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# North American Agrifood Market Integration: Situation and Perspectives

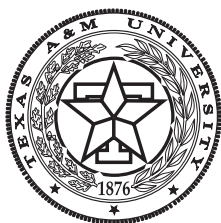


First Annual North American Agrifood Market Integration Workshop

# North American Agrifood Market Integration: Situation and Perspectives



Edited by:  
Karen M. Huff,  
Karl D. Meilke,  
Ronald D. Knutson,  
Rene F. Ochoa,  
James Rude,  
and Antonio Yunez-Naude



UNIVERSITY  
of GUELPH



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## Mexico

- PRECESAM – El Colegio de México – *Mexico City*
- Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación – *Mexico City*
- Senado de la República – *Mexico City*

Individuals from several government agencies, universities, agrifood organizations, and private sector representatives participated in the workshop as authors, discussants, and session chairs. The active participation of every one of the attendees was an important part of the success of this event.

The Agricultural and Food Policy Center at Texas A&M University took the lead role in providing the necessary local arrangements for the workshop. David Ernestes carried out the important task of designing and developing this document and its executive summary. He is also in charge of the NAAMIC website at Texas A&M University. Heather Sturgeon and Tracy Shorey of Agriculture and Agri-Food Canada helped to facilitate the work of the coordinating committee over the planning cycle. The hard work and dedication of these individuals is truly appreciated.

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# Background and Purpose



.....

*Karen M. Huff, Karl D. Meilke, Ronald D. Knutson,  
Rene F. Ochoa, James Rude, and Antonio Yunez-Naude*

## INTRODUCTION

This volume of papers contains the proceedings of the *First* North American Agrifood Market Integration Workshop organized by the North American Agrifood Market Integration Consortium (NAAMIC). NAAMIC consists of a group of agricultural economists from Canadian, Mexican and United States universities and governmental agencies including Agriculture and Agri-Food Canada (AAFC), Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación (SAGARPA), and the US Department of Agriculture (USDA). NAAMIC's mandate is to encourage frank and open discussion among policymakers, agrifood business leaders, and academics on any agrifood-related market integration issues that arise among the NAFTA members. Specific objectives of NAAMIC include:

- sharing information and fostering interaction among industry, academic, and government stakeholders on issues relating to market integration;
- fostering research about market integration; evaluating impacts and interactions of country policies, programs, and regulations on market integration; and
- defining, identifying, and evaluating policies that could advance market integration.

The NAAMIC organizers strongly believe that an open trading environment and further market integration are important avenues to increased prosperity for all participants in the agrifood value chain.

## THE CHAPTERS

The first NAAMIC workshop was held May 5-7, 2004, in Cancun, Mexico. Six groups of authors were commissioned to present papers on a variety of topics related to NAFTA, each followed by formal comments from discussants representing academia, the agrifood industry, producers and producer groups, and government policy makers. In addition to the formal discussion, each presentation generated plenty of informal discussion among workshop participants both during the formal meetings and at the informal receptions that concluded each workshop day. These contributions were developed into Chapters 2-7. A brief overview of the chapters contained in this volume follows.

### Defining Market Integration

Chapter 2, by Raymond Robertson (Macalester College), explains what we mean by the term *market integration*, particularly in the case of NAFTA. This paper not only defines market integration, but it also reviews four measures that are commonly used to evaluate the degree to which markets have integrated. In the case of NAFTA, measures that look at the breadth and depth of trade prove to be the most promising way of looking at North American market integration. Checking for price convergence and factor market integration is not always straightforward and may not be the best method for measuring integration within North America following NAFTA.

### The European Experience and Lessons for NAFTA

With the exception of a handful of agricultural commodities, the year 2003 witnessed the removal of most of the remaining tariff barriers among the NAFTA countries. One logical question might be what comes next for NAFTA. Each member could pursue its own multilateral and regional trade liberalization agendas and/or consider a deepening of the reforms brought about by NAFTA. The third chapter, by David Harvey (University of Newcastle upon Tyne), describes the European Union (EU) experience of first forming a customs union in 1957 and then gradually removing barriers to the free movement of labor and capital to form the common market we see today with its common institutions and policies, and for the most part, a common currency. Observing the very different motivations for the formation of the EU versus NAFTA, the paper considers the question of whether the NAFTA countries ought to follow a similar route to further market integration. One point that is clear is that further market integration, particularly in agriculture, will necessitate increased policy harmonization among the NAFTA members.

## **Measuring NAFTA Market Integration**

The next chapter, by Darcie Doan and Andrew Goldstein of AAFC, and Steven Zahniser, Tom Vollrath, and Chris Bolling of the USDA Economic Research Service (ERS), provides a survey of studies that have been conducted to observe how integrated the NAFTA agrifood market has become since 1994. This chapter also identifies areas in which market integration could be deepened through further liberalization. Continued differences in regulations and domestic support programs, as well as trade disputes, and the difficulty of moving goods across borders in the current environment of bioterrorist fears and mad cow disease all limit further integration. Given the observed benefits of NAFTA, these remaining barriers to free trade in the hemisphere should provide an incentive to decision-makers in each country to seek harmonized policies and possibly some common institutions.

## **The People Left Behind**

Chapters 5 and 6 consider the question of whether trade liberalization benefits all the players involved. The first of these by Edward Taylor (University of California at Davis), Antonio Yunez-Naude (El Colegio de México), Fernando Barceinas Paredes (Universidad Autónoma Metropolitana), and George Dyer (El Colegio de México and Universidad Nacional Autónoma de México-Morelia) looks at the impact of NAFTA and other policy reforms in the agricultural and rural economy of Mexico, with special reference to the field crops sub-sector, small farmers, and Mexico-US trade. Initially, the Mexican government expected that small non-competitive farmers and their families producing staples (maize in particular) would find employment in sectors benefiting from NAFTA. The government has since undertaken a number of recent initiatives to evaluate NAFTA's impact and to deal with rural poverty. While NAFTA has benefited big, commercial farmers and agrifood businesses in Mexico, rural communities appear to have regressed from producing crops for sale to subsistence farming. The study of NAFTA's influence on relatively isolated, poor farm households poses analytical challenges that are tackled in the paper. Finding a way to deal with continued rural poverty in Mexico and the possible negative impacts of NAFTA remains a challenge.

The next chapter, by Kristin Penn (Land O' Lakes), provides the personal perspective of a director of a multinational agrifood cooperative concerned with development, on how impoverished producers from transition and less developed economies can participate in the gains promised by freer trade. The lessons contained in this chapter should be of interest to any participant in regional or multilateral trade negotiations including both rich and poor nations.

## **Lessons from Mad Cow Disease**

Prior to the discovery of a single Canadian case of Mad Cow disease (Bovine Spongiform Encephalopathy or BSE) in May of 2003 (followed by another in the US in December of 2003), the North American cattle and beef market was an example of a highly integrated agrifood market. The chapter, by Julie Caswell (University of Massachusetts) and David Sparling (University of Guelph), examines this case in detail, including a discussion of the costliness of the approach that has been employed to deal with this situation. More than one year later, this market is still not fully open. A more integrated North American policy on how to deal with BSE could have kept borders open and prevented the huge losses felt by many producers and processors. This is yet another example that points to the need for improved policy harmonization within NAFTA.

## **FUTURE NAAMIC ENDEAVOURS**

This workshop is the first of three annual workshops planned by NAAMIC to coincide with the final stages of NAFTA's implementation. However, as Knutson et al. point out, the North American agrifood sector is not fully integrated, and many threats exist to erode the positive benefits of NAFTA, including (but not limited to) outbreaks of disease such as BSE, discontentment over the implications of freer trade such as outsourcing and increased import competition, food terrorism and security concerns, the impact of the 2002 US Farm Bill, limited improvement in the economic status of poor farmers in Mexico, and concerns about increased immigration.

The NAAMIC workshops provide an excellent opportunity to stimulate dialog among government, industry, and academic players about why and how these issues can be addressed. This dialog begins with the contributions presented in this volume. In particular, the papers point to the need for future discussions among the NAFTA countries to consider how to deal with the potential losers from freer trade – with options ranging from doing nothing, in light of how difficult it is to identify losers from trade liberalization, to providing partial compensation for actual losses – and the apparent need for policy harmonization within NAFTA in order to deepen the process of market integration.

## **REFERENCES**

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# Defining North American Economic Integration



*Raymond Robertson<sup>1</sup>*

## OVERVIEW

“Economic integration” is a term that is often used but rarely defined. In popular contexts, to “integrate” means to “make whole,” or to “unite.” In the economic context, however, the practical meaning of economic integration is the removal of barriers to commercial exchange. This concept applies to all forms of commercial exchange: goods and services (e.g., buying and selling final goods and services), production (buying, selling, and combining inputs such as materials and capital), and employment. Barriers to commercial exchange can be natural (e.g., mountains, oceans, and distance), cultural (e.g., information, language, and preferences), and political (e.g., borders, tariffs, quotas, and administrative standards). Since human economic activity is synonymous with commercial exchange, falling barriers to exchange define economic integration.

Understanding the idea of economic integration may be straightforward, but measuring it is not. The academic literature has identified a wide range of measures that capture various aspects of integration. Of these, the four most frequently used measures are product-level prices, factor markets, trade volumes, and product availability. All four are valuable measures that effectively capture different aspects of economic integration. The differences between the measures suggest that some might be more useful in certain contexts than in others. A comparison between the different measures suggests that the last two might generate

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<sup>1</sup> I thank Rick Barichello, Karen Huff, Ron Knutson, Rene Ochoa, Steven Zahniser, and participants at the 2004 NAAMIC workshop for very helpful comments and assume all responsibility for any remaining errors.

the most meaningful insights into North American economic integration because conditions in Mexico, a developing country, are quite different than in Canada and the US.

To motivate the different measures of economic integration, the next section of the chapter briefly discusses why economic integration is important. As defined above, economic integration is clearly important for growth, and thus ultimately each country's standard of living. Integration also drives change, which often is difficult and therefore resisted. These changes directly affect producers and consumers, and therefore it is important to be able to identify the results of instruments designed to foster economic integration, like trade agreements. The sections that follow therefore discuss each different measure of integration and what each tells us about integration in North America.

## THE IMPORTANCE OF INTEGRATION IN THE AMERICAS

Fifty years ago, Latin America and other developing regions were at the peak of Import Substitution Industrialization (ISI). Having rejected the open markets and free trade that characterized the world at the end of the nineteenth century, the conventional wisdom suggested that the path to prosperity was to focus inward and rely on government to generate the big push that would lead to development. Exhaustion of the ISI model, the relative success of the export-oriented East Asian countries, and the debt crisis triggered a reconsideration of the closed economy approach. In the mid 1980s and early 1990s Latin America dismantled barriers to trade and enacted sweeping reforms designed to integrate the previously closed countries into the world economy.

Economic integration is important for total national well-being because it affects aggregate growth. Growth ultimately determines each nation's standard of living. On the macro level, Frankel and Romer showed that countries that trade more internationally have higher incomes. The World Bank's 1993 report, *The East Asian Miracle: Economic Growth and Public Policy*, suggested that export promotion strategies explained much of the rapid and sustained growth of the Asian Tigers. European incomes converged as the European countries reduced barriers to trade (Ben-David). These are just three examples of many studies that find a positive link between economic integration and growth.<sup>2</sup>

Economic integration is also important to individual producers. Exposure to foreign markets is associated with higher rates of innovation within

---

<sup>2</sup> Of course, these studies have not escaped criticism. There is an ongoing debate about the specific policies that might contribute to growth through economic integration and the importance of other factors, such as institutions, that also affect growth. This debate is discussed later in the paper.

establishments (Alvarez and Robertson). Bernard and Jensen find a positive link between firm-level productivity and exposure to foreign markets.<sup>3</sup> Integration with world markets increases access to intermediate inputs and productivity-enhancing ideas. Economic integration also increases actual and potential competition, which brings both negative and positive challenges. Some firms competing with more efficient foreign producers shrink and lay off workers, while others respond aggressively and increase productivity.

Growth, innovation, and productivity are not the only potential benefits of trade. Most trade models suggest that the gains from trade are largest for consumers because consumers are able to buy goods more cheaply through imports. The potential size of the gains to consumers is quite large. Bradford and Lawrence, for example, estimate that if markets were integrated, and prices were equalized, then developing countries could experience gains over US\$103 billion and developed countries could experience gains over US\$450 billion.

Lured by the promise of these gains, but frustrated by the stalled Uruguay Round, countries pursued regional trade agreements. Europe advanced towards a single currency. In the Americas, several regional trade agreements emerged. Brazil, Argentina, Paraguay, and Uruguay formed MERCOSUR. The US, Canada, and Mexico successfully negotiated the North American Free Trade Agreement. Trade agreements soon formed what is now called the “spaghetti bowl” of trade agreements in the Americas (Inter-American Development Bank, Estevadeordal and Robertson).

The goal of these agreements is to foster integration by lowering various political barriers to commercial exchange. Tariffs and quotas drive wedges between prices. As these barriers fall, holding all other factors constant, prices converge. The agreements also strive to harmonize standards and eliminate other nontariff barriers. Lowering these political barriers may also reduce natural barriers as well, such as distance. While obviously not being able to change physical distance, trade agreements that increase the volume of trade can result in falling transportation costs because the average cost of transportation falls as the volume of trade increases (transportation exhibits economies of scale, as Hummels describes). Therefore, trade agreements could contribute to price convergence over and above the effect of reducing political barriers to trade.

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<sup>3</sup> Neither of these studies conclusively shows that the causality runs from exporting to higher productivity, and therefore may suggest that more productive firms are the ones that export.

These arguments suggest that an obvious metric for measuring integration would be to directly measure transportation costs between two countries. Surprisingly, very few studies directly incorporate transportation costs. Barrett and Li are one exception, and even they acknowledge that one can never observe all possible transactions costs that contribute to driving a wedge between international prices.<sup>4</sup> In the North American case, although about 70 percent of trade is transported by truck, different goods have different transportation costs related to weight. If one is interested in a particular good, changes in transportation costs might be a good way to measure changes in integration, but, at the aggregate level, these comparisons are less straightforward.

Even with the added benefit of falling average transportation costs, regional agreements may or may not sufficiently reduce barriers to integration. Nearly 20 years after reforms began, the Inter-American Development Bank now reports that Latin Americans are frustrated with the lack of growth and are losing their enthusiasm for reforms. At least two possible explanations could reconcile the lack of success with the findings that trade and growth are linked. First, trade liberalization may be a necessary, but not sufficient, condition for growth. Rodrik and Subramanian argue that “institutions rule”: protections of property rights, lack of corruption, healthy financial markets, infrastructure, and education may also be necessary conditions for growth. This may be particularly true for Mexico’s NAFTA experience (Tornell, Westerman, and Martinez). Another reason is that reforms may not have been completely carried out (Fontaine). In the case of international economic integration, the implication is that agreements that reduce tariffs may not be enough to actually facilitate integration, if other, less transparent, barriers take the place of tariffs, quotas, and licenses.

Therefore, it makes sense to take a multifaceted approach to understanding, measuring, and evaluating integration. While the academic literature contains several different measures of economic integration,<sup>5</sup> I present the measures that have received the most attention – price convergence, factor markets, trade volumes, and product availability – in the next four sections. Schiff and Winters offer an excellent overview of how regional agreements contribute to these measures. In each section, I discuss the applicability of each measure

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<sup>4</sup> See also Beghin and Fang.

<sup>5</sup> Studies that discuss how political and legal integration relate to economic integration include Eichengreen and Ehandi. There are several other measures that appear in the literature that are not discussed. Krueger, Salin, and Gray, for example, apply a probabilistic measure that draws on the industrial organization literature that is closely related to the price measures discussed in the third section of this paper.

for measuring integration in North America before and after NAFTA. The final section offers concluding thoughts.

## PRICE CONVERGENCE

When trading, buyers and sellers must agree on a price. Therefore, the fundamental mechanism underlying international economic integration is price equalization. Since different countries often use different currencies, economists use the term *purchasing power parity* (PPP) to discuss comparisons of prices in different currencies. If PPP holds, then currency-adjusted prices are equal across countries.

There are three ways to use prices as a metric for integration. The first is a convergence in absolute price levels. After accounting for natural, cultural, and political barriers to trade, price levels of identical products should be equal. The second is to follow price movements over time: prices of similar products should move in similar ways over time in integrated markets, regardless of whether or not the levels of the prices are equal. The third is to examine the range of variation of prices. This approach is based on the idea that prices in integrated markets should exhibit less variation than prices in segmented markets because arbitrage reduces the range in which prices can vary.

A growing number of studies use price levels of similar goods in different countries. The focus of these studies ranges from very specific products, such as pesticides in the US and Canada (Carlson et al.), to a wide range of products over many countries (Bradford and Lawrence). Carlson et al. find pesticide and herbicide prices differ between North Dakota and Manitoba and attribute these differences to differences in patents, market size, and number of available substitutes. Bradford and Lawrence also find that price differences in the European Union seem to be large and persistent. Producer prices exhibit differences as large as 20 percent in adjacent countries and reach 30 to 50 percent between continents.

The second approach follows prices over time. There are several variations of this theme. Some papers measure the speed at which prices converge back to some differential. Froot, Kim, and Rogoff examine deviations from PPP over 700 years and find that deviations are quite persistent. Others suggest that goods in integrated markets should change prices in comparable ways, such as in the same direction and

approximately the same time (Xu and Voon). Other authors use similar approaches, such as Betts and Kehoe,<sup>6</sup> but the findings are often mixed. Engel and Rogers employ a third approach. They posit bands that define the range of price movements that do not elicit arbitrage. Price movements out of these bands would invite arbitrage and bring prices back within the bands. Transportation costs increase the range in which prices can fluctuate without attracting competition. Therefore, they suggest that a measure of market integration is the variance of goods' prices between cities. Close cities should have narrow bands because transportation costs are lower, and therefore the overall variance of prices should be a function of distance and market barriers. As market barriers fall, the variance of price movements should also fall to reflect increasing integration.<sup>7</sup>

While prices might offer some of the most intuitive measures of integration, studies in this area face at least three significant problems. First, data are generally scarce. This is particularly true for data on price levels. Some recent studies (Bradford and Lawrence, Parsley and Wei) use detailed price data from cities around the world to estimate the degree of market fragmentation and the degree to which prices tend towards equalization. These data sets are relatively new, and offer potentially important insights that are still emerging.

Second, prices can diverge for reasons not directly related to economic integration. Prices may differ due to differences in demand elasticities, taxes, availability of substitutes, and other factors (Carlson et al., Knetter and Slaughter). Another significant factor could be the presence of nontariff barriers, such as administrative requirements and standards. These act as barriers to trade that are often difficult to observe but could have significant effects on prices. Therefore, it would be important to at least discuss the possible magnitude of these and other influences when using the price criterion for market integration.

Differences in monetary policy across countries may generate differences in price levels; this is complicated by the fact that the relationship between exchange rates and domestic prices is not well understood. In

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<sup>6</sup> For readers interested in econometrics, these studies include Granger causality, error-correction models, cointegration tests (Ghosh; Mohanty et al.; Mohanty and Langley; Moodley, Kerr, and Gordon; Paul, Miljkovic, and Ipe), and vector autoregression (VAR) models (Dawson and Dey). Baulch criticizes these studies, noting that transfer costs are significant and introduces a technique to incorporate transfer costs into the analysis. The problem with this approach, however, is that it requires some data on transfer costs, which are often very difficult to find.

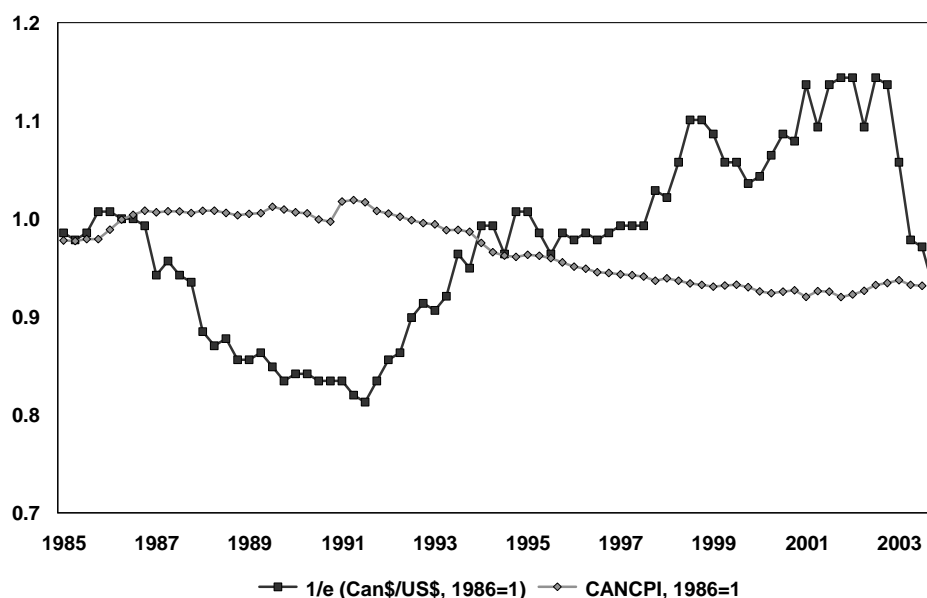
<sup>7</sup> Berkowitz and deJong employ this approach when examining Russian integration.

order to compare price levels between countries that use different currencies, one has to use some measure of the exchange rate. If the exchange rate is perfectly flexible and only moves to offset differences in inflation between two countries, then using the exchange rate is not a problem. Many studies find that exchange rates in general do not always move to offset differences in inflation.<sup>8</sup>

This problem probably affects comparisons between all countries, but some countries are affected more than others. The North American case is an excellent example. Canada and the US have relatively similar inflation rates, while Mexico and the US have very different inflation rates. Figure 2.1 plots the Canadian CPI (relative to the US CPI) and the nominal Canadian-US exchange rate (Canadian dollars per US dollar). This figure illustrates two important points. First, the relative

<sup>8</sup> Taylor, for example, describes some of the methodological problems involved in even addressing the question. Campa and Goldberg find only partial “pass through” in the short run, which means that prices and exchange rates do not move perfectly to offset each other, which makes price equalization across countries problematic.

**Figure 2.1:** Relative inflation and the exchange rate in Canada.



**Notes:** CANCPI represents the ratio of the Canadian consumer price index to the US consumer price index. These variables are linked by the relationship that defines the real exchange rate (the rate of exchange between two countries in terms of goods) as equal to the nominal exchange rate times the ratio of the price levels in each country. In this figure, a decline (increase) in the exchange rate represents an appreciation (depreciation) of the Canadian currency.

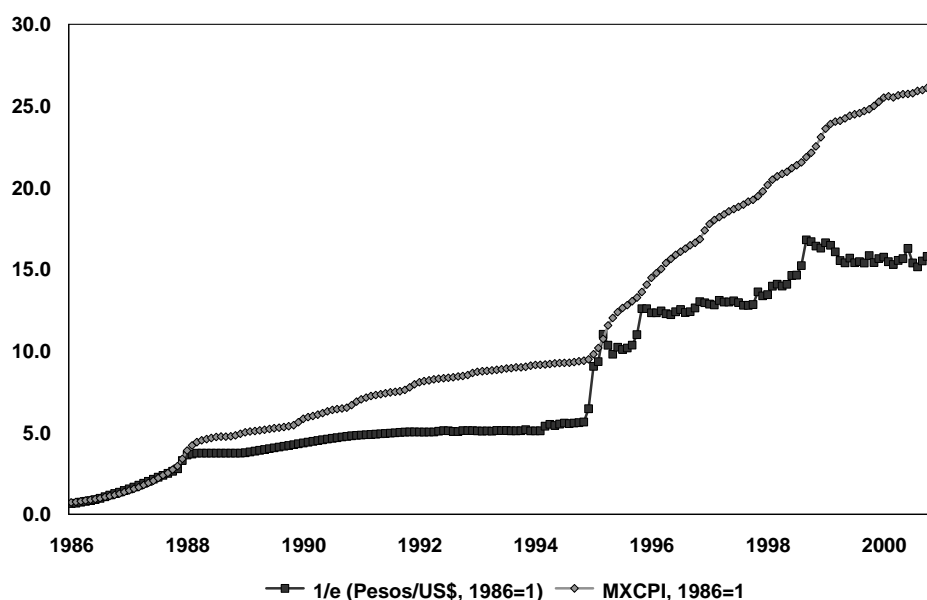
**Source:** Own calculations using data from International Monetary Fund.

inflation rate moves over a very small range (from .92 to 1.02), suggesting that US and Canadian inflation rates are very similar. Second, the Canadian dollar is relatively flexible and moves around the inflation-rate ratio, temporarily deviating but always returning. This suggests a relatively well-functioning exchange rate.

Figure 2.2, on the other hand, plots the Mexican CPI (relative to the US CPI) and the nominal peso-dollar exchange rate. The first thing to notice is that the scale of Mexican-US inflation comparison is over 20 times larger than the scale for the Canadian-US inflation ratio, showing that Mexican inflation rises significantly relative to US inflation over the 1986 to 2000 period. Second, there is generally a large gap between the movement of the peso and the inflation-rate ratio. In fact, the nominal exchange rate only changes to offset differences in inflation during the December 1994 peso crisis. For the rest of the period, Mexican prices, relative to US prices, are rising.<sup>9</sup> The real exchange rate (defined as the

<sup>9</sup> As expected, the gap between the relative inflation levels and the exchange rate has resulted in a corresponding change in the Mexican trade balance. See Robertson (2003).

**Figure 2.2:** Relative inflation and the exchange rate in Mexico.



**Notes:** MXCPI represents the ratio of the Mexican consumer price index to the US consumer price index. These variables are linked by the relationship that defines the real exchange rate (the rate of exchange between two countries in terms of goods) as equal to the nominal exchange rate times the ratio of the price levels in each country. In this figure, an increase in the exchange rate represents a depreciation of the Mexican currency.

**Source:** Own calculations using data from Banco de Mexico.

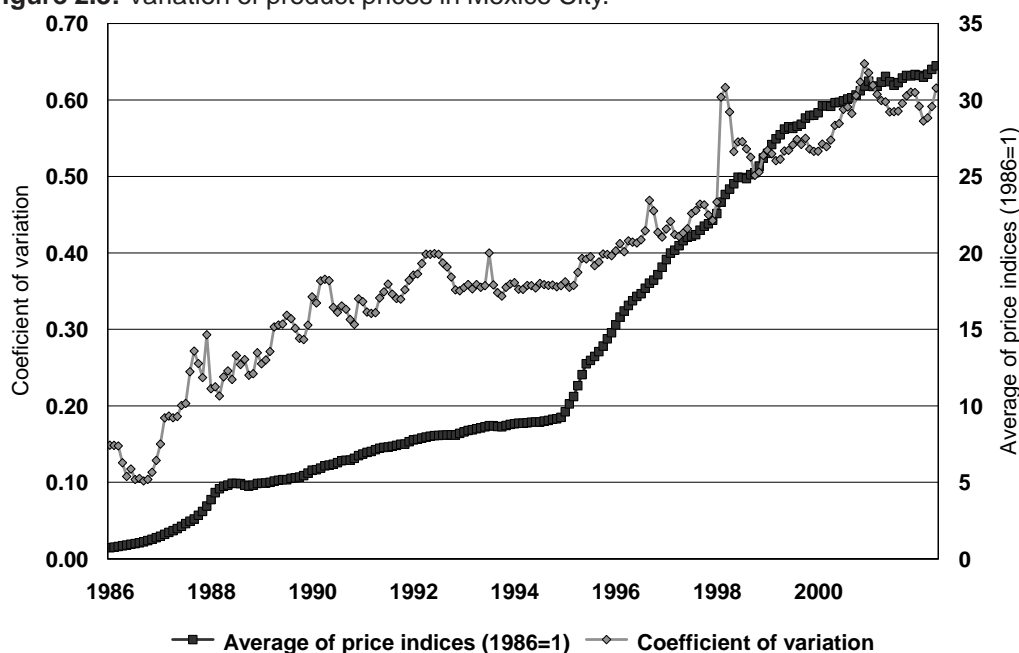
nominal exchange rate times the ratio of price levels) follows the trade balance closely in both countries, but the movements of the real exchange rate are much smaller in Canada and therefore Canada has (proportionally) smaller swings in the trade balance.

These figures illustrate that attempts to compare prices as a way to measure integration would have to take into account the macroeconomic imbalance implied by the difference in inflation rates and the adjustment in the different currencies. In the US-Canadian case, this does not seem to be a very serious problem because the exchange rate deviates less and tends to effectively offset differences in inflation rates. In the Mexican case, however, the exchange rate is not as effective and therefore confounds price comparisons.

Third, and perhaps more vexing for those wishing to apply the price metric to the Mexican case, would be the problem illustrated in Figure 2.3. As the figure implies, the coefficient of variation<sup>10</sup> of prices increases

<sup>10</sup> The coefficient of variation is the standard deviation divided by the average price level. Dividing by the average price level removes the effect of average inflation.

**Figure 2.3:** Variation of product prices in Mexico City.



**Notes:** The coefficient of variation is the standard deviation divided by the mean. The data are 212 product price indices (1986=1) that make up the Mexican Consumer Price Index. The average of price indices differs from the CPI in Figure 1b because the average in this figure is calculated as the simple, rather than the weighted, average, is for Mexico City only, and is not divided by the US CPI.

**Source:** Own calculations using data from Banco de Mexico.

in the NAFTA period, which often happens during inflationary periods (Parks; Glezakos and Nugent; Domberger; DeBelle and Lamont). Because prices of different products respond differently to inflation, using either relative prices or variation in prices as a metric for market integration could be significantly complicated by differences in inflation rates. In the Mexican case, price convergence or a convergence in the variation of prices that would be due to trade could be swamped by the relatively high rates of inflation in Mexico.

### **FACTOR MARKETS (CAPITAL AND LABOR)**

In addition to goods markets, barriers to commercial exchange can apply to factor markets. In fact, the two are related. In a model in which prices are related to costs (and, in perfect competition, equal marginal costs), product market integration can be analyzed by focusing on factor markets. The two most common factor markets are capital and labor. The neoclassical trade models, such as the Heckscher-Ohlin model, suggest that wages and returns to capital would equalize in integrated markets, regardless of why the markets are integrated. Free mobility of labor and capital might equalize factor prices, and, in theory, product market integration that equalizes prices should also equalize factor prices. Formally, the result that product price equalization leads to factor price equalization is known as the factor price equalization theorem.

We have already discussed some of the problems encountered when trying to observe whether or not product market prices equalize, so we now focus on the mobility of capital and labor. One important difference between capital and labor is that capital is generally assumed to be more internationally mobile than labor. NAFTA in particular was designed to facilitate capital flows. A large and voluminous literature tests for capital market integration. These papers generally find relatively integrated capital markets, but Oh, for example, finds that European capital market integration is still far from complete.

As with product-market integration, one can think about factor market integration both in terms of flows and prices. Both prices and flows have their advantages. The price of capital, however, is often difficult to define and incorporates many factors that affect returns, such as risk. Here I focus on flows purely for simplicity. NAFTA was designed to complement earlier reforms liberalizing capital markets and further facilitate capital flows. Factor flows have historically been more restricted between Mexico and the US than between Canada and the US, and therefore I will focus most of the discussion on factor markets to the Mexican-US case.

Mexico's 1973 Foreign Investment Law, *The Law to Promote Mexican Investment and to Regulate Foreign Investment*, restricted foreign capital

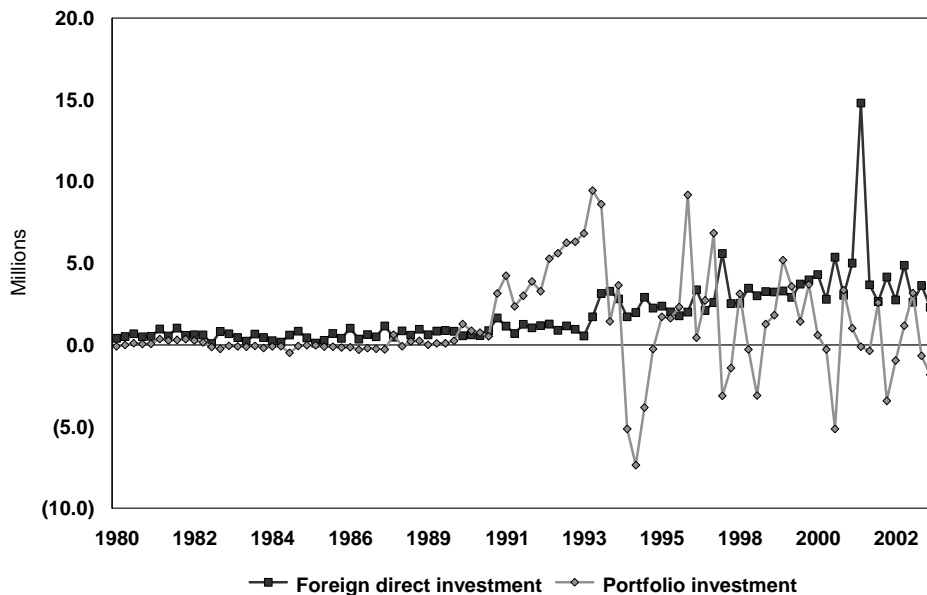
by establishing a general limit of 49 percent foreign ownership in Mexican businesses. In 1983, the Mexican government reformed the maquiladora program by relaxing controls on foreign investment for the Mexican border region. In May 1989, the Salinas de Gortari administration relaxed this law for the rest of the country by eliminating all existing administrative requirements and broadened the interpretation of the 1973 law to facilitate capital flows (Ros).

Figure 2.4 illustrates some of the changes in capital flows into Mexico between 1980 and 2000 by plotting aggregate net flows of both foreign direct investment and portfolio investment. The change in the foreign investment law in 1989 was followed by a sharp increase in relatively volatile portfolio investment, which reversed during 1994. The level and trend of FDI increased in 1994 (before the peso crisis).

The most prevalent example of foreign direct investment in Mexico has been the maquiladora industry. Maquiladoras are assembly plants in Mexico that export goods assembled with imported inputs. These are largely foreign firms that have been the engine behind Mexican manufacturing growth over the last 20 years.<sup>11</sup> The rise in maquiladora

<sup>11</sup> The Mexican maquiladora program has also been studied as a possible explanation of rising inequality in Mexico. See Feenstra and Hanson.

**Figure 2.4:** Capital flows to Mexico.

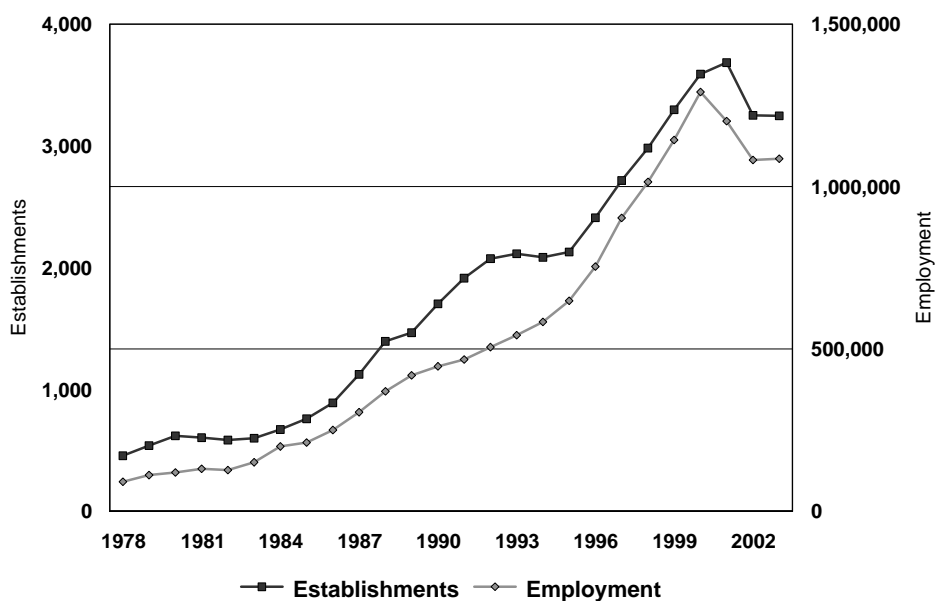


**Source:** Own calculations using data from Banco de Mexico.

establishments and employment potentially represents direct integration of the US and Mexican economies because it represents a fragmentation of the production process. Production of a final good can be broken into stages, such as design, materials, assembly, and marketing. Maquiladoras become part of the production chain of US companies because they perform the assembly stage of production and therefore tighten the links between the two countries.

