Whither the Maquiladora?

A Look at the Growth Prospects for the Industry After 2001

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Abstract: With the termination on January 1, 2001, of the tariff waiver on imported inputs, the maquiladora industry faces a loss of one of its most significant competitive advantages. The elimination of the tariff waiver is required under Article 303 of the North American Free Trade Agreement (NAFTA) treaty and has been set to occur since the ratification of the agreement in 1993. Nevertheless, there is a significant amount of uncertainty surrounding the new regulatory environment facing the maquiladora industry, and a number of questions about the future of the industry have been answered slowly or not at all. It is reasonable to believe that the loss of the tariff waiver and the uncertainty of the regulatory regime that replaces it will have a harmful affect on new investment in the industry. A look at the growth record of the maquiladora, however, over several different periods and in different locales, reveals an industry that continues to expand robustly. The reasons for continued expansion probably lie in its proximity to the U.S. market, lower labor costs, NAFTA rules of origin, and Mexico's bilateral trade agreements. In addition, aggregate measures of the industry support the hypothesis that the industry is in a state of (uneven) transformation, from first-generation, low-skilled assembly work to second-generation, advanced manufacturing.

1. Introduction: The maquiladora industry and NAFTA

With more than 1,000,000 workers and over 5 billion pesos in monthly wages and salaries, the maquiladora industry is critical to the Mexican economy. Nowhere is this more true than along the U.S./Mexico border where about 79 percent of the workers are located (INEGI, 1999). While Mexico depends on the foreign exchange earnings and jobs of this sector, many U.S. firms depend on its low cost parts to maintain their international competitiveness.

The maquiladora program began in 1965 when the government initiated the Border Industrialization Program (BIP) with its Decree for the Development and Operation of the Maquiladora Export Industry (Maquila Decree). The primary purpose of the plan was to generate employment along its northern border where large numbers of workers were unemployed due to the termination of the agricultural guest worker program (called the *bracero* program) in the United States. In its early years, the maquiladora program was viewed as a jobs program rather than as an industrial strategy for Mexican economic development. After 1982, with the onset of the debt crisis, the export surplus of the maquiladora and its ability to earn foreign exchange were perceived as additional reasons to encourage the industry's growth.

By the mid-1980s and early 1990s, public perceptions of the industry began to shift once again. Policy-makers in Mexico began to search out ways to increase the industry's economic ties to the rest of the national economy so that it would act as a source of demand for Mexican products and as an engine of economic growth. If supplier linkages can develop, then the industry truly shifts from a jobs program to a key component of the country's industrial strategy. While Mexican policy-makers continue to search for ways to develop the economic linkages between the maquiladoras and the rest of the national economy, many of the second-generation maquiladora that began operations in the late 1980s added a new twist. First-generation maquiladoras are mainly assembly operations that use unskilled and semiskilled labor in low-tech working environments to produce relatively unsophisticated components for more advanced firms in the United States and elsewhere. Many second-generation maquiladoras are different:

> No longer is it simply the low skilled, labor intensive, largely feminine assembly activity that it once was. Second-generation maquiladoras now incorporate much more advanced technology, more capital intensive methods, a more masculine labor force, and more manufacturing (Wilson, 1992, P. 4).

Other changes have proceeded as well. Some maquiladoras have begun to explore export markets outside North America, shipping televisions and electronic components to South America and other markets while raising workforce skill levels (Zúñiga, 1999). Others are experimenting with advanced, flexible manufacturing systems (Shaiken, 1990), and expanding into non-traditional products such as software (Moreno, 1999).

Meanwhile, the industry has continued to grow and thrive, often hitting double-digit growth rates. Because the economy of the maquiladora industry is more directly tied to the economy of U.S. manufacturing, it often acts as a stabilizing force when the national economy heads into recession (Gruben, 1990). For example, in 1995 when Mexico's GDP fell by 6 percent, employment in the maquiladora industry grew by more than 9 percent. And during 1998, when export earnings by the oil industry were off significantly, the maquiladora industry became the largest source of foreign revenue.

About three-fourths of all maquilas are located in border states, with the greatest concentration in cities on the border. This gives residents of the border region a significant stake in the future of the industry. On the Mexican side of the border, the impacts of the maquiladora industry are easy to conceptualize. In Tijuana, for example, at the end of 1998, there were approximately 700 maquiladora firms employing 146,000 workers (INEGI, 1999). While this is perhaps nearly 1/3 of Tijuana's economically active population, it is also estimated that for every worker in Tijuana's maquiladora industry, another job is generated in the city due to the direct, indirect, and induced effects of the spending by firms and workers (Alegría, 1995). Maquiladora workers in the state of Baja California earn approximately 1 billion pesos per month in wages, salaries and benefits, an amount equivalent to 1.2 billion U.S. dollars per year (INEGI, 1999).

