

Hualde, Alfredo

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THE MEXICAN BORDER REGION AFTER NAFTA: ATTEMPTING TO SURPASS THE ASSEMBLY INDUSTRY

**Paper for the 38th Congress of the European Regional Science Association, August 28
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Alfredo Hualde Alfaro (ahualde@colef.mx)

El Colegio de la Frontera Norte

Tijuana (Mexico)

Abstract:

In the last twenty years the Mexican border has attained an astonishing degree of industrialization with the arrival of foreign plants attracted by the low cost of the workforce. The so called maquiladora industry was conceptualized in the seventies as an enclave industry that would bring scarce benefits to the Mexican economy.

At the end of the century a more balanced judgment has emerged. Foreign plants have invested in more intensive production processes and more sophisticated organizational procedures: ISO900, just-in-time techniques are frequently implemented in the border region. As a consequence, knowledge of local engineers in industrial processes has remarkably increased in the last two decades.

In our work we analyze those contradictory trends that make of the border region one of the most dynamics in the world. From the perspective of regional development it is necessary to asses if the industry will evolve to a more integrated network with old and new local industries and if professional knowledge will be in the next years a more significative competitive advantage than low wages. As Gereffi has stressed there are among countries differente role exports from primary commodity exports to original brand-name manufacturing (OBM). Adopting the approach of the global commodity chain we will try to discuss if the Mexican border would be able to acquire the ability to proceed to more sophisticated high-value industrial niches.

Introduction:

Since the late sixties, a particular form of industrialization has developed in the Mexican municipalities on the U. S. border, with the installation of plants which carry out assembly and manufacturing processes and send the finished products to the United States. Characterized by an extraordinary dynamism, the process on the border is occurring in exactly those cities which lack any previous industrial tradition. After thirty years, it is estimated that total maquiladora employment, approximately eight hundred thousand, represents around 25 percent of all jobs in Mexican industry.ⁱ Almost 70 percent of maquiladora jobs are located in border states, but increasingly greater growth is found in central, western, and southern states (CIEMEX-WEFA, 1997).

In the seventies and the first half of the eighties, maquiladora plants came in for a lot of criticism in political and academic media because the entrance of foreign capital to the northern border was considered negative. The prevailing nationalist sentiments and the protectionist regime of import substitution clashed with what was considered a form of penetration by foreign capital. Moreover, condemnatory judgements on the fact that it was women who worked in border plants were constant, especially in academia. Lastly, the maquiladora was criticized as a strategy for local and regional development because of the limited productive links it created (Carrillo y Hernández, 1985, Fernández Kelly, 1983, González Aréchiga y Ramírez, 1990).

Many of the criticisms mentioned continue to reappear, not only in Mexico, but especially in critical moments of economic negotiation, such as that which occurred from 1993 to 1994 when NAFTA was signed. Unions and ecological organizations in Canada and the United States also based their opposition to NAFTA on working conditions and environmental damage which the maquiladora produces. It is possible that the environmental factor may play the critical role which working conditions did in the seventies.

Thus, the maquiladora has not lost its reputation as a problematic industry. However, the

possibility of rejecting this type of investment has decreased due to the currently strong presence of maquiladoras, the recent tendencies of foreign investment and the country's policy of economic opening initiated in the mid-eighties. On the contrary, local authorities in the border municipalities are trying to promote more investment of this type and in order to get it the industrial sectors are projecting modern, hard-working images. One also finds in these same cities attempts at institution building to promote and generate different dimensions of industry: transportation, training policies, environmental policy, etc. Non-border states are also broadly promoting themselves as attractive venues for industrial location, giving out publicity which even uses low wages as a form of appeal.

Without doubt, the importance of the maquiladora greatly transcends the local or regional level. For the Mexican government, the signing of NAFTA converted the maquiladora into where productive integration might take place and where future linkages might be extended. For their part, foreign investors continue to show that this form of subcontracting fits very well with their interests and strategies.

On the other hand, it should be emphasized that the maquiladora has demonstrated significant changes in the last decade as a consequence of restructuring processes in the international economy and of the dynamic existing in regions with larger numbers of maquiladoras. In spite of the fact that scientific production in and around maquiladoras synthesizes an important transformation of the plants installed on the border, there are differences with regard to the characterization of change, and especially in its assessment.

