The Effect of North American Free Trade Agreement (NAFTA): Ten Years Later

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Abstract

This paper examines the economic impact of the North American Free Trade Agreement (NAFTA) on international trade among the three member countries – Canada, Mexico and the United States, in the past ten years. Through regression techniques, estimated volume and the predicted trend for exports among the countries are compared with the actual observations. The empirical results indicate that NAFTA did achieve the desired goal of increasing trade among their member countries. The actual trade volume is greater than what the estimated trade volume would have been without NAFTA. Although all the member countries have seen their exports increased, the volumes vary among the three, with Mexico being the largest beneficiary.

Introduction

The year 2003 marks the 10th anniversary of the establishment of the North American Free Trade Agreement (NAFTA). Under this agreement, a free-trade bloc was created in which the three member countries, Canada, Mexico, and the United States have removed trade barriers among themselves but keep their separate national barriers against trade with the rest of the world. The rationale behind such a trade bloc agreement is to increase trade among the member countries, which will in turn raise world economic welfare.

Ten years have passed by since the NAFTA went into effect. It is important to know and if feasible, to measure quantitatively the effects of NAFTA on the economic welfare of the member countries. The purpose of this study is to empirically examine the economic impact of NAFTA on international trade among the three member countries. Specifically, regression techniques will be used to estimate trend lines for exports among the three member countries. Then, the predicted exports for the initial eight-years of NAFTA era will be compared with the actual observations of exports for the same period for the three member countries. Finally, some conclusions will be drawn from the study.

NAFTA has generated one of the most heated debates in the 1990s and as a result of that, there has been plethora of research regarding various issues pertinent to the agreement. Free trade advocates argued that open markets would create opportunities for businesses of all member countries, which would then stimulate their domestic economic growth. Protectionists stated that domestic jobs would be lost to cheaper foreign labor. To certain degree, both have occurred. However, the net effect has been favorable for the United States and Mexico, while the effect is less significant for Canada. Overall, the impact of NAFTA is that it has changed the business environment within which firms operate. It has created both opportunities and threats simultaneously (Pett and Wolff, 2003).

Cavanagh and Anderson conducted a study examining, among other things, the economic effect of NAFTA on member countries' labor markets. The agreement has increased investment and trade among the member countries. In addition, the secondary effect is that increased international competition due to freer trade may have resulted in increase labor productivity during the 1990s. However, the achievement in productivity did not come without cost. For example, in Mexico, the reported 50% increase in labor productivity was accompanied by an 11%

slide in real manufacturing wages between 1994 to 2001. Also, the achievement was not evenly distributed in Mexico. Mexican farmers were devastated by the foreign agricultural commodities and the rural area of the country had seen a rise in poverty rate to 82%, which was partially due to the fact that NAFTA opened the floodgate to cheap U.S. corn imports. In the U.S., workers have been facing the pressure of global human-resource outsourcing. U. S. employers frequently threaten to relocate their production facilities to Mexico and other low-wage countries in order to better negotiate with unions and restrain wages (Cavanagh and Anderson, 2002).

On the contrary, some researchers have found that NAFTA has had positive effect on Mexican wages. In their study, Serra and Espinosa argued that from 1994 to 1996, Mexican firms that had exported more than 80% of their total sales paid between 58 to 67 % higher wages than the average wage rate. The researchers also argued that overall, NAFTA achieved the objective of promoting trade and investment. Ten years ago, exports from Mexico were at par with those from the rest of the Latin America region. Now, Mexico's exports nearly double those of the rest of the Latin American countries combined. Equally drastic achievement has been found in terms of foreign direct investments. During the eight proceeding years before NAFTA, the average annual inflow of foreign direct investment to Mexico was approximately $3.47 million dollars. Since then, it has exceeded $13 billion (Serra and Espinosa, 2002).

Wall conducted a study primarily focusing on the effects of NAFTA on the geographical pattern of North American trade. The research suggests that the trade patterns and geographical outsourcing patterns have changed within the NAFTA region. Because NAFTA establishes a preferential trade area (PTA) the prosperity of this region depends on the relative sizes of trade creation and trade diversion. Companies' geographical movements within the PTA can help the organization leverage its economies of scale and be in a better position to produce more which in turn creates more trade. This drive in exports then requires more inputs from within the PTA region (Wall, 2003).

