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ABSTRACT

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In this paper we study the effect of NAFTA on the responsiveness of Mexican economy to real exchange rate shocks. We argue that, by opening the U.S. and Canadian markets to Mexican goods, NAFTA made it easier for domestic producers to take advantage of the opportunities brought by the depreciation of the real exchange rate. To identify this mechanism, we use plant-level data and compare the behavior of employment, production and investment after two big real exchange rate shocks: the first observed in the mid 1980s, the second the Tequila Crisis of 1994-5. The evidence indicates that after passage of NAFTA exporting firms exhibited higher growth rates of employment, sales, and investment vis-á-vis non-exporters. We confirm our results by analyzing the behavior of a control group of firms, that had complete access to the U.S. market during both devaluations, and we show that they responded in a similar way in both events. Finally, we also provide direct evidence on the relationship between exports and tariff reductions brought by NAFTA. Our results support the view that NAFTA has allowed Mexican producers to respond more quickly to real exchange shocks.

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1   Introduction and Motivation

Over the last two decades many developing countries have undergone economic reforms, including trade liberalizations that have lowered tariff and non-tariff barriers. At the same time, these countries have continued to experience significant macroeconomic shocks, including exchange rate crises, sudden stops in capital inflows and foreign debt defaults. Although both phenomena have been widely studied in the profession, the interaction between them has remained an under researched topic. It is precisely this gap what we will study in this paper: the interaction of economic reforms (particularly trade liberalization) and the reaction of open economies to aggregate shocks.

In particular, we focus on the extent to which trade reform affects the way in which the economy responds to changes in the real exchange rate. We do this in the specific context of the Mexican manufacturing sector, using firm-level longitudinal data to compare the reactions of employment, output, exports and investment to (big) changes in the real exchange rate in the absence and presence of NAFTA.

Our research design is motivated by the path of Mexico's real exchange rate, presented in Figure 1. As can be seen, there were two very large depreciations of the real exchange rate: one in the mid 1980s, the other the well-known "Tequila Crisis" of the 1994-1995. Both episodes witnessed enormous declines in the relative prices of domestic (Mexican) goods: the real exchange rate depreciation exceeded 70% in both episodes.[1] Yet, the two crises occurred in different economic environments, with NAFTA being perhaps the most important change of all. We seek to study precisely how these changes affected the dynamics of adjustment to real exchange rate shocks in the manufacturing sector.

Our paper is also related to the large and growing literature that attempts to evaluate the effects of NAFTA on the Mexican economy. This literature has analyzed among other issues the impact of NAFTA on wage inequality, aggregate growth and productivity.[2] We contribute to the literature by focusing on how NAFTA altered the responsiveness of the economy to real exchange rate shocks. The causal link underlying our analysis is straightforward: NAFTA increased the size of the external market for Mexican products. Hence, following a significant depreciation of the real exchange rate, the increase in external demand for Mexican output would be larger in the post-NAFTA era, and possibly large enough to offset the decline in domestic demand caused by the crisis.

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[1]We will adopt the convention of referring to Mexico as the *domestic* economy.

[2]Each of these topics is analyzed in Esquivel and Rodríguez-López (2003) and Verhoogen (2003) (wage inequality), Easterly, Fiess, and Lederman (2003) (growth and convergence), López-Córdova (2003) (manufacturing productivity), Romalis (2004) and Krueger (2000) on trade creation and diversion, and Kose, Meredith, and Towe (2004) on the synchronization of business cycles.

The next section of the paper explains in detail the mechanism through which an increase in the economy's degree of openness can change its response to real exchange rate changes. In Section 3, we present the empirical evidence regarding the response of manufacturing firms to real exchange rate shocks before and after NAFTA was in place. Our results indicate that after NAFTA, manufacturing firms increased their output, investment and employment more rapidly in response to real exchange rate depreciations. Section 4 presents some robustness checks that provide strong support for the hypothesis that the lower U.S. tariffs charged to Mexican goods after NAFTA are the key explanation for the different behavior observed in the earlier and later crises. To strengthen our argument further, in Section 5 we present an overview of the main developments in the Mexican economy since the 1980s. We will argue that NAFTA is the main structural reform introduced in Mexico between the two peaks of the real exchange rate and that it is the main suspect to which the different behavior in the manufacturing sector can be attributed. Section 6 concludes.

2   How Did NAFTA Affect Mexico? Microeconomic and Macroeconomic Effects.

Previous research on the impact of NAFTA has focused on the traditional questions brought by trade liberalization, including (i) trade creation and trade diversion brought by the trade agreement, (ii) factor returns and income distribution, (iii) productivity changes, (iv) convergence of income levels among participants of the agreement and (v) synchronization of business cycles among the participants in the trade agreement. Here we will seek to analyze another potential effect of trade liberalization: an increase in the responsiveness of output to external shocks.

The mechanism through which this effect arises is an increase in size of the external market. In effect, Free Trade Agreements are a particular type of trade reform distinguished by reciprocal access to each country's markets.[3] From this point of view NAFTA implied a significant increase in the potential demand for Mexican output. We argue that the expanded external market constitutes a mechanism that allows producers to weather the declines in domestic demands that occur during macroeconomic crises. Ultimately, this allows a macroeconomic adjustment that is less costly in terms of lost output and employment.

The traditional policy prescription for a small open economy that needs to decrease its external deficit calls for a reduction of aggregate domestic expenditure (through tighter

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[3]Of course complete access is not granted for all goods immediately and some sectors are never opened to free trade. This was not the case of the manufacturing sector.

monetary and/or fiscal policies) and a real depreciation of the currency.[4] The objective of the real exchange rate depreciation is to shift production inputs (most importantly labor) to the tradable goods sector. Since aggregate domestic expenditure is declining by assumption, the additional production of the tradable goods sector is shipped abroad. Implicit in this analysis is the assumption that the country faces a perfectly elastic demand for its exports that will absorb all the additional production of the country. In reality this assumption might not hold and therefore different degrees of access to foreign markets will imply different paths of adjustment.

The specific path of adjustment the country follows can have important welfare consequences. Calvo, Izquierdo, and Talvi (2003) highlight this point from a slightly different angle. In their post-mortem analysis of Argentina's collapse in 2001, Calvo, Izquierdo, and Talvi (2003) stress that the limited external openness of Argentina's economy required an extremely big real depreciation to cope with the sudden stop in capital inflows experienced by that country in 1999. The massive depreciation combined with widespread liability created by dollarization produced a negative balance-sheet effect that contributed to the depth of the recession. According to Calvo, Izquierdo, and Talvi (2003) the depreciation of the real exchange rate was smaller in countries where the output of tradable goods was more sensitive to changes in that relative price. From this perspective, our paper will contribute to understand the microeconomic channel through which all these occur.

In order to estimate the impact of NAFTA in this adjustment mechanism, we use firm-level data that contains information on production, employment, exports, and ownership structure. The data are available for periods before, during, and after the two major exchange rate crises shown in Figure 1. We compare the differences in behavior of firms in the aftermath of both episodes and argue that the differential in the response is due to the implementation of NAFTA. An obvious concern with this inference is that Mexico underwent other reforms between the two exchange rate crises. If this is the case, then it is not clear that we can attribute the different dynamics exclusively to NAFTA. Notwithstanding, we will show in Section 5 that the extent of the other reforms in the Mexican economy was limited and that NAFTA was the fundamental difference between both episodes.

3   Empirical Evidence

A simple comparison of trends in aggregate exports during and after the two major exchange rate depreciations suggests that the introduction of NAFTA changed the Mexican economy.

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[4]The need to reduce aggregate expenditure might be caused, for example, by a decrease in the amount of external finance available or a decline in the terms of trade.

As the data in Table 1 shows, the growth rate of exports during the second real exchange rate depreciation (the Tequila crisis) was significantly faster than the first (1986) crisis. It is also very interesting to note that exports exhibit a much more dynamic behavior during the appreciation phase. This simple evidence suggests that having access to the U.S. and Canadian markets after 1995 benefited the export sector. We now turn to analyze the microeconomic evidence of this phenomenon.

3.1 Data

For our microeconomic analysis of the behavior of firms during the two exchange rate crises we rely on firm-level data from the Annual Industry Survey (EIA) that is available since 1984.[5] There are two different configurations of this survey: the "old" or "traditional" one, that considered 129 industries within the manufacturing sector, and that covered the 1984-1994 period; and the "new" structure, that covers 205 industries since 1993.[6] In this paper we will use the old data for 1984-1992 and the new data for 1993- 2001. In both cases, we performed a thorough analysis of the data in order to use only the reliable observations, and we decided to work only with balanced panels for each period.[7]

3.2 Basic Trends

Figure 2 shows the changes in employment during the two crisis periods, computed as the percentage growth rates in employment.[8] From now on we will refer to the first real exchange rate shock as Episode 1 while the Tequila crisis well de referred to as Episode 2. In order to make the contrast between both episodes as clear as possible, we present the information in event-study type graphs centered in the year of each real exchange rate shock. Figure 2 shows clearly that employment grew significantly faster when NAFTA was in place. The evidence also indicates that employment was more volatile during the second shock: the

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[5]A more complete description of the data and the definitions of the main variables is presented in the Data Appendix.

[6]All of the industries covered in the old structure were covered in the new one, and the latter also included some new industries. A very careful match was done between them, in order compare the information between both periods, and also to create a panel for those firms present in both series.

[7]Although it would be interesting to analyze entry and exit during these periods, the survey made not effort to include newcomers, and the agency in charge of the survey (the Mexican Census Bureau, INEGI) reports very little exit.

[8]Unless explicitly stated, all the data reported comes from the EIA survey. For 1984-1992 the balanced panel consists of 1,467 firms, and for 1993-2001 the panel has 3,899 firms. The observations are not weighted to try to replicate the population values, so the totals do not match macro data.

drop in employment was smaller in 1986 than in 1995, and the increase in the aftermath of the shock was significantly bigger in 1996 than in 1987.

These differences could be due to several factors. First, the 1995 shock was concentrated in a few months, while the 1986 shock was more persistent. Also, the economy was in the midst of a crisis in 1986, and the real exchange rate shock was another (possible not unforeseeable) element of it, while in 1994 the economic climate was much more favorable and a large depreciation was largely unexpected. We will also show that the recovery from the "Tequila Crisis" was largely driven by exports, which were possible due to trade reform in general and NAFTA in particular.

Figure 3 shows the growth rates in exports during both episodes.[9] Although exports did increase significantly after the 1986-1987 real exchange rate shock (at an average rate of 11.2% for 1987-1990), the export boom of 1995 was spectacular (exports increased by 83% in the firms sampled by EIA), and it was sustained until 2000. Complementary data for all exports of the manufacturing sector (excluding maquiladoras[10]) is presented in Figure 4. It shows that exports grew steadily from 1982-1993, with a dip in 1985 followed by a recovery in 1986, the year of the first real exchange rate shock and also one year after Mexico joined the GATT. Starting in 1994 (the year NAFTA began) a change in trend is observed, which is accentuated in 1995, when exports increased from 27 to 40 billion dollars.

3.3   Does Export-Status Matter to Post-Crisis Adjustments?

Using the balanced panel for 1984-1992, it is possible to analyze the performance of firms during the 1986 real exchange rate shock. Given that, in principle, the shock was a positive event for firms that exported, we want to determine whether exporters actually had an advantage over non-exporters. For this we would like to identify exporters in 1984 or 1985, before the shock, and compare their performance during and after the shock. Unfortunately,

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[9]Export data are available starting 1986 but it was not collected in 1991, 1992 and 1994. However, the "new" panel has export data for all years starting in 1993. This explains the gap in Figure 3 and the impossibility of doing a proper event-like study as the one done in Figure 2. See Data Appendix for further details on the characteristics of the EIA.

[10]Maquiladoras are an important sector within manufacturing in Mexico. They are mainly foreign-owned plants performing assembly activities, and they are heavily concentrated both regionally (in the border states) and industry-wise (in textiles, electronics and auto-industry). Although the share of total imports and exports in manufacturing that pertains to maquiladoras is very high (about 50%), it is conceptually necessary not to include this sector in the analysis. These firms are required to export all of their output, and virtually all of their inputs (approximately 90-95%) are imported free of duty. Maquiladoras' dynamics are related to the U.S. economic cycle, and not at all to the situation of Mexico's domestic market. We will come back to this sector later, because it constitutes a good control group, whose behavior will help us strengthen our conclusions.

in the "old" panel exports are only available for 1986-1990, and in 1992. Therefore, we will only be able to compare ex-post exporters with ex-post non-exporters. We selected 1986 as the year of reference, the first for which the information if available. We analyze the second real exchange rate shock with the balanced panel of firms for the period 1993-2001. For comparability with the data available in the old panel we selected firms that did and did not export in 1995.[11]

Figures 5 and 6 show the "benefit" of being an exporter during the two real exchange rate shock episodes. The first figure presents the difference in employment growth between exporters and non-exporters, while the second depicts the difference in total sales growth between the two groups. We refer to this difference in the behavior of exporters and non-exporters as the *exporters' premium*. The evidence is also presented in event-study type graphs, analogous to Figure 2. As Figure 5 reveals, exporters exhibited a higher growth rate of employment when the real exchange rate shock was accompanied by NAFTA. This is especially the case in the year after the shock: the exporters' premium for employment is almost three percentage points in Episode 2 but close to zero in Episode 1.

More detailed evidence of the path of the exporters' premium can be found in Table 2. During the first real exchange rate shock, the excess growth rate of employment for exporters was positive in the year previous to the shock (1985), and remained positive (although small) through 1989. There is little evidence of a divergence between exporters and non-exporters during the shock. It was not until 1991-1992 (when the aggregate data in Table 3 shows a weakening in export growth) that the exporters' premium became negative. The data for the second real exchange rate shock present a very different behavior. Before the shock, when the peso was strong, employment growth was 1.9 percent lower at exporters than non-exporters. The year of the shock exporters performed substantially better than non-exporters (1.8 points), and the premium was even larger in 1996 and 1997 (2.8 and 2.2 percentage points, respectively). Finally, the positive premium disappeared and became negative in the appreciation phase (1998-2001). Hence, during the second episode a strong difference opened up in the performance of exporters vis-à-vis non-exporters, that was not present during the first crisis.

The sales data in Figure 6 confirm the story suggested by the employment data: exporters' relative performance was more strongly affected during the second episode. Although the growth in sales was 6.7 points higher for exporters in 1985, after the onset of the first exchange shock sales growth of exporters actually fell below the growth of non-exporters. In contrast, during Episode 2 one observes an opposite behavior: the exporters' premium is extremely high, close to 20 percentage points.

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[11]We repeated the analysis using also the ex-ante exporters, those that exported in 1993. The results are very similar, and all the conclusions that follow from analyzing ex-post exporters hold when ex-ante exporters are examined.

The complete path of the exporters' premium for total sales is presented in Table 3. It indicates that, after the first real exchange rate shock, the exporters' premium continued to be positive for some years. On the other hand, the exporters' premium after the second real exchange rate shock decreases significantly and turns negative three years after the shock.The smaller differences observed since 1996 probably reflect the recovery of the domestic economy, and thus of non-exporters, and the disadvantages of exporters in the appreciation phase.[12]

These raw differences suggest that there was a stronger response of exporters during the second real exchange rate shock, although probably the differential performance is smaller over the long run. However, the evidence discussed so far fails to consider other differences between exporters and non-exporters that could be relevant, such as industry, size and foreign ownership. These issues will be addressed next in a regression analysis.

3.4   Regression Analysis

In order to further explore the findings in Figure 5 and 6, we perform a regression analysis to measure the performance of exporters vis--vis non-exporters in both real exchange rate shock episodes, using employment, sales and expenses in new investment as the variables of interest. The idea is to control for other variables that could explain a differential performance between exporters and non-exporters (besides their ability to capture the benefits from trade liberalization), such as the industry, the firm size and foreign ownership.[13] Foreign ownership could explain the differential performance of exporters in the second shock: if exporters were more likely to be foreign in the 90s than in the 80s, and if being foreign-owned provides with advantages to firms (such as easier access to credit, which would be crucial when domestic credit is not available), then failure to control for ownership status could lead to faulty inferences.[14] Our regression models are of the following form:

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[12]It is interesting to note that the differences in employment and total sales growth between the two periods disappear if we average them (or take the compound growth rates) over the whole period. This is so because the downside for exporters in the appreciation phase is also higher during the second episode.

[13]Firm size is measured by the log of total employment, the log of total sales or by the log capital stock; four-digit (time-invariant) industry dummies are included to capture any industry peculiarities, and the share of capital owned by foreigners is used to construct foreign-ownership indicators.

[14]To capture these possible effects, we defined an indicator for firms with a share of FDI of 40% or larger, and the coefficient of this variable was allowed to vary by year. (The indicator is constant for a given firm in either the old or new panel, because the foreign ownership variable is available for only one year in each panel, (an unknown year between 1986 and 1990 for the old panel, and 1994 for the new panel). We also included an interaction of export-status and foreign ownership, and its coefficient also varied by year. However, this interaction term was almost never significant. In every case the sign and significance of the export coefficients (reported in the following tables) did not change, and the point estimates were not meaningfully different. For these reasons, the final set of regressions included only the FDI indicators (allowing the effect to be different each year).

$$Y_{it} = \sum_{s \in T} \gamma^s \cdot D^x \cdot \text{YEAR}_s + \sum_{s \in T} \delta^s \cdot \text{YEAR}_s + \phi \cdot \text{SECTOR} + \Omega Z_{it} + \epsilon_{it} \quad (1)$$

where Y_{it} the outcome measure (growth in sales, employment, or investment) of firm i in period t, D^X is a dummy variable for the exporter status of the firm in a given period (1986 in the old panel, and 1993 or 1995 in the new panel), YEAR_s is a year dummy for period s, SECTOR are 4-digit sector level dummies, Z is matrix of additional controls like foreign ownership of the firm and lags of the Y and Z variables, and ε_{it} is a random error. The coefficients of interest are the γ^s, which measure the premium of exporters, in different years.

