeding 90 percent.<sup>6</sup> Firms in these sectors may be able to exercise market power. Quagraine et al. found evidence to suggest that Canadian beef packers (but not hog packers) exercised market power throughout the 1980s and 1990s. Similar research has concluded that beef packers also exert market power in the US (Azzam), though these results have been challenged by other studies.

It is increasingly apparent that national governments cannot effectively monitor the conduct of the private sector without taking account of the activities of multinational enterprises outside national boundaries

<sup>6</sup>The concentration ratio refers to the sales of the top four firms as a percentage of total sales by the sector.

(Vaughan). Monitoring of anticompetitive behavior is likely to be much more successful when it is bolstered by international cooperation.

***Employment and Structural Change in Mexican Agriculture*** In Canada and the US, the percentage of the total civilian workforce employed in agriculture has declined gradually over the last century and is now quite small – about three percent for Canada and the US, according to statistics for 2002 (OECD 2004). In contrast, agriculture accounted for roughly 17 percent of civilian employment in Mexico in 2002. As market integration leads to the rationalization of agricultural production on a continental scale, the proportion of the Mexican labor force employed in agriculture is expected to decline substantially.

Mexico's labor productivity in agriculture<sup>7</sup> is about one-eighth of Canada's and less than one-tenth that of the US. With increasing integration and capital flows across borders, labor productivity in Mexico is expected to increase more rapidly than in either Canada or the US. Again, this is due in part to Mexico's relatively low capital-to-labor ratio. Economic models constructed by Nkunjimana, Love, and Shumway show that, in the intermediate run with flexible capital markets, trade liberalization (i.e., the full implementation of URAA commitments) will result in higher farm profits, agricultural labor wages, and agricultural labor productivity in Mexico.

A major difference between Mexican agriculture and the agricultural sectors of Canada and the US concerns the large number of small holdings in Mexico, with many farm operations encompassing 10 or fewer hectares (OECD 1997). Rationalization in Mexican agriculture is displacing many of these very small farms, thereby increasing the size and the growing prevalence of medium-to-large commercial farms. This rationalization is expected to boost labor productivity, but there is also the potential for increased unemployment if excess agricultural labor is not rapidly absorbed by other sectors of the Mexican economy (Nkunjimana, Love, and Shumway). Mexican employment data (as cited by Polaski) indicate that the country's agricultural sector lost about 1.3 million jobs between 1994 and 2002. While there has been concomitant job growth in tourism and export-oriented manufacturing, this growth has not been sufficiently robust to improve the employment situation in much of rural Mexico.

Less than robust job growth in Mexico is also a key factor contributing to the large flows of Mexican migration to the US. US farmers rely heavily on Mexican-born workers, many of whom lack legal authorization in the US. Zahniser and Trevino report that the US Department of Labor's

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<sup>7</sup> Labor productivity is a measure of an industry's value-added per unit of labor worked.

National Agricultural Workers Survey shows people born in Mexico made up 78 percent of all US farm workers in crop agriculture in FY 1998. Fifty-seven percent of these individuals lacked legal immigration status. Numerous Mexican migrants are also employed in meat processing and other subsectors within the US processed food industry. The presence of so many undocumented workers in the US agrifood sector underscores the fact that the North American labor market is becoming increasingly integrated, even in the face of migratory restrictions, and it raises questions about which portions of the US agrifood industry would be competitive in the absence of these workers.

Further effort is clearly needed to ensure that the benefits of North American integration are more equitably distributed, that standards of living in each NAFTA country are consistently above socially established minimums, and that everyone has the opportunity to make full use of their individual talents and gifts. To support this effort, researchers will need to integrate knowledge across a broad range of subject areas, including employment and job growth, regional and international migration, and the determinants of poverty and prosperity.

***Knowledge Spillovers*** An important strand of recent research focuses on the link between increased integration and productivity, showing how market openness can lead to domestic economic growth. New growth theory provides one explanation of this phenomenon in terms of knowledge spillovers. Knowledge spillovers are benefits derived from investment in research and development – including new technologies and new management systems – that accrue to individuals and firms other than the investor. MNEs help spread innovations across borders through intra-firm trade in knowledge-related intangibles. Such transactions represent an important transfer of resources from the parent to the affiliate, and by extension, to the affiliate's host country.

