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Agricultural Dumping Under NAFTA: Estimating the Costs of U.S. Agricultural Policies to Mexican Producers

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Abstract

With the opening of the Mexican economy under the North American Free Trade Agreement (NAFTA), Mexican agriculture came under new competitive pressures from U.S. exports. It was widely recognized at the beginning of NAFTA that Mexico had geographically-based comparative advantages in supplying off-season fruits and vegetables to a hungry U.S. market. NAFTA's liberalization of agricultural trade produced the expected results, with more staple crops and meats flowing south and more seasonal fruits and vegetables flowing north. In agriculture, tariffs and quotas have now mostly been eliminated. Not so agricultural subsidies, which were left largely undisciplined by NAFTA. High U.S. farm subsidies for exported crops, which compete with Mexican products, have prompted charges that the level playing field NAFTA was supposed to create is in fact tilted heavily in favor of the United States.

This paper assesses the costs of U.S. agricultural policies to Mexican producers by examining the extent to which the United States exported agricultural products to Mexico at prices below their costs of production, one of the definitions of "dumping" in the WTO. We study eight agricultural goods – corn, soybeans, wheat, rice, cotton, beef, pork, and poultry – all of which are heavily supported by the U.S. government, were produced in Mexico in significant volumes before NAFTA, and experienced dramatic increases in U.S. exports to Mexico after the agreement. We look at the years 1997-2005 because the beginning year follows both the implementation of NAFTA and the enactment of the 1996 U.S. Farm Bill, which significantly changed the nature of U.S. farm support. We estimate "dumping margins" and the costs to Mexican producers of prices driven below production costs by U.S. policies. We estimate Mexican losses for the eight products at $12.8 billion over the nine-year period, more than the value of Mexican tomato exports to the United States. Corn farmers experienced the greatest losses: $6.6 billion, an average of $99 per hectare per year.

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Introduction and Summary

With the opening of the Mexican economy under the North American Free Trade Agreement (NAFTA), Mexican agriculture came under new competitive pressures from U.S. exports. It was widely recognized at the beginning of NAFTA that Mexico had geographically-based comparative advantages in supplying off-season fruits and vegetables to a hungry U.S. market. U.S. producers maintained clear advantages over their southern neighbors in many staple crops and meats, with yields much higher than their Mexican counterparts and with large exportable surpluses. This posed clear risks to Mexico's large smallholder population, many of whom relied on crops that competed with U.S. imports proposed for liberalization. NAFTA's liberalization of agricultural trade produced the expected results, with more staple crops and meats flowing south and more seasonal fruits and vegetables flowing north.

NAFTA, which entered into force January 1, 1994, reduced tariffs and quotas on a wide range of products, with some sensitive products allowed longer transition periods to eliminate existing protections. Not all of these transition periods were followed – most notably corn in Mexico's case – and the last of the transition periods came to a close on January 1, 2008. In agriculture, tariffs and quotas have now largely been eliminated. Not so agricultural subsidies. NAFTA did not discipline subsidies, in contrast to World Trade Organization (WTO) negotiations which in agriculture have treated domestic farm subsidies as one of the three "pillars" of trade-distorting agricultural protection, the other two being export subsidies and market access (mainly tariffs).

U.S. farm subsidies since NAFTA have dwarfed Mexico's, and many of those subsidies are for crops the United States exports to Mexico. This has prompted charges that the level playing field NAFTA was supposed to create is in fact tilted heavily in favor of the United States. How can Mexican farmers compete if U.S. farmers are receiving billions of dollars in government support?

This paper assesses the contribution of U.S. agricultural policies to that country's competitive advantages over its southern neighbor. We examine the extent to which the United States exported agricultural products to Mexico at prices below their costs of production, one of the definitions of "dumping" in the WTO. We study eight agricultural

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goods – corn, soybeans, wheat, rice, cotton, beef, pork, and poultry – all of which are heavily supported by the U.S. government, were produced in Mexico in significant volumes before NAFTA, and experienced dramatic increases in U.S. exports to Mexico after the agreement. We look at the years 1997-2005 because the beginning year follows both the implementation of NAFTA and the enactment of the 1996 U.S. Farm Bill, which significantly changed the nature of U.S. farm support. We use 2005 as the end year to avoid confusing the data with the unusual commodity price increases that began in 2006.

We find that:

1. U.S. policies – not just subsidies – have had a significant effect on the competitiveness of U.S. exports, increasing production and lowering prices for crops and agricultural products that compete with Mexican production. For the eight supported commodities analyzed here, U.S. exports increased between 159% and 707% from the early 1990s.
2. The best estimate of the impacts of U.S. policies on exports is the so-called "dumping margin:" the percentage by which export prices are below production costs. From 1997-2005 the U.S. exported many supported crops at dumping-level prices. These ranged from 12% for soybeans to 38% for cotton.
3. Assuming Mexican producer prices were depressed by the same percentage as the dumping margins, below-cost exports cost Mexican producers of corn, soybeans, wheat, cotton and rice an estimated $9.7 billion from 1997-2005, just over $1 billion per year. Corn showed the highest losses. Average dumping margins of 19% contributed to a 413% increase in U.S. exports and a 66% decline in real producer prices in Mexico from the early 1990s to 2005. The estimated cost to Mexican producers of dumping-level corn prices was $6.6 billion over the nine-year period, an average of $99 per hectare per year, $38 per ton.
4. Meats were exported at below-cost prices because U.S. producers benefited from below-cost soybeans and corn, key components in feed, which is generally the largest single operating cost for industrial livestock producers. This so-called implicit subsidy to meat producers resulted in dumping margins of 5-10%. This cost Mexican livestock producers who did not use below-cost imported feed an estimated $3.2 billion between 1997 and 2005. The largest losses were in beef, at $1.6 billion, or $175 million per year.
5. We estimate total costs at $12.8 billion from 1997-2005 for the eight products (in constant 2000 US dollars). To put these losses in context, the average annual loss of $1.4 billion is equivalent to 10% of the value of all Mexican agricultural exports to the United States and greater than the current value of Mexican tomato exports to the United States.

As many pointed out when NAFTA was being negotiated, the large asymmetries in development among the three trading partners would result in a wide range of competitive problems for Mexico. To paraphrase Nobel Prize economist Amartya Sen, equal rules for unequal players are unequal rules.

North America needs more equal partners for NAFTA to meaningfully level the playing field. It will take time and large public investments in yield-enhancing improvements, the kind (e.g. irrigation) originally called for when NAFTA was negotiated. Until then, Mexico needs the right to continue protecting and supporting farmers in key food-producing sectors. Unfortunately, NAFTA has eliminated Mexico's most effective policy instruments for addressing dumping-level prices. Short of renegotiating NAFTA, only greater cooperation from the United States in limiting exports of the most sensitive products – white corn, beans, and nonfat dry milk, among others – will help protect Mexico's small-scale farmers.

Rising Imports, Subsidized Products

NAFTA contributed to large increases in U.S. exports to Mexico.[1] Using averages for 1990-1992 as a base, the total value of U.S. agricultural exports to Mexico increased 280% by 2006-8 to $13.2 billion. Table 1 summarizes the changes in U.S. exports for the most important products. The average value of production for 2006-8 is presented to show the relative importance of the different products. Corn and soybean products were the largest in value, followed by beef, wheat, poultry and cotton. The unusual rise in commodity prices in the latter period makes it less useful to use the value of production to gauge the rise in exports, so we present the change in the volume of exports from 1990-2 to 2006-8. Exports of animal products increased dramatically, with pork exports jumping 707%. Overall, grain and feed exports to Mexico increased 158%, with corn exports rising 413%, wheat exports up 599%, and rice exports up 524%. Soybean products jumped 205%. Cotton exports increased 531%.

The last two columns in Table 1 provide estimates of U.S. farm support. The OECD's Producer Support Estimate includes estimates for all forms of government support to producers. It is calculated as a percentage of the total value of farm production. Because U.S. farm support declines significantly when farm prices are high, we use an average PSE for the period 2002-4, a period more typical of U.S. support levels in the years prior to the recent commodity price increases.[2] We provide estimates for specific products where they are available. As the estimates suggest, many of the most important U.S. exports to Mexico are products considered heavily supported by U.S. farm policies. For example, the OECD estimated U.S. support for corn at 20% of the value of U.S. corn production. Support for wheat, sorghum, rice, sugar, and nonfat dry milk were even higher. In the last column we include the 2002-4 average for government payments to producers under the main commodity programs. For the five row crops we analyze here, payments ranged from $1.1 billion to $2.5 billion per year.

The table shows that the United States has dramatically increased its agricultural exports to Mexico and that many of those products receive high levels of government support. Even some of the products showing relatively low levels of support by OECD standards, notably meats, actually benefit significantly from U.S. agricultural policies because they reduce the prices for key inputs, such as corn and soybeans in feed. Similarly, high fructose corn syrup benefits from an "implicit subsidy" through its

reliance on subsidized corn. And malt, the exports of which have increased over 600% to feed Mexico's growing beer production, benefits from subsidies to barley.

Table 1--Selected U.S. agricultural exports to Mexico, 1990-92 vs. 2006-08

	Value	Export Volume			U.S. farm support	
	2006-08 average	1990-1992 average	2006-2008 average	Increase	2002-2004 average	
	millions US$	*Metric tons (thousands)*		*Percent*	*PSE%*	*Commodity Payments millions*
Total	13,200	--	--	280%	17%	
Animals and animal products	3,749	--	--	--	--	
Beef & veal	773	54	204	278%	4%	
Pork	402	27	218	707%	4%	
Poultry	443	85	396	363%	4%	
Nonfat dry milk	285	18	93	418%	40%	
Other *(includes beef & pork variety meats)*	1196	--	--	--	--	
Grains and feeds	3,989	6,974	18,010	158%	--	
All corn	1,939	2,014	10,330	413%	20%	2,293
Corn, excluding cracked	1,618	1,982	8,385	323%	--	
Cracked corn	321	32	1,945	6062%	--	
Wheat, unmilled	693	360	2,515	599%	30%	1,160
Sorghum	329	3727	1,988	-47%	38%	176
Rice	266	129	806	524%	33%	1,165
Brewing or distilling dregs and waste	140	8	755	9335%	--	
Malt, not roasted	103	41	302	643%	--	
Other	518	695	1,315	89%	--	
Oilseeds and products	2,292	2,055	6,288	206%	--	
Soybeans and soybean products	1,903	1,780	5,426	205%	--	
Soybeans only	1,284	1410	3,653	159%	18%	1,650
Other	389	275	863	214%	--	
Dry common beans	66	71	98	38%		
Sugar and tropical products	584	--	--	--	--	
Fructose syrup, containing more than 50 percent by weight of fructose, NESOI	112	17	349	2013%	--	
Sugar, cane or beet	87	184	174	-5%	57%	
Other	384	--	--	--	--	
Cotton, excluding linters	408	49	312	531%	--	2,523
Other	2,179	--	--	--	--	

Sources: USDA/FAS (2009), OECD (2004)

Because beans are a sensitive product for Mexican producers, we include export data in the table. Overall, bean exports from the United States have risen modestly, 38% since the early 1990s. By 2006-8, they accounted for 8% of Mexican consumption, up slightly from 5% in the early 1990s. Bean production is not directly supported by the principal U.S. agricultural policies.

For this project, we focus on eight of the most important exported products: corn, wheat, rice, soybeans, cotton, beef, pork, and poultry. Together they represent 52% of the value of U.S. agricultural exports to Mexico. All are highly supported products that compete with those of Mexican producers. Our goal is to estimate the impacts of U.S.

farm policies on Mexican producers, primarily by estimating the costs to Mexican producers of U.S. prices, which are driven below the cost of production by U.S. policies and which are then transmitted to the Mexican market through rising U.S. exports.

Notably absent from this presentation are several important products:

- **Sugar –** Because sugar trade has been complicated by a recently resolved and long-running dispute between Mexico and the United States, it is beyond the scope of this paper to analyze the impacts of U.S. sugar policies on Mexican producers. Adding to the difficulty is the nature of U.S. support. Support levels are high, with an estimated PSE of 57%, but the U.S. sugar program is dramatically different from other U.S. commodity programs because it is based not on subsidies but on price supports and regulated imports, and the United States exports little (not counting non-sugar sweeteners such as corn-based high fructose corn syrup). The main impact of U.S. policy on Mexican producers relates to their recent market access to the United States, with its supported prices.