Across from the Mexican border cities, there are also significant economic effects on the U.S. side. Maquiladora workers spend some share of their income in the United States and in relatively small cities, such as Calexico, this can be a significant share of the total demand for goods and services. In addition, maquiladoras generate demand for goods and services that are produced on the U.S. side of the border. It was estimated in the 1980s, for example, that about 1/3 of the maquiladoras in Baja California had U.S. operations that supplied expertise and physical inputs (Clement and Jenner, 1987). Estimates of the employment impacts on U.S. border cities are generally positive and significant (Hanson, 1996). Summing up the effect, Michael Patrick writes:

> Although the literature does not provide a clear and complete picture of the employment linkages between the maquiladora industry and U.S. border communities, the evidence indicates that a positive and in many cases strong relationship does exist (Patrick, 1990, P. 68).

Any significant change to the regulatory regime that created the maquiladora industry is likely to be felt throughout Mexico and along both sides of its northern border. Given the stakes, it is not surprising that there is concern over the fate of the maquiladora industry after it technically disappears on January 1, 2001. That is the date set by NAFTA for the elimination of the special duty-free status given by Mexico to maquiladora imports. The new rules are contained in Article 303, which covers restrictions on drawbacks and duty deferral programs. (See the Appendix for the precise wording and the official interpretation.) In essence, Article 303 forces importers to pay the amount which is the lesser of its own country's tariff on non-NAFTA imports or the tariff of the NAFTA partner receiving Mexico's exports of the transformed product.

An example may help illustrate the changes. Suppose a maquila imports items that would normally face a $5,000 tariff in the absence of the Maquila Decree. The imports are incorporated into a finished product that is exported to the United States where duties of $1,000 are normally paid. Under existing rules, Mexico may waive the entire $5,000 duty; under the rules beginning on January 1, 2001, Mexico may only waive $1,000, the lesser of the two duties. In effect, the increase in tariffs paid by the Mexican importer is $4,000.

This paper examines the issue of the fate of the maquiladora industry. The next section argues that the Mexican government has been slow to formulate the new regulations that will be applied to the maquiladora industry and that this has led to an unnecessarily high level of uncertainty. Section three looks at more general factors affecting the industry and tries to delineate the growth inhibiting and growth inducing forces. While it is relatively easy to tell stories with either positive or negative outcomes for the maquiladora industry, the ultimate fate of the industry is a factual matter that cannot be determined in advance through the consideration of theoretical growth forces. Hence, the final section looks at the growth record of the maquiladora industry, from 1980 to 1999. This empirical account of the industry shows little reason to be worried about its survivability after the disappearance of the tariff waiver in 2001. Some of the possible reasons for the recent robust growth of the industry are considered in the conclusion.

2. Uncertainty ahead

Speculation about the future of the maquiladora industry raises two distinct sets of questions. The first set concerns the tariff and non-tariff regulations that will apply to the maquiladora firms after the start of 2001. Of primary concern is the new tariff structure facing firms that import from non-NAFTA sources. It would seem easiest to apply the same tariff that non-maquila firms face when they import, but there have been numerous indications that the federal government will implement a new tariff structure for the ex-maquiladora. The Mexican government announced that President Zedillo would unveil a new set of tariffs for the post-2001 period at a meeting of maquila executives in October 1998, in Cancun, Mexico. Zedillo and two cabinet level ministers failed to show, however, and little new information was given. In the end, speculation developed that the government was divided between the Mexican Treasury's (*Secretaría de Hacienda y Crédito Público*, or SHCP) need for tariff revenues and the Commerce Department's (*Secretaría de Comercio y Fomento Industrial*, or SECOFI) need to promote foreign investment (Lindquist, 1998). Since then, ranges for new tariffs have been announced piecemeal, industry-by-industry.

A second question about the tariff regime for 2001 concerns the treatment of imports of machinery and equipment. Under the current maquila rules, machinery and equipment imports are allowed to enter duty-free even though they are not directly incorporated into the export good. In November of 1998, SECOFI decreed that import duties would be levied on machinery and equipment but that value added taxes, normally paid on such imports, would be waived for maquila importers (Sutter, 1998). This was followed two months later in January of 1999 by a

Journal of Commerce article reporting that there are significant pressures inside Mexico (coming from the Treasury Department) to rescind the tariff waiver on imports of machinery and equipment (McCosh, 1999).

Meanwhile, the maquiladora industry has vigorously protested the application of new taxes. Among others, the president of CONCAMIN (the confederation of industrial chambers), the director of Delphi (the largest auto parts manufacturer in the world), and the president of CANAINTEX (the national textile industry chamber) have taken their views to the press. The new laws, they assert, have hurt the opening of new maquila suppliers, hurt expansion plans of existing firms, and hurt exports (*Servicio Universal de Noticias*, February 15, March 3, March 4, 1999). Adding to the uncertainty, industry representatives recently claimed that the government is reconsidering its tax plans for maquiladora firms (Lindquist, March 25, 1999).