Knowledge spillovers from the US have had an important impact on the Canadian food and beverage industry (Bernstein). Such spillovers have lowered the average variable cost of food and beverage processing in Canada, as well as the intensity of labor, intermediate inputs, and physical capital. In other words, spillovers are causing the Canadian food and beverage processing industry to become more knowledge-intensive and more cost-effective. Further research about the relationships among trade, investment, and productivity growth could help identify and quantify the dynamic gains arising from integration in the agrifood sector.



## **OPPORTUNITIES FOR FURTHER INTEGRATION**

While economic research has provided much evidence of strong and growing integration in the agrifood sectors of the NAFTA countries, more progress can certainly be made to deepen this economic unification. Gravity models demonstrate that international borders continue to impede trade in North America (Helliwell). Research points to a number of factors that are potentially constraining integration in the agrifood sectors of Canada, the US, and Mexico. Barriers include regulatory differences, complicated border procedures, tariffs and duties, producer support programs, and trade disputes. Furthermore, heightened concerns about food safety and bioterrorism are causing governments to be particularly careful regarding imported food products.

### **Remaining Tariff Barriers**

NAFTA and the URAA have gone a long way towards removing tariff barriers among the three countries of North America, and only a few tariffs governing agrifood trade remain. Several commodities traded between Mexico and the US (and between Mexico and Canada) are subject to NAFTA's 14 year transition period and thus will not enjoy tariff and quota-free trade until 2008. Prominent examples are US exports to Mexico of corn, nonfat dried milk, and dried beans, and Mexican exports to the US of sugar, peanuts, and asparagus. For corn, Mexico has chosen to implement a more liberal transitional policy than that specified by NAFTA, to the benefit of Mexican hog and poultry producers who rely on imported feed ingredients.

Several trade barriers were exempted from CUSTA and NAFTA and thus are likely to be subject to market access disciplines negotiated in the context of the WTO's Doha Round. Canada, for example, retains high over-quota tariffs on imports of dairy products, poultry, and eggs, while the US retains a system of tariff rate quotas (TRQs) for dairy products, peanuts, peanut butter, and sugar. These barriers do not merely limit the volume of trade in these items; they also segment national markets and prevent the realization of the benefits that result from integration.

In sharp contrast to the lowering of tariff barriers in almost all commodity markets, Mexico and the US are locked in a protracted dispute about the implementation of NAFTA's provisions for bilateral sweetener trade. Due to this dispute, US-Mexico trade in sugar and sweeteners has experienced a marked decline. For FY 2003, the US provided Mexico with its minimum market-access allocation for raw sugar under the WTO and its customary portion of the US TRQ for refined sugar, but not the additional allocation specified by NAFTA (Flores and Hernandez).



In addition, Mexico did not specify the criteria of its TRQ for certain classifications of high fructose corn syrup (HFCS). Further complicating matters, the Mexican government has imposed a 20 percent sales tax on beverages containing sweeteners other than sugar, effectively stifling US HFCS exports to Mexico (Flores).

### **Trade Disputes**

Tariff elimination among Canada, the US, and Mexico has not resulted in a frictionless system of international exchange. At various times, certain agricultural imports have been subject to antidumping and countervailing duties by a NAFTA partner. Member countries have even resorted to closing their borders to imports of certain products. On occasion, actions taken to thwart trade are the result of lobbying efforts by producer groups who wish to protect the domestic market from foreign competition (Young). The interruption of commerce has frequently led to trade disputes.

Each country has its own institutions devoted to determining if trade remedies are warranted: the Canadian International Trade Tribunal, the US International Trade Commission, the US Department of Commerce, and the Mexican Secretariat of the Economy. The final determinations of these bodies may be appealed to the Dispute Settlement Bodies of the WTO and NAFTA.

Formal dispute resolution represents only a very small part of the available resolution processes. Informal mechanisms are often cost- and time-effective ways to resolve conflicts that impede trade flows. The inclusion of private industry in dispute resolution proceedings may circumvent the need to utilize formal, intergovernmental processes of dispute resolution. For example, in disputes over grapes and cattle, producer groups in Mexico and the US worked together to address the regulatory incompatibilities and allegations of dumping that were at the heart of the disagreements (Zahniser and Link). Improved dispute resolution procedures, with an emphasis on informal measures, will favor a smooth transition to more integrated markets.

### **Regulations**

Harmonization of divergent regulatory standards provides a means to advance market integration and to avoid trade disputes. Incompatible national regulatory frameworks are sometimes the result of inadequate national capacity to set and enforce standards. Technical assistance provides a mechanism for resolving or preventing disputes by building scientific and institutional capacity.