- **Sorghum –** A feed grain that has declined in importance with the rising importation of U.S. yellow and cracked corn, sorghum exports from the U.S. to Mexico have dropped 47% since the early 1990s. Mexican production has increased marginally in that time, just 7%. The crop is highly supported in the United States (PSE 38%), but we leave it out of this analysis because of its declining importance in trade.

- **Nonfat dry milk –** In recent years there as been a boom in U.S. exports to Mexico causing significant disruption to Mexican producers. The increase has been fueled by the expiration of NAFTA's restrictions in January 2008 and the recent expansion of export subsidies by the U.S. government to deal with unmarketable surpluses. Exports to Mexico more than doubled between 2006 and 2008. Prices on international markets fluctuated wildly during those years. U.S. dairy support programs differ from the main commodity programs, and the United States is not the price leader in international markets. We therefore leave dairy out of our core analysis, but we will provide a discussion of recent developments in U.S. dairy policy and their impacts on Mexican producers.

- **Ethanol (and "brewing or distilling dregs and waste") –** The rise in corn-based ethanol production in the United States, heavily encouraged by U.S. agricultural policies since 2001, has had a dramatic impact on U.S. agricultural markets. It is beyond the scope of this paper to analyze the interactions between ethanol policies and other commodity programs and their impacts on Mexican producers. Suffice it to say that ethanol incentives have increased land in corn, reduced land in other crops, and generally raised agricultural prices. Thus, these policies have generally had the opposite effect from U.S. commodity support programs, which tend to depress prices. The one implicit subsidy from U.S. ethanol policies that contributes to dumping-level prices is the production and exportation of so-called "brewing or distilling dregs or waste," a term that refers

to a by-product of the ethanol production process – commonly known as Distillers Dried Grains and Solubles (DDGS) – which is becoming an important and inexpensive additive to animal feed. As such, it represents an implicit subsidy to animal production, both in the United States and in Mexico. As the table shows, the United States exported an average of 755,000 metric tons to Mexico in recent years. It is also beyond the scope of this paper to analyze the impact of these exports on Mexican producers.

Understanding U.S. Agricultural Policy: Beyond Subsidies

To understand the impacts of U.S. agricultural policies on Mexican producers it is important to move beyond the reductionism common in many policy discussions, where U.S. agricultural policies are reduced to a question of producer subsidies. The implication is that subsidies are the primary cause of U.S. agricultural dumping and that eliminating them will result in fair prices in international markets. U.S. farm policies – and the reforms needed to correct them – are far more complex.

The United States has had a problem with overproduction of its main row crops for many years, with boom and bust cycles. The bust of the Great Depression brought in a more coherent set of policies that recognized the inherent tendency of U.S. agriculture to overproduce. It set up the U.S. Department of Agriculture as the equivalent of a "CEO for Agriculture," with the power to better manage the balance between supply and demand. These policies focused on managing supplies by establishing a price floor for farmers, reserves for surplus production, and conservation and set-aside programs to take some land out of production. The goal was to take enough land out of production to give farmers fair-market prices for their products, and to prevent wild price swings by buying the surplus when production was high and selling it onto the market when production was low. Another goal was to keep environmentally fragile land out of production by paying farmers to maintain it without cultivating it. This was not, primarily, a subsidy-based system. To the extent the government paid farmers directly, the payments not only served to support farm incomes but also reduced the market pressures driving overproduction in the first place.

That supply management system, with many twists, turns, successes, and failures, was the basis for U.S. agricultural policy until 1996, though reforms beginning in the 1970s progressively weakened those policies. The 1996 Freedom to Farm Act, however, ended supply management. The "freedom" of the title refers to the decoupling of government payments from production decisions. Farmers were to make planting decisions in response to market signals, not government incentives, with a "Direct Payment" to farmers based on their historical plantings, not their current activities. Such payments were deemed less "trade distorting" and more market-friendly. The market would set prices, and the market would limit overproduction.

In practice, the program created an immediate crisis. Millions of acres of land that had been held out of agriculture came back into production and prices plummeted.

The resulting economic crisis, which included the risk of a rural banking crisis, prompted emergency payments to farmers to compensate for low crop prices. These so-called Market Loss Assistance payments became codified in the 2002 Farm Bill as Countercyclical Payments, essentially a support payment when prices fall below a reference price. These combined with new Loan Deficiency Payments, which were based on prices and production of a particular crop. These two programs, along with the decoupled Direct Payments, formed the basis of the post-1996 farm subsidy system for major row crops. They were codified into the 2002 Farm Bill and largely renewed in the 2008 Farm Bill. As before, additional subsidies were provided for inputs (irrigation, energy, etc.), crop insurance, conservation, ethanol (starting in 2001), and a variety of other things.

The result was an increase in commodity payments from their pre-1996 levels of around $10 billion per year to around $20 billion per year. Not only had the budget outlay increased significantly, an important change had taken place in what the government got for its money. Before, payments had at least partially addressed the problem of overproduction, by holding land out of production, funding grain reserves, and trying to keep prices above a minimum level. After 1996, the government got very little for its money. Prices were allowed to fall, the government made up some of the difference with its array of subsidy payments, and those payments contributed to continued overproduction rather than helping to keep production in better balance with demand. (For a full discussion of these changes, see Ray, de la Torre Ugarte et al. 2003.)

The other significant change with this system was who benefited. Under the old system, prices were supported (to some degree), so consumers – notably agribusiness firms that use U.S. farm products as raw materials – paid a significant share of the cost in the form of higher prices. Under the reformed system prices were allowed to fall, with the government making up some of the difference. The burden shifted from consumers to taxpayers. This represented a tremendous boon to agribusiness interests. Most U.S. row crops are sold not as food to consumers but as raw material to agribusinesses – feedlots, food companies, clothing makers, etc. Suddenly, these businesses saw a steady oversupply of raw materials at low prices. Input suppliers also benefited, because to the extent government programs had reduced production they had also reduced demand for seeds, equipment, agrochemicals, etc. With the resumption of unchecked production, demand rose and government payments put money in the hands of farmers so they could buy those inputs.

For family farmers in the United States, the change meant that a smaller share of their income came from the market (albeit a market with a price floor) and a greater share came from government payments. Until the recent run-up in commodity prices, farmers routinely saw prices below the costs of production. In 2003, for example, an average mid-sized farm household with 1,000 acres of land earned only about $13,000 from farm sales. The farmers got somewhat more in government payments but supported themselves largely with off-farm sources of income. The situation scarcely improved with the recent wave of high prices (see Wise 2005; Wise and Harvie 2009). Government payments helped make up some of these losses. In the process, subsidies certainly helped

keep some farmers in business. But it does not follow from this fact that their elimination would have significantly reduced U.S. production, because farms that go out of business are generally bought up by larger-scale farmers and kept in production.

Export Dumping

The impact of the 1996 Farm Bill on U.S. export markets was significant. The U.S. had larger exportable surpluses, and prices were depressed to levels that qualified as "dumping." One of the definitions of "dumping" in international agreements is exporting a product at a price below its cost of production. The more commonly recognized definition relates to discriminatory pricing either below domestic prices or below prices charged in other export markets. For most agricultural commodities, the United States was not discriminating in its pricing, but it was exporting at prices below production costs for many of the years since the 1996 Farm Bill. (See text box.)

Defining Dumping

The General Agreement on Tariffs and Trade (GATT), the precursor to the World Trade Organization and the agreement on which most current trade law is based, provides two definitions of dumping. Article VI of GATT 1994 states that a product will be considered as being dumped if it is "introduced into the commerce of another country at less than its normal value…." The first method of determining dumping is the more commonly understood:

- *"… if the export price of the product exported from one country to another is less than the comparable price, in the ordinary course of trade, for the like product when destined for consumption in the exporting country."* (In other words, exporting at prices below the domestic price for the same product.)

Article VI provides a second definition of dumping for cases in which the domestic price is too distorted to provide a useful reference. Prices distorted by large subsidies qualify under this definition:

- *"…the margin of dumping shall be determined by comparison with … the cost of production in the country of origin plus a reasonable amount for administrative, selling and general costs and for profits."*

With U.S. agricultural prices distorted by government policies (not to mention high levels of market concentration), it is reasonable to apply the second definition of dumping to U.S. exports to Mexico. The United States, in an anti-dumping case against Canadian dairy exports, used this definition and it was upheld by the WTO's appellate body. The same decision recognized the use of average costs of production for comparison purposes.*

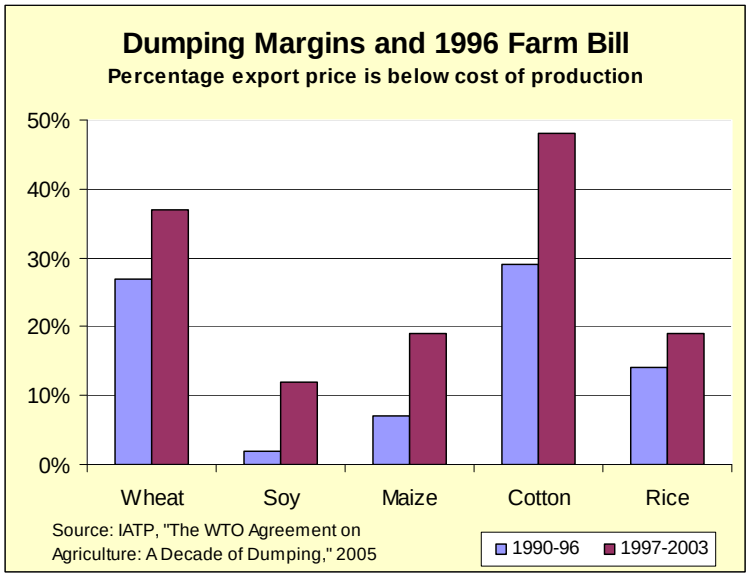
While this is an appropriate definition of dumping in the case of many U.S. agricultural exports to Mexico, the actions available to the Mexican government to defend its producers reside in the subsidies agreement of NAFTA. Countervailing duties (CVDs) are tariffs that can be imposed to recoup the losses to domestic producers from subsidized imports. NAFTA allows CVDs in cases of proven economic injury to domestic producers from the subsidies applied by an exporting country to its goods. A subsidy valued at more than 5% of the value of the traded good is considered actionable. The GATT prohibited such actions in agriculture among member governments under the so-called Peace Clause, which explicitly exempted agricultural goods from the GATT's CVD provisions. The Peace Clause has now expired, however, and the stalled negotiations on a new World Trade Organization agreement leave agricultural exporters that heavily subsidize their farmers vulnerable to action.

* "Canada – Measures Affecting the Importation of Milk and the Exportation of Dairy Products: Second Recourse to Article 21.5 of the DSU by New Zealand and The United States," Report of the Appellate Body (AB-2002-6), WORLD TRADE ORGANIZATION (WT/DS103/AB/RW2 and WT/DS113/AB/RW2 (20 December 2002), para. 80.

Source: GATT 1994, Article VI: http://www.wto.org/english/docs_e/legal_e/19-adp.pdf.

In particular, we examine the so-called "dumping margins" in the years 1997-2005, after the law took effect and before commodity prices surged on international markets. We rely on a methodology developed by Ritchie, Murphy and Lake (2003) for the Institute for Agriculture and Trade Policy (IATP), who estimate the percentage by which export prices for different agricultural products are below their costs of production. Dumping margins provide a more accurate estimate of the impacts of U.S. agricultural policies – not just subsidies – on foreign producers in export markets. IATP estimated dumping margins for five principal export crops both before and after the enactment of the 1996 Farm Bill. As Figure 1 shows, dumping margins rose significantly for all crops after 1996, with averages for 1997-2003 ranging from 12% for soy to nearly 50% for cotton.

Figure 1.



