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The Non-event of Produce and NAFTA

Richard Beilock
Professor of Food and Resource Economics, University of Florida

Ramon Espinel
Professor of Economics, Escuela Superior Politecnica del Litoral

Sikavas NaLampang,
Graduate Student in Food and Resource Economics, University of Florida

During negotiations leading up to NAFTA there was considerable opposition from produce producers in U.S. southern tier states. These producers feared that NAFTA, combined with Mexico's low labour and land costs, would unleash an unstoppable torrent of Mexican imports. Since enactment of NAFTA, Mexico's market share for produce in the U.S. has increased, while those of the southern tier producers have fallen. Seemingly this confirms earlier fears and threatens to harden sentiments against broader trade agreements. However, analyses of the volumes and distributions of produce shipments from 1985 through 1998 for southern tier states, Mexico, and, to facilitate comparisons, Canada and Chile, suggest that NAFTA had little, if anything, to do with these changes.

Introduction

There was widespread agreement that freer trade with Mexico, resulting from the North American Free Trade Agreement (NAFTA), would have markedly different effects on different areas of U.S. agriculture. U.S. grain, oilseeds, meat, and deciduous fruit producers would expand penetration into Mexican markets, but the opposite would occur in other areas, notably fresh winter vegetables and citrus. Producers in California, Arizona, Texas, and particularly Florida were seen as most vulnerable. Not surprisingly, there was considerable opposition to the agreement in these states, again, with Florida standing out in this regard. While the overall directions of impacts on trade from NAFTA were generally clear, their extent was a matter of considerable debate. Some viewed NAFTA's impacts as minor and overshadowed by changes in exchange rates, fuel prices, plant varieties, and so forth.[1] On the other end of the spectrum were those who saw NAFTA as a watershed event, one that precipitated drastic and possibly irreversible acceleration in Mexican horticultural imports and declines in domestic production.[2]

To shed some light on the extent to which concerns have been borne out, we present the results of a study of pre- and post-NAFTA (i.e., 1994) volumes and distributions of produce to U.S. markets by domestic and foreign producers:

Calizona (California and Arizona)	Southern tier producers	Mexico
Texas		Canada
Florida		Chile
Other Domestic		Other Imports

Patterns of imports are examined to see if and to what extent they are consistent with the hypothesis that Mexico's penetration into the United States of horticultural products accelerated, both absolutely and relative to non-NAFTA importers, subsequent to NAFTA. The distributions of produce deliveries across the United States and across seasons are also examined. Fuller descriptions of the data and approaches employed are presented in the technical annex.

EXPECTED PATTERN OF NAFTA-INDUCED IMPORTS

What patterns would be expected from NAFTA-induced import growth? Three areas in NAFTA are potentially relevant:

1. With NAFTA, tariffs on produce imports were either eliminated immediately or made subject to a phase-out schedule. Relative to 1993 average produce values reported by U.S. Customs, annual tariff reductions range from zero to 35 percent (see table 1). To the extent there is an effect from tariff reductions, market shares held by Mexico should reflect the magnitudes and patterns of those reductions.
2. NAFTA eliminated some barriers to investments in Mexican agriculture by U.S. and Canadian firms and, arguably, improved the overall climate for such investments. The expected pattern from this is uncertain. There may be lags of variable and indeterminate lengths between when investments are made and expansions/improvements realized in production. This is particularly problematic as foreign investments increased markedly in the early 1990s, in part due to anticipation of NAFTA. Moreover, with the 1994-95 peso crisis and recession total foreign investment fell precipitously [3] and growth in foreign direct investments stopped. What investment levels would have been without either the economic collapse or NAFTA is effectively unknowable.[4]
3. NAFTA mandated increased access for Mexican trucking into the United States and Canada. Arguing safety concerns, the United States has delayed implementation of the trucking reforms, and continues to restrict Mexican carriers to a narrow corridor along the border.

Table 1 Tariff Reductions from NAFTA on Selected Produce, as Percent of Value [1]

