

South of California

Industrialization Without Entrepreneurs

*Alejandro Mercado**
*Alfredo Hualde***

Towns on Mexico's northern border have been of interest to scholars since the late 1970s due to the enormous growth of foreign investment in for-export assembly plants. To the Mexican government this kind of investment was initially a palliative for regional unemployment. However, in the mid-1980s, the maquiladora plants became an important source of hard currency and jobs nationally.¹ In the last 10 years, of all the northern border cities, Tijuana has had the lowest unemployment and the highest rate of job creation. Though its growth is based on maquiladora development, the expansion is full of paradoxes. The positive figures for overall employment contrast sharply with low wages in the maquiladora industry.² At the same time, the consolidation of a prosperous middle class tied to retail trade, services and real estate, including rented industrial parks, has been crucial.

This border area has no networks for innovation or learning processes that could close the technological gaps inher-

ent to regional actors. Naturally, some maquiladoras are components of broader systems that are part of innovative technological networks, but since they are located outside the area, it is other workers and economies that enjoy the extraordinary profits they generate.

Without belittling Tijuana's economic transformation in recent decades, we must understand the concrete dimensions of its expansion. This analytical exercise is important at a time when Latin American countries are seeking new formulas for regional development in which

working conditions are an important indicator of social welfare. It is also useful for Mexico, where over a decade of trade opening, privatization and policies encouraging exports seem to have sharpened regional inequalities, relegated traditionally backward areas and impoverished great numbers of workers.

The concern we wish to express is whether it is possible to generate endogenous growth that will put a region on a path to technological learning that could sustain better living standards. We ask whether it is possible to change



Photos by Elsa Medina

Over the last 10 years maquiladoras have been an important source of jobs in Mexico's northern border cities.

* Researcher in U.S.-Mexican Studies at the CISAN.

** Coordinator of the Doctoral program at the Northern Border College.

an industrial structure in which plants are basically unconnected to each other and vertically dependent on other regions. What is more, after decades of certain kinds of economic relationships, we ask ourselves how viable it is to change the behavior of economic actors and the dynamics of their participation.

STRUCTURAL LIMITS IN THE EVOLUTION OF THE MAQUILADORA

Maquiladoras are now entering their fourth decade. Even today, their integration into the local economy is minimal and the majority of the jobs they provide are either totally unskilled or only slightly skilled. However, they have also gone through important transformations, including their increasing use of automation and, in some cases, the flexible organization of production. Greater organizational and technological complexity have, in turn, demanded the hiring of more local engineers and administrative personnel. In addition, Asian investment has been seen as a clear sign of technological transformation.

These indicators have to be viewed in context. In the first place, we should not lose sight of the fact that the maquiladoras are part of an evolving system. The first stages of their technological development are behind them and their processes and products are now going through a stage of standardization and maturation.

It is important to point out that the regions and countries that developed this kind of industry continue to see technical innovations coming out of the very technological paradigm that origi-

nally gave rise to them, which does not happen in the peripheral countries where plants simply relocate.³ This is due to the fact that innovative know-how is not easily transmitted. This kind of know-how is embodied in concrete actors and their relationships. For that reason, when these actors are geographically concentrated, technological evolution is circumscribed to a "winner" region. Therefore, some industries directly connected to the maquiladoras, like Japanese microelectronics, California's computer industry and San Diego's medical industry, belong to locked-in regions and technologies.

In the second place, the ability to supply border maquiladora plants is limited since they have consolidated manufacturing systems. The main obstacle to local integration is that their supplier network has long been consolidated, complete with experience and trust, especially with regard to very specialized components. However, local agents can compete by offering lower prices for the most standardized parts and components that vary little in quality. However, this means, again, that they can only compete on the basis of low wages, which does not solve the central problem.

In the third place, the existence of "new technologies," like automation and flexibility is not in and of itself an indication of regional technological dynamism. Quite the contrary. Automated processes reinforce the idea that the products are mature and at a stage in which time and cost reduction is fundamental for market survival. The use of flexible techniques does not necessarily mean that the area is going through a process of technological

learning. In these sectors, competition continues to be based on economies of scale and cost reduction.⁴

Lastly, we think that the prolonged existence of the maquiladoras, as well as their particular geographical location, have created a form of behavior and a way of interpreting and transferring information that reproduces and ensures continuity of a certain economic trend. Therefore, the logic of competition on the basis of cutting costs, a high degree of standardization and mass production technologies will continue to predominate in the area.

Structurally, the development of Mexico's northern border economy is subordinate and dependent on the U.S. economy. From this standpoint, the subordination is a consequence of the dependency: the economic decisions are made on the U.S. side, capital is managed from the United States and technology is at the service of the U.S. economy. Therefore, innovation would exclusively be concentrated "on the other side of the border."

It is true that the proximity of California favors vertical economic relations, both geographically and socially. However, it is simplistic to reduce economic activity to relations in which U.S. actors and activities dominate and impose specific dynamics on the Mexican side of the border.

It is certainly true that the proximity of California favors vertical economic relations, both geographically and socially.⁵ However, we think it is simplistic to reduce economic activity to relations in which U.S. actors and activities dominate and impose specific dynamics on the Mexican side of the border.