It is predicted that in the near future growth in employment will continue. However, there is no clear forecast about the type of plants which will come to the border, nor their strategies for interaction with local actors in a region characterized in the recent years by its high levels of economic dynamism. Hence, the need for detailed analysis of the forces driving industrialization on the border and the tendencies which present themselves in different dimensions.

In this context the work we present is structured in the following manner. In the first section we offer a general panorama of growth in the maquiladora industry and its contextualization in Mexican regions. In the second section we try to conceptualize this development based on three elements of analysis: a) characteristics of maquiladora productive and labor processes, b) border businessmen and c) the institutional phenomena and industrial policy at the border. Finally, we briefly discuss the possible tendencies of border industrialization in light of some theories such as those of endogenous development.

1. The growth of the maquiladora and the importance of the border region:

Why is the study of the border region and the maquiladora important? As we have already mentioned, there is a series of data which powerfully draw our attention. Firstly, the growth in employment and the number of plants, especially when manufacturing and industrial employment in Mexico remained stagnant in the eighties and became negative at the beginning of the nineties. During this time Mexico underwent an important structural adjustment with privatizations of companies, downsizing of the state and the crisis which accompanied successive devaluations. Manufacturing employment in Mexico decreased 0.2 percent between 1982 and 1992 and fell 4 percent between 1993 and 1995. In other categories of industry, employment increased only 1.8 percent in the period 1982-1992 and decreased 3.3 percent between 1993 and 1995 (Dussel, 1997).

The statistics above contrast with those of the maquiladora. The growth in employment has undoubtedly been the most striking characteristic of the maquiladora in the last decades, from 120,000 employees at the beginning of the eighties to 800,000 at the end of the nineties. The relative importance of employment also makes the maquiladora sector a strategic one since formal labor markets are not large enough in Mexico to absorb the increasing number of people looking for work. This fact has been translated into growth of the so-called informal sector in which about 40 percent of the economically active population are presently found.

It is estimated that maquiladora employment represents around 2 percent of total formal employment and about 25 percent of the manufacturing sector. Some projections estimate that at the end of the decade these figures will reach 6 percent and 36 percent respectively. However, in order to understand the meaning of the changes it is necessary to analyze certain transformations of a qualitative type:

- Firstly, a growing proportion of men employed in a traditionally female industry and an absolute growth of technical and administrative personnel
- Secondly, an increasingly greater creation of jobs in non-border states

A maquiladora with more males. In the mid-seventies, almost 80 percent of those employed in the maquiladora were women. The decrease in the relative proportion of women employed to 60 percent in the mid-nineties has given way to diverse arguments to explain this new tendency. From our point of view there are three main factors to explain this greater presence of males: a) The crisis of the eighties which brought men in search of work in any sector. b) the establishment of more technology intensive companies and c) the intensive increase in employment in sectors such as transportation. These changes were more noteworthy in border industry than in plants in the interior.

Increase in technical and professional work? It is interesting to examine what has happened in the maquiladora industry with administrative and professional employment because a substantial increase in both types of jobs would reveal an important qualitative change in the type of work available in these plants. The figures from the last decade indicate that the technicians, as proportion of total personnel employed, experienced a slight decrease from 12 percent of employees to 11 percent. The sector with the greatest proportion of technicians is electronic products and electronics where the percentage rises above 13 percent (CIEMEX, WEFA, 1994, 1997). Other sources give very similar results, although the significant thing is that the proportional increase in technicians occurs at the beginning of the eighties and later shows a certain stagnation.

Neither does the proportion of administrative personnel undergo important variations,

although it increases from 6.2 percent to 7.1 percent. As in the case of technicians, the electronic sector has a somewhat higher percentage of administrators, around 8 percent. On the other hand, important evidence from Tijuana plants making televisions has been found. In spite of being equipped with sophisticated technology, the percentage of engineers does not rise above 5 percent of employees. This supports the idea that technological changes take place without major variations in the structure of skill and employment. Put in other terms, maquiladora plants by and large continue being intensive in non-professional labor.