Data And Models

In order to empirically estimate the effects of NAFTA, export data were collected for the three member countries for the period from 1965 to 2001. The data were gathered from two sources: International Statistical Yearbooks by the IMF and the Statistical Abstract of the United States by the U.S. Department of Commerce. Using the data from 1965 to 1993, the year NAFTA was established, six regression equations were estimated for exports from each of the three member countries to the other two. The result of the estimation is reported in Table 1.

Table 1: Regression equations for Exports among NAFTA Region

Estimated Equation of Export	Adjusted R^2	F –Test (α=0.05)	t-Test (α=0.05)
U.S. Export to Canada: $Y_1 = -10480 + 3204.946X$	0.909	p<0.000	p<0.000
US Export to Mexico: $Y_2 = -6610 + 1237.70X$	0.786	p<0.000	p<0.000
Canada Export to U.S.: $Y_3 = -11738 + 43.57X$	0.957	p<0.000	p<0.000
Canada Export to Mexico: $Y_4 = -7.126 + 8.27X$	0.777	p<0.000	p<0.000
Mexico Export to U.S.; $Y_5 = -7488 + 1327.50X$	0.898	p<0.000	p<0.000
Mexico Export to Canada: $Y_6 = -275 + 1.628X$	0.681	p<0.000	p<0.000

The Y variables are exports from the member countries and the X variable is the time series from 1965 to 1993. As shown in Table 1, all six equations are statistically significant as confirmed by the F-tests and t-Tests. The estimated equations also have relatively high adjusted R^2, which implies a good fit of the model. The positive sign for the coefficients of the explanatory variable (X) is consistent with the expectation for NAFTA, meaning the general trend of exports for all three member countries is going up.

Using the estimated equations, exports from the member countries were fitted for the initial eight years of the NAFTA era from 1994 to 2001. The fitted exports were then compared with the actual observations of exports for the same period. The results were reported in Tables 2 to 4.

Table 2: Comparison Between fitted and actual Exports from the U.S. to NAFTA

	U.S. Export to Canada				U.S. Export to Mexico			
Year	**Fitted**	**Actual**	**Increase**	**% Δ**	**Fitted**	**Actual**	**Increase**	**% Δ**
1994	85668	114438	28770	33.58%	30521	50843	20322	66.58%
1995	88872	127226	38354	43.16%	31759	46292	14533	45.76%
1996	92077	134210	42133	45.76%	32996	56792	23796	72.12%
1997	95282	151766	56484	59.28%	34234	71388	37154	108.53%
1998	98487	156603	58116	59.01%	35472	78723	43251	121.93%
1999	101692	166600	64908	63.83%	36709	86909	50200	136.75%
2000	104897	178941	74044	70.59%	37947	111349	73402	193.43%
2001	108102	163424	55322	51.18%	39185	101297	62112	158.51%

As shown in Table 2, comparing with the fitted data, U.S. exports to Canada and Mexico have both increased significantly during the first eight years of NAFTA era. For example, U.S. export to Canada increased somewhere between 33% to 70% while its export to Mexico increased even more, from 72% in 1996 to 193% in 2000.

Canadian exports to the United States and Mexico have also increased comparing with the fitted data. The country's export to the U.S. increased between 27.68% in 1994 and 87.63% in 2002. The Canadian export to Mexico increased from 32.16% in 1994 to 131.24% in 2001.

