Ruffled Feathers: Tariff Rate Quotas and Voluntary Export Agreements in U.S.-Mexican Poultry Meat Trade

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Abstract

The North American Free Trade Agreement (NAFTA) opened up trade opportunities between the U.S. and Mexico in poultry products. Mexico agreed to reduce tariffs on agricultural products over the adjustment period and eliminate non-tariff barriers. As the phase-in of the NAFTA liberalizations reached completion, safeguard measures were instituted to protect Mexican producers from dumping or import surges and consumers from unsafe foods.

Under NAFTA, tariffs on poultry meat imported into Mexico fell from 260% in 1993 to zero in 2003. Imports surged and Mexican poultry producers petitioned for protection. In July 2003, Mexico imposed a bilateral safeguard measure in the form of an annual TRQ on chicken leg quarters to protect local producers for five years. This paper analyzes the background of the U.S.-Mexican poultry trade dispute and implications of the voluntary safeguard agreement.

Key Words: Voluntary export agreements, TRQs, trade policy.

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Introduction

The U.S. is Mexico's primary supplier of poultry products, mainly mechanically deboned chicken meat (MDC), chicken leg quarters (CLQs) and turkey meat in parts and frozen. The main consumers of U.S. imports are companies located along the border area and meat processors. This border area comprises the territory between the international zone with the United States and a 20 km parallel line from the international border, including a portion of Sonora and the Gulf of Mexico. This region includes major cities such as Tijuana, Mexicali, Ensenada, San Luis Rio Colorado, Ciudad Juárez, and La Paz. MDC can be shipped throughout the country, primarily for sausage producers.

Objectives

The objectives of this study are to describe the trade policy environment for imports of poultry products into the Mexican market since the implementation of NAFTA in 1994 and to analyze the impact of the 2003-2008 voluntary safeguard agreement imposed on poultry meat products imported from the United States into Mexico. This analysis is limited to chicken meat trade between the U.S. and Mexico, mainly frozen chicken leg quarters and fresh and frozen chicken cuts. Turkey meat, eggs, and other poultry products are outside the scope of this study because they were not impacted by the trade policy mechanisms imposed by the Mexican government.

Overview of Mexican Poultry Production and Consumption

The Mexican poultry industry has been the fastest growing sector of Mexico's livestock industry. From 1994 to 2005, Mexican poultry production increased by an average of 5.5% per

year. In 2005, 51% of Mexican production of chicken was concentrated in 5 states: Veracruz, Querétaro, Aguascalientes, Jalisco and the region known as Comarca Lagunera (located between the states of Coahuila y Durango). Commercial poultry production in Mexico is highly concentrated, with the top three producers—Bachoco, Pilgrim's Pride, and Tyson—accounting for 60% of the market. According to the National Poultry Industry in Mexico, the industry has generated 1,072,000 jobs, of which 178,000 are direct and 872,000 indirect jobs.

Currently, Mexican consumers prefer the wet market as a major supplier of chicken meat since they are considered to have the freshest products. Wal-Mart or other popular retailers like Comercial Mexicana, Superama, Aurrera account for 7% of the consumption. The rest of the distribution is done by selling live chicken 28%, roasted chicken 26%, public markets 25%, chicken parts 10%, and with other value added 4%.

Per capita consumption of chicken meat increased from 19.9 kg to 24.2 kg from 2000 to 2005, which represents an increase of 21.6%. Factors that favor the consumption of chicken meat in Mexico include an increase in points of product sale closer to the consumer, quality of the product (freshness), and an increase of fast food restaurants.

Mexican Poultry Imports

The Mexican market is supplied by its domestic production and imported poultry products. The main exporters of poultry products to Mexico are U.S. producers especially in Mechanically Deboned Chicken (MDC) meat and Chicken Leg Quarters (CLQ). Other countries that export poultry products to Mexico include Chile, Denmark, Hungary and Spain, although none of them represent a significant share of the Mexican import market.

In 2005, Mexico imported 502,956 tons of poultry meat and other poultry products. Forty percent of the imports correspond to MDC (partly consumed by the sausage and cold meat

industry), 30% turkey meat, 25% chicken leg quarters and thighs, and 4% other processed poultry meat.