Our strategy consists in estimating equation 1 separately for each of the different real exchange rate depreciation episodes denoted by T and compare the value of the γ coefficients obtained in each one of them. For the first episode $T \in [1985, 1992]$ and for the second one $T \in [1994, 2001]$.

Figures 7, 8 and 9 show the values of the estimated γ's when the outcome measure Y_{it} is employment, total sales and investment respectively. As can be seen, it is clearly the case that exporters exhibited higher growth rates of employment and sales as well as bigger investment rates during the second episode indicating that NAFTA, by allowing Mexican producers to export more to the U.S. market, made a significant difference for the response to the real exchange rate shock. Next, we discuss in more detail the regressions from where the estimates shown in figures 7 to 9 are taken.

Table 4 shows the regression results for the first real exchange rate shock. Using the balanced panel of firms (1467 observations per year) for 1984-1992, the percentage change in employment and in total sales is regressed on an indicator of export-status in 1986, which is allowed to have a year specific coefficient, industry and year dummies, an indicator variable for foreign ownership (whose effect may vary by year), and a variable that captures the size of the firm (lagged employment, sales or capital). The results confirm the previous findings: exporters (as of 1986) did not benefit much from the real exchange rate shock in the late 1980s. There are some significant gains in employment growth in 1987, but these are smaller than those reported for the second real exchange rate shock, and vanish by 1988. Some relative benefits are found for sales in 1986, but these are also much smaller than in the second episode.[15] Larger differences arise between exporters and non-exporters in the early nineties, when exporters had a weaker performance than non-exporters.

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[15]It is important to note, as shown in Tables 2 and 3 that the small differences between exporters and non-exporters in the first real exchange rate shock existed when the overall recovery of the economy was rather slow, while during the second real exchange rate shock the differences occurred in midst of a general recovery (starting in 1996-1997). This suggests that the larger and more persistent benefits by exporters during the second shock were arguably more meaningful.

For the second real exchange rate episode, Table 5 reports similar regressions for exporters selected in 1995.[16] The results are also consistent with the discussion so far: exporters benefited significantly from the real exchange rate shock. While there were no significant differences in terms of employment growth between exporters and non-exporters in 1994, between 1995 and 1997 exporters' employment grew 2-6 percentage points more than similar non-exporters. In 1999 exporters began to perform below non-exporters, and this pattern continued into 2001. With respect to total sales, the models in Table 5 show that exporters performed better than non-exporters in 1994, but the difference was 3-4 times larger in 1995. In the following years the differential was much smaller, and even negative by 1999-2001. These figures also validate the earlier results.

Tables 6 shows a parallel set of models for firm investment. The dependent variable in each case is the log of spending in new investment, and either the lagged value of the dependent variable or the log of capital at the beginning of the year is included as an independent variable. The results in the right panel confirm the superior relative performance of exporters in the second real exchange rate episode. The left panel shows the results for the old panel: all the estimated coefficients on exporter status are small or approximately zero. By comparison, results for the second crisis episode, shown in the right-hand column of Table 6, show more rapid growth in investment by exporters in response to the crisis.[17,18]

3.5   Robustness of the Results

We performed several checks to test the robustness of the results. First, we allowed the coefficient of industry to vary over time, repeating the analysis using four digit industry dummies interacted with year dummies.[19] The results remain largely unchanged, as shown in Tables 1 to 3 in the appendix.

We also restricted the analysis to include only firms that did not export more than

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[16]As stated before, the ideal group to study the effects of the real exchange rate shock would the ex-ante exporters. Those are the firms that already exported in 1993. Notwithstanding, the group of exporters in 1995 is shown in order to compare this group (with all the selection caveats) with a similar group during the first episode, when the ideal group is not available.

[17]Note that the coefficients are not directly comparable, for the concepts classified as expenditures in new investment differ between the old panel and the new panel. The purpose of the table is to show difference in the patterns within each real exchange rate shock episode.

[18]Table 6 presents the results with exporters selected in 1993, before the real exchange rate shock. The results with the exporters selected in 1995 are almost identical and are available upon request.

[19]Arguably, the inclusion of $industry * year$ effects may be considered over controlling, for some four-digit industries may have "good" performance during some years precisely because of the high share of firms that export in that industry. So, it is reasonable to expect that some of the "true" export effect will be captured by the inclusion of these interaction terms.

75% of their output every year, for these firms could be affected more by external demand shocks, independent from the real exchange rate shock. Excluding these firms does not alter the results: exporters benefited more from the post-NAFTA real exchange rate shock than they did from the shock in the late 1980s. The point estimates are slightly smaller, especially for sales in 1995, but the overall message from these regressions is the same as that from the previous analysis.[20] We also excluded small firms, defined as those with total employment smaller than fifty workers every year.[21] This is a small group of firms, and not considering them did not alter the results in a meaningful way.[22]

Finally, we repeated the analysis using only the firms in the long panel (1984- 2001).[23] This was done to address the plausible concern that most of the different response of exports was driven by new firms that did not exist during the first RER depreciation.[24] The results, although not as strong, remain qualitatively unchanged (as seen in Tables 6 and 7 in the appendix) and they confirm the pattern described so far. Even holding the set of firms constant, exporters performed much better vis--vis non-exporters during the second real exchange rate shock, and the overall response of exports to the devaluations was stronger in the post-NAFTA shock.

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[20]In the regressions throughout the paper we define as exporters firms with any exports in a given year. Alternatively, one could either use the export share or restrict exporters to firms with a share of exports greater than X% of total sales. When restricting the analysis to exclude firms that export a certain share of their exports on every year we used two cut points: 50% and 75%. The results suggest that the lower the cut-off point, the less strong and significant the results, thus suggesting that the higher the export share, the larger the benefits for exporters.

[21]In this case we also used several cut-off points: twenty-five, forty and fifty. We show the results for the latter case, but in all of them the results are virtually indistinguishable from those shown in the previous section

[22]These specifications are shown in regressions 4 and 5 in the appendix. Those tables resemble the main tables in the paper (Tables 4 and 5); the first column is a copy from the regression with the complete sample; then we show the results restricting the sample to exclude high-export firms (more than 75% of sales exported each year) and then we show the results from excluding small firms. As the tables show, the general results hold. We do not show the results for the spending in new investment (Table 6) when restricting the sample by size and high-export intensity. Those results are largely unchanged.

[23]There are 999 firms that appear in both panels and that have reliable information and that do not have missing or "strange" values for the most important variables that we use.

[24]If this were the case, one could argue that other factors (besides NAFTA) determined the creation of firms capable of seizing the opportunity represented by the devaluation. Note that firms present in the new panel but not in the old one are not necessarily new firms (in the sense of them being created after the old panel was selected). Different sample designs and different data availability does not allow to infer that a firm present in the new panel only is of recent creation. To illustrate, although the long panel has 999 firms with complete information, in principle at least 400 firms with complete data for the new panel exist in the old panel, but with incomplete information.

3.6   Who is exporting more? A closer look at the Exporting Firms

An important question is which firms exported more during the second real exchange rate shock: was it new exporters or was it firms that had a previous exporting experience? The data shows that as a share of total exports, it is the old exporters the group that export by far the largest share. For example, if in the long panel we follow exporters as of 1986 and compute their share of total exports we get that they exported 93% of the total exports between 1987 and 1990, and they still represented about 84% of the exports in the 1993-2001 period. These figures suggest that the group of firms that exported in 1986 (and that are still present in 2001) were able to adapt and to increase exports after NAFTA and after the second real exchange rate shock. If we use the "new" panel only, then we get the same result. Following the share of total exports from exporters in 1993, we find that in 1995 it was 95%, and it did not fall from 93% for the 1994-2001 period.

This discussion does not imply that the different response of exporters vis a vis non-exporters among both episodes is driven by the "old" exporters. It could be the case that, since exporting requires experience that accumulates over time, exports might react more to a second RER shock only because the difference in experience and not because tariffs in the destination market have declined among both episodes. To discard this case we estimated our base equation (1) for the sub-sample of firms that we observe over the complete period 1985-2001 instead of the intervals 1985-1992 and 1994-2001 that we have used so far. To test for the relevance of the experience in exporting mechanism we selected exporters in 1986, the earliest available date for which exporter status is available. If experience of exporting firms explains the different behavior, the γ coefficient in a regression like (1) after the second shock should be bigger than the one observed after the first shock. On the contrary, the results of this regression indicate that both coefficients are identical at the standard confidence levels.[25] Therefore we can reject the hypothesis that the difference on the level of exporters' experience is the factor driving our main results.

4   Further Analysis: Exploring the Link Between Tariff Reduction and Mexico's Manufacturing Activity

We have documented that exporters reacted in a much more favorable way during the post-NAFTA real exchange rate shock than during the pre-NAFTA shock, and we argued that NAFTA contributed to this different response. The results did not change in a significant way

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[25]The results of the regression are not reported in the paper but are available from the authors upon reques.

when several robustness tests were done. Here we extend the analysis in order to strengthen our conclusion of the centrality of NAFTA in explaining the export boom of 1995. We will also provide additional evidence from the U.S. trade data to corroborate the mechanism by which NAFTA acted, namely by providing firms in Mexico access to the U.S. market.

4.1   Maquiladoras as a Control Group

The first set of evidence we present concerns the behavior of the Maquiladora sector in Mexico during both exchange rate shocks. Although we excluded maquiladoras from our main analysis, this group of firms constitutes a control group, in the sense that the expected effect of each real exchange rate shock should have been similar in both episodes. By definition maquiladoras operate under zero-tariffs, so they had "complete access" to the U.S. market during both real exchange rate shocks. Hence, we expect that they should have responded similarly during both RER shocks. Figure 10 suggests that the behavior of the maquiladora sector to both RER shocks was indeed very similar. We will now provide regression evidence that confirms this preliminary evidence.

The ideal setup would be to have a long panel of maquiladoras, and to measure the response of individual firms during the devaluations. Unfortunately, data for maquiladoras are not available at the firm level for the 1980s, so we can only use aggregate data for this sector of the Mexican economy. For this we gather data on the total exports of manufactured goods of the maquiladora and non-maquiladora sectors for the period 1980-2006 and run the following regression separately for each of those sectors:

$$\Delta E_t = \beta_0 + \beta_1 \Delta RER_{t-1} + \beta_2 [\Delta RER_{t-1} * NAFTA] + \beta_3 NAFTA + \epsilon_t \qquad (2)$$

where E_t represents total exports in year t, RER_t is Mexico's real exchange rate defined in such a way that and increase in RER corresponds to a real depreciation of the Mexican currency and NAFTA is a dummy variable equal to one for the period of NAFTA (1994 onwards) and 0 otherwise. We include the RER lagged one period in (2). First the behavior of the data presented in Figure 10 suggests that Maquiladora exports react with a lag of one year to changes in the RER. On the other hand, introducing the RER lagged reduces problems of reverse causality that could arise in 2 if this variable was introduced contemporaneously in that equation.

For our hypothesis that NAFTA made exports more sensible to real exchange rate changes to be supported by the evidence, the coefficient β_2 in regression (2) should be

positive for the non-maquila sector and zero for the maquila sector. This is precisely what we find after running the regressions as is reported in Table 7. [26] This provides evidence in favor of our hypothesis that NAFTA increased the sensitivity of Mexico's non-maquila manufacturing exports to changes in the real exchange rate.

4.2 Tariffs and Exports: Direct Evidence

Now we turn to evidence on the mechanism that we argue is behind the different responses of the Mexican manufacturing sector to the two exchange rate shocks: the lower U.S. tariffs charged to Mexican exports in the post-NAFTA era. In particular, we will analyze the behavior of Mexican exports to the U.S. in the aftermath of the tequila crises and how its dynamics were influenced by the tariff reduction brought by NAFTA.

The evidence comes from highly disaggregated trade and tariff data published by the U.S. International Trade Commission and processed by John Romalis.[27] The data contains information on the tariffs charged to Mexican products sold in the U.S. during the period 1989 to 2001 and on the volume of imports from Mexico and other countries. The data are classified using the Harmonized Tariff Schedule (HTS) designed by the US Census Bureau and we use the 6-digit sub classification that comprises approximately 4200 product categories.

We use this data to examine the relation between tariffs reductions and the exports of Mexico's manufacturing sector with cross-section regressions of the form:

$$Y_i = \eta \Delta TAR_i + \theta L \Delta TAR_i + \vartheta_i \tag{3}$$

where Y_i is an outcome measure for sector i (either the growth rate of Mexican imports or the change in the market share of Mexican imports), TAR_i is the tariff charged in the U.S. to goods produced by sector i, Δ is the first difference operator, L is the lag operator, ϑ_i is a random error and η and θ are the coefficients to be estimated.[28] This strategy helps us to

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[26]It should be noted that the small sample size makes it difficult to reject the hypothesis that the β_2 coefficient is different from zero. Nevertheless, the finding that the point estimate of β_2 is positive for non-maquila exports and zero for the maquila sector is robust across all the specifications presented in Table 7.

[27]See Romalis (2004) for details on how the tariff data is constructed. The trade data is taken from the US International Trade Commission (USITC) web-based database.

[28]It would be interesting to include measures of *non-tariff barriers* in regression 3 but unfortunately there is no systematic data on them. See Anderson and van Wincoop (2004) for the enormous limitations of the scarce data on non-tariff barriers. On the other hand, non-tariff barriers (e.g. quotas) appear to be much

clarify the importance of NAFTA tariffs reductions especially when the outcome variables Y_i are measured in 1995. Since the real exchange rate shock affected all manufacturing sectors in that year the variation in the tariff reduction across different sectors will indicate if NAFTA made a difference. Given the timing of the events, it is crucial to include the lagged change in tariffs: the biggest tariff reductions occurred between 1994 and 1993 while the tequila crises occurred one year later.

The evidence clearly indicates that NAFTA eased the access of Mexico's goods to the U.S. market. First, we look at Mexican exports of all types of goods to the U.S. in 1994, the year NAFTA was implemented (we exclude the lagged change in tariffs from this analysis). The results presented in Table 8 indicate that the market share of Mexican goods increased more in sectors with bigger tariff reductions. Likewise, Table 9 shows that the growth rate of exports increased more in sectors with bigger tariffs cuts. Finally, and most relevant to our paper, the sectors that exhibited the biggest increases in exports in the year that followed the Tequila crisis (1995) were those that had experienced the biggest tariff reductions in 1994. This is seen in the negative and significant coefficient of the lagged change in tariffs in Table 10.

The next step is to redo the analysis in Tables 8 to 10 but now looking only at manufacturing goods.[29] The results of these regressions are presented in Tables 11 to 13 and they confirm the results obtained previously: reductions in tariffs brought by NAFTA increased the Mexican exports to the US even after considering the effect of the significant real exchange rate depreciation observed in the aftermath of the Tequila crisis.

As an additional test we explored directly if the interaction between changes in the RER and tariffs has an effect on the behavior of Mexican exports to the US. On other words we test directly if exports growth would be higher for those sectors that experienced the biggest reductions in tariffs which is the main hypothesis of this paper. This test is done with the following regression (Δ corresponds to the first difference operator and ln denotes the natural logarithm):

$$\Delta\ln(\text{Exports})_{jt} = \beta_1\Delta\ln(\text{RER})_{t-1} + \beta_2\Delta\tau_{jt} + \beta_3\Delta\ln(\text{RER})_{t-1}\Delta\tau_{jt} + \phi_j + \epsilon_{jt} \qquad (4)$$

more common for agricultural goods than for manufactures. The evidence presented in Anderson and van Wincoop (2004) documents that this is the case for the U.S. Unfortunately, there is no information on how non-tariff barriers have changed over time.

[29]As explained earlier, manufacturing activities are classified according to the NAICS system. Since the trade data is classified according to the HTS system it is necessary to reclassify the trade data to the NAICS system. Fortunately the US Census provides a concordance file that allows to transform the information presented in HTS code to NAICS classification.

According to our hypothesis to explain the different behavior of exporting firms during both episodes, we expect that the coefficient β_3 in regression (4) should be negative: for a given depreciation of the RER in the previous year $(t-1)$, exports from Mexico to the US of sector j goods in year t will increase more the higher the reduction in tariffs for that sector. Tariffs applied in the U.S. to in year t to Mexican goods of sector j are measured by τ_{jt}.

The estimation of regression (4) poses a number of challenges. First, we would like to estimate it with a sample that covers the RER shocks of 1987 and 1995. Unfortunately there is no data source that combines both bilateral trade and tariff information at the sector level over the complete period. The longest available sample with data suitable to estimate (4) starts in 1991 and this will be the one we will use. The second challenge is to get tariff and bilateral data that is consistent with one another. For this we used again data from the USITC. This implies that our dependent variable in equation (4) will be imports from Mexico to the U.S. reported by the USITC. With this we assure that the tariff data is entirely consistent with the trade flows. Tariff rates at the sector level are calculated also from USITC data as:

$$\tau_{jt} = \frac{\text{Duties Charged}_{jt}}{\text{CIF Imports Value}_{jt}} \tag{5}$$

Finally, the RER data comes from the Bank of Mexico and the annual observation corresponds to the average of the monthly observations for each year. The RER is defined such that an increase in this variable corresponds to a real depreciation of the Mexican currency. The real depreciation enters with one lag to minimize problems of endogeneity with the dependent variable.