Figure 2.5 shows the evolution of employment and establishments in Mexico's maquiladora industry. Establishments and employment rise rapidly after changes in the foreign investment law in 1983. The rate of growth increases again following NAFTA. Since 2000, however, both employment and the number of plants have been falling. Several analysts have suggested that this decline represents a loss of Mexican competitiveness relative to other countries, such as China. Others have suggested that the decline is actually evidence of very close integration between US and Mexican markets. Figure 2.6 (taken from Hanson and Robertson) suggests that US manufacturing output and Mexican maquiladora value added are actually very closely related, which might suggest that capital flows have been a force integrating North America. The relative decline of the maquiladora employment and establishments might therefore be attributed to the US recession.

**Figure 2.5:** Establishments and employment in the maquiladora industry.



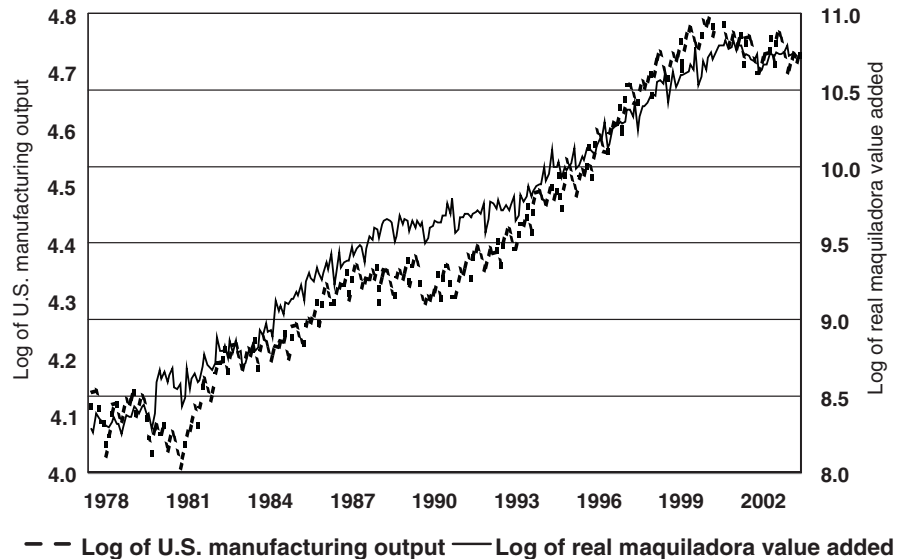
**Source:** Own calculations using data from INEGI.

While NAFTA was partially designed to facilitate capital flows, labor flows were specifically excluded from the main agreement. Furthermore, several measures were implemented concurrently with NAFTA that were designed to make labor less mobile across the border. Operation Hold the Line, Operation Gatekeeper, and Operation Rio Grande<sup>12</sup> were three initiatives of the US border patrol to increase migration costs to Mexican workers seeking employment in the US. Operation Hold the Line was implemented in 1993 and focused on El Paso. Operation Gatekeeper went into effect in October 1994 in San Diego. Operation Rio Grande in McAllen, Texas was launched in August 1997. These increased barriers to migration are designed to segment the Mexican and US labor markets.

Reliable illegal immigration data are difficult to find, suggesting that prices (wages), rather than flows, might be a better metric of labor market integration. Similar workers should earn similar wages in integrated labor markets. As is well known, Mexican and US wages are quite different. Figure 2.7 illustrates the long-run (1963 to 1999) gap in the dollar value of US and Mexican average wages. The gap is very large and persistent. The wages do seem to exhibit some similarity in

<sup>12</sup> See US Department of Justice for more information about these initiatives.

**Figure 2.6:** Output in US manufacturing and Mexican maquiladoras.

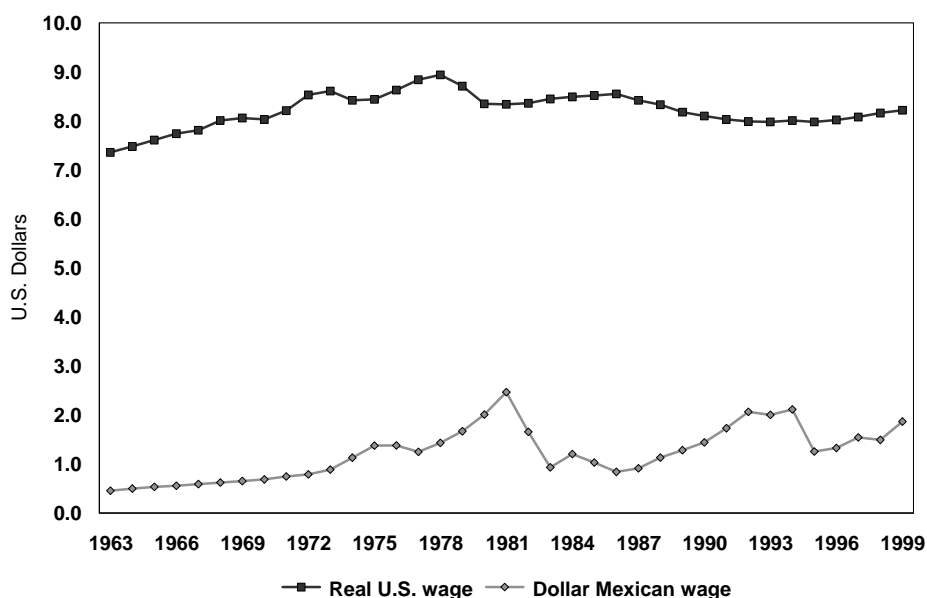


**Source:** Own calculations using data from the *Statistical Abstract of Latin America* and the US Bureau of Labor Statistics (BLS).

movement over the 36 year span. Both real US and dollar-valued Mexican wages rise from 1963 to about 1980. Starting in 1980, US real wages begin a gradual decline that lasts until about 1995. Concurrent with the debt crisis (1982) and the peso crisis (1994), Mexican wages fall sharply. Overall, however, absolute convergence might be evaluated by comparing the ratio of dollar wages in each country. Over the 36 year period, there is evidence of dollar-valued wage convergence that was interrupted by the debt and peso crises.

As with product prices, comparing wages between countries is complicated when countries use different currencies and when the currencies do not adjust to offset differences in inflation rates. Therefore, one can consider an alternative measure that is based on real domestic purchasing power. Rather than transforming Mexican wages into dollars using the nominal exchange rate, we could transform Mexican wages into real wages using the Mexican CPI and transform US wages into real wages using the US CPI. These two series are then divided by the value in some base year (e.g., 1963) so that we can compare real wage movements relative to the differential in the base year.

**Figure 2.7:** Comparing Mexican and US dollar wages.



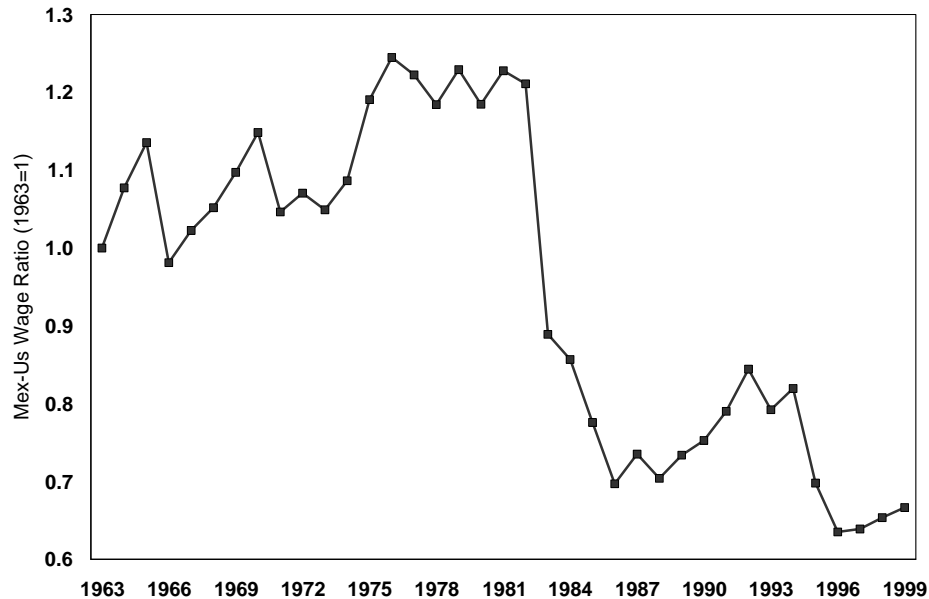
**Notes:** Mexican data are hourly wages in manufacturing (*Statistical Abstract of Latin America* various years), converted to dollars using the nominal peso/dollar exchange rate (International Financial Statistics). US wages are hourly wages in manufacturing (US Bureau of Labor Statistics series CEU3000000060, available on line at <<http://www.bls.gov/>>), converted to real wages using the Consumer Price Index.

**Source:** Own calculations using data from the *Statistical Abstract of Latin America* and the US Bureau of Labor Statistics (BLS).

Like Figure 2.7, Figure 2.8 compares US and Mexican real wages, but rather than graphing the two series, the figure illustrates the ratio of Mexican to US real wages (normalized to 1 in 1963). Real Mexican wages rise more (prior to 1980) and fall more (after 1980) than US wages. As we saw when using the dollar measure of wages, the debt crisis of the early 1980s coincided with a very large decline in Mexican purchasing power. In terms of relative purchasing power, the drops that followed the debt crisis and the peso crisis interrupted a trend towards wage convergence and create the impression of wage divergence over the 1980 to 1999 period.

Rising trade seems consistent with the convergence in the dollar-valued wages, but inconsistent with the purchasing-power-based wage measures. In both cases, a large gap persists. The wage gap between US and Mexican workers, however, does not necessarily imply that labor markets are segmented. The cost of crossing the border drives a wedge between wages that might represent an equilibrium differential. That

**Figure 2.8:** Comparing Mexican and US real wages.



**Notes:** Mexican data are hourly wages in manufacturing (*Statistical Abstract of Latin America* various years), converted to real wages using the Mexican CPI (International Financial Statistics). US wages are hourly wages in manufacturing (US Bureau of Labor Statistics series CEU3000000060, available on line at <http://www.bls.gov/>), converted to real wages using the Consumer Price Index. Real Mexican wages were then divided by real US wages, and this series was divided by the 1963 value to create the index.

**Source:** Own calculations using data from the *Statistical Abstract of Latin America* and the US Bureau of Labor Statistics (BLS).

is, workers might migrate if the expected gains from migrating are larger than the cost of crossing the border, but would not migrate if the gain is smaller. Thus, workers would continue to migrate until the difference between wages in the two countries returned to the cost of migrating. For example, if wages increase in the US so that the gap is larger than the migration cost, workers would leave Mexico as long as the gap persisted and would stop migrating when the gap returned to the cost of migrating.

One implication of this approach is that labor markets can be considered integrated even in the presence of an absolute wage differential if wages in the two countries move in the same direction. That is, labor markets are integrated if wage shocks in the US are transmitted to Mexico. This is the basic premise behind Robertson (2000). By matching US and Mexican household surveys, he analyzes the transmission of US labor market shocks into Mexico.

The results suggest that US and Mexican labor markets are closely integrated. Mexican wages respond to US wage shocks and return to the equilibrium differential relatively quickly. Furthermore, the results suggest that the Mexican border region is more closely integrated with the US than the Mexican interior is. Wages in Mexican border cities (Tijuana, Ciudad Juarez, Nuevo Laredo, and Matamoros) exhibit stronger responses to US wage shocks, and return more quickly to the equilibrium differential than wages in the interior of Mexico.

Robertson (2004) analyzes both absolute and relative wage convergence before and after NAFTA. The results from both absolute and relative wages suggest that there is very little evidence of increased labor market integration following NAFTA. These results are somewhat surprising, given the fact that trade and foreign investment increase following NAFTA, and both of these measures are expected to contribute to labor market integration. A more direct comparison of the different factors that can integrate labor markets, however, suggests a possible explanation. Regression analysis that directly compares trade, foreign investment, migration controls, and wages, suggests that, as expected, trade and foreign investment are positively correlated with wages and therefore contribute to market integration. Border enforcement, while formally separate from NAFTA, increased during the implementation of NAFTA. Border enforcement is negatively correlated with Mexican wages and may have mitigated the gains that came from rising trade and investment.<sup>13</sup>

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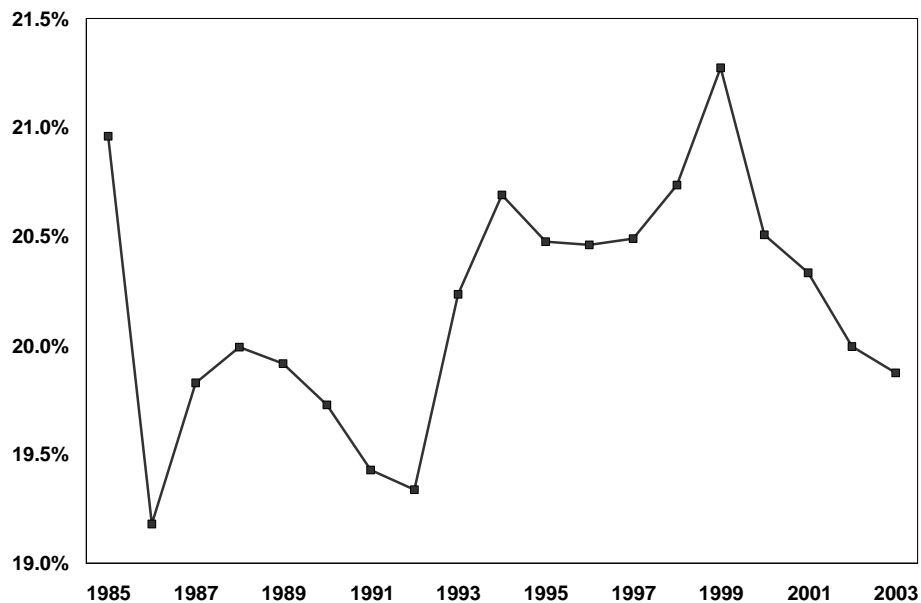
<sup>13</sup> Hanson, Robertson, and Spilimbergo also find that rising US border enforcement depresses Mexican wages.

## TRADE VOLUMES

If existing barriers inhibit trade, falling barriers should increase trade volumes. Therefore, perhaps the most intuitive measure of economic integration is the volume of trade. Courchene, for example, leads his discussion of North American economic integration with a discussion of how trade flows have increased between Canada and the US. International trade theory suggests that international trade is sufficient to integrate markets and most people probably think of trade volumes first when thinking about exchange between countries (Barrett). Furthermore, trade data are easily accessible and rising trade flows often follow trade liberalization.

In terms of trade volume, Canada is the largest US trading partner. Trade between the US and Canada increased greatly between 1986 and 1999. Figure 2.9 shows that between 1986 and 1999, Canada's share of total US trade rose. Since 1999, however, this share has been falling. Interestingly, if one includes 1985, there is no statistically significant trend in Canada's share of US trade over the 1985 to 2003 period. Figure 2.10, which shows Canada's share of US exports and imports, illustrates that, while Canada's share of US exports has been rising steadily over the last 12 years, Canada's share of US imports rose from 1987 to 1995,

**Figure 2.9:** Canadian share of US total goods trade.



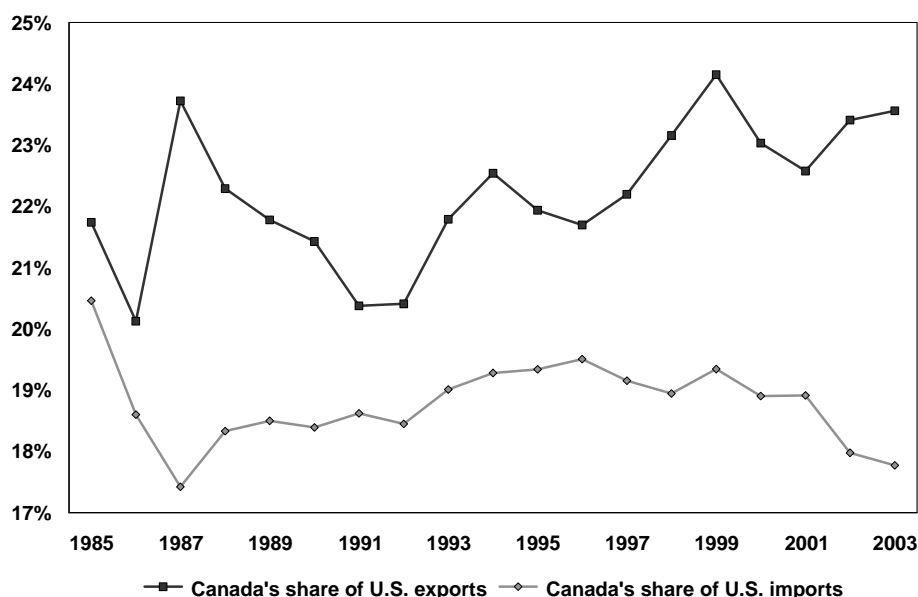
**Source:** Own calculations using data from the US Census Bureau, Foreign Trade Division.

and has been falling since 1996, but, overall, the changes have been relatively small.

The change in trade volume between Mexico and the US has received much attention. Trade between Mexico and the US has been increasing since 1985, with a positive spike following the peso crisis. Trade volumes fell with the onset of the US recession in 2000, but recovered somewhat in 2002. The trend in total trade is higher in the NAFTA period (post January 1994) than before NAFTA. It is important to note that the change in trade is not likely to be due to the peso crisis or changes in the exchange rate. Figure 2.2 shows that the real exchange rate follows the same pattern before and after the peso crisis, and that the peso crisis corrected the overvaluation of the peso. The persistence of the trend, therefore, is most suggestive of a real effect of economic integration.

Figures 2.11 and 2.12 illustrate these results by showing the trends in Mexico's share of US exports and imports between 1985 and 2003. Mexico's share of US imports and exports more than doubles over the last 20 years. Since NAFTA, Mexico's share of total US imports rose by nearly 50 percent, and Mexico's share of US exports rose by approximately 100 percent. Mexico began liberalizing trade when it joined the GATT in 1986. Tariffs fell sharply between 1986 and 1988 and remained stable until the peso crisis in December 1994. Both Figures

**Figure 2.10:** Canadian share of US goods imports and exports.



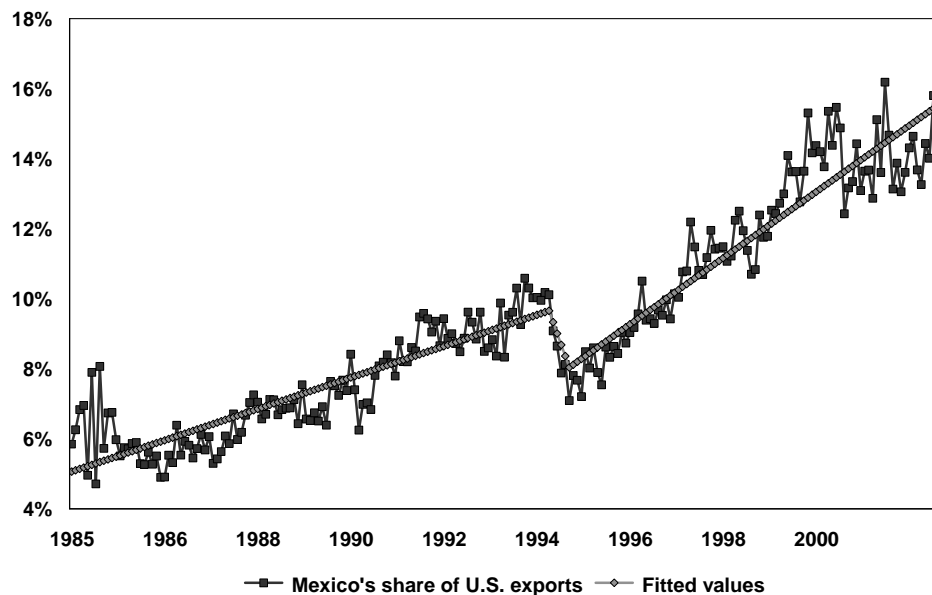
**Source:** Own calculations using data from the US Census Bureau, Foreign Trade Division.

2.11 and 2.12 show that Mexico's share of US exports and imports fell between 1985 and 1987, but started climbing in 1987 and continued to rise for the rest of the period.

The peso crisis in 1994 did affect exports and imports between Mexico and the US. Figures 2.11 and 2.12 illustrate two different ways to think about changes in Mexico's share of US trade. The first is the *level* of the share of trade. Both figures show that the level of the share of trade is higher in the NAFTA period than before. Mexico's share of US exports fell sharply during the crisis, as Mexico's domestic demand collapsed, but the recovery was particularly robust. The second is the rate of increase. Figure 2.11 reflects the econometric result that the rate of increase of Mexico's share of total US exports is higher after NAFTA than before, although this seems to level out somewhat with the 2000 US recession.

The change in imports reflects a somewhat different pattern. Mexico's peso collapse made Mexican goods much less expensive for the US, and Mexico's exports to the US increased as a result. Interestingly, there seems to be a clear structural break at that time. Mexico's share of US imports remained at a higher level and continued to increase. The rate of increase was slightly higher (and the difference was statistically

**Figure 2.11:** Mexican share of US goods exports.



**Source:** Own calculations using data from the US Census Bureau, Foreign Trade Division.

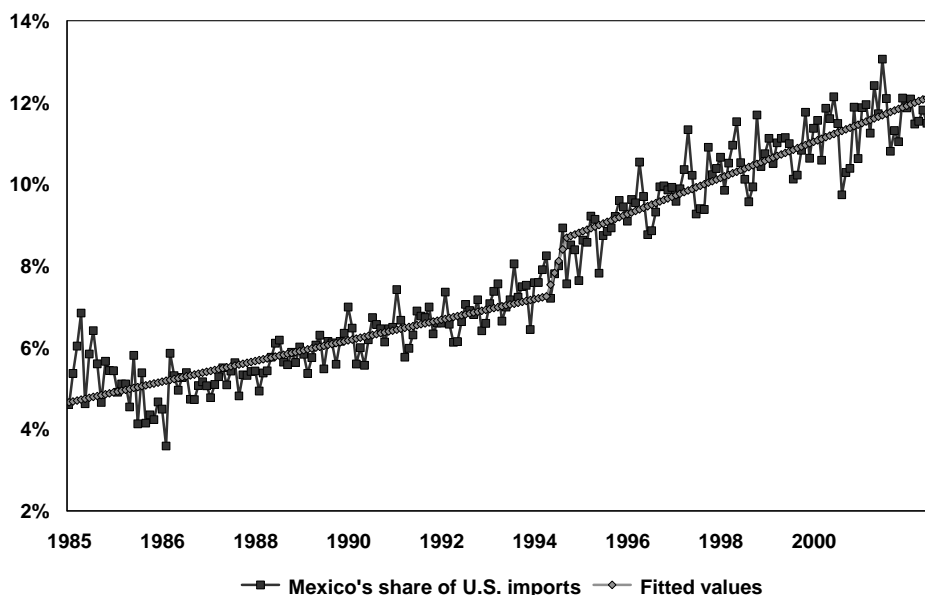
significant) in the post NAFTA period, suggesting that both the level and the rate of increase of Mexico's share of US trade increased after NAFTA.

Jakab, Kovacs, and Oszlay present a related measure based on trade volumes. They first calculate the *potential* trade volumes between country pairs that are based on the characteristics of countries that contribute to trade (distance, income, border, language, and other factors). They then compare observed trade levels and the potential trade volumes, as well as calculating the speed of convergence towards the potential trade level. Estevadeordal and Robertson conduct a similar exercise for the Americas in preparation for the Free Trade Agreement of the Americas (FTAA). They find that the gravity model actually under-predicts Mexico's trade volumes prior to the FTAA, which suggests that Mexico is already trading more than would be expected based on the usual gravity model estimates. Mexico's trade is expected to increase with the FTAA.

### PRODUCT AVAILABILITY

Knetter and Slaughter, and Broda and Weinstein suggest two different possible measures of market integration that have deep roots in theory but have received relatively little empirical attention. Simply put, these

**Figure 2.12:** Mexican share of US goods imports.



**Source:** Own calculations using data from the US Census Bureau, Foreign Trade Division.

involve looking at the range of products traded. Product markets might be integrated if prices equalize, as discussed earlier, but empirically one can only compare the prices of goods that are actually present in the market. Increasing the range of goods that are traded, and therefore increasing the choices of products available to producers, is one of the most significant gains from trade liberalization.

Knetter and Slaughter develop a useful metric to measure market “thickness”, which is essentially a count of the number of goods in which trade is observed divided by the total number of possible goods. This measure therefore ranges from zero to one as market thickness increases. They then calculate this measure for a sample of 24 OECD countries and 122 “world” countries. Not surprisingly, country pairs within the OECD trade a wider range of goods than the world in general. They also find that, in general, markets have become more “thick” over time, although this pattern was not uniform during the 1980s. Unfortunately, they are unable to link the trends with changes in trade barriers, making it difficult to determine whether falling trade barriers increase the range of goods traded.

Broda and Weinstein, on the other hand, find stronger links between liberalization and the number of goods traded. Defining goods by both category and country (assuming each country’s variety is unique), they find that between 1972 and 2001, the number of varieties that the US imported grew from 74,667 (7731 goods from an average of 9.7 countries) to 259,215 (16,390 goods from an average of 15.8 countries). One interesting finding is that, in terms of rank in supplying varieties to the US, Canada moved from fourth to first and Mexico moved from thirteenth to eighth. Focusing their empirical analysis on the US, they find that the increase in varieties increased US welfare by 3 percent.

## CONCLUSIONS

Economic integration is synonymous with falling barriers to commercial exchange. International economic integration is important because it is linked to growth and has significant effects on producers and consumers. Defining, measuring, and evaluating integration is therefore important but is not always straightforward. Comparing prices between the US and Mexico is complicated by the fact that the two countries have different inflation rates and the peso-dollar exchange rate does not adjust to offset the difference. An alternative is to focus on factor markets. Capital flows increased after NAFTA, and seem to be a factor integrating the two economies. Legal labor flows have also increased, but, apart from and concurrent with NAFTA, the US raised border enforcement in ways that may have mitigated the integrating effects of product and

capital market integration. As a result, there is little evidence that labor markets are more integrated following NAFTA.

The more promising measures of integration seem to be those that focus on either the breadth or depth of trade volumes. Falling transportation costs and falling barriers to trade facilitate goods flows and make it easier for both producers and consumers to obtain goods at a lower cost. Following NAFTA, both the level and the rate of increase of Mexico's share of US exports and imports rose, suggesting an increasing depth of product-market integration.

One of the most promising measures of economic integration in North America is one that measures the breadth of product-market trade. Trade agreements lower barriers to the trade of currently traded products, but also make trade in new products possible. Trade in new products has a very significant potential for increasing the welfare of producers and consumers throughout North America.

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# European Perspective on Market Integration: Lessons from NAFTA

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## INTRODUCTION

This chapter is entitled a “European perspective.” The particular perspective presented here is European in the sense that: a) it is generated by an incurably European author, one who has experienced policy analysis on both sides of the Atlantic but whose native wit and empathies lie, by both nature and nurture, with the eastern seaboard of the fluid divide; b) it is conditioned by an appreciation of circumstance (sociogeography) and context (political history) which is, perhaps, missing from some North American (especially the US) perceptions. However, it is definitely a rather than the European perspective. The author makes no claims to be archetypical or representative, still less descriptive, of European perspectives and positions on market integration, or of the policy implications and imperatives that are consequent on these positions.

Where did the European idea of a “common market” come from, and what is the notion of market integration that underlies and rationalizes this action? The immediate aftermath of World War II generated a major surge of international cooperation and restructuring (e.g., the World Bank, the IMF, the GATT) as world leaders tried to secure the peace and immunize international relations from the plague of major war. This surge of internationalism and supranationalism was, perhaps, strongest in continental Europe, emerging from the second catastrophic war in 50 years, and determined to prevent such tragedy from occurring ever again. “Already during the Second World War, the conviction was growing that nationalism was at the roots of the disaster which fascism had wrought in Europe and that, therefore, Europe should be rebuilt in a sphere of increased international integration, especially in economic

terms” (Molle, p. 44). “In the aftermath of the Second World War, *rapprochement* between France and Germany was a priority for many Western European statesmen” (Tracy, p. 248). By 1951, the European Coal and Steel Community, with a supranational High Authority, had already been formed, ensuring equal access by all participants (the Six<sup>1</sup>) to these critical strategic resources. The European Economic Community (1958), later the European Union (EU), was a natural successor, very much born of political imperative and determination to integrate. Molle identifies six major steps towards full integration: Free Trade Area; Customs Union; Common Market (free movement of labor and capital); Economic Union; Monetary Union; Political Union. Following the disaster of the Second World War, the western European countries, led by the Six, made rapid progress towards Economic Union, albeit that the later steps – especially the common or single market and monetary union took longer to develop, while full economic and political union remains an aspiration for some, and anathema to others. There has been a continual and fundamental contest within the EU between those seeking genuine political union (especially the leaders, though not necessarily the electorates of France and Germany) and those content with intergovernmental cooperation (led by the UK). Perhaps the major brake on progress has been the lack of enthusiasm, most obviously by the UK, for supranational authorities and for political union.

The primary objective of the formation of the Common Agricultural Policy (CAP) of the EU has been to integrate agricultural and thus food markets. The Treaty of Rome which established the European Economic Community in 1958 required that “The Common Market shall extend to agriculture and trade in agricultural products” (Article 38) and that “The Community shall be based on a Customs Union” (Article 9), requiring the elimination of all barriers to trade between Member States (Ritson). The Single European Act of 1985 substantially refined the EU’s pursuit of market integration, and defined the internal market as “an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured in accordance with the provisions of this Treaty.”<sup>2</sup>

The principles on which the Single European Market (SEM) is founded are: non-discrimination (Article 12), which prohibits “any discrimination on the grounds of nationality” (subsequently extended by the European Court of Justice to include discrimination on many other grounds); mutual recognition, by which domestic legislation within one Member

<sup>1</sup> The original six were, France, Germany, Italy, Belgium, Luxembourg, and Netherlands. The UK declined to join, refusing to participate in a Community of supranational character.

<sup>2</sup> This section, including the following paragraphs, summarizes the outline provided by the European Commission (2001).

State is treated as equivalent to domestic legislation in other Member States. However, the principle of mutual recognition has not proved sufficient. Common directives (Community legislation) have therefore been adopted to harmonize national rules. Harmonization directives generally focus on the demands of health, safety and environmental protection, and also on common standards. Indeed, official assessment of progress towards a genuine SEM typically centers on the extent to which Member States have implemented the succession of common directives emanating from the European Commission.

The SEM is aimed at establishing four major freedoms of movement: for *goods*; for *services*; for *people*; for *capital*. Freedom of movement for goods has been directed towards eliminating all barriers to trade. The European Court of Justice has played a key role in this respect, compensating for the absence of any reference in the Treaties by providing definitions of obstacles to trade. In the case of charges having equivalent effects to customs duties, it considered any duty, whatever its name or procedure, which is imposed on imported products but not on similar national products as having the same restrictive effect on the free movement of goods as a customs duty, because it alters the price. As for measures having equivalent effect to quantitative restrictions, the Court defined these as any trade regulation in the Member States likely to hinder Community trade, directly or indirectly, actually or potentially. Finally, in the 1985 White Paper on the completion of the internal market, and the implementation date of 1992, the EU eliminated physical barriers (border checks and customs formalities) and began to tackle the constantly increasing number of technical barriers via the principle of mutual recognition of standards and Community harmonization.

European citizenship means that all citizens of the Union have the right to move and reside freely within the territory of the Member States.<sup>3</sup> The Treaty of Amsterdam marked an important step bringing the provisions of the Schengen agreement within the framework of the EU's institutions and in providing for the creation of an "area of freedom, security and justice" without checks on persons on the internal borders of the EU, whatever their nationality. Denmark and, to a certain extent, the UK and Ireland have, however, chosen not to participate fully in these new initiatives on the free movement of persons. The Court of Justice has interpreted this Article broadly and extended the principle of freedom of movement to persons seeking employment. However, several Member States are delaying the full implementation of these

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<sup>3</sup> This is subject to the limitations and conditions laid down by the EC Treaty of 1986, and the provisions taken for its application. Freedom of movement for persons may be subject to certain restrictions if they are justified on grounds of public policy, public security and public health.

freedoms to the Central European countries, arguing that to do so threatens to disrupt local labor markets and, perhaps, make crime prevention more difficult.

Freedom of movement for services allows nationals or Community businesses to provide services in another Member State to the state of residence. The right of establishment includes the possibility for self-employed persons and Community businesses to set up and perform their activity in another Member State.<sup>4</sup> Certain sectors such as transport, banking, and insurance have been subject to substantial regulation in the Member States and the application of the freedom of movement for services has not been achieved simply through mutual recognition of standards, necessitating the development of Community legislation and directives.

Freedom of movement for capital prohibits all restrictions on capital movements (investments) and all restrictions on payments (payment for goods or services). Member States are, however, authorized to take any measure justified by the wish to prevent infringements of their own legislation, specifically relating to fiscal provisions or prudential supervision of financial institutions. Moreover, Member States may lay down procedures for declaring capital movements for administrative or statistical information purposes in addition to measures associated with public policy or public security. However, these measures and procedures must not be a means of arbitrary discrimination or a disguised restriction on the free movement of capital and payments. Since 1 January 1999, the Articles relating to safeguard clauses to remedy crises in the balance of payments (Articles 119 and 120 of the EC Treaty) are no longer applicable to those Member States having adopted the single currency. On the other hand, they remain applicable to the Member States that do not yet belong to the euro zone.

These paragraphs indicate the general background to market integration within the EU. The emphasis is strongly on harmonization – the explicit and proactive development of common policies and laws (and consequent surrender or derogation of national sovereignty), as opposed to mere convergence or compatibility (Josling). The strong pressure towards a *de facto* if not *de jure* political union is self-evident in this emphasis. From this perspective, the greatest obstacle to continued market integration is the insistence amongst many Member States (notably the UK) on retaining national sovereignty over important matters, such as monetary policy and fiscal measures.

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<sup>4</sup> Once again, this provision excludes services linked to the civil service and stipulates that restrictions on the freedom to perform services can be justified on grounds of public policy, public security, and public health.

The short answer to the question implicit in the title of this paper is that Europeans do not consider that market integration is possible without policy integration, and that the latter is a prerequisite for the former. Clearly, from a North American perspective, there is room for debate over this view, since the North American Free Trade Area (NAFTA) is not predicated on policy harmonization and integration. A typical European response to a question of why North American markets are not better integrated would therefore be: they cannot be expected to be so until and unless the relevant policies are integrated. However, it should be clear that political integration (either as explicit intergovernmental cooperation or as political union) has been the major European motivation for economic integration, in distinct contrast to that apparent in NAFTA. Economic integration is seen in Europe as a necessary, but not sufficient condition for political stability, rather than as a desirable end in itself. Indeed, in Europe market integration often seems to be regarded as a necessary evil, rather than an attractive aspiration.