Mexican imports of chicken meat from the U.S. increased from 125,535 MT in 1998 to 241,896 MT in 2007, representing an average annual increase of over 9% (USITC). This increase reflects both the increased demand for chicken in Mexico and the inability of Mexican producers to expand production fast enough to keep up with increased demand.

Trade Policy Environment for Poultry Meat Imports into Mexico

Under the North American Free Trade Agreement (NAFTA), tariffs on poultry meat were gradually reduced from 260% in 1993 to 0% in 2003. When NAFTA tariffs approached the zero tariff in 2002, Mexican poultry producers complained that U.S. poultry producers had an unfair advantage since they had access to feed grains at a lower cost, allegedly due to U.S. government subsidy programs. Mexican farmers perceive this as an unfair advantage. As a result of this issue, the Mexican Poultry Producers Association (UNA) presented a safeguard request to the Secretary of Economy (SE) on September 10, 2002; and based on NAFTA article 801, requested that a bilateral safeguard tariff rate of 98.8% be applied to applicable imports of chicken leg quarters from the United States. UNA indicated that such a level of protection was required to enable the poultry industry to further develop and better compete with imports of U.S. chicken. The SE concluded that as a result of the analysis done, there was enough evidence to presume that the lifting of current poultry tariffs without the imposition of safeguards would result in a significant increase in poultry imports that could cause serious damage to domestic production levels. Consequently, the SE considered it necessary to initiate an investigation to evaluate the imposition of bilateral safeguard measures on imported chicken leg quarters.

On July 25, 2003, the Secretariat of Economy published in the *Diario Oficial* (Federal Register) a decree imposing bilateral safeguard measures on imported U.S. chicken leg quarters (CLQs), which was classified under tariffs 0207.13.03 and 0207.14.04. Then a voluntary safeguard agreement was signed between the U.S. and Mexico, which established an annual tariff-rate quota on imports of fresh and frozen U.S. chicken leg quarters. The SE announced that for the period between July 25, 2003, to December 31, 2003, Mexico would issue import licenses providing duty free access for 46,950 MT of CLQs to the northern border line and the border region. This is approximately one-half of the annual 100,000 MT TRQ for 2004. This tariff-rate quota (TRQ) was administered as in the past by direct allocation. The SE established a 98.8% duty for above quota U.S. CLQ exports to Mexico. This safeguard was in place for 5 years and the tariff phased out to zero in December 2007. As an exchange for the safeguard agreement, Mexico did not impose, nor apply any other requirements or restrictions on U.S imported poultry products.

The safeguard and the TRQ were established with the objective of maintaining a degree of protection for the Mexican domestic industry (GAIN 2003). NAFTA and the safeguard agreement TRQ's for the years 1994 through 2008 are shown in Table 1. The quotas and above-quota-rates are shown along with import quantities in Figures 1a and 1b, respectively. Figure 2 shows the price of chicken leg quarters in the U.S. and Mexico. This price difference is partly attributable to the TRQ policies which act to restrain imports.

Analysis of Mexican Imports of U.S. Chicken

An econometric model was constructed to analyze the impact of deregulation of the import market though NAFTA and the subsequent implementation of the voluntary safeguard agreement on U.S.-Mexican poultry trade in three poultry products – frozen chicken leg quarters,

fresh/chilled chicken cuts (including fresh leg quarters), and other frozen cuts. The model analyzes monthly data from 1997 to 2007. This data period includes the phase-out of NAFTA TRQs from 1997 to 2002, and the voluntary safeguard agreement TRQ that started in July of 2003.

Excess Supply and Excess Demand Functions

The Mexican market for U.S. chicken is very small relative to total U.S. production, so U.S. chicken production is treated as exogenous in our estimations. The excess supply of chicken part *j* to Mexico is modeled as a function of U.S. total production of chicken and U.S. prices of part *j* exports to Mexico and the rest of the world (ROW) for the three chicken products most commonly exported to Mexico (frozen leg quarters, fresh/chilled chicken cuts including fresh leg quarters, and other frozen chicken parts). The equation for U.S. chicken part *j* is specified as:

(1) $$Q^{j}_{US\text{-}MEX,\,t} = a_0 + a_1 Q_{US,\,t} + a_2 P^{j}_{US\text{-}MEX,\,t} + a_3 P^{j}_{US\text{-}ROW,\,t} + \varepsilon_{1jt.}$$

Where all variable are as defined in Table 2.