Commodity	Months[2]	Pre-NAFTA tariff, percentage of value[1]	Years for phase-out[3]	Yearly tariff reduction, percentage of value [4]
Apples	all	0	n.a.	0
Cabbage	all	0	n.a.	0
Cantaloupes	Jan-May	0	n.a.	0
Cantaloupes	May-July	35.0	15	2.3
Cantaloupes	Aug-Sep	20.0	10	2.0
Cantaloupes	Sep-Nov	35.0	15	2.3
Cantaloupes	Dec	35.0	0	35.0
Carrots, under 10 cm.	all	7.9	0	7.9
Carrots, other	all	4.0	5	0.8
Celery, reduced in size	all	7.5	10	0.8
Celery, other	Apr-July	1.4	0	1.4
Celery, other	Aug-Nov	5.5	5	1.1
Celery, other	Dec-Apr	5.5	10	0.6
Cucumbers	Dec-Feb	12.1	0	12.1
Cucumbers	Mar-May	16.4	15	1.1
Cucumbers	June	16.4	5	3.3
Cucumbers	July-Aug	8.2	0	8.2
Cucumbers	Sep	16.4	5	3.3
Cucumbers	Oct-Nov	16.4	15	1.1
Grapefruit	Aug-Sep	2.3	0	2.3
Grapefruit	Oct	1.9	10	0.2
Grapefruit	Nov-July	3.0	10	0.3
Grapes	Feb-Mar	0.2	0	0.2
Grapes	Apr-Feb	0.2	0	0.2
Lettuce	Dec-Mar	11.8	10	1.2
Lettuce	Apr-Mar	11.8	5	2.4
Lettuce	June-Oct	2.4	0	2.4
Lettuce	Nov	11.8	5	2.4
Onions	all	8.3	10	0.8
Oranges	Dec-May	5.5	5	1.1
Oranges	June-Nov	5.5	0	5.5
Peaches	all	.06	0	0.6
Squash	Oct-June	2.7	10	0.3
Squash	July-Sep	2.7	5	0.5
Sweet Corn	all	25.0	5	5.5
Tomatoes	Mar-July	6.1	10	0.6
Tomatoes	July-Aug	4.3	5	0.9
Tomatoes	Sep-Nov	6.1	5	0.7

Commodity	Months[2]	Pre-NAFTA tariff, percentage of value[1]	Years for phase-out[3]	Yearly tariff reduction, percentage of value [4]
Tomatoes	Nov-Feb	4.3	10	0.4
Tomatoes, cherry	May-Nov	4.3	5	0.6
Tomatoes, cherry	Dec-Apr	4.3	0	4.4
Watermelons	Dec-Mar	20.0	0	20.0
Watermelons	Apr	20.0	0	20.0
Watermelons	May-Sep	20.0	10	2.0
Watermelons	Oct-Nov	20.0	0	20.0

NOTES: 1. In some cases tariffs are expressed as percentage of value. When tariffs are expressed in terms of dollars per kilogram, conversion to percentage of value equivalence was done using the average value reported by U.S. Customs for 1993. These values are the averages across all months and subtypes (such as cherry and regular tomatoes) of a commodity.

2. Divisions either at the end or the middle of the month.

3. Number of years after initiation of NAFTA over which tariff declines to zero.

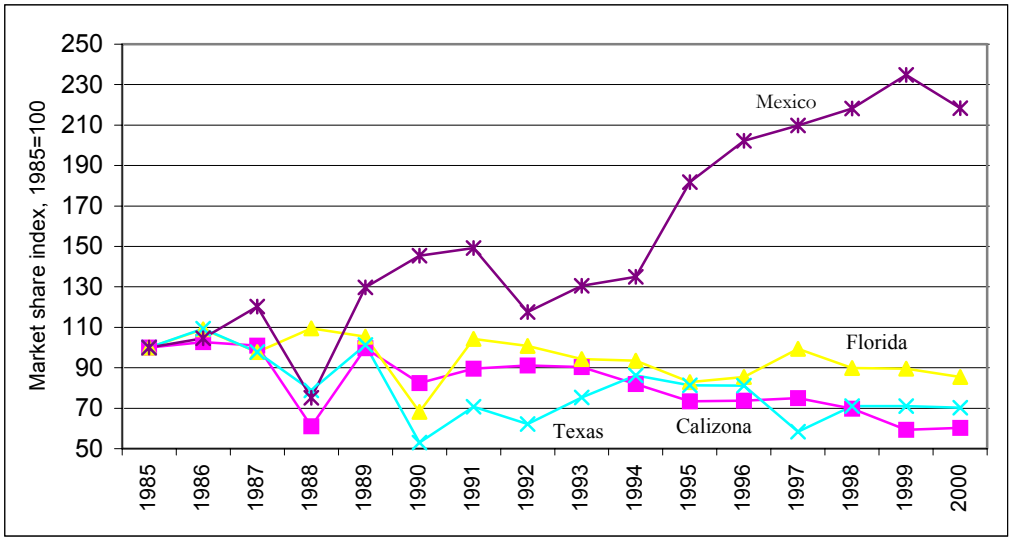
4. Average annual decline in tariff expressed as a percentage of 1993 average commodity value.