A new geography of employment. Two changes are important in the geographic distribution of employment: those which modify the distribution of jobs among border municipalities and those which alter the proportion of jobs on the border in comparison to jobs in other states.

Among border municipalities the decreased relative importance of Ciudad Juárez is noteworthy, although it continues being the city with the greatest concentration of maquiladora jobs, approximately 180,000. Nevertheless, its rate of participation at the national level decreased from 36 percent of the employed population in 1984 to 24.4 percent in 1993. In contrast, the importance of Tijuana increased from 12.2 percent to 14 percent and the rest of the increases explain the non-border cities.

In the mid-eighties only 13.5 percent of the maquiladora plants and 15 percent of those employed were found in non-border states. Ten years later these percentages reach 27.5 percent of those employed and 31.32 percent of plants respectively. This change in the geographic distribution has given rise to several explanations, the most important of which cite low wages as a localization factor, predicting still greater relocation to the southern states to come. However, low wages do not explain everything. At the end of the nineties the border municipalities continue to have the fundamental advantage over the interior states of their closeness to the North American market (United States and Canada), and an apprenticeship from having constructed industrial parks, local organizations and even labor itself, especially engineers and top management. The bonds between the border states and their neighbors in the United States (California, Texas, Arizona) constitute “economic

regions” which go beyond the maquiladora itself. This facilitates the adoption of techniques for organizing production such as “just in time” systems. At any rate, it should be recognized that the wage factor already referred to above and a lower turnover rate than in cities such as Tijuana and Ciudad Juárez act in favor of the interior states. For these reasons, more than because of any drastic changes in favor of one of the two areas, a specialization by sectors which is similar to what presently occurs will quite likely be seen in the future:

- In the northwest, specialization is centered in the electronic industry in cities such as Tijuana, with leading products such as televisions. In this city the presence of Asian plants is important (especially Japanese and Korean) which attempt to access the North American market by installing headquarter plants in California and maquiladoras in Mexico. The average size of plants in the electronic sector is about 500 workers and according to the plants themselves, they achieve high standards of productivity. One well-known Korean television company makes 12 units per minute in its Tijuana plant with only a 3 percent defect rate in its production. ⁱⁱ

- In the central border zone, with Ciudad Juárez as the gathering point, transport plants which make components for the automotive industry are found. They have their headquarters not only in the center but also on the east coast of the U.S. These are very large plants with an average size of 838 workers (Mendiola, 1997).

- In the non-border states plants linked to the more traditional sectors have been established, especially in clothing, shoes, toys, furniture, etc. In this group, significant growth which stems from NAFTA is happening in clothing maquiladoras. Important increases in this sector have been shown in the Yucatán peninsula and there are important plans for a city wide garment industry in the state of Morelos (Mendiola, 1997). In general, the size of the plants is smaller, approximately 200 workers on average for the clothing industry.

The above data are indicative of certain features which have conditioned the development of Mexican regions in the last years. Certainly, in a macro approximation it is

necessary to take into account the type of model of development in which industrialization has emerged. Some academics have proposed *industrialization hubs* as a most useful explanatory category (Alonso, Alegría y Carrillo, 1997). According to this perspective there would be two industrialization hubs in Mexico: one constituted by the companies and regions connected to the hub created by the export substitution model and the second constituted by the model developed on the border with the creation of maquiladoras. The distinctive features of such “industrialization hubs” have to do with the ownership of companies (national companies vs. foreign companies), a certain technological dualism (traditional technology vs. automated technologies) and the orientation to markets (internal market vs. international markets). At any rate, these differences, which are relevant in explaining the changes which took place in the eighties, appear a little oversimplified to take into account what is happening at the end of the nineties, especially when going from the macro level (models or hubs of industrialization) to an intermediate level of analysis in order to understand differences between regions.

Ruiz Durán (1997) distinguishes four models of territorial development in Mexico:

- a) The model of economies of agglomeration which corresponds to the basic industrial centers of the import substitution model: Mexico City, Guadalajara and Monterrey.
- b) The model of state intervention.
- c) The basic model of traditional activities
- d) The model of foreign investment located mainly in the northern regions.