Others have used a different methodology to estimate dumping margins based on price-plus-domestic-subsidy, also grounded in WTO anti-dumping disciplines. This method yielded an even higher estimate of dumping margins for U.S. corn in Mexico (Berthelot 2003a). Oxfam used this methodology to derive a dumping estimate for U.S. corn that was about 40% higher than the IATP estimate (Oxfam 2003).

We use the IATP methodology, based on below-cost exports, because it can capture the effects of agricultural policies other than subsidies on prices. To the extent dumping margins increased because of the removal of supply management policies in 1996, our estimates will account for the impacts of those policies. Support for such an approach comes from a wide range of economic modeling of the elimination of U.S. agricultural subsidies, which suggests that for most crops the production and price impacts are much lower than is commonly assumed, particularly as international markets adjust over the medium and long term.

For example, several modeling efforts suggested price increases for corn of around 3% from different liberalization scenarios. The International Food Policy

Research Institute (IFPRI) modeled the elimination of all developed country subsidies, including export subsidies, and found only a 2.9% increase in corn prices by 2020 (IFPRI 2003). The InterAmerican Development Bank modeled the impact of subsidy elimination in the Western Hemisphere in preparation for trade negotiations on the proposed Free Trade Area of the Americas and found that subsidy elimination in all countries would generate only a 1.8% price rise for coarse grains, a category dominated by maize (Monteagudo and Watanuki 2002). The USDA's Economic Research Service modeled the elimination of all developed country subsidies and showed only a 3.7% rise in agricultural prices overall in a static computable general equilibrium analysis (Diao, Somwaru et al. 2001). Some studies, particularly those that rely on static models for subsidy elimination for one crop, offer higher estimates (see, for example, Sumner 2005). Others point out that over the long run it is possible for subsidy elimination among *all* crops to lead to both lower production *and* lower prices for a particular commodity, as elimination of government payments changes land use by altering the relative returns to different crops (see, for example, Ray, de la Torre Ugarte et al. 2003; Alston 2007).

For these reasons we do not focus here on subsidy levels but rather on dumping margins. Nor do we rely on the OECD's Producer Subsidy Equivalent (PSE), probably the most commonly cited estimate of agricultural support. Though still widely used, the PSE methodology has several flaws that make it a poor gauge of developing country farm support. In addition, crop-specific subsidy estimates have become less useful with recent changes in methodology (see Wise 2004 for a detailed presentation of the methodological problems with the PSE). For rough cross-country comparisons, however, the PSE data can be useful for analyzing producer support.

Figure 2.

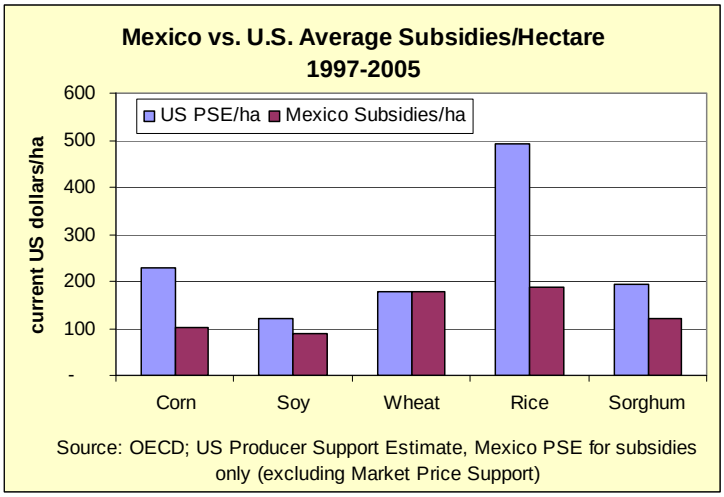


Figure 2 compares the United States and Mexico's subsidies-per-hectare for five crops covered by the OECD from 1997-2005.[3] Only for wheat and soybeans were Mexican subsidies comparable to U.S. subsidies. U.S. support to its maize and rice farmers was more than double Mexico's on a per hectare basis. (The OECD does not calculate the PSE for cotton.) It is clear from this analysis that the U.S. supports its

producers far more than Mexico does, leaving Mexican farmers more vulnerable to the impacts of low-priced U.S. exports.

For our analysis, dumping margins provide a more useful estimate of the impacts of U.S. policies, in addition to recognizing the complexity of the policy solutions required in the United States to ensure that export prices do not fall below production costs. Another reason to focus on dumping margins and not subsidies is that some of the main beneficiaries of U.S. policies received few direct payments from the government. In particular, meat producers benefited indirectly from feed components that were priced below production costs. This made their products cheaper on both domestic and international markets. By focusing on the gap between prices and costs, we can estimate the "implicit subsidies" to these important consumers of agricultural raw materials. They too exported at prices below true production costs, and we can estimate the dumping margins for some of these animal products, which also saw a surge in exports to Mexico after NAFTA. Other important U.S. exports that benefited from such implicit subsidies include high fructose corn syrup (from support to corn) and malt for beer (from support to barley), though we do not analyze them in this paper.

Export Credits

Our estimates of dumping margins for exported crops and meats account for the impact of all domestic subsidies, because we are comparing observed export prices to an estimate of what such prices would have been if farmers had received full costs of production for their crops. The one subsidy included in our cost-of-production calculations is the estimate for input subsidies, because these are indeed costs of production paid for by the government.

The one significant area of U.S. government support that is not captured by our dumping margin calculations is that of export credits. The U.S. government's use of export subsidies is relatively limited compared to the European Union's (dairy is a notable exception), but export credits have been important, particularly for Mexico. Three principal export credit programs have operated in the last two decades, all of which provide credit guarantees to importers of U.S. agricultural products. These guarantees promote U.S. exports by providing credit in markets where it may not be readily available, by providing credit at below-market rates, and/or by covering losses due to failures to repay loans. Our dumping margin estimates fail to capture the effect of such measures on prices because the credit is provided to importers of particular U.S. products. As such, they drive down the price to those importers, which make U.S. exports more competitive, but they do not drive down export prices in a generalized way.

Data on export credits are limited. Their value as an export subsidy is also difficult to determine. In current WTO negotiations, there is agreement to end export subsidies, which the European Union has used extensively. There is also agreement to limit export credits, which has spawned debate and analysis over the "subsidy equivalent" value of an export credit. Generally, it is accepted that the amount by which the credit is offered below market rates is equivalent to a subsidy, as is any government

funding to cover losses from default. (See Hoekman and Messerlin 2006 p. 217 for a discussion of these issues and some estimates of subsidy equivalents)

Here we do not attempt to incorporate subsidy equivalents for export credits into our analysis of the costs to Mexican producers of U.S. agricultural policies. Rather, we present the available data from 1999-2008 on the value of those credits by agricultural sector and suggest what they might have meant for Mexico, using corn as our example.

Table 2.

Export Credits to Mexico by Commodity, 1999-2008

millions of current USD

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
Feed grains	440	364	124	229	231	251	103	-	-	-	**1,742**
Oilseeds	347	290	124	125	120	201	112	3	10	-	**1,332**
Cotton	161	118	122	71	105	96	53	-	-	-	**725**
Wheat	110	60	8	47	53	61	30	-	-	-	**368**
Meat (pork, poultry, beef)	59	119	83	31	21	27	46	-	-	-	**386**
Rice	13	3	6	7	6	13	25	-	1	29	**102**
Protein Meals	22	14	1	22	3	7	2	-	-	-	**70**
Pulses	0	-	3	7	2	1	1	-	-	-	**14**
Other	109	93	48	59	38	19	23	-	-	10	**398**
Total export credits	**1,261**	**1,061**	**519**	**596**	**578**	**675**	**394**	**3**	**11**	**39**	**5,138**
Mexico % of total program	41%	34%	16%	18%	18%	23%	15%	0%	1%	1%	**19%**
Subsidy equivalent at 4.9% (OECD estimate)											
Total	61.8	52.0	25.4	29.2	28.3	33.1	19.3	0.1	0.5	1.9	**252**
Feed grains	21.6	17.8	6.1	11.2	11.3	12.3	5.1	-	-	-	**85**

Source: FAS Monthly Summary of Export Credit Guarantee Program Activity, GSM-102, GSM-103, and SCGP. Fiscal years run Sept-Oct.

As Table 2 shows, export credits have been declining in importance, particularly for Mexico. Approved credits in 1999 and 2000 were valued at more than $1 billion, but by 2005 they were down to about $400 million, and from 2006-8 they have been less than $40 million per year. In 1999 Mexico received 41% of all export credits; in recent years the share has been less than 2%. Over the ten-year period, feed grains and oilseeds accounted for 60% of the allocations, with smaller but significant shares going to support cotton, wheat, and meat exports.

What impact might this support have meant for U.S. exports and for Mexican producers? The OECD estimated the subsidy equivalent of U.S. export credits in 1998, just from below-market credit terms, at 4.9% of the value of the credit based on interest rates at the beginning of that year (OECD 2000). Using this admittedly rough estimate, the subsidy equivalent of total U.S. export credits to Mexico from 1999-2005 would be $249 million, or $36 million per year. For feed grains, the vast majority of which are corn, the subsidy equivalent was $85 million, or $12 million per year. In the context of large U.S. subsidies – $4.5 billion/year for corn from 1997-2005 – and dumping margins – 19% for the same period – this represents a relatively small but significant additional advantage to U.S. exporters.

Of course, export credits also have the effect of increasing exports; that is, after all, their goal. This increases the impact on Mexican producers. Researchers estimated in the early 1990s that a 1% increase in export credits resulted in a 0.11% increase in U.S.

exports (Santillan, Ames et al. 1997). Because these data are relatively old, we do not attempt here to estimate the extent to which U.S. export credit programs increased U.S. corn exports.

Estimating the Costs to Mexican Producers of U.S. Dumping

When exports enter Mexico at prices below their costs of production, there are two categories of impacts for Mexican producers:

- Domestic farm prices are driven lower, reducing receipts to farmers.
- Demand for domestic farm products is displaced by imports.

In this paper, we attempt only to estimate the direct costs of lower prices. It would require more complex modeling to estimate accurately the ways in which higher U.S. prices for a variety of farm products would reduce demand in Mexico for U.S. exports, boost demand for Mexican production (despite slightly lower aggregate demand due to higher prices), and raise prices further due to higher demand. More complicated still is estimating how such changes in price and demand would affect different types of producers. One would need an economy-wide model to do justice to such estimates for the variety of crops we consider here. For this paper, we focus on the estimated impacts on Mexican farm prices, and the resulting costs to Mexican producers, from below-cost U.S. export prices.

Methodology

After identifying the major U.S. agricultural exports to Mexico that are directly or indirectly affected by U.S. farm policies, we estimate the cost to Mexican producers of prices for imports from the United States that are below the costs of production. To do this, we calculate dumping margins for the different exports. Following a methodology developed for crop exports by Ritchie, Murphy and Lake (2003) for the Institute for Agriculture and Trade Policy, we compare export prices for crops for the years 1997-2005 to the U.S. costs of production (COP), adjusted to account for the costs of bringing the product to the point of export.[4] Because input subsidies amount to a cost of production paid by the government, input subsidies are added to farmer costs of production in the COP estimates. If the COP price is higher than the export price, the difference is referred to as the "dumping margin," expressed as the percentage the export price is below the COP price. (If the export price for a given year is not below the COP price, the dumping margin is recorded as zero.) We then estimate the amount by which export prices would have been higher without that margin. Assuming that U.S. prices are the reference prices for import-competing Mexican products,[5] and that Mexican prices would rise by a similar percentage under this scenario,[6] we estimate adjusted Mexican prices. Assuming that this higher price would add value to all Mexican production,[7] we multiply the price difference by the volume of Mexican production to estimate the amount by which Mexican producers were underpaid for their crops due to dumping-level import prices. The annual losses for the years 1997-2005 are totaled to give an estimate of losses during the nine-year period.

Data limitations make these estimates necessarily rough. Data on farmer costs of production, from the U.S. Department of Agriculture, are well-regarded, though they may not fully account for the appreciation of land. It would be preferable to use regional averages that map clearly to export markets, but data is not reliable so we use national averages.[8] Data on transportation and handling costs are not available, so an estimate is based on the average difference between the export price and the price at the farm gate in a high-production region with good access to shipping. Export prices are annual averages from the Gulf port, rather than specific export prices to Mexico. Thus, our estimates should be interpreted as a rough indication of dumping margins and their costs to Mexican producers.