Cooperation to eliminate regulatory incompatibilities facilitates trade by reducing transaction costs. As tariffs have come down as part of CUSTA and NAFTA, various behind-the-border barriers (including regulatory differences) have increased in relative importance. In a recent survey of Canadian exporters conducted by the Fraser Institute, a majority of respondents viewed “informal” barriers as hindering access to the US market. These informal barriers include regulatory differences, regulatory complexity, cumbersome customs procedures, and domestic content requirements.

An increase in the incorporation of science and technology in food products, coupled with greater consumer awareness and concern about the health aspects of the food they eat, has increased pressure to regulate food production. Regulations ensure that reasonable measures have been taken to address health and safety concerns, some of which arise directly from the use of new technologies in food production (Short).

Countries are allowed, within the context of the WTO and NAFTA, to set regulatory standards as they see fit, as long as these are based upon a scientific assessment of risk. However, national regulations established at different times are likely to differ from similar policies in neighboring countries. A conscientious policy of regulatory cooperation is needed if international harmonization is to be achieved (Short). Economists and other policy researchers could play an important role in this process by estimating the costs and benefits of nontariff barriers affecting the agrifood sector. This information could then be used by policymakers to set priorities for regulatory cooperation.

***Harmonize What and with Whom?*** Government officials and regulatory agencies may wish to consider where harmonization will yield the greatest trade benefits. For Canada and Mexico, harmonization with the US will make the most sense most of the time, given the size and importance of the US market to many Canadian and Mexican agrifood exporters.

Regulatory harmonization may not always be appropriate because of domestic policy concerns. National regulations that differ from the regulations of trading partners have the potential to benefit influential producer groups whose production is oriented mainly toward the domestic market. They may also benefit its citizens for health, environmental, cost, and other reasons. Different societal perceptions of and tolerance for specific types of risk can be the driving factor maintaining regulatory differences among the countries of North America.

It is important not to underestimate the practical obstacles to regulatory cooperation. Obstacles include the legislated mandates of domestic

regulatory agencies, the capacity of national regulatory systems to comply with international norms, and the lack of public support for regulatory harmonization.

Nevertheless, national governments could facilitate additional regulatory harmonization for cross-border economic activities. Guidelines could be developed, requiring governments to consider whether or not the adoption of a trading partner's regulation would suit domestic objectives. If so, the development of specifically national regulations would not be necessary. Governments could also review existing regulation with a view of removing arbitrary differences (Short). Technical regulations on food packaging, as well as some sanitary and phytosanitary (SPS) requirements are areas in which regulatory differences "make work for border officials but do little to add to the store of human happiness" (Josling).

In order to address the issues raised by regulatory divergence in a concerted and productive manner, cross-border institutional cooperation and additional political interaction is needed (Josling). NAFTA is accompanied by few tri-national institutional structures, particularly when compared with the European Union. NAFTA established two committees which play a role in ensuring that regulations are compatible: the Committee on Standards and Related Measures and the Sanitary and Phytosanitary Committee. These committees meet infrequently, and their power is limited to making recommendations to member governments (Young). There are also a number of Technical Working Groups (TWGs) related to agriculture. The TWG on Pesticides, which operates under the auspices of the SPS Committee, is one of the more effective of these groups and could serve as a model for the others.

***Food Safety and the Threat of Bioterrorism*** Recently, growing concern regarding food safety has strengthened demand for additional regulations. In response, the NAFTA governments have been upgrading existing food standards and regulations, as well as creating new ones. The terrorist attacks of September 2001 have been a particularly strong catalyst for government action to mitigate threats to the civilian population from politically motivated groups. Contamination of the food supply using agents such as anthrax, botulism, and pneumonic plague is viewed as one of the most potentially devastating forms of bioterrorism. Threats to the safety of the food supply also arise from plant and animal diseases that are growing in prominence, such as Bovine Spongiform Encephalopathy (BSE) and Avian influenza.

New regulations and procedures to protect public health and safety need to be crafted in ways that do not unduly burden trade. The US Public Health Security and Bioterrorism Preparedness and Response Act of

2002 illustrates the extent to which decision makers are concerned with the potential impacts of such regulations on agrifood trade. Section 307 of the Act requires that the US Food and Drug Administration (FDA) receive prior notice of food imported into the US, beginning on 12 December 2003. In the design of the regulation's interim final rule,<sup>8</sup> numerous changes were made to the proposed rule in response to comments from industry groups and foreign governments. Examples include specification of shorter, rolling deadlines for the submission of prior notice, broadening the definition of persons authorized to submit prior notice, and eliminating several items from the set of information that must be included in the notice (USFDA).