A third question about the new tax regime is whether there will be special provisions for imports from non-NAFTA sources in cases where the import cannot be supplied by a NAFTA partner. Herminio Blanco Mendoza, the head of SECOFI, has stated that Asian owned maquilas that import parts that cannot be sourced in North America will receive the same tariff treatment as firms meeting the North American content requirements (Hall, 1998). It is not clear that this proposed policy conforms to Article 303 of the NAFTA agreement, however, since it would in effect continue the tariff waiver for some firms. As long as the exports are destined for non-NAFTA countries, Mexico can legally continue the tariff waiver and it has stated that it will do so. If the exports are destined for the United States or Canada, however, then the treaty (Article 303) requires an end to the tariff waiver, regardless of the ability of NAFTA countries to provide the components.

These three questions (about the new tariff rates on imports from non-NAFTA sources, tariffs on machinery and equipment, and tariffs on goods that cannot be sourced in North America) each concern the new tariff regime to be applied to firms after 2001. This is not the only uncertainty facing the maquiladora industry, however. In addition, there is a question about the maquiladoras' access to the Mexican market. Specifically, what share of the maquila output can be sold into the domestic Mexican market? This issue should have been settled with the signing of the NAFTA agreement, but statements by Mexican officials have resurrected it as another source of uncertainty. Mexico recently announced that effective November 1, 2000, a firm must export at least 30 percent of its output in order to qualify for designation as a maquila (Patten, 1999). On the surface, this appears to violate provisions in the NAFTA, which call for a phased increase in allowable sales to the domestic Mexican market, culminating in a 100 percent allowance in 2001, when the tariff waiver ends. Furthermore, it has been reported that the Treasury (*Hacienda*) has shifted to a more aggressive enforcement of tax laws governing the maquila designation. The reported objective is to reduce the number of maquilas that sell to the domestic Mexican market since it is believed that they are displacing export oriented companies (McCosh, 1999).

As a general rule, uncertainty is not good for investment. It is not surprising, then, that the absence of a clear set of rules for the post-2001 maquiladora industry has some people worried.

Uncertainty over rules, coupled with the likely increase in operating costs due to the elimination of a substantial portion of the import duty waiver, could spell hard times for the industry as it transitions into a new regulatory regime. Nevertheless, the government of Mexico recognizes the importance of the industry and has repeatedly stated its commitment to keeping the industry competitive (Ramirez, 1997; Tricks, 1998).

3. Factors for and against growth in the maquiladora industry

It is impossible to predict the impacts of these and other official statements. Nor can we predict the effects of confusion over the new maquila rules and the limits placed on them by NAFTA. Nevertheless, one point stands out; the elimination of the tariff waiver has been programmed since the ratification of NAFTA in 1993. Nearly six years later, and only two years from its implementation, the rules are still uncertain. Clearly, if uncertainty over regulations is unhealthy for investment, then the failure to clarify the details of a new, NAFTA-conforming regime for the maquiladora industry cannot be good for business. Couple this uncertainty with increases in costs due to the disappearance of the present tariff waiver, and there is a strong argument for the disappearance of a substantial part of the industry.

Nor are these the only reasons to think that the days of the maquila industry are numbered. The crisis that began in 1997 in Asia is another potentially negative factor, particularly for Baja California where a large share of the investment during the 1990s has been by Asian firms. With the onset of the Asian crisis and the spread of recession through the high growth Asian economies during 1998, capital has become more costly for Asian firms. Investment plans have been scaled back and some Asian firms have divested their holdings (Calbreath, 1998). Most analysts predict that it will take several years and perhaps as long as a decade, for the affected Asian nations to return to rapid growth.

These three factors—regulatory uncertainty, added costs, and the Asian crisis—each point in the direction of an industrial decline. Note, however, that it is not at all clear what a "decline" in the maquiladora industry means. One possibility is a decline in the rate of growth, so that growth continues to be positive but not as rapid as previously. Another possibility is that growth actually turns negative, meaning that firms are dis-investing, selling off plants and laying off workers, while no new firms step in to pick-up the slack through purchases of the idled plants. Clearly, this would be the worst outcome for the health of the regional economy.

While the previously discussed factors point towards some degree of decline, for the sake of balance it must also be pointed out that other factors point towards continued growth. Five key positive factors that are independent of the new maquila regulations are 1) proximity to the U.S. market; 2) easy availability of U.S. labor skills, services, and other inputs which are complementary to Mexican production; 3) lower labor costs in Mexico; 4) rules of origin under NAFTA that create a tariff advantage for goods defined as made in North America; and 5) Mexico's bilateral agreements with other nations, including both South American developing countries and the current discussions with the European Union (EU). The first three factors are the traditional reasons given for the competitive advantage of firms in the border region. The fourth and fifth factors are new and stem largely from Mexico's increased integration with the global economy.

Proximity to the U.S. market provides firms with several advantages. The United States is the largest single national market in the world. When firms plan to sell final products into the market, proximity reduces transportation and other infrastructure related costs such as communication. Just-in-time inventory systems, along with relatively faster market feedback, enable firms to adopt advanced manufacturing methods which are more efficient and more sensitive to changes in the market. Communications between supplier and assembler are faster and the turn around time to correct defects or to start new product lines are reduced. Furthermore, proximity to the United States increases the availability of business services, labor skills, and life-style amenities (e.g., golf courses, world-renowned universities, etc.) that make the border region an attractive location.