For meat exports (pork, poultry, and beef) we use the version of this methodology further refined by Starmer, Witteman and Wise (2006). U.S. livestock producers receive far less direct support from U.S. agricultural policies than do crop farmers, but they are arguably among the largest beneficiaries of the system. Two of the most important components of their feed mixtures, corn and soybeans, are heavily supported crops that have generally shown farm gate prices below farmer costs of production. Starmer et al. refer to the resulting savings on feed as the "implicit subsidy" to industrial livestock operations, with estimated savings from 1997-2005 of $11.2 billion for broiler chickens, $8.5 billion for hogs, and $4.5 billion for cattle. Because feed is the largest operating cost in industrial operations, these savings amounted to discounts on operating costs of 13%, 15%, and 5% respectively for the three sectors (Starmer and Wise 2007). Here, we use those implicit subsidy estimates to generate a dumping margin for U.S. meats, accounting for the difference between farm gate and export prices by adjusting the implicit subsidy downward by the same percentage, thus factoring in the costs of transporation. Following the same steps as for crops, we then estimate the costs to Mexican producers of below-cost imported meats from the United States.

Because the industrialized sectors of Mexican livestock production are significant and because they rely heavily on imported U.S. feed components, implicit subsidies to feed are a benefit to them, not a cost. Thus, we estimate losses only for that share of Mexican livestock production considered less industrialized and therefore less likely to rely on imported feed, based on studies from the 2002 period (Speir, Bowden et al. 2003). For our calculations, we assume that 80% of beef cattle are grazed, 50% of hog production is fed from domestic sources, and 10% of poultry production relies on domestic feed.

Of course, these estimates of the costs of dumping for these eight products underestimate the full cost to Mexican producers, because higher U.S. export prices would reduce the demand in Mexico for imports from the United States and increase demand for domestic production, as noted earlier. Even though total demand in Mexico would go down with higher prices, it would not fall by as much as the demand for imports, so there would be a supply stimulus from higher prices that would allow Mexican production to produce more and sell at prices driven still higher by increased domestic demand. We do not have the time nor the data to estimate these costs accurately, but we expect the total gains would be significantly higher than our estimated

gains just from eliminating dumping-level prices. Our estimates will be particularly low for crops such as soybeans, cotton, and rice, which have seen stagnant or falling domestic production in the face of imports. In those markets, the supply stimulus of higher prices and lower imports may have made a significant difference to production, a difference not captured by our estimates.

Summary of Findings

For the five crops and three livestock sectors analyzed, the results show varied but significant impacts on Mexican producers, as presented in Table 3. As noted earlier, all eight products saw significant growth in U.S. exports from the early 1990s, the lowest being a 159% increase in soybean exports and the highest a 707% increase in pork exports. All eight products showed positive dumping margins for the period we examined (1997-2005), with the estimates for the livestock products (using a different methodology based on implicit subsidies to feed) lower (5%-10%) than the estimates for the crops (16%-38%). The related trends in Mexico were significant as well. Producer prices fell dramatically for all products from their levels in the early 1990s, with 2005 prices (in real pesos) 44%-67% lower.

Table 3.

Impacts of U.S. Dumping on Mexican Producers

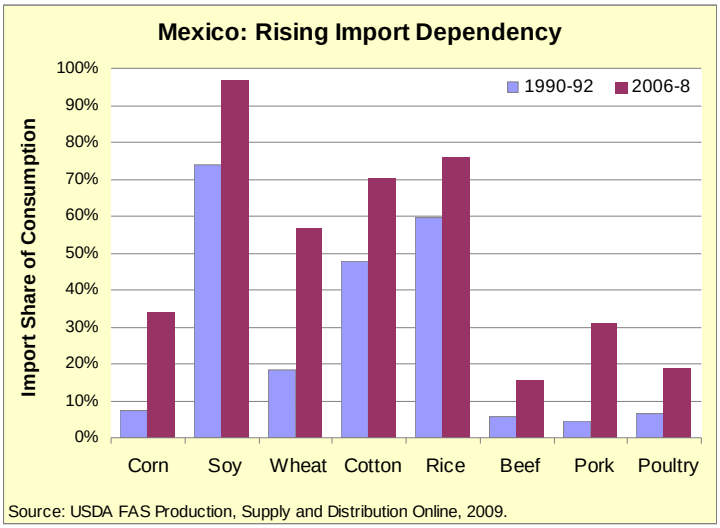
	United States				Mexico						
	Exports to Mexico (1000 mt)			Dumping margin	Producer Price Drop	Mex production (1000 mt)			Total Import Dependency		Losses 1997-2005
	1990-92	2006-8	growth %	avg 97-05	2005/90-2 real pesos	1990-92	2006-8	growth	1990-92	2006-8	2000US$ millions
Corn - All	2,014	10,330	413%	19%	-66%	15,807	23,650	50%	7%	34%	6,571
w/o cracked	1,982	8,385	323%						7%	28%	
Soybeans	1,410	3,653	159%	12%	-67%	619	105	-83%	74%	97%	31
Wheat	360	2,515	599%	34%	-58%	3,871	3,611	-7%	18%	57%	2,176
Cotton	49	312	531%	38%	-65%	138	134	-3%	48%	70%	805
Rice	129	806	524%	16%	-51%	197	181	-8%	60%	76%	67
Subtotal											**9,650**
Beef	54	204	278%	5%	-45%	1,677	2,191	31%	6%	16%	1,566
Pork	27	218	707%	10%	-56%	814	1,140	40%	4%	31%	1,161
Poultry	85	396	363%	10%	-44%	1,156	2,693	133%	7%	19%	455
Subtotal											**3,182**
Total Losses											**12,832**

Sources: USDA-FATUS; IATP; Starmer et al. (2006); SAGARPA.

There was significant variation in the observed impacts of rising imports and lower prices on Mexican production. Corn stands out for its counterintuitive 50% increase in production, which leaves Mexico largely self-sufficient in the production of white corn for human consumption and highly dependent on imports for the fast-growing livestock sector. The other crops all showed declines in Mexican production, with small declines in wheat (7%), cotton (3%) and rice (8%) and a large decline (83%) in soybean production, which Mexico all-but-ceased producing. The livestock products all showed robust increases (31%-133%), which reflect the dynamic demand for meat-based proteins

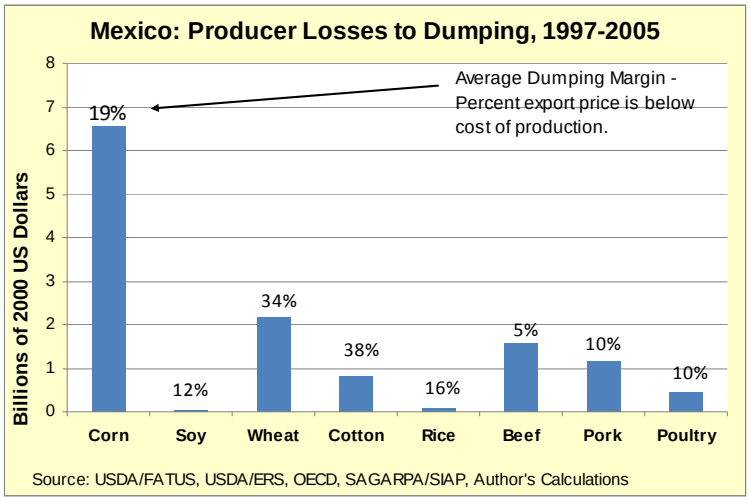
in the Mexican diet and the continued ability of Mexico-based producers to meet some of that growing demand.

Figure 3.



Mexico's import dependency – the share of domestic consumption coming from imports – for all eight products increased significantly. (See Figure 3.) In livestock, dependency increased from the early-1990s levels of 4-7% to 2006-8 levels of 16-31%. For the crops, the initial levels of dependency were higher in the early 1990s (7-74%) and the levels of import dependency were much higher by 2006-8 – ranging from 34% for corn to 97% for soybeans. The vast majority of imports came from the United States.

Figure 4.



The estimated losses to producers from dumping-level prices were large for all products except soybeans and rice. (See Figure 4.) For these crops, dumping margins were moderately high (12% and 16%) but the losses to Mexican producers were relatively low because Mexican production levels were relatively low. For the remaining

three crops, losses for the nine-year period 1997-2005 ranged from $805 million for cotton to $6.6 billion for corn. Estimated losses to livestock producers ranged from $455 million for poultry to nearly $1.6 billion for beef, estimates that reflect comparatively low dumping margins but high levels of Mexican production affected by those depressed prices. Losses for all eight products from 1997-2005 totaled $12.8 billion, an average of $1.4 billion per year.

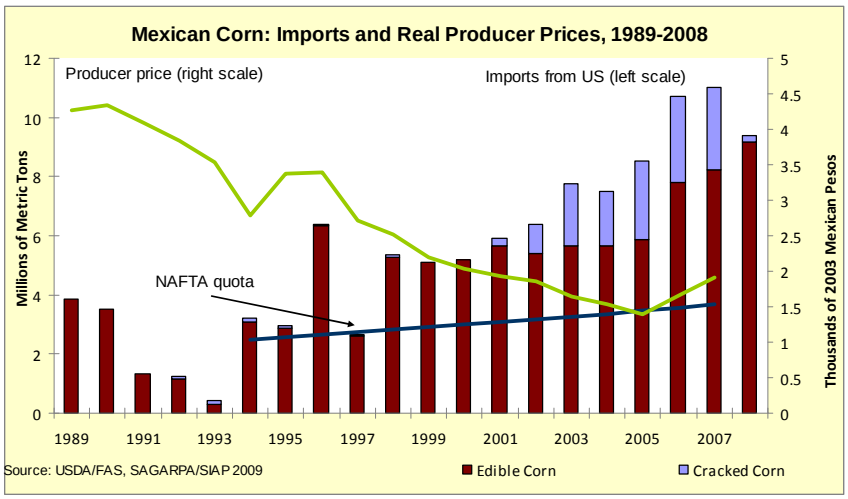
Following are the findings for each of the eight products analyzed here. We provide more detailed analysis of corn because dumping-level prices for corn stand out as the most significant source of losses for Mexican producers, and because corn remains such an important part of Mexican agriculture and Mexican diets.

Crop Agriculture

Corn

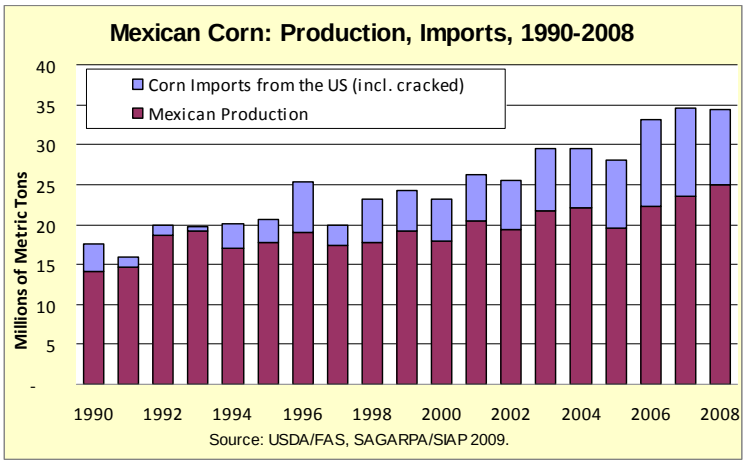
U.S. exports increased dramatically, in part because the Mexican government largely chose not to enforce the TRQ during NAFTA's transition and in part because the United States dramatically increased the exportation of cracked corn, which fell outside the purview of the TRQ. (Foregone tariff revenues from over-quota corn imports from the United States are estimated to be $3.8 billion, in current U.S. dollars, though this seems a less useful way of estimating the costs of Mexico's unilateral accelerated liberalization, as we will discuss later.) With the expiration of the TRQ in January 2008, exports of cracked corn came to a virtual halt as exports of yellow corn, fully deregulated, replaced them. Though cracked corn did not count against the NAFTA quota, here we include it in the analysis because it benefited from the same levels of agricultural support in the United States and had the same market-depressing impacts. With cracked corn, total exports increased 413% from 1990-2 to 2006-8. The vast majority of U.S. corn went to Mexico's growing livestock sector as well as industrial uses.