The results of regression (4) are presented in Table 14 and the evidence strongly supports the claim that Mexican exports to the U.S. increased more for those sector for which tariffs decline (i.e. $\Delta\tau_{jt} < 0$) and that this effect reinforced the competitive boost given by a real deprecation of Mexico's currency.

As a final test of the relevance of NAFTA's tariff reductions for the dynamics of Mexico's manufacturing, we analyze the extent to which the decision to export is influenced by the reduction in tariffs. In order to examine the effect of tariff-reduction on entry into the export activity, we did an analysis of the probability that a firm started to export, based on the change in the tariffs that it faced one and two years before the decision to export was taken. For this exercise, we used the tariff data at the four-digit level, and computed the yearly changes in tariffs for the period 1989-2001.[30] Given data limitations we were only

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[30]For a description on the tariff data, see the Data Appendix. The tariffs refer to those faced by Mexican

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able to model the relationship between changes in tariffs and entry into exporting activities for the period 1994-2001. We estimated a simple random effects probit model on the panel, using both the long panel and the new panel. This model is in the following form:

$$
\begin{aligned}
Prob(Y_{ijt} = 1 | Y_{ijt-k}) = &\Phi(\gamma LT_j + \theta L.2\Delta T_j + \xi L\Delta RER_t + \psi L.2\Delta RER_t + \\
&\sum_t \kappa_t D_t^y + \sum_r \lambda_r D_r^{IND2})
\end{aligned}
\tag{6}
$$

where Y_{ijt} is and indicator on whether the firm i in industry j exported in period t, given that it has not exported in the past. ΔT_j is the change in the tariff charged in the U.S. to goods produced by sector j, and ΔRER_t is the change in the real exchange rate; D_t^y is the year dummy for period t, while D_r^{IND2} is the two-digit industry dummy for industry r[31]; Δ is the first difference operator and L is the lag operator. The coefficients to be estimated are γ, θ, ξ and ψ and the vectors κ_t and λ_r.

Table 15 shows the results from the regressions for the new panel.[32] For each year, only the non-exporters on the previous period were included. Besides the change in tariffs, lagged one and two periods, other covariates are considered: two-digit industry dummies (columns 1, 3 and 4), year dummies (column 2 and 3), and the real exchange rate depreciation (for the two previous years, column 4). Although the significance level is smaller when year-dummies are included, the results confirm that there was a positive impact of the reduction on tariffs on the probability of switching to exporter status.[33] Even though we cannot compare the effect of tariff reductions in the two crisis periods (due to the lack of data on tariffs for the earlier period)[34], it is important to stress that the effect of tariffs is present even after controlling for unrestricted time dummies, which capture all economy-wide influences.

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firms when trading with the U.S.

[31]Tariffs are computed for each four-digit industry, while dummies are included for each two-digit industry

[32]The results for the long panel are shown in the appendix. Although the significance of the coefficients on the tariffs is smaller, the general results hold. It is important to stress that the firms in the new panel that do not appear in the long panel are not necessarily new firms (i.e. firms established recently). More firms are included in the new panel due to sampling and design issues.

[33]It would be ideal to know the country to which firms exported; however, that information is not available on the data.

[34]Nevertheless, it is likely that during the first shock the change in the tariffs faced by Mexican firms in the US market did not change significantly, or if they did the changes were not only for Mexico, for there were no bilateral trade agreements between the US and Mexico at that time.

5 Did Everything Else Remain Constant?

The Mexican economy has undergone a process of economic reform that started in part after the debt crisis of 1982. Moreover, this process was accelerated after the 1986 exchange rate shock. The possibility that reforms other than NAFTA occurred between the first real exchange rate crisis and the second is important, since it would lead us to overstate the effect of NAFTA. For this reason, in this section we summarize the extent of other reforms to gauge the likelihood that they have contributed to altering the response of manufacturing firms to exchange rate shocks. As we will explain, in general reforms other than trade are not likely to have caused significant impacts in the response of the Mexican manufacturing to real exchange rate shocks, and in general to the Mexican economy. The only likely exception is the privatization of the Mexico's telecommunications and roads networks that have produced noticeable changes in those sectors. We turn now to discussing the extent and depth of each of the other reforms undertaken in Mexico since the mid 1980s'.[35]

Financial liberalization, undertaken after 1989, is one of the key changes other than trade reform introduced in Mexico after 1986. In theory a successful financial reform will lead to more efficient capital markets that will improve access to financing allowing firms to respond better to shocks. In the context of this paper, one can imagine that an export-oriented firm that faces a favorable price shock will increase its production more when it has access to a deeper financial market. By the same token, that same firm will be able to invest more when the expectations of future profits increase if financial markets are more developed. In spite of this, the empirical evidence does not indicate that financial liberalization eased the credit market restrictions faced by firms. It is also important to consider that the 1995 crisis involved a collapse of the recently privatized banking industry, and a virtual stall to credit. So, if producers responded differently in the 1990s it was not because of the reforms to the financial sector.

Gelos and Werner (2002) study the effects of financial liberalization using a sample of manufacturing firms during 1984-1994. They ran the standard test of cash flow sensibility of investment before and after the reforms of financial sector. In practice this means adding a dummy variable after 1989 when they date the financial liberalization. The results do not reveal a significant ease of access to credit market constraints except for the "very small" firms in the sample. In other words, the importance of cash flow availability for investment after financial liberalization was put in place diminished only for a subset of firms.[36] For our purposes, the results of Gelos and Werner (2002) indicate that financial liberalization did not imply a significant ease of financial constraints for firms in the manufacturing sector. In other

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[35]See Aspe (1993) and Lustig (2002) for general references on the evolution of the Mexican economy during that period.

[36]A firm belongs to the "very small" group if it has less than 40 and more than 3 employees. This group comprises 84 firms out of the total 1046 firms in the sample.

words, the available research does not indicate that financial reforms would have allowed Mexican producers, through more ample access to financial resources, to take advantage of the real exchange depreciation and increase their production and exports.

Along with this microeconomic evidence, other indicators traditionally used to measure financial development also present a mixed picture on the real extent of financial development. These indicators are presented in Table 16. As it can be seen, even though the amount of credit provided to the private sector increased significantly between both episodes, other indicators like the ratio of M3 to GDP remained basically unchanged. The same is true of indicators of stock market development that show a remarkable increase in the value of traded firms but not in the liquidity of the stock market or a significant increase in the number of firms that gained access to this type of financing. All these suggest that it is unlikely that financial markets underwent a significant reform between 1986 and 1994.[37,38]

In contrast to financial markets, the telecommunications sector and the road network exhibited significant improvements after the 1986 real exchange rate shock. The development of both types of infrastructure can be clearly appreciated in Table 16. This evidence diminishes the importance of trade reform and NAFTA as the unique cause of the different response of Mexican manufacturing firms to each real exchange rate shock. Nevertheless, one could argue that the improvement of the telecommunications infrastructure is more an element that contributed to avoid a bottleneck in order to take advantage of the opportunities presented by NAFTA rather than an opportunity in itself. From this perspective then, NAFTA is the "true" improvement in Mexico.

The assertion that improved infrastructure (roads and telecommunications) did not play such an important role in the different response of manufacturing exports and employment observed in both depreciation episodes, is also supported by the dynamics of the maquiladora sector. As discussed in section 4.1, the response of maquiladoras' exports in both real exchange depreciations is extremely similar. If better communication networks increased significantly the production capacity of firms, one would expect a much bigger of response maquiladora activity during the second episode.[39]

The observed improvement in the telecommunications and road networks are part of

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[37]Table 16 shows a very significant increase in *Domestic Credit to the Private Sector* between both periods. This indicator has been singled out as one of the best measures of financial reform. From this perspective the failure to detect any effect of financial liberalization on firms' as reported by Gelos and Werner (2002) is somewhat puzzling. A possible explanation is that most of this credit was channeled to households to finance consumption as has been observed similar episodes of credit booms in other developing countries.

[38]Tornell, Westermann, and Martínez (2004) also provide evidence of limited reform in the financial sector and claim that it remains a bottleneck for Mexico's economic development.

[39]As stated before, this suggests the need of a better understanding of the determinants of the maquiladora sector dynamics.

the privatization program of Mexico's government. This program was especially active in the mid 1980s and early 1990s. Since the privatization process occurs roughly in between both real exchange rate shocks it could also be the case that it influenced the different behavior of manufacturing firms after each shock. However, a careful examination of the Mexican experience suggests that this is not the case. For starters, the most notorious privatizations took place outside the manufacturing sector, namely the telephone monopoly (TELMEX), the banking industry, airlines and mining. Besides, using data from the "old" panel, we find that at most 5% of the total sales of the firms in the panel correspond to firms under public ownership. The small presence of the public sector in manufacturing (except, of course, in the oil industry which is still publicly owned) suggests that privatizations were not very relevant.[40]

Apart than the privatization process that lead to the described improvements in the road and telecommunications network, one needs to analyze other reforms in the public sector. The indicators presented in Table 16 suggest that there was no significant reform of Mexico's public sector institutions during the period of interest. The total tax burden and the government size remained virtually unchanged. It is also interesting to note that the implicit tax rate on imports also exhibits almost no modification between both real exchange rate shocks.[41] This indicates that the trade liberalization initiated by Mexico in the mid 1980s was not as deep as the one observed after NAFTA.[42]

Other indicators of institutional reform present a similar picture as the crude indicators discussed in the preceding paragraph. This is also the conclusion of Easterly, Fiess, and Lederman (2003) that use political risk indicators to conclude that there is still a large institutions gap between Mexico and the U.S. The data they present also indicates that institutions didn't exhibit a significant improvement between the 1980s and the implementation of NAFTA.[43]

Another important factor that might influence the dynamics of exports and their reaction to a RER shock are transports costs. It might be the case that if transport costs declined markedly during the episodes we study in this paper then the different reaction in exports might be due to this element and not lower trade barriers. To gauge the plausibility of this hypothesis we gathered data on transport costs for Mexican exports to the U.S. from the USITC. In particular, the USITC reports *Imports Charges* that correspond to "the aggregate cost of all freight, insurance and other charges (excluding U.S. import duties)" at

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[40]Aspe (1993) describes in detail the Mexican privatization process.

[41]The tariff rate presented in Table 16 is calculated as the ratio of total tariff revenue to imports of goods and services. The inclusion of services makes this implicit tariff rate be lower than the nominal tariff.

[42]The implicit tariff rate, calculated with the same method explained in the previous footnote, declines to under 2% after 1995.

[43]Their data comes from Political Risk Services and measures the extent of corruption, rule of law and efficiency of the judiciary system. See in particular Table 5 in their paper.

the good level of U.S. imports from Mexico. Then we can calculate a proxy of the fraction of imported value to which transport costs correspond to with:

$$\text{Transport Cost}_{jt} = \frac{\text{Import Charges}_{jt}}{\text{Import CIF}_{jt} - \text{Import Charges}_{jt}} \tag{7}$$

We computed (7) for each j-type good and calculated its annual average over all the goods categories. The results are presented in Table 17 and indicate that there has been no significant decline in the cost of shipping goods from Mexico to the U.S. during the sample period. Since this result might appear in contradiction with the current discussion on the reduction of transportation costs, it is important to remember that the bulk of Mexico-U.S. trade is conducted by ground transportation. According to Hummels (2007), the decline of transport costs observed recently in the world has been concentrated in maritime and air freights so the results of Table 17 appear to be no anomaly. This evidence indicates then that changes in transport costs are not very likely to have been an important force in explaining the different response of the manufacturing sector in both RER shock episodes.

Another element that can alter the behavior of the economy after a depreciation of the real exchange rate is the structure of its foreign debt regarding both its currency composition and maturity profile. This issue has recently received careful scrutiny in the international finance literature. To address this issue properly one should have detailed information on the firms' liability structure. Unfortunately, our data does not contain any information on the firms' liabilities. However, there are other pieces of evidence that indicate that financial vulnerability did not change significantly between the two dates of interest. First, the economy-wide information presented in Table 16 shows that although the total indebtedness level declined significantly, the exposure to foreign currency fluctuations remained high and the maturity structure was actually more tilted towards the short run in 1995 than in 1986. Second, firm-level data reported by Bleakley and Cowan (2002) indicates that foreign currency debt in Mexico in 1996 was high for Latin American standards.[44] Morevoer, Pratap, Lobato, and Somuano (2003) and Pratap and Urrutia (2004) report for a different sample of Mexican of firms than the one we use here that dollar-denominated debt both as a fraction of total exports and total debt increased steadily during the period 1989-1994. This suggests that the negative worth effect brought by the RER shock is likely to have been stronger in the second episode than in the first one. Hence, if anything, the effects of dollar-denominated debt would have translated into a *smaller* response of exports during the Tequila crisis.

An additional factor that might influence the response of a firm to a change in the

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[44]The data of Bleakley and Cowan (2002) indicate that in 1996 the dollarization level of Mexican corporations liabilities averaged 20% of total assets. This is second only to Argentinean firms and much higher than the corresponding figure observed in Chile, Colombia and Brazil.

real exchange rate (or any other macroeconomic shock) is aggregate economic volatility. Aggregate volatility is important because it influences the degree to which economic agents perceive shocks as permanent or transitory. The rate of inflation provides a good approximation to the aggregate level of macroeconomic volatility. It exhibits a significant decline in period before the Tequila crisis compared to the one observed before 1986. Nevertheless, the volatility of GDP does not appear to have been significantly different between the two real exchange rate exchange rate shocks as Figure 11 suggests.[45]

In relation to this point a recent paper by Das, Roberts, and Tybout (2007) argues that macroeconomic volatility does not have a significant impact on the exporting behavior of firms. According to the results reported by those authors for the case of Colombia, a doubling of the volatility of the real exchange rate has a quantitatively small effect on the volume exported and on the number of firms who decide to become exporters. It would be interesting to study if these same results would hold for the case of Mexico but that study is beyond the scope of this paper. For the purposes of this paper we interpret the findings of Das, Roberts, and Tybout (2007) as evidence that changes in macroeconomic (e.g. real exchange rate) volatility do not appear to have an important effect on the response of exports to an exchange rate shock.

Another element that could explain the different response of exporter to a real exchange shock is the extent to which they are perceived as transitory or permanent phenomena. If the 1995 shock was perceived to be permanent while the 1987 to be transitory, then this fact will trigger by itself a different response of exporters. However the origin of both shocks makes it very unlikely that they were judged as different phenomena with regards to their expected duration. As discussed earlier, both shocks were the result of a macroeconomic crises during which the nominal exchange rate depreciated abruptly. Given the short term rigidity of prices, the RER depreciated as well but this should have been perceived as a transitory phenomena. This because none of the real determinants of the relative price of Mexican and U.S. goods experienced a permanent change that would be consistent with a permanent change of Mexico RER.[46] Finally, it is a stylized fact observed in developing countries that RER depreciations observed after financial crisis and/or abandonment of exchange rate pegs are always reversed in some years so it is very unlikely that the expected duration of these episodes was expected to be very different.

Along with macroeconomic developments in Mexico, the business cycle in the United

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[45]The series in Figure 11 corresponds to the standard deviation of the quarterly growth rate of seasonally adjusted GDP. The seasonal adjustment terms are obtained from a regression of the original GDP series on a time trend and quarterly dummies. After extracting the seasonal component of the series, we computed the growth rate with respect to the preceding quarter and took the standard deviation of it over 8 preceding quarters. This is the series we plot in Figure 11.

[46]By "real" determinants we refer to terms of trade, relative productivity of the tradable and non tradable sectors and income-expenditure ratio.

States also influences the dynamics of manufacturing productivity in Mexico. This is due to the fact that the U.S. is the biggest buyer of Mexican products. Figure 12 shows that the U.S. economy was not in a severe economic downturn or boom when the two real exchange rate shocks that we are interested in studying took place. This discards the possibility that the different response of Mexican exports in both episodes is driven by the U.S. business cycle.

Finally, we analyze the extent of trade liberalization that occurred before NAFTA. Table 18 describes the process of unilateral trade liberalization that took place in Mexico's manufacturing sector after 1985. The data show a significant reduction of the trade barriers (tariffs and quotas) across all sectors of manufacturing sectors. Certainly this development might have had important implications on the behavior of the manufacturing sector. Nevertheless, this reform is a unilateral trade reform: it doesn't alter the barriers faced by Mexican exports in their destination market. Secondly, Table 18 indicates that trade liberalization was more intense in the years 1985 to 1987 which coincide with the first real exchange rate shock episode. Therefore, it does not appear to be the case that unilateral trade liberalization changed significantly between both real exchange rate shock episodes.

The picture that emerges after analyzing all this evidence is that there were no other significant changes other than trade reform and in particular NAFTA between both real exchange rate shocks. This allows us to conclude that it is very likely that most of the different response of manufacturing firms to the real exchange rate depreciation is due to NAFTA.

6   Conclusion

Although the effects of NAFTA on the Mexican economy have been analyzed thoroughly,[47] we contribute by comparing the response of the economy to similar real exchange crisis in the absence and presence of this trade agreement. The evidence presented in this paper indicates that NAFTA changed significantly the adjustment dynamics of the Mexican manufacturing sector to a real exchange rate shocks. The benefits that this brought in terms of higher levels of employment and production during the severe Tequila crisis is an unaccounted, until now, benefit of NAFTA for Mexico. Using microeconomic data on the behavior of firms and on Mexican imports to the U.S. we were able to show the differential performance during two similar devaluations, one before and the other after NAFTA, and we also documented the channel by which NAFTA contributed to this reality.