Without going into detail about the particularities of each one of these models it is evident that the development of the regions included in each model has been uneven from the beginning of the economic opening. Without doubt, the model of economies of agglomeration, which corresponds to the basic centers of the import substitution model and the model of foreign investment are the ones which could stand up to international competition with the fewest problems. In fact, the first model still makes up approximately two thirds of the industrial PIB but with less dynamism in the eighties and the nineties (Ruiz Durán, 1997). The greater rates of regional growth occur in the maquiladora states.

Our fundamental argument is that the productive restructuring of the last two decades is translated into a more heterogeneous spatial industrialization even within the same regions. In the second place, it is not possible to reduce the industrial restructuring of the last two decades to the expansion of the maquiladoras on the border with the United States. Other interesting tendencies to highlight are the following:

- The growth of non-maquiladora industrial employment in cities in the north of the country where new automotive plants have been installed: such as Ford in Hermosillo (Sonora) and Chihuahua (Chihuahua)-- where a Ford plant making motors is also found--, or Saltillo (Chihuahua) where General Motors has set up shop. These plants have brought about the existence of a series of smaller plants providing autoparts.

- The restructuring in traditional industrial agglomerations which are diversified or specialized. In the same case, one would find, for example, what happened in Monterrey, where the business class organized in strong industrial and financial groups, modernized their companies by means of technological acquisition and joint ventures with foreign companies. In the second case, an industrial district of footwear would be found in León which restructured with the assistance of local and regional organizations. (Rabelotti 1995, Brown y Domínguez, 1997).

- The emergence of relatively diversified industrial zones in the center of the country which arise in part as a consequence of the decentralization of industry in Mexico City. Such would be the case with Aguascalientes, Querétaro and certain zones in the state of Guanajuato where the textile, metal mechanic and automotive industries respectively predominate. However, specialization as pronounced as in León, mentioned above, does not occur.

- The emergence of “industrial districts” linked to traditional activities and inserted into international subcontracting. A significant example is that of Moroleón (Guanajuato), a small locality in the central area of the country where there is a dense concentration of workshops making garments (mainly sweaters) destined for export (Vangstrup, 1995). Or even other

districts whose main difference from those in Europe is their encapsulation in the territory where they are and their modest success, barely supporting the survival of the producers who work there. Such is the case of San Mateo Atenco in the state of Mexico (Saraví, 1997).

The above are examples linked to more or less successful regions of adaptation to the new conditions of international competition. Certainly, other regions and other businessmen have run into worse luck. Such is the case of Monclova (Coahuila), a northern city where the restructuring in steel caused a significant increase in unemployment. Or the closures that have taken place at several times in the textile industry in the state of Puebla or other states in the center of the country. The Mexican businessmen that have succeeded in surviving in the traditional sectors have undertaken various strategies: a) converting their productive companies into marketers of another brand; b) turning to the maquiladora program and inserting themselves into international subcontracting; c) moving into the informal economy or subcontracting processing in the informal economy; d) acquiring new technologies, new forms of administration and searching for unexploited niches in the economy. Although there are no studies which give an idea of which were the most frequent strategies, it is logical to think that the last option may be the most difficult for small businessmen in the absence of an industrial strategy with a defined profile and in the face of scarce credit. Our own field work in the city of Monterrey indicates that certain qualities are needed that are not present very often: high formal education, understanding of technology, chances for national and international networking, in other words, what some authors have called “social capital”. (Carrillo and Hualde, 1997).

2. Toward a conceptualization of border regionalization.

The transformations described above tell us of an important productive restructuring in the maquiladora and non-maquiladora sector, in Mexican geography as well as in border geography. Therefore, we argue that the regions of the northern border of Mexico cannot be conceptualized simply as maquiladora regions or enclave regions whose growth depends exclusively on the decisions of foreign investors, although neither are they endogenously developed or planned as industrial districts. To better understand the transformations, in the

following paragraphs we will analyze: i) the characteristics of the companies situated in the border regions, ii) the type of local businessmen, and iii) the region's institutions.

i) Characteristics of the maquiladoras:

What kind of plants operate in the mid-nineties in the border region? Let's say at the outset that the characterization of what is happening on the border is not simple. Can what happens in more than 900 plants located in Tijuana and other Baja California cities and the almost 300 which operate in Ciudad Juárez be contained in one single explanatory framework? Research in this regard oscillates between the recognition of diversity and the attempt to characterize a form of industrialization which has particular characteristics distinguishing it from other forms of industrialization. We think that such explanatory tension has to do with the assessment of the transformations which have taken place in the last years which once again are related to the comparative terms used to measure such transformations. If the comparison is carried out within the productive chain of which the maquiladoras are a part it is concluded that it is really not the border region of Mexico where the greatest innovations take place. If the judgement is made on the basis of the exact evolution of the maquiladora, then the conclusion is that the changes are significant and it is necessary to reflect on them in the context of an industrial fabric that is dynamic and in transformation.

In a recent article we give greater importance to the general perspective of the productive chain (Hualde y Mercado, 1996). From this point of view, the products now appearing on the border are found at a particular point in their evolution. The first stages of technological development have been passed, and we are now at the point where there is high standardization and general maturation of the processes and the products. It is important to point out that the regions, countries and firms where these products are created, still control the technological paradigms which gave them life; which is why successive innovations continue appearing in these regions and countries, but not in the peripheral regions of relocation (Storper, 1995, Dicken, 1993). This is because the innovative knowledge is not

transmitted automatically, to reduce the possibility that these technologies might be imitated. Besides, technological evolution will be concentrated in a “winning” region, because knowledge is “incorporated” in particular actors who are spatially concentrated. Thus, a part of the industry directly connected maquiladoras such as Japanese microelectronics, the computer industry of California, the medical industry of San Diego, are “sealed” or locked-in technologies and regions. (see Arthur, 1989; 1990),

Secondly, since we find segments of consolidated manufacturing systems on the border, the possibility of provisioning the maquiladora is limited. The main obstacle is that the networks of suppliers rely on a long history of consolidation, accompanied by experience and trust (Riviere D’Arc, 1995). The parties involved have known each other for a long time and have generated implicit frameworks of understanding. Their relationship will be dominated by close ties of subcontracting, the more specialized the components are (see Holmes, 1992 Scott, 1988, 1990). This is the main obstacle to local integration. Nevertheless, the local agents can compete and they do compete effectively in the provisioning of the parts and components which are most standardized and vary least in quality. Competition in this type of component is via price and the technology is very elemental, reinforcing in principle the trap of low wages.

The above description takes technology and the products present on the border into account in a general way, yet it does not permit the discovery of differences between plants. With this objective in mind we propose a generational typology which differentiates systems of production (Carrillo y Hualde, 1997; Hualde, 1997).

- Maquiladoras based on intensification of manual labor. Corresponds to the maquiladoras characterized in the literature at the end of the seventies and the beginning of the eighties. The most characteristic features of these types of plants are rudimentary technology, elemental organization, assembly processes and labor intensity.

- Maquiladoras based on the rationalization of work. This category refers to plants appearing in the mid-eighties in which the effort to organize production and work is translated

into an increase of automated technologies and the introduction of techniques and personnel policies mentioned above. Although these plants can be labor intensive, their crucial feature would be the form of rationalizing work. They are manufacturing processes to the extent that the companies carry out processes which transform material such as metals and plastics before assembling the product.

- Maquiladoras based on intensive competition over knowledge. The example we have is the General Motors design plant in Ciudad Juárez which employs almost a thousand engineers responsible for the design of parts. The setting up of Delphi is interesting, but nothing guarantees that this points to a generalizable tendency in the coming years (Carrillo y Hualde, 1997). In Tijuana television plants there are attempts to introduce product design, but there is no conclusive evidence that the process is currently taking place.