In the Mexican inverse excess demand equation for each product *j*, the US to Mexico export price was estimated as a function of annual Mexican chicken production, the quantity of product *j* exported to Mexico from the U.S., the price of an alternative consumer product (beef), Mexican income, the exchange rate (pesos/dollar), the monthly average quotas under NAFTA and the voluntary safe agreement, the over-quota tariff rates for NAFTA and the voluntary safe agreement, and an interaction term between the quota and over-quota tariff rate. Annual Mexican production increased steadily over the data period, but those increases were limited by feed grain production constraints in Mexico and annual production was treated as exogenous in our estimation of monthly imports.

(2) $P^j_{US\text{-}MEX,\,t} = b_0 + b_1 Q_{MEX,\,t} + b_2 Q^j_{US\text{-}MEX,\,t} + b_4 P^{alt}_{MEX,\,t} + b_5 Inc_{MEX,\,t} + b_6 Ex_{MEX\text{-}US,\,t} + b_7 Q_{TRQ,t} + b_8 R_{TRQ,\,t} + b_9 QR_{TRQ,\,t} + \varepsilon_{2jt}$,

The endogenous variables in the model are: $Q^j_{US\text{-}MEX}$ and $P^j_{US\text{-}MEX}$. The exogenous variables are: Q_{MEX}, Q_{US}, $P^j_{US\text{-}ROW}$, P^j_{MEX}, P^{alt}_{MEX}, Inc_{MEX}, $Ex_{MEX\text{-}US}$, Q_{TRQ}, R_{TRQ}, QR_{TRQ}. The model was estimated with SAS using three-stage least squares.

The policy variables, Q_{TRQ} and $R_{TRQ,}$ and their interaction term, QR_{TRQ}, model the components of the two tariff rate quota policies in effect during the data period. The NAFTA TRQ was in effect from the implementation of NAFTA until December of 2002. Over this period the quantity of duty free imports increased while, at the same time, the tariff rate for over-quota imports decreased on an annual basis. The voluntary safeguard TRQ on US leg quarter imports took effect in July 2003, and continued through December 2007. As was true for the NAFTA TRQ, the TRQ quantity was gradually increased and the over-quota tariff rate was gradually decreased on an annual basis over the life of the agreement.

The policy variables represent the tariff rate quota impacts from both NAFTA and the voluntary safeguard agreement, and include separate variables for the quota and the above-quota tariff rate, and an interaction term for these variables. The impacts of the policy variables are thus calculated as follows:

(3) $$\frac{dP^j_{US-MEX}}{dQ_{TRQ}} = b_7 + b_9 R_{TRQ}, \; and, \quad \frac{dP^j_{US-MEX}}{dR_{TRQ}} = b_8 + b_9 Q_{TRQ}$$

We expected an increase in the quota level to have a positive impact on the U.S. export price of each chicken part, and an increase in the above-quota tariff rate to have a negative impact on the U.S. price. The impacts of the quota and the above-quota tariff rate were evaluated for each observation for the observed combinations of quota and tariff rates, and the average of these impacts across all observations are reported.

Considered separately, both quotas and tariffs create a difference in prices between the two countries involved in a trade. Both policies lower the price in the exporting country and raise the price in the importing country relative to the prices that would exist under free trade.

Liberalization of a quota by increasing the quota, or a tariff by decreasing the tariff rate would therefore be expected to increase the price in the exporting country and decrease the price in the importing country. Since we use the US price of leg quarter exports to Mexico in both equations, we therefore expect an increase in a TRQ quota or a decrease in a TRQ tariff rate to have a positive effect on the US export price, so we expect a positive coefficient for Q_{TRQ} and a negative coefficient for $R_{TRQ.}$ The interaction term between the quota level and tariff rate allow for the impact of each component to be influenced by the other.

Results

Parameter estimates and their probability levels are reported in Table 3. Elasticity estimates for significant non-policy variables are shown in Table 4, and policy variable impacts are reported in Table 5. Specific results for each chicken product are discussed in the following section.