Another traditional advantage of production in Mexico is lower labor costs. This is more controversial from an economic development standpoint since it has probably caused some parent firms to view maquilas as little more than a labor cost savings and has delayed the recognition of the need to fit them into a broader manufacturing strategy. In turn, in some cases this may have delayed the development of more sophisticated manufacturing processes, with the attending capital investment and skills acquisition. Nevertheless, labor costs are lower. According to the U.S. Bureau of Labor Statistics, total hourly compensation for production workers was $1.75 in Mexico.[1] Multinational corporations looking for a suitable offshore site to locate production would most likely compare Mexico to newly industrializing Asian countries, where wages are considerably higher in dollar terms. For example, the 1997 total hourly compensation cost (in U.S. dollars) in Hong Kong during 1997 was $5.42, in Korea was $7.22, and in Taiwan was $5.89 (Bureau of Labor Statistics, 1999).[2]

Another source of competitive advantage for Mexico is its commercial policy. This applies to both the NAFTA agreement and the several bilateral agreements the country has signed with countries in South and Central America, as well as the agreement with the EU which is under negotiation. NAFTA's rules of origin for manufactured goods vary from product to product, but in most cases there are incentives for firms to have their product identified as North American in

[1] Total hourly compensation for production workers refers to the hourly cost of non-technical and non-administrative workers. It includes wages and benefits, as well as any taxes levied on employers, such as retirement, health, or other mandated payments. Note also that wages are higher in the Baja California border region than in the interior of Mexico. In addition, as production becomes more sophisticated in the maquiladora, wages of production workers are less representative of wages overall.

[2] Mexico's labor cost advantage over the Asian economies declined in 1998, since the collapse of numerous Asian economies weakened their currencies against the dollar. In addition, Mexico's competitive advantage in labor costs is less when the entire manufacturing labor force is compared. INEGI (1999) estimates that average hourly labor costs for all manufacturing workers were equivalent to 3.3 U.S. dollars in Mexico in 1997, and 6.1 U.S. dollars in Korea. Again, wages are higher than average and, consequently, higher than the $3.3 figure, along parts of Mexico's northern border, particularly in Baja California.

origin. In some cases (e.g., apparel and televisions) the rules specify that certain components must be made in North America and in others cases (e.g., autos and auto parts) a certain percentage of the product must be of North American origin. In both cases, it has encouraged Asian and European firms to locate their suppliers in North America, often in maquiladora assembly operations. A significant share of the Asian investment of the 1990s was at least in part motivated by this desire to "jump over" the tariffs they would otherwise face when the tariff waiver for maquilas is ended. In addition, Mexico offers U.S., European and Asian capital the advantages of free entry into several South American countries due to its bilateral trade agreements. While these markets are smaller than the North American market, they are growing rapidly and have, so far, escaped the worst of the fallout from the Asian crisis. In addition, Mexico has indicated that it will continue the maquiladora regime, including the tariff waiver, for firms that export to non-NAFTA countries.

4. A look at the recent growth record

The previous discussion has tried to make the point that there are both negative (growth destroying) and positive (growth creating) forces at work on the maquiladora industry. In principle, there is no clear set of criteria that can be used to determine which set of factors, negative or positive, is stronger. Nor has anyone developed a way to measure the relative strength of each of the positive factors or each of the negative factors. Ultimately, this is an empirical question that can only be answered by watching the behavior of the industry.

This does not mean, however, that we have to wait until the year 2001 to see what the industry's response will be. Setting up a manufacturing plant is expensive and if it is only viable for a few years, then firms will not make the investment except under truly extraordinary circumstances, such as the prospect of extremely high monopoly profits or some other guarantee that they can recoup their investment in a short time period. Given this fact of life, most firms are undoubtedly preparing for life after the disappearance of the tax breaks. Hence, if we look at their behavior over the last few years, particularly since the signing of the NAFTA agreement which specified the end of the tariff waiver, we should get a clear idea what is likely to happen after 2001. On the one hand, if the last few years show up as a period of declining growth, then regulatory uncertainty, or the tax issue, or the Asian crisis (depending on the timing of the decline in growth) looks important. On the other hand, if the last few years appear to be ones of high growth, then one could argue that the factors that help to create positive growth are relatively more important than the negative growth factors.

Table 1 reports the average annual rate of growth of maquiladora employment (see page 11). The sample includes the cities with the most significant number of firms and employees. The numbers are annual average growth rates, based on twelve month moving averages. The numbers in parentheses are standard deviations. Table 2 contains growth rates for the number of establishments, calculated in the same way (see page 12).

Both tables break the data into several time periods in order to determine if the implementation of NAFTA was a significant event for the growth record. Column 1 spans the entire period, 1980 to the end of 1998. Columns 2 and 3 break the period into pre- and post-NAFTA years, and the final column looks at the last two years. If the elimination of the tariff waiver is of overriding significance, then growth in employment and in the number of establishments should have declined, at the least. Realistically, if the elimination of the tariff waiver contained in NAFTA threatens the competitiveness of the industry, an actual decline in employment and establishments is not unreasonable.