Animal health concerns are also capable of impeding regional integration. The discovery of BSE in North America, for example, resulted in a large-scale disruption to the North American cattle and beef market, formerly one of the most integrated markets on the continent. With the discovery of BSE in a Canadian beef cow in May 2003, the US closed its border to Canadian cattle and beef, and most other foreign markets (including Mexico) were also closed to Canadian product. While the US and Mexican borders have since been partially reopened to imports of most Canadian beef products, full reopening has been delayed by the discovery of a BSE case in the US in December 2003. This discovery also led major US trading partners, including Mexico, to impose trade bans on US beef and cattle. The broad economic impact of these bans has focused attention on the extent to which food safety issues can disrupt market integration. It also has highlighted the importance of regional cooperation in the design and implementation of animal health measures.<sup>9</sup>

### **Domestic Farm Programs**

Domestic farm programs of the traditional type (such as supply management) require border measures in order to be effective. If one allows free trade in all commodities, one is agreeing to modify or dismantle these types of programs (Josling). Decoupled and better targeted agricultural programs will be relatively unaffected by freer trade and heightened integration. The logic behind recent decoupled programs, such as the Canadian Agricultural Income Stabilization program, is to eliminate trade distortions by severing the link between producer support and the prices for specific commodities. Given the utilization of both decoupled and coupled programs in each NAFTA

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<sup>8</sup> To allow for extensive public feedback on the interim final rule, the FDA increased the commentary period from 30 to 90 days, with a deadline of 13 July 2004.

<sup>9</sup> For more information about the BSE cases in North America and their impact on market integration, see Caswell and Sparling.

country, policymakers are likely to benefit from additional economic analysis of the extent to which divergent domestic policies act as barriers to regional integration.

### **Consumer Demand**

Food consumption across the NAFTA countries exhibits many differences and similarities. Differences in food preferences are primarily driven by differences in culture and income. For example, Mexican consumers eat less meat than do US or Canadian consumers, although meat consumption levels in Mexico are rising with income growth in that country. There are also differences due to the age structure of the Mexican population compared with the Canadian and US populations. While the aging “baby-boom” generation in Canada and the US generates demand for smaller portions of ready-to-eat foods, the Mexican population is much younger and therefore less susceptible to this trend.

Large ethnic niche markets, such as Hispanic groups throughout the US, and Asians in both Canada and the US present opportunities for food manufacturers who successfully customize their products for particular segments of the population. In addition, there is a process of cultural blending in which people are eating foods from other cultures – a trend that contributes to the enlargement of ethnic niche markets and the homogenization of food preferences throughout the continent. Insofar as the trend toward convergence in food preferences continues, it will create new opportunities for food manufacturers and retailers to expand their operations on a geographic basis, thereby furthering integration in the sector.

There are also broad similarities in attitudes toward food production and food technologies across the NAFTA countries. A recent survey conducted by Environics International in four countries in the Americas (Mexico, Brazil, Canada, and the US) and four in Europe (Great Britain, Italy, Germany, and France), found that people in the NAFTA region and Brazil have very similar attitudes toward food. They are open to change in the food system as long as the change promises to be beneficial, such as the enhancement of the nutritional value of food. Compared with Europeans, North Americans are much less strongly opposed to genetically modified foods. In short, there are many similarities in view among consumers in Canada, the US, and Mexico, and “a pronounced food culture divide” between the Americas and Europe. These attitudinal similarities are an indication that, broadly speaking, similar food production practices and food technologies can be used in all three NAFTA countries.

## CONCLUSIONS

Integration of the North American agrifood sector has created tangible economic benefits for consumers, producers, and processors. Integration has expanded the range and amount of food products available to consumers, it has allowed producers and processors to specialize in goods for which they demonstrate comparative advantage, and it has generated positive externalities in the food processing industry.

However, there remain many unanswered questions about the extent and impact of integration. While extensive data depicting changes in national prices, cross-border trade, and FDI are available and have been analyzed, much less is known about how integration is reshaping the industrial and social organization of the North American agrifood sector. Relatively little empirical evidence exists with which to gauge integration's impact on employment, competition, and efficiency, especially at the state, provincial, and local levels. Further research in these areas could help decision makers anticipate the benefits and costs of further integration. Such research will also help policymakers understand how best to achieve agrifood policy objectives, given the reality of increasingly integrated continental markets.