Frozen Chicken Leg Quarters

In the excess supply equations for frozen leg quarters, exports of leg quarters to Mexico was positively related to the quantity of U.S. chicken production and the price of leg quarters exported to markets other than Mexico, but not significantly related to the price of exports to Mexico. The impact of U.S. chicken production on exports was as expected, but the signs of both price variables were inconsistent with theory. These results may be due to the very small share of the Mexican market for U.S. chicken meat relative to the domestic market and rest of the world exports.

Coefficient estimates for four of the five non-policy variables in the inverse excess demand equation for frozen leg quarters were statistically significant with the expected signs. The price of frozen leg quarter imports was found to be negatively related to the level of Mexican chicken production and the exchange rate (pesos/dollar), and positively related to the level of Mexican income. The elasticity of import price with respect to Mexican chicken production was estimated as -6.77, indicating a relatively strong response of imports to domestic production. The price-flexibility coefficient for leg quarter imports was estimated to be -1.20, the exchange rate elasticity was -1.23, and the income elasticity of demand for the import price was 7.03, indicating a strong price response to changes in Mexican income.

For frozen chicken leg quarters, all three policy variables were significant at the one percent level. The average impact of the quota variable, calculated as described above, was negative but had no economically significant impact on the price of imports. With respect to the impact of the above-quota tariff rate, a 10 percent decrease in the above-quota rate is estimated to increase the US price of exports to Mexico by 3.67 cents per kilogram.

Fresh/chilled Chicken Cuts

Results for the fresh chicken cuts category differed strongly from those for both frozen leg quarters and other frozen cuts. Better fits were obtained for both the excess supply and demand equations for fresh cuts, and the excess supply equation results were superior with regard to theoretical expectations for impacts of the independent variables. Coefficients of all three variables in the excess supply equation were significant at the one percent level and of the expected sign. The own-price supply elasticity for U.S. exports of fresh cuts to Mexico was estimated as 0.35. A one percent increase in the price of U.S. fresh cuts exports to other countries was estimated to reduce exports to Mexico by 1.59 percent. Exports of fresh cuts to Mexico were

also found to increase by an estimated 2.62 percent in response to a one percent increase in U.S. broiler production.

Coefficients of three of the five independent variables in the excess demand equation for fresh cuts were significant, and all were of the expected sign. The price of fresh cut imports was found to be negatively related to the level of Mexican chicken production, as expected, and positively related to the level of Mexican income. The elasticity of import price with respect to Mexican chicken production was estimated as -2.56, indicating a significant response of import demand to domestic production. The income elasticity of demand for U.S fresh chicken parts was 3.14, indicating a significant increase in the demand for U.S. fresh chicken cuts in response to increases in Mexican income. The price-flexibility coefficient for fresh cuts was estimated to be -1.03, suggesting a near unity excess demand elasticity for fresh cuts.

Impacts of the policy variables on the demand for U.S. fresh cuts were similar to those estimated for frozen chicken leg quarters. Coefficients of all three policy variables were significant in the excess demand equation. The impact of the changes in tariff-free quota levels on U.S. export prices during the period studied appeared to be insignificant. A 10 percent decrease in the above-quota tariff rate was estimated to increase the U.S. price of fresh cut exports to Mexico by 1.9 cents per kilogram.

Other frozen chicken cuts

Estimation results for other cuts, frozen were very poor for the excess supply equation, but excess demand results were similar to those for the other two chicken products examined here. Coefficients of the own-price and U.S. production variables in the excess supply equation were both significant and both had signs counter to theoretical expectations (Table 3).

Coefficients of four of the five independent variables in the excess demand equation for frozen cuts were statistically significant and all were of the expected sign. The price flexibility coefficient estimate was -1.28. The price of frozen cut imports was also found to be negatively related to the level of Mexican chicken production and the exchange rate (pesos/dollar), and positively related to the level of Mexican income. The elasticity of import price with respect to Mexican chicken production was estimated as -1.78 indicating a significant response of import demand to domestic production. The income elasticity of demand for U.S frozen cut price was the lowest of the three parts at 1.18, indicating an increase in the demand for U.S. frozen chicken cuts in response to increases in Mexican income.