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[47]See, for example, a collection of essays assessing the impact of NAFTA in Mexico ten years down the road: Casares and Sobarzo (2004).

There are various avenues for future research that our work suggests. One of these is to analyze the extent to which trade reforms change the adjustment dynamics of other countries to shocks in the real exchange rate. An element of particular interest is the role (if any) played by free trade areas and unilateral trade liberalization on the sensitivity of exports to changes in the real exchange rate. Further understanding of the dynamics of adjustment of the export sector to changes in the real exchange rate is also an interesting topic for future study. This is a topic of special relevance for developing and emerging economies where real currency depreciations are often associated with declines in economic activity. In this sense, a closer examination of the determinants of exporters' output could help design policies that aim to increase the efficiency of external adjustment.

Figure 1: Real Exchange Rate in Mexico
(1990=100)
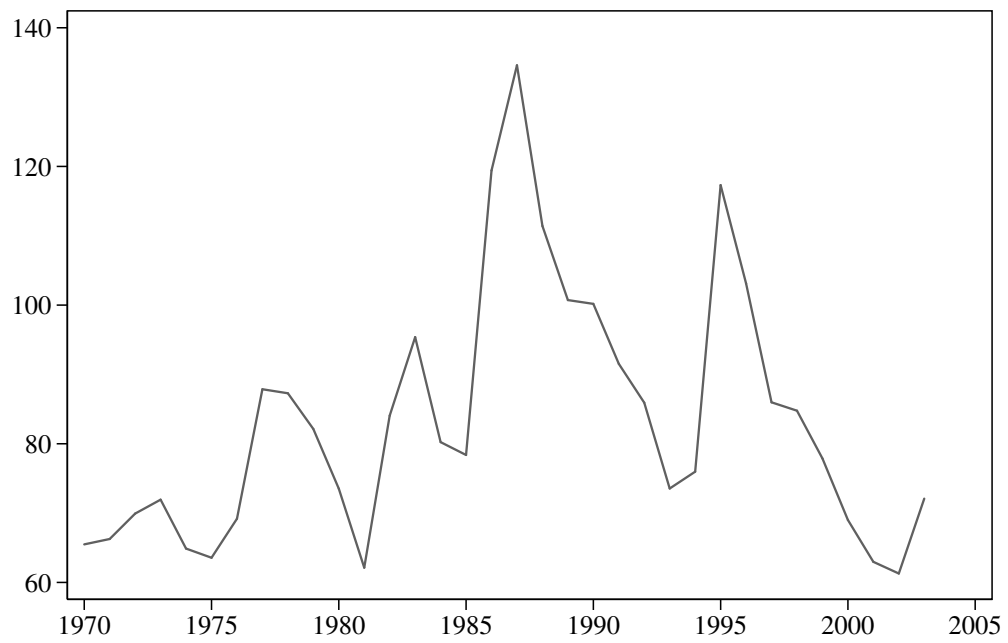
Source: Banco de Mexico

Figure 2: Yearly Change in Employment
All Manufacturing Industries (%)
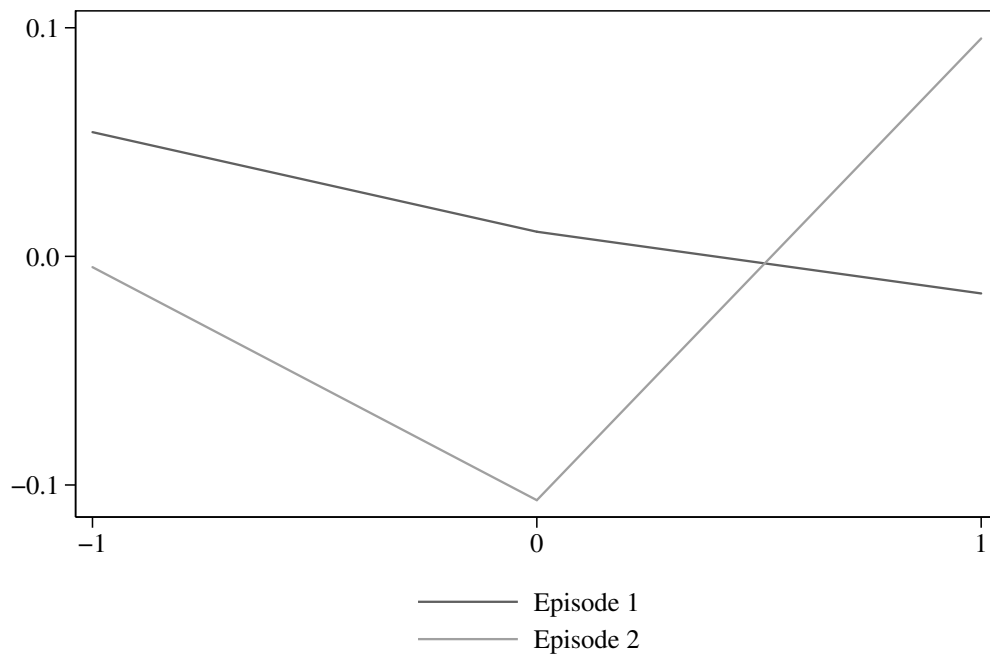
Episode 1
Episode 2

For episode 1 time 0 is 1986
For episode 2 time 0 is 1995

Figure 3: Yearly Change in Exports
All Manufacturing Industries
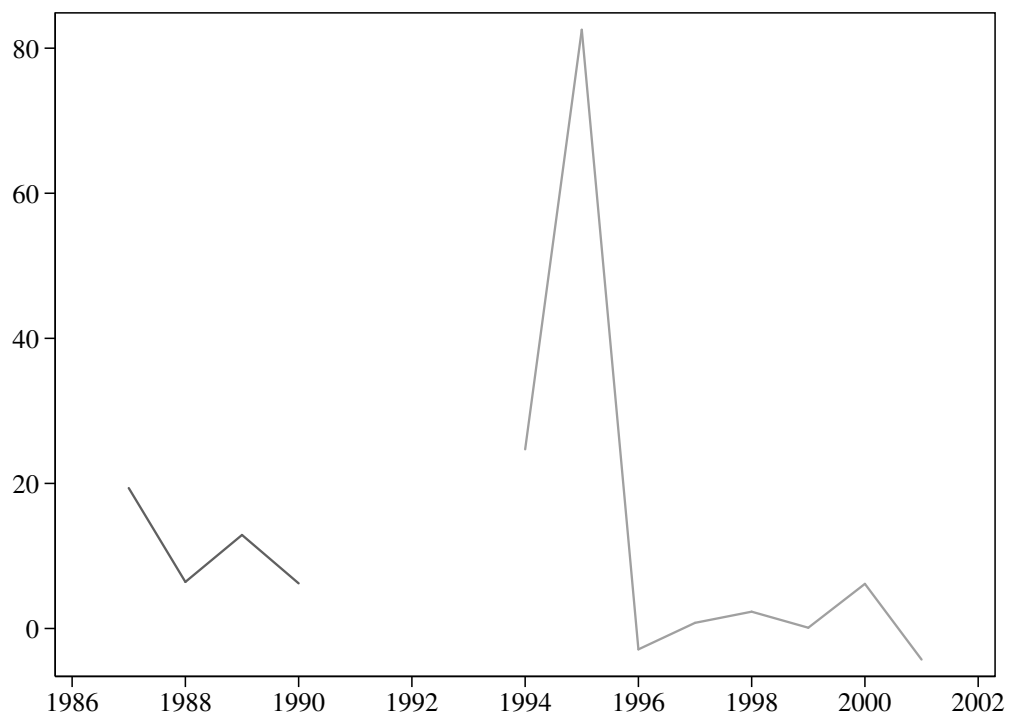
Figure 4: Total Manufacturing Exports
(real pesos of 2002)
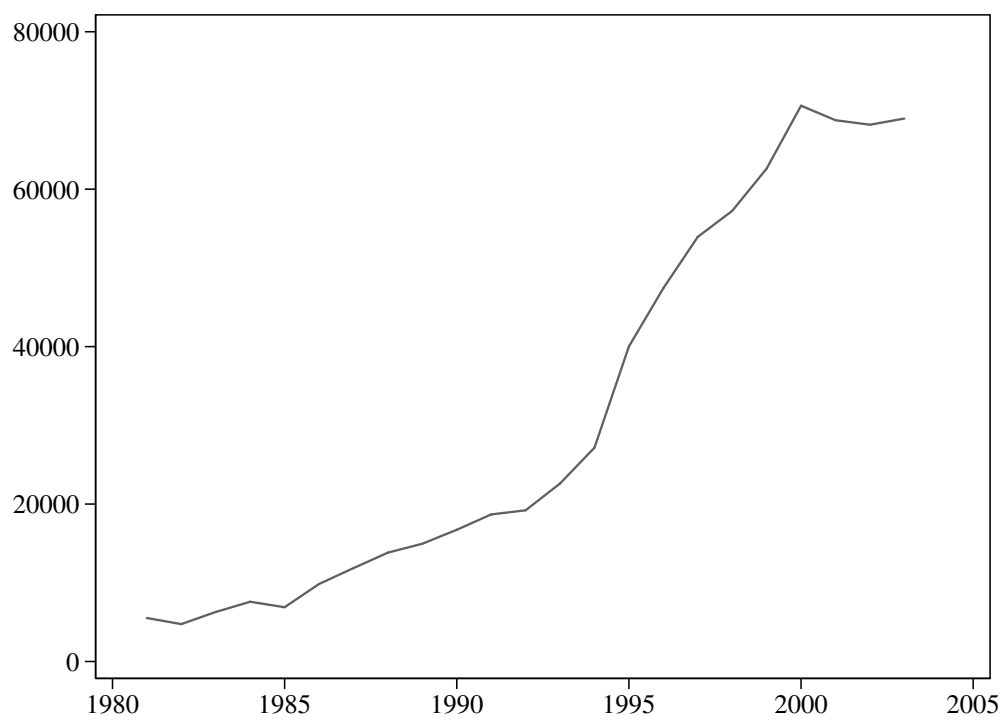
Figure 5: Difference in Employment Growth in Both Episodes
Exports-Non Exporters
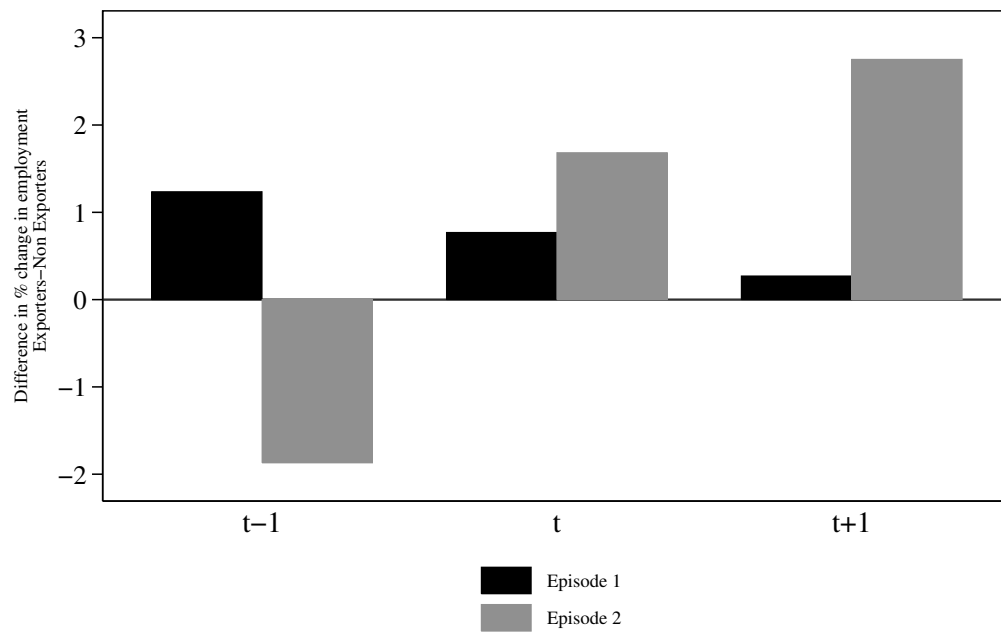
Note: The data for this graph is reported in Table 2
For Episode 1 time t corresponds to 1986
For Episode 2 time t corresponds to 1995

Figure 6: Difference in Total Sales Growth in Both Episodes
Exports-Non Exporters
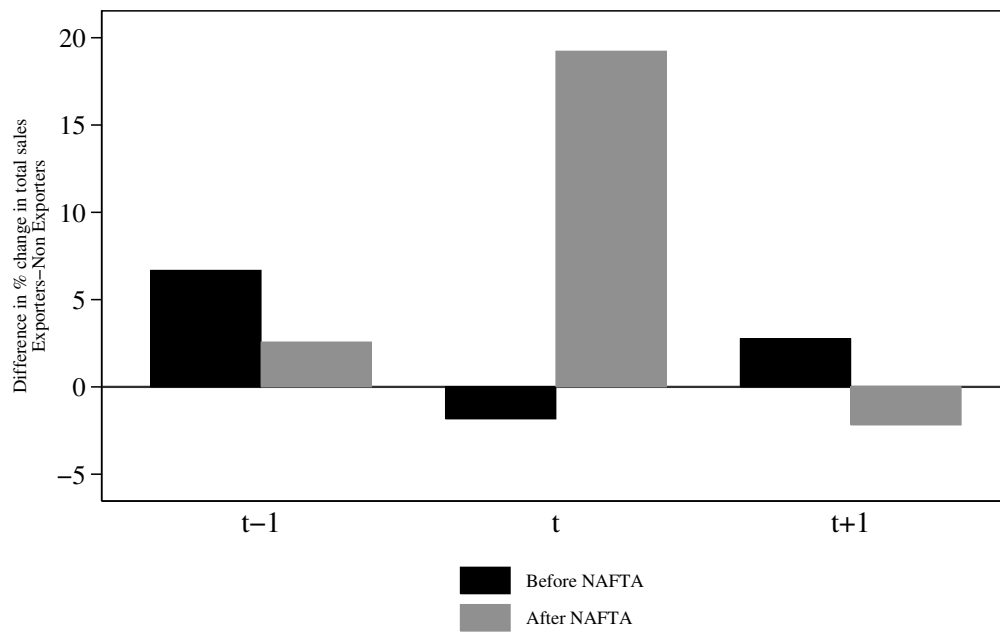
Note: The data for this graph is reported in Table 3
For Episode 1 time t corresponds to 1986
For Episode 2 time t corresponds to 1995

Figure 7: γ Coefficients for Employment Regressions
(γ: coefficient on exporter status dummy)

——— Epsiode 1, year 0 = 1986
– – – Episode 2, year 0 = 1995
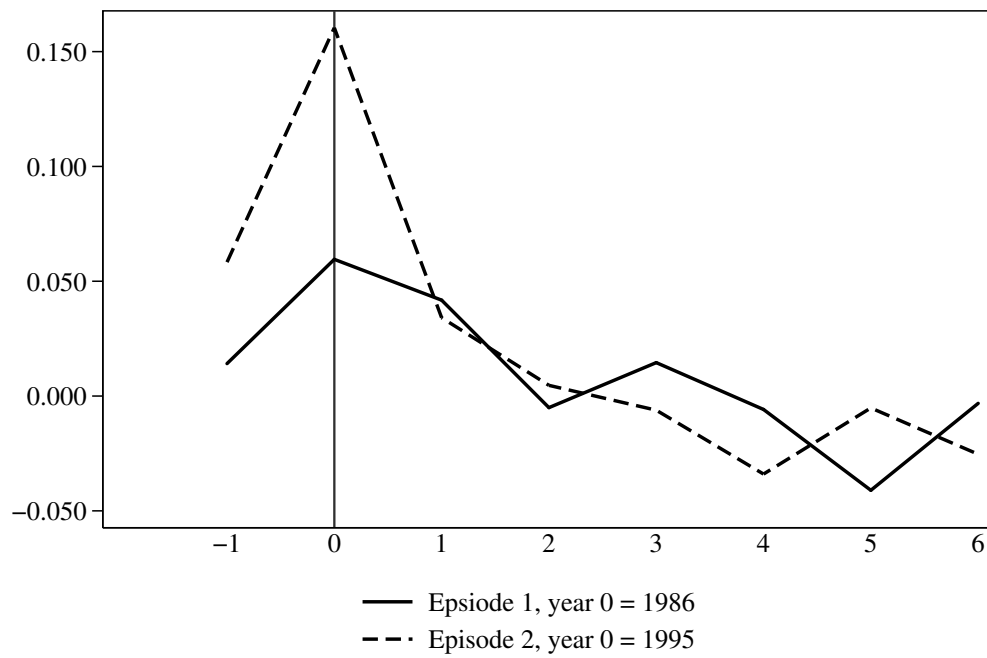
The vertical line indicates the year of the
real exchange rate shock