## **MARKET INTEGRATION IN AGRICULTURE**

The presumption of the formation of the customs union was that a common policy would necessarily lead to the integration of markets, following the law of one price (Thompson, Sul, and Bol). The three principles of the Common Agricultural Policy (CAP) sought to ensure that agricultural, and thus also food markets would become integrated: free trade within the community; community preference (i.e., a common external tariff); and common financing (by which the European budget is responsible for all revenues and expenditures generated by the policy, ensuring that policies operate similarly in all Member States). There is an obvious contrast between this European approach and that currently adopted in NAFTA, stemming from the critical fact that the former is a customs union, while the latter remains a free trade area, so far, without any ambition towards common policies and a customs union.

The early days of the CAP focused on the development of the common policy instrument package (dominated by variable import levies and intervention purchases) and the setting of the common prices (target, intervention, and threshold prices). These were established, first for cereals, at the Stressa Conference in 1967, well before the more general notions of the SEM became defined. Since these common (administered) prices were set in a common currency unit, their effects in each of the Member States depended crucially on the ruling market exchange rates. The objective of market integration within the CAP was clearly exhibited in the response to these exchange rate effects – Monetary Compensatory Amounts (MCAs). MCAs were quite simply border taxes and subsidies (borne at the expense of the EU's common budget rather than national

budgets) set so as to preserve the protection levels in Member States at previous exchange rates, and clearly impeding free trade and genuine market integration. Although these MCAs were supposed to be temporary, and to be adjusted towards (rather than away from) market exchange rate prices, they rapidly became a major source of contention among the Member States. The conflicts only resolved as the Member States converged on monetary union, first through their exchange rate mechanism (ERM).

Since then, much of the resilience of the CAP to sensible reform has stemmed from differences of opinion amongst the Member States about the appropriate level of support and protection to be afforded to the agricultural sector, with the strong political tendency to gravitate towards the highest common factor rather than the lowest common denominator.<sup>5</sup> The underlying pressures for protection of national markets and producer constituencies have been well evidenced by the responses to the BSE crisis in the UK. No doubt the immediate prevention of beef trade between the UK and the rest of the EU was justified on objective scientific grounds of prevention of disease spread. However, France, in particular, preserved this trade restriction beyond the justified limits, and was only prevented from continuing protection by an appeal to the Court of Justice.<sup>6</sup> Now that the CAP has moved substantially from border protection and market intervention towards direct payments to farmers (justified, if that is the word, on the grounds of multifunctionality, Harvey, 2003), one can expect that future conflicts over the CAP will tend to focus on the competitive advantages offered by Member States' differing interpretations and applications of the these payments. Perhaps it is in these future conflicts that the general notion of decoupling will be most thoroughly tested.

### **Has Market Integration Happened?**

Despite the difficulties of actually demonstrating the practical exhibition of the law of one price (Thompson, Sul, and Bol; Sanjuan and Gil; Zantias), it is generally assumed that well developed and serviced markets will find their own levels of integration, recognizing the difficulties of commodity differentiation and the costs of marketing. Market integration raises a complex set of questions. Relevant policy analysis needs to take

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<sup>5</sup> An analysis of these pressures during the early days of the CAP can be found in Harvey (1982).

<sup>6</sup> See, for example, *Agra-Europe*. "France Re-Opens Battle over UK Beef Exports." September 29, 1999, and *Agra-Europe*. "EU Judge Rejects French Ban on UK Beef." September 21, 2001. However, as argued in *Agra-Europe*. "European Court Ruling on British Beef to France Has Little Meaning." December 14, 2001, market conditions still prevented a resumption of the pre-BSE beef trade from the UK to France.

account not only of the rigor of the analytical base (both evidential and theoretical) but also of the practical issues of political salience and constituent interest, and (ultimately) the real phenomena of socioeconomic interaction and public amelioration and judgment. In the interests of brevity and clarity, these questions are here subdivided into: the (traditional) economic questions; the real (practical) questions; and the ultimate (fundamental) questions.

### **What are the economic questions?**

The traditional economic questions raised by the phrase “market integration” are at once trivially simple and specifically complex. The principle of the “law of one price” underlies virtually all “pure” economic analysis – it is taken as the perfectly competitive benchmark. Most policy-related analysis assumes that markets will integrate perfectly – that is, exhibit the law of one price (Fackler and Goodwin), unless they are subject to imperfect competition. This “law” says that under competitive free trade, and ignoring details of transactions, marketing and transport costs, the price of the same good will be the same in different locations. It follows from the fact that markets operate by traders pursuing profit opportunities (buying cheap and selling dear) and *arbitrage* between different markets until there are no further profit opportunities. The purchasing power parity theory of long run exchange rate adjustments follows directly from this arbitrage activity pursued through foreign exchange markets as well as through product markets.

Furthermore, the theory of contestable markets (Baumol, Panzer, and Willig) shows that the social efficiency of markets<sup>7</sup> does not depend on “assumptions about how incumbent firms behave *vis-à-vis* one another, but from models in which such assumptions are largely irrelevant” (p. xxi). In effect, this theory is an elaboration of the arbitrage idea outlined above. If firms are making large profits, then we would expect others to enter the business and compete for these profits, contesting the market, and thus reducing profit margins by both reducing prices charged and the costs of delivering the product or service. It follows that much of the work on apparently oligopolistic market structures and trade relationships is also largely irrelevant to the question of whether or not particular markets are capable of or exhibit economic integration. Even when the market is sufficiently concentrated among a few large firms that each will need to recognize the effect of its marketing and pricing decisions on its competitors, the contestable state of the market implies that none of these firms can dominate in the sense of earning excess

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<sup>7</sup> Social efficiency is taken here to mean simply that no one person can be made better off without making at least one other person (business) worse off, including the possibility (at least) of compensation of the losers while still leaving the winners better off.

profits (above those necessary to persuade investors and suppliers to remain in the business). Makowski and Ostroy analyze perfect competition in a rather different fashion, but reach essentially the same conclusions.

Li and Barrett make the important distinction between market integration and market equilibrium. They define market integration as “the influence of one market by another through the Walrasian transfer of excess demand” and note that “when two markets are integrated, supply and demand in one market affect the price and/or the transactions volume in the other” (p. 2). As they also note, this definition is closely related to the concepts of tradability and contestability (Baumol, Panzer, and Willig). Markets can be integrated while not necessarily being in competitive equilibrium, i.e., arbitrage profits or (equivalently) rents can persist in integrated markets. The classic example is the effect of a tariff, which collects rent on the trade flow, but does not (except in the case of a prohibitive tariff) prevent market integration. On the other hand, competitive equilibrium can occur in two markets that do not trade, because the costs of trade are not covered by the price differential between the markets. In this case, competitive equilibrium is not equivalent to market integration. Li and Barrett identify perfect integration as a special case in which markets are both integrated and in long run competitive equilibrium. As they point out, it is this special condition on which existing market integration literature focuses (Goldberg and Knetter). Li and Barrett conclude: “tests of the law of one price (LOP) are a test of the perfect integration hypothesis, not a test of (perhaps imperfect) integration or of (perhaps segmented) competitive equilibrium” (p. 3).

Segmented markets are the rule rather than the exception – products in different markets and different locations are seldom viewed as completely identical (homogeneous) as LOP requires. If consumers have different tastes and preferences for the products from one location over another, they will exhibit different demand characteristics for each product, and the market will be segmented, and will thus tend to exhibit different prices for apparently similar products. This situation is normal in most advanced consumer markets. It can be expected to be the case in many markets for intermediate products (most of the food chain), since the logistics and management of supply chains (the transactions costs and risks associated with alternate suppliers) is likely to give an advantage to one source over another, from habit, in the short-term, if nothing else.

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<sup>8</sup> See, for example, *Agra-Europe*. “Higher Beef Prices Not Just Seasonal.” April 20, 2001.

As an example, it is frequently observed that Scottish beef markets tend to exhibit a persistent price premium over their English counterparts.<sup>8</sup> Given the similarity of other conditions surrounding these markets and the freedom of trade between the two provinces of the UK, this premium has to reflect a customer preference for Scottish as opposed to English beef. The premium is often enough to encourage live feeder cattle trade from England into Scotland for finishing. Similar market integration is observed in the live lamb trade between the UK and France, where French consumers (at the encouragement of the French marketing cooperatives) place a premium on French lamb (i.e., lamb slaughtered in French abattoirs). However, public antipathy towards long haul transport of live animals serves to limit this market integration, as protestors argue for restrictions on this transport, and occasionally manage to close the major channel ports to this traffic. Indeed, the natural forces of market integration can frustrate the ambitions of public pressure groups in favor of more benign and civilized production and marketing systems. A case in point is the animal welfare lobby in the UK, which lobbied successfully for more stringent and earlier application of animal welfare legislation for pig production in the UK than elsewhere in the EU. One consequence was that pig production in the UK declined substantially, while consumers were content to eat pigs raised in less welfare friendly conditions on the continent.<sup>9</sup> Nevertheless, in spite of apparent disadvantages implied by traditional analysis of market situations, enterprising traders often find ways of developing markets and displaying market integration in spite of the odds (e.g., UK farmers exporting mutton and lamb to the French market against apparently adverse price differentials and exchange rate disadvantage).<sup>10</sup>

In short, it can be argued that markets do naturally integrate, although attempts to demonstrate this proposition formally by econometric techniques are almost bound to be fraught with difficulty, not least incorporating the detailed contextual and circumstantial evidence necessary to properly test the market integration hypothesis. Academic exercises in demonstrating the proposition are almost equivalent to the yachtsman's "man overboard" drills – perfectly adequate for demonstration of boat handling (econometric) abilities, but of limited practicality for actually rescuing people (demonstrating the proposition). All that is required for markets to integrate is that there are no significant barriers to entry or costs of exit over and above the economic costs of transferring ownership of the business assets. Hence, even natural monopolies are subject to contestable markets and, given reasonably operating capital markets, subject to competitive pressures

<sup>9</sup> See, for example, *Agra-Europe*. "GB Herd Figures Raise Concern for Pig Farmers." January 29, 1999.

<sup>10</sup> See, *Agra-Europe*. "Changes in EU Sheep Trade Balance Emerging." July 14, 2000.

through the normal workings of the market place for capital. Since any remaining barriers to entry and exit are, I assert, universally the result of policy or social intervention of some form, market integration can be taken as given in the absence of policy intervention.

The fundamental basis for this assertion is the proposition that markets are the social analogues of the natural evolutionary system of the survival of the fittest – the blind pursuit of better fits with the social environments and political climates in which people and their businesses find themselves, and for which they are partly responsible. Markets are the mechanisms through which we all seek to find appropriate balances between earning a living (replication) and having a life (survival). They are the mechanisms through which our individual and private decisions and choices on these two fundamental human (animal) activities are reflected and negotiated between us to achieve a satisfactory compromise and balance between competing objectives and ambitions.<sup>11</sup> On this basis, markets evolve (develop and progress) so as to achieve better fits and balances, and, in so doing, naturally become more integrated – just as their natural ecological counterparts do. Hence, as an important corollary, perfect competition (in which the goods and services are treated as homogenous and indistinguishable) is not the climax condition of natural markets. Natural markets will develop as monopolistic competition, where businesses will differentiate their products according to the willingness to pay exhibited by particular and distinct market segments. The richer economies become, the more differentiated (and integrated) their markets are likely to be.

However, there is a key difference between natural and social evolution. Humans think they decide the better fits through their social institutions (North) – their rules, codes and practices which govern social acceptability. The criteria for survival and successful replication in social evolution are determined endogenously, rather than being exogenously predetermined by biophysical processes and laws, as is the case in natural evolution. The establishment of the social criteria through which we decide on the justice, equity, and sustainability of our market outcomes is through policy (government control) and social mores. These are necessarily outside though obviously related to our market interactions. Harvey (2004a) explores these ideas in more detail.

However, actually demonstrating this proposition in specific instances is likely to be extremely complex, for three major reasons. First, as already noted (Antle) markets will naturally tend towards product differentiation and heterogeneity, some of which will be spatially (regionally) specific. For example, it is plausible to suppose that Japanese

<sup>11</sup> Again, the analysis of perfect competition provided by Makowski and Ostroly is consistent with this interpretation of the competitive process.

rice consumers will be willing to pay a substantial premium for domestically produced rice even under conditions of perfectly free trade. If so, then removing the considerable import protection from the Japanese rice market cannot be expected to lead to Japanese rice prices equaling the border price. Second, transactions costs (Williamson) and search costs will affect the extent to which observed prices can be expected to satisfy LOP. Since direct observation of these costs is typically practically impossible, empirical demonstration of LOP will be difficult if not impossible.<sup>12</sup> Third, the real world does not exhibit equilibrium conditions, but is always (in terms of the analytical frameworks economists use) in the process of moving from one conceptual (or virtual) equilibrium (at which it has never been) towards another virtual equilibrium that it will never reach. For all these reasons, attempts to explore the extent of market integration, either by looking at trade volumes or by comparing spatially separated prices, are almost bound to be impossibly difficult, and hence subject to alternative interpretations and dispute.

Nevertheless, markets work, unless they are actively prevented from doing so. Active prevention is what policies are about, so complete market integration depends on policy integration. This is not to say that markets will not integrate without policy integration. They will. However, inconsistent or incompatible policies will inevitably generate pressures for change on both sides of the divide, partly through inequitable rents arising from different policies, and partly through the inevitable side effects of inconsistent policies. Wheat and barley wars within NAFTA, for example, are to be expected, so long as policies supporting these sectors differ on either side of the 49<sup>th</sup> parallel.

### **What are the real questions?**

The real questions – those that exercise the political debate and the resulting constitutional and legal frameworks of actual policy – concern the popular and constituency concerns about social and economic integration, and the consequences of and for policy integration. These questions typically revolve around the extent to which opening up trade between previously disconnected (disintegrated) markets is likely to hurt indigenous producers and their labor forces, or help previously disadvantaged groups and sectors. This important question is addressed by Penn and Taylor et al. in their contributions to this book.

Europeans, especially, have found the more general issue of integrating economies (as opposed to specific markets) a topic of considerable interest and confusion, especially in relation to the current accession of the

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<sup>12</sup> See Li and Barrett for an example of this.

Central European Countries (CECs). Tangermann and Banse, prefacing a volume on the integration of CEC agriculture with that of the EU, conclude that “overall, the message is that determined policy efforts are still required in both Central Europe and the EU, and in the accession negotiations to make eastward enlargement a success in the agricultural and food sector” (p. x). The European Commission, as the guardian of the European ideal of integration, has appropriated, if not coined, the term “cohesion” to articulate the aspiration that economic integration (including as a necessary precursor, market integration) should lead to reduced disparities between countries, regions, sectors, and groups, leading to or associated with more social inclusion and opportunities for self-expression and determination, and hence social (as well as political) progression. The European Commission’s *Third Report on Economic and Social Cohesion* spends 166 pages dissecting and attempting to measure and analyze cohesion amongst the present members of the EU and highlighting the challenges facing the Union as it expands to Central Europe in May this year. Among its conclusions are:

*The enlargement of the Union to 25 Member States, and subsequently to 27 or more, will present an unprecedented challenge for the competitiveness and internal cohesion of the Union. As illustrated in this report, enlargement will lead to the widening of the economic development gap, a geographical shift in the problem of disparities towards the east and a more difficult employment situation: socioeconomic disparities will double and the average GDP of the Union will decrease by 12.5%.*

*At the same time, the whole of the Union faces challenges arising from a likely acceleration in economic restructuring as a result of globalization, trade opening, the technological revolution, the development of the knowledge economy and society, an ageing population and a growth in immigration (p. 20).*

*This report has shown that disparities in output, productivity and access to jobs which persist between countries and regions stem from structural deficiencies in key factors of competitiveness – inadequate endowment of physical and human capital, a lack of innovative capacity and regional governance, and a low level of environmental capital. The cost of not pursuing a vigorous cohesion policy to promote growth and tackle disparities is therefore measured not only in terms of a loss of individual and collective well-being but also in economic terms, in a loss of potential real income and higher living standards. Given the interdependencies*

*inherent in an integrated economy, these losses are not confined to the less competitive regions or to individuals who are not working or who are in unproductive jobs but affect everyone in the Union.*

*Strengthening regional competitiveness through well-targeted investment throughout the Union and providing economic opportunities which help people fulfill their capabilities will thus underpin the growth potential of the EU economy as a whole to the common benefit of all. By securing a more balanced spread of economic activity across the Union, regional policy helps to reduce the pressures of over-concentration, congestion and bottlenecks (p. 21).*

It is beyond the bounds of this paper to examine these questions in detail. However, it is clear that the role of the agricultural and food sector in the development process is a major part of the real questions about market (and hence policy) integration as countries come together in trading blocs, and as world trade is liberalized. It is certainly a major question as far as Europeans are concerned, especially at the time of Central European expansion of the EU.

One question, especially, is of central relevance to both the EU and NAFTA – the question of the extent and type of support available for the disadvantaged agricultural sectors of the less developed regions of the trading bloc. Hungary, Poland and Mexico are all in very similar macroeconomic, social, and political conditions to those being experienced in Western Europe and North America when they developed their protective agricultural policies. As economies develop, so there is a necessary reduction in the proportion of total incomes that can be earned from agriculture, and a necessary reallocation of labor (especially) from agriculture to other occupations and activities. The market signals for this reallocation are that incomes fall in agriculture relative to elsewhere. These signals, when combined with democratic politics and socioeconomic concerns have always led in the past to support and protection being provided for the declining agricultural sector. It is difficult to believe that these sociopolitical pressures will be any different in economies seeking to make the same development progress now.

Poland, Hungary, and Mexico need some way of satisfying these pressures with respect to their substantial and politically powerful agricultural lobbies, and to be able to do so without draining limited tax funds. In other words, although the global pressures, evident in the drive towards market liberalization and integration, are heavily antagonistic to agricultural support and protection, domestic political pressures (and hence social stability) are strongly supportive of such

policies. Meanwhile, the residues of past support within the developed regions of both Europe and America (especially the rent capitalization in the agrifood chain and for land and farm capital, as well as the bureaucracies associated with these support systems) are keen to preserve their supported status. Here is a very convincing recipe for continued farm support policies – well evident in both Europe and North America.<sup>13</sup>

In short, while policy harmonization and integration seem fundamental to market integration, the apparently rational economic response of policy elimination is far from being socially or politically acceptable. Developed regions will argue for multifunctional or resource preservation support, which will naturally be interpreted as continued support under different rhetorical rationales. Developing regions will similarly argue for continued, if not enhanced, support as development assistance (or amelioration). These rather different pressures should rationally lead to rather different policy responses. However, these differing responses do not lead to policy or market integration. Developing regions will press for explicitly agricultural support. Developed regions, on the other hand, will search for resource protection and support, though will be obliged to resist (or ameliorate) considerable pressures to maintain or compensate for historic levels of agricultural support and the rents they have generated. The outcome, within communities of both developed and developing regions committed to policy harmonization, may well be very substantial continuation of past support policies. In those cases (NAFTA) not so committed to policy harmonization, policy differentiation will persist and even intensify. Associated markets will integrate so far as they are able, but will continue to show less than perfect integration, leading to continual dispute.

### **What are the fundamental questions?**

The fundamental questions arise from considering the ways in which societies and communities collectively determine the most appropriate mix and balance of freedom for individuals and private concerns to pursue their incomes and life-styles with community ambitions and aspirations for more security and coherence. Figure 3.1 illustrates the problem.

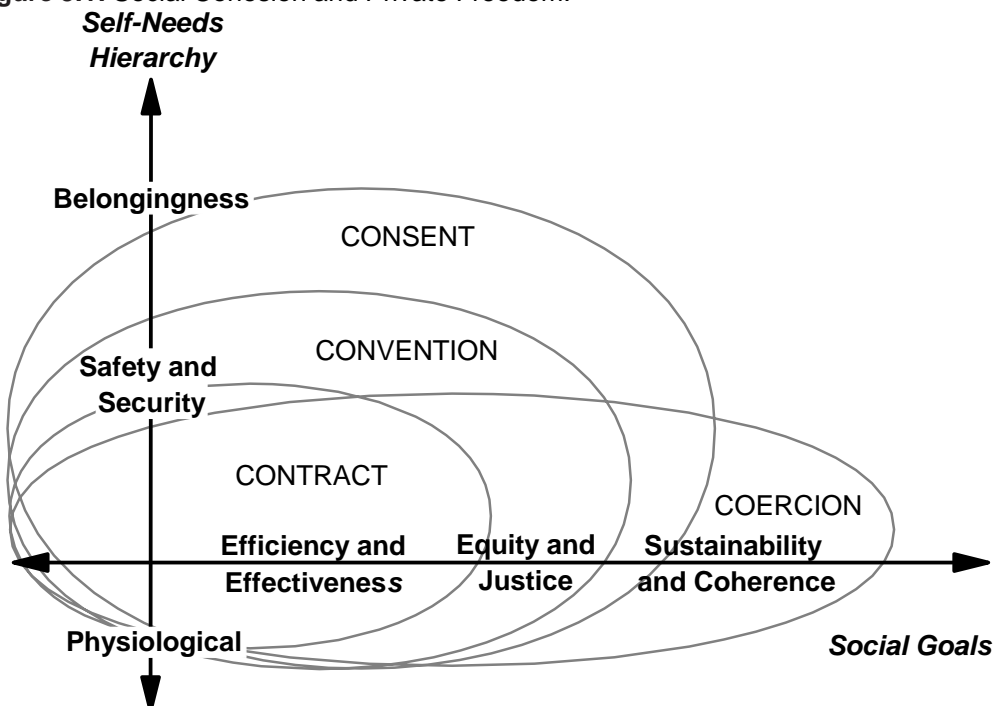
Here, private ambitions are characterized approximately on the vertical axis, while social or communal ambitions are characterized along the horizontal axis. Markets, as represented in traditional economics, are essentially founded on contract, and are well adapted to satisfy primitive or basic private and social needs, but are less able to meet the higher needs of equity and security, still less of belongingness or coherence. As

<sup>13</sup> Harvey (2004b) explores these arguments in more detail.

a consequence, societies evolve their own conventions and regulations (coercion) through their governments to seek to correct the “market failures”, and policies and market interventions are the result. The long arm of the law is necessarily attached to Adam Smith’s invisible hand. While the emergence of the democratic convention is supposed to provide popular legitimacy to these social adaptations of coercion, it is hard to believe that one cross on one piece of paper every four or five years is sufficient to provide genuine consent.

Hayami, for example, contrasts “community yoke”, as the thesis that the free market will release peasants from their serfdom with the “evil market” antithesis that the market undermines the moral codes of the pre-market traditions on which the market is founded. His argument is that what he calls “village communities” rely on (community) consent as the set of pre-market social relations. It is consent of this form, according to this representation, which underlies the belongingness (and perhaps the cohesion) which such societies feel the western *common model* of free trade, common law, universal political franchise and democracy threatens to undermine. In a real sense, this can be seen as a different version of the Marxian antithesis that capitalism contains within it the seeds of its own destruction.

**Figure 3.1: Social Cohesion and Private Freedom.**

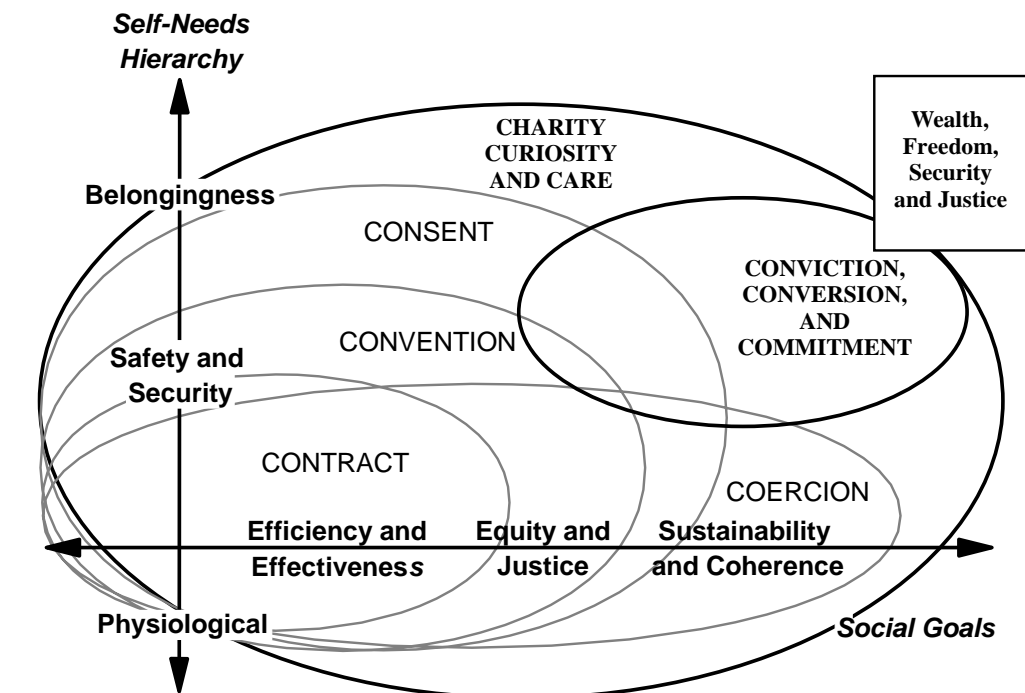


Source: Harvey (2004a).

Yet, following North, there are grounds for supposing that modern societies have yet to find and develop transactions and negotiations systems capable of fully harmonizing and integrating private ambitions with public aspirations. Our so-called common model is hardly up to the task. Of course, markets and societies are continuing to evolve. Business is taking increasing care to develop stakeholder involvement and commitment while governments are seeking 'third ways' (Giddens 1999, 2000). The fundamental questions, according to this outline argument, concern the identification of these missing transactions systems, and ways of encouraging and cultivating their development.

A conjecture of what the common model misses is illustrated in Figure 3.2. Harvey (2001) provides an outline explanation of why these particular transactions systems might be regarded as fundamental. Hofstede, on the basis of extensive empirical research, proposes that different cultures solve these fundamental social problems of harmonizing personal and social ambitions, with their associated attributions and transaction system mixes, in identifiably different ways. He detects five principal axes of cultural difference, where cultural differences can be measured according to the balance particular societies chose along these principal axes. The axes are: individual/collective, the major axis identified in Figures 3.1 and 3.2, and, as noted by Hofstede,

**Figure 3.2:** Conjecture of Transaction Systems and Private Versus Social Interests.



Source: Harvey (2004a).

“positioning itself between these poles is a very basic problem all societies face” (p. xx); uncertainty avoidance (the extent to which society tries to control the unknown and uncontrollable); power distance (the degree of inequality the society is prepared to accept and expect); male/female (the emotional dimension of society’s accepted practices); and long term/short term (the extent to which society accepts delayed gratification of ambitions). The suggestion here is that these differences actually manifest through different framings and mixes of the basic social transaction systems.

## CONCLUSIONS AND LESSONS FOR NAFTA

Given basic communications and transport connections, and reliable contract enforcement and exchange completion systems, markets will integrate and develop by themselves. However, the extent of their possible integration depends on interventions and regulations imposed by government policies. Hence, full market integration cannot be achieved without policy integration. But policy integration requires a consensus and commitment to social integration, which is unlikely without market integration. Changes, even improvements, in one part of this interactive system cannot be guaranteed to be sustainable, or even possible, still less optimal, without consideration of the forces and dynamics of the other parts. Markets are not independent of policy, while policy is not independent of either markets or the social systems within which policies are embedded and to which they respond.

The interactive, reflexive and recursive character of socioeconomic and political systems are complex. The nature of these systems means that any simple, unidirectional causality representation is partial, if not actually misleading. It is true that market integration is either prevented by or conditional on policy differentiation. However, the apparent implication that policy harmonization is therefore necessary for market integration should be treated with substantial caution. The simple economics of market integration and general equilibrium only make sense in the abstract, virtual world in which there are no politics, policies or society. Even then, the climax condition of a competitive economy is far more likely to involve extensive differentiation and segmentation, and thus major departures from the simplistic “Law of One Price.” The richer economies become, the greater these departures will be.

In the real world, policies do exist, and not by accident but by design. Societies generate policies through their political systems in response to identifiable pressures and interactions, even if these are not always well understood. Policy harmonization and integration thus require social integration and coherence. The European idea is that this

coherence can be encouraged through market integration and policy harmonization. The lesson of this idea for NAFTA is that policy harmonization is a necessary, if not sufficient step towards market integration.

However, this European idea is itself predicated on the assumption that the now traditional transactions systems [of contract, convention and coercion (with relatively minimal consent) – the western common model] are sufficient to generate social cohesion and commitment. There are strong intellectual grounds, backed up with (so far, casual) evidence, to believe that this assumption is also dangerously heroic. Economics' sister social sciences often concentrate on social interactions outside both formal government and economic exchange, and criticize economic ideas of rationality devoid of any human emotion, perception, attribution or aspiration. The behavioral assumptions on which conventional economics is constructed frequently miss important elements of human behavior, and are often contradicted by observation (especially in the areas of risk and uncertainty, and tradeoffs between the present and future). One way in which conventional economics might be able to relate to these critical omissions is through the concepts of transactions systems (and their associated costs and benefits). Pursuit of these ideas is both warranted and, according to these arguments, of high priority on both sides of the Atlantic. Without integration of the social sciences themselves, further investigation or pursuit of market integration seems likely to be both frustrated and frustrating. Meanwhile, the real world will continue its blind pursuit of better fits between private and public lives and livelihoods, and will generate such integration as this hunting and gathering, and associated adaptation, can achieve. If we wish to cultivate better societies than are possible through blind pursuit, then we all need to take much more care than is evident in the past in understanding what it is we are trying to do, and in understanding the natures and nurtures of the cultures we seek to cultivate.

No soybean grower, for example, would dream of trying to grow soybeans without the support of a sophisticated understanding of the needs and requirements of the soybean, and of the effects of competitors and pests on the crop. This is difficult enough. Cultivating markets and societies is even more difficult. Here, the "plants" not only mind and respond to what is done to them, they also care and reply, as do their competitors and pests – and generate new behaviors and responses as a result. Until or unless we can develop our social sciences to more fully understand these systemic interactions, and develop new ways of channeling and guiding them, we will continue to rely on happy accident and chance for the development of more genuine integration, both of markets and of the societies which underlie them.

There is little doubt that the current enlargement of the EU to include the Central European countries represents a major challenge. Although not the most substantial enlargement the Union has taken on, in proportional terms, the current enlargement involves a more substantial dispersion between the rich and the poorer members than previously. Some regard this enlargement as presenting a major opportunity for the Union to become more liberal and competitive (*The Economist*). Others, however, (perhaps especially some of the Western Member States) consider that the obvious economic and social divisions may prove too difficult to bridge without straining existing conventions and institutions beyond their fracture points. It remains to be seen whether the socioeconomic realities of modern mixed economies are capable of matching the laudable political imperative that, in common with the previous history of the Union, has driven this enlargement.

More prosaically, the lessons to be learned by NAFTA from the European experience are likely to be limited. As emphasized in the introduction, the fundamental motivation for integration in Europe has been, and continues to be political rather than strictly economic. Having, it is fervently to be hoped, learned the lessons of the two world wars on their own territories, Europeans are driven by the imperative of immunizing themselves against any repeat occurrence. Market and economic integration are necessary, but neither sufficient nor necessarily even locally desirable, steps in this immunization process. Conditions on the other side of the Atlantic are rather different, where economic integration is seen (from the perspective of this author at least) as being inherently desirable in and of itself. It would be surprising if these distinct and very different motivations led either naturally or socially optimally to the same sorts of institutions and organizations of markets.

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# 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.

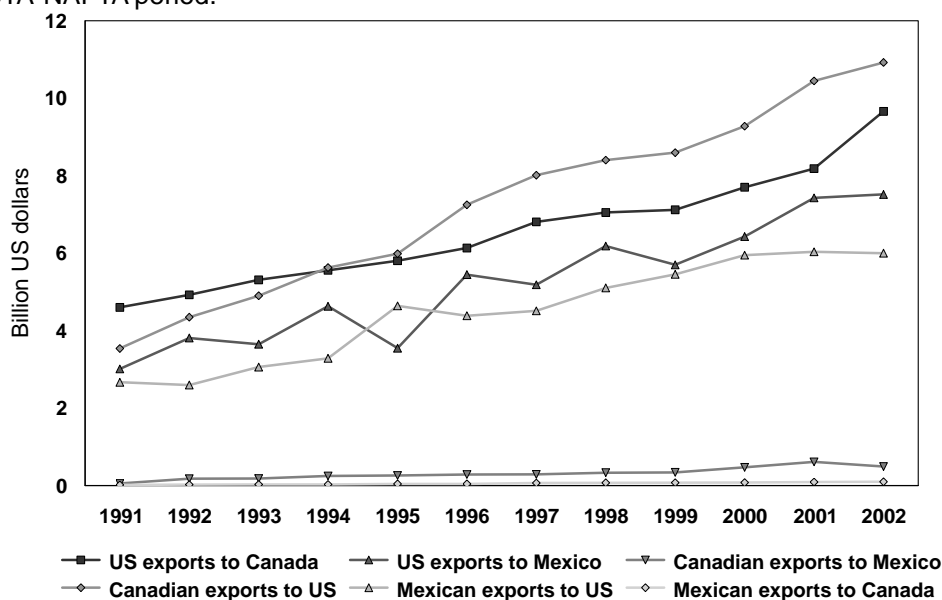
### Trade Data

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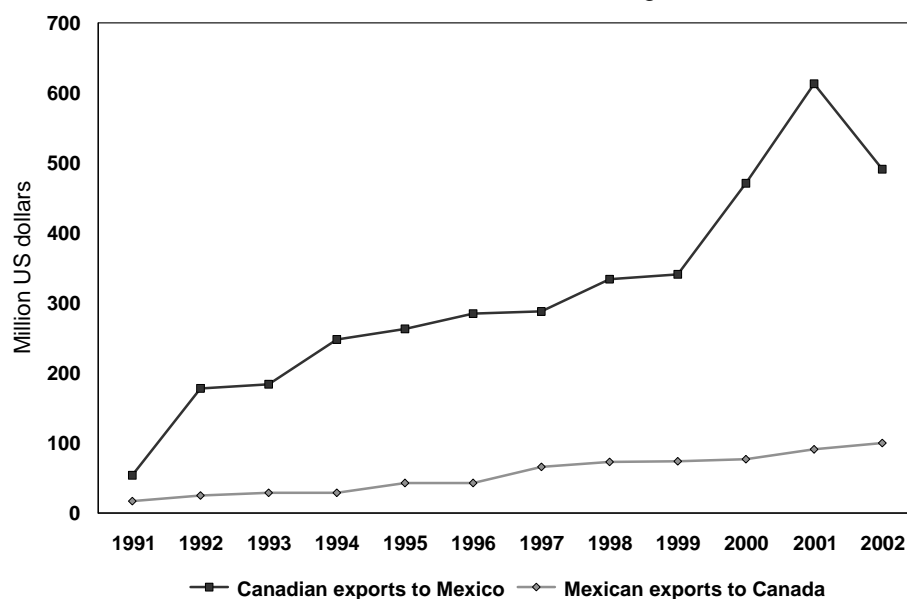
<sup>2</sup> Developing countries, including Mexico, have an additional 4 years to implement their URAA commitments.