Results

All Produce

In figure 1 indices of the market shares for all produce are presented for Calizona, Texas, Florida, and Mexico. The data appear to vindicate the doomsayers. Clearly the positions of the domestic producers have been progressively eroded by Mexico, and NAFTA has greatly accelerated this decline. However, looks may be deceiving. Certainly the three southern tier producers lost market share over the entire period, while Mexico gained. But to what extent were the losses of the former captured by and due to Mexico and were Mexico's dramatic gains and southern tier producer losses in the mid-1990s the result of NAFTA?

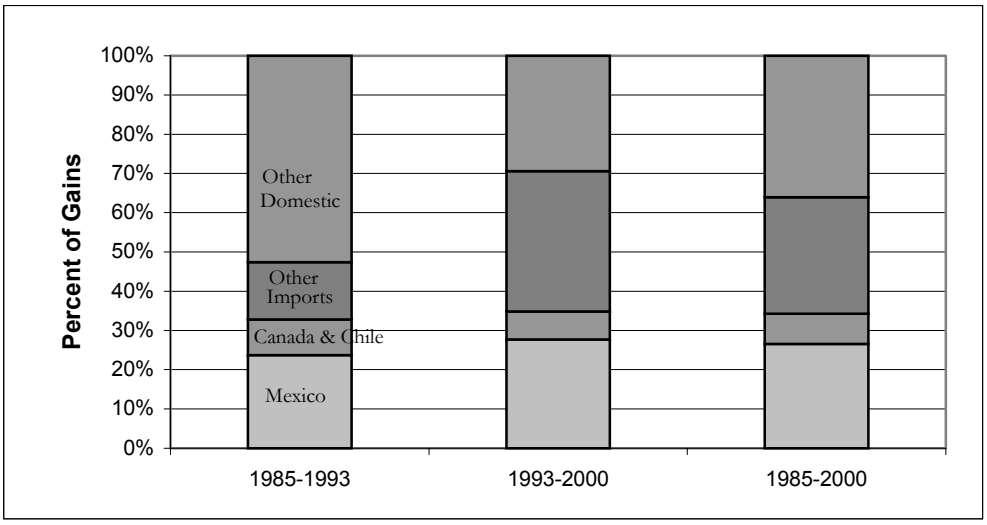
Figure 1 Index of Market Shares in U.S. of Calizona, Texas, Florida and Mexico: All Produce: 1985-2000



Mexico versus the Southern Tier Producers

Between 1985 and 2000 the combined market share of the three southern tier producers fell from 55 to 36 percent; just over 70 percent of this decline was subsequent to NAFTA, from 1994 through 2000. Over the same period, Other Domestic, Chile, Canada, and Mexico all realized gains in market shares. Whether one examines the entire 16-year period or the pre- or post- NAFTA years separately, Mexico accounts for only about a quarter of those gains (see figure 2). In other words, approximately three-quarters of the ground lost by the three southern tier producers was captured by producers other than Mexico.

Figure 2 Relative Market Share Gains by Other Domestic and Imports for All Produce: 1985-2000



Indeed, there is surprisingly little evidence of a relationship between the market shares of the three southern tier producers and that of Mexico. The simple correlations between indices of the market shares of Mexico and each of the southern tier producers are negative and statistically significant (see the technical annex, exhibit A.1). These negative correlations suggest that Mexico's market share rose (fell) at the expense (to the benefit) of the each of the southern tier producers – again, appearing to vindicate the doomsayers. But statistically significant correlations using time series data may be a result of commonly experienced changes across time, such as technological developments, rather than underlying interrelationships. To test this, each of the southern tier market share indices was regressed against Mexico's market share index and a trend term. The results indicate that with the addition of a trend term, information about movements in Mexico's market share is of little or no value in explaining movements in the market shares of any of the three southern tier producers (see the technical annex, table A.1).[5] In other words, the market shares of the southern tier producers have changed over time, but these changes have, apparently, been independent of changes in Mexico's market share.