Figure 8: γ coefficients for Total Sales Regressions
(γ: coefficient on exporter status dummy)
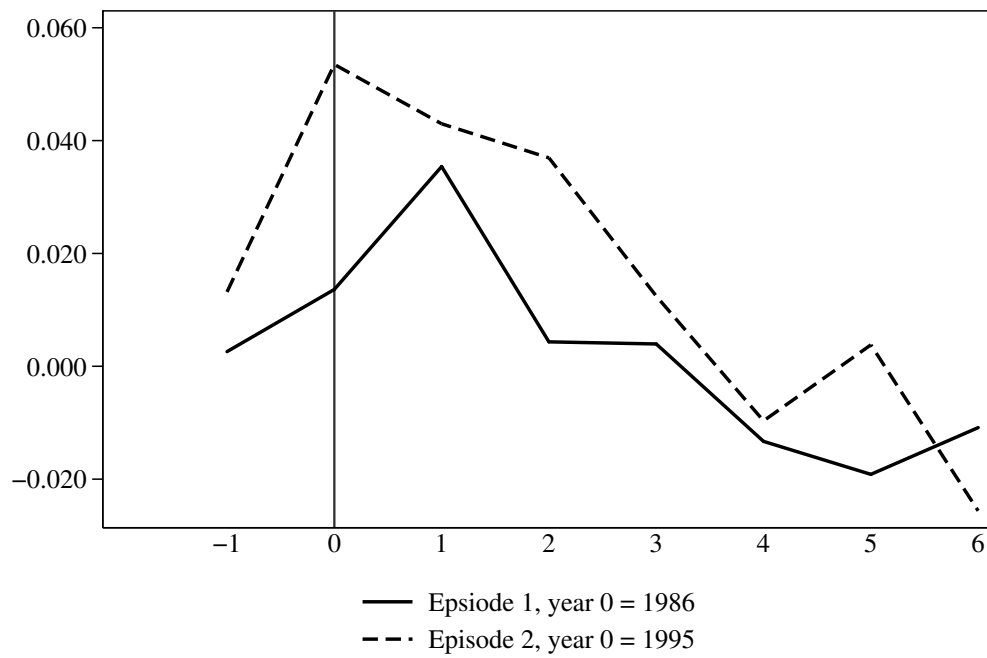
The vertical line indicates the year of the
real exchange rate shock

Figure 9: γ coefficients for Investment Regressions
(γ: coefficient on exporter status dummy)

———— Epsiode 1, year 0 = 1986

– – – Episode 2, year 0 = 1995
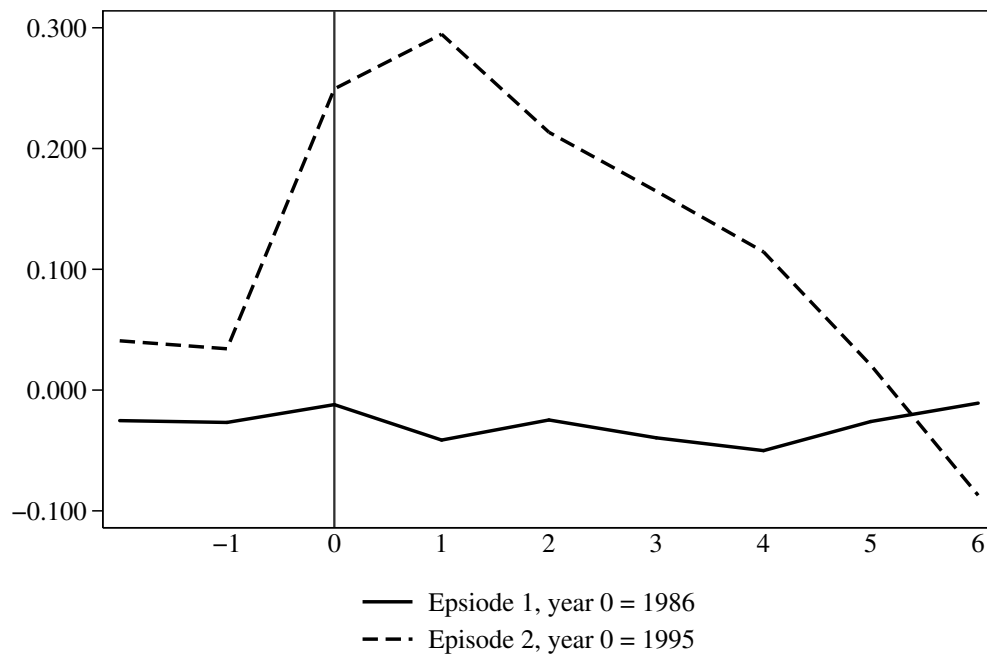
The vertical line indicates the year of the
real exchange rate shock

Figure 10: Maquiladora Output and the Real Exchange Rate
Percent change per year (%)

Change in Total Output (%)
Lagged Change in Real Exchange Rate (%)
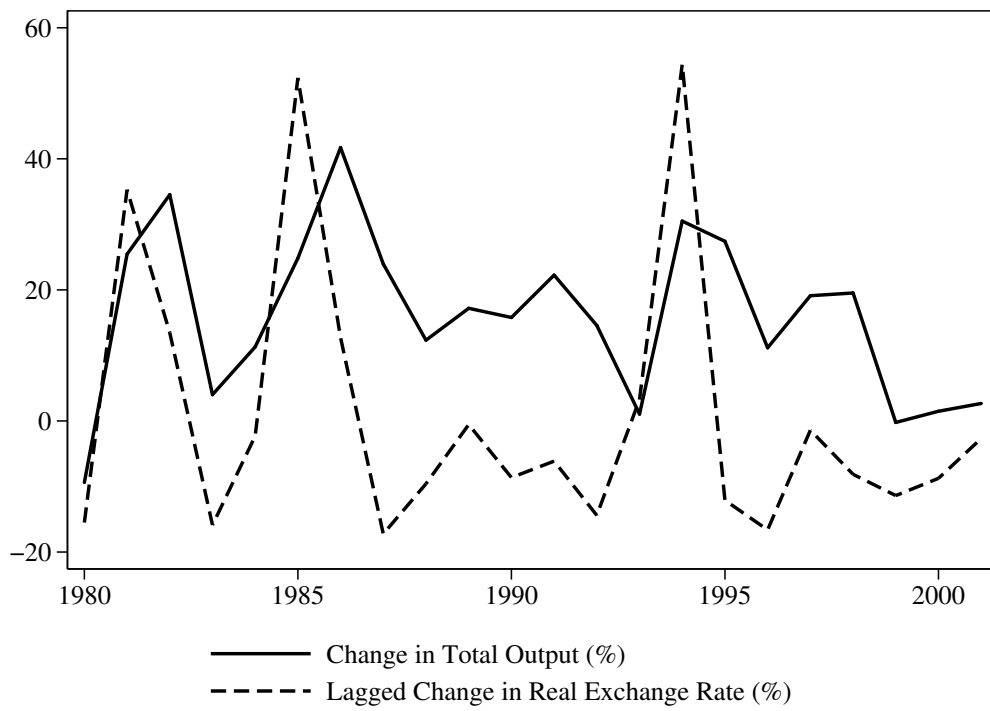
Figure 11: Standard Deviation of Mexico's Growth Rate of GDP
Moving Average over eight past quarters
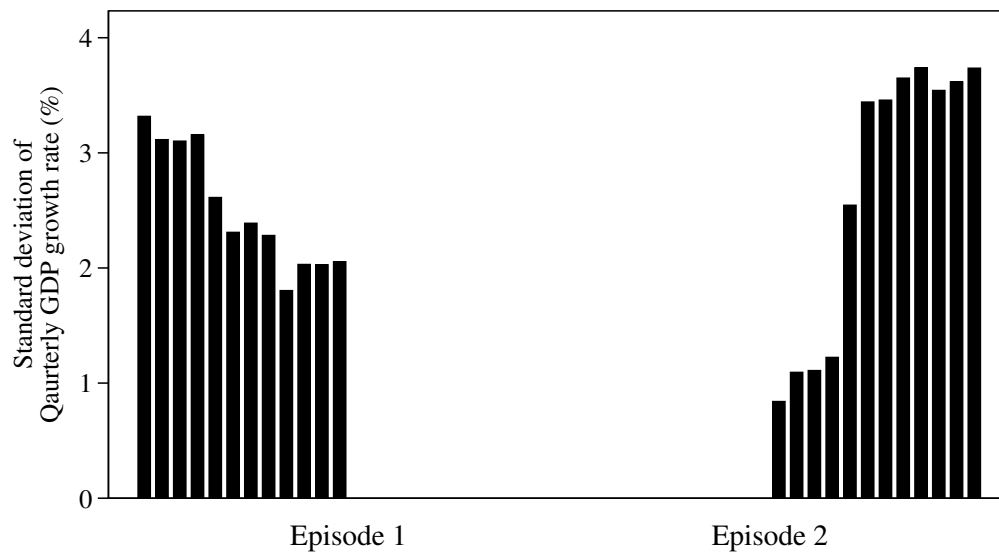
Episode 1 spans from first quarter of 1985 to fourth quarter of 1987
Episode 1 spans from first quarter of 1994 to fourth quarter of 1996

Figure 12: Growth Rate United States GDP
(with respect to previous quarter at annual rate)
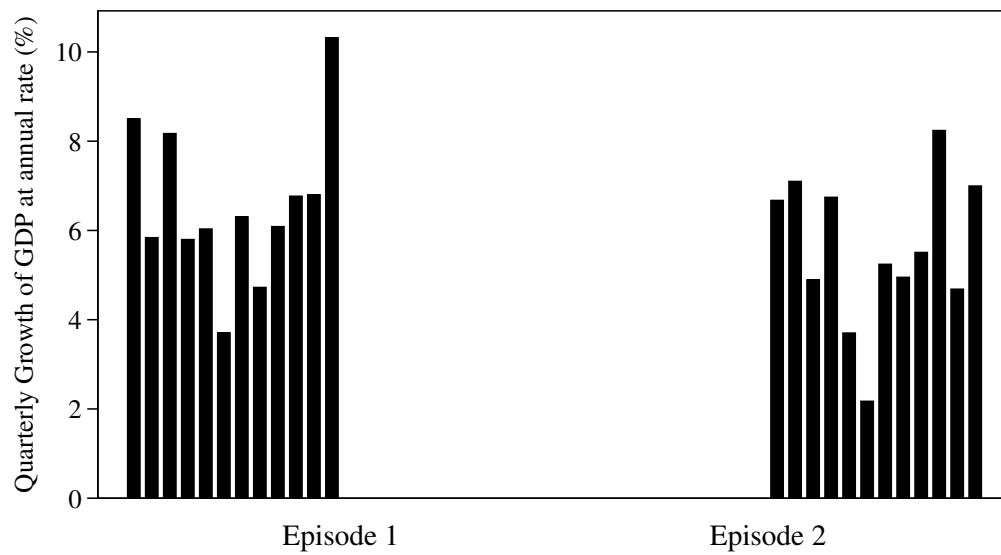
Episode 1 spans from first quarter of 1985 to fourth quarter of 1987
Episode 1 spans from first quarter of 1994 to fourth quarter of 1996

Table 1: Aggregate Exports in Two Episodes

	First Episode		Second Episode	
	RER Shock 1984-1987	Appreciation Phase 1987-1993	RER Shock 1994-1996	Appreciation Phase 1996-2002
Total Exports Growth (%) [1,2]	3.0	5.8	24.1	7.5
GDP Growth (%) [1,2]	0.2	3.4	-0.7	3.7
Total Exports Growth (%) [1,3]	-5.4	6.6	30.6	57.7
Manufacturing Exports Growth (%) [1,3]	20.3	12.6	34.1	66.9

Source: Authors' calculations from World Development Indicators and Banco de Mexico data.

[1] Average growth rate per year.

[2] Calculated from national accounts constant Mexican pesos values.

[3] Calculated from current dollar values. Does not include Maquila sector.

Table 2: Employment Growth (%)

PANEL A
First Real Exchange Depreciation Episode (1986)

	Exporters in 1986	Non-Exporters in 1986	Difference
1985	3.4	2.2	1.2
1986	1.0	0.2	0.8
1987	-0.7	-0.9	0.3
1988	1.4	0.8	0.6
1989	5.2	4.2	1.0
1990	2.4	2.8	-0.4
1991	-0.2	1.3	-1.5
1992	-3.1	-0.5	-2.6

PANEL B
Second Real Exchange Depreciation Episode (1995)

	Exporters in 1995	Non-Exporters in 1995	Difference
1994	-1.1	0.8	-1.9
1995	-4.6	-6.3	1.7
1996	6.0	3.2	2.8
1997	7.9	5.7	2.2
1998	4.8	4.9	-0.1
1999	1.6	3.4	-1.8
2000	2.5	2.3	0.2
2001	-4.5	-0.2	-4.4

Source: Authors' calculations based on the EIA data.

Table 3: Sales Growth (%)

PANEL A
First Real Exchange Depreciation Episode (1986)

	Exporters in 1986	Non-Exporters in 1986	Difference
1985	9.2	2.5	6.7
1986	1.0	2.8	-1.8
1987	7.6	4.9	2.8
1988	4.4	2.9	1.5
1989	12.4	8.7	3.7
1990	4.7	-1.7	6.4
1991	1.8	4.1	-2.3
1992	3.1	3.5	-0.4

PANEL B
Second Real Exchange Depreciation Episode (1995)

	Exporters in 1995	Non-Exporters in 1995	Difference
1994	9.6	7.1	2.6
1995	14.6	-4.7	19.2
1996	4.1	6.3	-2.2
1997	5.6	4.4	1.2
1998	1.8	4.4	-2.6
1999	-1.5	2.1	-3.6
2000	5.1	2.8	2.3
2001	-5.2	0.8	-6.0

Source: Authors' calculations based on the EIA data.
Sales are measured in real Mexican pesos of 2002.

Table 4: Employment and Total Sales Growth in First Episode

	Dep Var: % Change in Employment			Dep Var: % Change in Total Sales		
γ^{1985}	0.0026	-0.00602	-0.00728	0.01413	-0.0108	-0.00676
	[0.01125]	[0.01130]	[0.01132]	[0.02639]	[0.02662]	[0.02660]
γ^{1986}	0.01362	0.00498	0.00372	0.05954*	0.03432	0.03842
	[0.01213]	[0.01221]	[0.01213]	[0.02420]	[0.02430]	[0.02420]
γ^{1987}	0.03540**	0.02666*	0.02534*	0.04177	0.0151	0.0193
	[0.01207]	[0.01220]	[0.01203]	[0.02608]	[0.02611]	[0.02623]
γ^{1988}	0.00433	-0.00485	-0.00621	-0.00504	-0.03265	-0.02814
	[0.00969]	[0.00975]	[0.00978]	[0.02145]	[0.02181]	[0.02162]
γ^{1989}	0.00396	-0.00534	-0.00669	0.01456	-0.01277	-0.00816
	[0.01026]	[0.01027]	[0.01039]	[0.01938]	[0.01961]	[0.01944]
γ^{1990}	-0.01331	-0.02268*	-0.02403**	-0.00584	-0.0333	-0.02857
	[0.00923]	[0.00926]	[0.00924]	[0.01706]	[0.01721]	[0.01719]
γ^{1991}	-0.01915	-0.02836**	-0.02970**	-0.04104*	-0.06842**	-0.06374**
	[0.00988]	[0.00992]	[0.00988]	[0.01625]	[0.01651]	[0.01640]
γ^{1992}	-0.01087	-0.01988*	-0.02117*	-0.00318	-0.02921	-0.02472
	[0.00991]	[0.01003]	[0.00998]	[0.01830]	[0.01823]	[0.01821]
δ^{1986}	-0.02731**	-0.02756**	-0.02762**	-0.11706**	-0.11862**	-0.11836**
	[0.00784]	[0.00785]	[0.00784]	[0.01708]	[0.01713]	[0.01714]
δ^{1987}	-0.02576**	-0.02598**	-0.02596**	-0.04626**	-0.04570*	-0.04551*
	[0.00781]	[0.00782]	[0.00782]	[0.01782]	[0.01791]	[0.01792]
δ^{1988}	-0.01053	-0.01066	-0.01063	-0.04232**	-0.04189**	-0.04161**
	[0.00775]	[0.00778]	[0.00777]	[0.01563]	[0.01574]	[0.01576]
δ^{1989}	0.01111	0.01086	0.01087	0.02215	0.02206	0.02241
	[0.00857]	[0.00858]	[0.00858]	[0.01570]	[0.01586]	[0.01585]
δ^{1990}	0.00183	0.00125	0.00116	-0.03330*	-0.03592*	-0.03533*
	[0.00767]	[0.00768]	[0.00767]	[0.01580]	[0.01592]	[0.01593]
δ^{1991}	-0.0063	-0.00715	-0.00728	-0.03270*	-0.03607*	-0.03530*
	[0.00785]	[0.00789]	[0.00788]	[0.01526]	[0.01537]	[0.01538]
δ^{1992}	-0.03586**	-0.03683**	-0.03700**	-0.07963**	-0.08373**	-0.08303**
	[0.00814]	[0.00816]	[0.00815]	[0.01576]	[0.01581]	[0.01583]
$\log(\text{firm size})_{t-1}$	-0.01548**					-0.01135**
	[0.00195]					[0.00345]
$\log(\text{total sales})_{t-1}$		-0.00115		-0.02996**		
		[0.00138]		[0.00281]		
$\log(\text{capital})_{t-1}$			0.00014		-0.00241	
			[0.00096]		[0.00210]	
Constant	0.13309**	0.07954**	0.06608**	0.46867**	0.17394**	0.20030**
	[0.02184]	[0.02384]	[0.02095]	[0.04753]	[0.04035]	[0.03859]
Observations	11736	11736	11736	11736	11736	11736
R^2	0.03	0.02	0.02	0.04	0.03	0.03
F test	4.51	3.7	3.7	5.85	4.88	4.9
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.