**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.



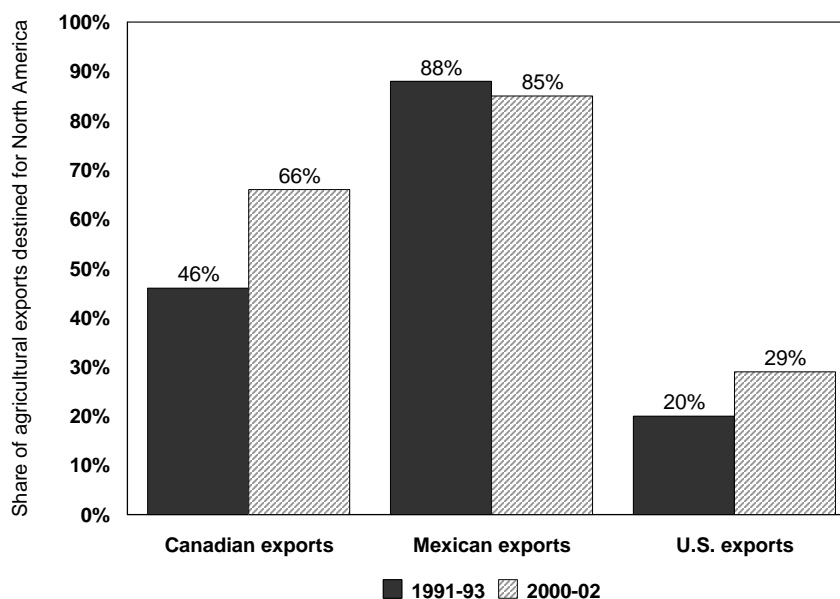
**Source:** United Nations Statistical Office, as compiled by US Department of Agriculture, Foreign Agricultural Service (2004).

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, Dohman, 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.

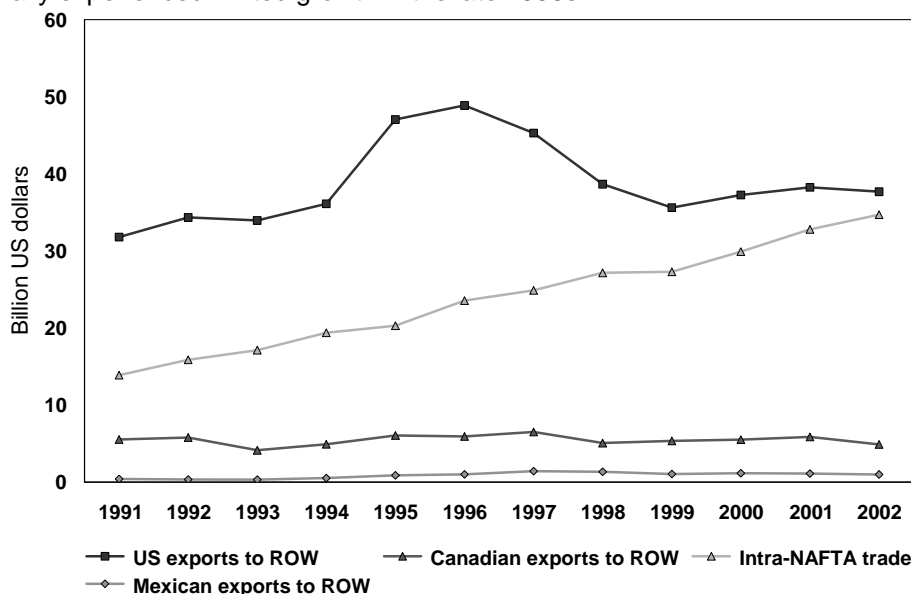
Further evidence of the close integration of the North American market may be obtained from bilateral trade-intensity indices (BTIs) (Brown). The BTI measures the relative importance of a specific exporter in

**Figure 4.3:** Canada and the US have become more dependent on the North American Market, while Mexican exports have become less so.



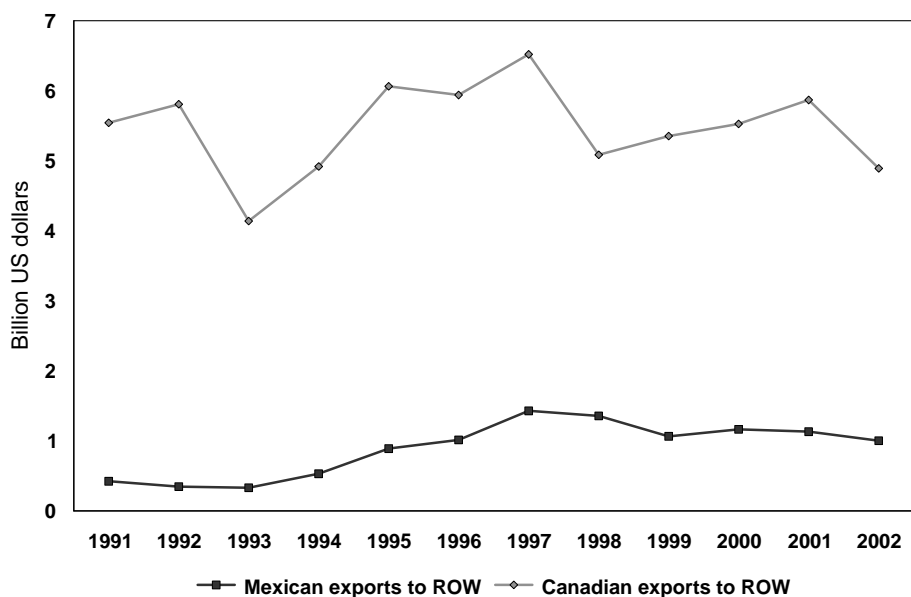
**Source:** United Nations Statistical Office, as compiled by US Department of Agriculture, Foreign Agricultural Service (2004).

**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.

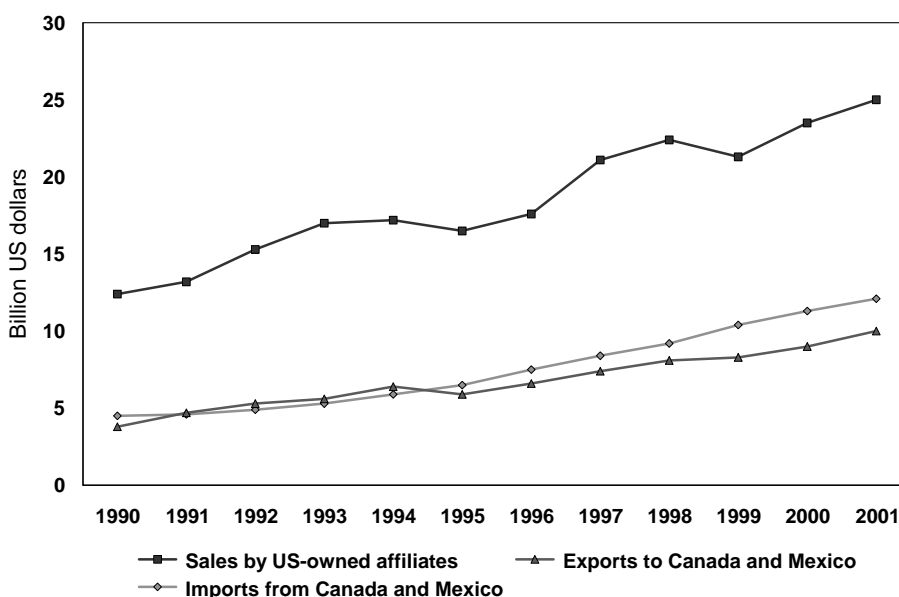
<sup>3</sup> FDI is to be distinguished from *portfolio investment*, which is characterized by a lack of management control.

<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.

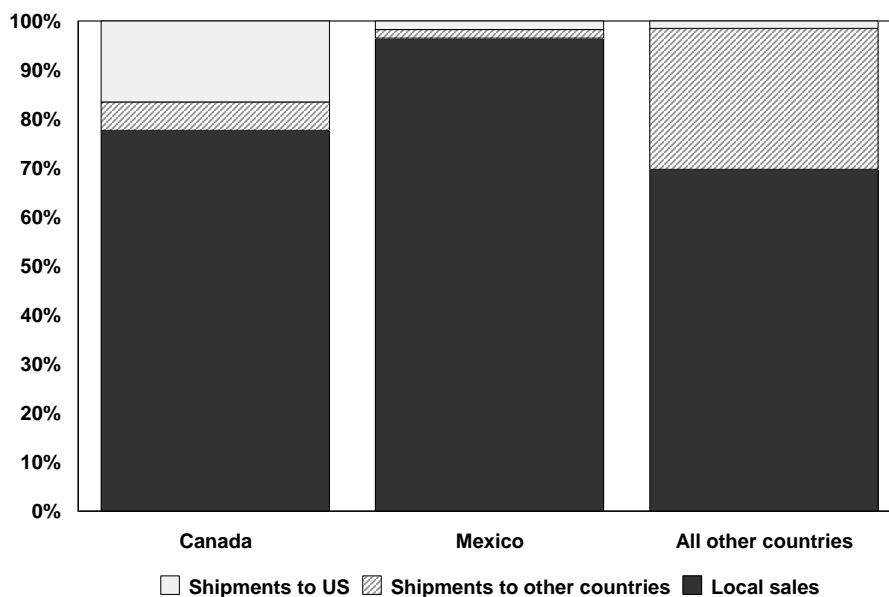
Most food multinationals operating in North America are market servers. Factors such as perishability, regionalized food preferences, and high transportation costs force food companies to buy or build food

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. Quagrainie 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

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<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.

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# Transition Policy and the Structure of the Agriculture of Mexico



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## INTRODUCTION

Beginning in the early 1980s, Mexico witnessed a radical change in the economic orientation of its development policies, from a strategy of import substitution to a model of outward orientation with diminishing direct state intervention. A phase-out of government intervention in agriculture started at the end of the 1980s and deepened during the second quarter of the Salinas Administration, culminating with the implementation of the North American Free Trade Agreement or NAFTA in 1994.

The inclusion of agriculture in NAFTA has, since the beginning of negotiations with the US, provoked a deep controversy in Mexico. At one extreme is the official view arguing that trade liberalization helps to promote the structural transformation of the agricultural and rural economy of Mexico; at the other extreme are some academics and journalists maintaining that agricultural trade liberalization between Mexico and the US adversely affects Mexican farmers and jeopardizes the country's food self-sufficiency. Recently, farmers, peasants, and other groups of Mexican civil society have criticized NAFTA in an organized fashion, arguing that agricultural trade liberalization with the US has negatively affected the agriculture of Mexico. The pressures have intensified to such an extent that, in 2003, the Fox administration agreed with farmers and peasant organizations to evaluate the effects of the accord on Mexico's countryside.

The overall purpose of this chapter is to contribute towards understanding the impacts of NAFTA and other policy reforms in the agricultural and rural economy of Mexico, with special reference to the field crops sub-sector, to small farmers, and to trade between Mexico

and the US. Our starting point is the effect of liberalization policies on relative prices, which according to received economic wisdom leads to predictable changes in resource allocations on farms. Profound liberalization is expected to result in major changes in prices, provoking a structural transformation of trade and domestic supply.

Recent literature on the effects of agricultural reforms on Mexico's rural economy seeks insights from trends or descriptive statistics of relevant variables during the periods before and after major policy changes.<sup>1</sup> We propose that analysis of policy impacts be based on econometric methods to test whether or not a shock (such as NAFTA) has caused structural change and on micro economy-wide analysis to explore the effects of shocks on rural economies. We have carried out econometric analyses of prices, planted area and yields, and trade of major commodities imported and exported by Mexico to the US.<sup>2</sup> We also have developed new methods to uncover rural economy-wide impacts of policy reforms, by embedding "micro" models of agricultural households within larger, regional, economy-wide models.

This chapter has three main objectives. The first is to review major changes in Mexico's agricultural policies in the context of trade liberalization. The second is to explore econometrically the impact of these policy changes on key variables of interest, including prices, trade, production, and rural out-migration. The third is to illustrate the use of disaggregated policy modeling techniques to explore the sometimes paradoxical impacts of recent policy changes on Mexico's rural economies. After reviewing trends in the evolution of the rural economy of Mexico, including employment, land property rights, and poverty, we suggest hypotheses to explain why some of the expected effects of NAFTA and agricultural reforms have not occurred. The chapter ends with a reflection on the current political/economic situation in Mexico.

## MAJOR REFORMS AND NEW INSTITUTIONS

The National Company of Popular Subsistence (CONASUPO) was a major player in government intervention in agriculture. Before the reforms of the 1980s, the Company's programs involved eleven agricultural field crops (termed basic crops): barley, beans, copra, maize, cotton, rice, sesame, sorghum, soybeans, sunflower, and wheat. By supporting prices for the producers of these crops by processing, storing,

<sup>1</sup> This has been specially the case of studies on NAFTA impacts on the Mexican agricultural sector (Schwentenius et al.; Puyana and Romero).

<sup>2</sup> Details are in Yunez-Naude and Barceinas (2002 and 2004). Other important traded commodities such as sugar and livestock are not covered due to data and time limitations.

and distributing the crops, and by regulating trade through direct imports, CONASUPO exerted control over an important component of Mexico's food chain.

By 1995/96, most of CONASUPO's subsidiaries and financial activities were dismantled, privatized, or transferred to farmers, and by 1999, the liquidation of CONASUPO was practically complete (Table 5.1, details are in Yunez-Naude).

In 1991, an agricultural marketing agency, ASERCA (Support Services for Agricultural Marketing), was created as a substitute for some of CONASUPO's functions. The operations of ASERCA are directed towards marketing of basic crops, but the agency does not buy or store commodities, as CONASUPO did. Another important function of ASERCA is the program of direct income transfers to farmers (PROCAMPO is discussed below).

A major reform in Mexican state intervention in staple production was implemented parallel to the creation of ASERCA: the elimination of guaranteed prices that CONASUPO had traditionally awarded to the producers of basic crops (the exceptions were beans and maize, whose guaranteed prices were eliminated in the mid-1990s). Starting in 1995, the Administration of President Zedillo (1995-2000) took further steps towards a more liberalized food chain that led to the final decision to liquidate CONASUPO before the end of his mandate in 2000.

Some months before NAFTA was signed, PROCAMPO began to be implemented. The program is a "decoupled" income support for all farmers producing basic crops with the purpose of facilitating producers' transition from price supports to freer and more open international markets. PROCAMPO is planned to last until 2008, when full liberalization under NAFTA will be reached.

In addition to ASERCA and PROCAMPO, in 1995, the Zedillo Administration created "Alliance for the Countryside." Alliance's main objective is to increase agricultural productivity and to provide funds for farmers to make investments to better integrate their operations in the food chain and improve sanitary conditions. A major purpose of Alliance is to promote farming efficiency by exploiting potential comparative advantage by growing fruits and vegetables rather than basic crops. Alliance includes a phytosanitary program and has a decentralized character, with state-level control of its programs and contributions to the funding by participating farmers (SAGARPA).

**Table 5.1: Agricultural policy reforms, 1985-2003.**

POLICY/YEARS	DESCRIPTION
Mexico joins GATT/1986-1994	By 1990/91, most licenses to import agricultural products abolished. In 1991-1994 most agricultural commodities subjected to tariffs fluctuating between 0 and 20%.
Institutional reforms and the government's new role/1988-1999	Privatization of State companies: seed and production of fertilizer, grain storage and marketing of coffee, sugar and tobacco. ASERCA (1991) was created to give marketing support and services to producers.
Reform of the Agrarian Law/1992	Land redistribution ends. Recognizes the individual rights of each ejido.
NAFTA with two separate agricultural agreements: Mexico-Canada and Mexico-US/1994	Defines the obligatory conditions for market access and export subsidies. Each country has the right to choose its own internal subsidies, phytosanitary measures, rules of origin and regulations for packing and tagging products. Consistency with the WTO and the Uruguay Round. Import and export licenses are abolished and substituted by tariffification. In Jan. 2008 NAFTA members will eliminate all tariffs.
PROCAMPO, part of ASERCA/ Winter 1993-1994	Direct payments to the producers of basic crops that compensate producers for the loss of input subsidies, price supports, and import protection. Grants annual direct payments per hectare to those producers who continue to produce, based on historical acreage for nine crops.
Elimination of producer price supports, abolition of CONASUPO/1991-1999	In 1991 guaranteed prices for wheat, sorghum, soybeans, rice, barley, safflower, sesame seed, and sunflower were eliminated, and in 1999 support prices for beans and maize producers were abolished.
Creation of the Ministry for Social Development/1991	PROGRESA: monetary transfers to poor rural female household heads for nutrition, school, and health services (from 2001 the program is extended and called OPORTUNIDADES)
Alliance for the Countryside (Alianza para el Campo)/1995	Set of programs designed to support farmers with productive potential in an open economy. Federalized. Each state is responsible for the application of Alliance's programs. Farmers in the programs have to contribute to its financing.
Agri-food Armour/2002	To protect Mexican farmers from impacts of US Farm Bill of 2002
Privatization of rural credit/1990-2003	Reduction of official credit and credit subsidies. Creation of Financiera Rural and abolition of BARURAL
National Accord for the Countryside/2003	An agreement between the Fox Administration and farmer and peasant organizations to define policies for rural development

**Source:** Yunez-Naude and Barceinas (2004).

In relation to credit, the Salinas Administration decided to reduce its credit subsidies, with the expectation that private credit institutions would satisfy the credit requirements of Mexican farmers.

With the *ejidal* reform of 1992, the Mexican State also enacted a major change in land property rights. Up to 1991, farms in Mexico were either private or *ejidal*, and *ejidal* lands could not be sold or leased out by *ejidatarios*.<sup>3</sup> The *ejidal* reform marks the end of land redistribution, seeks to give security to those who own land, and to enhance well defined property rights in land, and through this, to develop the land market (Saldivar).

The first step the Mexican government took towards trade liberalization was to join the GATT in 1986. By 1990:1, most licenses to import agricultural products were abolished, and in the period 1991-1994 most agricultural commodities were under a tariff regime. The second step was NAFTA.

Under NAFTA, some agricultural commodities were liberalized in January 1994; others – ones considered sensitive by the signing governments – were subject to a process of year-to-year liberalization, so that full free trade was either reached in January 2003 or will be attained in January 2008. For the latter group of commodities, tariff rate quotas (TRQs) and/or seasonal tariffs were used: Mexico imposed TRQs on the imports of barley, dry edible beans, maize, and powdered milk. The US imposed seasonal tariffs as well as TRQs for several fresh vegetables and fruits imported from Mexico.

Quota levels were established based on average 1989-1991 trade flows between Mexico and its two North American partners. In 1994, the TRQs were set at 2.5 million metric tons (t) for US maize and 1,000 t for Canadian maize, and the above-quota base or consolidated tariff on maize from both countries was fixed at 215 percent (or 206.4 US\$/t). In January 1994, the quota for dry edible beans was 50,000 t for the US and 1,500 t for Canada, and the above-quota tariff was 139 percent (480 US\$/t). For both grain and malt barley, the 1994 quota was set at 120,000 t for imports from the US and 30,000 t for imports from Canada, and the above-quota *ad valorem* tariffs were 128 percent for grain barley and 175 percent for malt barley. Beginning in 1995, the quotas for these three crops and for milk powder have been growing each year, and the above quota tariffs have been progressively reduced as protection is gradually phased out (Yunez-Naude and Barceinas 2002).

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<sup>3</sup> However, renting *ejidal* land was done before the reform. Since this practice was illegal, there is not reliable data about its extent.

NAFTA does not imply specific commitments with regard to domestic marketing support reductions or export subsidies. It allows its members to use safeguards and includes dispute settlement mechanisms in Chapters 19 and 20.<sup>4</sup>

## **SOCIAL PROGRAMS**

Parallel to economic liberalization, specific policies to attend to the rural poor were created. The first one was the Program of National Solidarity or PRONASOL founded in 1988, followed by the creation of the Ministry for Social Development or SEDESOL. One of the most important programs of SEDESOL was PROGRESA (Program for Rural Education, Health and Nutrition), created in 1997.

PROGRESA's objective was to contribute to human capital formation, focusing on the poorest rural families, providing monetary and in kind transfers to poor rural female household heads conditional upon sending their children to school, caring about their nutrition, and bringing them to health centers on a regular basis.

In the National Program for Social Development (2001-2006), the current Administration has adopted the notion of human development and calls its social strategy, CONTIGO. The purpose of CONTIGO is to bring together governmental efforts to enhance human development by promoting the capacities of the people (education, health, and nutrition); by generating income opportunities (infrastructure, credit, and employment); by helping the poor in acquiring assets (housing, savings, and property titles); and by providing them social protection (insurance, social provision, and attention to collective risks). CONTIGO extends the objectives of the previous administrations by expanding the activities of PROGRESA (now called OPORTUNIDADES) to the urban sector (Programa de las Naciones Unidas para el Desarrollo).

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<sup>4</sup> In this latter respect, and given the strong US opposition to exempt NAFTA countries from each other's antidumping and countervailing duty actions (AD/CVD), a compromise was reached in the Canadian-US Free Trade Agreement or CUSTA – and followed in NAFTA – to establish binational panels to review AD/CVD actions between two countries when requested by an involved party. The role of these binational panels is limited to determine whether a country appropriately follows its own national AD/CVD laws in making a particular determination. National AD/CVD laws of the US were not changed, and Mexico adapted them to be in accordance to its trade liberalization policies. Although national AD/CVD laws cannot be questioned by the review panels, the process provides an alternative to having national courts handle appeals of AD/CVD decisions. This provides the possibility of greater impartiality of the review. (Leycegui and Cornejo; Lederman, Maloney, and Serven [Chap. 3]).

## PREDICTED IMPACTS OF POLICY REFORMS

Predictions of the effects of internal liberalization and NAFTA on Mexico's agriculture are based on price movements caused by these policy changes. In particular, with the elimination of producer price supports for basic crops in Mexico and with trade liberalization in North America, prices of imported crops by Mexico were expected to decrease. With this change, Mexican producers of importables would be forced to compete with Canadian and US farmers. Greater competition would increase productivity and/or reduce Mexico's supply of importables. Farmers were expected to substitute the production of exportables for importables. Under this scenario, NAFTA and internal policy reforms would provoke considerable growth in agricultural trade in North America (for Mexico, particularly with the US).

It was also predicted that employment created by increasing production of exportables would be insufficient to absorb the displaced workers from the importables sector, leading to a rise in rural out-migration.

The above expectations implicitly assume macroeconomic stability, a condition that the Mexican economy did not enjoy from the end of 1994 to 1996 (Audley et al.). So, in reviewing the evolution of Mexico during NAFTA one has to keep in mind the macroeconomic crisis that this country suffered during the above mentioned period.

## TENDENCIES AND ECONOMETRIC ANALYSES OF STRUCTURAL CHANGE<sup>5</sup>

Here we review trends in agricultural prices, trade and production and summarize findings from our econometric analyses.

### Prices

There has been a general tendency for Mexico's prices of major exported and imported crops to follow US prices more closely in the wake of reforms (Yunez-Naude and Barceinas 2002). Of particular interest here are domestic prices of major crops imported by Mexico. The data show

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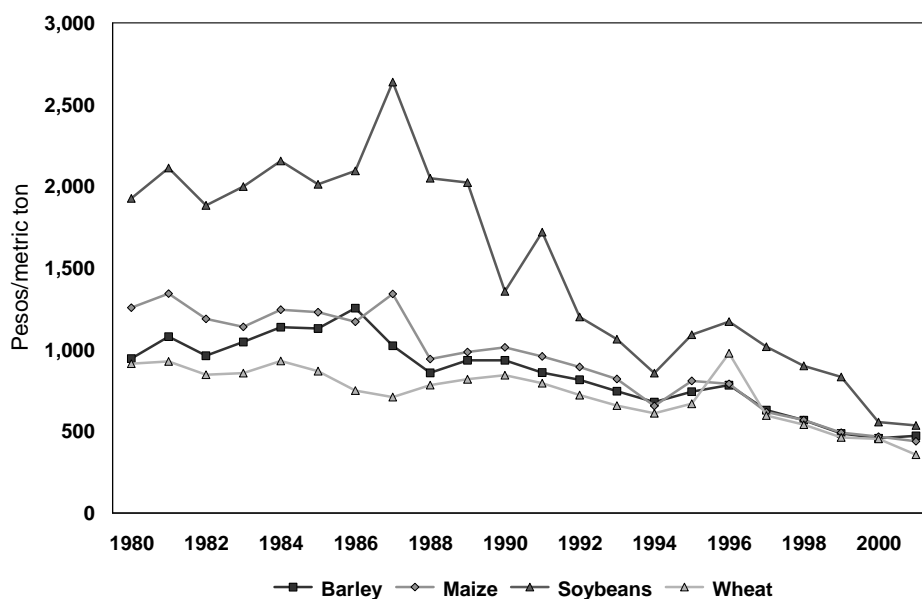
<sup>5</sup> The notion of structural change used in this section is statistical. It is based on time series data and tells us if a change of model parameters between two periods is permanent or not. From the statistical tests existing in the literature, we use the Error Correction Model to test structural change in prices; for trade we applied tests of "unknown break point" (Zivot and Andrews; Ben-David and Papell); and for structural change in production and productivity we used the more conventional Chow test (the latter was used due to the low amount of available observations).

that these have been diminishing (Figure 5.1). However, with the exception of an increase during the macroeconomic crisis of 1994-1996, this trend appears to have been present since 1987. Hence, econometric analysis is required to study the nature of price changes for major imported crops.

We used the theory of “Purchasing Power Parity” (PPP) and, in particular, the “Error Correction Model” (ECM) to test whether or not the “law of one price” has ruled the market of Mexico’s major traded crops during NAFTA; that is, if the internal price of each of these commodities has followed closely the foreign (US) price. The methodology also allows for empirical study of whether there have been changes in the speed of adjustment of these two prices before and after NAFTA (Baffes and Ajwad). The results reported here are for major crops imported by Mexico from the US (barley, maize, sorghum, soybeans, and wheat) and the study covers the period from January 1981 to March 2003.<sup>6</sup>

<sup>6</sup> The econometric estimates of the ECM were done for the whole period, as well as separately for the pre-NAFTA and NAFTA periods (the exception is soy, because the available data series begins in January 1994). We also studied the evolution of relative prices of major exported vegetables and fruits. The results show that since NAFTA, there has been a tendency for domestic and US prices of these crops to converge, i.e., that the two price series are cointegrated. These findings and details of the ECM are in Yunez-Naude and Barceinas (2003).

**Figure 5.1:** Average producer prices of selected basic crops in Mexico (1994=1).



**Source:** Mexico Ministry of Agriculture (SAGARPA) data base (SIACON) deflated by the National Consumer Price Index from Bank of Mexico.

Our findings indicate that during the last 22 years there is a tendency for the internal price of barley, maize, sorghum and wheat to follow the US price, and that this price convergence was present before and during NAFTA. However, the adjustment of Mexican prices to changes in the US price takes a long time (at least 20 months), and the periods of adjustment did not decrease during NAFTA.

These results contrast with accepted wisdom in two ways. First, they are inconsistent with the view that, before the elimination of producer price supports for basic crops, prices of grains in Mexico moved independently of international prices. Second, they do not support the contention that price convergence of these crops began with NAFTA. As we will discuss below, these tendencies could be one of the reasons explaining why production of basic crops in Mexico has not collapsed during NAFTA's implementation.

## **Trade**

The share of agricultural trade in Mexico's total agricultural supply has almost doubled during the last 13 years, from an average of 18.7 percent during the four years prior to NAFTA to an average of 35 percent from 1994-2002. This share was even higher during the macroeconomic crisis of 1994-1996 (39 percent), and has remained high since then (35 percent during 1997-2002).<sup>7</sup>

Agricultural trade between Mexico and the US has also increased during NAFTA. The value of exports in constant US dollars increased by an average of 49 percent from 1994-2003 compared with 1989-1993, and imports rose 53 percent during the same period. As a consequence, Mexico's agricultural trade deficit with the US has widened.

The volume of Mexican exports of major fresh vegetables and fruits has grown considerably under NAFTA: by 75 and 100 percent, respectively, in the period 1995-2002 compared with 1983-1994. This jump is also shown by the share of exports in the domestic production

<sup>7</sup> The shares include forestry and are calculated with trade (Secretaría de Economía) and production data (Instituto Nacional de Estadística Geografía e Informática). The data were deflated using the US consumer price index (US Department of Labor Bureau of Labor Statistics).

<sup>8</sup> The model we applied is convenient for our purposes, because if structural change is detected, the date when this happens is determined endogenously. The variable for estimating the equation of structural change in agricultural trade was the value of agricultural monthly exports and imports (totals and per crop) in constant pesos using the real exchange rate index for 1990. For the case of total agricultural exports and imports, the period we considered was from January 1980 to August 2002. Due to data restrictions, the period considered for specific crops or groups of crops was from January 1991 to August 2002 (Yunez-Naude and Barceinas 2004).

of these crops, which rose from 14.1 to 20.8 percent during the same period. Imports of the six major basic crops also grew, by 88 percent in physical terms.

The latter trend has meant that the ratio of imports to total national production of these crops has increased continuously during the reforms and NAFTA. The combined volume of imports of barley, beans, maize, sorghum, soybeans, and wheat accounted for 27.5 percent of domestic production during the period 1983-1990, 29.8 percent in the following four year period, 34.7 percent during 1995-1996 and almost 50 percent from 1997-2003 (Yunez-Naude and Barceinas 2004).

The evolution of Mexico agricultural trade indicates that, as expected, it has increased during NAFTA. However, this trend could have been present before NAFTA. We conducted an econometric study to test if the Agreement caused structural change in agricultural trade.<sup>8</sup>

Our results show that there is a contrast between agricultural exports and imports. As expected, agricultural exports have experienced structural change, but imports have not. Total agricultural and tomato exports experienced structural change in the last month of 1994. Fresh vegetables, melons, watermelons, and “other fresh fruits” also experienced structural change, but in different periods (November 1994, September 1994, and June 1995, respectively). In contrast, we find no evidence of structural change in total agricultural imports or in any of the major imported crops considered in the analysis (maize, sorghum, other oilseeds and seeds, and wheat).

The dates of structural change for exports make us suspect that this could have been due to the sharp devaluation of the peso at the end of December 1994 and beginning of 1995 (our findings on trends in Mexico’s agricultural trade are similar to those reported by the US Department of Agriculture Economic Research Service [1999 and 2000]).

### **Production and Productivity**

As expected, the volume of production of major exported vegetables and fruits has grown continuously since the early 1990s and during NAFTA. This is explained by an increase in both total area planted and yields for each of the major exported crops (Tables 5.2 and 5.3).<sup>9</sup>

What is striking is that, in contrast with expectations, national production of the most imported and important basic crops grown in Mexico (barley, beans, maize, sorghum, soybeans, and wheat) also

<sup>9</sup> The exceptions are garlic in the period 2001-2003 compared with 1997-2000 and in the area cultivated in tomatoes during the same periods. However, tomato yields rose.

**Table 5.2:** Volume of production, cultivated area, and yields for major exported vegetables (simple averages).

Period	Commodity	Production (t)	Cultivated Area (Ha)	Yields (t/Cropped Ha)	Commodity	Production (t)	Cultivated Area (Ha)	Yields (t/Cropped Ha)
1983-90	Cauliflower	40,007	2,763	14.3	Garlic	52,813	6,943	7.7
1991-94		52,835	3,717	14.6		54,168	7,399	7.4
1995-96		43,048	2,920	15.3		54,509	7,120	7.7
1997-00		58,068	3,539	16.8		64,079	8,580	7.6
2001-03		57,670	3,047	19.4		47,019	5,619	8.4
1983-90	Broccoli	79,909	7,755	10.7	Onions	593,361	37,011	16.9
1991-94		149,755	14,552	10.4		703,540	38,513	18.7
1995-96		143,524	13,476	10.7		682,326	34,356	20.1
1997-00		215,883	18,470	12.1		957,957	43,719	22.6
2001-03		236,983	19,019	12.7		1,106,462	45,709	25.3
1983-90	Carrots	157,398	6,820	23.6	Tomatoes	1,759,108	76,287	24.56
1991-94		227,360	9,098	25.8		1,583,647	80,282	21.34
1995-96		209,544	8,988	23.4		1,941,775	74,159	27.09
1997-00		341,724	14,936	23.4		1,940,435	71,955	27.89
2001-03		355,655	14,596	25.1		1,963,828	68,579	29.74
1983-90	Cucumbers	251,236	15,637	17.0	Totals	2,933,829	153,216	19.1
1991-94		258,556	15,436	17.7		3,029,861	168,997	17.9
1995-96		322,034	15,910	20.6		3,396,760	156,928	21.6
1997-00		428,194	18,088	24.1		4,006,340	179,288	22.3
2001-03		441,938	17,741	25.4		4,209,555	174,311	24.1

**Sources:** Mexico Ministry of Agriculture Data Bases (SIACON) and Anuario Estadístico de la Producción Agrícola 1999-2000 (preliminary data for 2003).

**Table 5.3:** Volume of production, cultivated area, and yields for major exported fruits (simple averages).

Period	Commodity	Production (t)	Cultivated Area (Ha)	Yields (t/Cropped Ha)	Commodity	Production (t)	Cultivated Area (Ha)	Yields (t/Cropped Ha)
1983-90	Avocados	552,952	83,699	8.4	Oranges	2,014,141	211,316	12.6
1991-94		753,538	92,464	8.8		2,753,953	281,757	12.3
1995-96		813,942	92,199	9.1		3,778,075	335,409	12.9
1997-00		856,370	93,705	9.5		3,651,931	328,361	11.7
2001-03		934,400	97,064	9.8		4,053,263	342,578	12.2
1983-90	Lemons	762,074	80,973	10.7	Papaws	510,149	22,335	28.3
1991-94		758,177	88,784	9.6		394,615	19,157	24.7
1995-96		1,021,073	102,038	11.1		489,909	21,007	31.6
1997-00		1,313,145	119,366	12.1		602,825	20,979	32.7
2001-03		1,719,266	137,035	13.1		817,312	21,353	40.5
1983-90	Mangoes	1,023,273	114,866	10.6	Strawberries	70,557	4,600	16.7
1991-94		1,115,717	139,492	9.2		80,233	6,086	16.6
1995-96		1,266,043	151,364	9.3		95,055	4,635	20.5
1997-00		1,510,776	159,736	9.9		91,840	4,160	22.6
2001-03		1,565,827	170,418	9.5		113,901	4,318	26.9
1983-90	Guavas	150,257	14,915	12.4	Watermelons	441,759	39,381	13.0
1991-94		190,540	15,764	13.1		426,815	37,953	13.1
1995-96		205,963	17,237	12.3		509,271	35,172	16.3
1997-00		198,101	20,614	11.7		842,324	42,858	21.2
2001-03		285,368	22,093	13.2		923,732	44,050	22.2
1983-90	Cantaloupes	394,566	36,546	12.5	Totals	5,919,728	608,631	9.7
1991-94		495,472	42,996	12.9		6,969,059	724,453	9.6
1995-96		448,011	30,152	16.0		8,627,342	789,212	10.9
1997-00		598,010	30,277	20.6		9,665,322	820,057	11.8
2001-03		512,701	23,236	22.7		10,925,770	862,145	12.7

**Sources:** Mexico Ministry of Agriculture Data Bases (SIACON) and Anuario Estadístico de la Producción Agrícola 1999-2000 (preliminary data for 2003).

increased during the 1990s and the first years of the new millennium – that is, during the deepening of internal reforms and NAFTA (Table 5.4). This is explained by a continued increase in crop yields. For example, during 2001-2003, the production of these six basic crops was 36 percent higher than in 1983-1990, yields increased 21 percent, and cultivated area remained practically the same.

There are different trends when we distinguish production of major basic crops under irrigated conditions from production on rain-fed lands. Supply from irrigated lands increased sharply during 1991-1994 with respect to the previous eight year period (19.5 percent), but it remained practically the same from 1995-2003 (around 14 million t). Parallel to this, cultivated area decreased (by more than 20 percent), meaning that yields increased for crops under irrigation. Production under rain-fed conditions followed a different trend, expanding over the whole period under study (for example, average production during 2001-2003 was 40 percent higher than in 1983-1990). This trend is based on an increase in planted area and, to a lesser extent, in yields. Whereas production and cultivated area under irrigation declined during the macroeconomic crisis of 1994-1996 compared to the previous four year period (5.7 and 15 percent, respectively), supply and cultivated area under rain-fed conditions increased during the same period (by 21.8 and 15.7 percent). The expansion of rain-fed production suggests a different reaction by farmers producing basic crops depending on their access to water (a question that is discussed in the next section, with special reference to maize).