As tariffs come down and agrifood trade among Canada, the US, and Mexico reaches higher levels, nontariff barriers are capturing more attention from public and private decision makers. These barriers often take the form of regulatory differences or domestic farm programs, neither of which is typically considered a border policy, *per se*. Interest in promoting trade and market efficiency explains why the agricultural ministries of the NAFTA countries have devoted a great deal of energy to improving SPS measures so that they do not unnecessarily restrict trade. Also, producers and policymakers in each member country are keenly interested in the ramifications of the farm policies of neighboring NAFTA countries.

The increasing commercial interdependence of the NAFTA countries provides public decision makers with an incentive to harmonize policies so that trade is not artificially constrained. Policy convergence is clearly fostered by common membership in multilateral institutions, such as the WTO. North American agrifood market integration can be further advanced via increased cooperation among the governments of the NAFTA countries, possibly through new or augmented institutional structures.

## REFERENCES

- Agriculture and Agri-food Canada. "An Overview of the Canadian Agriculture and Agri-food System." 2003.
- Azzam, A. "Competition in the US Meat Packing Industry: Is It History?" *Agricultural Economics* 18(1998):107 – 26.
- Bernstein, J. "Inter-Industry and US R&D Spillovers, Canadian Industrial Production and Productivity Growth." Working Paper No. 19, Industry Canada, 1998.
- Bolling, C., and A. Jerardo. *Effects of North American Free Trade Agreement on Agriculture and the Rural Economy*. Washington, DC: US Department of Agriculture, Economic Research Service Electronic Outlook Report No. WRS-02-1. S. Zahniser and J. Link, eds., July 2002. <[www.ers.usda.gov/publications/wrs0201/](http://www.ers.usda.gov/publications/wrs0201/)>. (31 August 2004).
- Bolling, C., J. Calderon Elizalde, and C. Handy. "US Firms Invest in Mexico's Food Processing Industry." *FoodReview Promoting Food Safety: An Economic Appraisal* 22(September 1999):26 – 30. <<http://www.ers.usda.gov/publications/foodreview/may1999/frmay99g.pdf>>. (31 August 2004).
- Brown, A. *Applied Economics: Aspects of the World Economy in War and Peace*. Edinburgh: Hugh Paton and Sons Ltd., 1947.
- Burfisher, M., S. Robinson, and K. Thierfelder. "Developing Countries and the Gains from Regionalism: Links between Trade and Farm Policy Reforms in Mexico." *American Journal of Agricultural Economics* 84(2002):736 – 48.
- Burnham, J. and J. Epperson. "A Profile of Foreign Direct Investment by the US Fruit and Vegetable Industry." *Agribusiness* 14(1998):379 – 88.
- Caswell, J., and D. Sparling. "Risk Management in the Integrated NAFTA Market: Lessons from the Case of BSE." Paper presented at the First Annual North American Agrifood Market Integration Workshop, Cancun, Mexico, May 2004. <<http://naamic.tamu.edu/cancun.htm>>. (31 August 2004).
- Cho, G., I. Sheldon, and S. McCorriston. "Exchange Rate Uncertainty and Agricultural Trade." *American Journal of Agricultural Economics* 84(2002):931 – 42.
- Cook, R., C. Benito, J. Matson, D. Runsten, K. Schwedel, and T. Taylor. "Implications of the North American Free Trade Agreement for the US Horticultural Sector." *NAFTA: North American Free Trade Agreement: Effects on Agriculture, Vol. IV, Fruit and Vegetable Issues* Park Ridge, Illinois: American Farm Bureau Research Foundation, 1992.
- Courchene, T. "FTA at 15, NAFTA at 10: A Canadian Perspective on North American Integration." *The North American Journal of Economics and Finance* 14(2003):263 – 85.
- Createc +. "An Elite Survey of US Agrifood and Agri-Biotech Industry Representatives Regarding Investment Decisions." Report prepared for Investment Partnerships Canada and Agriculture and Agrifood Canada, 2003.
- Diao, X., T. Roe, and A. Somwaru. "What is the Cause of Growth in Regional Trade: Trade Liberalization or RTA's?: The Case of Agriculture." *World Economy* 21(2001):1 – 14.