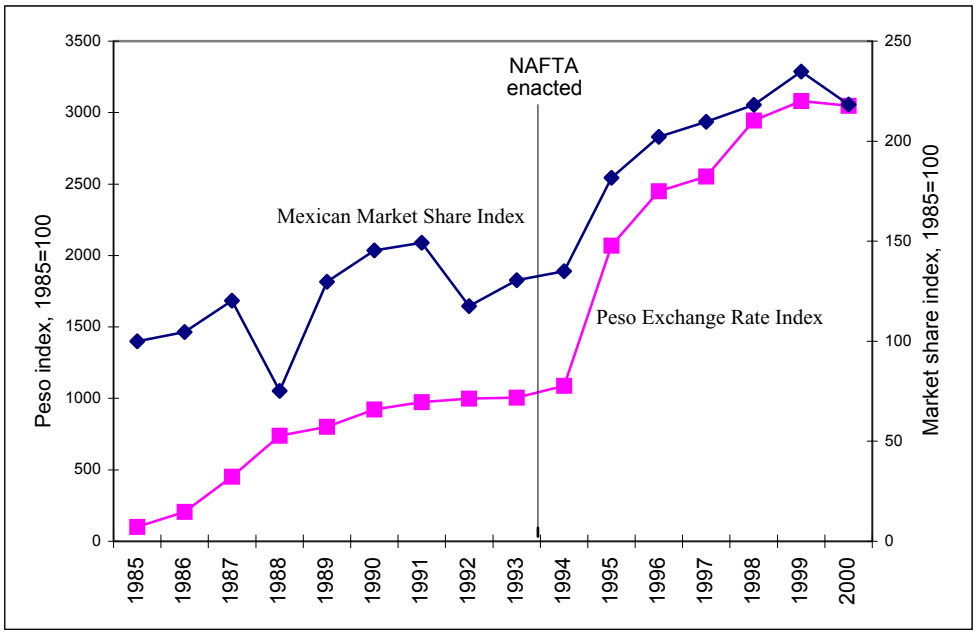
Of course, Mexican producers compete with those in the southern tier states and, as such, there are numerous occasions when a Florida or Texas or California producer ships an additional truckload of product at the cost of its Mexican

counterpart shipping one less truckload, and vice versa. The analysis does not indicate that this never happens. Rather, it suggests that the U.S. produce market is complex, with competition not only among these four players but also with Other Domestic, Canada and Chile, and Other Imports. Given this complexity, in the aggregate, Mexican gains or losses do not necessarily result in the reverse for the southern tier producers. An indication of this is that between 1993 and 2000, when Mexico made its most dramatic market share gains, Calizona, which is generally thought to be the least vulnerable of the southern tier producers to Mexican competition, realized the largest absolute and percentage market share losses.[6]

NAFTA and the Mid-1990s Increase in Imports from Mexico

Referring back to figure 1, it is evident that Mexican imports rose rapidly in the mid-1990s before essentially stabilizing at a higher level. This rise was coincident with enactment of NAFTA, and the agreement is frequently pointed to as the primary cause. But there are solid reasons to question this:for many of the most important horticultural products (most notably tomatoes) the tariff relief was small and/or spread out over several years; it seems doubtful that earlier investments would show their effects so suddenly or that post-enactment investments would have had time to take effect; and the trucking liberalizations never happened. Coincident with NAFTA's enactment was an economic crisis with the rapid devaluation of the peso as its most notable feature, which is frequently cited as a cause for the overall increase of imports from Mexico in the mid-1990s. Indeed, the ebb and flow of the peso against the dollar tracks well with Mexico's produce market share in the United States (see figure 3).

Figure 3 Indices of Peso exchange rate and Mexican market share in U.S. produce market



To explore if and to what extent changes in the peso and NAFTA have influenced Mexico's market penetration, the index of Mexico's market share was regressed against a trend term, the peso/dollar index, and either a binary variable equaling zero before 1994 and one thereafter or a variable equaling zero through 1993 and becoming a trend term thereafter. The results, presented in table A.2 of the technical annex, are startling. The peso/dollar index alone explains 91 percent of the variation in Mexico's market share index. The addition of the trend term and/or the variables indicating the enactment of NAFTA do nothing to improve the explanatory power. In other words, there is no indication that NAFTA affected Mexico's overall market share in the U.S. produce market.

Individual Commodities

We now turn to brief, primarily graphical, analyses of six individual commodities: tomatoes, carrots, onions, squash, cucumbers, and cantaloupes. These were selected because of both their importance and their range with regard to tariff reductions.