Coefficients of all three policy variables were significant in the excess demand equation. The average impact of the quota variable was positive but had no economically significant impact on the price of imports. Frozen chicken cuts prices had the lowest response to the above-quota tariff rates of the chicken parts analyzed here; a 10 percent decrease in the above-quota tariff rate was estimated to increase the U.S. price of frozen cut exports to Mexico by 0.54 cents per kilogram.

The results suggest that U.S exports of the three chicken parts to Mexico under the NAFTA and the voluntary safe agreement policies were statistically impacted by the quota, but the level of the quota had no significant economic impact on the price of imports. On the other hand, the above-quota tariff rate had a significant impact on the U.S. export prices. It should be noted that both the NAFTA quota and the voluntary agreement quota stayed almost constant during the period analyzed, while the above-quota tariff rate under each program declined annually. Import levels were usually well above quota levels for both policies, and imports tended to increase as each above-quota rate declined as the policies were phased out.

The Mexican poultry industry has reported that it benefited by the TRQ on the import of U.S. chicken leg quarters under the voluntary safeguard agreement, and this was apparently due to the impact of the tariff rate on import prices. The National Poultry Association reported that the Mexican industry continues developing its technology, integrating their farm industry, and taking steps to improve quality and sanitary practices.

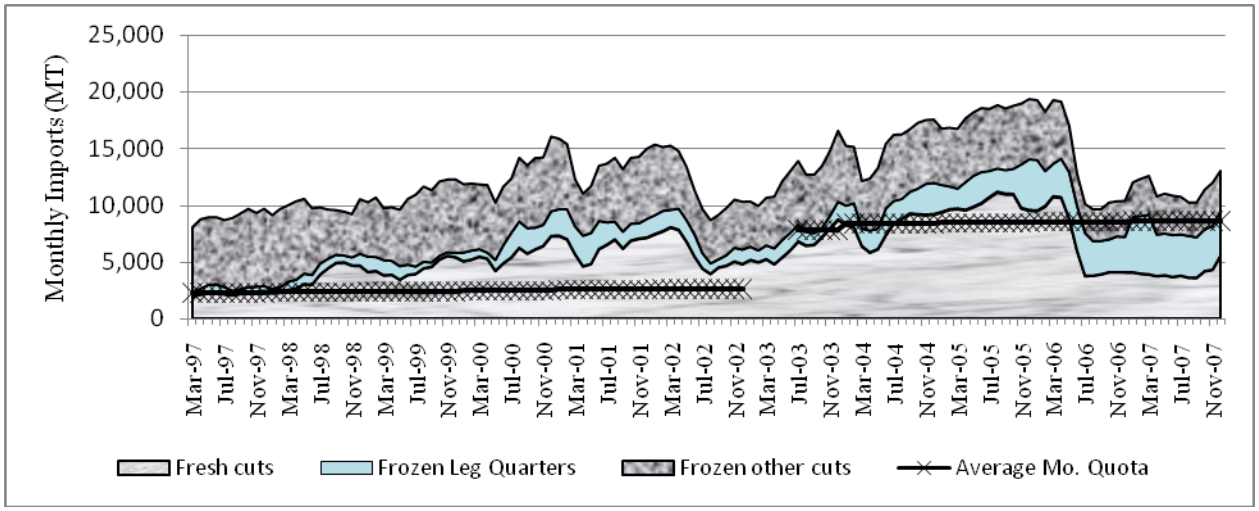

Figure 1a. Quantity of Chicken Imports from U.S by Part, and Quotas under NAFTA and Safeguard TRQ's.