- Doan, D., B. Paddock, and J. Dyer. "Grain Transportation Policy and Transformation in Western Canadian Agriculture." Paper presented at the Policy Reform and Adjustment Workshop, Wye Campus of Imperial College, London, 23 – 25 October 2003. <[http://agadjust.aers.psu.edu/Workshop\\_files/Doan\\_Paddock\\_Dyer.pdf](http://agadjust.aers.psu.edu/Workshop_files/Doan_Paddock_Dyer.pdf)>. (31 August 2004).
- Drysdale, P. "Japanese-Australian Trade." PhD dissertation, Australian National University, Canberra, 1967.
- Enviro-nics International. *Food Issues Monitor*. Toronto, 2002.
- Flores, D. *Mexico Sugar Annual Report 2004*. Washington, DC: US Department of Agriculture, Foreign Agricultural Service, Global Agriculture Information Network Report No. MX4045, 6 April 2004. <[www.fas.usda.gov/gainfiles/200404/146105944.pdf](http://www.fas.usda.gov/gainfiles/200404/146105944.pdf)>. (31 August 2004).
- Flores, D., and G. Hernandez. *Mexico Sugar Semi-Annual 2003*. Washington, DC: USDA/FAS, Global Agriculture Information Network Report No. MX3135, 10 October 2003. <<http://www.fas.usda.gov/gainfiles/200310/145986357.pdf>>. (31 August 2004).
- Fraser Institute. *The Unseen Wall*. Occasional Paper No. 76, Vancouver, BC, 2003.
- Handy, C., and J. Bamford. "Foreign Investment, Competitiveness and Trade." *Policy Harmonization and Adjustment in North American Agricultural and Food Industry* R.M.A. Loyns, R. Knutson, K. Meilke, and A. Yunez-Naude, eds., pp. 48 – 67. Winnipeg, Canada: Friesen Printers, February 2000.
- Helliwell, J. *How Much Do National Borders Matter?* Brookings Institution Press: Washington, DC, 1998.
- Henderson, D., C. Handy, S. Neff, eds. *Globalization of the Processed Foods Market*. Washington, DC: USDA/ERS, Agricultural Economic Report No. 742, 1996.
- Hufbauer, G. "One Market, One Continent." Paper presented at North American Agricultural Market Integration Symposium, Washington, DC: USDA/ERS, November 6 – 7, 2000.
- Jerardo, A. "The US Ag Trade Balance...More than Just a Number." *Amber Waves* 2(February 2004):36 – 41. <[www.ers.usda.gov/Amberwaves/February04/Features/USTradeBalance.htm](http://www.ers.usda.gov/Amberwaves/February04/Features/USTradeBalance.htm)>. (31 August 2004).
- Josling, T. "Policy Dynamics in North American Agriculture: Definitions of and Pressures for Harmonization, Convergence, and Compatibility in Policies and Programs Affecting the Agrifood Sector." *Harmonization/Convergence/Compatibility in Agriculture and Agrifood Policy: Canada, US, and Mexico*. R.M.A. Loyns, R. Knutson, K. Meilke, and D. Sumner, eds., pp. 7 – 20. Winnipeg, Canada: Friesen Printers, October 1997.
- Krugman, P., and M. Obstfeld. *International Economics: Theory and Policy*. Addison, Wesley, and Longman, 2000.
- Knutson, R., and R. Ochoa. "Achieving Market Integration." *Ag Exporter*. USDA/FAS, January 2004. <[www.fas.usda.gov/info/agexporter/agexport.html](http://www.fas.usda.gov/info/agexporter/agexport.html)>. (31 August 2004).
- Mohanty, S. and S. Langley. "The Effects of Various Policy Regimes in the Integration of North American Grain Markets." *Canadian Journal of Agricultural Economics* 51(2003):109 – 20.
- Moodley, R., W. Kerr, and D. Gordon. "Has the Canada-US Trade Agreement Fostered Price Integration?" *Review of World Economics* 136(2000):334 – 54.