Although there is no quantitative calculation of the number of plants in each generation, we can infer from certain data that maquiladoras based on the rationalization of work are probably the ones which presently employ the greatest number of people. These are medium or large plants (from 300 to 4,000 employees) which, although they support simple assembly processes in some production lines, are based on an internal organization of some complexity, apply techniques such as just-in-time and use forms of managing personnel which are meant to achieve the quality required. On what is this calculation based? In Tijuana in the last few years there has been a tendency to concentrate employment in larger electronic plants which are the most studied and in which organizational innovations appear with respect to labor intensive work. According to Table 1, the employment in this sector—46,720 people—is concentrated in 140 plants. Table 2 shows that of the 18 plants listed which together involve a total of about 35,000 employees, the majority are electronic. In Ciudad Juárez something similar happens in the automotive industry.

ii) Businessmen and management

In regions where foreign capital predominates it is important to see if a local business

class exists, especially from the perspective of a more endogenous regional development.ⁱⁱⁱ On the border a local business class exists, but with some peculiarities which have to do with the economic history of the border cities. In effect, Tijuana as well as Ciudad Juárez passed from being towns with casinos, brothels, cantinas and a few businesses in the thirties and became the venues of important firms with abundant job creation. However, during these decades there was no serious attempt at industrialization; the logic of economic organization and participation was directed at the capture of a fraction of that spend by their northern neighbors and the exploitation of legal restrictions in one or the other country. The evolution of federal policy, at the demand of local businessmen, strengthened this idea and the establishment of the *Sistema Aduanero de Perímetros Libres* in the cities of Ensenada y Tijuana in 1933 was created under this logic. The system permitted the “exemption from taxes on the import of merchandize, for use or consumption within the same zone (Mendoza, 1982). This program and its later modifications gave an institutional framework to the growing business tendencies in the zone, leaving any industrial effort at a secondary level.

Two nascent groups were added to the owners of local businesses in the seventies; one, that of local businessmen connected directly and indirectly to the maquiladora and the group that would guarantee and promote real estate capital.^{iv}

In this way the history of the formation of businessmen’s groups developed two conventions which would endure. One is the use of the border as a source of economic benefits, taking advantage of legal regulations having to do with legally exportable articles and those not exportable according to differences in the legal systems of both territories.^v The other is the creation of an economic identity where the role of the local businessman will be one of intermediation.

In this context the maquiladora appears and is integrated without substantially changing the way local businessmen act. Those who participate, either as owners or administrators, perform the work of intermediation the same as previously. Their specific function will be to mediate between the foreign companies and the local labor force; they do not produce, rather they administer; they take care of technology, machinery, take charge of administration and ensure quality levels and production quotas. There is not a break in the general pattern of intermediation, but rather its extension into other economic spheres.

The industrial development that is induced in this way is based on the above logic of business or trade and not on a logic of productive innovation. Such a business logic cannot be considered static. It is brought about by conventions, collective behavior and forms of action that are not always clear and on occasion are contradictory. Conventions, as customary practices, can serve as an impetus or an obstacle to endogenous regional development and to the learning of forms of action based on knowledge. In the case of Tijuana we have assumed the prevalence of a general practice of intermediation that fosters an induced and subordinated regional development. However, this is not the only important convention. There are also customary practices related to values and behavior of “up and coming go getters” and other conventions found among wage workers, mainly in the maquiladora industry.

From our point of view, the majority of “up and coming go getters” are found within the maquiladoras: they are engineers and managers who have acquired a consolidated professionalism over ten, fifteen or twenty years in the same or different plants (Hualde, 1995, 1997). Our research on border engineers reveals several important aspects:

1. The existence of a heterogeneous group of professionals who have acquired significant expertise in cutting-edge practices adopted by the maquiladoras. Such engineers are capable of organizing a newly created plant, carrying out process and product engineering, and of proposing forms of organization and administrative innovations to the parent companies.
2. The existence of a professional identity which appreciates the maquiladora, but that is inclined in the medium term to create independent companies.
3. The setting up of a series of independent supplier companies for maquiladoras which range from companies of tool machinery, to lamination, measurement and calibration services, consults in training and development of human resources, etc.