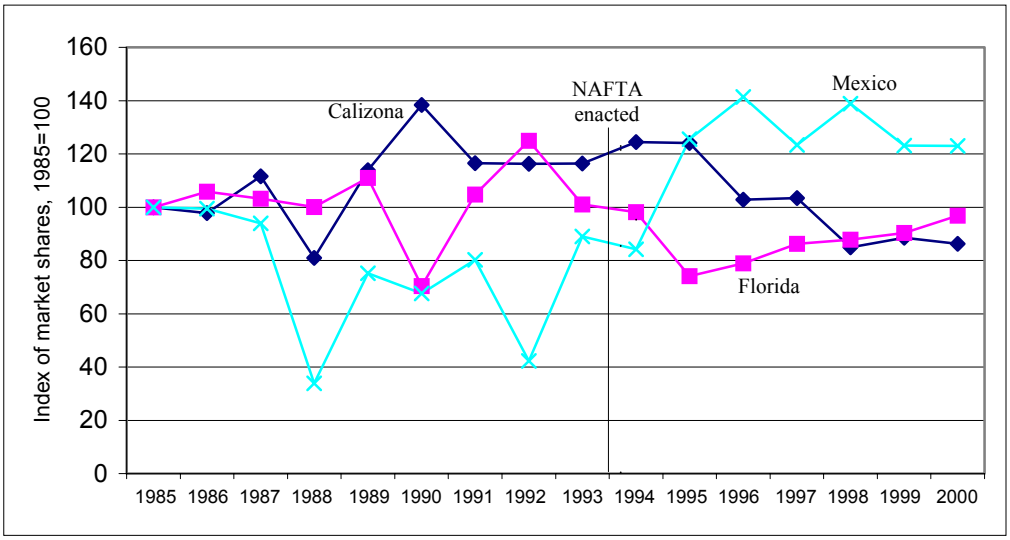
Tomatoes

In terms of both value and volume, tomatoes are Mexico's most important produce export to the United States. Not surprisingly, much of the debate about produce leading up to NAFTA revolved around this commodity despite the fact that the tariff relief, as a percentage of value, was among the lowest in the agreement (see table 1). Fueling controversy about the treaty was the increased penetration by Mexico into U.S. markets in the early and mid-1990s due to technological and marketing improvements[7] and, in the eyes of some, unfair pricing practices (Girapunthong, 2000). In apparent and bitter justification of NAFTA's opponents, Mexico's market share in the U.S. fresh tomato market in 1995 was almost 50 percent greater than in 1994, while Florida's fell by a quarter (see figure 4). There is no doubt that in 1995 Florida tomato producers suffered from Mexico's competition. But NAFTA's role in this is debatable for five reasons:

1. As already noted, tariff relief from the agreement was slight.
2. Mexico's share in the U.S. tomato market began its expansion two years before NAFTA.
3. Imports from other sources, such as Canada, also rose over this period.[8]
4. If and to the extent increased market penetration was due to Mexico selling product below fair value, the inroads were not due to the treaty.
5. The rise in Mexico's exports to the United States coincided with the rapid devaluation of the peso.

Since 1995, Mexico's market share has stabilized, while Florida's has recovered to 1985 levels and Calizona's has eroded (figure 4). Between 1995 and 1998, Calizona lost approximately 10 percent of the market share in both the third and fourth quarters of the year.[9] As with all produce, Mexico acquired only a fraction of the market share ceded by Calizona. In the third quarter, Calizona's losses were made up, almost equally, by Mexico, Canada, and Other Imports and in the fourth quarter by Florida.

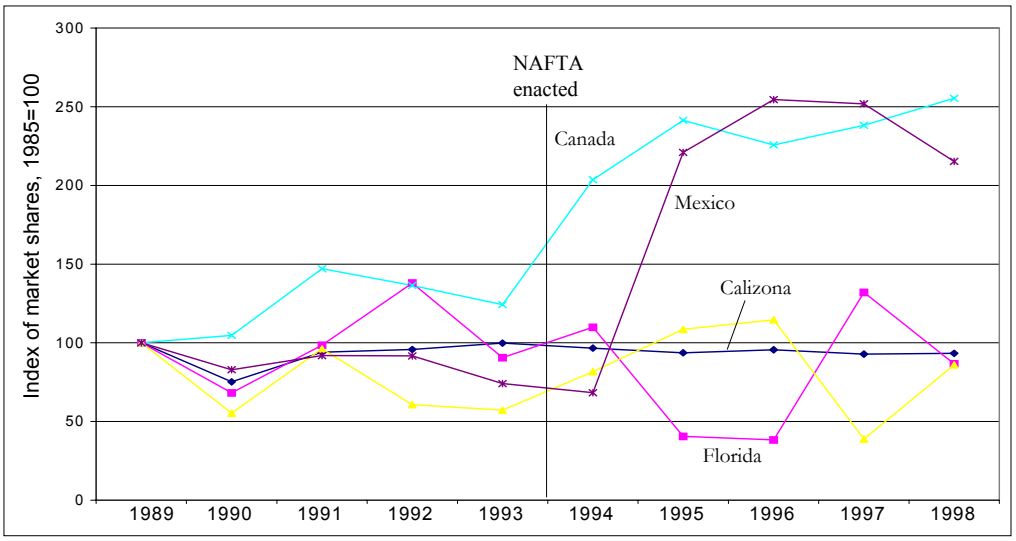
Figure 4 Index of Market Shares in US of Calizona, Florida, and Mexico: Tomatoes, 1985-2000