Table 3: Comparison Between fitted and actual Exports from Canada to NAFTA

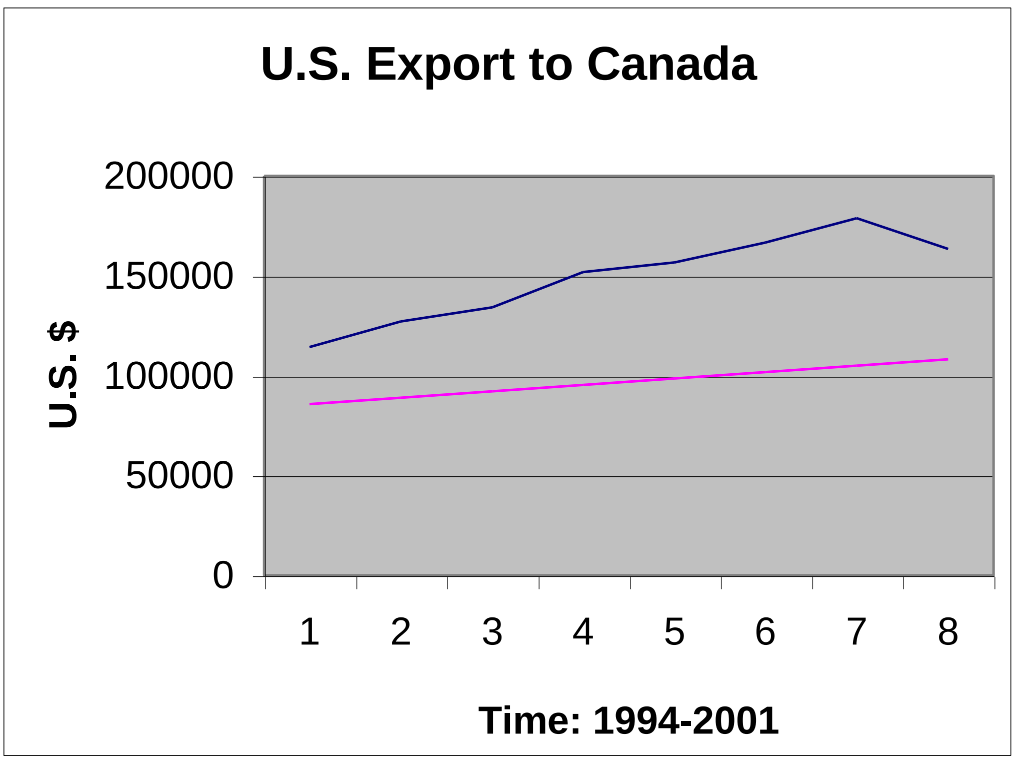
	Canada Export to U.S.				Canada Export to Mexico			
Year	**Fitted**	**Actual**	**Increase**	**% Δ**	**Fitted**	**Actual**	**Increase**	**% Δ**
1994	100569	128405	27836	27.68%	541	715	174	32.16%
1995	104312	144369	40057	38.40%	559	786	227	40.61%
1996	108056	155892	47836	44.27%	578	855	277	47.92%
1997	111800	168201	56401	50.45%	596	916	320	53.69%
1998	115543	173256	57713	49.95%	614	858	244	39.74%
1999	119287	198711	79424	66.58%	633	1025	392	61.93%
2000	123030	230838	107808	87.63%	651	1390	739	113.52%
2001	126774	216268	89494	70.59%	669	1547	878	131.24%

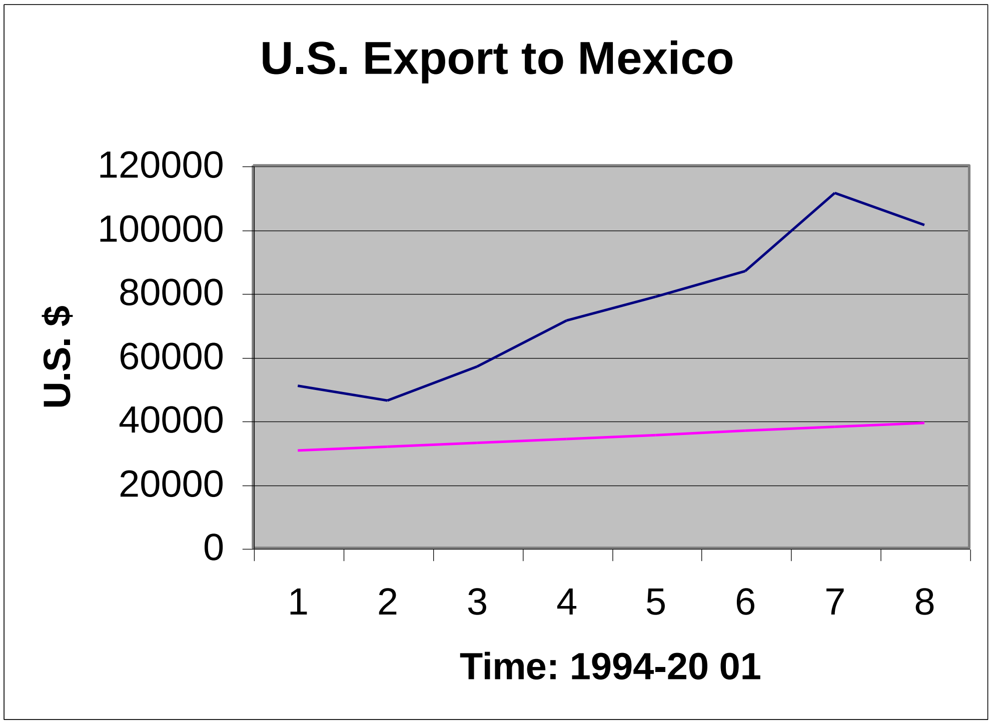
Table 4: Comparison Between fitted and actual Exports from Mexico to NAFTA