Although the empirical evidence with respect to this type of company is still in its infancy, it is necessary to examine the form in which the professional trajectories of border managers are evolving. From our point of view, the relative scarcity of independent companies has to do with the following point which we try to develop: the fragility of border institutions related to industry.

iii) Institutions and industrial policy:

One of the aspects which the European regional literature has emphasized most since the eighties is the importance of a coherent institutional development surrounding industry (Beccatini 1988, Vázquez Barquero, 1995). This formation of educational, research, financial, and promotional institutions is of vital importance for industrial agglomerations known as industrial districts or for the theory which proposes an endogenous development different from that which is based in processes dominated by foreign investment. This institutional framework arises, for its part, from a series of social and cultural relations which make up an *industrial atmosphere* in the sense of a “Marshallian district”, or in the sense of an industrial milieu, as the French refer to it. It is difficult to speak of this sort of phenomenon on the northern border, at least in the same sense with which it is talked about in Europe. There are several reasons for this. Firstly, the clear domination of foreign companies which although they are increasingly integrating themselves into the regions, do not have ties with the companies set up locally over hundreds of years. Secondly, the vertical orientation of such companies towards their parent companies. The low index of value that comes from local suppliers, about 2 percent, is the datum which shows this lack of integration. Lately, the Asian companies have developed suppliers in Tijuana to comply with the rules of origin of NAFTA but these suppliers continue to be Japanese or Korean. Thirdly, we believe that due to the high growth in investment, the creation of institutions did not become a visible necessity. In the same sense, the Mexican government’s policy of economic opening, together with the idea that market forces orient industries adequately, deprived the Mexican regions, especially the northern border, of institutions to support the maquiladora. Their principal task consisted of giving shape to a regulatory framework which increasingly facilitates the productive operation of the maquiladoras.

This situation described in a schematic manner does not mean that there are not institutions nor that such a picture has to remain immutable in the coming years. To give an example that we have investigated recently, the maquiladora plants have relations of different types with educational institutions in the public and private sector. A great majority of the engineers graduated from these schools find work and develop their professional careers in the industry. However, it is clear that the style which has been described for certain European

regions is absent from this dense network of institutions. That certainly isn't surprising given the differences in development between Mexico and European regions.

In spite of this reality, which it is still necessary to study in more detail, some aspects turn out to be indicative of tendencies which can make the situation described above change. These changes arise with the new industrial and regional policy orientation designed by the central government in the last three years. Effectively, the federal government, which began its term in 1994, does not appear so convinced of the primacy of the market in economic activity, nor that a quite orthodox macroeconomic policy is incompatible with the creation of certain institutions for industrial support (Mattar y Peres, 1997). Similarly, it has recently been recognized that the economic opening and the need to compete globally should be accompanied by the creation of productive clusters. Finally, globalization is not contradictory to the need to promote regional development for small and medium businesses. The new scheme demonstrates the preoccupation of the government authorities with the integration between companies in specific regional frameworks. On this subject, however, there are still clear limitations, especially in comparison with other European schemes: "Although the program covers a wide range of policies and actions, it has a notorious lack of material on decentralized industrial policy. While it recognizes the role of the regional dimension—and the emphasis on industrial groupings is thus reaffirmed—it still does not conceive of the possibility of industrial policies, and not just actions 'dedicated' to the level of the states and the regions." (Mattar y Peres, 1997).

These active orientations are reflected in the creation of state offices of economic development. These are offices in which local businessmen and state government officials participate in a most important way. At any rate, the first ones are those which have the most clear initiative at the time of putting forward new projects; the public sector, according to what those in charge of the offices say, relinquishes a more leading role because of the conviction that it is businessmen who better understand the reality of the region and can act to attract the investment that is more beneficial for it.^{vi}

Although those responsible for the offices of economic development manage on small budgets, at least in the state of Chihuahua where Ciudad Juárez is the municipality with the most industry, they have planned Chihuahua Century XXI. This plan provides a diagnostic of the state economy. It begins with the idea that the traditional advantages of the state might

be inadequate in the new competitive scenario if certain productive chains are not reformulated. The plan foresees the necessity of integrating clusters into the base in the presently existing productive system. There are three clusters to be developed: the first is based on the maquiladora industry, the second on the state's natural resources and the third is focused on the service industry. Within the maquiladora sector, the plan distinguishes three clusters to develop: the automotive, the electronic and textiles/ clothing. The example of the automotive cluster reveals what we have been emphasizing about the maquiladora. For this cluster the report emphasized the following weaknesses:

- Reduced number of local suppliers (lack of development of the cluster).
- Limited design functions and limited skills in the local maquiladora industry.
- Chihuahua is not recognized as a center for automotive manufacturing (automotive assembly plants)

This diagnostic has led to the formulation of a series of policies directed at the development of clusters. However, the plan at no point specifies the means that should be used, and, especially, the economic resources that should be mobilized to fulfill its objectives.