Carrots

Carrots are a fairly minor export crop for Mexico. With between 75 and 80 percent of the market, Calizona is the dominant supplier. Carrots are included here because of their similarity with tomatoes. For both: (1) tariff relief under NAFTA is small (see table 1),[10] (2) Mexico's market share in the United States rose sharply in 1995 and stabilized thereafter, and (3) other importers, notably Canada, also experienced gains (see figure 5). The small tariff relief, the coincidence of rising Canadian imports, and the peso devaluation suggest that NAFTA was not the primary catalyst for the rise in Mexican imports.

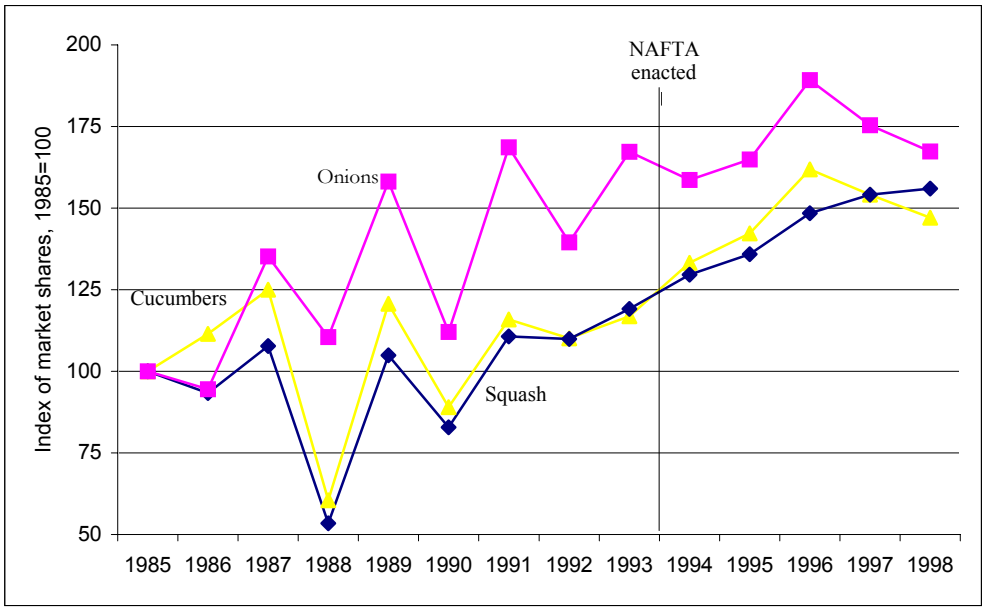
Figure 5 Index of Market Shares in US of Calizona, Florida, Texas, Canada, and Mexico: Carrots, 1989-1998



Onions, Squash, and Cucumbers

For onions and squash, NAFTA provided Mexico with minor tariff relief. Depending upon the season, tariff relief for cucumbers ranged between 1 and 12 percent of the 1993 product value (see table 1). Mexico is an important and growing supplier in the U.S. market of these commodities. Figure 6 presents their market share indices for Mexico. As can be seen, in each case the growth of Mexico's share predates NAFTA and there are no evident discontinuities before and after enactment.

Figure 6 Index of Mexico's Market Shares in US of Cucumbers, Squash, and Onions, 1985-1998



Cantaloupes

Mexico is an important supplier of cantaloupes. In 1991, Mexico accounted for just over a quarter of the U.S. market. However, by 1993 this had declined to 12 percent. Whether due to NAFTA and/or other factors, between 1993 and 1998 Mexico's market share rebounded to 19 percent. However, the ebb and flow of Mexico's market share was dwarfed by the explosive growth of Other Imports, primarily from Central America (see figure 7), suggesting that NAFTA was, at best, a minor factor. What is most interesting about cantaloupes is not that Mexico's market share rebounded after NAFTA's enactment, but that this is one of the few instances where the pattern of the increase suggests a response to tariff relief. Mexico exports virtually no cantaloupes to the United States during the third quarter of the year. Under NAFTA, there was no tariff relief in the first quarter (as there had not been a tariff) and annual reductions equivalent to 2.3 percent of the 1993 product value for most of the second quarter and fourth quarters (see table 1). Also, in the last month of the fourth quarter, the tariff, equivalent to 35 percent of the 1993 product value, was removed in 1994. Figure 8 presents quarterly market share indices for Mexico in the U.S. cantaloupe market. As one moves from the pre-enactment period to the post-

enactment period, there is no recovery for first quarter Mexican exports to the United States, but there are sharp recoveries for the second and fourth quarters, the quarters for which there was tariff relief.