As shown in Table 1, there are no periods of employment decline (negative growth). This point is worth repeating: every region and every time period has experienced positive employment growth. Indeed the growth record is remarkable, particularly given the depressed conditions in Mexico through much of the 1980s and the 5-6 percent decline in GDP after the collapse of the peso in 1994-1995. In fact, during the 1995 recession maquiladora employment grew by 9.4 percent.

Setting aside Reynosa and Nuevo Laredo, five of the remaining eight areas had faster employment growth after NAFTA was signed. Furthermore, looking at all regions in the last two years, seven of ten areas exceeded their long run growth (1980-1998) in employment during the last two years of data (1997-1998), and eight of ten exceeded the long run trend in the growth rate of the number of establishments. In addition, the standard deviations of growth have gotten smaller, indicating that monthly variation in growth rates has decreased during the last two years. Not only is growth faster, it is more constant.

Another feature of the tables is that every region and time period (except Chihuahua, 1994-1998) had faster employment growth than establishment growth, implying that the average establishment size has been continuously increasing (Figure 1). Historically, an increase in the size of firms has been associated with greater economies of scale in most high income, industrial economies such as the United States. Economies of scale are important for several reasons but most notably because they usually lead to lower unit costs in production.

The trend toward larger establishment sizes can be divided into three periods. The first period lasted from 1980 until mid-1984. During this period, the average rose from around 210 to 310. The growth of firm size reversed itself in the second half of 1984, and fell to around 240 during 1991-1992. Thereafter, it began another significant increase, hitting 340 during 1998.

In addition to the possibility of greater economies of scale, larger firm size may also be related to the development of a national, Mexican, supplier base. One hypothesis is that small firms have a harder time attracting suppliers to locate near them because the volume of their outputs used by local firms is too small. Consequently, suppliers find it more cost effective to ship inputs from existing plants even if they are located across international boundaries. To my knowledge, there are no studies of the impact of firm size on the development of a base of suppliers for the maquila industry. It is consistent with economic theory, however, to think that an increase in the size of firms will, at the least, remove one obstacle to the creation of a national base of maquila suppliers.

Summing up the results of Tables 1 and 2, the growth rate of maquila establishments and employees tell us that there has been no tendency for growth to become negative, or even to slow down. In fact, growth appears to be speeding up, although the last two years are too short a period to determine if this is a long run trend.

5. Explanations

Tables 1 and 2 support the view that there is no slowdown ahead. The maquiladora industry will continue to expand, perhaps even increasing its rate of growth. This naturally raises questions about causal factors: Why is the maquiladora industry continuing to grow, particularly in the face of a loss of a substantial part of its benefits from the tariff waiver?

Several possible explanations come to mind. First, it is possible, although not likely, that the data are flawed and that the growth rate measurements of Tables 1 and 2 are relatively meaningless. It is beyond the scope of this paper to offer judgments about INEGI's data gathering methods, but there are no indications that they are particularly flawed, or that the growth rates of Tables 1 and 2 would disappear with a more accurate accounting of the underlying data. Similarly, while it is possible that a crash in the rate of growth lies ahead, it also seems unlikely since it would imply that firms continue to invest up to the point when the tariff waiver disappears. The implication of this behavior is that the waiver is not important to investments made before it ends, but it is extremely important to those made later. It is unreasonable to think that there should be such asymmetry in the impact of policy on investment incentives.

If we accept the estimates at face value, then we need to look for explanations. Some of the best explanations for the continuing rapid growth are the ones already given 1) proximity to the U.S. market for its output and easy availability of U.S. labor skills and life-style amenities; 2) lower labor costs in Mexico; 3) rules of origin under NAFTA which create a tariff advantage for goods defined as made in North America; and 4) Mexico's commercial relations with Central and South America (and potentially Europe). These factors have already been discussed, and it seems that they continue to play a decisive role in the economic life of the maquiladora industry.

Other factors may be at work as well, however. It is clear that while the *Hacienda* wants to maximize revenues, SECOFI is interested in promoting industrial growth. To that end, SECOFI has offered tax breaks to firms that supply the maquilas and has worked with a number of firms to upgrade the skills of maquila workers (USITC, 1997). In addition, there have been aggressive campaigns by a number of state and municipal governments to attract maquila type investment. These campaigns have been supported, both directly and indirectly, by the Mexican federal government.

One of the most significant elements of investment promotion policies has been the encouragement given to firms to locate maquila operations outside of the border region (Figure 2). Beginning in 1989-1990, the percentage of maquila establishments outside border states began a very significant climb, from around 10 percent to over 25. The extremely rapid growth of non-border maquila is important because, in many cases, firms sprang up in cities where there is an existing industrial base. Potentially, it is easier for these maquilas to develop linkages with suppliers since, unlike the border maquila, there is less distance between assemblers and input producers.