In Tijuana, the economic development office is formulating a similar plan that has not yet been approved. However, the central idea of it is that the city cannot be the host of simply any type of maquiladora, but that priority should be given to high technology maquiladoras such as aeronautics, biotechnology, electronics and similar sectors which certainly are highly developed in the neighboring state of California. The Tijuana plan appears to promote the continuity of investment in large plants such as has happened in recent years.

In summary, we find new institutions, apart from the traditional businessmen's chambers, which carry out diagnostics, propose a type of image/objective for the states in the industrial terrain, but do not arrive at specific means to carry out an industrial policy.

Concluding remarks:

The maquiladora industry has known great qualitative growth in recent years and a series of qualitative transformations which notably differentiates it from the first assembly

shops installed in the sixties. However, it is also notorious for the lack of development of a local industrial business class in spite of the existence of an *industrial atmosphere* and an important labor market, including the segment of professional workers. We could say that among businessmen a convention of *intermediation* continues to predominate. On the other hand, the local institutional framework is still insufficient for the conception of industrializing projects which are conducted starting from design at the local/regional level, taking into account the dynamic linked to globalization processes in which the regions are found. This weakness has been qualified in recent years by the creation of offices of economic development and of orientations at the federal level which promote policies of more active industrialization.

If we adopt the perspective of endogenous development we find some elements in the border regions which can be taken advantage of to deepen this type of development: personnel experienced in advanced forms of productive organization, cosmopolitan culture (or at least internationalized), business inclinations (unrealized). The border regions in this sense have advantages with respect to other Mexican regions where it is really difficult to find such endogenous potential. However, given the type of industrialization existing on the border, the competition for these cities is not limited to other Mexican regions. On the contrary, at least until the recent Asiatic crises, “the other regions” which competed with the border were in southeast Asia and in that type of competition the wage level continued being an important competitive factor. In this sense, recent investment in design centers which employ local engineers appear to indicate a step toward the transfer of value added operations to the border regions. In the perspective of productive chains which Gereffi proposes, the carrying out of design would assume a step forward, although limited since the orientation of the productive chain continues to be dominated by the producers, that is, by parent companies, regardless of the work local engineers do in Mexican cities. Unlike other territories such as Korea where large domestic companies were created which controlled the production and design of electronic consumer products, the border economy lacks similar domestic firms (Bloom, 1992).^{vii} However, it is obvious that the complex reality of the border cannot be reduced to an enclave. We can say that on the border there is an important apprenticeship focused especially in the professional strata and a level of institutional organization, which while they are quite thinly spread and do not have the diversity of a *milieu* or an industrial district,

points to interesting tendencies. In the terminology of Salais and Storper (1993) we do not see a production world similar to the industrial world which they describe. We are dealing with standardized products (although the products can vary) destined to a general market. The competition among the producers is based mainly on price. In spite of this, in border localities there are elements of a *world of possible production* different from the world of industrial production. At any rate, in order for the dialectic of transformation to work in favor of this production model, more radical changes are necessary in the conventions which guide the collective action of businessmen and institutions which interact on the border. The promotion of joint actions among local businessmen could be a good starting point in the search for collective efficiency (Schmitz, 1995).

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ⁱ In mid-1998 some maquiladora spokespersons estimated in newspaper reports that the total number of jobs exceeded one million.

ⁱⁱ Personal interview with Human Resources Manager, June 2, 1998.

ⁱⁱⁱ On the other hand it is important to remember that the maquiladora has also been implanted in the last years in regions, such as Monterrey and Guadalajara, where native capital had been an important protagonist in the import substitution process.

^{iv} In 1997, for example, Tijuana had 37 industrial parks.

^v An illustrative example is that presently Viagra can be purchased in Tijuana drugstores without a prescription, but not in California. California consumers can take advantage of the legal regulatory differences to buy this product.

^{vi} Personal interview with a government official from Economic Development in Tijuana..

^{vii} The reference to Korea should be taken with certain care since the movement toward "superior" production stages is part of a national strategy; in our case we are speaking only of a region.