- Ndayisenga, F. "The Effects of Free Trade Agreements on Canada-US Trade Flows in Processed Food Products." Agriculture and Agri-food Canada Working Paper, 2001.
- Nkunzimana, S., A. Love, and C. Shumway. "Mexican Agricultural Trade under the GATT." *Applied Economics* 35(2003):449 – 59.
- Orden, D. "Exchange Rate Effects on Agricultural Trade." *Journal of Agricultural and Applied Economics* 34(2002):303 – 12.
- Organization for Economic Cooperation and Development. "Review of Agricultural Policies in Mexico." Paris, 1997.
- \_\_\_\_\_. "OECD Online Labor Force Statistics Database." 2004. <[www1.oecd.org/scripts/cde/members/lfsdataauthenticate.asp](http://www1.oecd.org/scripts/cde/members/lfsdataauthenticate.asp)>. (26 August 2004).
- Polaski, S. "Jobs, Wages, and Household Income." *NAFTA's Promise and Reality: Lessons for Mexico and the Western Hemisphere*. J. Audley, S. Polaski, D. Papademetriou, and S. Vaughan, eds., Washington, DC: Carnegie Endowment for International Peace, 2003. <[www.ceip.org/files/publications/NAFTA\\_Report\\_full.asp](http://www.ceip.org/files/publications/NAFTA_Report_full.asp)>. (31 August 2004).
- Qasmi, B., and S. Fausti. "NAFTA Intra-industry Trade in Agricultural Food Products." *Agribusiness* 17 (2001):255 – 71.
- Quagraine, K., J. Unterschultz, M. Veeman, and S. Jeffrey. "Test for Processor Market Power in the Markets for Cattle and Hogs in Canada." *Canadian Journal of Agricultural Economics* 51(2003):397 – 411.
- Robertson, R. "Defining North American Economic Integration." Paper presented at First Annual North American Agrifood Market Integration Workshop, Cancun, Mexico, May 2004. <<http://naamic.tamu.edu/cancun.htm>>. (31 August 2004).
- Schnepf, R., E. Dohlman, and C. Bolling. *Agriculture in Brazil and Argentina*. Washington, DC: USDA/ERS Agriculture and Trade Report WRS-01-3, November 2001. <[www.ers.usda.gov/publications/wrs013/](http://www.ers.usda.gov/publications/wrs013/)>. (31 August 2004).
- Shatz, H. "What Attracts FDI?" *Global Competitiveness Report 1997*. World Economic Forum, Geneva, Switzerland, 1997.
- Short, C. "Issues and Opportunities for Regulatory Systems Harmonization." Paper presented at North American Agricultural Market Integration Symposium, Washington, DC: USDA/ERS, November 6 – 7, 2000.
- Sparling, D., and R. Cook. "Strategic Alliances and Joint Ventures Under NAFTA: Concepts and Evidence." *Policy Harmonization and Adjustment in North American Agricultural and Food Industry* R.M.A. Loyns, R. Knutson, K. Meilke, and A. Yunez-Naude, eds., pp. 68 – 94. Winnipeg, Canada: Friesen Printers, February 2000.
- Trebilcock, M., and R. Howse. *The Regulation of International Trade*. New York: Routledge, 1995.
- Tropp, D., D. Scully, J. Link, and J. Malaga. *Mexico's Changing Marketing System for Fresh Produce: Emerging Markets, Practices, Trends, and Issues*. Washington, DC: USDA, Agricultural Marketing Service, October 2002. <[www.ers.usda.gov/Briefing/NAFTA/PDFFiles/mexfreshprod.pdf](http://www.ers.usda.gov/Briefing/NAFTA/PDFFiles/mexfreshprod.pdf)>. (31 August 2004).
- US Department of Agriculture, Economic Research Service (USDA/ERS). *Processed Food Trade Database*. Interactive database, 2004.
- US Department of Agriculture, Foreign Agricultural Service (USDA/FAS). *Global Agricultural Trade System*. Interactive database, 2004.