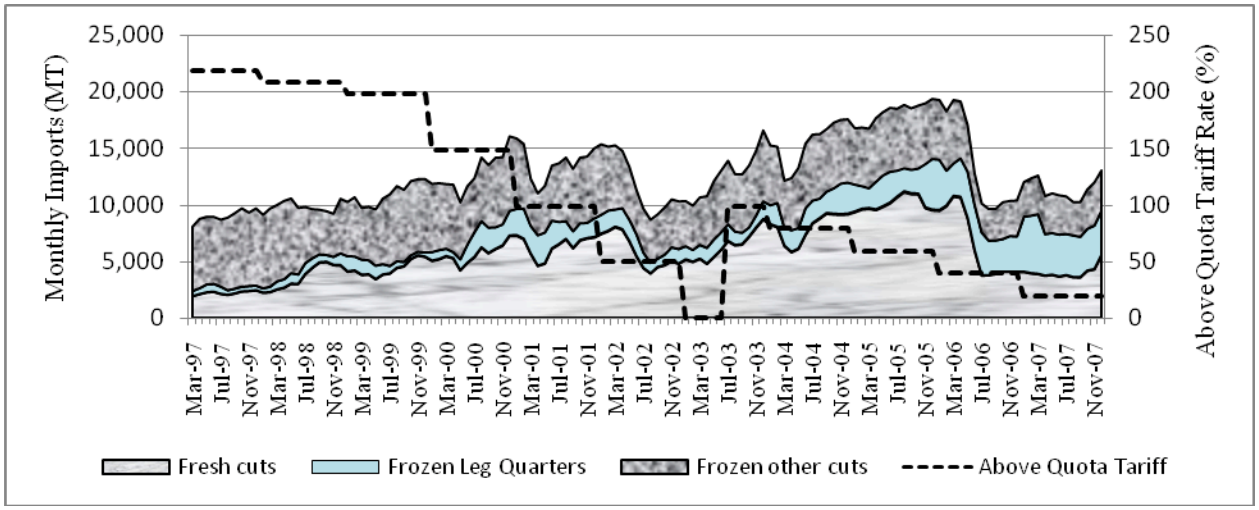

Figure 1b. Quantity of Chicken Imports from U.S by Part, and Above Quota Tariff Rates under NAFTA and Safeguard TRQ's.