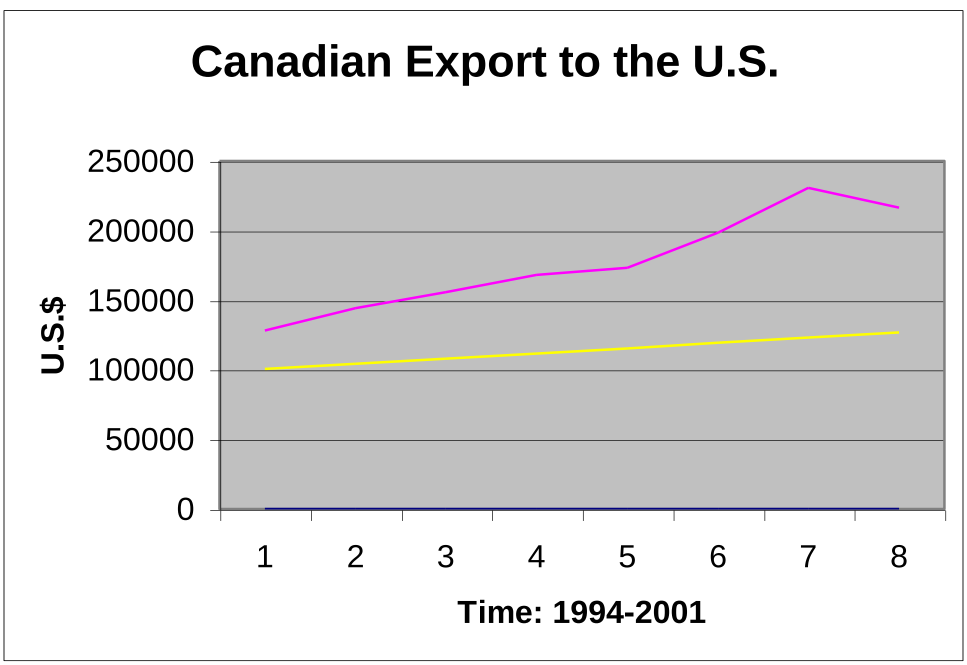
	Mexico Export to U.S.				Mexico Export to Canada			
Year	**Fitted**	**Actual**	**Increase**	**% Δ**	**Fitted**	**Actual**	**Increase**	**% Δ**
1994	32338	49494	17156	53.05%	974	1470	496	50.92%
1995	33666	62101	28435	84.46%	1015	1979	964	94.98%
1996	34993	74297	39304	112.32%	1099	2170	1071	97.45%
1997	36321	85938	49617	136.61%	1140	2157	1017	89.21%
1998	37648	94629	56981	151.35%	1182	1521	339	28.68%
1999	38976	109721	70745	181.51%	1223	2391	1168	95.50%
2000	40303	135926	95623	237.26%	1265	3353	2088	165.06%
2001	41631	131338	89707	215.48%	1307	3070	1763	134.89%