- US Department of Commerce, Bureau of Economic Analysis. Web site, 2004. <<http://www.bea.gov>>. (21 April 2004).
- US Department of Justice. "Justice Department and Texas Attorney General Require Restructuring of Tortilla Flour Merger." Press release No. 96-446, 13 September 1996. <[www.usdoj.gov/opa/pr/1996/Sept96/446at.htm](http://www.usdoj.gov/opa/pr/1996/Sept96/446at.htm)>. (31 August 2004).
- US Food and Drug Administration (USFDA). "Prior Notice of Imported Food Under the Public Health Security and Bioterrorism Preparedness and Response Act of 2002." *Federal Register*. 68(10 October 2003). <[www.fda.gov/OHRMS/DOCKETS/98fr/03-25877.pdf](http://www.fda.gov/OHRMS/DOCKETS/98fr/03-25877.pdf)>. (31 August 2004).
- Vaughan, O. "Implications of Foreign Direct Investment for the Canadian Food and Beverage Manufacturing Industry." Working Paper No. 2/95, Agriculture and Agri-food Canada, 1995.
- Vollrath, T. "Changing Agricultural Trade Patterns in North America." Paper presented at North American Trade Relationships: Policy Challenges for 2002 and Beyond, workshop organized by the American Agricultural Economics Association and Canadian Agricultural Economics Society, Chicago, 8 August 2001. <[http://www.farmfoundation.org/north\\_american\\_trade\\_relationships.htm](http://www.farmfoundation.org/north_american_trade_relationships.htm)>. (31 August 2004).
- \_\_\_\_\_. *North American Agricultural Market Integration and Its Impact on the Food and Fiber System*. Washington, DC: USDA/ERS Agriculture Information Bulletin No. 784, 2003. <[www.ers.usda.gov/publications/aib784/](http://www.ers.usda.gov/publications/aib784/)>. (31 August 2004).
- \_\_\_\_\_. "Gauging NAFTA's Successes and Confronting Future Challenges." *Ag Exporter*. USDA/FAS, January 2004, pp. 7 – 8. <[www.fas.usda.gov/info/agexporter/agexport.html](http://www.fas.usda.gov/info/agexporter/agexport.html)>. (31 August 2004).
- Vollrath, T., and C. Hallahan. "Testing for Integration of US Canadian Meat and Livestock Markets." *Canadian Journal of Agricultural Economics*, in press.
- Wang, Z., W. Coyle, M. Gehlhar, and T. Vollrath. "The Impact of Distance on US Agricultural Exports – An Econometric Analysis." *Technological Change in the Transportation Sector – Effects on US Food and Agricultural Trade: A Proceedings*. W. Coyle and N. Ballenger, eds., Washington, DC: USDA/ERS Miscellaneous Publication No. 1566, September 2000.
- West, D. and O. Vaughan. "Multinational Firms, Investment and Trade in Canada's Food and Beverages Industry: Policy Implications." Working Paper No. 7/95, Agriculture and Agri-food Canada, 1995.
- Worth, T. "Regional Trade Agreements and Foreign Direct Investment." *Regional Trade Agreements and US Agriculture*. M. Burfisher and E. Jones eds., Washington, DC: USDA/ERS Agricultural Economic Report No. 771, November 1998. <<http://www.ers.usda.gov/publications/aer771/>>. (31 August 2004).
- Young, L. "Looking to the Future: Conflict Resolution and Avoidance in NAFTA's Agricultural Trade." *Trade Liberalization under NAFTA: Report Card on Agriculture*. R.M.A. Loyns, K. Meilke, R.D. Knutson, and A. Yunez-Naude, eds., pp. 331 – 47, Winnipeg, Canada: Friesen Printers, January 2001.
- Zahniser, S., R. Hoppe, J. Johnson, and D. Banker. "Structural Change in an Era of Increased Openness: A Background Paper on the Structure of US Agriculture." *Structural Change as a Source of Trade Disputes under NAFTA*. R.M.A. Loyns, K. Meilke, R.D. Knutson, and A. Yunez-Naude, eds., pp. 8 – 60. Winnipeg, Canada: Friesen Printers, February 2002.

- Zahniser, S., and J. Link, eds. *Effects of North American Free Trade Agreement on Agriculture and the Rural Economy*. Washington, DC: USDA/ERS Electronic Outlook Report No. WRS-02-01, 2002. <<http://www.ers.usda.gov/publications/wrs0201/>>. (31 August 2004).
- Zahniser, S., D. Pick, G. Pompelli, and M. Gehlhar. "Trade Liberalization in the Western Hemisphere: Impacts on US Agricultural Exports." *US Agriculture and the Free Trade Area of the Americas*, M. Burfisher, ed., pp. 39 – 51 and 132 – 35, Washington, DC: USDA/ERS Agricultural Economic Report No. 827, March 2004. <<http://www.ers.usda.gov/Publications/aer827/>>. (31 August 2004).
- Zahniser, S., and F. Trevino. "Hired Farm Labor: Comparing the US and Mexico." *Agricultural Outlook*. Washington, DC: USDA/ERS, January-February 2001. <<http://www.ers.usda.gov/publications/AgOutlook/Jan2001/AO278G.pdf>>. (31 August 2004).