Table 5: Employment and Total Sales Growth in Second Episode

	Dep Var: % Change in Employment			Dep Var: % Change in Total Sales		
γ^{1994}	0.01318	0.00361	0.00279	0.05831**	0.04225**	0.04854**
	[0.00938]	[0.00947]	[0.00949]	[0.01306]	[0.01317]	[0.01310]
γ^{1995}	0.05350**	0.04366**	0.04306**	0.16040**	0.14334**	0.14986**
	[0.00908]	[0.00903]	[0.00910]	[0.01501]	[0.01502]	[0.01503]
γ^{1996}	0.04298**	0.03194**	0.03085**	0.03413**	0.01191	0.02118
	[0.00868]	[0.00876]	[0.00874]	[0.01276]	[0.01270]	[0.01279]
γ^{1997}	0.03694**	0.02525**	0.02481**	0.00466	-0.01522	-0.0086
	[0.00894]	[0.00892]	[0.00892]	[0.01338]	[0.01339]	[0.01341]
γ^{1998}	0.01244	0.00033	-0.00061	-0.00616	-0.02750**	-0.01929
	[0.00765]	[0.00759]	[0.00758]	[0.01002]	[0.01002]	[0.01002]
γ^{1999}	-0.00967	-0.02174**	-0.02222**	-0.03397**	-0.05498**	-0.04687**
	[0.00658]	[0.00660]	[0.00662]	[0.00970]	[0.00967]	[0.00968]
γ^{2000}	0.0038	-0.00794	-0.00863	-0.00518	-0.02905**	-0.0174
	[0.00629]	[0.00623]	[0.00622]	[0.01129]	[0.01056]	[0.01123]
γ^{2001}	-0.02562**	-0.03725**	-0.03749**	-0.02535**	-0.04440**	-0.03724**
	[0.00627]	[0.00628]	[0.00628]	[0.00976]	[0.00974]	[0.00973]
δ^{1995}	-0.10764**	-0.10782**	-0.10845**	-0.18057**	-0.18201**	-0.18133**
	[0.00807]	[0.00811]	[0.00813]	[0.01160]	[0.01161]	[0.01162]
δ^{1996}	0.01925*	0.02129*	0.02108*	0.00606	0.0085	0.00792
	[0.00860]	[0.00864]	[0.00866]	[0.01153]	[0.01157]	[0.01157]
δ^{1997}	0.04741**	0.04889**	0.04924**	0.03450**	0.03671**	0.03563**
	[0.00834]	[0.00837]	[0.00839]	[0.01182]	[0.01182]	[0.01187]
δ^{1998}	0.02763**	0.02794**	0.02839**	-0.04091**	-0.03930**	-0.04094**
	[0.00758]	[0.00760]	[0.00763]	[0.01075]	[0.01076]	[0.01078]
δ^{1999}	0.00425	0.00379	0.00387	-0.06891**	-0.06818**	-0.06904**
	[0.00790]	[0.00793]	[0.00795]	[0.01073]	[0.01074]	[0.01075]
δ^{2000}	-0.01145	-0.01218	-0.01236	-0.07340**	-0.07304**	-0.07323**
	[0.00743]	[0.00745]	[0.00747]	[0.01026]	[0.01025]	[0.01027]
δ^{2001}	-0.04450**	-0.04533**	-0.04613**	-0.11723**	-0.11801**	-0.11684**
	[0.00772]	[0.00774]	[0.00776]	[0.01055]	[0.01052]	[0.01056]
$\log(\text{firm size})_{t-1}$	-0.01616**					-0.00338
	[0.00164]					[0.00219]
$\log(\text{total sales})_{t-1}$		0.00295**		-0.01765**		
		[0.00103]		[0.00183]		
$\log(\text{capital})_{t-1}$			0.00320**		0.00675**	
			[0.00087]		[0.00133]	
Constant	0.11865**	0.0068	0.0118	0.26587**	0.00191	0.07965**
	[0.01504]	[0.01784]	[0.01435]	[0.02607]	[0.01890]	[0.01828]
Observations	31192	31192	31146	31192	31146	31192
R^2	0.05	0.04	0.04	0.04	0.04	0.04
F test	22.65	21.73	21.6	19.21	19.25	18.61
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in brackets.
* significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.

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Table 6: Investment in Both Episodes

	Old Panel, 1984-1992 (Exporters in 1986)			New Panel, 1993-2001 (Exporters in 1995)	
γ^{1984}	-0.02528 [0.03853]		γ^{1993}	0.04081 [0.05789]	
γ^{1985}	-0.0268 [0.03633]	0.01746 [0.02495]	γ^{1994}	0.03419 [0.05363]	0.18089** [0.05923]
γ^{1986}	-0.01204 [0.03458]	0.06360** [0.02297]	γ^{1995}	0.24938** [0.05688]	0.43419** [0.06252]
γ^{1987}	-0.04138 [0.03595]	0.03225 [0.02078]	γ^{1996}	0.29468** [0.05321]	0.35532** [0.05655]
γ^{1988}	-0.02475 [0.03402]	0.04811* [0.02001]	γ^{1997}	0.21347** [0.05015]	0.23475** [0.05371]
γ^{1989}	-0.03954 [0.03341]	0.00572 [0.01941]	γ^{1998}	0.16472** [0.04972]	0.26502** [0.05310]
γ^{1990}	-0.05014 [0.03302]	0.00724 [0.02189]	γ^{1999}	0.11445* [0.05035]	0.25350** [0.05430]
γ^{1991}	-0.02602 [0.03217]	0.06017* [0.02442]	γ^{2000}	0.02061 [0.05210]	0.17828** [0.05501]
γ^{1992}	-0.0108 [0.03483]	0.07361 [0.04150]	γ^{2001}	-0.08713 [0.05691]	0.11532 [0.06100]
δ^{1985}	0.06032* [0.02731]		δ^{1994}	-0.01243 [0.05241]	
δ^{1986}	0.03113 [0.02734]	-0.09647** [0.01841]	δ^{1995}	-0.40458** [0.05322]	-0.64083** [0.05844]
δ^{1987}	0.00369 [0.02744]	-0.13593** [0.01760]	δ^{1996}	-0.02897 [0.05269]	-0.06124 [0.05623]
δ^{1988}	-0.00482 [0.02803]	-0.05735** [0.01640]	δ^{1997}	0.17897** [0.05053]	0.06983 [0.05415]
δ^{1989}	0.07918** [0.02669]	0.04877** [0.01781]	δ^{1998}	0.20409** [0.05025]	-0.03802 [0.05334]
δ^{1990}	0.14020** [0.02604]	0.01951 [0.01778]	δ^{1999}	0.02256 [0.04947]	-0.21627** [0.05299]
δ^{1991}	0.15869** [0.02599]	0.03055 [0.01933]	δ^{2000}	-0.07417 [0.05130]	-0.17723** [0.05443]
δ^{1992}	0.21215** [0.02693]	-0.05028 [0.02716]	δ^{2001}	-0.32602** [0.05198]	-0.28135** [0.05599]
log(capital)	0.88362** [0.00334]			0.90203** [0.00614]	
log(new investment)$_{t-1}$		0.96040** [0.00357]			0.66188** [0.00571]
Constant	0.48368** [0.05059]	0.38154** [0.05683]		-1.12555** [0.09170]	2.59656** [0.09115]
Observations	13156	11682		28757	23026
R^2	0.91	0.95		0.59	0.56
F test	2096.88	2685.51		526.84	368.62
Prob > F	0.000	0.000		0.000	0.000

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.

Table 7: Mexican Manufacturing Exports and RER Changes
1980-2006

	(1) Non Maquila	(2) Maquila	(3) Non Maquila	(4) Maquila	(5) Non Maquila	(6) Maquila
$\Delta\ln(\text{RER})_{t-1}$	0.444	0.237	0.442	0.233	0.434	0.229
	[0.126]***	[0.118]*	[0.128]***	[0.118]*	[0.126]***	[0.120]*
$\Delta\ln(\text{RER})_{t-1} * \text{NAFTA}$	0.328	-0.073	0.328	-0.072	0.307	-0.083
	[0.198]	[0.185]	[0.201]	[0.186]	[0.198]	[0.188]
NAFTA			-0.02	-0.039	0.084	0.015
			[0.045]	[0.041]	[0.087]	[0.083]
Trend					-0.008	-0.004
					[0.006]	[0.006]
Constant	0.131	0.147	0.141	0.165	0.291	0.243
	[0.022]***	[0.020]***	[0.031]***	[0.028]***	[0.113]**	[0.108]**
Observations	25	25	25	25	25	25
R^2	0.41	0.16	0.42	0.19	0.47	0.22

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Table 8: NAFTA and Mexico's Share of U.S. Market
HTS 6-Digit Classification

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Change in Mexico's Market Share						
Change in tariff	-0.135	-0.179	-0.123	-0.105	-0.11	-0.273
	[0.047]***	[0.073]**	[0.055]**	[0.081]	[0.089]	[0.160]*
(Change in tariff)^2		-0.317		0.136		-0.935
		[0.400]		[0.479]		[0.763]
Constant	0.000	0.000	-0.005	-0.005	0.015	0.014
	[0.001]	[0.001]	[0.002]***	[0.002]***	[0.003]***	[0.003]***
Observations	3970	3970	2833	2833	1137	1137
R-squared	0.002	0.002	0.002	0.002	0.001	0.003

Panel B: Change in log of Mexico's Market Share‡						
Change in log tariff †	-0.125		-0.11		-0.109	
	[0.039]***		[0.046]**		[0.073]	
Constant	0.000		-0.005		0.012	
	[0.001]		[0.001]***		[0.002]***	
Observations	3970		2833		1137	
R-squared	0.003		0.002		0.002	

Standard errors in brackets.
significant at 10%; ** significant at 5%; *** significant at 1%.
‡ Calculated from ln(1 + Market Share).
† Calculated from ln(1+tariff).
Columns (1) and (2) include the full sample available. Columns (3) and (4) include only those goods that Mexico already exported in 1993.
Columns (5) and (6) include only those goods that Mexico exported in 1994 but not in 1993.

Table 9: Growth of Mexico's Exports in 1994
HTS 6-Digit Classification

	(1)	(2)	(3)	(4)	(5)	(6)
Change in tariff	-21.831	-23.239		-28.365	-26.554	
	[20.400]	[30.347]		[7.056]***	[10.498]**	
(Change in tariff)^2		-11.195			14.39	
		[178.585]			[61.762]	
Change in log tariff†			-24.181			-30.964
			[22.279]			[7.707]***
Constant	2.911	2.91	2.907	1.547	1.549	1.545
	[0.615]***	[0.616]***	[0.615]***	[0.213]***	[0.213]***	[0.213]***
Observations	2836	2836	2836	2829	2829	2829
R-squared	0.000	0.000	0.000	0.006	0.006	0.006

Standard errors in brackets.
significant at 10%; ** significant at 5%; *** significant at 1%.
Columns (4) to (6) exclude sectors were export growth exceeded 30,000%.
$\dagger$ Calculated from ln(1+tariff).

Table 10: Growth of Mexico's Exports in 1995
HTS 6-Digit Classification

	(1)	(2)	(3)	(4)
Change in tariff	32.445	14.647		
	[42.197]	[14.235]		
Lagged change in tariff	-48.019	-34.73		
	[29.491]	[9.958]***		
Change in log tariff†			39.247	17.278
			[49.134]	[16.580]
Lagged change in log tariff†			-53.275	-37.67
			[32.381]	[10.936]***
Constant	5.366	3.125	5.363	3.127
	[0.940]***	[0.317]***	[0.942]***	[0.318]***
Observations	2899	2888	2899	2888
R^2	0.001	0.005	0.001	0.005

Standard errors in brackets.
significant at 10%; ** significant at 5%; *** significant at 1%.
Columns (2) and (4) exclude sectors were export growth exceeded 30,000%.
$\dagger$ Calculated from ln(1+tariff).

Table 11: NAFTA and Mexico's Manufactured Goods Share of U.S. Market
NAICS 6-Digit Classification

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Change in Mexico's Market Share					
Change in tariff	-0.195	-0.187	-0.198	-0.194	-0.008	-0.070
	[0.095]**	[0.205]	[0.096]**	[0.208]	[0.002]**	[0.042]
Change in log tariff†						
(Change in tariff)^2		0.120		0.060		-1.335
		[2.637]		[2.662]		[0.905]
Constant	0.004	0.004	0.004	0.004	0.000	0.000
	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.000]	[0.000]
Observations	370	370	365	365	5	5
R-squared	0.011	0.011	0.012	0.012	0.809	0.909
	Panel B: Change in log of Mexico's Market Share ‡					
Change in log tariff†	-0.200		-0.203		-0.008	
	[0.083]**		[0.084]**		[0.002]**	
Constant	0.003		0.003		0.000	
	[0.002]**		[0.002]**		[0.000]	
Observations	370		365		5	
R-squared	0.015		0.016		0.810	

Standard errors in brackets.
significant at 10%; ** significant at 5%; *** significant at 1%.
‡ Calculated from ln(1 + Market Share).
† Calculated from ln(1+tariff).
Columns (1) and (2) include the full sample available. Columns (3) and (4) include only those goods that Mexico already exported in 1993.
Columns (5) and (6) include only those goods that Mexico exported in 1994 but not in 1993.

Table 12: Growth of Mexico's Manufactured Goods Exports in 1994
NAICS 6-Digit Classification

	(1)	(2)	(3)
Change in tariff	-24.050	6.812	
	[6.685]***	[14.307]	
(Change in tariff)^2		445.610	
		[182.975]**	
Change in log tariff†			-26.237
			[7.145]***
Constant	0.442	0.516	0.437
	[0.133]***	[0.136]***	[0.133]***
Observations	365	365	365
R-squared	0.034	0.050	0.036

Standard errors in brackets.
significant at 10%; ** significant at 5%; *** significant at 1%.
† Calculated from ln(1+tariff).

Table 13: Growth of Mexico's Manufactured Goods Exports in 1995
NAICS 6-Digit Classification

	(1)	(2)	(3)	(4)
Change in tariff	-23.301		-3.169	
	[60.846]		[2.459]	
Lagged change in tariff	-32.322		-7.031	
	[48.496]		[1.974]***	
Change in log tariff†		-27.022		-3.442
		[65.955]		[2.669]
Lagged change in log tariff†		-35.944		-7.332
		[51.953]		[2.118]***
Constant	1.540	1.527	0.268	0.269
	[0.964]	[0.965]	[0.040]***	[0.040]***
Observations	368	368	357	357
R-squared	0.001	0.002	0.037	0.035

Standard errors in brackets.
significant at 10%; ** significant at 5%; *** significant at 1%.
Columns (3) and (4) exclude sectors were export growth exceeded 500%.
† Calculated from ln(1+tariff).

Table 14: U.S. Imports from Mexico: Tariffs and RER Interaction
Annual Data, 1990-2001

	$\Delta\ln(\text{Imports})_{jt}$			
	All Sectors	Manufacturing	All Sectors	Manufacturing
$\Delta\ln(\text{RER})_{t-1}$	0.232	0.263	0.228	0.259
	[0.091]**	[0.089]***	[0.091]**	[0.089]***
$\Delta\tau_{jt}$	-0.07	-0.075	-0.069	-0.074
	[0.013]***	[0.012]***	[0.013]***	[0.012]***
$\Delta\ln(\text{RER})_{t-1} * \Delta\tau_{jt}$	-0.273	-0.268	-0.274	-0.27
	[0.093]***	[0.086]***	[0.093]***	[0.086]***
Constant	0.098	0.099	0.124	0.122
	[0.015]***	[0.014]***	[0.033]***	[0.033]***
Observations	1904	1570	1904	1570
Number of Sectors	164	133	164	133
Sector Fixed Effects	YES	YES	YES	YES
Trend	NO	NO	YES	YES
R^2	0.02	0.04	0.02	0.04

Table 15: Entry into Exports and Change in Tariffs
(New Panel)

	(1)	(2)	(3)	(4)
change in tariff (t-1, t-2)	-3.98286	-8.49910*	-6.34194	-5.97135
	[4.07938]	[3.80257]	[4.47062]	[4.16119]
change in tariff (t-2, t-3)	-15.72051**	-8.32213*	-7.04631	-16.70741**
	[4.14535]	[3.80915]	[4.61739]	[4.12087]
change in RER, t-1				0.51979**
				[0.12901]
change in RER, t-2				0.24468
				[0.14122]
Constant	-1.93005**	-1.74572**	-1.95478**	-1.94628**
	[0.08385]	[0.11048]	[0.11475]	[0.08546]
Year dummies	NO	YES	YES	NO
Industry dummies	YES	NO	YES	YES
Observations	4174	4174	4174	4174
Number of firms	658	658	658	658

Standard errors in brackets.
significant at 5%; ** significant at 1%.