Figure 5.



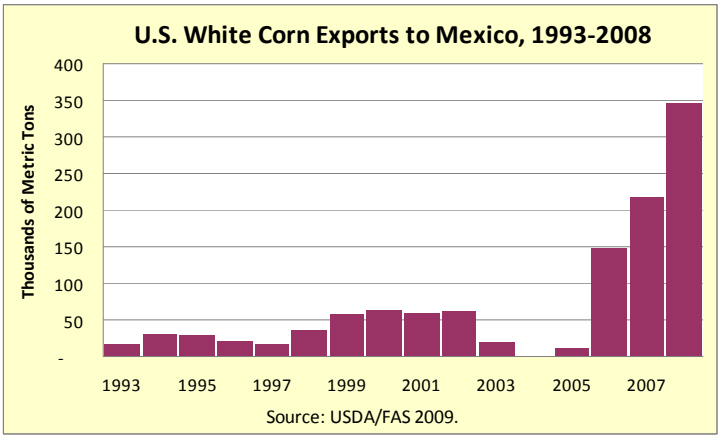
As the Figure 5 shows, with the surge in imports there was a 66% drop in real producer prices from the early 1990s to 2005, before the recent rise in commodity prices. During the same time Mexico's import dependency increased from 7% to 34%, a share that would have been significantly higher if not for an impressive 50% increase in corn production, most of it white corn. The lower section of the bar in Figure 6 shows the impressive growth in Mexican corn production, which came in spite of falling prices.

Figure 6.



White corn imports from the United States have been small, in part because the Mexican government imposed tariffs on some over-quota white corn, which slowed an upward trend in U.S. production for export between 1998 and 2002. It is worth noting that in recent years, and particularly since the expiration of NAFTA's TRQ, white corn imports have risen significantly. (See Figure 7.)

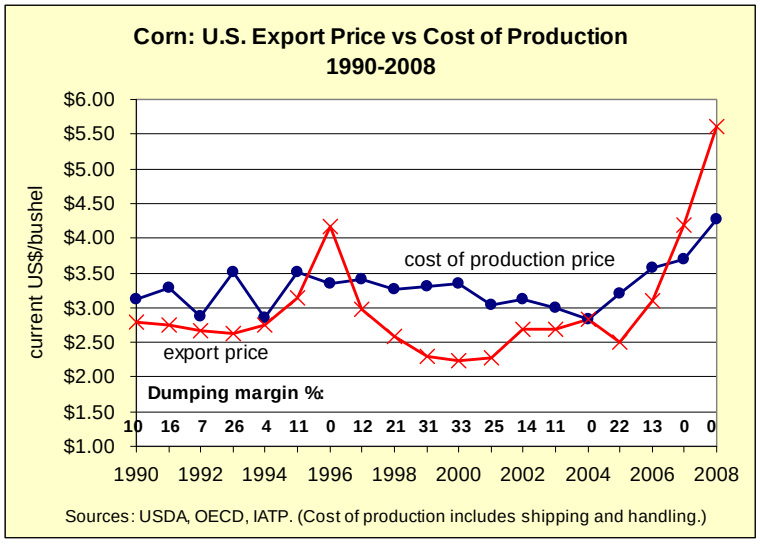
Figure 7.



Dumping margins from 1997-2005 averaged 19%. (By way of reference, the PSE for the period averaged 24%, and commodity payments averaged $4.5 billion.) Figure 8 compares the U.S. export price to the estimated price based on costs of production. If the Export line is below the COP line on the graph, there is a dumping margin. The dumping margin is noted for each year. The gap between the two shows the extent of the dumping

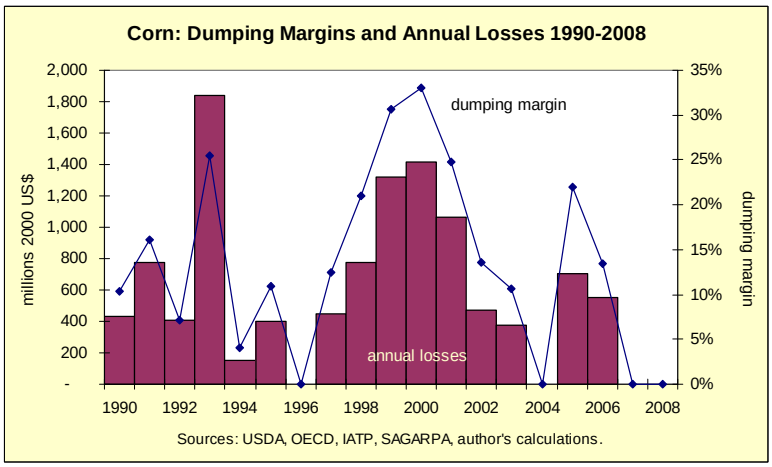
margin. As the graph shows, only in 1996, 2004, 2007, and 2008 were export prices at or above costs of production. Dumping margins were significantly higher after 1996.

Figure 8.



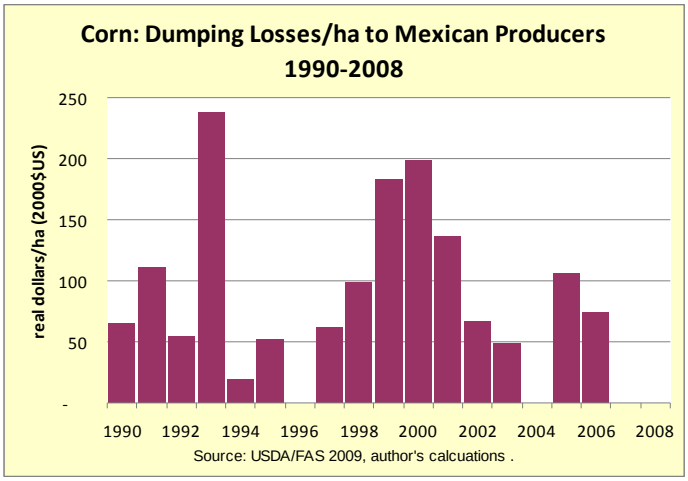
If the dumping margin were eliminated and prices reflected farmers' true costs of production, export prices would have been 25% higher from 1997-2005. If we assume Mexican prices would have been higher by the same percentage, with the U.S. price serving as the reference price for the Mexican market, the estimated losses on all Mexican production reach $6.6 billion. This figure represents the total of annual losses from 1997-2005, a period in which dumping margins ranged from 0% in 2004 (with zero estimated losses) to 33% in 2000 ($1.4 billion in losses). The largest losses in the 1997-2005 period occurred between 1998 and 2001, but losses exceeded $370 million in every year except 2004. From 1997-2005, annual losses averaged $730 million. Losses for the entire period in the graphs, 1990-2008, were $11.1 billion, in part due to particularly high dumping margins, Mexican producer prices, and Mexican production in 1993. Estimated losses that year exceeded $1.8 billion. (See Figure 9.)

Figure 9.



What did this mean to Mexican producers? From 1997-2005, producers lost an estimated $99/ha per year (see Figure 10).[9] For most years, per hectare losses were between $50 and $100. In 1993, 1999, and 2000, losses exceeded $175/ha.

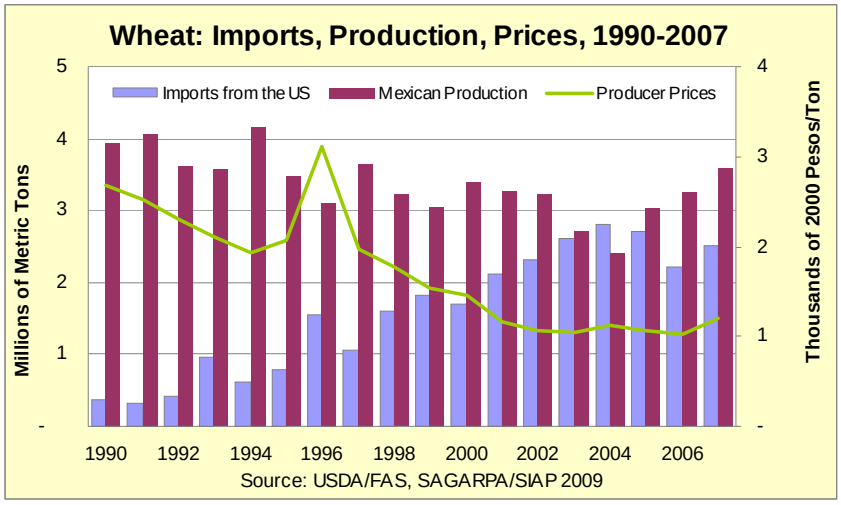
Figure 10.



These totals do not include the additional losses to some Mexican meat producers from below-cost corn, which depressed imported meat prices through the implicit subsidy to feed corn in U.S. livestock production, as discussed below.

Wheat

Figure 11.

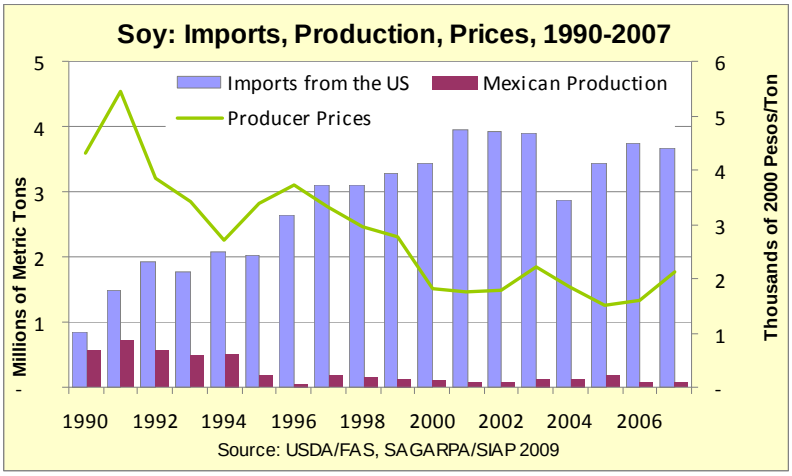


Wheat was considered one of the few staple crops in which Mexico could compete with U.S. producers for efficiency, so our estimates of $2.2 billion in losses to Mexican producers from dumping-level prices are telling. U.S. exports to Mexico increased sevenfold (599%) from the early 1990s to 2006-8. With an average dumping

margin of 34% from 1997-2005 (PSE of 33%, average commodity payments of $2.2 billion), the impacts on Mexican producers were dramatic. Real producer prices fell 58% from the early 1990s to 2005. Unlike the case of corn, Mexican production declined under the flood of low-priced imports, falling 7% from 1990-2 to 2006-8. Import dependency increased from 18% to 73%. With dumping margins so high, their elimination would have reduced by a significant amount the price decline producers saw in Mexico. As noted above, we estimate losses to Mexican producers at $2.2 billion, an average of $242 million per year from 1997-2005. Annual per hectare losses were $371. There were significant losses in every year, with the largest losses occurring between 1999 and 2002.[10]

Soybeans

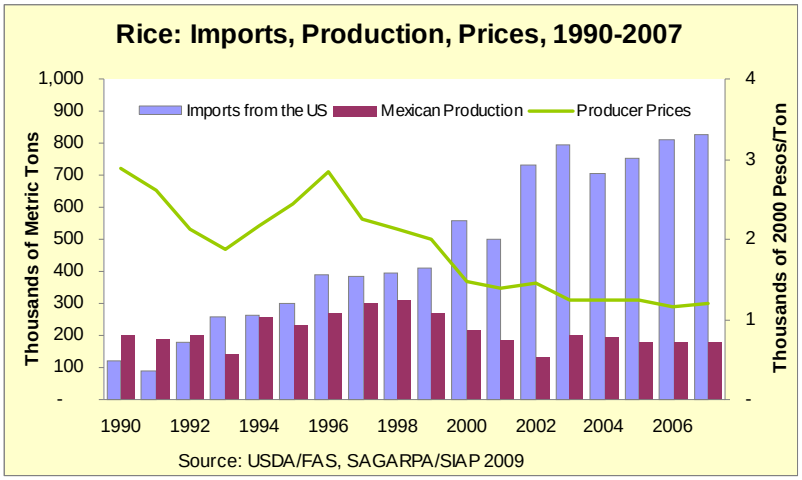
Figure 12.