Yields from irrigated lands are much higher than yields under rain-fed conditions, and the disparity has deepened since the second half of the 1990s. For the six basic crops we studied, in 1983-1990 and 1991-1994 the average yield (t/ha) under irrigation were 2.9 times higher than yields obtained under rain-fed conditions. The difference increased to more than 3.4 times after 1997.

The same result obtains when we consider basic crops separately. Of particular interest is maize. This grain has been the major crop produced in Mexico, overall, and in terms of Mexico's supply of staples. During 1983-1990 it accounted for almost 48 percent of total supply of the six major basic crops and 57 percent of total cultivated area in these crops. Surprisingly, these percentages have increased during the period of reforms and NAFTA: during 2001-2003 the contributions of maize production and cultivated area to the respective totals for the six basic crops were around 56 and 60 percent, respectively. After a sharp rise in maize production and cultivated area under irrigated lands during 1991-1994 (121 and 56 percent, respectively, compared with 1983-1990), these contributions remained practically the same in 1995 to 1996 and

2001 to 2003. For rain-fed maize, the situation during the period of reforms and NAFTA has remained similar to that prevailing during 1983 to 1990 (we propose hypotheses below that are intended to explain these unpredicted trends).

Whether or not the evolution of the Mexican supply of major basic crops during the last 13 years signifies a structural change is an empirical question. Crop production is the result of cultivated area and yields. We tested econometrically whether structural changes in the effects of prices and trade on Mexico's supply of the most important imported and exported crops took place beginning with NAFTA's implementation (Table 5.5).<sup>10</sup>

Our results show that out of the seven major exported vegetables for which we applied the test, tomatoes experienced (negative) structural change in cultivated area and broccoli a significant (positive) rise in yields. These structural changes are due to trends in supply under irrigation.<sup>11</sup> For the case of exported fruits, data availability limited us to study only melons and watermelons, and our findings indicate that both goods show significant positive changes in yields but not in cultivated area.

The only basic crop that experienced structural change in cultivated area beginning with NAFTA is sorghum produced on rain-fed lands. The direction of the change is towards increasing planted area and is significant enough to produce positive structural change in total (including irrigated) area in this grain.<sup>12</sup> With respect to yields, barley produced under irrigation is the only basic crop that experiences positive structural change, and yields for soybeans show structural change in the opposite direction.

These econometric results do not contradict previous observations regarding trends in the production of major exported and imported crops. Furthermore, they indicate that, overall, no structural change is

<sup>10</sup> The period covered is from 1980-2002. We used planted area instead of cropped area since the latter depends heavily on climate and can hence be taken as exogenous to farmers' decisions.

<sup>11</sup> Notwithstanding that most exported vegetables are produced on irrigated lands, our analysis shows that the area cultivated in broccoli and cucumbers had a positive increase under rain-fed conditions. This result could be the basis to study whether farmers producing these two crops under good rain-fed conditions may have reacted to liberalization policies.

<sup>12</sup> The result is interesting if we take into account that sorghum production is a close substitute for maize production. An analysis of this issue is lacking but fundamental to study the effects of NAFTA and policy reforms on Mexico's supply of staples.

**Table 5.4:** Volume of production, cultivated area, and yields for major basic crops (simple averages).

Product	Period	Production ('000 t)			Cultivated Area ('000 of Ha)			Yields (t/Cultivated Ha.)		
		a. Total	b. Irrigated	c. Rainfed	a. Total	b. Irrigated	c. Rainfed	a. Total	b. Irrigated	c. Rainfed
<b>Barley</b>	1983-90	690	317	373	325	64	260	2.1	4.9	1.4
	1991-94	651	305	346	282	59	223	2.3	5.1	1.5
	1995-96	713	281	433	318	48	270	2.2	5.8	1.6
	1997-00	699	229	470	342	41	301	2.0	5.6	1.6
	2001-03	973	383	529	372	63	301	2.6	6.1	1.8
<b>Beans</b>	1983-90	998	270	728	2,164	227	1,937	0.5	1.2	0.4
	1991-94	1,187	399	788	2,149	302	1,847	0.6	1.3	0.4
	1995-96	1,310	399	911	2,275	277	1,998	0.6	1.4	0.5
	1997-00	1,043	407	637	2,306	302	2,003	0.5	1.3	0.3
	2001-03*	1,341	403	903	2,073	258	1,832	0.6	1.6	0.5
<b>Maize</b>	1983-90	12,472	2,932	9,540	8,076	994	7,082	1.5	2.9	1.3
	1991-94	16,885	6,488	10,397	8,294	1,553	6,741	2.0	4.2	1.5
	1995-96	18,189	5,997	12,192	8,859	1,343	7,516	2.1	4.5	1.6
	1997-00	17,844	5,957	11,886	8,649	1,175	7,474	2.1	5.1	1.6
	2001-03*	19,846	6,661	13,055	8,285	1,121	7,213	2.4	5.9	1.8
<b>Sorghum</b>	1983-90	6,890	3,607	3,283	2,009	618	1,391	3.4	5.8	2.4
	1991-94	5,612	2,895	2,717	1,423	395	1,028	3.9	7.3	2.6
	1995-96	7,419	3,548	3,871	2,059	468	1,591	3.6	7.6	2.4
	1997-00	9,292	4,455	4,837	2,320	479	1,841	4.0	9.3	2.6
	2001-03*	10,052	4,304	5,215	2,329	459	1,877	4.3	9.4	2.8

**Sources:** FAO and Mexican Ministry of Agriculture: Data Bases (SAGAR SIACON) and Anuario Estadístico de la Producción Agrícola 1999-2000

\* The data for irrigated and rain-fed lands are for the period of 2001-02.

**Table 5.4 continued:** Volume of production, cultivated area, and yields for major basic crops (simple averages).

Product	Period	Production ('000 t)			Cultivated Area ('000 of Ha)			Yields (t/Cultivated Ha.)		
		a. Total	b. Irrigated	c. Rainfed	a. Total	b. Irrigated	c. Rainfed	a. Total	b. Irrigated	c. Rainfed
<b>Soybeans</b>	1983-90	704	605	99	401	317	84	1.8	1.9	1.2
	1991-94	585	504	81	304	250	54	1.9	2.0	1.5
	1995-96	123	70	53	103	50	53	1.2	1.4	1.0
	1997-00	142	62	80	108	38	70	1.3	1.7	1.1
	2001-03*	111	37	67	69	21	47	1.6	1.8	1.4
<b>Wheat</b>	1983-90	4,292	4,036	256	1,087	887	200	4.0	4.6	1.3
	1991-94	3,854	3,474	379	970	730	240	4.0	4.8	1.6
	1995-96	3,422	2,966	455	911	611	300	3.8	4.9	1.5
	1997-00	3,351	3,072	279	765	565	200	4.4	5.4	1.4
	2001-03*	3,151	3,012	244	664	531	146	4.7	5.7	1.7
<b>Totals</b>	1983-90	26,046	11,767	14,280	14,061	3,107	10,954	1.9	3.8	1.3
	1991-94	28,774	14,066	14,708	13,422	3,290	10,133	2.1	4.3	1.5
	1995-96	31,177	13,260	17,916	14,525	2,797	11,728	2.1	4.7	1.5
	1997-00	32,371	14,182	18,189	14,489	2,599	11,890	2.2	5.5	1.5
	2001-03*	35,474	14,799	20,675	13,793	2,453	11,416	2.6	6.0	1.8

**Sources:** FAO and Mexican Ministry of Agriculture: Data Bases (SAGAR SIACON) and Anuario Estadístico de la Producción Agrícola 1999-2000

\* The data for irrigated and rain-fed lands are for the period of 2001-02.

**Table 5.5:** Structural change in cultivated area and yields of major traded crops, 1980-2002.

	Cultivated Area			Yields		
	Total	Under Irrigation	Rainfed	Total	Under Irrigation	Rainfed
<b>Exportables</b>						
Broccoli	NO	NO	YES	YES	YES	NO
Carrots	NO	NO	NO	NO	NO	NO
Cauliflower	NO	NO	NO	NO	NO	NO
Cucumbers	NO	NO	YES	NO*	NO*	NO
Garlic	NO	NO	YES	NO	NO	NO
Onions	NO	NO	NO	NO*	NO	NO
Tomatoes	YES	YES	NO	NO	NO	YES
Melons	NO	NO	NO	YES	YES	NO
Watermelon	NO	NO	NO	YES	YES	NO*
<b>Importables</b>						
Beans	NO	NO*	NO	NO	NO	NO
Barley	NO	NO	NO	NO	YES	NO
Maize	NO	NO	NO*	NO	NO	NO
Wheat	NO*	NO	NO	NO	NO	NO
Soybeans	NO	NO	NO	YES	YES	NO
Sorghum	YES	NO	YES	NO	NO	NO

**Source:** Own estimations.

\*Significant at 10% level.

apparent in Mexican agriculture after more than ten years of reforms and NAFTA.

### **Trends in Other Relevant Variables Related to the Rural Economy**

Econometric tests of structural change in relevant rural and agricultural variables for Mexico other than prices, trade, and production are lacking (as we will see below, the exception is migration). Notwithstanding this, for the purposes of this chapter, we now discuss the evolution of labor productivity and wages, rural out-migration, credit, land property rights, and poverty).

**Labor Productivity** Concurrent with the trends in yields, labor productivity in crop production – measured as value added divided by employment – increased continuously, from the late 1980s to 2001. Agricultural real wages have experienced a different evolution: they decreased from 1980-1997 (especially during the macroeconomic crisis of 1994-1996) and rose slightly from 1997-2001 (Puyana and Romero).

***Rural Employment and Out-migration*** Employment in the agricultural sector of Mexico has decreased, and this is reflected in a drop of almost two percent in total employment in the primary sector (agriculture and mining) during 1993-2002 versus 1984-1993, according to estimates by Audley et al., based on Mexico National Employment Surveys. Although this is in accordance with expectations, a critical question is where these displaced workers from the “primary sector” have found alternative jobs. Answering this question is complicated by the nature of official data; for example, employment figures are based on a sectoralization of the Mexican economy by major production activities, ignoring the complexity of rural households’ economic life. That is, the data abstract from the fact that a typical rural household in Mexico is a diversified production unit whose members are engaged in crop, cattle, and other household production activities, as well as in local, domestic-migrant, and international labor markets (see next section).

Preliminary results from the Mexico National Rural Household Survey of 2003 offer some insight into where the displaced workers from the primary sector may be located.<sup>13</sup> These results show statistical evidence that rural out-migration (both internal and to the US) rose significantly during the 1990s compared to the previous decade. The increase has been most pronounced for migration to the US during the second half of the 1990s through 2002. The number of migrants from Mexican villages in the rest of the country was 182 percent higher in 1994 than in 1980, but it was 352 percent higher in 2002. The number of migrants from rural Mexico in the US rose more slowly during the first period (it grew 92 percent between 1980 and 1994). However, it was 452 percent higher in 2002 than in 1980.

If we consider that most rural migrants in the rest of Mexico go to cities, we can link the above finding with the official data on agricultural employment and propose that increasing numbers of people born in rural Mexico are working in nonagricultural activities. We can add to this the argument of Audley et al. that insufficient growth in manufacturing employment during the 1990s meant that many of these rural migrants work in urban informal services, and many others with networks in the US decided to migrate to the north.

***Credit*** Credit subsidies and official credit coverage for working capital given to farmers by public financial institutions for rural development declined sharply during the 1990s. During and prior to the deepening of reforms in the 1980s, the government granted credit subsidies to

<sup>13</sup> Encuesta Nacional a Hogares Rurales de Mexico (ENHRUM) is a statistically representative survey of households living in towns and villages with 500 to 2,500 people all over Mexico. It gathered data on migration from 1980 to 2002 (Taylor and Dyer; PRECESAMa).

farmers and provided 55 percent of total credit given to the agricultural sector. Since 1990, official credit has been sharply reduced, and the private credit percentage increased to more than 73 percent. The amount of credit channeled to agriculture grew during the first four years of the 1990s (11 percent in constant pesos), but it has decreased sharply since the financial crisis of 1995 (total credit granted to agriculture was 21 percent higher in 1983-1990 than in 1996-2000 [Yunez-Naude and Barceinas 2002]). In addition, the proportion of agricultural credit in total credit granted in Mexico has been declining; it fell from 5.9 percent in 1994 to 2.8 percent in 2002 (Puyana and Romero).

The above trends suggest that the banking crisis of 1994/95 was a major factor impeding the flow of private credit to agriculture that was expected to occur after economic and *ejido* reforms.

Lower credit access may have forced commercial farmers to use decoupled supports (PROCAMPO and Alliance for the Countryside) as a substitute for credit in order to continue production. Credit constraints may have reduced the options that liberalization provided to farmers to switch production to competitive crops after policy reforms and NAFTA (see below). The credit crisis limited domestic investment in agriculture, and US investment in Mexico's field crops has remained low (Bolding, Calderon, and Handy; Casco and Rosenzweig).

***The Ejidal Reform*** Certification of *ejido* lands to individual *ejidatarios* is a prerequisite for the development of land markets in Mexico. The Salinas Administration expected that the process of issuing individual certificates of title to *ejido* land parcels, conducted by the Program for Certification of *Ejidal* Rights (PROCEDE) would conclude in a couple of years. This did not happen, and the process of certification is still under way.

One reason for the slow pace of certification is that, in order to assess ownership rights, PROCEDE has to confirm the boundaries of *ejidos* and individual parcels, resolve internal disputes, and distribute titles. PROCEDE has given new life to boundary disputes, particularly conflicts with absentee *ejidatarios*, over the inheritance right of non-*ejidatario* women or children, and over the rightful ownership of land that has been illegally used for loan collateral (Saldivar).

Once land is certificated, it can be transferred to someone else within the family or within the *ejido* by way of sale. Then the certificate can be converted to a private property title; a request to this effect has to be submitted to the entire *ejido* assembly and majority approval (50 percent plus one vote) obtained. If permission is granted and a title issued, the proprietor of the land has a "complete right" to the land (*derecho pleno*)

and can then sell it to anyone, inside or outside the *ejido*, as private property.

The process of certification of *ejidal* lands is now almost complete: in 2002, 76 percent of the *ejidal* lands were certified. However, in the same year, only 3.86 percent of the *ejidal* lands had a “complete right” (Ministry of Agrarian Reform).

Leasing-out *ejidal* lands has increased since the reform. According to the 1997 National *Ejido* Survey, from 1994-1997 there was a 19 percent increase in rental transactions by *ejidatarios* (Saldivar). By 1999, 51.4 percent of the rural territory was still under *ejido* regime and just five percent of *ejidatarios* had sold their land (Appendini 2001). Jones and Ward argue that changes in ownership patterns have been much more modest than expected under the *ejidal* reform, partly because of the slow pace of individual land titling under the PROCEDE program and the limited productive value of the land except in urban and suburban *ejidos*, where land is coveted by private real estate developers, and irrigated land where productivity is assured.

**Rural Poverty** Poverty incidence has been greater in rural than in urban Mexico, and the difference has not changed appreciably during the last ten years. The incidence of extreme rural poverty has been around 30 points higher in rural than urban areas, whereas the rural-urban difference in moderate rural poverty has decreased from around 30 points in 1992 to 25 points in 2002. Rural (and urban) poverty – moderate and extreme – increased during the macroeconomic crisis that Mexico suffered in 1994-1996 and has been decreasing since then, returning in 2002 to the levels of 1992 (Caballero).

## THE STRUCTURE OF MEXICO’S RURAL ECONOMY

Overall, our studies of the evolution of the rural and agricultural economy of Mexico indicate that, rather than experiencing a sudden structural transformation during policy reforms and NAFTA, this sector has experienced year-to-year cumulative changes since the 1980s (the exception being the effects on agricultural exports and rural out-migration in the context of the macroeconomic crisis of 1994-1996). The structure of crop production in Mexico has not radically changed, and in particular, production of basic crops other than soybeans has not collapsed. Government policies and the dual character of agricultural production in Mexico may explain this surprising outcome.

The heterogeneity of the Mexican agricultural sector is reflected in the coexistence of entrepreneurial farmers with peasant or family producers. The latter are rural households engaged jointly in production and consumption of staples, agriculture representing only a part of

their “portfolio” of income earning activities. In general, peasant producers have limited land (typically with plots no larger than two to two and one half hectares) and do not have access to irrigation and credit. Most are subsistence producers who do not participate in maize markets; their production and consumption decisions are shaped by unobserved “shadow prices” instead of market prices. The traditional view is that subsistence farms, isolated from outside markets by high transaction costs, have a supply response that is perfectly inelastic: output on these farms does not change when the market price of maize falls.

By contrast, the entrepreneurial or commercial farmer’s decision making process is the same as that of any farmer in the developed world: their production is specialized, for profit, and for the market in a context of low transaction costs. These characteristics enable commercial farmers to react to price changes by altering their supply of agricultural goods.

Both commercial and peasant farmers producing basic staples have benefited from PROCAMPO, and there is evidence that direct income transfers may have promoted domestic production of major crops imported by Mexico, particularly on small farms. Garcia and Taylor, Yunez-Naude, and Hampton look at the case of maize.

We propose that – together with productivity increases and direct income transfers (i.e., PROCAMPO) – new governmental programs and policies directed towards commercial or entrepreneurial farmers can explain why the production of some basic crops has not collapsed during the reforms, and also why the prices of staples have not followed US prices more closely during the same period. These policies include the marketing subsidies granted through ASERCA and other supports related to Alliance for the Countryside.

ASERCA offers marketing supports to commercial producers of basic crops in surplus regions.<sup>14</sup> Until the spring/summer season of 2000 the government and surplus producers negotiated a certain price. Then, in a public bid, interested buyers asked for a subsidy in order to commit themselves to buy a certain amount of the crop in question at the negotiated price. Hence, marketing supports of ASERCA are not decoupled and they could have helped maintain or even promote the commercial production of these crops, notwithstanding competition from the US under NAFTA.

<sup>14</sup> This is the case of the northern Mexico surplus producing States, where most of the marketing assistance budget has been directed (for example, 89 percent during 2002). This has been especially so for maize in the State of Sinaloa; sorghum in the State of Tamaulipas and wheat in the State of Sonora. The case of maize in Sinaloa is discussed in de Ita.

Subsidies granted to commercial farmers by Alliance for the Countryside have to be added to the PROCAMPO and ASERCA supports as explanations for why the production of staples by entrepreneurial agriculture has not collapsed and/or why the structure of commercial farmers' supply has not changed more significantly under market reforms and NAFTA. As reported by the United Nations Food and Agricultural Organization (FAO), there is evidence that, instead of substituting staples for competitive crops, commercial farmers have used Alliance supports to respond to the credit crisis from which they have suffered since the macroeconomic crisis of 1994-1996.

In relation to peasant agriculture, the relevant crop is maize, the major basic staple for human consumption in Mexico. A considerable portion of the production of maize by family farmers is used for own consumption. Due to the lack of disaggregated time series data, an approximation is required to distinguish peasant from commercial production of maize. This can be done by using maize output on irrigated land to approximate commercial production and output on non-irrigated lands as peasant production.

Table 5.4 shows that maize production and cultivated area on rain-fed lands has increased since 1995/96 (note, in contrast with irrigated maize, yields on rain-fed lands have remained practically unchanged).

There are two alternative hypotheses which have been proposed in the literature to explain why peasant production of maize has not collapsed in the wake of policy reforms and NAFTA. The first one is that, due to high transaction costs, peasant agriculture is relatively isolated from maize markets. In addition to cultivating the grain for home consumption, this means that, as producers of maize, the peasantry is not directly affected by price changes (de Janvry, Fafchamps, and Sadoulet). The alternative hypothesis, by Dyer and Taylor, is that economic linkages among commercial and subsistence households have shaped the outcomes of policy and market shocks in surprising ways (see next section).

The agrarian structure of Mexico can also provide an explanation for why the *ejidal* reform has not led to the expected radical increase in the size of agricultural units. Although research on this theme is needed, we propose that the development of the market for *ejidal* lands has taken place only in areas located near urban and tourism centers and in zones with high quality lands for agricultural production, as well as developed transportation, communications, and marketing infrastructure.

## A RURAL, MICRO ECONOMY-WIDE PERSPECTIVE

Throughout modern history, marked heterogeneity among producers has characterized agriculture in Mexico, where a majority of land-poor, subsistence households coexists in more or less isolated markets with a small number of land-rich, commercial (i.e., surplus) growers (Hewitt; Appendini 1994). The extent of their interaction is such that social scientists often explain each group's actions in relation to those of the other group (Bartra; Fox). This has not been the case in the economics literature. Mexican maize agriculture is also marked by a panoply of transaction costs. These costs have been described in relation to maize markets (de Janvry, Sadoulet, and de Anda; Key, Sadoulet, and de Janvry), and a diversity of crops and services associated with maize are typically non-tradable (Clawson; Hernández; Martínez et al.).<sup>15</sup> However, enormous geographical heterogeneity suggests that the particular combination of market failures affecting this sector varies widely.

The ability to predict supply response (or lack of response) in less developed rural economies is limited by the lack of an integrated macro/microeconomic analysis that accounts for interactions among heterogeneous rural households, particularly between commercial and subsistence farms. Countrywide models capture aggregate general equilibrium effects, but, as pointed out by de Janvry, Sadoulet, and de Anda, they necessarily neglect heterogeneity across rural households revealed in microeconomic analysis. Microeconomic models have their own limitations. In order to predict aggregate responses, it is not sufficient to add up responses estimated from representative micro-household models. One must also account for interactions among heterogeneous households in local markets.

Drawing from Dyer and Taylor, we use a disaggregated economy-wide model to demonstrate how interactions between commercial and subsistence farms in local markets shape the outcomes of a nationwide change in the price of maize. Disaggregated models highlight heterogeneous household responses to market signals by incorporating household specific shadow prices for subsistence maize farmers. A series of individual household farm models is embedded within a village model. This makes it possible to link micro responses with aggregate outcomes in a manner not possible using conventional computable general equilibrium approaches.

We use a disaggregated model to simulate the village-wide and household specific impacts of a ten percent decrease in maize price,

<sup>15</sup> Non-market benefits of maize include economic, social, and ritual services (e.g., food security); income diversification; and social standing.

reflecting recent policy reforms. We estimated the model with data from a survey of households in Zoateopan, a village located in the Sierra Norte de Puebla.<sup>16</sup> This is an isolated village in which 94 percent of households are subsistence maize producers. Textbook models of subsistence farmers, guided by idiosyncratic shadow prices, would not predict a major impact of changes in the market price of maize in this village.

Wages, like land rents, are assumed to be locally endogenous.<sup>17</sup> We believe that this assumption is realistic. Although the Mexican rural labor force is relatively mobile, significant variation in the agricultural wage across the country suggests the existence of market imperfections generating local wages or at least some rigidities in rural labor markets. At the time of the survey, households in this village did not have access to migrant labor markets that might connect the village with outside wages. Nevertheless, we also explore the impacts of maize prices in a hypothetical scenario of access to outside labor markets (i.e., a fixed wage).

In each of the endogenous and exogenous wage scenarios, the model yields estimated impacts of the simulated changes on every household in the sample. This distinguishes the present model from previous village-wide models and is critical for estimating differential impacts of staple price shocks across households. Table 5.6 reports village-wide aggregate impacts of the price change. Table 5.7 reports distributional effects, as measured by Gini coefficients estimated from individual household outcomes.<sup>18</sup>

The initial impact of the decrease in the market price of maize is felt only by commercial households. The price decrease creates a direct incentive for surplus growers to scale back their maize production. Maize output on commercial farms decreases by more than 28 percent in the endogenous wage scenario [column (a)]. In the fixed wage scenario, commercial farm output drops more sharply, by 48 percent, as commercial farms actually withdraw from the market and labor leaves the village.

As commercial production contracts, the demand for land and labor on commercial farms decreases substantially, forcing local rental rates and (in the endogenous wage scenario) wages downward by 14 and ten

<sup>16</sup> A ten percent decrease is chosen for convenience. Maize prices actually dropped 13 percent between 1994 – the start of NAFTA – and 1999 – the year of our survey (Banco de Mexico).

<sup>17</sup> Despite legal restrictions on ejido land, rental was already common throughout rural Mexico prior to the recent reform of land tenure laws (Dewalt and Rees).

<sup>18</sup> These are not obtainable from previous village or aggregate CGE models.

**Table 5.6:** Effects of a 10% decrease in the market price of maize, Zoateopan, Mexico (percentage change).

Variable	(a) Closed Labor Market (endogenous wage)	(b) Open Labor Market (fixed wage)
<b>Production activities</b>		
Maize (aggregate)	-4.89	-14.22
Commercial Households	-28.52	-47.65
Subsistence Households	4.77	-0.56
Other agriculture	4.45	0.00
Livestock	-0.64	0.64
Non-Ag. Activities	-18.98	-9.49
Commerce	-36.19	-18.45
Labor wage	-9.60	0.00
Rental rate	-14.05	-14.25
Village GDP	-7.26	-3.77
Household income*	-1.69	-0.87
Commercial Households	-3.97	-3.04
Subsistence Households	-1.57	-0.75
Maize household surplus*	-57.20	-100.00
<b>Demand*</b>		
Homegrown maize	5.30	-0.45
Commercial Households	5.37	0.40
Subsistence Households	5.29	-0.62
Market maize	4.52	6.72
Commercial Households	-4.31	0.94
Subsistence Households	4.54	6.73
Animal products	-4.10	-1.85
Non-Ag. Goods	-4.57	-2.29
Other food	-10.33	-5.27
Manufactured goods	-9.53	-5.20
Village maize imports	15.50	23.69

\* Village aggregate.

percent, respectively. Land rents and wages represent costs of production for both commercial and subsistence households. A decrease in these input prices partially compensates commercial households for the lower output price; this is why the negative output shock is smaller (i.e., the elasticity is closer to zero) in column (a) than in column (b). When both rental and wage rates are endogenous, all subsistence growers increase their scale of production. Although commercial maize production falls, subsistence maize production increases in the

**Table 5.7:** Effects of a change in the market price of maize, Zoateopan, Mexico

Variable	Original	After Maize Price Change	
		13% Increase	13% Decrease
Gini coefficient for real income	0.356	0.362	0.353
Gini coefficient for land use	0.562	0.606	0.502
Average number of plots per household	1.64	1.48	1.83
% Households giving-up plots	-	14.58	4.17
% Households taking-up plots	-	2.08	23.00
% Households leaving agriculture	-	4.17	0.00

endogenous wage scenario (by just under five percent). When wages are fixed, subsistence production is almost unchanged.

In both scenarios, household incomes fall. The income drop is larger in commercial than in subsistence households, and it is larger in the endogenous wage than in the fixed wage scenario, due to the negative effect on wage income. With lower maize prices, despite lower incomes, the demand for market maize increases and the demand for homegrown maize rises in most cases. Due to the rental of land to subsistence households, consumption of homegrown maize rises by 5.3 percent in scenario (a). A contraction in commercial output and a higher local demand for maize result in a 57 percent decrease in total household marketed surplus of maize (from a small base) in the endogenous wage case, and a complete disappearance of marketed surplus in the exogenous wage case. As a result, village maize “imports” or purchases from outside markets rise by 15 to 24 percent, reflecting a higher village maize deficit.

Lower household incomes decrease the demand for non-maize goods and services. Since the price of village non-tradables falls, the demand for fixed priced imports decreases the most, leading to a contraction of the formal commerce sector. Nonetheless, demand for non-tradables also adversely affects local activities that do not use land or male labor, such as nonagricultural activities and, in some households, livestock. As a result, the village’s GDP decreases by four to seven percent. Although every household experiences a nominal decrease in income, changes in real income are positive for some households; three out of ten households experience a real income increase. Households engaged in formal commerce experience the greatest decreases, even greater than those of commercial maize growers.<sup>19</sup> Households whose chief income source is migrant remittances, as well as those dependent on public welfare, experience increases in real income as they consume cheaper local goods, but do not lose from the decrease in local wages.

The maize price decrease results in a more egalitarian distribution of land, as land previously used by a few commercial growers is distributed among a large number of subsistence households; the

<sup>19</sup> This is true in absolute terms, but not as a percentage.

Gini coefficient for land decreases from 0.562 to 0.502. A sensitivity analysis suggests that most of these changes are gradual. As price changes go from five to ten to 13 percent, household responses intensify with a cumulative effect on village aggregates.

It should be noted that the simulations presented above do not take into account other policy changes that were concurrent with the decrease in the market price of maize such as PROGRESA and PROCAMPO, nor production subsidies to commercial farms, which were not observed in this village as in many other villages in Mexico (PRECESAMb). They also ignore technological changes that appear to have accompanied trade liberalization, increasing productivity, and buffering commercial farmers from the negative effects of lower staple prices.

Nevertheless, the simulation results suggest a local explanation for the unexpected supply response to maize price liberalization seen across Mexico. In Zoateopan's largely subsistence economy, the decline in the price of maize induced commercial maize growers to scale back production, reducing their demand for land and labor. Subsistence growers who must buy maize to satisfy part of their consumption needs benefited directly from the price drop but suffered from lower wages and fewer jobs. Although some of these households experienced increases in real income, most experienced declines. As incomes dropped, so did expenditures, which resulted in a contraction of demand for local goods and village imports. On balance, the village became more self-reliant, as households substituted local goods for imports they could no longer afford and homegrown goods for purchased goods. In the end, a lower maize price was deleterious for seven out of ten households in a mostly subsistence community that purchases three quarters of its maize. Thus, the decline in maize price did not trigger a shift away from subsistence maize cultivation – as experts predicted (Levy and van Wijnbergen) – but rather, stimulated subsistence activities, including maize as well as other goods and services.

## **SUMMARY AND FINAL REFLECTIONS**

The results of our analyses of the evolution of Mexico's agricultural sector during the last two decades indicate that, instead of structural change, this sector has experienced a process of gradual change characterized by: lower prices for Mexican producers of basic crops; a growth in agricultural trade and trade deficits; and productivity increases in some traded crops produced under irrigated lands. The exceptions are structural changes in rural out-migration to the US

and in cultivated area and yields of some agricultural exportables that occurred during the peso devaluation of the mid 1990s.

Increases in agricultural labor productivity and the development of private property rights appear to have experienced a relatively gradual process of change, whereas the problems of rural credit, employment, and poverty remain. In addition, it is plausible that a process of “retrogression” has been present in the production of maize by small farmers (i.e., from producing the staple for market to producing it for subsistence).

Despite the macroeconomic stability Mexico has experienced since the last quarter of the 1990s and the steadiness of the process of change in some basic components of agriculture and in the rural economy, the country witnessed political unrest during late 2002 and the beginning of 2003, spearheaded by farmers and peasant organizations. The farmer and peasant movement (called *El Campo no Aguanta Más*) ushered in a new political context that could be dated to 2000, with the election of President Fox. The main motivation for this movement was the perception that the state of affairs in the countryside had worsened under policy reforms and NAFTA (Dyer and Dyer).

In relation to NAFTA and agriculture, the following three events were signaled by farmers as the basis for their political actions: 1) the increase in imports of basic foods and maize in particular; 2) the US Farm Security and Rural Investment Act of 2002 or US Farm Bill; and 3) the deepening of the process of agricultural trade liberalization with the US beginning in January 2003. Negotiations between these organizations and the Fox Administration led to policy changes, crystallized first in what is called the “Agro-Food Armour” (AFA) and later in the National Accord for the Countryside (*Acuerdo Nacional para el Campo*).

The AFA was designed to mirror the US Farm Bill; it includes: an income safety net scheme for the producers of basic grains and oilseeds on a multi-year basis; energy subsidies to equalize the costs of electricity and diesel that Mexican farmers pay with the costs paid by their Canadian and US counterparts; and a commitment to increase access to credit at lower interest rates for Mexican farmers. The AFA also meant changes in Mexico Trade Law to create an effective framework to face unfair competition from dumped imports (Knuston and Ochoa; Rosenzweig).

The National Accord for the Countryside (NAC) was signed in April, 2003 by the government and farmer and peasant organizations. The NAC expands the coverage of the AFA to the rural economy and includes several principles, ranging from acknowledgment that rural sustainable development is a fundamental component of national development, to food self-sufficiency, food security, and the implementation of differentiated support policies by type of rural producer.<sup>20</sup>

The NAC's treatment of maize is particularly noteworthy. There is a controversy over whether imports of US corn have competed with Mexican maize production under NAFTA.<sup>21</sup> The disagreement stems from the fact that most maize imports are of the yellow variety, whereas most of the production in Mexico is of white maize. Farmers and some authors argue that the two types of maize are substitutes for processing (Puyana and Romero), whereas the Mexican government and other analysts argue that they are not (Zahniser and Coyle).

Settling this question is fundamental because, if the second interpretation is valid, imported yellow maize does not pose serious competition for Mexican farmers, and hence the government decision to allow maize over-quota imports without charging the established tariff under NAFTA could be justified on the grounds that these over-quota imports promote Mexico's agro-industry and livestock production without harming maize producers. However, if this is the case, the following question emerges: why did the Salinas Administration negotiate a transitional TRQ regime for maize with the US?

Keeping in mind the question about uses of national and imported maize, the NAC could provoke other uncertainties, since its goal of attaining food self-sufficiency does not consider the implications on trade policy of the prospect that both maize and livestock demand in Mexico will increase with income growth.

It is likely that the commitments of the Fox Administration under the NAC will, at most, be put into practice only partially. However, as Aceves argues, the relevance of the accord is that it reflects a

<sup>20</sup> In practice, the NAC meant 1,580 million pesos of fresh resources over and above the 116,100 million pesos of the budget approved by Congress for 2003, an additional 100 pesos per hectare of PROCAMPO to producers with less than five hectares, the extension of PROCAMPO transfers to farmers with less than one hectare of land, and the expansion of several programs benefiting the poorest sections of rural society (Aceves; Dyer and Dyer).

<sup>21</sup> Among other reasons, the debate is rooted in the lack of detailed studies on the characteristics and evolution of maize demand in Mexico.

serious effort to reconsider some former public policies towards the rural sector of Mexico. The design of new policies requires a clear understanding of the functioning of Mexico's rural economy and the likely impacts of policy changes on a disaggregated level.

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# Trade Agreements and Economic Development: Some Observations

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*Kristin Penn*

## INTRODUCTION

This chapter is a brief essay by a person who does not usually write papers – we at Land O'Lakes spend far more time refining a well-tested set of development tools than in describing the theories and concepts that led to the approaches we now use – not that investment in concepts is not important, or that we probably should do more of it. It is mainly that our base concepts do not change much in the intermediate term.

Also, I would admit at the outset that our “conceptualizing” is heavily “retro-engineered,” in that we primarily test approaches in the real world, apply what works best and refine that approach to better suit the conditions we encounter at any given moment, or place. We do not spend much time evaluating the reasons why a particular approach has worked.

I would argue that our practical approach is the way most development is done – starting in Europe and the US two centuries ago, in Asia a century later, and elsewhere today. It is now the way the transition economies are attempting to come to grips with their new realities. In fact, the power of commercial experience is far greater than theoretical constructs, at least in its early stages.

Some would add that many of the conceptual approaches to development that violate that practical approach have led to trivial, or negative results, and continue to do so (e.g., the precautionary Luddism that is holding back investment in technology and development in parts of the world today, to say nothing of the conceptual advances expected from central planning since 1848 and that we are still working to correct today – and others).