In a more general sense, it can be argued that the maquilas are in a period of transformation. The transformation is taking them from simple assembly with large numbers of unskilled and semiskilled workers (first-generation), to more complex manufacturing, with all of the technical attributes of modern industry, including research and design capability with highly skilled labor (second-generation). While this transformation is very uneven, its implications are extremely positive. In particular, it bodes well for the long run viability of the industry. There is some evidence of these changes in Figure 3, which graphs the proportion of maquiladora workers that are classified as technical and administrative personnel. Technical workers now make up about 12 percent of the maquiladora labor force, a 33 percent increase over the 9 percent level of the early 1980s. While the upward trend has reversed itself over short periods, it does illustrate a robust long run tendency.[3]

6. Conclusions

An educated guess about the future of the maquiladora industry, based on a close examination of the recent past, is that the industry is becoming incorporated into Mexican manufacturing. As this happens, the legacy of the maquiladora will remain. One important element of this legacy will be the dynamic growth of manufacturing in the north of Mexico brought on by large quantities of foreign investment. Another element is the spreading of the maquiladora industry to the interior of Mexico where significant opportunities exist for technology transfer to the rest of Mexican industry. And third, second-generation maquiladoras have been one vehicle for the dissemination of advanced manufacturing techniques, which hold out the possibility of a profound modernization of the entire manufacturing sector.

In a more general sense, it seems extremely unlikely that there will be anything remotely similar to a disappearance of the physical investment and production of today's maquiladora. To quote a recent study conducted by the United Nation's Economic Commission on Latin America and the Caribbean (ECLAC, or CEPAL in Spanish):

[3]The temporary decline in the number of technical workers (1992-1996) coincides with the increase in the number of workers per firm (Figure 1). Hence, one hypothesis is that technical workers have continued to increase but during periods in which firms take on large numbers of new employees, the growth of non-technical workers overwhelms the long run increase in technicians.

En conclusión, se puede aserverar que la puesta en marcha del Tratado de Libre Comercio de América del Norte no ha significado un cambio significativo de tendencia en el desarrollo de la industria de la maquila. La actividad sigue manteniendo un ritmo de crecimiento apreciable (CEPAL, 1996, P. 21).

(In conclusion, it can be positively asserted that the start of NAFTA has not meant a significant change in the development tendencies of the maquila industry. Activity continues to maintain a rhythm of appreciable growth.)

Table 1
Maquiladora Employment
Mean Annual Growth Rates
(12 month moving averages)

	(1) 1980:1-1998:12	**(2) 1980:1-1993:12**	**(3) 1994:1-1998:12**	**(4) 1997:1-1998:12**
California border				
Mexicali	10.5 (19.4)	8.1 (21.5)	16.6 (9.4)	18.5 (9.4)
Tijuana	13.7 (9.3)	14.2 (10.2)	12.6 (6.2)	13.3 (7.2)
Arizona border				
Nogales	5.1 (12.4)	2.9 (13.3)	11.0 (7.3)	12.8 (6.8)
Texas border				
Chihuahua	13.4 (20.4)	16.8 (19.1)	4.6 (20.9)	10.4 (3.4)
Ciudad Juárez	9.2 (9.2)	9.3 (10.5)	9.0 (4.0)	10.0 (2.6)
Matamoros	7.2 (8.6)	7.0 (9.5)	7.8 (5.3)	10.2 (5.4)
Nuevo Laredo*	4.2 (5.3)		5.1 (4.9)	3.5 (3.1)
Reynosa*	9.7 (4.7)		9.5 (4.8)	11.8 (4.9)
All other cities	14.7 (15.6)	13.8 (17.9)	17.0 (5.5)	19.6 (3.6)
Non-border states	18.6 (15.0)	18.3 (16.9)	20.0 (7.9)	20.2 (4.5)

*1993:7-1998:12

The numbers in parentheses are standard deviations.
Source: Author's calculations based on data from INEGI, Banco de Información Económica (BDINEGI).

Table 2
Maquiladora Establishments
Mean Annual Growth Rates
(12 month moving averages)

	(1) 1980:1-1998:12	**(2) 1980:1-1993:12**	**(3) 1994:1-1998:12**	**(4) 1997:1-1998:12**
California border				
Mexicali	4.7 (14.0)	4.9 (15.1)	4.0 (10.7)	14.6 (2.4)
Tijuana	9.9 (10.2)	12.0 (9.9)	4.5 (9.2)	11.6 (1.7)
Arizona border				
Nogales	2.1 (9.4)	0.6 (10.4)	6.0 (4.1)	8.3 (1.6)
Texas border				
Chihuahua	8.3 (13.5)	9.3 (13.9)	5.7 (12.2)	7.4 (4.8)
Ciudad Juárez	4.7 (8.9)	6.4 (8.3)	0.3 (9.0)	-1.2 (9.2)
Matamoros	4.9 (12.8)	5.4 (14.5)	3.8 (6.7)	7.0 (2.2)
Nuevo Laredo*	-0.9 (4.1)		-0.4 (3.9)	0.0 (3.0)
Reynosa*	4.8 (7.0)		5.3 (7.3)	6.3 (3.4)
All other cities	12.2 (12.5)	12.7 (14.3)	10.9 (5.1)	13.6 (1.2)
Non-border states	15.5 (16.1)	15.8 (18.6)	14.8 (5.7)	15.8 (1.7)

*1993:7-1998:12

The numbers in parentheses are standard deviations.
Source: Author's calculations based on data from INEGI, Banco de Información Económica (BDINEGI).