Before NAFTA, Mexico was already importing a large share of its soybeans and related products from the United States. With deeper integration, U.S. exports increased 159%, producer prices dropped 67%, Mexico's production fell 83%, and import dependency grew from 74% to 97% between 1990-2 and 2006-8. From 1997-2005, U.S. dumping margins averaged 12% (PSE 17%, average commodity payments of $1.5 billion), low compared to other crops but up from earlier years, as the 1996 Farm Bill authorized commodity payments for soybeans for the first time. Low dumping margins and low Mexican production levels made for relatively small losses to soybean producers from dumping-level prices – just $31 million over the nine-year period, just $3.4 million per year, or $43 per hectare. As with corn, however, the dumping margins for soybeans, and the implicit subsidy to feed, resulted in more significant losses to Mexican livestock producers, as noted below.

Rice

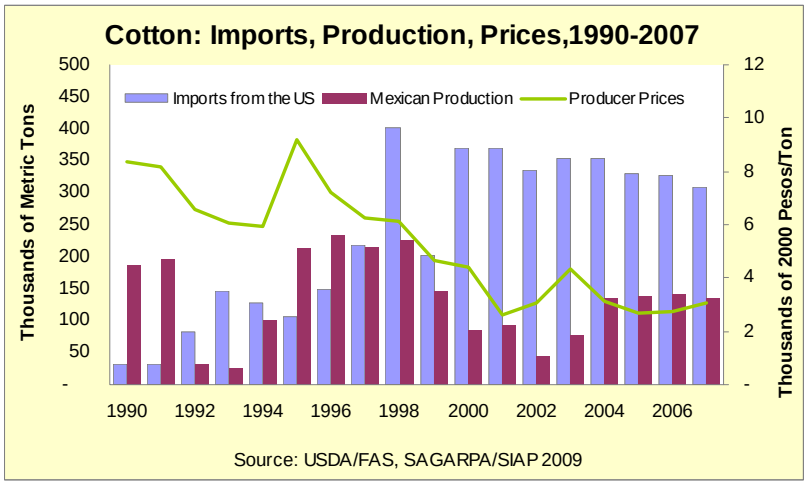
Figure 13.



As with soybeans, losses to Mexican rice producers were relatively low ($67 million) because production was low. From the early 1990s to 2006-8, U.S. exports to Mexico increased 524% and producer prices fell 51% by 2005, with dumping margins of 16% from 1997-2005 (PSE 30%, average commodity payments of $1.0 billion). Mexican production declined 8%, with import dependency increasing from 60% to 76%. Estimated losses to Mexican rice producers for the nine-year period were $67 million, $7.5 million per year, or $102/ha.

Cotton

Figure 14.



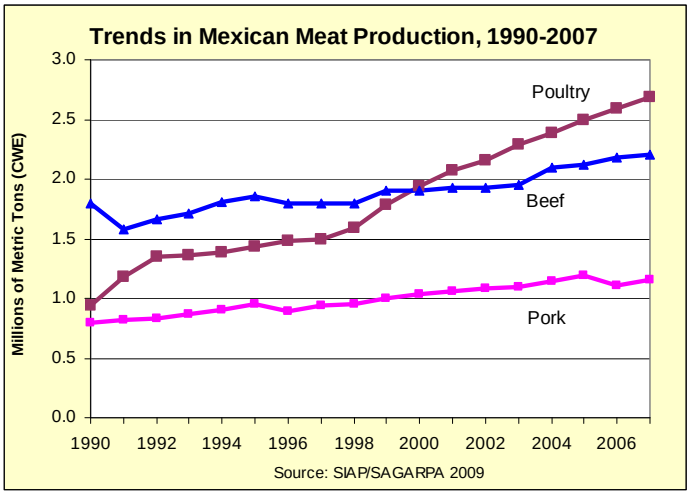
The losses to cotton producers were high – $805 million – due to high dumping margins and declining but important Mexican production. U.S. exports increased 531% from the early 1990s to 2006-8. With dumping margins of 38% (and average commodity payments of $2.3 billion) for a product widely recognized as one of the most affected by

U.S. agricultural policies, producer prices in Mexico had declined 65% by 2005. Mexican production stagnated, falling 3%. Import dependency rose from 48% in the early 1990s to 70% in 2006-8. Annual losses to Mexican cotton producers averaged $89 million, with significant losses in every year from 1997-2005. Because production was so low, these losses were very high on a per hectare basis: $754/ha annually from 1997-2005.

Animal Agriculture

As noted earlier, demand has been increasing in Mexico for meats, so Mexican production has been rising even as imports from the United States increased. As Figure 15 shows, Mexican production of poultry has increased the most dramatically.[11]

Figure 15.



Our estimates of losses to Mexican livestock producers of beef, pork, and poultry use a different methodology, as noted earlier. Rather than estimate the percentage by which export prices are below production costs – a calculation that is more difficult to do accurately for semi-processed products such as meat – we estimate only the extent to which implicit subsidies to feed, through below-cost corn and soybeans, reduced export prices. We refer to this as the dumping margin from implicit feed subsidies. It allows us to estimate the percentage by which export prices would have risen if U.S. meat producers had paid full production cost for the corn and soybeans in their feed, which is the largest operating cost for industrial livestock producers.

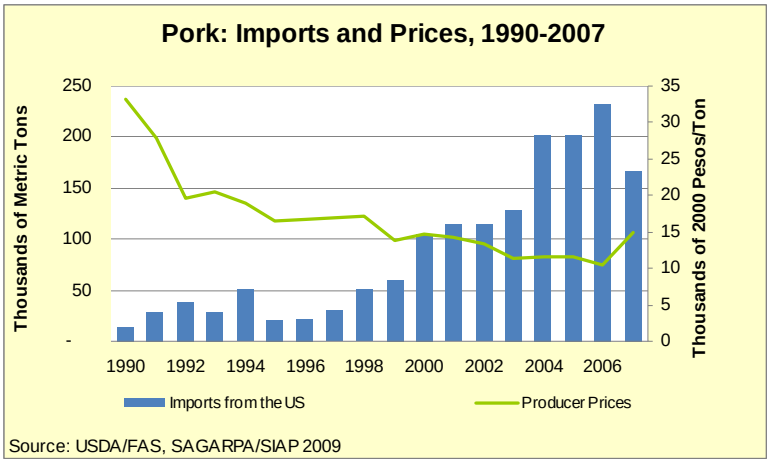
We offer these estimates with important caveats. First, livestock production in Mexico, unlike crop production, has seen significant levels of integration, with U.S. firms investing heavily in industrial operations. So the difference between U.S. and "Mexican" producers, which seems quite valid for crop agriculture, is certainly less so for animal agriculture. Second, to the extent industrial livestock producers in Mexico – be they from the United States or Mexico – rely primarily on imported corn and soybeans for their feed, they have been enjoying the same implicit subsidy as their U.S.-based counterparts.

As such, the aggregate estimates of losses to Mexican producers from below-cost imports will overstate the actual losses. The Mexican producers who would lose under the scenario we present are those who grow their own feed or rely on domestically grown feed sources. Those producers, in fact, face competition not just from implicitly subsidized imports but from implicitly subsidized industrial producers in Mexico who rely on imported corn and soybeans. As such, the implicit subsidy to feed gives an unfair advantage to industrial producers over livestock farmers who are still growing most of their own feed or relying on domestic sources of feed.

As noted earlier, we estimate losses to Mexican producers only for the portion of livestock production considered not to be dependent on imported feed components during this period. This includes 80% of beef cattle, 50% of pork, and just 10% of poultry (Speir, Bowden et al. 2003). This is, admittedly, an imprecise estimate, as pork and poultry in Mexico have continued to industrialize since the time of these studies. Using these figures, we estimate the cost to non-industrialized Mexican beef, hog, and poultry producers at $3.2 billion from 1997-2005 – $1.6 billion for beef cattle, $1.2 billion for pork producers, and $455 million for poultry.

Pork

Figure 16.

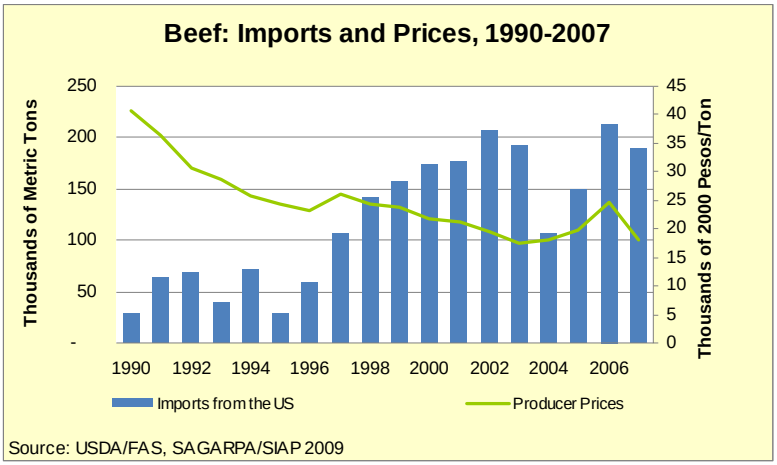


Pork saw the largest jump in U.S. exports – 707% – of the eight products we analyzed. With dumping margins of 10%, producer prices in Mexico fell 56% by 2005 from their levels in the early 1990s. Still, Mexican production increased 40% from the early 1990s to 2006-8, with import dependency rising from 4% to 31%.

How did dumping-level prices affect Mexican producers? According to one 2003 study, in 2002 about half of Mexican hogs were produced in large-scale confinement operations (Speir, Bowden et al. 2003). If we assume that they relied on imported feed components while the remaining mid-size commercial operators (20% of production) and household producers (30% of production) relied on domestic sources of feed, the cost to Mexican producers would be $1.25 billion for the nine-year period, or $129 million per year.

Beef

Figure 17.

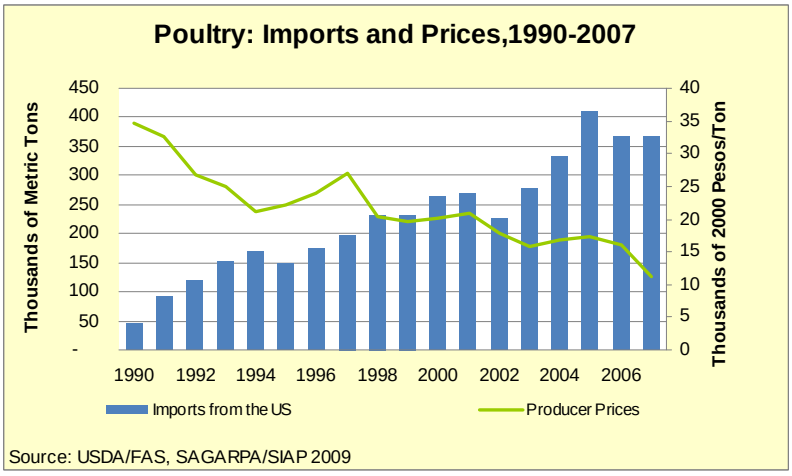


Losses from below-cost imported beef were high. Beef imports from the United States increased 278% since the early 1990s and Mexican producer prices fell 45%. Estimated dumping margins are lower than for pork and poultry, just 5%, which reflects the lower share of production costs accounted for by feed. Despite lower prices, Mexican production increased 31%, leaving import dependency at 16%, up from 6% in the early 1990s.

Cattle in Mexico are still mostly grazed. According to one study, in 2002 about 80% of cattle were fed on pasture rather than feedlots and thus these ranchers did not benefit from the implicit subsidy to imported feed. For that 80% of production, losses from below-cost beef from 1997-2005 were an estimated $1.6 billion, or $175 million per year.

Poultry

Figure 18.



With consumption rising dramatically in Mexico from the early 1990s, the market for poultry was dynamic, allowing for increases in both imports and domestic production. U.S. exports to Mexico increased 363%. With average dumping margins of 10%, producer prices in Mexico fell 44%. Still Mexican production increased an impressive 133%. Import dependency rose from 7% to 19%.