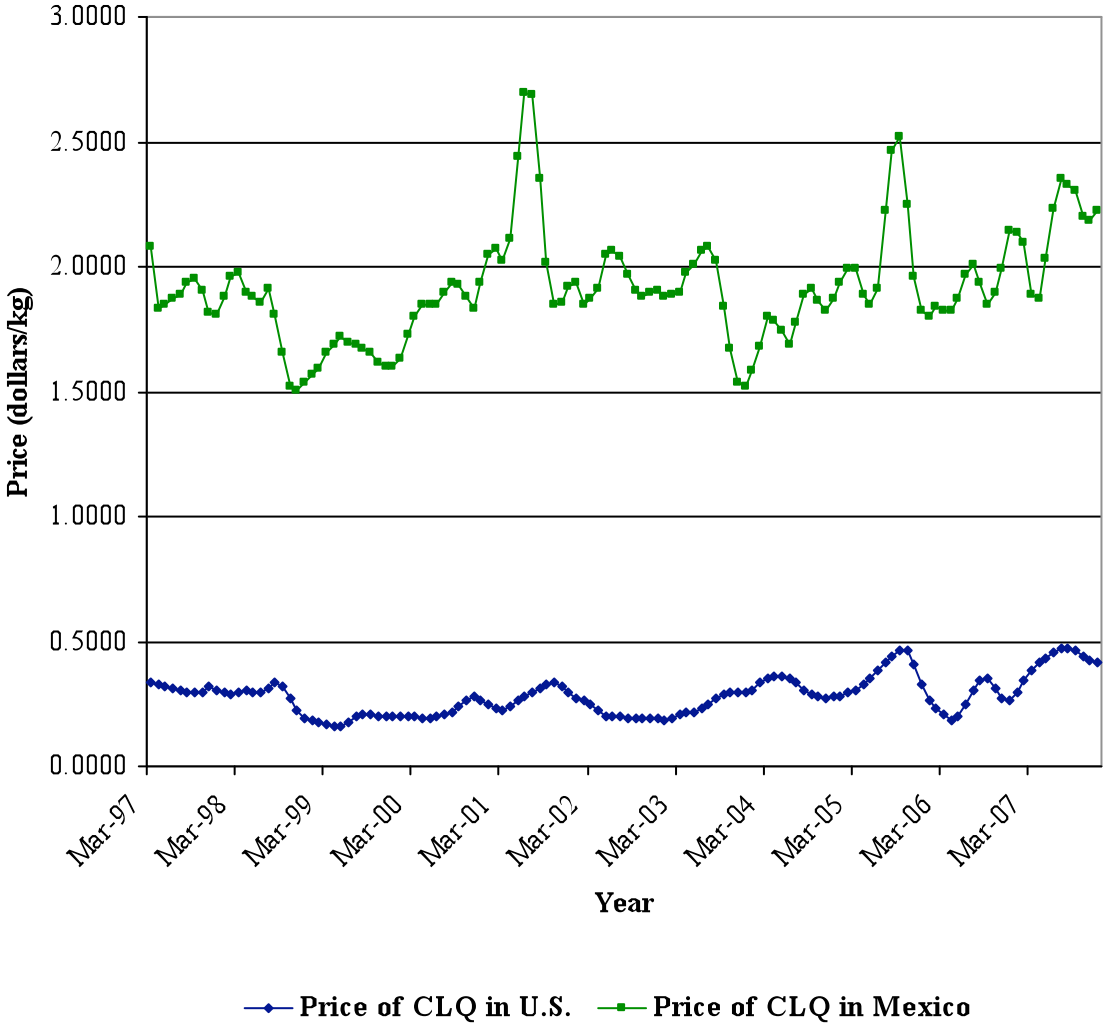

Figure 2. Price of CLQs in Mexico and U.S. 1997-2007

Source: Mexican prices: U.S. Department of Agriculture various GAIN Report (various). U.S. prices: National Agriculture Statistics Service of USDA

Table 1. Tariff Rate Quotas for U.S. Chicken Meat Imports

	Year	Quota MT	Above-Quota Tariff Rate
NAFTA	1994	26,574	249.6%
	1995	25,800	239.2%
	1996	26,574	228.8%
	1997	27,371	218.4%
	1998	28,192	208.0%
	1999	29,040	197.6%
	2000	29,911	148.2%
	2001	30,808	98.80%
	2002	31,732	49.40%
Voluntary Safeguard Agreement	January-June 2003	No quota	0%
	July-December 2003	46,950	98.8%
	2004	101,000	79.0%
	2005	102,000	59.3%
	2006	103,030	39.5%
	2007	104,060	19.8%
	2008	0	0

Source: Agro-Alimentary and Fisheries Statistical Information Service, SAGARPA.

Table 2. Variable Definitions	
Variable	Definition
$Q^{CLQo}_{US\text{-}MEX}$	Quantity of U.S. total exports[1] of frozen chicken leg quarters to Mexico. (MT)
$Q^{CUTSe}_{US\text{-}MEX}$	Quantity of U.S. total exports of fresh chicken cuts to Mexico. (MT)
$Q^{CUTSo}_{US\text{-}MEX}$	Quantity of U.S. total exports of frozen chicken cuts to Mexico. (MT)
$P^{CLQo}_{US\text{-}MEX}$	Price[2] of the U.S. total exports of frozen chicken leg quarters to Mexico. (U.S. dollars/kg)
$P^{CUTSe}_{US\text{-}MEX}$	Price of the U.S. total exports of fresh chicken cuts to Mexico. (U.S. dollars/kg)
$P^{CUTSo}_{US\text{-}MEX}$	Price of the U.S. total exports of frozen chicken cuts to Mexico. (U.S. dollars/kg)
Q_{US}	Quantity of chicken slaughtered in the US. (MT)
Q_{MEX}	Quantity of chicken slaughtered in Mexico. (MT)
$P^{CLQo}_{US\text{-}ROW}$	Price of the U.S total exports of frozen chicken leg quarters to ROW. (U.S. dollars/kg)
$P^{CUTSe}_{US\text{-}ROW}$	Price of the U.S total exports of fresh chicken cuts to ROW. (U.S. dollars/kg)
$P^{CUTSo}_{US\text{-}ROW}$	Price of the U.S total exports of frozen chicken cuts to ROW. (U.S. dollars/kg)
P^{alt}_{MEX}	Mexican domestic price of alternative product (beef meat). (Mexican Pesos/kg)
Inc_{MEX}	Mexican Income. (Mexican pesos per day)
$Ex_{MEX\text{-}US}$	Exchange rate of Mexican pesos per dollar.
Q_{TRQ}	Monthly average quota (MT) with zero tariff during NAFTA and the Voluntary Safe Agreement.
R_{TRQ}	Tariff percentage for product exported over quota during NAFTA and Voluntary Safe Agreement.
QR_{TRQ}	Interaction term between Q_{TRQ} and R_{TRQ}