Figure 7 Index of Market Shares in US of Imports , Cantaloupes, 1985-1998

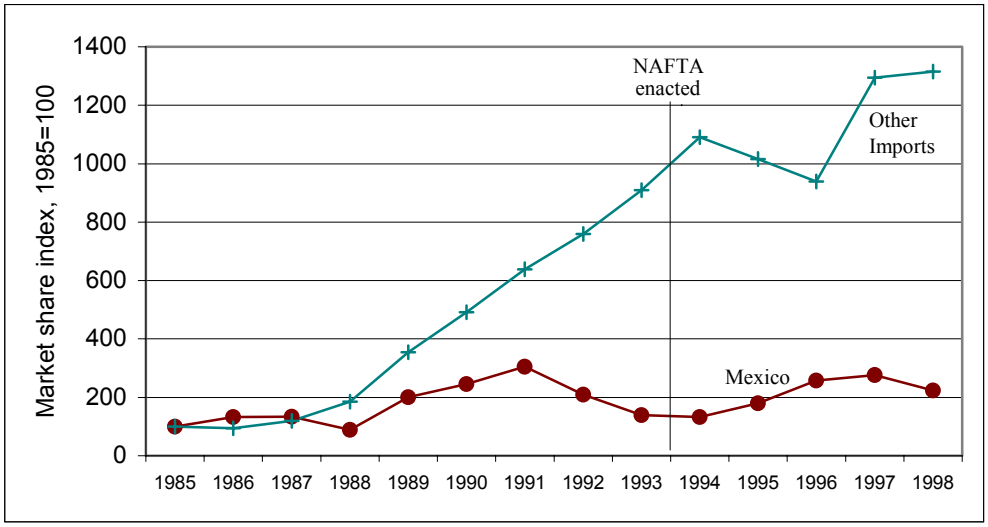
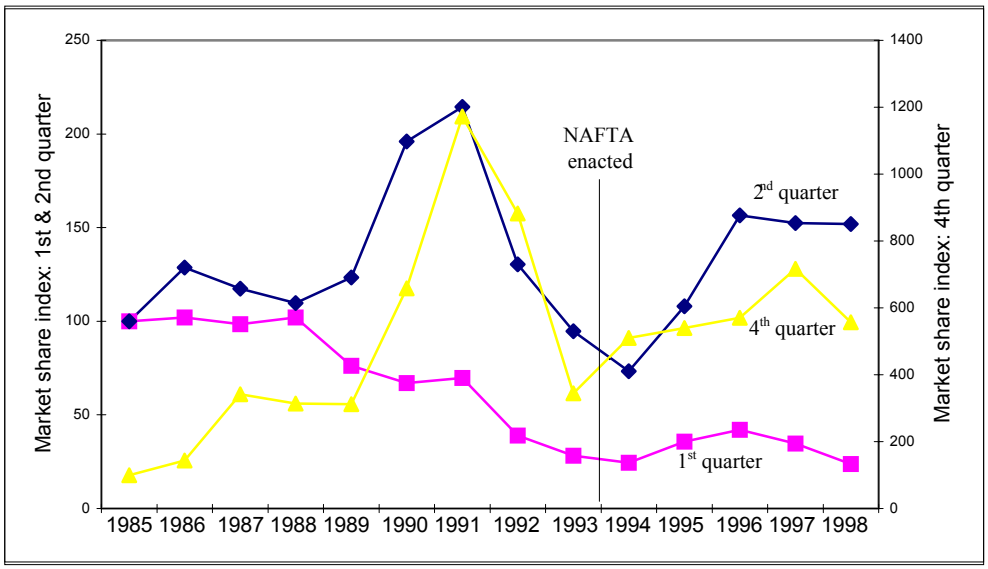


Figure 8 Quarterly Mexican Market Share Indices for Cantaloupes in U.S. Market: 1985-1998, 1985=100



Conclusions

Superficial evidence and popular outcries to the contrary, the pattern of changes in Mexican imports and imports from other sources yielded surprisingly little evidence of a link with NAFTA. Indeed, at least at an aggregate level, over 90 percent of variations in Mexico's market share in the United States can be explained by the peso/dollar rate, with information regarding NAFTA adding little or nothing. The analysis also suggested that competition in the U.S. produce market is more complex than a simple alignment of southern tier producers versus Mexico. Atthe aggregate level, there is little relationship between Mexico's market share and those of any of the three southern tier producers. This does not indicate an absence of competition among these producers, but it does indicate that gains (losses) by one can and frequently do come at the expense (advantage) of other producers, such as Canada and Other Domestic producers.