Poultry is the most industrialized of the livestock sectors, with an estimated 90% of production coming from large-scale industrial operations in 2002. Assuming these producers relied on imported feed, they gained from the implicit subsidy to soybeans and corn. For the remaining 10% of producers, we estimate the costs of U.S. dumping of below-cost poultry at $455 million, or $51 million per year.

Discussion

We have estimated the costs to Mexican producers of prices that have been lowered by U.S. exports to Mexico of products exported at prices depressed by U.S. agricultural policies below their true costs of production. While these are imprecise estimates, it should be noted that they are quite likely underestimates, because they include only the costs of low prices, not the additional costs associated with further market adjustments that would take place if U.S. export prices had reflected costs of production. All would have benefited Mexican producers, bringing them decreased competition from imports, increased demand for their products, and higher prices due to the increased demand.

As noted earlier, it is beyond the scope of this paper to model the complex cross-product effects of such price changes. Still, some recent studies suggest the magnitude of such effects. Brooks, Dyer et al. (2009) attempt to estimate the impacts of recent price increases for maize on agricultural land use, production, and incomes in Mexico. Such modeling confirms that income from farming overall would rise and that there would be a supply stimulus that leads to increased planting and production. Dyer (2008) provides detailed estimates for how such a scenario might play out for maize in Mexico. Dyer models the impacts of the 2007 price increases on maize land, production and incomes for different regions of Mexico. He models a 23% increase in producer prices, which corresponded with a 5% increase in consumer prices, based on the changes seen in 2007. In 2007, there was an observed 3.5% increase in land planted in corn in response to the price increase. Dyer's model for the center-west region of Mexico, considered the mid-point in his regional analyses, projects a 9% increase in land in maize, overwhelmingly among commercial producers, and a 6.4% increase in production. Other crops show reductions in land and production. Salaries increase 2% due to the increase in labor demand on commercial farms. Income from farming increases 2% overall in the region. Real incomes increase 0.5% for rural communities with small and medium-sized plots, mainly from wage income, 6.3% for large commercial producers.

One could use these modeling results to derive rudimentary estimates of the impact of eliminating dumping-level prices, which averaged 19% between 1997 and

2005. The resulting 25% increase in producer prices, comparable to the 23% increase modeled by Dyer, would generate a 9% increase in land in maize, a 6% increase in production, and farm income increases of 2%. Alternatively, one could estimate the increase in land and production from the observed 3.5% increase in land planted in corn in response to the 2007 price increase of 23%. One could assume a commensurate increase in maize production. This method of estimation suggests a significant but lower production increase from the elimination of dumping margins. If prices remained high for a matter of years, as they would if dumping margins were eliminated, one would expect to see additional increases over time in cultivation and production.

These findings are presented only to suggest the extent to which these larger economy-wide impacts of higher prices might have affected producers, impacts that would have gone beyond the simple price impacts we estimate here.

Before concluding, we discuss the implications of our findings for corn policy during the NAFTA transition period, examine the recent surge in imports of nonfat dry milk, and look at whether higher commodity prices in recent years signal an end to dumping.

Corn: Not just a question of foregone tariffs

The trend of rising Mexican corn production has certainly been encouraging. It has come despite the Mexican government's unilateral acceleration of NAFTA's transition period for liberalizing the sector under the tariff-rate quota. In nearly all years since NAFTA took effect, the government approved over-quota imports with no tariffs or very low tariffs. One exception has been the imposition of tariffs on over-quota white corn imports, and the effect of such policies is evident in the drop in imports during those years. The effect is also evident in the recent rise in white corn imports from the United States now that the TRQ has expired, a worrisome trend for Mexican producers.

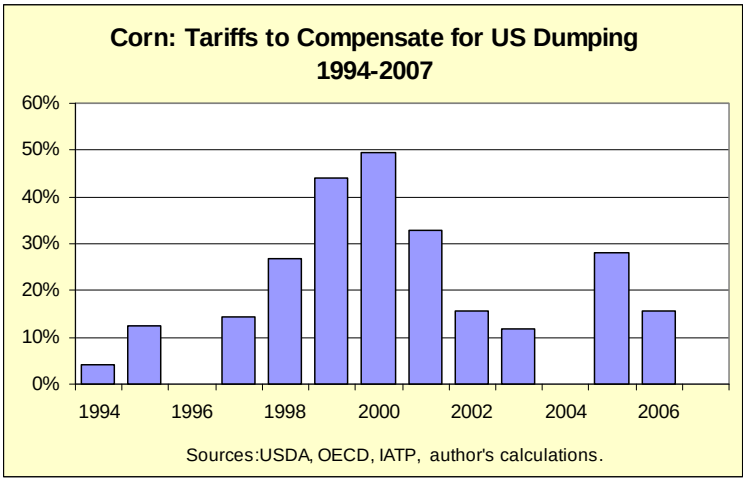
Analyses of Mexico's abandonment of the TRQ for corn have mostly centered on lost tariff revenues. Some argue that if the Mexican government had charged the full tariff allowed by NAFTA for over-quota imports, the government would have earned an estimated $3.8 billion in tariffs. While this number is compelling, it is not the best estimate of the costs of unilateral liberalization. The purpose of the TRQ, with its prohibitively high tariffs on over-quota imports, was to allow the Mexican government to limit the amount coming into the country without banning importation entirely. Only in the final years of the TRQ, when tariffs fell to 36% and 18%, would the imposition of TRQ tariffs not have had the impact of stopping or significantly reducing over-quota imports. For this reason, the $3.8 billion in foregone tariff revenues is an entirely hypothetical figure. With full TRQ tariffs, imports would have largely stopped in most years and there would have been virtually no tariff revenues.

A more helpful way to understand the impact of Mexico's unilateral liberalization of corn trade is to focus on the power the TRQ gave the Mexican government to impose tariffs to level the playing field with U.S. exporters, address unfair competition due to

dumping, and manage supply and demand for corn in a Mexican market that saw steadily rising demand. The TRQ established a ceiling for over-quota tariffs. The Mexican government had the power during the transition period to use tariffs below those high ceilings to manage the Mexican corn market for the benefit of producers. Rising demand from the livestock sector for feed corn did not need to be met by imported yellow corn, at least not to the extent allowed by the Mexican government. Tariff policies could have stimulated production of yellow corn in Mexico and could have encouraged demand for the use of native corn varieties for livestock. This would have required increased domestic production, which would have required public investment in productivity-enhancing improvements, such as irrigation. The payoff from such an investment, backed by the judicious management of the TRQ for Mexico's long-run agricultural development, would have been a significantly more competitive corn sector and decreased import dependence.

The TRQ could also have been used to address dumping. In this paper we estimate the extent to which U.S. corn has come into Mexico at prices below the costs of production. A defensive tariff could have been set at levels to address such dumping. Figure 19 shows the tariff levels that would have compensated for dumping, based on our dumping margin estimates, for the years in which the TRQ was operating, at least for over-quota corn imports. (Under-quota imports still would have been below costs.) All would have been allowed under the TRQ.

Figure 19.



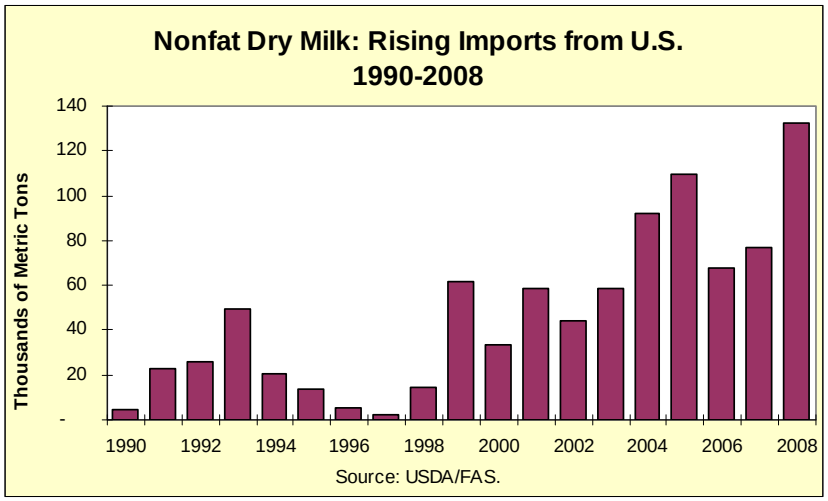
An additional question relates to the tariff levels that would have been needed to go beyond compensating for dumping and would have helped create the kind of 15-year transition toward more competitive Mexican corn production.

Nonfat Dry Milk

NAFTA set a 10-year transition for full liberalization of nonfat dry milk exports from the United States, then extended export limitations until the final phase-out of TRQs in 2008. U.S. exports nearly doubled from 2007-2008, with 2008 exports of 133,000 metric tons. This is nearly triple the average exports from 1997-2005. (See Figure 20.) Preliminary figures for 2009 suggest exports of 138,000 tons by the end of the year.

As noted earlier, U.S. dairy support programs differ from the main commodity programs, and the United States is not the price leader in international markets. Australia, New Zealand, and the European Union are the leading low-cost exporters, the latter in large part because of significant subsidies to its domestic dairy farmers. In particular, the EU provides large export subsidies, which drive down international prices.

Figure 20.



The U.S. government intervenes in dairy more than in other commodities, but subsidies come in the form of price supports, which still often leave prices below farmer costs of production. The program does not dampen price swings but rather acts as an emergency floor which is rarely breached. U.S. domestic prices exceed international prices, which the U.S. Department of Agriculture attributes to the strength of the domestic market and restrictions on dairy imports. Nonfat dry milk prices, however, are closer to international prices at about 125% of world prices (as opposed to milk fat solids at about 175%). More than half of U.S. nonfat dry milk exports are subsidized or given as food aid. Both act as a disposal method for surplus production.

Surpluses are particularly high under current market conditions. After prices rose in 2007-8, consistent with the broad run-up in commodity prices, production expanded. In late 2008 and 2009, prices plummeted on international markets. In the United States, prices fell 50% to $11-$13 per hundredweight of milk (the standard measure) when costs of production generally exceeded $17/cwt. In part, the price drop in the United States was the result of a 72% increase in 2009 in the importation of milk solids, which are not regulated under U.S. dairy import restrictions.

The U.S. government has responded to large surpluses by expanding export subsidies under the Dairy Export Incentive Program (DEIP), a subsidy program in place since 1995 that provides a direct cash payment to exporters. This allows them to sell exports at a cost below their purchase price. The U.S. government justifies such subsidies as necessary to make U.S. exports competitive with highly subsidized European exports. In 2009, DEIP subsidies could reach $170/mt, about 8% of the current export price of $2,047/mt. Exports to Mexico receive a large share of DEIP subsidies.

What does all this mean for Mexican producers? First, the United States is certainly dumping nonfat dry milk in Mexico, not only at prices below costs of production but also at prices below those on the U.S. domestic market. This is the classic definition of dumping. Eliminating U.S. export subsidies would likely reduce U.S. exports and raise prices, though it is difficult to determine the extent to which Mexican imports from other countries would hold prices down. Interestingly, an OECD study predicted that the worldwide elimination of all export subsidies in dairy would drive down prices in the European Union, raise prices elsewhere, and would also reduce U.S. exports by nearly half within five years (OECD 2002).

Second, low international prices for nonfat dry milk are not primarily the result of U.S. agricultural policies. International dairy markets are highly distorted by the policies of the European Union and many other exporting countries, including the United States. To the extent Mexico wants to protect its dairy farmers from that distorted international market, it will require a negotiated reduction in U.S. exports and export subsidies and continued protection from other exporters. Unfortunately, NAFTA leaves the Mexican government little room to pursue such policies.

Is Dumping a Thing of the Past?