Table 16: Mexico's Development Indicators
(Average over three preceding years unless indicated)

	1986	1995
Financial Development		
Domestic credit provided by banking sector (% of GDP)	50.5	41.7
Domestic credit to private sector (% of GDP)	13.3	32.9
Liquid liabilities (M3) as % of GDP	29.3	28.9
Listed domestic companies, total	203[1]	197
Market capitalization of listed companies (% of GDP)	7.5[1]	39.7
Stocks traded, total value (% of GDP)	3.1[1]	15.8
Stocks traded, turnover ratio (%)	51.7[1]	39.4
Infrastructure		
Fixed line and mobile phone subscribers (per 1,000 people)	52.9	88.2
Telephone mainlines (per 1,000 people)	47.8	83.6
Telephone mainlines per employee	100.4	156.0
Roads, total network (km)	239235[2]	263491
Public Sector and Taxes		
Tax revenue (% of GDP)	14.9	13.4
Import duties (% of Imports)	5.8	5.2
Government Consumption/GDP (%)	9.1	10.8
Foreign Indebtedness		
External Total Debt/GDP (%)	56.3	32.3
Short-term debt (% of total external debt)	7.8	25.8
Foreign Currency-denominated Long Term Debt (%)[3]	93.5	78.7

Source: Authors' calculations from World Development Indicators, International Financial Statistics and Global Development Finance databases.
[1] Data for 1998, first year for which there is data.
[2] Data for 1990, first year for which there is data.
[3] Includes all foreign currencies except "multiple".

Table 17: Transport Costs of Mexican Exports to the U.S.
Average for all Goods

	All Goods	Only Manufacturing
1989	2.9%	1.6%
1990	4.0%	2.3%
1991	4.1%	2.3%
1992	4.2%	2.3%
1993	4.4%	2.0%
1994	4.3%	2.3%
1995	3.5%	2.3%
1996	3.7%	2.2%
1997	3.6%	2.3%
1998	3.6%	2.2%
1999	3.4%	2.1%
2000	3.2%	2.1%
2001	3.1%	2.0%

Table 18: Mexico's Tariffs and Quotas in the 1980's
(t: tariffs, q:quoatas)

			1984	1985	1986	1987	1988	1989	1990
31	Food Products	t	42.9	45.4	32.1	22.9	14.8	15.8	16.2
		q	100.0	80.1	62.2	33.3	20.8	20.6	16.8
32	Textiles & Apparel	t	38.6	43.2	40.4	26.6	16.8	16.6	16.7
		q	92.9	66.8	38.0	31.1	2.8	1.1	1.0
33	Wood Products	t	47.3	48.5	44.9	29.9	17.7	17.6	17.8
		q	100.0	75.6	25.7	0.0	0.0	0.0	0.0
34	Paper & Printing	t	33.7	36.5	34.8	23.7	7.7	10.1	9.9
		q	96.7	54.1	11.2	9.5	3.4	4.1	0.0
35	Chemicals	t	29.1	29.9	27.0	20.5	13.4	14.3	14.4
		q	85.7	54.0	21.1	4.8	0.0	0.0	0.0
36	Stone, Clay, Glass	t	37.1	38.5	33.8	22.4	13.8	14.3	14.3
		q	99.0	53.1	5.2	0.0	0.0	0.0	0.0
37	Basic Metals	t	13.6	16.7	18.4	13.8	7.9	11.0	11.0
		q	93.3	47.4	0.0	0.0	0.0	0.0	0.0
38	Metal Products	t	43.1	46.3	30.0	20.8	14.1	15.9	16.1
		q	90.7	74.8	54.7	51.4	42.7	44.1	44.1
39	Other Industries	t	40.9	42.9	40.5	27.5	17.1	18.1	18.4
		q	100.0	50.0	0.0	0.0	0.0	0.0	0.0

Source: Hanson and Harrison (1995), Table 2.

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A   Data Appendix

This paper uses data from the Mexican Encuesta Industrial Annual (EIA), the Annual Industrial Survey. This survey has been widely used in studies on the Mexican manufacturing sector. We use two versions of the survey; one denoted the "old" version, which was done yearly from 1984 to 1994[48], and a new version that runs from 1993 to 2001[49]. We use the old data for 1984 to 1992 and the new one from 1993 to 2001.

It is important to note that in both cases sample selection is not random, so this is not a sample representative of all the manufacturing industries in Mexico, but it does provide reliable information for medium and large firms. Firms with more than one hundred employees were included with certainty, and then firms were included until 85% of the value of production at the 6-digit industry level was included. There was not a decisive effort to capture entry.

The basic differences in both surveys are in the industry classification used. For the old panel the Mexican National Accounts System (SCN) was used, and for the new panel another taxonomy was applied (the Product and Activities Mexican Classification, CMAP). For the firms that appear in both panels there is no problem, we know the correspondence between SCN and CMAP; for those that are not in both panels, we assigned the value of CMAP based on the most common correspondence found in the data.[50] With the CMAP classification, it is possible to use other standard industry and trade classifications, such as the SITC and HTS, based on existing links between CMAP and the NAICS, the North American Industry Classification System.[51]

We cleaned the data according to several criteria. We dropped observations with missing key variables (employments, exports, sales, foreign ownership), with suspiciously large changes in these variables, or those that INEGI said to be "problematic" (which includes plants whose information all or parts of it, is reported in another plant of the same firm, or plants that report information of other plants of the same firm). We also decided to work with the balanced versions of each panel. For the 1984-1994 panel, the raw data has 3,199 firms. In this panel some crucial information, namely exports, are only reported for 1986-1990 and 1992. After cleaning the data we used 1,467 firms. The new panel has a different number of firms each year, ranging from 6,862 in 1993 to 5,707 in 2001. After cleaning the data, we worked with 3,899 firms. A total of 999 firms are present in both panels. These are the complete samples, and in the paper we restricted them according to other criteria, such as size and export-intensity.

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[48]This data has been used by Aitken, Harrison, and Lipsey (1996), and Gelos and Werner (2002), among others

[49]This data is the one used by Verhoogen (2003) (to whom we are grateful for sharing many crucial insights as for cleaning the data) and by López-Córdova (2003)

[50]In most of the cases more than 90% of the firms with a given SCN code were assigned to the same CMAP code.

[51]Of course, this is not straightforward. There is not a one-to-one match between CMAP and NAICS, and then between NAICS and other common classifications. We used existing correspondence tables and several matching algorithms of our own.

The key variables are straightforward: total employment, total sales, sales to foreign markets, and spending in new investment. We deflated all variables with the producer price index to express them in pesos of June of 2002.

The two-digit industry codes used in Table 18 is the following:

31 Food, Beverages and Tobacco

32 Textiles

33 Wood

34 Paper and Printing

35 Chemicals

36 Non-metallic Minerals

37 Basic Metallic Industries

38 Machinery and Equipment

39 Other Manufacturing

B   Additional Regressions

Table 1: Employment and Sales During Episode 1
(Allowing for industry-year interactions)

	Dep Var: % Change in Employment			Dep Var: % Change in Total Sales		
γ^{1985}	-0.00401	-0.01274	-0.01398	-0.00396	-0.02858	-0.02469
	[0.01225]	[0.01230]	[0.01233]	[0.02878]	[0.02903]	[0.02899]
γ^{1986}	0.00969	0.0011	-0.00011	0.09714**	0.07295**	0.07680**
	[0.01173]	[0.01179]	[0.01173]	[0.02661]	[0.02658]	[0.02653]
γ^{1987}	0.04700**	0.03846**	0.03716**	0.04191	0.01553	0.01935
	[0.01308]	[0.01321]	[0.01310]	[0.02760]	[0.02764]	[0.02770]
γ^{1988}	-0.00262	-0.01168	-0.013	-0.04667*	-0.07370**	-0.06953**
	[0.01070]	[0.01076]	[0.01079]	[0.02262]	[0.02295]	[0.02279]
γ^{1989}	-0.00508	-0.01409	-0.01536	0.00441	-0.02111	-0.01701
	[0.01019]	[0.01019]	[0.01015]	[0.02197]	[0.02220]	[0.02209]
γ^{1990}	-0.01403	-0.02286*	-0.02410*	-0.01154	-0.03654	-0.03252
	[0.00988]	[0.00990]	[0.00989]	[0.01923]	[0.01942]	[0.01942]
γ^{1991}	-0.02685*	-0.03543**	-0.03665**	-0.03637*	-0.06093**	-0.05702**
	[0.01085]	[0.01090]	[0.01087]	[0.01764]	[0.01785]	[0.01778]
γ^{1992}	0.00876	0.00058	-0.0006	0.01782	-0.00544	-0.00185
	[0.01035]	[0.01040]	[0.01038]	[0.01943]	[0.01929]	[0.01928]
γ^{1986}	0.17683	0.06831	0.06853	-0.35159**	-0.34658**	-0.33837**
	[0.11671]	[0.11850]	[0.11846]	[0.12149]	[0.12213]	[0.06113]
γ^{1987}	-0.0092	-0.11938**	-0.11896**	-0.00273	0.00903	0.01799
	[0.03621]	[0.03963]	[0.03967]	[0.17936]	[0.18027]	[0.14611]
γ^{1988}	0.06302	-0.04664	-0.04622	-0.02679	-0.01701	-0.00783
	[0.07087]	[0.07307]	[0.07315]	[0.14195]	[0.14365]	[0.09708]
γ^{1989}	0.11711*	0.00731	0.00767	-0.00326	0.0048	0.01415
	[0.04804]	[0.05103]	[0.05110]	[0.12778]	[0.12904]	[0.07372]
γ^{1990}	0.03332	-0.07759*	-0.07737*	-0.14198	-0.13724	-0.12719
	[0.03201]	[0.03570]	[0.03571]	[0.13076]	[0.13241]	[0.07948]
δ^{1991}	0.07292*	-0.0382	-0.03797	0.17565	0.18134	0.19134
	[0.03431]	[0.03798]	[0.03803]	[0.17795]	[0.18121]	[0.14672]
δ^{1992}	0.11162**					0.01025
	[0.04041]					[0.13195]
log(firm size)$_{t-1}$	-0.01478**					-0.01057**
	[0.00193]					[0.00340]
log(total sales)$_{t-1}$		-0.00101		-0.02842**		
		[0.00137]		[0.00277]		
log(capital)$_{t-1}$			0.0002		-0.00241	
			[0.00095]		[0.00207]	
Constant	0.04777	0.10537**	0.09257**	0.45708**	0.17067	0.18483**
	[0.02743]	[0.03425]	[0.03189]	[0.12403]	[0.12159]	[0.05820]
Observations	11736	11736	11736	11736	11736	11736
R-squared	0.07	0.07	0.07	0.1	0.09	0.09
F test	2.77	2.9	2.84	4.99	10.77	5.9
Prob > F	0	0	0	0	0	0

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.
Coefficients for the interaction of industry and year not shown.

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Table 2: Employment and Sales During Episode 2
(Allowing for industry-year interactions)

	Dep Var: % Change in Employment			Dep Var: % Change in Total Sales		
γ^{1994}	0.01935	0.00985	0.00942	0.05445**	0.03951**	0.04523**
	[0.01028]	[0.01037]	[0.01040]	[0.01390]	[0.01398]	[0.01393]
γ^{1995}	0.05700**	0.04712**	0.04671**	0.15942**	0.14319**	0.14949**
	[0.01000]	[0.00998]	[0.01004]	[0.01495]	[0.01493]	[0.01494]
γ^{1996}	0.02565**	0.01445	0.013	0.01521	-0.00539	0.00301
	[0.00921]	[0.00927]	[0.00925]	[0.01337]	[0.01339]	[0.01340]
γ^{1997}	0.03060**	0.01905*	0.01872*	-0.01529	-0.03350*	-0.02761
	[0.00938]	[0.00933]	[0.00932]	[0.01448]	[0.01445]	[0.01454]
γ^{1998}	0.00575	-0.00606	-0.0066	-0.00749	-0.02725*	-0.0195
	[0.00794]	[0.00788]	[0.00787]	[0.01066]	[0.01065]	[0.01066]
γ^{1999}	-0.00188	-0.01357	-0.01376	-0.02561**	-0.04519**	-0.03747**
	[0.00712]	[0.00715]	[0.00717]	[0.00989]	[0.00985]	[0.00986]
γ^{2000}	0.00676	-0.00478	-0.00518	0.00097	-0.02284*	-0.01044
	[0.00664]	[0.00657]	[0.00655]	[0.01200]	[0.01097]	[0.01196]
γ^{2001}	-0.01918**	-0.03070**	-0.03057**	-0.00507	-0.02371*	-0.01632
	[0.00681]	[0.00682]	[0.00683]	[0.01045]	[0.01044]	[0.01041]
δ^{1995}	-0.09432*	-0.11551**	-0.02882	-0.02485	-0.07951	-0.11711
	[0.04633]	[0.04436]	[0.03849]	[0.06056]	[0.05738]	[0.06951]
δ^{1996}	0	-0.01952	0.06729	0.09036	0.03876	0
	[0.00000]	[0.04597]	[0.04033]	[0.05964]	[0.05642]	[0.00000]
δ^{1997}	-0.01436	-0.03428	0.05261	0.0754	0.02388	-0.01501
	[0.04347]	[0.04110]	[0.03463]	[0.04142]	[0.03595]	[0.05328]
δ^{1998}	-0.01624	-0.03653	0.05017	0.00936	-0.04295	-0.08136
	[0.03975]	[0.03691]	[0.02964]	[0.04249]	[0.03771]	[0.05442]
δ^{1999}	0.02051	0	0.08632*	0	-0.05188	-0.08986
	[0.04559]	[0.00000]	[0.03809]	[0.00000]	[0.04396]	[0.05910]
δ^{2000}	0.00719	-0.01388	0.07222	0.07851	0.02827	-0.01004
	[0.05169]	[0.05014]	[0.04488]	[0.05050]	[0.04626]	[0.06069]
δ^{2001}	-0.02846	-0.04991	0.03601	0.06546	0.01448	-0.02302
	[0.04009]	[0.03808]	[0.03096]	[0.04412]	[0.04047]	[0.05612]
$\log(\text{firm size})_{t-1}$	-0.01536**					-0.00252
	[0.00163]					[0.00216]
$\log(\text{total sales})_{t-1}$		0.00335**		-0.01603**		
		[0.00102]		[0.00181]		
$\log(\text{capital})_{t-1}$			0.00330**		0.00693**	
			[0.00087]		[0.00130]	
Constant	0.13053**	0.0389	-0.0392	0.14863**	-0.04551	0.06757
	[0.03491]	[0.03446]	[0.02338]	[0.04002]	[0.03125]	[0.05017]
Observations	31192	31192	31146	31192	31146	31192
R-squared	0.07	0.07	0.07	0.09	0.09	0.09
F test	6.65	6.67	6.67	8.8	9.01	8.88
Prob > F	0	0	0	0	0	0

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.
Coefficients for the interaction of industry and year not shown.

Table 3: Investment with Industry and Year Effects
(Allowing for industry-year interactions)

Old Panel, 1984-1992 (Exporters selected in 1986)			New Panel, 1993-2001 (Exporters selected in 1995)		
γ^{1984}	-0.05047		γ^{1993}	0.07817	
	[0.04222]			[0.06193]	
γ^{1985}	-0.04525	0.0116	γ^{1994}	0.13056*	0.23774**
	[0.04027]	[0.02736]		[0.05748]	[0.06448]
γ^{1986}	-0.01411	0.08326**	γ^{1995}	0.25738**	0.39859**
	[0.03808]	[0.02565]		[0.05990]	[0.06655]
γ^{1987}	-0.0442	0.03502	γ^{1996}	0.19605**	0.25558**
	[0.03990]	[0.02278]		[0.05729]	[0.06049]
γ^{1988}	-0.03063	0.05033*	γ^{1997}	0.19182**	0.26451**
	[0.03777]	[0.02259]		[0.05374]	[0.05682]
γ^{1989}	-0.04139	0.00484	γ^{1998}	0.12752*	0.24276**
	[0.03769]	[0.02262]		[0.05302]	[0.05710]
γ^{1990}	-0.03279	0.0198	γ^{1999}	0.09604	0.26545**
	[0.03709]	[0.02397]		[0.05459]	[0.05888]
γ^{1991}	-0.00763	0.06628*	γ^{2000}	0.03944	0.20821**
	[0.03654]	[0.02748]		[0.05699]	[0.05960]
γ^{1992}	0.00615	0.02911	γ^{2001}	-0.06833	0.13005*
	[0.03860]	[0.04460]		[0.06052]	[0.06564]
δ^{1986}	0.07015		δ^{1994}	-0.032	
	[0.15022]			[0.23961]	
δ^{1987}	0.0586	-0.03339	δ^{1995}	-0.82460**	-0.56320*
	[0.15607]	[0.16855]		[0.25548]	[0.28199]
δ^{1987}	0.00906	-0.37741**	δ^{1996}	-0.28975	0.18558
	[0.15469]	[0.14418]		[0.26431]	[0.25640]
δ^{1988}	0.00633	-0.14016	δ^{1997}	-0.46869	-0.07025
	[0.15843]	[0.08499]		[0.26969]	[0.30939]
δ^{1989}	0.06043	-0.00638	δ^{1998}	-0.23199	0.3202
	[0.15350]	[0.06800]		[0.23137]	[0.26291]
δ^{1990}	0.03543	-0.08363	δ^{1999}	-0.35655	0.02853
	[0.16458]	[0.08172]		[0.23213]	[0.26843]
δ^{1991}	-0.01882	-0.07987	δ^{2000}	-0.43751	-0.00498
	[0.16639]	[0.13599]		[0.22813]	[0.27847]
δ^{1992}	0.19763	-0.16047	δ^{2001}	-0.40146	0.17888
	[0.15330]	[0.25492]		[0.25181]	[0.28947]
log(capital)	0.88386**		log(capital)	0.90461**	
	[0.00337]			[0.00613]	
log(new investment)$_{t-1}$		0.96138**	log(new investment)$_{t-1}$		0.66457**
		[0.00354]			[0.00573]
Constant	0.51064**	0.45326**	Constant	-0.85845**	2.39994**
	[0.12042]	[0.06479]		[0.16976]	[0.19599]
Observations	13156	11682		28757	23026
R-squared	0.91	0.95		0.6	0.57
F test	1206.24	1181.14		94.08	71.51
Prob > F	0	0		0	0

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.
Coefficients for the interaction of industry and year not shown.