Figure 1
Employees per Establishment

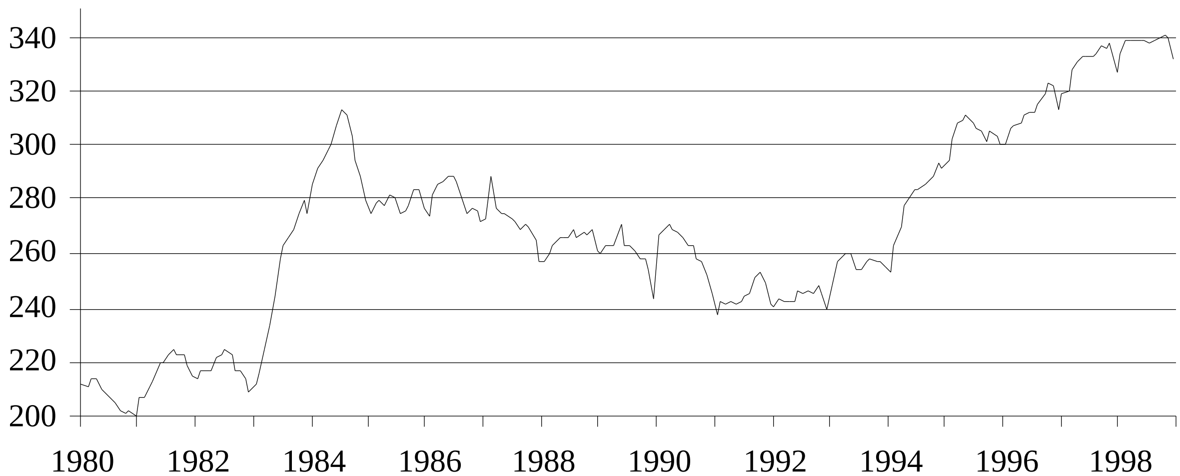


Figure 2
Percent of Maquilas in Non-border States

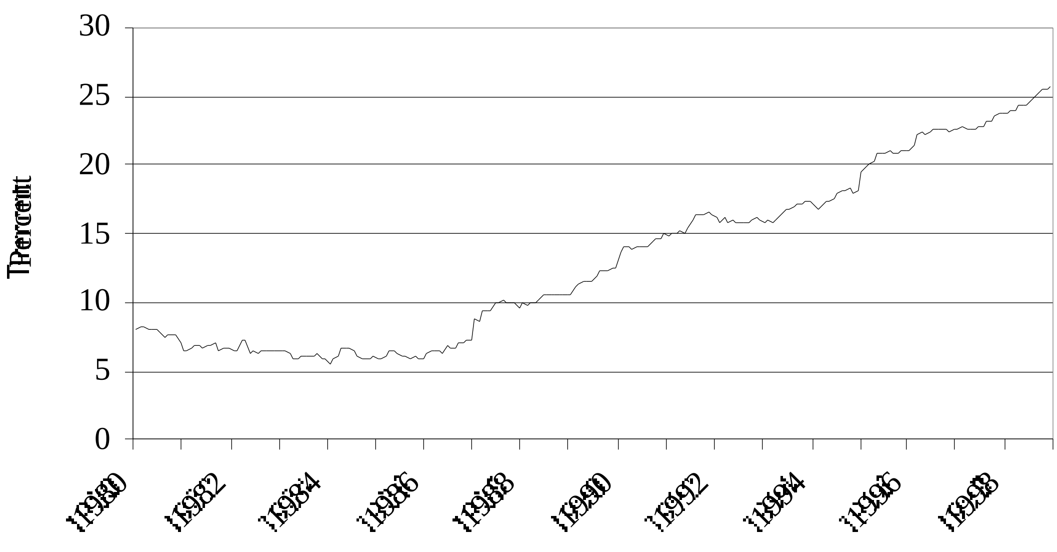
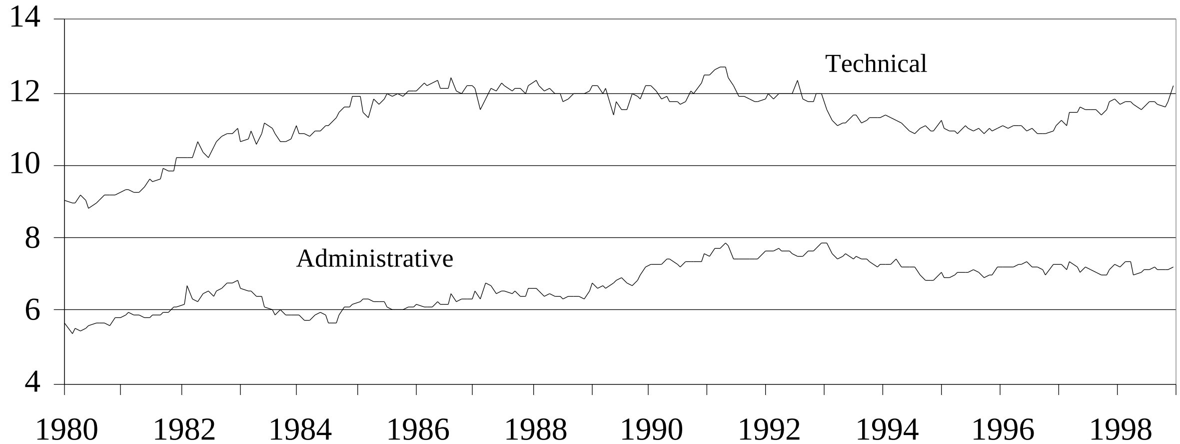