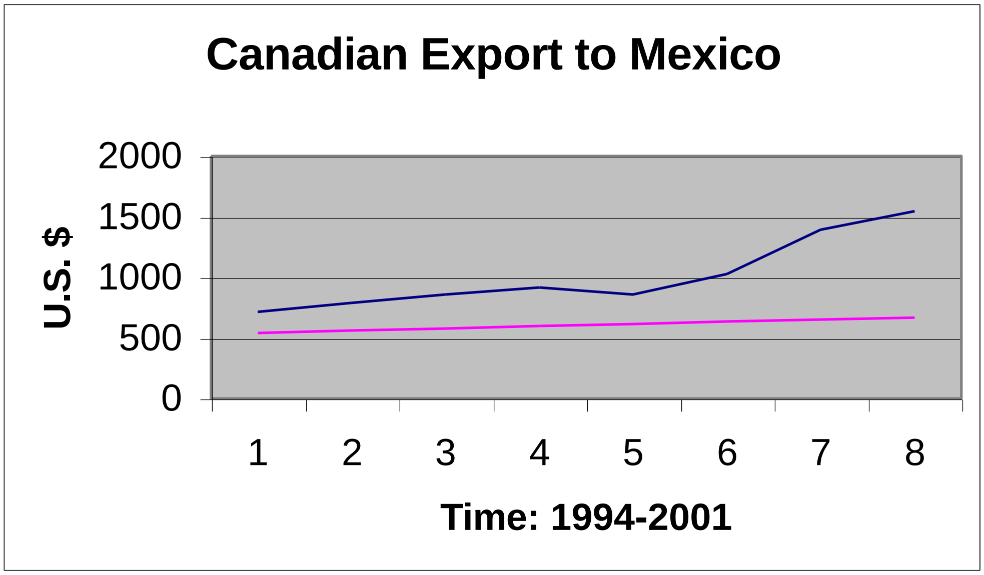
Among the three member countries, Mexico has demonstrated the highest percentage increases in its exports to both Canada and the United States. As shown in Table 4, Comparing with the fitted data, Mexico's export to the U. S. increased 53.05% in 1994, , to 237.26% in 2000. The country's export to Canada increased somewhere between 28.68% in 1998 and 165.06% in 2000.

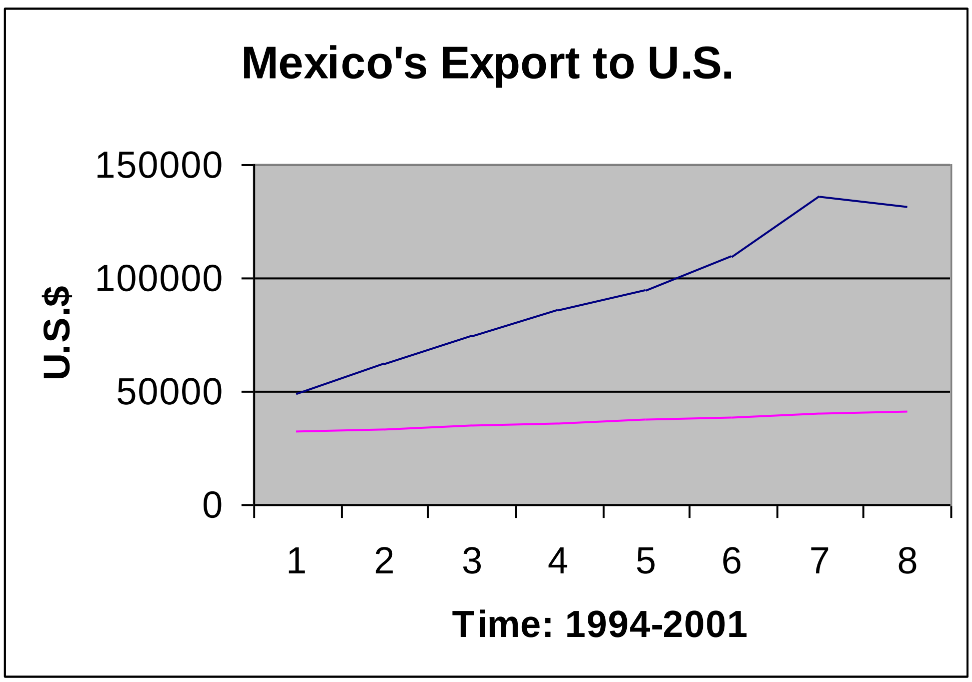
Figures 1 to 6 illustrate graphically the same information presented in the above tables. Once again, the curves representing actual exports are above the curves representing the fitted lines based on regression equations that we have estimated. In addition, the actual export curves seem to depart from the fitted curves asymptotically, suggesting the long run effect of NAFTA may be larger than the short run effect.