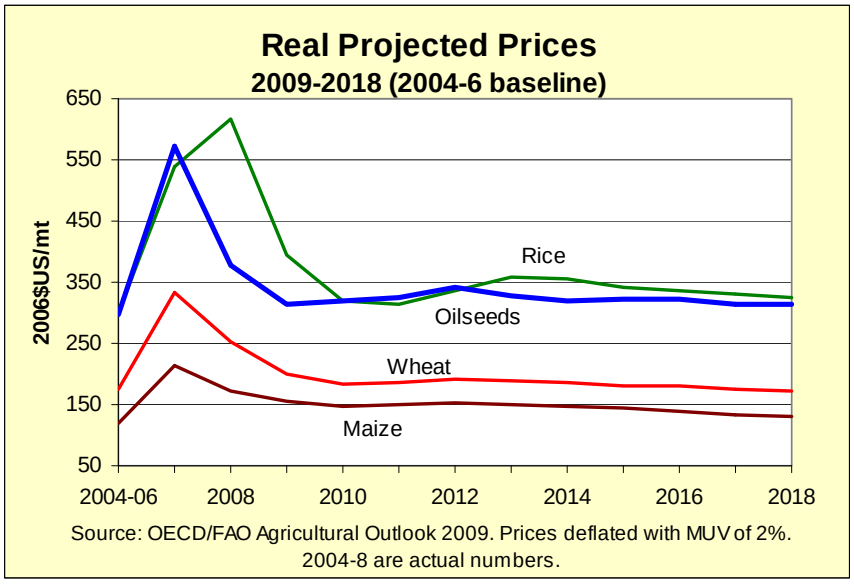
The commodity price boom of 2007-8 drove agricultural prices well above the costs of production for most crops. Worries about high food prices displaced concerns about dumping, as food shortages and riots focused attention on price volatility and on the human costs to developing countries of increased import dependence. The free-trade mantra to buy cheap and plentiful food on the international market gave way when agricultural commodities were no longer cheap or plentiful. Fortunately, it prompted a widespread call to re-examine the issue of food dependence and the related need for developing countries to continue investing in their own food-producing sectors (see, for example, World Bank 2007; G-8 Declaration 2009; IAASTD 2009).

The renewed attention to food self-sufficiency was accompanied by warnings – or promises, from the perspective of producers – that the price spikes were ushering in a new era of high prices for agricultural commodities. How justified are these projections? After all, if market prices can be expected to exceed production costs in most years, dumping could well be a thing of the past.

Projections suggest that there is some truth to the claim that agricultural commodity prices may reach a new plateau higher than the dumping level prices of the late 1990s and early 2000s. New demand for meat-based diets in large developing countries will increased the demand for feed grains, while agri-fuels, heavily supported by developed country subsidies, represent a new source of demand for agricultural land. These new sources of demand, it is argued, will keep supplies of agricultural commodities tight and prices high.

The trends indeed suggest a plateau, with most prices well below their peaks during the food price crisis but above the low levels of the early 2000s. In nominal terms, prices for rice, wheat, maize, and oilseeds in 2018 are projected to be 25%-37% higher than they were in 2004-6, though they are no higher than 2009 prices with the exception of oilseeds, which are projected to be up 19% (OECD-FAO 2009).

Figure 21.



Still, adjusted for inflation, even with a minimal 2% annual rate, most prices are scarcely higher than they were in the 2004-6 base period (see Figure 21). In real terms, wheat prices remain at their pre-spike levels, oilseed prices are just 6% higher, and rice and maize prices are projected 8% higher in 2018 than they were in 2004-6. Compared with 2009 prices, inflation-adjusted prices in 2018 are projected 13% lower for wheat, 16% lower for maize, and 17% lower for rice, while oilseed prices are flat. This may well represent an improvement over the long-term decline in agricultural commodity prices, which since 1960 have shown an average annual decline in purchasing power of about 2% (FAO 2004). It would be a serious mistake, however, to confuse a temporary halt in the long-term trends toward lower prices with a reversal of fortunes for the world's farmers.

Would such modest real price increases over 2004-6 levels eliminate dumping? Probably not. Costs of production, heavily driven by the prices for petroleum-based inputs, remain well above their pre-spike levels as well, and there is little indication that input costs will go down significantly in the future. In the United States, producers are warning that falling prices are again failing to cover high operating costs. For 2009, costs of production for corn in the United States are 17% above their 2007 levels. Preliminary price data suggest that in 2009 the United States is already exporting wheat and cotton at prices below production costs.

While the long-term trends suggest slightly higher nominal prices for some agricultural commodities, it would be a mistake to conclude that Mexican producers have seen the end of U.S. agricultural dumping.

Conclusions

The findings here confirm that U.S. agricultural policies have had a significant effect on Mexican producers, particularly in the 1997-2005 period, a time when NAFTA was in effect, the policy changes associated with the 1996 U.S. Farm Bill had been enacted, and before the recent spikes in commodity prices. Using our estimates of dumping margins, we see significant losses to Mexican producers from prices forced lower by U.S. products exported to Mexico at below their costs of production. For the eight products studied here, we estimate those losses at $12.8 billion, or $1.4 billion per year (in 2000 U.S. dollars).

To put these numbers in context, the annual losses are more than 10% of the value of all Mexican agricultural exports to the United States (including beer, which is, oddly, classified as Mexico's most important agricultural export). The losses surpass the total value of Mexico's annual tomato exports to the United States, which surged after NAFTA.

Losses to corn farmers account for nearly half of the total losses. This is not surprising, given the crop's continued importance in Mexico, the 19% average dumping margin, and the dramatic rise in U.S. exports with Mexico's failure to enforce NAFTA's transitionary tariff-rate quota. Our estimate of an average $99/ha loss in the value of Mexican corn to farmers highlights the real costs of agricultural dumping. In real pesos (2000), this is an average loss of 958 pesos/ha between 1997 and 2005, or 367 pesos per metric ton. For the lowest productivity smallholders, this eliminated any positive income from the sales of corn in the marketplace. It illustrates one of the most important reasons for the widely observed "retreat to subsistence" among Mexican smallholders: When it no longer pays to sell your corn, better to use it just to feed your family.

These losses also highlight the importance of Procampo payments to Mexican farmers, and the irony that they have compensated for U.S. dumping rather than helped farmers increase productivity. Procampo was set up as part of the transition period under NAFTA as an income-support program to help farmers become more competitive or shift

to other crops or livelihoods. On its face, Procampo was intended to address the asymmetries between U.S. and Mexican agriculture. As an income-support program, Procampo proved an important lifeline, but its value as a stimulus to competitive corn production was largely undercut by U.S. dumping. Between 1994 and 2005, the real value of Procampo payments declined 39%. In 2000 pesos, payments to the smallest producers averaged 858 pesos/ha. This was insufficient even to compensate Mexico's corn farmers for the price impacts of dumping, which averaged 958 pesos/ha. Nothing was left over to help farmers address the true sources of the developmental asymmetries between U.S. and Mexican corn farmers.

What options does Mexico now have to address U.S. dumping? The Mexican government has been providing more significant subsidies in recent years, with programs directed disproportionately to the largest commercial producers. Some have argued that this is an inefficient way to support Mexican agriculture in the face of subsidized imports, since Mexico cannot hope to compete with the resources at the disposal of the U.S. Treasury Department for agricultural subsidies (see, for example, Sumner and Balagtas 2007). Indeed, compensatory tariffs may well be more effective – and more cost-effective – in addressing dumping than trying to match U.S. subsidies, but NAFTA largely removes this option. Mexico could certainly make the case for countervailing tariffs under the WTO agreement based on high levels of U.S. corn subsidies (see Wise 2007 for a full analysis of this option). The political cost of such a claim, however, would be high. The Mexican government's decision to provide some subsidy support to corn farmers is quite rational in the context of NAFTA. The agreement left agricultural subsidies undisciplined while eliminating tariffs, in effect providing a policy incentive for agricultural subsidies.[12]

Mexico had the right to impose tariffs until 2008 but largely chose not to do so. As we've shown, the TRQ allowed Mexico the policy space to compensate for U.S. corn dumping with tariffs. Now the government's policy options are more constrained. Short of renegotiating NAFTA, or pursuing a countervailing duty claim based on U.S. subsidy levels, Mexico could request voluntary export restraints on the most sensitive U.S. exports: white corn, beans, nonfat dry milk, among others. There are precedents for such restraints, and the request is consistent with the emerging concept of "special products" in the WTO's Doha Round negotiations. (Without such export restraints from the United States, however, any Mexican claim of special products under a new WTO agreement would be meaningless, since NAFTA takes precedence over the WTO.) For the United States, white corn and bean exports are small, so a request for export restraints would represent a small concession economically, though perhaps a large concession as a precedent. Nonfat dry milk exports are more significant and would be more costly for the United States to concede.

At this point, of course, there is little indication that the Mexican government is prepared to request any such consideration from the United States, nor that the U.S. government would be willing to cooperate with such a request. This leaves Mexican producers largely undefended if and when U.S. agricultural dumping resumes. In any case, their experience stands as a stark cautionary tale for developing countries

considering trade agreements with rich countries that export agricultural products at prices below their costs of production. Agricultural export dumping costs producers dearly in the importing country.

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NOTES

[1] For a good overview of these trends, see Zahniser, S. and Z. Crago (2009). NAFTA at 15: Building on Free Trade. Washington, DC, USDA Economic Research Service. Zahniser, S. (2007). NAFTA at 13. Washington, DC, United States Department of Agriculture**:** 49. And on Mexico, de Ita, A. (2008). Fourteen Years of NAFTA and the Tortilla Crisis. Americas Program Special Report. Washington, DC, Americas Program, Center for International Policy (CIP).

[2] The OECD after 2005 ceased publishing useful crop-by-crop estimates of farm support, due to a change in methodology. These data are also for the most recent years available.

[3] We use subsidies per hectare rather than the more common measure of overall support as a percentage of crop value. For comparisons of producer support between countries with very different levels of productivity, the latter has a tendency to overstate the support levels for the lower productivity country. Estimating subsidies per hectare offers a more useful comparison. For a more detailed discussion, see Wise, T. A. (2004). The Paradox of Agricultural Subsidies: Measurement Issues, Agricultural Dumping, and Policy Reform. Medford, Mass., Global Development and Environment Institute**:** 32.

[4] Following Ritchie et al., we use national average farmer costs of production, OECD estimates of input subsidies, an averaged estimate for handling and transportation costs to the Gulf port, and annual export prices at the Gulf port.

[5] For all the products considered in this study except one, the OECD lists the United States price as the reference price for Mexico. The lone exception is beef, for which Australian beef is considered the reference price. Given that half of Mexico's beef imports come from the US, our assumption seems justified in this case (OECD (2005). Agricultural Policies in OECD Countries: Monitoring and Evaluation.)

[6] This is a stronger assumption. Mexican prices would increase by less than this if, for example, monopsony control of markets prevented full transmission of higher prices or competing imports from other countries held down prices. There is strong evidence that the former condition prevails in some markets.

[7] This is also a strong assumption. Subsistence producers would not earn this additional amount from higher prices. Thus, we are really estimating not the monetary losses but rather the lost value from dumping-level prices. Here we refer to these as losses.

[8] For corn, soybeans, and cotton, regional variation is minimal from 1997-2005, with farmer costs of production in the lowest-cost regions less than 7% below the national average. For rice, the variation is 13%, and for wheat it is 20%. Only for wheat would our dumping margin estimates be significantly affected by using regional costs of production from the lowest cost region rather than national averages.

[9] This figure is simply the total losses divided by the total land in corn for each year.

[10] As noted earlier, the estimated dumping margins and losses for wheat, based on average national U.S. cost of production, are sensitive due to the wide variation in regional efficiency. Using the most efficient region rather than the national average would result in costs of production 20% lower and dumping margins of 20% instead of 34%.

[11] Our estimates do not include most processed meats.

[12] For more detailed analyses of NAFTA and its agricultural provisions, see Wise, T. A. (2009). Reforming NAFTA's Agricultural Provisions. The Future of North American Trade Policy: Lessons from NAFTA. K. P. Gallagher, T. A. Wise and E. Dussel Peters. Boston, MA, Pardee Center for the Study of the Longer-Range Future, Boston University**:** 35-42, Zepeda, E., T. A. Wise, et al. (2009). Rethinking Trade Policy for Development: Lessons from Mexico Under NAFTA. Policy Outlook. Washington, Carnegie Endowment for International Peace**:** 23.

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