My purpose here is to introduce a few Land O'Lakes development concepts, describe some of the most important trade concepts that guide our work in an increasingly interconnected world, describe in more detail our approach to development and some of the key tools we use, and then offer some observations about links between trade liberalization, competition, and development. I want to emphasize the important overlap between development and trade reforms and an exciting tool we use to build on the increased competition implicit in trade reform.

## **WHO WE ARE**

Land O'Lakes is an integrated, diversified national cooperative with 300,000 US farmer-members in 1,400 local cooperatives. The company is a national leader in deli cheeses, premium butter, eggs, feeds, seeds, plant foods, and crop protection products; among other products and inputs. Consumers link its name and the Indian Maiden logo to high quality and traditional taste standards, and have confidence in our products. The result is substantial national market shares in a number of important product lines.

Land O'Lakes' international development strategy is to share and build upon members' experience and expertise. We currently have a number of development experts with substantial experience in development programs worldwide. Our International Development Division dates from 1981, and now manages a multi-million dollar portfolio in 30 countries. While the company was seen largely as a source of technical assistance for milk production and marketing 23 years ago, we now offer a unique, highly focused economic development approach that builds upon intense training and technical assistance delivered to, and through, producer groups, processors, and marketing organizations of varying sizes and degrees of sophistication, reflecting the initial conditions in each target country.

A major development tool is our expertise in the organization and support of cooperative activities. These associations have demonstrated capacity to help producers increase their efficiency, apply economic discipline to improve and control quality throughout the marketing chain, and develop new products and services tailored to consumers' needs. They also offer customized support for producers in the context of the economic and social problems limiting investment and income growth of smallholder livestock producers – shorthand for a broad range of family concerns (including, in some cases, health care, women's issues, rural development issues, and many others).

Land O'Lakes' strategic, practical business solutions are all designed to facilitate the increased flow of products from production to consumption,

with commensurate increases in producer income as a result. This system focuses on investments of many kinds (technical assistance, production inputs, capital, and many others) and can enhance the current value of producer resources, no matter how small the beginning resource base – a working definition of development in many low-end productivity situations.

In developed economies, marketing chains add value to commodities at every step and convey benefits to all participants along the way. In more primitive systems, the chain often is neither effective nor efficient. Marketing costs can be so large and the flow of information about consumer preferences so weak that incentives to invest at any point are severely diminished. Still, removal of a modest number of bottlenecks often boosts productivity and efficiency throughout the chain. So, we usually begin by identifying steps that can be taken by producers and processors to strengthen linkages with each other and throughout the chain.

As described in subsequent sections, our contribution in both low-productivity and modest-productivity development situations depends on capacity to add value through the chain. In some situations, the additional amount of value-added is quite significant. With this emphasis on adding value, we have been able to build a solid link with trade reforms as an aspect of development, even in some isolated rural areas.

### **Agricultural Development Experience**

Land O'Lakes' most comprehensive (and mature) application of its dairy and livestock development tools is now in Albania, which continues to serve as a promising model for other parts of the world. Before Albania, we worked on the privatization and revitalization of formerly state-owned enterprises (and, the farms they supported) in Poland and across Central Europe, but that task is largely completed and we now are engaging in ever more challenging situations. The Albania case is instructive.

During the post-World War II era, Albanian dairy operations were collectivized and severely neglected – and, the collectives were largely destroyed during the transition in the early 1990s. The US Agency for International Development (USAID) requested Land O'Lakes' assistance to reorganize the dairy production base, which was defined by ultra-low productivity.

The initial effort to engage the sector was relatively crude, but involved more than 8,000 smallholders (both men and women) in intensive programs of education and outreach. Producers were organized into

working associations of some 400 group-business units of 15 to 20 families each, which received regular “productivity training” from a team of 20 locally recruited and trained female extension agents. The team, together with local producers, was able to facilitate access to input supplies, breeding and financial services, and other inputs.

The program then built on this base to establish service centers around milk collection sites (locally owned and managed) to deliver additional services. Thirty livestock service centers now provide access to inputs and other supplies (including credit), and information, and serve as conduits for product marketing activities. Instituting a “Seal of Quality” program has effectively implemented industry-promoted quality standards to help expand domestic markets and compete with imports.

These efforts continue today, with increasingly dramatic sector-wide results. Local livestock producers have become a far more cohesive group and are generating some of their own investment capital, which is going into better technology to increase efficiency and expand markets – with high returns. It has significantly improved smallholders’ business concepts and their incomes.

### **Development Principles**

The foregoing description of the Albanian experience demonstrates the capacity of well-designed development programs to increase productivity and market linkages for low-productivity producers. To sustain economic growth, three basic principles deserve special mention, especially in dealing with low productivity, and more isolated producers. These include:

- **Making Small Producers More Commercial.** Land O’Lakes’ approaches are relentlessly profit-oriented and owned by the small producers they include, and are more easily integrated into commercial sectors. Independent, small producers frequently lack the scale and capacity to control costs or expand markets, but their associations/cooperatives are often able to improve their market positions. A variety of methods for improving producers’ commercial viability are used, and success in this area has been quite high in a number of environments.
- **Smallholder Services through Associations.** Associations regularly demonstrate their effectiveness in helping producers both improve their efficiency and strengthen their civil society – a characteristic desired by many donors and governments, alike. Still, many associations are formed to operate top-down, dominated by a small, elite group, and provide minimal services. Land O’Lakes insists on a fundamentally different approach, building on grassroots

members' interests, economic incentives, and capacities to create local associations that often coalesce into regional or national associations to pursue producer interests at those levels.

- **Focus on Quality.** Increasingly, development situations include producers with substantial resources, but markets limited by the low quality products that are produced. This situation describes a very large share of developing country producers, and is described in greater detail later in this chapter.

## Competition and Development

One objective of this chapter is to describe the interactions between competition and development, which become increasingly important once basic productivity is strengthened and the worst bottlenecks are removed from the marketing chain. I want to address the myth that competition undercuts primitive, low-productivity agricultural systems. Our experience is that fair competition created within developing countries or from imports can help build markets and promote development, even in very poor communities.

Our experience has shown that trade is singularly important for the success of development programs, both for the markets it provides and for the external competition it insures. In general, trade benefits all participants, although not uniformly. It:

- Widens market access and stimulates investment;
- Supports increased scale and efficiency of production;
- Stimulates specialization and increased productivity;
- Provides access to wider variety and lower cost goods for consumers;
- Supports higher real income and saving;
- Supports better technology;
- Attracts more capital from domestic and foreign sources;
- Increases competition and efficient use of resources; and
- Promotes economic growth and development.

Trade reforms mean there will be both winners and losers, and appropriate policies are needed to insure that losers' needs receive consideration. As a result, it is essential to work toward more open markets at the same time as we work to enhance the resources of low-productivity producers.

## Opening Markets

Agriculture remains the most protected sector globally, in part because it was not significantly included in the early trade negotiations that have been undertaken since World War II. There have been eight

**Table 6.1:** Trade negotiating rounds since World War II.

Year	Place/Name	Coverage	Countries
1947	Geneva	Tariffs	12
1949	Annecy	Tariffs	13
1951	Torquay	Tariffs	38
1956	Geneva	Tariffs	26
1960-61	Geneva/Dillon	Tariffs	26
1964-67	Geneva/Kennedy	Tariffs and anti-dumping	62
1973-79	Geneva/Tokyo	Tariffs, non-tariff measures, framework agreement	102
1986-94	Geneva/Uruguay	Tariffs, non-tariff measures, rules, services, intellectual property, dispute settlement, textiles, agriculture, creation of the WTO	123
2002-04	Geneva/Doha	All goods and services, tariffs, non-tariff measures, anti-dumping and subsidies, regional trade agreements, intellectual property, environment, dispute settlement	144

**Source:** WTO.

multilateral negotiating rounds during that time, with the first seven almost exclusively focused on non-agricultural markets. The Uruguay Round (1986 to 1994) was the first to specifically include agricultural issues (Table 6.1).

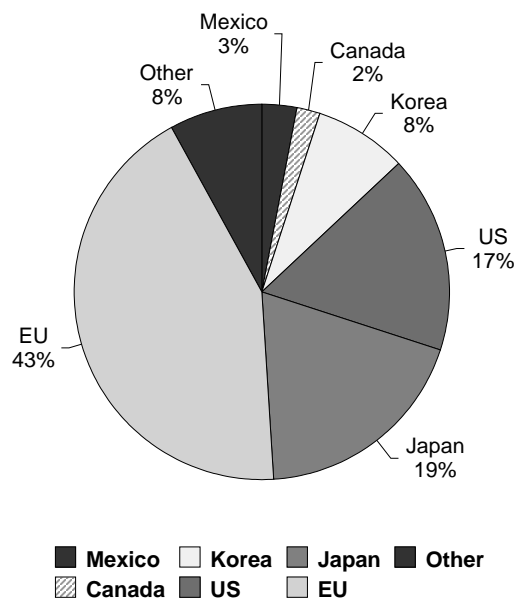
Without going into all of the evidence, I want to make the point that we have just scratched the surface in our efforts to liberalize trade and that huge barriers remain. The following figures provide examples of producer supports for selected countries, and of the high levels of bound tariffs that remain for many agrifood commodities in most of the world's regions.

The Organization for Economic Cooperation and Development (OECD) estimates producer support levels for each member country, including most of the world's major economies. The very high producer supports that exist in key developed countries (i.e., Korea, Japan, the EU, and the US) can be seen in Figure 6.1.

For most developing countries (India, especially), high tariffs are the principal means of producer protection. Table 6.2 presents bound agrifood tariffs by selected commodity and region. In many cases, the tariff rate on specific products is prohibitively high. Clearly, import duties as large as those applied by many countries diminish the demand for agricultural products significantly. In addition, they discriminate against high value products such as fresh and frozen meats, among others. Agreement to

**Table 6.2:** Average WTO bound tariffs, by region and commodity group.

Region	All Products	Grains	Oilcakes	Oilseed Oils	Fresh Beef, Pork, Poultry	Dairy	Sweeteners
North America	24.5	24.7	13.3	17.5	49.4	83.2	50.4
Central America	54.1	55.3	44.7	72.1	68.2	68.0	65.3
Caribbean	85.7	85.5	85.5	79.3	90.8	86.7	86.0
South America	39.4	46.0	39.7	38.7	43.0	42.6	39.0
EU 15	30.1	52.5	2.9	12.5	40.5	87.5	58.8
Western Europe	103.5	99.7	80.6	94.9	273.7	221.2	82.5
Eastern Europe	49.2	47.1	8.8	33.9	89.9	83.9	73.0
Middle East	48.2	40.0	39.0	37.9	62.4	64.9	41.6
North Africa	71.4	84.2	78.3	106.5	93.5	74.2	143.4
Sub-Saharan Africa	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Southern Africa	39.2	36.8	33.0	81.0	95.0	23.3	22.0
Asia Pacific Rim	34.0	60.0	22.0	24.3	32.1	70.7	37.5
South Asia	113.2	103.3	111.9	134.5	112.7	104.3	121.2

**Source:** ERSb.**Notes:** Averages are computed using the commodity average for each country in a particular region.**Figure 6.1:** Share of total OECD producer subsidy equivalent expenditure, 2002.

OECD PSE, 2002 US\$234.8 billion

**Source:** OECDa.

**Table 6.3:** Value of Agricultural Exports for Major Trading Blocs, 2001.

Trading Bloc	Total Trade	Intra-Regional Trade	External Trade	Intra-Regional Trade Share
		Billion US\$		Percent
EU 25	215.4	161.4	54.0	74.9
NAFTA	102.4	49.0	53.4	47.8
MERCOSUR	38.2	4.6	33.6	12.1

**Source:** UN Trade Statistics and US Bureau of Census Statistics.

reform and liberalize these trade barriers should be among the highest priorities of the ongoing Doha Round.

**Regional and Bilateral Agreements** In an effort to continue to expand markets after progress toward agreement on the Doha trade talks bogged down in September 2003, the US Administration has increased its focus on regional and bilateral free trade agreements as it said it would from the Round's beginning.

Regional trade agreements (RTAs) traditionally were little used, but have become much more important in recent years (OECD).<sup>1</sup> By 2003, 187 RTAs were in operation, with most implemented after 1995. Today, RTAs cover 43 percent of world trade, a share expected to grow to 55 percent by 2005 as agreements currently in the pipeline come into force.

It is difficult to overstate the importance of RTAs in today's world (Table 6.3). For example, the three major trading blocs, the EU-25, NAFTA and MERCOSUR engaged in just over US\$356 billion in agricultural trade (i.e., agriculture, forestry, and fisheries) in 2001. The new EU-25 is by far the largest of these, with more than twice the exports reported for NAFTA. MERCOSUR is very small by comparison, less than one-fifth the size of the EU and two-fifths the size of NAFTA. While NAFTA and MERCOSUR depend primarily on external markets, the EU is primarily an internal trading bloc with nearly 76 percent of its agricultural trade taking place between member countries.

<sup>1</sup> RTAs are accepted under the WTO. In general, the WTO mandates each member accord Most Favored Nation (MFN) status to all other WTO members. But the WTO allows an exception for regional trade initiatives that extend different terms of trade to participating countries, as long as an RTA complies with the following two main requirements outlined in the GATT Article XXIV: 1) the agreement lowers barriers within the regional groups, and 2) the agreement can't raise trade barriers for non-participating members.

**Table 6.4:** US Regional Trade Agreements and US Exports, 2003.

	Agricultural Products	Fishery Products	Forestry Products	Total
Billion US\$				
<b>Signed RTA</b>				
NAFTA	17.2	0.7	2.2	20.1
Israel	0.4	0	0	0.4
Jordan	0.1	0	0	0.1
Chile	0.1	0	0	0.2
Singapore	0.3	0	0	0.3
<b>RTA Negotiated</b>				
CAFTA	1.1	0	0	1.2
Com Republic	0.4	0	0	0.5
Australia	0.6	0	0	0.7
Morocco	0.1	0	0	0.1
<b>RTA Negotiating</b>				
FTAA	21.6	0.7	2.3	24.6
Thailand	0.7	0	0	0.7
Bahrain	0	0	0	0
SACU	0.2	0	0	0.2
<b>Total US Exports to Target Regions</b>	24.7	1.5	4.7	30.9
<b>Total US Exports</b>	53.1	3	5	61
% of US Total Exports				
Signed RTA share	34.2	23.5	44.7	
Negotiated RTA share	4.4	1.1	1.7	
Negotiating RTA share	6.5	2.2	2.7	
Target Region Share	45.1	26.8	49.1	44.5

**Source:** US Bureau of Census.

The US now has six Free Trade Agreement partners including mega-partners such as Canada and Mexico, but also Israel, Jordan, Chile, and Singapore. It also has a number of other agreements in the pipeline (Table 6.4). Unlike the EU, the US will depend on world markets for the bulk of its trade even if it completes all of the agreements now contemplated, about 44 percent of the US total. Beyond the agreements now on the table, those awaiting consideration are with smaller markets, including an ASEAN initiative, and the US-Middle East Free Trade Area which depends on the development of more stable political conditions in the region, but is contemplated “within the decade.”

Most US RTAs include agricultural trade, and most have exceptions for some products. However, by 2008, nearly all tariffs for both agriculture and non-agricultural commodities will be eliminated under NAFTA, for example. The agreements with Chile and Singapore, and the recently concluded agreements with Australia, Morocco, and Central American countries include extensive agricultural provisions, but offer exceptions for sensitive products such as sugar under the Central America Free Trade Agreement (CAFTA).

**Table 6.5:** World Population and Income Growth Patterns, 2003-2013.

	Population			GDP			
	Millions of People	Average Annual Growth Rate (%)		Global Share of GDP (%)	Average Annual Growth Rate (%)		
		2004-2008	2009-2013		2000-2003	2004-2008	2009-2013
World	6,302	1.1	1.1	100	2.3	3.3	3.3
Developed Nations	868	0.5	0.4	75.2	1.9	2.6	2.6
Transition Economies	411	0	0.1	2.4	4.4	4.3	4.2
Developing Nations	5,025	1.3	1.2	22.3	3.5	5.1	5
Asia	3,372	1.1	1.1	10.8	5.5	6	5.9
China	1,287	0.6	0.7	3.8	7.9	7.3	7
India	1,050	1.4	1.3	1.6	5	5.7	5.8
Latin America	546	1.3	1.1	6.1	1.4	3.8	4
Middle East	257	1.9	1.8	3.8	1.6	4.9	4
Africa	850	2	1.7	1.7	3.3	4.3	4.1

**Source:** USDA.

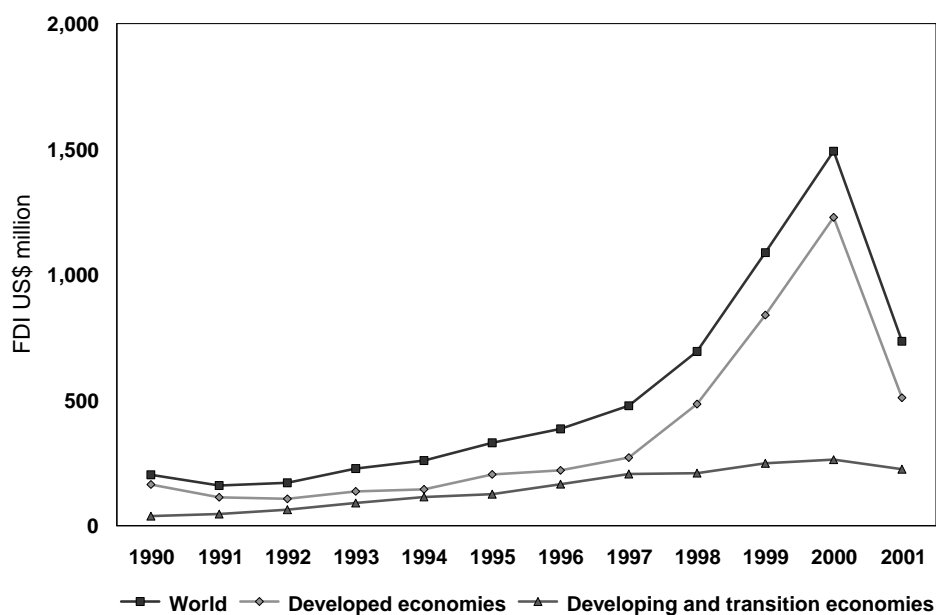
## Trade and Developing Countries

The world's developed countries (e.g., Europe, Canada, Japan, Australia, and the US) have less than 900 million people and are growing very slowly – below replacement rates, in many cases (Table 6.5). Nevertheless, they have more than three quarters of the world's wealth. Developing countries, by contrast, have nearly 80 percent of the people but less than one quarter of the wealth. However, they are growing rapidly – population growth there is nearly three times as fast as in developed countries, and income growth is projected to be nearly twice as fast over the next decade. Both trends emphasize the importance of developing country markets for agricultural producers.

Developing countries have turned increasingly to foreign investment to finance economic growth and to provide additional sources of food. As the world has become more interconnected, a number of developing countries have designed their economic policies to promote rapid growth, focusing on export sales to developed country markets and working to attract direct foreign investment on the basis of their rapid economic growth.

The direct foreign investment phenomenon virtually exploded across the world in the late 1990s (Figure 6.2). During the eleven years 1990 to

**Figure 6.2:** FDI Flow, Selected Regions, 1990-2001.



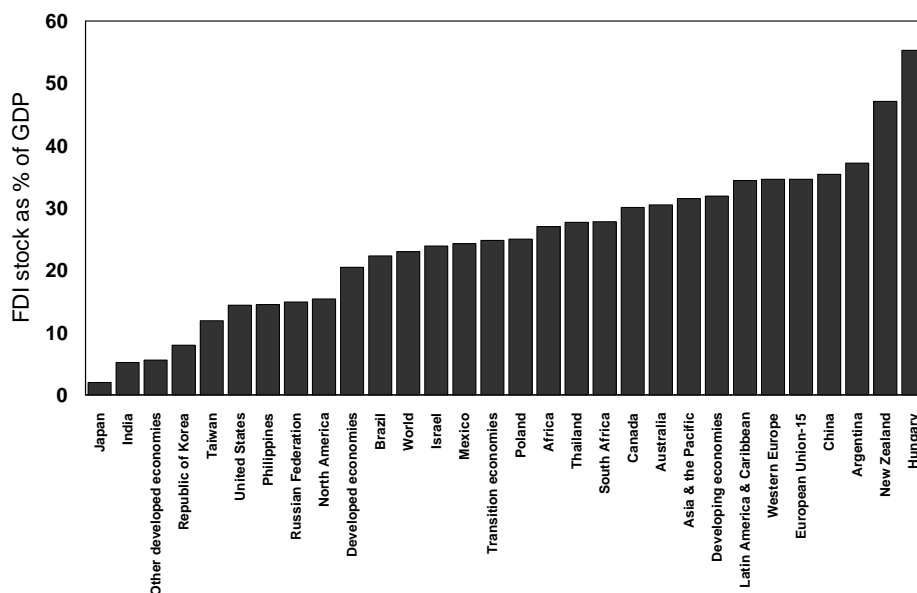
**Source:** United Nations Conference on Trade and Development.

2000, world FDI grew from US\$203 billion to US\$1.49 trillion, with most of the growth after the Asian economic crisis in 1997-1998. In general, the world's rapid growth in FDI was driven by developed countries investing in other developed countries, although investment in developing countries increased significantly. In 2000, the peak investment year, more than 80 percent of FDI was in developed countries.

While the flow of FDI to developed countries is far larger than that to developing countries, the FDI flows are important to developing nations. By 2002, the stock of FDI in a number of countries and regions had become very large; more than 30 percent in Canada, Western Europe and the EU-15 (Figure 6.3). For developed countries, the average was just over 20 percent; for developing countries, the average was nearly 32 percent. Japan and India have the lowest FDI among major countries, two percent for Japan and 5.2 percent for India. For a number of countries, adverse currency trends have both constrained their GDP and inflated the ratio of FDI to GDP, so that Malaysia and Hungary, for example have a stock of FDI that is very high, more than 55 percent in relation to GDP.

In general, world population and basic food needs are growing slowly. While population growth in the early post-World War II period was

**Figure 6.3: FDI Stock as Share of GDP, Selected Countries and Regions, 2002.**



Source: OECDdb.

upwards of two percent annually (and, in Africa and the Middle East is still well above the world average), growth today throughout Asia and Latin America is just over one percent. As a consequence, it is the expanding economies, and not the growing populations that have become the engine of growth. US Department of Agriculture baseline projections predict that economic growth is expected to expand four to five percent annually through the coming decade (ERSa). Such a pace clearly indicates substantial increases in food demand, and in the types of food consumed, as well.

This pattern has been established for some time, and is leading to expectations that in the coming decade, food consumption per person of wheat, rice, and coarse grains likely will flatten or even decline, while high value-added foods and feed uses of grain and meal will increase significantly, along with vegetable oils. Economic growth capable of supporting such trends is relatively new, established over the past decade, but appears likely to become much stronger in the future.

### **Supporting Development in an Economic and Trade Growth Environment**

The range of economic and development environments in which Land O'Lakes is active provides a good measure of the varying challenges it faces. To promote development in such diverse environments requires a range of development tools that are effective in both the most isolated, almost totally non-commercial situations (such as Albania when Land O'Lakes first began work there), to those with substantial existing market linkages, but poor current terms of trade because of important bottlenecks (such as Macedonia). Examples of such situations include:

- **Adding Value and Consumer Marketing in Uganda.** In Uganda, Land O'Lakes has successfully organized milk production and processing systems (80 producer cooperatives established), improved quality control practices at the farm and plant levels, and overseen new product investment by seven processors. These investments have stimulated growth of per capita consumption (up by 15 percent).
- **Access to Services in Montenegro.** This project created a country-wide network of 33 rural producer associations representing more than 9,000 members. These associations effectively solved feed distribution issues by forming a producer trade association to purchase feed inputs directly from suppliers (sales to members of US\$1 million in the first year).
- **Productivity through Breeding Services in Malawi.** In Malawi, Land O'Lakes has assisted more than 18 milk bulking groups to organize and provide productivity training to more than 2,000 dairy producers. In partnership with World Wide Sires, 54 artificial

insemination technicians have been trained, including nine women who were the first female technicians in Malawi. The technicians have established 15 private profitable artificial insemination units.

- **Quality Control and Market Share Improvement in Macedonia.** In addition to a number of technical assistance projects to improve crop and livestock productivity, especially by the newly private, very small farmers, Land O'Lakes focused heavily on developing and maintaining product quality and value throughout the marketing chain. The Land O'Lakes Macedonia activity (a five-year USAID program) supported dairy and meat processing enterprises, especially, and sheep producers of special "mountain" cheese. The program's quality improvement and brand development strategy effectively developed high quality products (comparable with that of imports from Western Europe) for Macedonian consumers and encouraged processors to comply with ISO 2001 and HACCP quality standards.

### **"Seal of Quality" and Competition**

There are many reasons why agricultural sectors have trouble taking advantage of the growth opportunities that come from trade reforms, but not all are equally difficult. Some come from profound, continued market isolation – weak market links, or no links at all. But, even in such cases, efforts to build cooperative associations to increase productivity, increase marketing efficiency, add value, and to shorten marketing chains can enhance producers' incomes.

However, there are other, very interesting situations that are not well understood and are very common. In many developing countries, there are abundant natural resources and significant currently underutilized facilities, as well as surplus human resources. In many such situations, former policy failures have led to a degraded system that is minimal in almost every respect – low industrial capacity utilization, low productivity for farms and livestock, minimal value-added to products, poor product quality, and minimal information from markets and consumers. Often, such markets have been highly protected from international competition, but sometimes imports have captured much of the high-end local market.

In such situations, Land O'Lakes has developed a unique "Seal of Quality" (SOQ) approach to build on its basic productivity-enhancement efforts – a concentrated program of technical assistance focused on a few important bottlenecks in the marketing chain in order to quickly move local producers into more competitive positions in local markets, and, in a few cases, move them effectively into export markets.

Macedonia was our “laboratory” for this concept, and it is still our test situation, although we are finding at least limited application in a large number of situations in other countries. The SOQ approach is more complex than other important development tools, but effectively serves as a development link between the efforts focused on the lowest-productivity producers and communities, and those with much higher potential productivity, but who are performing badly (and, where competition from imports is large and growing). The SOQ approach can generate very positive impacts all along the food chain from producers and processors, to retailers and consumers. It seems to be generally and intuitively understood by producers and processors, who then join cooperatively to impose the standards and build the brands they use to expand markets.

The central characteristic of this approach is its relentless consumer focus, and the recognition that consumers are universally price sensitive, but value other quality attributes including food safety, freshness, and taste even above price in some settings.

The SOQ symbol is a trademark or brand, awarded exclusively to firms who comply with superior quality standards, measured scientifically and systematically through a transparent process. The Seal, and the process for awarding it, are the property (and under the control) of producers and processors. Through a complex communications development plan, the Seal rather quickly becomes well recognized in the marketplace, and SOQ products increase their market share by filling unmet demand for safe, healthy products that meet superior quality standards, and are independently tested. They also have been able to expand market shares in competition with imports in some cases, and even in a few export markets.

The key variables in this process are related to the existing market constraints – the degree of sophistication and understanding of consumer demand (and market conditions in the target country), the availability of unused production and processing capacity to respond efficiently to market growth, the capacity to control quality through production processes, and the availability of at least relatively strong commercial protections to permit effective control through the process.

### **Trade and Rural Development**

Land O'Lakes was recently contracted by the Ministry of Agriculture, Livestock and Fisheries (MAEP) in Madagascar to assist in the design of a Master Plan for Rural Development to be led by MAEP. During January 2004, a joint Land O'Lakes/MAEP team conducted on-site field assessments across Madagascar's agriculture, livestock, and traditional

fisheries systems. The team identified strengths and existing capacities of the targeted systems that could support additional investment to overcome gaps or weaknesses that now limit profitability and growth throughout the sector. The team applied practical, tested (rather than academic) assessment measures, but included reviews of a large number of existing documents. This practical market and business-oriented process focused on identifying how investments in rural development can best “jump-start” economic growth and generate the greatest, most sustainable return.

Agriculture is especially important in Madagascar, where more than 80 percent of its 16 million people live in rural areas and depend on production of crops, livestock and fishing. A large majority of these people live below the poverty line (with access to less than 2,133 calories daily) and struggle to provide adequate household food supplies. This dependence on subsistence agriculture makes it difficult to create commercially viable agricultural systems and attract investment. Both the farms and the businesses that serve them are fragmented and disorganized. Critical links between production, processing and marketing are weak. Farmers and their groups are constrained by low productivity and lack commercial marketing techniques, business management skills, and a market-orientation. Systems that supply inputs, extension, technical and financial services all are weak.

The team’s assessment provided the analytical foundation for a practical, market-driven, business-based “Master Plan for Rural Development” which has been approved by the MAEP to accelerate the growth of the rural economy, and to cut rural poverty in half. The Plan is built around an overarching perspective and action strategy for other efforts and plans already devised and underway. The Plan will not replace programs now in place, but will supplement them with a clearly defined resource management approach. Its purpose is to maximize the market-oriented efforts essential to advance rural development quickly and sustainably. The Plan hopes to accomplish at least two objectives, each critical to agricultural reform: first, to lift 700,000 rural households (3.5 million people) from their current poverty to a food secure environment; and second to engage 350,000 households (1.75 million people) in a more effective, formal, market-based food system where they will be able to double their household revenue (incomes up 100 percent).

Supporting activities also will permit a broad range of important, measurable results by the end of the initial five year plan’s implementation:

- Establish or expand 1,000 profitable small, medium, and large agribusinesses, creating 10,000 new opportunities for gainful employment;

- Establish 350 new, profitable cooperatives (17,500 people) and strengthen 500 existing associations (5,000 people) which will give producers more organized, direct access to markets, inputs, and services;
- Attract US\$50 million in new capital investment into the domestic food, agriculture and agribusiness systems, thereby achieving sustainability and continued growth well beyond the five year period of this plan;
- Create a Task Force for Extension and Applied Research Excellence to improve the delivery of technical support provided by non-governmental organizations (NGOs) and the private sector to over 500,000 households;
- Implement at least five key policy reforms that will significantly contribute to an enabling environment for rural development; and
- Develop a number of effective partnerships and alliances with NGOs, donors, and the private sector which will leverage at least US\$50 million of critical resources and business transactions that contribute to the Master Plan actions.

Efforts under the Plan will build MAEP's capacity to alleviate poverty by expanding markets, creating linkages between farmers and buyers, and improving productivity. This approach will enhance the significant potential of the country's agriculture, livestock and traditional fisheries to generate: 1) increased local food production and sales, and sales of production inputs; 2) profits for emerging agribusinesses; and 3) greater productivity, efficiency, production, and profits for many individual farm families.

The Master Plan is not a *project* but a strategy to better guide development initiatives, allocate resources, promote collaboration driven by market opportunities, make business development sustainable, and increase the profitability of all stakeholders in agriculture, livestock, and traditional fisheries systems.

The core of the five year Master Plan is a series of concrete initiatives that will contribute significantly to efforts to alleviate poverty in rural Madagascar. Its implementation will be mainly the responsibility of the Department of Inter-Regional Rural Development, with supervision and guidance provided by the Secretary General and Minister of MAEP. The plan proposes four principal areas, which are intertwined and mutually supportive:

- 1) Develop market-driven agriculture, livestock, and traditional fisheries systems. All activities should be oriented to specific, tangible, and reachable markets to convert commodity production

into sales. Physical infrastructure, services and capacity building should enable the flow of product from farm to value-adding enterprises, or an end market. The market linkages for selected commodities, especially perishable products must be strengthened. There should be a major focus on greatly improving the marketing and business acumen of associations and cooperatives. Engaging model farmers and entrepreneurs to share their experiences and lessons learned with others will be an important key to success. Capacity building in marketing, business, cooperatives, and productivity improving skills, plus a shift in mind-set towards self-determination and pro-activeness must be incorporated into all activities supporting rural development;

- 2) Focus extension and applied research on market-driven approaches, and increase this support. It is critical over the next five years to focus intensively on orienting training, extension, and applied research on clear market opportunities, solid business decision-making, and practical productivity practices so that farmers maximize benefits of clearly identified markets. The establishment of a Task Force for Extension and Applied Research Excellence, led by the Ministry, should bring together a cross-section of members representing models of excellence in extension and research to develop and implement a campaign to significantly augment their competence. Training and extension should be strengthened to include an emphasis on market orientation, business planning, and proven, market-driven productivity practices made available by the Task Force. The private sector will be strongly encouraged to assist in enabling, on a commercial basis, replication and distribution of new varieties and genetics of productive inputs to support the objectives of this initiative;
- 3) Establish a more enabling environment for rapid and sustainable rural development. The MAEP is responsible for fostering an environment that is conducive to enabling rural development to prosper. A number of key policy steps can break the chain of poverty in Madagascar and set the stage for significant increases in food security, household income, profitable agribusinesses, job creation, and capital investment in the food and agriculture systems. These need to be identified clearly and assigned meaningful priorities. MAEP will seek successful collaboration with other ministries to improve policy initiatives dealing with security, roads, land, rural development, child nutrition, and quality controls to ensure the environment crucial to rural development and poverty reduction is in place; and
- 4) Create alliances to leverage resources and business opportunities for rural development. The Master Plan recognizes the important role that business and Public-Private Partnerships (PPP) can play in effective rural development. The aim is to ensure both profits

and broad distribution of benefits so that everyone “wins.” Alliances are a means of bringing stakeholders together, through formal or informal methods. They draw upon the contributions that the various parties can make, and are aimed at goals that represent common interests. Alliances for rural development need to be established to mobilize the capabilities and interests of the various stakeholders, in order to seek out and take advantage of market opportunities and more demand-driven production. Actors and interests brought together may include: central and provincial government administrations, private sector entrepreneurs, NGOs and religious groups, civil society, external technical and financial partners, local government organizations and associations, and universities. The PPP approach of the Government of Madagascar places great importance on alliances and collaborations. The MAEP will use this approach to guide resource allocations and collaboration with others. Alliances will create linkages among potential stakeholders, encourage capacity-building, and facilitate match-making for marketing and investment.

The Master Plan for Rural Development defines a workable strategy for use by the Ministry to build internal capacities including marketing, agribusiness and cooperative development, guiding resource allocation, and influencing others to join together in efforts to be more oriented towards market opportunities, sustainable business development, and efficient production of commodities by farmers and farmer groups. Securing collaboration especially with international NGOs, donors, and directly with local and international businesses is a top priority for the Ministry, and is critical to successful dissemination of market-oriented solutions, and enabling of investments to the rural population engaged in agriculture, livestock, and fisheries.

## **ADDITIONAL THOUGHTS ABOUT TRADE AND DEVELOPMENT**

Trade reforms mainly target policy protections, and their primary objective is to increase the degree of market access and competition across markets as they identify and schedule reductions in policy protections. These benefits are extremely important to economies, but often have little impact on groups that have weak market links and lack capacity to position their operations to take advantage of market growth, especially growth that requires tailored products or services.

In developing countries, the number of people who fall into these categories is very large. For example, 1.25 billion people live on less than US\$1 per day, and 70 percent of those are rural with most depending on farming, forestry, or fishing. Of these, 841 million people suffer under-

nutrition or hunger – mainly due to lack of resources except in times of war, natural disaster, or politically-imposed famine, when more are threatened. This poverty also is the result of a lack of education, health resources, and economic capital.

Some 3 billion people (half the global population) live on less than US\$2 per day. These people and the regions where they are concentrated are Land O'Lakes' development targets. It is important to recognize that trade expansion and economic growth work only slowly to extend development to the fringes of each economy, and cannot quickly overcome low resource values that result from non-economic forces including: 1) economic and political tensions; 2) cultural, racial, and sexual tensions; 3) a fundamental lack of resource quality as a result of the existing climate, soils, geology, surface features, and latitude; 4) cultural aversion to resource mobility; and 5) inter-generational commitment to low-return enterprises, including low capital, high labor systems, and low or no value-added agriculture. The worst example of this being slash and burn farming.