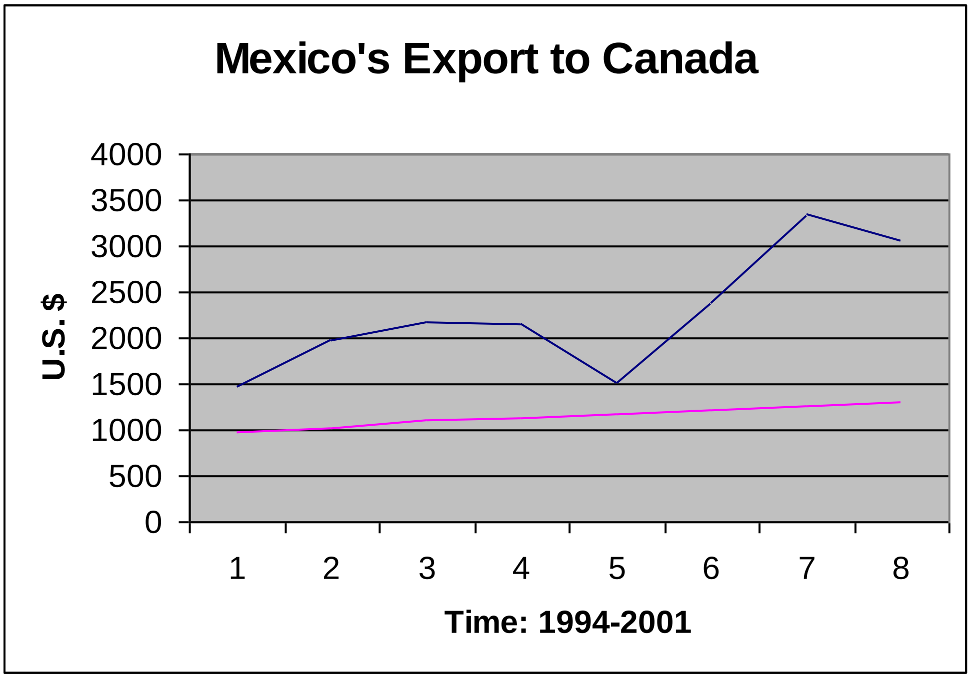



U.S. Export to Mexico
U.S. $
120000
100000
80000
60000
40000
20000
0
1
2
3
4
5
6
7
8
Time: 1994-20 01


Canadian Export to the U.S.
U.S.$
250000
200000
150000
100000
50000
0
1
2
3
4
5
6
7
8
Time: 1994-2001


Canadian Export to Mexico
U.S. $
2000
1500
1000
500
0
1
2
3
4
5
6
7
8
Time: 1994-2001


Mexico's Export to U.S.
U.S.$
150000
100000
50000
0
1
2
3
4
5
6
7
8
Time: 1994-2001



Conclusions

The empirical results of the study indicate that NAFTA did achieve the desired goal of increasing trade among the three countries. As demonstrated by the information in the table and further illustrated by the graphs, the actual trade volume, without exception, is greater than what the estimated trade volume would have been without NAFTA. Although all three member countries have seen their exports increased, the increases vary among the three member countries. It seems that Mexico has been the largest beneficiary of the three because it has achieved the highest percentage increases in exports to the other two NAFTA member countries.

The major limitation of the study is that it does not take into consideration other socioeconomic variables that might also have affected the exports. These variables may include but not limited to incomes, price indexes, exchange rates, foreign direct investments and others. In order to include these variables to conduct a more comprehensive study, a longer time period is necessary. When it is feasible, more observations in the time series will become available to facilitate a more sophisticated regression equation.

References

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Notes