The examination of individual commodities supports the view that NAFTA has had little impact on Mexican exports to the United States. In several cases, such as that of squash, Mexican penetration into U.S. markets preceded enactment of NAFTA

and/or showed no acceleration after enactment. In other cases, such as those of carrots and tomatoes, increases in Mexican exports following enactment occurred despite minimal tariff relief and were largely matched by other importers. These facts suggest that increases resulted from factors that were unrelated to NAFTA and from which other producers also benefited, for example, poor weather in Florida or adoption of improved technology. In addition, Mexican exporters benefited from the peso crisis and possibly, in the case of tomatoes, unfair pricing practices.

These results may seem surprising, but are consistent with the generally low level and/or lengthy phase-in of tariff relief granted under the agreement. The longer-run impacts of NAFTA on produce movements may be more pronounced. The severity of the 1994-95 peso crisis and economic downturn likely over-rode or masked other effects, including NAFTA, and delayed realization of the agreement's potential for encouraging investments. Another limiting factor may be the postponement of NAFTA's transportation provisions. However it is clear that NAFTA did not bring about dramatic, negative changes for the U.S. produce industry. It is hoped that this knowledge will give confidence to U.S. producer groups and their supporters as the economies of North America become more integrated and will encourage them to adopt more balanced, less reactionary negotiating positions as broader trade agreements are considered.

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Endnotes

1. For example, the U.S. International Trade Commission listed the following as major causes of increased Mexican horticultural imports throughout the 1990s: increased consumer demands, frosts in Florida, and technological advances in Mexico. NAFTA's impacts were seen as relatively minor. Also see National Food and Agricultural Policy Project, 1997; de Janvry, Sadoulet, and Davis, 1997; and Malaga, 1997.
2. For example, Skip Jonas of the Florida Tomato Committee believes NAFTA has devastated the Florida tomato and citrus industries (statement made at a WTO Listening Session, June 4, 1999).
3. Actually becoming negative in 1995.
4. It could be argued, as does de Janvry, that the impacts of liberalized foreign investments are small. For all of Mexican agriculture, direct foreign investments in agriculture account for 0.1 percent of all direct foreign investments and have never been above $50 million in any year (Economist Intelligence Unit, 2000). However, the full value of the technological, marketing, and management advances from and accompanying such investments may not be reflected by

investment totals. Moreover, improvements outside of agriculture, particularly in communications and transportation, can contribute to Mexico's agricultural export capacity.

5. A somewhat less direct way of examining this is to regress the indices of southern tier producer market shares against a trend term and either a binary variable (NAFDUM) denoting pre- and post- enactment periods or a post-enactment slope shifter for the trend term (NAFTRND). The results of such estimations are: for Florida, insignificant equations; for Calizona, significant equations explaining less than 60 percent of the variation and with no significant explanatory variables; for Texas, equations that are significant though weak, explaining about 55 percent of the variation. In both of the Texas equations, the parameter estimates for the trend term are significant and negative. The parameter estimates for NAFDUM and NAFTRND are positive (indicating improvements in the post-enactment period), and the former is significant. These results are available from the authors on demand.
6. Using an index of market shares with 1993=100, in 2000 the index for Calizona was 67, compared to 93 and 91 for Texas and Florida, respectively.
7. An example of technological improvements was the adoption of extended-shelf-life varieties which enabled Mexican growers to improve the quality of the delivered product and to lower wastage. During the late 1980s and 1990s, CAADES, the grower association in Sinaloa State, was instrumental in assisting its growers in tailoring their production, packaging, and marketing practices to those favoured in the United States.
8. Between 1994 and 1995 Canada's market share increased by 59 percent and that of Other Imports increased by 22 percent. Taking a longer view, using a 1993-based market share index, in 2000 Mexico's index for tomatoes was 138, that of Other Import's was 161, and that of Canada was 1,357. It should be stressed, however, that Mexico remains by far the dominant importer.
9. Calizona's second quarter in 1998 was poor; however, this appears to be an aberration, perhaps weather-related, contrary to trends to that point.
10. The exception to this is carrots under 10 cm, where the 1994 tariff elimination was equivalent to nearly 8 percent of the 1993 value (see table 1).

The technical annex to this paper, pages 159-162, is available as a separate document.