[1] Total exports for all parts represent both domestic and foreign exports. Foreign exports, also referred to as re-exports, are goods that have entered the United States, but are exported as substantially the same product.(Source: USITC Data Web)

[2] FAS domestic exports value / domestic exports quantity (Source: USITC Data Web). FAS (Free Alongside Ship) is the value of exports at the U.S. port, based on transaction price, including inland freight, insurance, and other charges.

Table 3. Estimation Results for U.S. Chicken Exports to Mexico			
Variable	CLQ frozen	Chicken Cuts fresh	Chicken Cuts frozen
Excess Supply: $Q^j_{US\text{-}MEX}$			
Constant	-7844.25*** (0.0001)	-2226.1 (0.1911)	10870*** (0.0001)
$P^j_{US\text{-}MEX}$	-681.88 (0.1641)	3073.9*** (0.0047)	-4388*** (0.0001)
Q_{US}	0.0078*** (0.0001)	0.0125*** (0.001)	-0.0025*** (0.0005)
$P^j_{US\text{-}ROW}$	624.37*** (0.0002)	-7649.7*** (0.0001)	741.62 (0.3372)
Adj-R^2	0.606	0.813	0.439
Excess Demand: $P^j_{US\text{-}MEX}$			
Constant	0.7312 (0.1799)	0.2517 (0.5946)	2.5*** (0.0001)
$Q^j_{US\text{-}MEX}$	-0.00049*** (0.0001)	-0.00012*** (0.0001)	-0.00019*** (0.0001)
Q_{MEX}	-0.00003*** (0.0001)	-0.000009** (0.05)	-0.000007** (0.066)
P^{alt}_{MEX}	0.0049 (0.5828)	0.011 (0.2233)	0.0021 (0.75)
Inc_{MEX}	0.03568*** (0.0001)	0.014*** (0.0003)	0.0058** (0.0637)
$Ex_{MEX\text{-}US}$	-0.095*** (0.002)	-0.031 (0.2181)	-0.072*** (0.0073)
Q_{TRQ}	0.000273*** (0.0001)	0.00015*** (0.0001)	0.000064** (0.0320)
R_{TRQ}	0.01164*** (0.0001)	0.006*** (0.0001)	0.002295*** (0.0079)
QR_{TRQ}	-0.000003*** (0.0001)	-0.0000001*** (0.0001)	-0.00000057** (0.0567)
Adj-R^2	0.3135	0.913	0.571

Note: Numbers in parentheses are the p-values of the parameters estimators.

Adj-R^2s were calculated at the 2sls stage.

***Significant at the 10% level, **significant at the 5% level.

Table 4. Estimated Elasticities for U.S. Chicken Exports to Mexico			
	CLQ frozen	Chicken Cuts fresh	Chicken Cuts frozen
Independent Variable:	**Dependent Variable: $Q^j_{US\text{-}MEX}$**		
$P^j_{US\text{-}MEX}$	---	0.35	---
Q_{US}	5.064	2.62	---
$P^j_{US\text{-}ROW}$	---	-1.59	---
Independent Variable:	**Dependent Variable: $P^j_{US\text{-}MEX}$**		
$Q^j_{US\text{-}MEX}$	-1.20	-1.03	-1.28
Q_{MEX}	-6.77	-2.56	-1.78
P^{alt}_{MEX}	---	---	---
Inc_{MEX}	7.03	3.14	1.18
$Ex_{MEX\text{-}US}$	-1.23	---	-0.96

Table 5. Average Estimated Impacts of Policy Variables for period t			
	CLQ frozen	Chicken Cuts fresh	Chicken Cuts frozen
Independent Variable	**Dependent Variable: $P^j_{US\text{-}MEX}$**		
Q_{TRQ}	-0.00004855	-0.00001408	0.00000438
R_{TRQ}	-0.00366055	-0.00192306	-0.00054193

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