Thus, while freer trade can help deal with a broad range of economic problems, it is also important to recognize competition from any direction is often threatening for low-productivity groups with weak market links. While globalization can bring economies closer together and provide general economic benefits, it has no magic solution for many key economic stress factors. Still, it is important to recognize, as Land O'Lakes does, that benefits from trade – larger markets, greater competition, and many more, are as fundamentally important to development as they are to market expansion; necessary, if not sufficient conditions. Much more direct development support is necessary to help these economies, and organization and support for community based, locally focused, and commercially oriented ventures are the most extensively tested development tools in use by Land O'Lakes today.

## **CLOSING OBSERVATIONS**

Even recognizing the growth constraints described above, well-designed development systems have demonstrated capacity to enhance resource values. They can effectively improve productivity and production, increase incomes, strengthen market linkages, and expand and improve capacity to invest in individual and community wealth.

The Land O'Lakes approach to the business of food, farming, and people is to cooperate to increase farm productivity and efficiency, reduce investment constraints, add value, enhance quality, build markets, reward stakeholders, build practical business solutions, focus on

consumers' needs, and reward stakeholders. We know through this process that cooperation equals strength in the market place.

I want to leave with you some observations: First, most isolated, low-productivity groups are threatened by all development processes, not just trade. At a minimum, they must become more mobile and competitive to have any chance to escape their poverty. Also, trade agreements and trade don't damage isolated producers, but they will build around them to fill markets that could have been supplied by better organized local entities. There is no effective shield for local economies from this development pressure but the SOQ program practiced by Land O'Lakes offers an effective approach in at least some such situations. Also I wish to emphasize that trade capacity building of stakeholders is critical. Finally, sustainable rural and agriculture development always involves sound business principles, including market orientation, information systems, consumer orientation, competition to improve efficiency, building or strengthening technology, a strong marketing chain that adds value throughout, and supportive government policies (investing in human resources, infrastructure, and sound macroeconomics, among others).

With regard to the trade-development nexus, trade supports development and is essential for sustained development, in part because:

- Modern agriculture rewards capital much more than labor, and capital-based agriculture produces more than enough to meet family requirements and must be commercial to be sustained;
- Economies of capital investment are not just large, they are dominant;
- Labor intensive agriculture insures poverty for most workers, even with extensive protection;
- Land O'Lakes' strategy for the longer-term is to help small, poor producers increase the value of their resources through technical assistance, stronger market linkages, reinvestment of their own capital and development of new capital sources, and to help them invest in human capital that is mobile. Creating capital in resources and mobilizing resources depend on many of the same tools; and
- Trade stimulates change and growth, and helps attract the longer-term investment essential to development.

Lastly, I'd like to reiterate the importance of trade capacity building among the targeted population that is being "left behind." Capacity building is not just physical but *human* infrastructure, and to do it well, there must be strong government commitment for change and funding, absolute coordination of foreign assistance focused on mutual strategy and goals, and real engagement of the private sector in efforts to develop

the necessary linkages from the farm to the market to ensure economic benefits for all stakeholders of trade.

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# Risk Management in the Integrated NAFTA Market: Lessons from the Case of BSE

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## INTRODUCTION

Globalization is changing the nature and structure of agricultural and food markets. In agriculture, globalization is providing producers with new market opportunities, as well as broader options for sourcing raw material and intermediate inputs. The globalization of the food industries is providing consumers with unprecedented choice and increased value as products are traded across borders. The result is production and marketing systems that are increasingly more integrated. The Canada-US Free Trade Agreement (CUSTA) and the North American Free Trade Agreement (NAFTA) have accelerated this integration for North American markets by reducing barriers to the flow of goods among Canada, Mexico, and the US.

Increasing integration of production systems and markets presents new risk management challenges for regulators and industry around all aspects of plant health, animal health, and food quality, particularly food safety. Increased integration is promoted by well-coordinated regulatory systems across trading partners. At the same time, increased integration means increased interdependence and a higher potential for widespread disruptions in the event of a problem. Here we examine the case of the management of bovine spongiform encephalopathy (BSE), popularly referred to as mad cow disease, in the North American beef industry. The industry and trade was greatly disrupted in 2003, and continues to be disrupted, by the discovery of a BSE case in Canada in May and another in the US in December.

BSE provides a dramatic example of the importance of risk management systems and how animal health, plant health, and food safety events

can disrupt industries and markets within NAFTA, as well as trade with non-NAFTA countries. However, it is only one of a long list of examples of such risks including Foot and Mouth Disease, Avian Influenza, microbial contamination, and bio-terrorism. They highlight the challenges for governments and industries in managing risk in integrated markets and in responding in the event of failure.

## **RISK MANAGEMENT IN INTEGRATED MARKETS**

Market integration is a matter of degree (Robertson); it can range from integration based on market incentives, to the lowering of trade barriers through free trade agreements (e.g., NAFTA), to the elimination of internal barriers and the adoption of common policy through a new centralized government [e.g., the European Union (EU)]. Trade between countries takes place on the basis of their agreements with each other and, for most countries, within the larger context of the World Trade Organization (WTO) that sets the general rules of the road for trading relationships. A central challenge with market integration is on the regulatory side, particularly in regard to risk management.

To achieve freer access to markets, trade agreements focus on controlling tariff and nontariff barriers to trade. Tariff barriers are the familiar duties on imports and other measures, such as quotas, whose major influence is on the price of goods. Nontariff barriers include a huge array of other practices that may impede trade – including regulatory measures adopted by countries to manage risks (Roberts et al., Buzby). As tariff barriers have been reduced in recent decades, concern grew that nontariff barriers would be used as a substitute to protect domestic industries. For example, say tariffs on imports of boneless beef products are greatly reduced leading to an upsurge in imports. While the country in question may be restricted from reinstating tariffs by its trade agreements, what would prevent it from finding a safety hazard associated with the imports and setting regulations that prevent the increase in imports? To prevent this scenario, the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) of the WTO sets standards for when nontariff barriers to trade arising from regulation of plant and animal health and safety, and food safety, will be considered legitimate. The interpretation of this agreement is currently being fleshed out in the process of disputes before the WTO.

Risk management, and the regulatory programs that are designed to achieve it, are the responsibility of national governments. Under the SPS Agreement, countries have the right to choose the appropriate level of protection, based on risk assessment, and to implement programs to

achieve that level of protection in the least trade restrictive manner. Increasingly, governments base their regulatory decisions on risk analysis, which involves risk assessment, risk management, and risk communication. Governments ultimately make regulatory decisions based on the benefits and costs of taking, or not taking, action. Because factors differ between countries, as does the evaluation of risk and the regulatory infrastructure, national governments tend to make different decisions about how to control risks such as those posed by BSE or microbial contamination. Direct parallels can be drawn to regulation of risks in nearly any industry (e.g., prescription drugs, car safety).

Increased market integration usually rests, in part, on facilitating compliance of trading partners with each other's regulations. Governments can do this in three ways:

- ***Policy Coordination***: gradually reducing differences in policy, frequently based on voluntary adherence to international codes of practice.
- ***Equivalence Agreements***: agreeing to accept the regulatory program of the trading partner as achieving the same standard (i.e., being equivalent), although the regulatory program used to achieve the standard may differ. This is a strong form of mutual recognition.
- ***Harmonization***: adopting identical standards and enforcement mechanisms.

In practice, all three routes to regulatory rapprochement have proven rocky. The benefits of a looser coordination of policy may not justify the effort needed to achieve it. Equivalence agreements are notoriously difficult to arrive at because they often involve exhaustive and exhausting reviews of each other's (frequently changing) policy. Harmonization requires agreement on regulatory goals and mechanisms that is usually not forthcoming among independent countries. Countries are loath to turn over any of their risk management and regulatory decision-making to outsiders.

Frustration with the slow pace of regulatory facilitation motivated the EU to consolidate significant regulatory functions in a central government structure in order to achieve harmonization (Harvey). The NAFTA countries, on the other hand, are practicing weaker forms of policy coordination or at most equivalence. This necessarily places limits on the degree of market integration that is achievable. Our case study explores the benefits and costs of these limits, and the implication of having an integrated market without a supporting integrated risk management infrastructure.

## **BSE as a Case Study**

We examine the policy implications of regulatory and market integration in the context of BSE in the North American beef industry. Under NAFTA, this industry has become integrated on every level of the supply chain from feed production through to prepared food products. In 2003, North America confirmed two cases of BSE.

BSE is an excellent opportunity to study the interaction of government risk management decisions and trade effects. BSE first emerged in the UK in the 1980s (for a fact sheet on BSE see Canadian Food Inspection Agency). It is one of a group of transmissible spongiform encephalopathies (TSEs) that affect the central nervous system. BSE affects this system in cattle and thus is an animal health risk. Little is known for certain about BSE. Many experts believe that cattle become infected by the feeding of TSE infected ruminant (i.e., cattle, sheep, goats, deer, elk, bison) protein products to cattle. The disease is eventually fatal to cattle. At the peak of the outbreak, the UK reported over 37,000 BSE cases in 1992 (OIEc). BSE has been considered to pose a human health risk since 1996 when a newly recognized form of Creutzfeldt-Jacob Disease (CJD), called variant CJD (vCJD), was diagnosed. It is thought to be linked to consumption of meat products from BSE-infected cattle. To date, the OIE reports that BSE cases have been confirmed in over 20 countries around the world, including most of the EU, Japan, Canada, and the US (OIEb). The number of reported cases in countries other than the UK has been much lower, ranging from peaks of 333 cases in Ireland in 2002, 274 cases in France in 2001, and 159 in Portugal in 1999, down to a peak of 4 cases in Japan in 2003 (OIEd). No cases have been reported in Mexico.

The management of BSE-related risk requires a broad set of measures ranging from regulation of feed practices, to movement of live animals, surveillance, slaughter, distribution of beef products, rendering, and even handling of table scraps (i.e., plate waste). Given that BSE is a newly emerged risk, these systems have been under development in a swiftly changing environment. As we shall see, a failure in the systems, defined to date in the trading environment as finding one BSE case, triggers the complete closing of export markets for live animals and beef products. This closing is not mandated by international standards, but is the result of risk management decisions made by importing countries. Thus the stability of this integrated trade sector in North America, and sales to non-NAFTA countries, hinges on the effectiveness of the diverse, nonintegrated regulatory systems of the NAFTA countries. To evaluate the effects of this situation, we turn first to looking at the level of integration in North American beef markets and then to the trade shocks that resulted from the BSE cases confirmed in 2003.

## HOW INTEGRATED ARE THE NAFTA BEEF INDUSTRIES?

Each NAFTA country has a successful beef industry that it considers to be an important agrifood sector. Prior to CUSTA and NAFTA, tariffs inhibited trade in cattle and beef among Canada, Mexico, and the US, and their beef industries operated relatively independently. In 1989, CUSTA opened the way for free trade in the beef industries between the US and Canada. The free trade was extended to Mexico in 1994 through NAFTA. Since CUSTA and NAFTA, there has been a dramatic increase in the interdependence of the beef markets in the three countries in both production and consumption. In this section we examine the degree of integration among the three NAFTA beef markets just prior to the BSE events that occurred in 2003. Thus 2002 is the last full year of data that reflects pre-BSE experience in NAFTA.

The beef industries in the NAFTA countries generally refers to the industries that produce live cattle and fresh, chilled, or frozen beef products, as well as processed meats or offal (which make up about 5 percent of exports in Canada). The primary production sectors in Canada and the US are quite similar. The production sector includes cow-calf operators that produce the calves, stockers, or backgrounders, that raise the calves to pre-finishing weights, and feedlot operators that finish the cows on grain rations. The Mexican industry is very different. Cattle tend to be grass fed and feedlots are less common. In the past, Mexican consumers have tended to purchase less expensive grass fed beef, but more recently consumption of premium grain fed beef has increased with improvements in income and standards of living.

The processing sector includes processors that slaughter and butcher the animals, further processors that produce high quality boxed beef cuts, and rendering operations that convert the processing by-products into bone meal and tallow. Economies of scale in the beef processing industry are significant; Canada and the US have several large processors who dominate the industry and a multitude of smaller processors and further processors. Concentration is high in both countries, with the four largest firms in steer and heifer slaughter holding 81 percent of the US market in 1999 (Harris et al.) and 81.6 percent of the Canadian market in 2002, according to a Standing Committee on Agriculture report.

Inputs to the cattle industry include genetics and feed inputs such as grains and protein sources. For trade purposes, products of the beef industry are separated into two main categories: live cattle and beef products. Other categories, like tallow, offal, and hides, are relatively minor compared to these two, comprising less than 1 percent of industry

**Table 7.1: NAFTA beef and cattle consumption and trade, 2002.**

<b>2002 Beef Consumption and Trade (in '000 metric tons)</b>					
	<b>Consumption</b>	<b>Imports</b>	<b>Exports</b>	<b>Net Trade</b>	<b>Net Trade as a % of Consumption</b>
Canada	992	307	610	303	30.54%
Mexico	2,409	489	10	-479	-19.88%
US	12,738	1,460	1,110	-350	-2.75%

<b>2002 Cattle Slaughter and Trade (in '000 animals)</b>					
	<b>Slaughter</b>	<b>Imports</b>	<b>Exports</b>	<b>Net Trade</b>	<b>Net Trade as a % of Slaughter</b>
Canada	3,753	138	1,690	1,552	41.35%
Mexico	8,310	206	948	742	8.93%
US	36,970	2,503	244	-2,259	-6.11%

**Source:** USDac.

trade. The relative sizes of the NAFTA beef industries are shown in Table 7.1.

### **Integration of Beef Markets**

Trade in beef animals and products falls into two broad categories – trade in live cattle, destined for feedlots or processing, or trade in beef, which refers to the trade in the meat products from processed cattle. The US and Canada rank second and third in terms of exports of beef with 16 percent and 15 percent of the global trade in beef, respectively. However, their trade patterns are very different. As the largest consumer of beef in the world, the US market and production systems affect the activities of both of its NAFTA partners. Both the US and Mexico are net importers of beef, while Canada is a net exporter of both beef and cattle, Mexico is a net exporter of cattle, and the US is a net importer of cattle (Table 7.1).

The NAFTA beef industries are integrated at every level, from production through to the markets for end products. The nature of that integration reflects the market structures and comparative advantages of the three countries. Canada's relatively low cost production system has allowed it to expand its industry through exports of both live cattle and beef into the US. The percentage of total Canadian beef production exported to the US has increased from 12 percent in 1990 to almost 48 percent in 2002. Poulin and Boame report that ninety percent of Canadian exports go to the US, while only 11 percent of the US trade goes to Canada. Mexico's exports, which are almost exclusively cattle, are also completely focused on the US market.

Canadian beef and cattle have absorbed much of the growth in the US market, as illustrated in Figure 7.1. Mexico's industry has not experienced the same benefits from freer trade, with growth in Mexico's cattle industry on the order of 1 percent per year. The US beef industry has taken advantage of its quality advantage and its role has become one of providing higher quality beef to both Mexico and Canada.

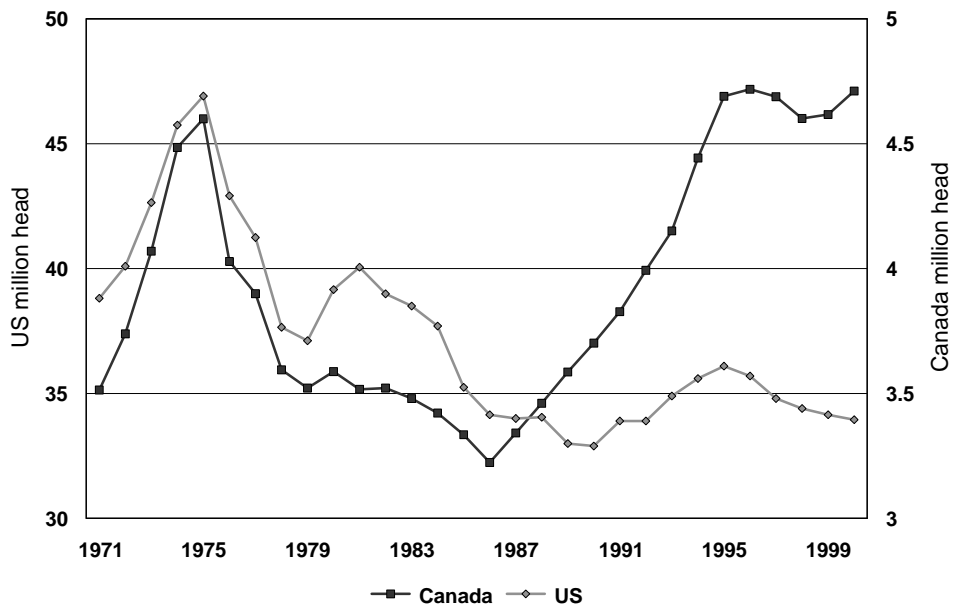
Of the NAFTA countries, only the US is a major player in non-NAFTA markets, both as an exporter (Table 7.2) and importer. Sixty-five percent of US beef exports are to non-NAFTA countries and 66 percent of beef imports are from non-NAFTA countries, mainly Australia and New Zealand.

### Integration of Live Cattle Markets

Trade in cattle occurs primarily in the form of Canada and Mexico supplying US feedlot operators and processors with live animals. Canada provided 68 percent<sup>1</sup> of the US cattle imports in 2002, imports that have become an integral component of the US production system. Canadian cow-calf operations supply some of the young stock to US producers,

<sup>1</sup> The US imported 2.5 million cattle in 2002; 1.7 million came from Canada (USDAb).

**Figure 7.1:** Canada and US Beef Cow Numbers, July 1.



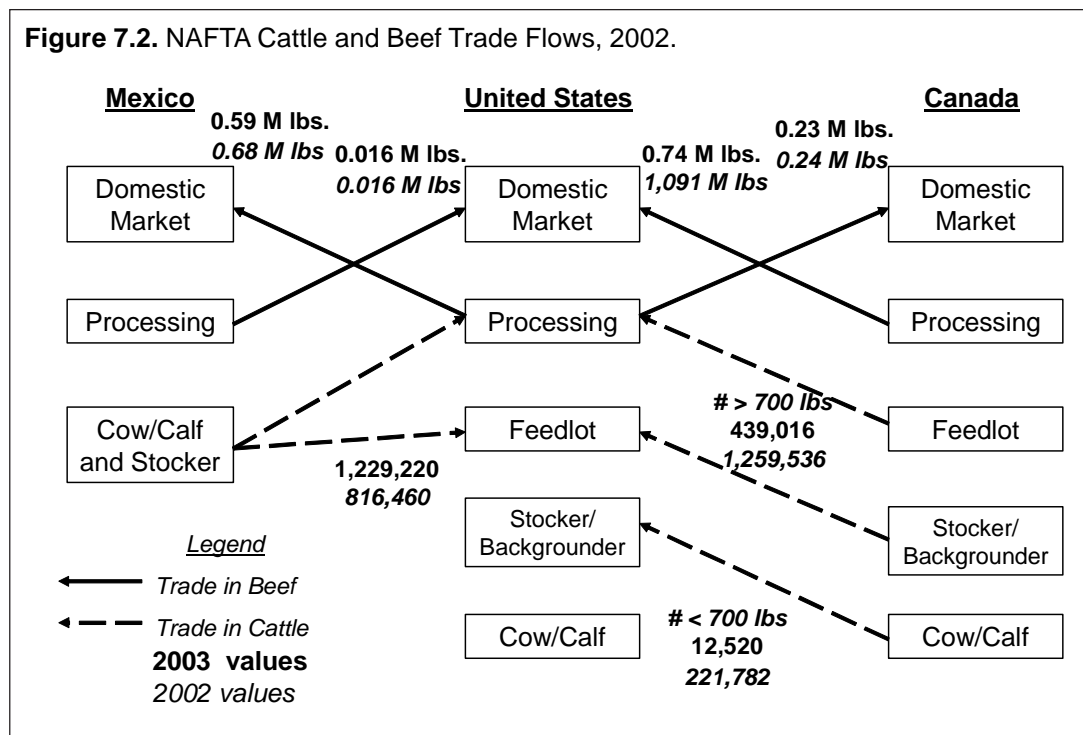
**Source:** Canfax and Gracey, p. 19.

**Table 7.2:** US Beef Exports to NAFTA and non-NAFTA Markets, 2002.

US Beef Exports 2002			
	Volume Million lbs.	Value Million US\$	Percentage
Japan	771	854	32.7%
Mexico	629	615	23.6%
South Korea	597	619	23.7%
Canada	241	286	11.0%
Other	212	236	9.0%
Total	2,450	2,610	100.0%

**Source:** USDAb.

but the major movement is from backgrounders to US feedlots or from feedlots to US processing facilities. This trade has advanced to the point that US feedlots, particularly in the northwestern states, are dependent on Canadian cattle for their normal operations. Mexican live cattle also figure prominently into the US production system providing almost all of the remaining cattle imports, mainly into feedlots. Figure 7.2 shows the dominant flows of live cattle (dotted lines) and beef (solid lines) among the NAFTA countries in 2002.

**Figure 7.2.** NAFTA Cattle and Beef Trade Flows, 2002.

## **Integration of Beef Meat Markets**

Trade in beef and veal products within NAFTA is less significant than the movement of cattle. In 2002, Canada provided 1.091 million lbs. (34 percent) of US imports and purchased 0.24 million lbs. in return. Exports of beef from Mexico to either country are insignificant. Although the US is a net importer of beef within NAFTA, it has taken on an export role as a source of products that are targeted for the higher end of local consumption. Higher incomes and changing tastes have led many upper end consumers in Mexico to purchase US grain fed beef, rather than the leaner grass fed local meat. Much of Canada's imports were in the form of high quality boxed beef. Canada is the leading importer of value added US beef products in the prepared/preserved category (Leuck).

Although the integration of the beef industries has increased dramatically since CUSTA and NAFTA, the degree of integration varies radically by country. For example, Canada's 1.45 million cattle exported to the US annually comprise almost 25 percent of Canadian cattle inventories but amount to less than 5 percent of US numbers. Mexico's cattle exports to the US amount to only 3 percent of Mexican cattle inventories.

## **BSE FREE STATUS: WHAT IS IT, HOW IS IT LOST, AND WHAT ARE THE TRADE EFFECTS OF LOSING IT?**

The confirmation of BSE cases in Canada and the US resulted in both countries effectively losing their BSE free status.<sup>2</sup> The trade impacts of these cases are determined by decisions made by trading partners on what, if any, import restrictions to impose in response to the cases. The process of determining BSE status and import restrictions is a complicated one that goes to the heart of risk management decision-making in integrated markets.

## **International Guidance on BSE Status and Related Import Restrictions**

As a transmissible animal disease, international standards and guidance regarding the management of BSE and the sanitary safety of world trade are developed by the World Organization for Animal Health (known by its original acronym OIE, Office International des Epizooties). OIE is an intergovernmental organization created by international agreement; it had 166 member countries as of March 2004. OIE standards are recognized as reference international sanitary rules by

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<sup>2</sup> Canada had a previous case of BSE confirmed in 1993 in a cow that had been imported from Britain in 1987. Prior to the 2003 case, Canada's trading partners treated it as BSE-free.

the WTO. This means that a country whose standards conform to those of the OIE cannot be challenged in a trade dispute based on the legitimacy of its standards. OIE classifies BSE as a List B disease, one that is considered to be of socioeconomic and/or public health importance within countries and that is significant in the international trade of animals and animal products.

Currently OIE has five levels of BSE status outlined in its Terrestrial Animal Health Code (OIEa) and discussions are under way to simplify the categorization (OIEe). First, and of key importance, the Code lays out criteria for determining BSE status that depend on a country or zone's risk assessment and management activities. The criteria present the key risk management actions pertaining to BSE. Specifically, the Code says:

The bovine spongiform encephalopathy (BSE) status of the cattle population of a country or zone can only be determined on the basis of the following criteria:

- 1) The outcome of a risk assessment identifying all potential factors for BSE occurrence and their historic perspective, in particular:
  - a) The potential for introduction and recycling of the BSE agent through consumption by cattle of *meat-and-bone meal* or *greaves* of ruminant origin;
  - b) Importation of *meat-and-bone meal* or *greaves* potentially contaminated with a transmissible spongiform encephalopathy (TSE) or feedstuffs containing either;
  - c) Importation of animals or embryos/oocytes potentially infected with a TSE;
  - d) Epidemiological situation concerning all animal TSE in the country or zone;
  - e) Extent of knowledge of the population structure of cattle, sheep, and goats in the country or zone;
  - f) The origin of use of ruminant carcasses (including fallen stock), by-products and slaughterhouse waste, the parameters of the rendering processes, and the methods of animal feed manufacture;
- 2) On-going awareness programme for veterinarians, farmers, and workers involved in transportation, marketing, and slaughter of cattle to encourage reporting of all cases of neurological disease in adult cattle;
- 3) Compulsory notification and investigation of all cattle showing clinical signs compatible with BSE;
- 4) A BSE surveillance and monitoring system with emphasis on risks identified in point 1) above, taking into account the guidelines in

Appendix 3.8.4.; records of the number and results of investigations should be maintained for at least 7 years; and

- 5) Examination in an approved laboratory of brain or other tissues collected within the framework of the aforementioned surveillance system.

These criteria set a consistent worldwide hurdle for a country wishing to present evidence regarding its status.

The levels of BSE status for a country or zone are: BSE free, BSE provisionally free, minimal BSE risk, moderate BSE risk, and high BSE risk (OIEa). The criteria for BSE free include that the criteria listed above are met, and there has been no case, all cases have been demonstrated to originate directly from importation of live cattle (with proper actions taken in response), or the last indigenous case was reported more than 7 years ago. In addition, specified risk management programs must have been in place for at least 7 years. BSE provisionally free is similar to BSE free but is applied where appropriate risk management programs have been in place less than 7 years. The further three criteria hinge on the length of time since the last indigenous case and the incidence of BSE within the cattle herd in the country or zone.

For BSE, the OIE does not itself assign countries to the five levels. Instead, importing countries use the levels to judge other countries. In January 2004, however, the OIE noted that it “has been recently requested to examine country submissions, made on a voluntary basis, for determining whether they meet the conditions to be officially classified by an OIE decision as “BSE free” or “BSE provisionally free.” For the moment, the OIE does not give an opinion on the further 3 categories existing in the code. So far, no country has been given such recognition by the OIE.” (OIEf)

In the Code, the BSE levels are then linked to OIE judgments as to the degree of trade restrictions that may be imposed by a country that would be consistent with protecting animal and public health (OIEa), while meeting WTO requirements that regulations not be more trade restrictive than necessary and that measures applied to imports must be the same as those applied domestically. Under the Code, there are several classes of commodities, including milk and milk products, protein-free tallow, and hides and skins, which should be authorized for importation regardless of the BSE status of the exporting country or zone. The provisions for cattle, and fresh beef (bone-in and deboned) and meat products from cattle, are very detailed. The essential point, however, is that the provisions do not in any case suggest flat prohibition of imports. Instead, for example, “fresh meat may be imported safely from a country of any BSE status but with increasing restrictions so

that, for countries presenting a high BSE risk, more severe measures are applied to the cattle and to the meat itself. The experts consider that, if these measures are followed, the meat is safe.” (OIEf)

### **How Countries Actually Apply (or More Accurately Don’t Apply) the OIE Guidance**

Importing countries make the judgment on an exporting country or zone’s BSE status. In practice, this designation is relatively straightforward, although much controversy may exist regarding the adequacy of surveillance and monitoring programs to detect BSE. But it is clear, for example, that when a case is confirmed, a country loses its BSE free or BSE provisionally free status and likely enters the minimal BSE risk level unless additional information indicates a higher incidence of BSE in its cattle herd.

The huge trade impacts from confirming a BSE case come not from the loss of BSE free status per se, but from the import restrictions that have been routinely imposed upon the loss of such status. These restrictions are total bans on cattle and beef imports, rather than the graduated restrictions recommended by OIE. The OIE is, in fact, at pains to point out that, except for short suspensions of trade during investigation following the confirmation of a case, “It is apparent that some Member Countries are applying trade bans when an exporting country reports the presence of BSE, without consulting the recommendations in the Code or conducting a risk analysis in accordance with its OIE and WTO obligations.” (OIEf) The OIE points out that this not only results in trade disruptions that are unnecessary to protect human and animal health, but also presents a perverse incentive by penalizing countries that implement well-structured and transparent surveillance systems. As a side effect, since the ban is not based on a risk analysis in the first place, it will be unclear what steps would be necessary to allow resumption of imports.

### **The Current Benefit-Cost Calculus for BSE Risk Management Decisions**

In 2003, it was the turn of Canada and the US to experience the imposition of border closings by their trading partners, including each other and Mexico. In trade in cattle and beef products, the old recommendation to do unto others as you would have them do unto you, which is the underlying premise of international standards such as those of the OIE, seems to have completely broken down. Many countries have experienced very major disruptions in their industries from a single

case or a small number of cases when indications are that, given current regulatory programs such as feed regulations, the likelihood of more than a very small incidence of BSE is very low and the predicted human health hazard, again with regulatory controls in place, is judged to be negligible. These countries, including Canada and the US, are usually not in a strong position to argue that the importing countries are overreacting because they imposed the same restrictions against other countries upon the appearance of BSE.

Countries' choice of import bans suggests that they are either taking into account a much broader range of potential benefits and costs of restrictions than the OIE approach considers, have misguided views of the benefits and costs of restrictions, are piggy-backing protectionist policies on animal and public health regulations, or some combination of these factors. The imposition of bans when a case is confirmed raises the stakes for losing BSE free status, and makes them particularly high for a country with a significant export sector. If keeping a no or low risk status is important, then it will also likely be a disincentive for countries to integrate their management programs for the risk because they fear a resultant loss of control over the outcomes and the costs of achieving them.

## **THE IMPACT OF BSE CASES IN THE NAFTA INTEGRATED MARKET**

### **Factors that Influence the Impact of Risk Events**

There is no doubt that integration of the NAFTA beef industries has allowed countries to take advantage of their inherent capabilities and competencies resulting in both producer and consumer benefits. However, integration implies interdependence, and interdependence affects risk, as well as efficiency. In highly integrated systems, problems in one country can have significant impacts on both the production systems and markets of the others. In the case of food safety, plant health, and animal health risks, the nature and severity of a challenge depends on the following factors.

1. The nature of the event.
2. The country where the event occurs and the degree of integration of that country's production system and markets with those of the other nations.

We examine both of these in the context of BSE in the NAFTA beef industries.

## The Nature of the Event

The risk and impact of food safety, plant health, or animal health events are highly dependent on the nature of the underlying hazard and the distribution of products involved. The movement of animals between countries can increase risk in two ways, by increasing the probability of an event occurring, and by increasing the scale of the event through wider distribution. We may classify challenges to food systems into two broad categories, private events where impacts are primarily limited to an individual supply chain (e.g., a set of companies that are related in production, processing, and distribution) and its customers, and public events, where the impacts extend beyond a single supply chain and can affect an entire national industry.

***Private Events Limited to Single Food Supply Chains*** The impact of hazards like *E. coli* or *Salmonella*, although dangerous to the public, may be limited to the food chains directly handling and distributing the affected products (e.g., a hamburger grinding facility and the fast food company that buys from it). If those chains involve NAFTA partners, then there may be trade impacts, but those will still be primarily limited to firms in the distribution chain.

Immediate government responses to private events tend to be in the nature of censure (prosecution), recalls, fines, and increased monitoring of the firm(s) responsible for allowing the hazard into the chain. The policy response is frequently the introduction or further enforcement of regulations governing food safety, including those that affect the incentives for firms to adopt food safety systems, such as Hazard Analysis Critical Control Points (HACCP), to improve food safety in their products. Consumer response to such outbreaks tends to be focused on the products and firms involved, through reduced consumption and legal action in the form of individual or class action lawsuits. If the event is particularly serious there may be spillover effects on demand in other chains but these tend to be relatively short-lived.

***Public Events That Impact Regional/National Industries*** Due to government import decisions, the impacts of events such as BSE or Foot and Mouth Disease extend far beyond the chain where they are discovered. Although the public health risk may actually be smaller than with other hazards, government reactions have been immediate and industry-wide. Borders in foreign markets close immediately. In such public events it is common for government and industry to work together to control the hazard and reopen export markets. Government response includes identifying the extent of the event, informing trading partners of the nature of the problem, and assisting industry in controlling the hazard and dealing with the economic impacts of the

event. Policy reactions include further risk assessment, supporting or requiring changes in the production/processing system, improving detection/identification systems, supporting research aimed at reducing the risk, and assisting the industry in recovering from the negative financial and reputational effects. Policy decisions for trading partners concern conditions that result in closing the border, what products will be affected, and when to reopen the border to all or selected products. They also deal with ensuring that negative impacts of the event on their own industry and markets are mitigated.

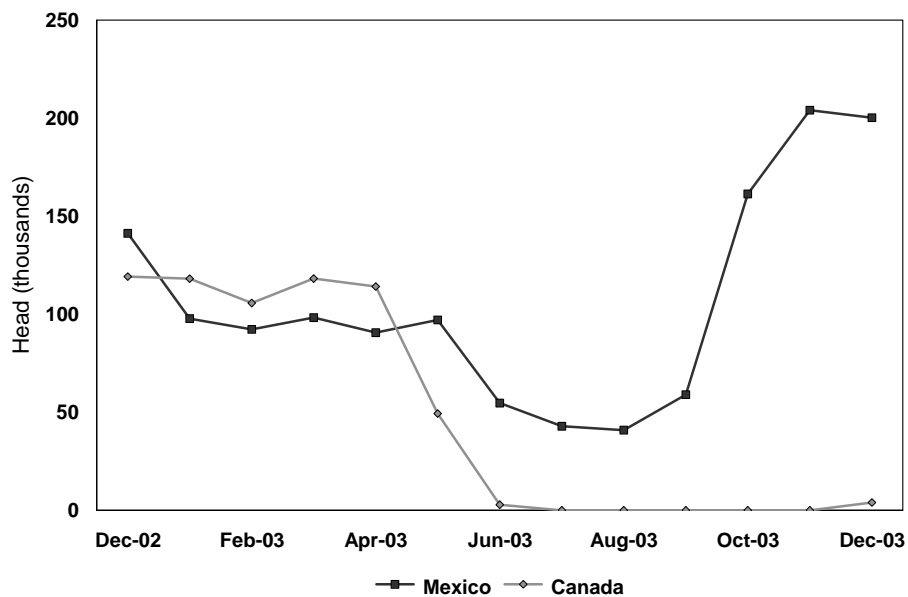
For both private and public food safety events, consumer perceptions are key determinants of the ultimate impact. In the case of the BSE events in Canada and the US in 2003, domestic consumer confidence in the safety of beef held firm and demand for beef remained strong. This was due, in part, to the relatively isolated nature of the occurrences.