Table 4: Employment and Sales During Episode 1
(Excluding High-Export and Small Firms)

	Dep Var: % Change in Employment			Dep Var: % Change in Total Sales		
	(1)	(2)	(3)	(4)	(5)	(6)
γ^{1985}	0.0026	0.00272	-0.00224	0.01413	0.01378	0.0079
	[0.01125]	[0.01125]	[0.01147]	[0.02639]	[0.02639]	[0.02701]
γ^{1986}	0.01362	0.01051	0.01099	0.05954*	0.06124*	0.05096*
	[0.01213]	[0.01164]	[0.01237]	[0.02420]	[0.02514]	[0.02464]
γ^{1987}	0.03540**	0.03764**	0.03600**	0.04177	0.04598	0.04005
	[0.01207]	[0.01245]	[0.01220]	[0.02608]	[0.02679]	[0.02629]
γ^{1988}	0.00433	0.00192	0.00197	-0.00504	-0.002	-0.01139
	[0.00969]	[0.00980]	[0.00991]	[0.02145]	[0.02175]	[0.02159]
γ^{1989}	0.00396	-0.00308	0.00453	0.01456	0.01334	0.00732
	[0.01026]	[0.00965]	[0.01031]	[0.01938]	[0.01977]	[0.01939]
γ^{1990}	-0.01331	-0.01435	-0.01435	-0.00584	-0.0085	0.00094
	[0.00923]	[0.00930]	[0.00942]	[0.01706]	[0.01631]	[0.01705]
γ^{1991}	-0.01915	-0.01903	-0.0161	-0.04104*	-0.04140*	-0.04288**
	[0.00988]	[0.00990]	[0.00993]	[0.01625]	[0.01627]	[0.01635]
γ^{1992}	-0.01087	-0.00797	-0.01172	-0.00318	-0.00052	0.00366
	[0.00991]	[0.01003]	[0.00977]	[0.01830]	[0.01852]	[0.01842]
δ^{1986}	-0.02731**	-0.02789**	-0.03178**	-0.11706**	-0.11720**	-0.12266**
	[0.00784]	[0.00783]	[0.00856]	[0.01708]	[0.01710]	[0.01821]
δ^{1987}	-0.02576**	-0.02568**	-0.03108**	-0.04626**	-0.04499*	-0.04772*
	[0.00781]	[0.00782]	[0.00852]	[0.01782]	[0.01784]	[0.01932]
δ^{1988}	-0.01053	-0.00988	-0.01511	-0.04232**	-0.04191**	-0.04932**
	[0.00775]	[0.00777]	[0.00841]	[0.01563]	[0.01565]	[0.01659]
δ^{1989}	0.01111	0.01171	0.0031	0.02215	0.02228	0.01447
	[0.00857]	[0.00859]	[0.00833]	[0.01570]	[0.01573]	[0.01656]
δ^{1990}	0.00183	0.00125	-0.00277	-0.03330*	-0.03340*	-0.04866**
	[0.00767]	[0.00768]	[0.00817]	[0.01580]	[0.01582]	[0.01666]
δ^{1991}	-0.0063	-0.00631	-0.0148	-0.03270*	-0.03272*	-0.03865*
	[0.00785]	[0.00785]	[0.00829]	[0.01526]	[0.01526]	[0.01621]
δ^{1992}	-0.03586**	-0.03609**	-0.04537**	-0.07963**	-0.07910**	-0.09435**
	[0.00814]	[0.00816]	[0.00879]	[0.01576]	[0.01578]	[0.01664]
$\log(\text{firm size})_{t-1}$	-0.01548**	-0.01527**	-0.01953**			
	[0.00195]	[0.00197]	[0.00226]			
$\log(\text{total sales})_{t-1}$				-0.02996**	-0.02985**	-0.03131**
				[0.00281]	[0.00283]	[0.00312]
Constant	0.13309**	0.13383**	0.16512**	0.46867**	0.46819**	0.49755**
	[0.02184]	[0.02212]	[0.02657]	[0.04753]	[0.04813]	[0.05211]
Observations	11736	11588	10680	11736	11588	10680
R-squared	0.03	0.03	0.03	0.04	0.04	0.04
F test	4.51	4.35	4.92	5.85	5.75	5.63
Prob > F	0	0	0	0	0	0

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.
Coefficients for the interaction of industry and year not shown.
Note: Columns (2) and (4) are from table 4; columns (3) and (6) exclude from the sample
the small firms, those with less than forty workers in every year.

Table 5: Employment and Sales During Episode 2
(Excluding High-Export and Small Firms, Exporters selected in 1995)

	Dep Var: % Change in Employment			Dep Var: % Change in Total Sales		
	(1)	(2)	(3)	(4)	(5)	(6)
γ^{1994}	0.01318	0.00635	0.00761	0.05831**	0.04774**	0.05660**
	[0.00938]	[0.00921]	[0.01006]	[0.01306]	[0.01299]	[0.01354]
γ^{1995}	0.05350**	0.04818**	0.05351**	0.16040**	0.12147**	0.14444**
	[0.00908]	[0.00937]	[0.00965]	[0.01501]	[0.01469]	[0.01518]
γ^{1996}	0.04298**	0.03735**	0.03924**	0.03413**	0.02942*	0.02281
	[0.00868]	[0.00859]	[0.00923]	[0.01276]	[0.01257]	[0.01323]
γ^{1997}	0.03694**	0.03204**	0.03693**	0.00466	0.0037	0.00425
	[0.00894]	[0.00880]	[0.00955]	[0.01338]	[0.01339]	[0.01395]
γ^{1998}	0.01244	0.0069	0.00895	-0.00616	-0.01127	-0.01008
	[0.00765]	[0.00737]	[0.00807]	[0.01002]	[0.01013]	[0.01046]
γ^{1999}	-0.00967	-0.01229	-0.01182	-0.03397**	-0.03289**	-0.03559**
	[0.00658]	[0.00666]	[0.00710]	[0.00970]	[0.00982]	[0.01024]
γ^{2000}	0.0038	0.00678	0.00313	-0.00518	-0.00121	-0.00252
	[0.00629]	[0.00646]	[0.00652]	[0.01129]	[0.01122]	[0.01180]
γ^{2001}	-0.02562**	-0.02190**	-0.02443**	-0.02535**	-0.02478*	-0.03517**
	[0.00627]	[0.00627]	[0.00666]	[0.00976]	[0.00993]	[0.01005]
δ^{1995}	-0.10764**	-0.10723**	-0.11393**	-0.18057**	-0.17942**	-0.16755**
	[0.00807]	[0.00808]	[0.00904]	[0.01160]	[0.01160]	[0.01255]
δ^{1996}	0.01925*	0.01951*	0.02105*	0.00606	0.00571	0.0161
	[0.00860]	[0.00861]	[0.00951]	[0.01153]	[0.01155]	[0.01231]
δ^{1997}	0.04741**	0.04564**	0.04339**	0.03450**	0.03333**	0.03339**
	[0.00834]	[0.00832]	[0.00935]	[0.01182]	[0.01183]	[0.01271]
δ^{1998}	0.02763**	0.02786**	0.02577**	-0.04091**	-0.04096**	-0.04031**
	[0.00758]	[0.00759]	[0.00843]	[0.01075]	[0.01074]	[0.01156]
δ^{1999}	0.00425	0.00445	0.00166	-0.06891**	-0.06910**	-0.06697**
	[0.00790]	[0.00792]	[0.00880]	[0.01073]	[0.01075]	[0.01156]
δ^{2000}	-0.01145	-0.01137	-0.01694*	-0.07340**	-0.07432**	-0.07677**
	[0.00743]	[0.00744]	[0.00821]	[0.01026]	[0.01024]	[0.01095]
δ^{2001}	-0.04450**	-0.04450**	-0.05047**	-0.11723**	-0.11677**	-0.11281**
	[0.00772]	[0.00773]	[0.00847]	[0.01055]	[0.01057]	[0.01136]
$\log(\text{firm size})_{t-1}$	-0.01616**	-0.01605**	-0.02883**			
	[0.00164]	[0.00167]	[0.00215]			
$\log(\text{total sales})_{t-1}$				-0.01765**	-0.01730**	-0.02250**
				[0.00183]	[0.00188]	[0.00209]
Constant	0.11865**	0.11857**	0.20012**	0.26587**	0.26271**	0.33000**
	[0.01504]	[0.01519]	[0.01777]	[0.02607]	[0.02655]	[0.02869]
Observations	31192	29996	27440	31192	29996	27440
R-squared	0.05	0.05	0.06	0.04	0.04	0.04
F test	22.65	22	22.21	19.21	18.09	17.82
Prob > F	0	0	0	0	0	0

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.
Coefficients for the interaction of industry and year not shown.
Note: Columns (2) and (4) are from table 5; columns (3) and (6) exclude from the sample
the small firms, those with less than forty workers in every year.

Table 6: Employment and Sales During Episode 1
(Including only firms present in the Long Panel)

	Dep Var: % Change in Employment			Dep Var: % Change in Total Sales		
γ^{1985}	0.01118	0.0026	0.00103	0.00398	-0.0202	-0.0149
	[0.01231]	[0.01227]	[0.01226]	[0.02884]	[0.02927]	[0.02917]
γ^{1986}	0.00076	-0.00793	-0.00949	0.04085	0.01652	0.02195
	[0.01389]	[0.01397]	[0.01394]	[0.02498]	[0.02514]	[0.02500]
γ^{1987}	0.02791*	0.01923	0.01763	0.05302	0.0277	0.03313
	[0.01370]	[0.01390]	[0.01374]	[0.03039]	[0.03043]	[0.03057]
γ^{1988}	0.00591	-0.00311	-0.00475	0.00962	-0.01696	-0.01127
	[0.01088]	[0.01094]	[0.01101]	[0.02643]	[0.02691]	[0.02665]
γ^{1989}	0.00048	-0.00868	-0.01032	0.00778	-0.01886	-0.01304
	[0.01192]	[0.01195]	[0.01192]	[0.02258]	[0.02282]	[0.02258]
γ^{1990}	-0.01752	-0.02671*	-0.02833**	-0.00719	-0.03384	-0.02797
	[0.01061]	[0.01056]	[0.01060]	[0.01850]	[0.01873]	[0.01864]
γ^{1991}	-0.02818*	-0.03722**	-0.03882**	-0.04833**	-0.07491**	-0.06910**
	[0.01188]	[0.01193]	[0.01190]	[0.01813]	[0.01849]	[0.01834]
γ^{1992}	-0.02262	-0.03134*	-0.03290**	0.00027	-0.02478	-0.01926
	[0.01212]	[0.01228]	[0.01225]	[0.02220]	[0.02211]	[0.02209]
δ^{1986}	-0.02355*	-0.02385*	-0.02388*	-0.11942**	-0.12108**	-0.12078**
	[0.00947]	[0.00947]	[0.00946]	[0.01889]	[0.01892]	[0.01894]
δ^{1987}	-0.02123*	-0.02153*	-0.02150*	-0.03834	-0.03814	-0.03786
	[0.00935]	[0.00937]	[0.00937]	[0.02006]	[0.02018]	[0.02018]
δ^{1988}	-0.00807	-0.00837	-0.00832	-0.03685*	-0.03713*	-0.03676*
	[0.00875]	[0.00878]	[0.00877]	[0.01738]	[0.01757]	[0.01757]
δ^{1989}	0.02110*	0.02063*	0.02065*	0.03133	0.0302	0.03071
	[0.00884]	[0.00883]	[0.00882]	[0.01745]	[0.01767]	[0.01764]
δ^{1990}	0.00793	0.00695	0.00687	-0.03353	-0.03751*	-0.03659*
	[0.00904]	[0.00906]	[0.00904]	[0.01802]	[0.01821]	[0.01820]
δ^{1991}	0.00106	-0.00028	-0.00039	-0.02074	-0.02555	-0.02435
	[0.00887]	[0.00890]	[0.00887]	[0.01753]	[0.01771]	[0.01771]
δ^{1992}	-0.02344*	-0.02504**	-0.02524**	-0.07675**	-0.08276**	-0.08146**
	[0.00964]	[0.00965]	[0.00963]	[0.01763]	[0.01771]	[0.01773]
$\log(\text{firm size})_{t-1}$	-0.01439**					-0.01131**
	[0.00228]					[0.00405]
$\log(\text{total sales})_{t-1}$		-0.0008		-0.02933**		
		[0.00160]		[0.00332]		
$\log(\text{capital})_{t-1}$			0.00068		-0.00158	
			[0.00118]		[0.00250]	
Constant	0.12548**	0.07297**	0.05838*	0.46450**	0.16793**	0.20163**
	[0.02493]	[0.02706]	[0.02367]	[0.05505]	[0.04535]	[0.04330]
Observations	7992	7992	7992	7992	7992	7992
R-squared	0.03	0.03	0.03	0.04	0.03	0.03
F test	3.74	3.27	3.29	4.66	3.91	3.91
Prob > F	0	0	0	0	0	0

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.

Table 7: Employment and Sales During Episode 2
(Including only firms present in the Long Panel)
(Exporter Selected in 1995)

	Dep Var: % Change in Employment			Dep Var: % Change in Total Sales		
γ^{1994}	0.00034	-0.0074	-0.00925	0.06370**	0.04659*	0.05346*
	[0.01176]	[0.01185]	[0.01189]	[0.02161]	[0.02200]	[0.02159]
γ^{1995}	0.04794**	0.04014**	0.03862*	0.10391**	0.08670**	0.09307**
	[0.01517]	[0.01520]	[0.01518]	[0.02604]	[0.02599]	[0.02602]
γ^{1996}	0.03883*	0.0304	0.02859	0.00612	-0.01213	-0.00604
	[0.01663]	[0.01696]	[0.01715]	[0.02228]	[0.02247]	[0.02231]
γ^{1997}	0.03681*	0.02783	0.02606	0.02757	0.00892	0.01528
	[0.01579]	[0.01567]	[0.01551]	[0.02295]	[0.02307]	[0.02285]
γ^{1998}	-0.00121	-0.01053	-0.01273	0.00706	-0.01254	-0.00558
	[0.01096]	[0.01102]	[0.01103]	[0.01787]	[0.01797]	[0.01785]
γ^{1999}	-0.03869**	-0.04794**	-0.04973**	-0.04863**	-0.06852**	-0.06125**
	[0.01338]	[0.01355]	[0.01377]	[0.01682]	[0.01701]	[0.01698]
γ^{2000}	-0.01395	-0.02280*	-0.02438*	0.00704	-0.012	-0.00505
	[0.01003]	[0.00995]	[0.01004]	[0.01642]	[0.01646]	[0.01652]
γ^{2001}	-0.03903**	-0.04775**	-0.04931**	-0.03907*	-0.05499**	-0.05122**
	[0.01104]	[0.01107]	[0.01109]	[0.01796]	[0.01779]	[0.01799]
δ^{1995}	-0.06157**	-0.06123**	-0.06181**	-0.10580**	-0.10701**	-0.10582**
	[0.01123]	[0.01126]	[0.01129]	[0.02169]	[0.02170]	[0.02170]
δ^{1996}	0.05673**	0.05832**	0.05799**	0.06590**	0.06623**	0.06752**
	[0.01521]	[0.01535]	[0.01544]	[0.02080]	[0.02084]	[0.02084]
δ^{1997}	0.06383**	0.06524**	0.06534**	0.03149	0.03355	0.03242
	[0.01130]	[0.01130]	[0.01133]	[0.01986]	[0.01990]	[0.01992]
δ^{1998}	0.06033**	0.06135**	0.06210**	-0.01841	-0.01697	-0.01788
	[0.01039]	[0.01039]	[0.01040]	[0.01784]	[0.01784]	[0.01786]
δ^{1999}	0.04892**	0.04953**	0.04963**	-0.02333	-0.02224	-0.02284
	[0.01277]	[0.01281]	[0.01283]	[0.01914]	[0.01917]	[0.01918]
δ^{2000}	0.03018**	0.03062**	0.03032**	-0.04540*	-0.04492*	-0.04479*
	[0.01092]	[0.01089]	[0.01089]	[0.01882]	[0.01880]	[0.01882]
δ^{2001}	0.00148	0.0019	0.00143	-0.07943**	-0.08264**	-0.07850**
	[0.01056]	[0.01056]	[0.01059]	[0.01821]	[0.01785]	[0.01819]
$\log(\text{firm size})_{t-1}$	-0.01128**					0.0014
	[0.00317]					[0.00351]
$\log(\text{total sales})_{t-1}$		0.00076		-0.01068**		
		[0.00201]		[0.00275]		
$\log(\text{capital})_{t-1}$			0.00202		0.00659**	
			[0.00169]		[0.00217]	
Constant	0.02658	-0.03189	-0.04025*	0.11995**	-0.04909	-0.00136
	[0.02022]	[0.02601]	[0.02050]	[0.04545]	[0.03698]	[0.03705]
Observations	7992	7992	7980	7992	7980	7992
R-squared	0.06	0.06	0.06	0.04	0.04	0.04
F test	8.5	8.24	8.24	6.02	5.94	5.87
Prob > F	0	0	0	0	0	0

Robust standard errors in brackets.
significant at 5%; ** significant at 1%
Coefficients for 4-digit industry dummies and for the interactions of FDI and year, not shown.

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