Figure 3
Percentage of Technical and Administrative Workers



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Appendix: Article 303 of the North American Free Trade Agreement

Appendix Part 1 provides the actual wording of Article 303. Article 303 is the relevant part of the NAFTA agreement eliminating the tariff waiver in its current form by the year 2001. Appendix Part 2, is an official synopsis of Article 303, prepared by the governments of Canada, Mexico, and the United States. A copy of the complete synopsis is available from the Organization of American States at http://www.sice.oas.org/summary/RES_TLCE.stm#5.2.3.

Appendix Part 1

Article 303: Restriction on Drawback and Duty Deferral Programs

1. Except as otherwise provided in this Article, no Party may refund the amount of customs duties paid, or waive or reduce the amount of customs duties owed, on a good imported into its territory, on condition that the good is:
   a) subsequently exported to the territory of another Party,
   b) used as a material in the production of another good that is subsequently exported to the territory of another Party, or
   c) substituted by an identical or similar good used as a material in the production of another good that is subsequently exported to the territory of another Party, in an amount that exceeds the lesser of the total amount of customs duties paid or owed on the good on importation into its territory and the total amount of customs duties paid to another Party on the good that has been subsequently exported to the territory of that other Party.

2. No Party may, on condition of export, refund, waive or reduce:
   a) an antidumping or countervailing duty that is applied pursuant to a Party's domestic law and that is not applied inconsistently with Chapter Nineteen (Review and Dispute Settlement in Antidumping and Countervailing Duty Matters);
   b) a premium offered or collected on an imported good arising out of any tendering system in respect of the administration of quantitative import restrictions, tariff rate quotas or tariff preference levels;
   c) a fee applied pursuant to section 22 of the U.S. Agricultural Adjustment Act, subject to Chapter Seven (Agriculture and Sanitary and Phytosanitary Measures); or
   d) customs duties paid or owed on a good imported into its territory and substituted by an identical or similar good that is subsequently exported to the territory of another Party.

3. Where a good is imported into the territory of a Party pursuant to a duty deferral program and is subsequently exported to the territory of another Party, or is used as a material in the production of another good that is subsequently exported to the territory of another Party, or is substituted by an identical or similar good used as a material in the production of another good that is subsequently exported to the territory of another Party, the Party from whose territory the good is exported:
   a) shall assess the customs duties as if the exported good had been withdrawn for domestic consumption; and

b) may waive or reduce such customs duties to the extent permitted under paragraph 1.

4. In determining the amount of customs duties that may be refunded, waived or reduced pursuant to paragraph 1 on a good imported into its territory, each Party shall require presentation of satisfactory evidence of the amount of customs duties paid to another Party on the good that has been subsequently exported to the territory of that other Party.

5. Where satisfactory evidence of the customs duties paid to the Party to which a good is subsequently exported under a duty deferral program described in paragraph 3 is not presented within 60 days after the date of exportation, the Party from whose territory the good was exported:
   a) shall collect customs duties as if the exported good had been withdrawn for domestic consumption; and
   b) may refund such customs duties to the extent permitted under paragraph 1 on the timely presentation of such evidence under its laws and regulations.

Appendix Part 2

Synopsis of the Proposed North American Free Trade Agreement

Chapter 5: Trade in Goods. Section 2: Market Access. Part 3: Drawback.

NAFTA establishes rules on the use of "drawback" or similar programs that provide for the refund or waiver of customs duties on materials used in the production of goods subsequently exported to another NAFTA country.

Existing drawback programs will terminate by January 1, 2001, for Mexico/U.S. and Canada/Mexico trade; the Agreement will extend for two years the deadline established in the Canada/U.S. FTA for the elimination of drawback programs. At the time these programs are eliminated, each NAFTA country will adopt a procedure for goods still subject to duties in the free trade area to avoid the "double taxation" effects of the payment of duties in two countries.

Under these procedures, the amount of customs duties that a country may waive or refund under such programs will not exceed the lesser of:

- duties owed or paid on imported, non-North American materials used in the production of a good subsequently exported to another NAFTA country; or
- duties paid to that NAFTA country on the importation of such good.