### **Trade Patterns of the Country Where the Event Occurs**

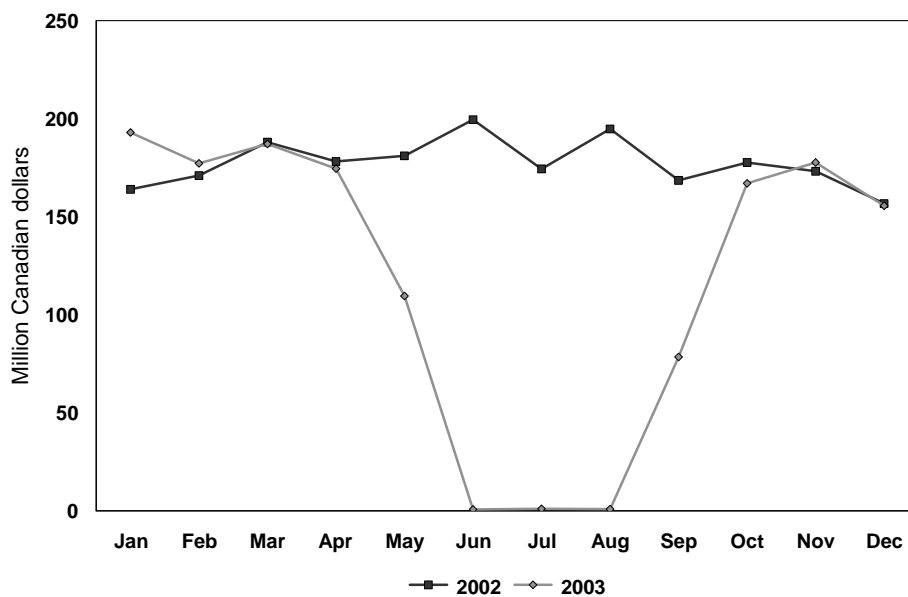
Although the trade effects of a BSE event are immediate and substantial for the country involved, the ultimate economic impact is highly dependent on its trade dependency, its cattle and beef trade patterns, and, most importantly, the export intensity of the national beef industry. This difference in economic impacts is dramatically illustrated in the case of the discoveries of BSE in Canada and the US. The Canadian beef industry is highly focused on exports, particularly to the US.

Canada's single BSE event, discovered on 20 May 2003, and the border closings that followed, including with the US and Mexico, effectively curtailed exports of live cattle to the US starting in June 2003 as shown in Figure 7.3. As well as the decline in Canadian shipments to the US, there also appeared to be an initial negative spillover effect on cattle trade with Mexico (Figure 7.3). It appears as though US buyers simply cut imports until they had time to fully assess the risks associated with any imported cattle. The effect for Mexico was relatively short-lived since the US beef production system is highly dependent on imports of cattle. By autumn 2003, Mexican cattle had replaced most of the Canadian cattle exports to the US.

Canadian beef exports to the US also completely collapsed after the BSE case confirmation in May 2003 (Figure 7.4). The Canadian domestic consumer market was too small to absorb the 47 percent of Canadian beef produced for export and prices plummeted at the farm gate. Retail prices decreased, but not to the same extent (Figure 7.5). Imports into Canada rose marginally in June before falling as domestic prices plummeted, knocking out foreign competition (Figure 7.6). For the remainder of 2003 imports into Canada remained at 50 percent of their

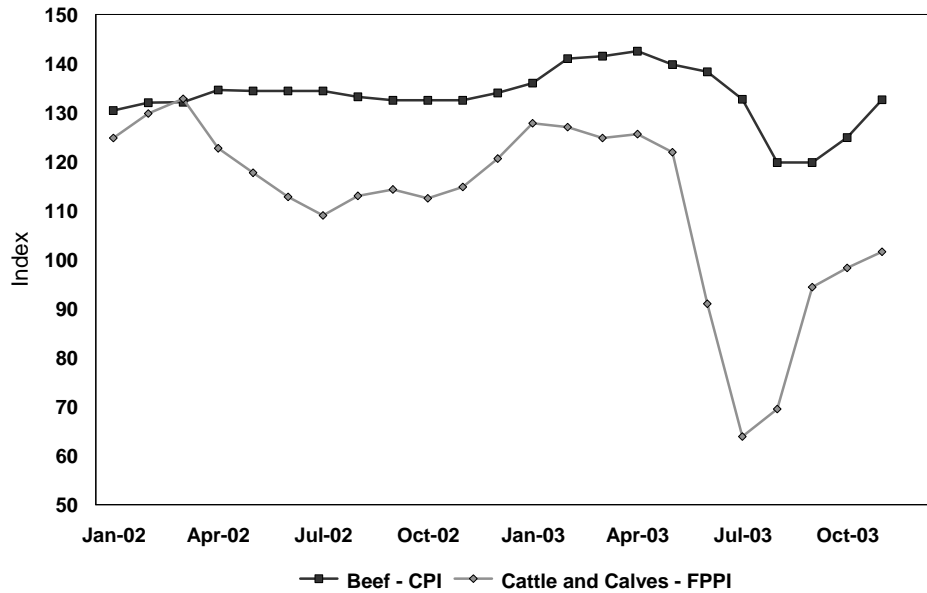
**Figure 7.3:** Live cattle imports into the US from Canada and Mexico, 2003.

Source: USDAe.

**Figure 7.4:** Canadian beef exports, 2002-2003.

Source: Boame et al.

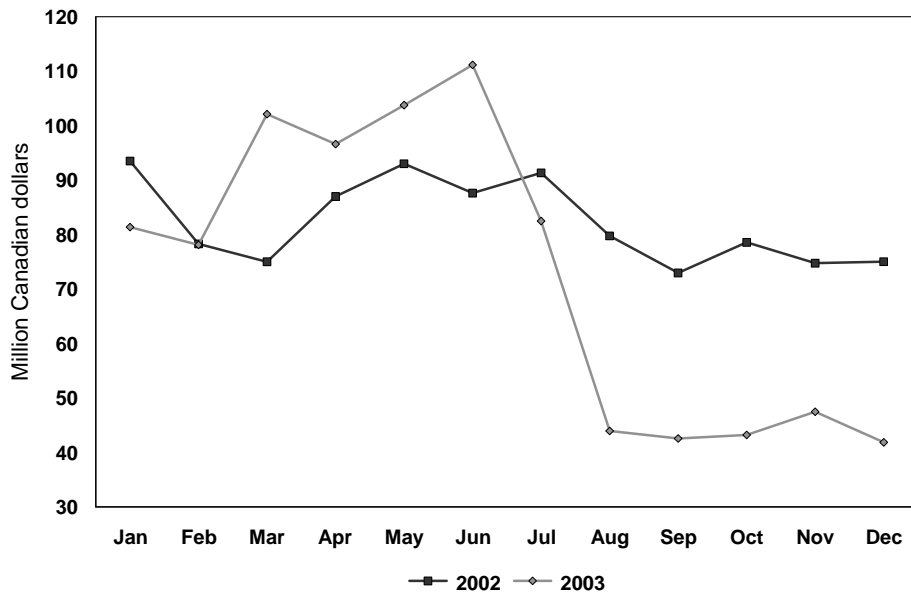
**Figure 7.5:** Canadian farm price index of cattle compared to retail price, 2002-2003.



**Note:** Beef CPI numbers are estimates.

**Source:** Agriculture Division, Statistics Canada

**Figure 7.6:** Canadian beef imports, 2002-2003.



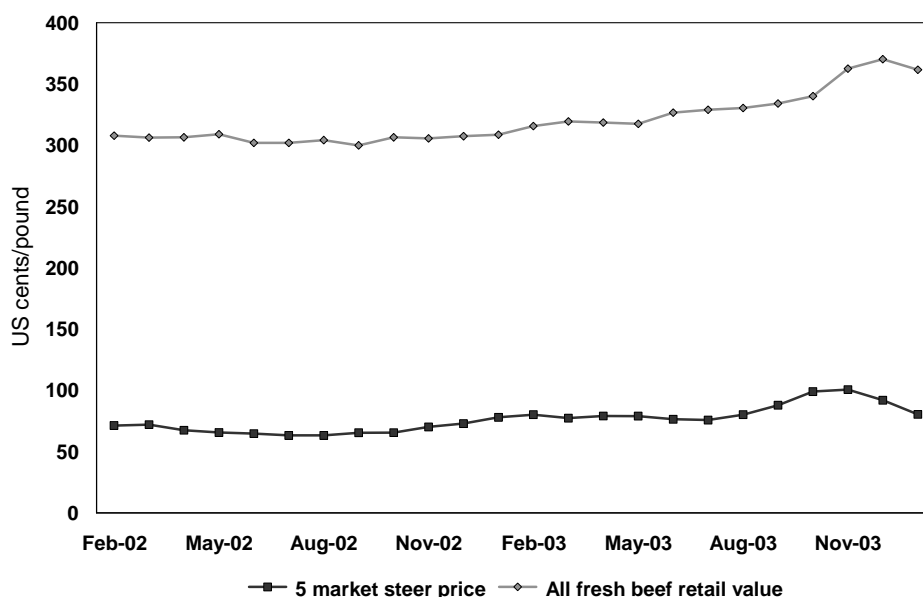
**Source:** International Trade Division, Statistics Canada.

usual level. As discussed further below, Canadian beef exports began to recover in September 2003 when the US partially reopened its border by beginning to issue permits for the importation of boneless beef from cattle under 30 months of age as well as boneless sheep or goat meat from animals under 12 months of age, boneless veal from calves 36 weeks of age or younger at slaughter, and fresh or frozen bovine liver (Acord, Feldman, and Binkley). By mid-November the weekly sales volume had fully recovered (Binkley 2003b), although exports of cattle have yet to resume. On April 23, 2004 Canada reciprocated, allowing the importation of US beef produced from cattle less than 30 months of age.

In the US, prices for both beef and cattle rose throughout 2003 as the industry struggled to cope with increasing demand and a reduced supply from traditional suppliers in Canada (Figure 7.7). As a net importer, the US was able to redirect its traditional exports into serving the domestic market. The fact that the US event occurred in December 2003, when the Canadian border was not fully reopened, meant that the market remained under-supplied compared to traditional levels putting upward pressure on prices for live cattle and retail beef.

The disruptions created by the Canadian event were compounded when BSE was confirmed in the US on 23 December 2003, effectively closing export markets for cattle and beef products. The cessation of beef exports

**Figure 7.7:** US cattle and beef prices, 2002-2003.



Source: Hahn.

from the US to Mexico provided an opportunity for Mexican producers to capture more of the higher end market. In 2004, imports to Mexico are forecast to fall to 20 percent of previously forecast levels. It is anticipated that Mexican cattle producers will hold back 80 percent of the approximately 1.25 million cattle previously forecasted to be exported to the US in the absence of BSE (Trejo).

By the beginning of 2004, cattle stocks in Mexico and the US had dropped 4.8 percent and 1.2 percent, respectively, to historically low levels. US beginning beef inventories were down 24.2 percent from a year earlier. Tight supplies in both the US and Mexico had dramatic impacts on the prices of both cattle and beef. In March 2004, US retail beef prices were at record levels, up 11.6 percent from a year earlier (Hahn). Although Mexican prices are more difficult to obtain, Trejo estimates that retail prices have increased 15 percent since the ban on imports from the US.

### **Initial Steps toward Reopening Borders and Refining BSE Status**

Regaining BSE free status is an ultimate objective for both Canada and the US but this will likely take several years according to OIE guidelines. In the meantime, the countries are eager to resume their previous levels of exports under some sort of low risk status based on demonstrating that adequate risk assessment and management measures are in place to assure that exports pose very low risks to animal or public health. This demonstration is also important to assure domestic consumers. A factor in favor of Canada and the US being able to show minimal risk, barring confirmation of many additional cases, is that investigations concluded that the two cows that were confirmed with BSE both were born in Canada in 1997 before current bans on feeding ruminant protein to cattle were in place.

There are essentially two routes to accomplish border reopenings. The first is to demonstrate compliance with the OIE Code and encourage other countries to conform to the Code. This would involve demonstrating that the country meets the criteria to be classified as minimal BSE risk and encouraging importing countries to follow the trade restriction guidelines, which are not very restrictive, for a country with minimal BSE risk. This would also involve countries practicing what they preach, that is applying the same standards to others who want to import into their countries. The approach would be to say, "Look, we all fell off the bandwagon in terms of ignoring OIE standards and imposing overly strict trade sanctions in the case of BSE. Let's all climb back on the bandwagon."

The second option is to negotiate border reopenings on an ad hoc basis. This is the route being taken at least in the short term, as governments are reluctant to lift trade restrictions pending demonstration of compliance with OIE and their own criteria. For example, the US is very anxious to resume exports to lucrative markets in Japan and South Korea. After its own BSE outbreak, Japan instituted requirements that every cow be tested for BSE at slaughter and is to date indicating that it will reopen its border to US beef when the same requirement is instituted for exports to Japan. The US argues that this level of testing is not warranted by the likelihood of risk, particularly for young animals used for beef products. It is unclear how this type of standoff can be resolved but discussions continue (USDA).

In the meantime, the NAFTA countries have taken steps to reopen borders on an ad hoc basis. Because of the integrated cattle and beef markets, an important consideration in such reopenings is their effect on trade with non-NAFTA countries. The reopenings themselves constitute an integration of risk management systems. In any case, Canada needs full trade with the US to relieve the over-supply in the Canadian market. The resumption of a normal flow of exports from Canada into the US and from the US into Mexico should relieve the price pressure caused by the shortages in the US and Mexican markets.

In August and September 2003, the US took the first step toward reopening the border with Canada by awarding a special low risk BSE classification to Canada. Since then, the US began allowing importation of boneless Canadian beef products and other products from cattle less than 30 months of age based on a permit system. Mexico took similar action toward Canada (Binkley 2003a). These actions are consistent with OIE guidelines for a country with minimal risk. This has resulted in only moderate price relief. The USDA estimates that reopening the border to Canadian feeder cattle would result in a return to more normal pricing levels, a shift of roughly US\$631 million from producer surplus to consumer surplus, and a net gain of US\$12.6 million (USDAa). Reopening the border to all beef imports would result in a shift of US\$1.3 to US\$1.5 billion and a net gain of US\$91 to US\$101 million depending on pricing assumptions.

Mexico partially lifted its ban on US beef imports in March 2004 after closing its border immediately after the confirmation of the US BSE case in December 2003 (Lewis). The Mexican trade was resumed with strict controls, for example requiring the use of certain border posts and Mexican importers. On 23 April 2004 Canada reopened its border to US beef under the same rules used by the US to reopen its border to Canada.

A wild card in the current NAFTA situation would be the impact on trade if Mexico were to confirm a BSE case. Insufficient time has probably elapsed for its NAFTA trading partners to have learned from their own BSE experiences. It is likely that immediate border closings would ensue and the under-supply situation in the US market would be exacerbated.

## **LIVING WITH BSE POSITIVE STATUS: REGULATORY RESPONSES**

### **What Role Should Governments Play in Food Markets?**

Risk management programs for BSE are complex because actions to manage the animal and public health risks associated with BSE must be implemented in feed production, cattle ranching, feedlots, slaughter, processing, and rendering. Managing BSE risk also involves additional risks, including financial risk to supply chain participants, loss of competitiveness in domestic and international markets, and loss of consumer confidence. Governments balance different objectives when dealing with any food industry. The roles that they play during the normal operation of an industry may differ from those they play when a shock like BSE hits. Both roles are complicated when the industry is heavily integrated across national borders.

Government objectives toward an industry like the beef industry include:

1. Protecting the public health. Actions include enacting regulations and standards related to the safety of the products (e.g., regulations on production, distribution, trade, and labeling), enforcing regulations and standards, and censuring or prosecuting firms that do not meet standards.
2. Helping to ensure the viability of the industry. Actions include protecting all members of the industry from the actions of a few under-performers by ensuring the safety of all products produced in the industry, establishing financial risk management strategies, particularly for cyclical industries, and facilitating and promoting trade (e.g., enforcement of existing trade rules, coordinating or harmonizing of regulatory standards, aiding local industries to connect to trading opportunities).
3. Responding in the case of a major challenge or shock, which will include aspects of both 1 and 2 above. Actions include changes in product flow (e.g., border closings or restrictions, herd disposal, quarantines), addressing the initial impact on the industry involved and developing mitigation strategies where possible, assisting industry members to survive the period of disruption, and taking actions to reopen borders.

Governments increasingly claim that their regulatory decisions are based on “sound science,” generally meaning based on risk assessment, and it is the case that regulations increasingly do have a basis in risk assessment. However, ultimate risk management decisions by governments rest on a complex processing of plant, animal or human health risks; financial risks to industries; and market risks. Sandman and Lanard capture this reality in their characterization of US BSE policy prior to a case being found in December 2003, “The US government was protecting public health from vCJD as much as it wanted – not as much as possible, but as much as it thought appropriate. And its judgment about how much protection was appropriate was influenced, sensibly enough, by the fact that so far the US hadn’t found any mad cows at all.”

### **Revamping Regulations in Crisis Mode**

Countries around the world responded to the BSE epidemic in the UK, and the related public health risk, by putting in place numerous regulations to control the establishment and spread of BSE in their cattle herds. A central element in these regulations was restrictions on the feeding of ruminant proteins to ruminants. Another central element was setting up surveillance systems to detect the presence of BSE. Canada and the US instituted feed restrictions in 1997, with Canada’s restrictions being broader than those imposed in the US. The 2003 cases in North America exposed major weaknesses in animal tracing systems, as tracking the affected cows to their source, tracing offspring and cohorts, and tracking feed sources proved time consuming, laborious, and in the end not definitive.

In both countries, the immediate reaction to having a BSE case was the institution of new anti-BSE measures. These new regulations were particularly sweeping in the US, leading critics to argue that the prior regulations were clearly inadequate and giving the impression that the public health had not been adequately protected. Ironically, as Sandman and Lanard, among others, point out, in the US case the government did a better job of protecting the public health than it did of protecting beef sales. In other words, there is little argument that the policies in place reduced public health risk from BSE to a minimal level, but they did not go as far as possible to reduce the risk of finding a BSE case and triggering border closings. However, again ironically, the major opposition to stricter controls before the US case was confirmed came from the industry itself, which feared higher costs associated with new controls. The US industry remains extremely concerned about the costs of new risk management requirements (Acord and Feldman).

Regulatory decision-making always involves tensions between the level of public health protection to be achieved and other goals that may be being pursued such as minimizing the cost impact of regulations or risk of loss of markets in case of an adverse event. Part of the explanation for market disruptions as the result of adverse events, such as the confirming of a BSE case, can be found in inadequate risk management decision-making at the national level. A further issue that must be dealt with at the national level is the degree to which companies are allowed to pursue quality assurance programs beyond those instituted by the government and, if so, under what rules. For example, a meat processing company in the US wants to test every animal for BSE in order to sell its products into the Japanese market. To date, the US Department of Agriculture has refused to allow it to do so (Adamy).

### **Compensating Industry**

One of the issues in an integrated agricultural market is compensation and subsidies in the event of a public event impacting a domestic industry. In the face of curtailed exports, the Canadian government took several actions to stabilize and support the domestic beef industry. On 4 June 2003 the government announced an end to supplementary beef imports where Canadian products could be supplied. On 12 June 2003, the government implemented a work share program to keep processing facilities open and workers employed and on 18 June 2003 announced a support program based on a sliding scale between the Canadian base price and the US weekly average market price (Statistics Canada). The Canadian government has recently devoted C\$995 million to compensating farmers and, to a much lesser extent, processors for their losses related to the trade disruptions caused by the Canadian BSE case.

Although proving that the extent of the loss exceeds the value of the compensation is relatively easy, the issue remains of whether such relief programs provide an unfair advantage to one member of the trading region. If governments invest heavily in systems designed to prevent or control BSE, can that investment also be seen as a subsidy that provides an unfair trade advantage, potentially allowing an industry to underinvest in safety related areas? In this particular instance, the differences in impact among the three NAFTA countries are obvious but the ultimate result of compensation is less clear. To date, BSE farm disaster relief has not become a subsidy issue at the WTO or within NAFTA. However, the potential for challenges exists. Due to curtailed trade with Canada and domestic conditions, compensation was not an issue in the US where the industry is experiencing tight supplies and high prices.

### **The Benefit-Cost Calculus for BSE Differs By Country**

Risk management is a complicated business that has to take into account a broad range of factors that ultimately determine what a country chooses as the correct policy. With BSE, as with most regulatory decisions, there is uncertainty about the severity of the risks involved, the efficacy of steps that can be taken to mitigate them, and the costs of those steps. In other words, there is uncertainty about the benefits and costs of taking action. This uncertainty is particularly a problem with newer risks and what are believed to be low probability risks. In the BSE case, the twist is added that export restrictions have been based unnecessarily on a zero/one criterion of whether a country or zone has confirmed one BSE case.

Countries end up with different regulatory programs that reflect the nuances of their own benefit-cost calculation. An example of a factor that may be forecasted and evaluated differently across countries is consumer response to the presence of BSE. Based on what it thinks is necessary to sustain consumer confidence, Japan is currently testing every cow used for beef products. The US views this requirement as unreasonable given its own benefit/cost calculus. When countries' views differ, there are two avenues to take: negotiate a compromise or initiate a dispute at the WTO. For country groups moving toward integrating their economies, such as NAFTA, and for important trading partners in general, the latter avenue is not recommended. The dilemma, however, is that the former avenue of negotiation and cooperation usually does not go very far. This is the problem of integrated markets without integrated risk management.

Countries cannot coordinate policy closely, let alone seek equivalence or harmonization, unless they agree on which benefits and costs to count and how to weigh them, along with what risk assessment and regulatory mechanisms to use. Making risk management decisions is a core responsibility of governments. There are good reasons for them to want to keep the decision-making process under their own control in order to tailor programs to their own situations. The key in integrated markets is to find a way to make a commitment to integrated risk management that has mutual benefits. The EU may not be the clearest model for NAFTA because it involves the building of a regulatory structure under a centralized government. Food Standards Australia New Zealand may be where to look for a model for NAFTA, because it seeks to integrate standards across the two nations.

## **POLICY IMPLICATIONS OF BSE: INTEGRATED MARKETS – INTEGRATED RISK MANAGEMENT?**

### **Management of BSE Risk**

The NAFTA markets for cattle and beef products were becoming closely integrated prior to the confirmation of BSE cases in Canada and the US in 2003. The confirmation of these cases caused severe disruption and reversed the degree of integration, at least temporarily. The NAFTA governments are on the road to rebuilding the integrated market through ad hoc regulatory and import restriction decisions (e.g., the US granting Canada a special low risk status for some beef imports and vice versa). Is there a way to build a more secure integrated market based on integrated risk management so that day-to-day trade is smoother and crises do not result in major disruptions? What would be the payoffs and drawbacks of doing so?

Governments influence industry actions primarily through regulation, taxation, and funding. They influence industry success through, among other things, trade negotiations and actions. There are several areas related to protecting the public and industry in regard to preventing and controlling BSE that require policy decisions by NAFTA governments.

***Regulations Regarding Feed Content, Feeding Practices, and Traceability*** As noted above, all three governments had put feed regulations in place to deal with the challenge of BSE. Generally speaking, these dealt primarily with the issue of feeding animal protein to ruminants. All three also took the step of discontinuing trade in beef and cattle with countries where BSE was present. The regulations were put in place too late in the Canadian BSE case and the case of the US dairy cow found to have BSE. Both were traced to Canada, with birth before the feed regulations were enacted.

Regulations must be adopted by industry and enforced if they are to be effective. In integrated markets, importers must have confidence that a system of safeguards is in place and effectively protecting them. The BSE cases in Canada and the US highlighted the fact that the level of traceability for animals and beef products in the system is inadequate.

***Systems for Detecting and Controlling BSE*** Currently, testing for BSE is very likely insufficient to detect BSE at an acceptable level of sensitivity. Surveillance systems require testing regimes and technologies, monitoring of those systems, traceability systems, and strategies for responding to outbreaks.

Avoiding BSE outbreaks and minimizing their impact requires a rigorous, complete systems approach to industry quality and tracking. There are several components to a quality/traceability system in the NAFTA beef industries, including slaughter and processing standards. Because the beef production systems and markets are integrated, the quality systems and processes must be as well. A special challenge is assuring the comparability of enforcement activity and industry compliance. Governments have indicated a willingness to invest in new technologies and systems to assist industry in improving its detection and tracking capabilities.

### **BSE Management in the Face of NAFTA Market Integration**

Managing systems that are integrated across several jurisdictions poses real challenges for governments, particularly in addressing the integration or interaction of quality and food safety systems across international borders. Although this integration is rudimentary within NAFTA at this point,<sup>3</sup> the governments are moving toward a greater understanding and awareness of each other's regulatory, industrial, animal health, and food safety environments. For example, in fall 2003, the USDA Animal and Plant Health Inspection Service did a complete review of "Canada's veterinary infrastructure, disease history, practices for preventing widespread introduction, exposure, and/or establishment of BSE, and measures taken following detection of the disease" (USDAA, p. 3). This requires coordination of multiple regulatory programs. Although industry can adapt to different standards in different markets, having to deal with different standards has a cost.

BSE challenged NAFTA governments in terms of managing consumer response to negative events. To date, North American governments have not had to deal with a domestic consumer backlash. In Canada's case, a single cow was identified as having BSE and that animal had already been removed from the food system. When the discovery was made, public confidence in the safety of Canadian beef was tested, but the general perceptions around the safety of the Canadian food system were not significantly altered. In the US, a dairy cow with BSE found in December 2003 did not appear to affect public confidence. Demand for beef in the US actually appeared to strengthen, probably due to dietary trends. However, government actions toward trading partners have the potential to alter public perceptions of risk and coordinating both the actions and communications related to those actions can have an impact on consumer attitudes.

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<sup>3</sup> The NAFTA countries have a standing North American Animal Health Committee that includes the chief veterinary officers of the three countries. The group has developed and is working to implement a North American BSE strategy.

A key area where the integrated NAFTA market complicates the response to BSE is in trade with non-NAFTA countries. For example, if an importing country authorizes beef imports from Canada but not the US, Canada must be able to show that US product is not present in Canadian exports. This is an additional respect in which the integrated market puts a premium on an integrated risk management system. If the NAFTA countries had harmonized systems, approval of one for export would imply approval of all and no need for monitoring of cross shipping between countries.

### **What Would a NAFTA BSE Management Program Look Like?**

To be fully effective, a higher level of market integration requires increasing levels of regulatory integration – moving from looser coordination or equivalence agreements toward harmonization. From a BSE risk management perspective, a preferred system would be harmonized and borderless with the same standards and risk management strategies used throughout the NAFTA beef production and marketing system. There are three overall components to implementing a common NAFTA BSE management program:

1. Establishing regulations or standards.
2. Applying those standards in the operation of the industry.
3. Monitoring the application of the regulations or standards throughout the industry.

While defining the exact scientific and system details is beyond the scope of this chapter, in Table 7.3 we examine the requirements for a harmonized BSE risk management strategy, the status of the NAFTA beef industries in meeting each requirement, and the likelihood of achieving NAFTA consensus and implementation in the near term.

The list in Table 7.3 is quite daunting and does not begin to reflect the complexity of the underlying risk management policies and regulations. The main drawbacks or roadblocks to harmonization are this complexity, the effort needed to harmonize policy, and the potential loss of the ability to tailor programs to domestic circumstances. However, since each country must have a regulatory structure in place to accomplish BSE management, there may be benefits in terms of efficiencies in joint development of a BSE management plan. The major benefit of harmonized policy would be to have an integrated regulatory system that supports market integration and provides increased assurance against market disruption.

**Table 7.3:** Requirements for an integrated NAFTA BSE management program.

<b>Requirement</b>	<b>State of the Industry and Regulations</b>	<b>Likelihood of NAFTA Agreement</b>
Harmonization of feed regulations concerning the use of animal protein in cattle and dairy feed.	Regulations are in place and fairly consistent across NAFTA. However, testing and monitoring regimes vary.	High for standards. Moderate for monitoring and testing.
Standards for production, shipping, and slaughter.	US has moved to a common process-based system for meat products by requiring HACCP for firms shipping processed meat into the US. However, this is only for one range of products and one level of the beef supply chain.	Reasonable for HACCP but much lower at other levels of the chain, in part due to national differences in production systems.
Common requirements for tracking animals through the system. Requires common data standards and formats, and the integration of systems for exchanging information and trace-back in the event of a problem.	Systems are rudimentary in most cases. Resistance to mandatory implementation is high, particularly in the US. Capabilities among small farming operations in all three countries are low.	While traceability systems will continue to be implemented, particularly in Canada, complete NAFTA implementation and integration is unlikely in the near term.
A common testing regime where participants in each country use: <ul style="list-style-type: none"> <li>a. Technologies approved by all parties.</li> <li>b. Common standards for testing frequency.</li> <li>c. Common standards for storage and reporting (format, timing, and distribution of the reports). Terms of storage would also be required.</li> <li>d. Common approaches to exception testing.</li> </ul>	Testing regimes are broadly based on OIE standards but vary in terms of testing frequency. Standards for tracking and reporting are not common across NAFTA. In Canada, tracking is mandated for individual animals. In the US, roughly 30% of animals have individual tracking capabilities. Tracking rate is lower in Mexico.	Agreement on testing regimes and technologies is possible. Coordinating testing programs, tracking capabilities, and data standards is less likely.
Jointly planned response to outbreaks anywhere in the system.	Recent outbreaks have revealed deficiencies in planning. Some are being addressed under BSE and bio-terrorism programs.	Although there are discussions, nations are working on internal plans first.
Agreement on subsidy levels <ul style="list-style-type: none"> <li>a. For investments in traceability and testing systems.</li> <li>b. For industry participants in the event of an outbreak.</li> </ul>	Subsidies for systems are not yet addressed. Canada has compensation program for BSE disruptions.	Agreement unlikely.
A common approach to monitoring the execution of the regulations regarding inputs, processing, testing, and tracing.	Common thought on the principles of HACCP as a process-based support for ensuring safety and monitoring. No consensus on specifics for BSE.	There will likely be an equivalence situation.

## CONCLUSIONS

There are usually two likely culprits when agricultural and food markets are disrupted because of plant health, animal health, or food safety risks: inadequate risk management within a country or lack of harmonized

risk management approaches between countries. Both are present in the case of BSE in NAFTA. First, risk management programs in Canada and the US were inadequate to prevent the confirmation of cases causing both to lose their presumptive BSE free status. An alternative perspective is that the countries failed to structure a risk management program under which the confirmation of a case could be convincingly presented as being within the bounds indicating very low risk. To date, Mexico has avoided the BSE positive fate of Canada and the US.

Second, the NAFTA market has suffered from poor harmonization of policy on several fronts. Part of this suffering has been common across the world and results from the practice of countries in regard to BSE of imposing border closings rather than following the import restriction guidance of OIE, the relevant international standards body. This is a generalized problem and one that the NAFTA countries cannot solve for the world. It requires a return to discipline on the part of all OIE members.

However, the overwhelming bulk of the trade affected by the NAFTA BSE cases was internal to NAFTA. This reflects the importance of the trading partners to each other and the increasing integration of North American agricultural and food markets, as well as the fact that the effect of the closing of non-NAFTA markets was somewhat muted in the US due to a tight supply situation. Regardless of whether the world decides to abide by OIE guidance, the NAFTA countries could have done so, developed more closely coordinated risk management programs around OIE guidance, and thereby avoided a large share of the trade disruption. This would have further strengthened the NAFTA market even in the face of the BSE crisis. There was adequate time to develop such an approach, because the BSE risk, as well as the consequences of a case confirmation, has been known for many years. Rather than having a response in place, the NAFTA countries relied on never finding a BSE case.

This BSE case study suggests several lessons relating to the role of regulation in an integrated market:

- NAFTA countries are pursuing high levels of market integration through the elimination of tariff barriers but have a relatively primitive level of coordination in regard to nontariff barriers, such as regulations dealing with plant health, animal health, and food safety.
- As a result, the economic integration of markets can outrun regulatory integration, leaving industries extremely vulnerable to disruption within NAFTA based on regulatory decision-making, e.g.,

the closing of the US border to Canadian cattle and beef upon confirmation of a BSE case.

- In addition, market integration within NAFTA poses problems for exports to non-NAFTA countries when plant health, animal health, and food safety issues arise, e.g., assuring importers that products are sourced only from those NAFTA countries that meet their standards.
- There are legitimate reasons why countries may be reluctant to harmonize regulatory policy. But they must recognize the downside of not doing so in the context of an economically integrated market.
- NAFTA currently has no mechanism to move toward regulatory integration except on a very fragmented, ad hoc basis. This will prove to be a continuing drag on market integration.
- Serviceable mechanisms exist (e.g., mutual adherence to OIE standards) for closer coordination of regulatory policy. However, the complexity of the required regulatory systems will in many cases seriously limit the success of coordination or equivalence strategies. The NAFTA countries will have to decide to what extent to take the next step toward policy harmonization.
- Harmonization itself depends on further development of risk management policy capabilities in each country.
- Failure to address regulatory integration will leave the market vulnerable to recurring market disruptions.

How far can NAFTA get toward market integration without fuller regulatory integration? The answer may be pretty far when it comes to the management of well understood risks but not so far when it comes to newer and fast changing situations such as BSE. Market integration will require more effort toward regulatory integration or the disruptions caused by new events may eventually reverse the integration trend and its associated economic benefits.

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# Program and Participants



## WORKSHOP PROGRAM

### **Welcome and opening session**

*Chair: Jeffrey Jones – Senado de la República*

### **Session I: Economics and definition of market integration**

*Chair: Walt Armbruster – Farm Foundation*

Base paper: Defining North American Economic Integration

*Raymond Robertson – Macalester College-St. Paul, MN*

Discussant

*Richard Barichello – University of British Columbia*

General discussion

### **Session II: European perspective on market integration**

*Chair: Karl Meilke – University of Guelph*

Base paper: European Perspective on Market Integration: Lessons for NAFTA

*David Harvey – University of New Castle upon Tyne, UK*

Discussant

*Liam McCreery – CAFTA.*

General discussion

**Session III: Extent of Market Integration under NAFTA***Chair: Tulay Yildirim – AAFC*

Base paper: North American Integration in Agriculture: A Survey Paper

*Darcie Doan and Andrew Goldstein – AAFC**Steven Zahniser, Tom Vollrath, and Chris Bolling – USDA*

Discussant

*Ken Shwedel – Rabobank-Mexico*

General discussion

**Session IV: Policy-makers panel: Is market integration a policy goal?***Chair: Jeffrey Jones – Senado de la República*

Panel

*Antonio Ruiz - SAGARPA**Lloyd Day – USDA**Michael Keenan – AAFC*

General discussion

**Session V: Issues evolving from market integration: The people left behind: Transition policy and the structure of agrifood sector***Chair: Praveen Dixit – USDA*

Base paper: Transition Policy and the Structure of the Agriculture of Mexico

*J. Edward Taylor – University of California-Davis**Antonio Yúnez-Naude – El Colegio de México**Fernando Barceinas – Universidad Autónoma Metropolitana-Azcapotzalco**George Dyer – Universidad Nacional Autónoma de México-Morelia*

Base paper: Trade Agreements and Economic Development: Some Observations

*Kristin Penn – Land O' Lakes International Programs*

Discussants

*Celso Humberto Delgado – Confederación Nacional Campesina**Sergio Soto – SEDESOL**Armando Paredes – Consejo Nacional Agropecuario*

General discussion

**Session VI: Issues evolving from market integration:  
Integration risk/crisis management, BSE case study**

*Chair: Brian Paddock – AAFC*

Base paper: Risk Management in the Integrated NAFTA Market:  
Lessons from the Case of BSE

*Julie A. Caswell – University of Massachusetts*

*Dave Sparling – University of Guelph*

Discussants

*Gale Wagner – Texas A&M University*

*Lynn Malmberg – L.A. Malmberg Risk Management, Ltd.*

General discussion

**Session VII: Conference wrap up with an industry panel  
discussion on market integration**

*Chair: Rene F. Ochoa – Texas A&M University*

Panel

*Canada – Matt Taylor – Canadian Animal Health Coalition*

*United States – Terry Wolf – US Grains Council*

*Mexico – César de Anda – Unión Nacional de Avicultores*

*Alvaro Madero – SIGMA Alimentos*

General Discussion



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# NORTH AMERICAN AGRIFOOD MARKET INTEGRATION CONSORTIUM

First Annual North American Agrifood Market Integration Workshop

*North American Agrifood Market Integration: Situation and Perspectives - Executive Summary*  
May 2004, Cancun, Mexico

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*The first in a series of workshops organized by the North American Agrifood Market Integration Consortium designed to foster dialog among policy makers, agrifood industry leaders, and academics on agriculture and food-related market integration issues among NAFTA countries.*

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