Our idea is that, although this type of relationship does exist from the macro-social perspective, day-to-day dealings are more complex and also develop through negotiation processes which include cooperation and complementary relationships involving the interests, norms and values of the actors on the border themselves.⁶

On the other hand, the economic dependence and interdependence of cities like Tijuana cannot be reduced exclusively to their relations with their northern neighbor. As Tijuana has become an industrial city and an important consumer market, its relations with Mexican economic centers like Mexico City, Guadalajara and Monterrey have also increased.

Tijuana has undergone an extraordinary change: from a town of brothels, bars and a few shops, it has become the headquarters of important companies and the source of many jobs. Today, it is Mexico's sixth largest city in terms of population, and is undoubtedly very important to the national economy. Now, do these two Tijuanas have anything in common? A few brief historical references would be useful in attempting to answer this question.

Tijuana was practically invented in response to the Puritanical attitudes of turn-of-the-century California which tried to ban gambling and prostitution. Prohibition itself finally sent these activities south of the border. All this is widely documented. What has not been explained in any great detail has been the Mexicanization of its economy. As different historical accounts have reported, the first demand made to U.S. proprietors was that 50 percent of their employees be Mexican.⁷ At the same time, some smaller businessmen, the owners of bars and brothels,

accumulated enough capital to invest later in the retail trade, services and tourism.

On the other hand, though, there were no serious attempts at industrialization. The dynamic of participating and operating in the economy was limited to capturing part of what our northern neighbors spent in Mexico and exploiting the legal restrictions of both countries. The evolution of federal policies toward the area in general as demanded more or less by local businessmen supports this argument. The 1933 creation of the Customs Systems for the Ensenada and Tijuana Free Zones is part of this dynamic. The system allowed for "tax exemption on imported goods for use and consumption within the zone itself."

This program and its later modifications created an institutional framework for augmenting the local vocation for retail and wholesale trade, putting any idea of industrialization firmly in second place.

Local businessmen can be grouped in the following way: a) those who took advantage of the free zone (or "hook" items) and mainly sold tax-free imports; b) service providers for visitors (bars, prostitution, gambling, restaurants); and c) those who supplied what the city itself needed, first selling goods imported from California and later domestically made consumer goods. Two other groups would develop later: local businessmen directly and indirectly linked to maquiladora plants and those dealing in real estate.⁸

The emergence of these groups of businessmen had two lasting effects: one is seeing the border area as a place



to profit from exports. The other is the creation of an economic identity wherein local businessmen are intermediaries.

It is into this context that the maquiladora industry was introduced without substantially changing local entrepreneurial behavior. Those who get involved in the maquiladoras, as owners or managers, also act as intermediaries. Their specific function is to mediate between foreign companies and the local work force. They do not produce technology and machinery; they receive them and take care of the management side of the operation, complying with quality norms and production quotas. The general pattern of intermediation is not broken; it simply continues in other economic spheres.

Existing literature has generally played down the direct participation of local businessmen in promoting and managing maquiladora plants. However, according to a 1988 survey, about 50 percent of the electronics and plastics maquiladoras were 100 percent owned by Mexican capital. A recent ECLAC study found that almost 60 percent of the maquiladora industry has participating domestic capital. In other words, the way in which these businessmen have become integrated into the industry has considerably influenced the general process of its expansion.

The conventional form of organization of these maquiladoras can be seen when they are compared with plants operating in countries like Korea. Initially, the Korean maquiladora plants were just like the Tijuana plants: not integrated into the local economy, simple assembly processes, etc. With time,

however, the Koreans developed local systems and took over the production processes, changing their orientation directly toward the large consumers, like big stores. Gereffi has documented this evolution from “producer-driven productive chains” to “market-driven productive chains”. Mexico’s maquiladora industry has not evolved like this and nothing clearly indicates any change in the future.

The induced industrial development was based on the logic of trade, not a logic of innovative production. This commercial dynamic has not remained static; it has been spurred by practices and collective behavior that are not always clear and are sometimes contradictory. Traditional practices can be an inducement to or an obstacle for regional endogenous development and for learning the knowledge-based forms of action. In the Tijuana case, we have assumed that intermediation as a traditional practice dominates, thus propitiating heteronomous, induced regional development.

IS INNOVATION HAPPENING SOMEWHERE ELSE?

On the border, discussions about technology have been limited to that applied in the maquiladora industry. Automated processes inaugurated in the mid-1980s have given rise to optimism about “technology transfer.”⁹ Our point of view is that there has been no real transfer of technology as long as there are no economic bodies which completely dominate the technological processes. This impedes the creation of absolute advantages, that is, producing goods on the basis of know-how exclusive to their producers or of characteristics intrinsic to traditional goods.

However, we should emphasize that local engineers have learned a great deal about the use of equipment, quality standards, the design of manufacturing processes and pieces and adapting equipment, as well as about making minor innovations. This learning process is today limited to the maquiladora industry, which offers them the possibility of



a career, even if it be restricted to the maquiladoras. That is to say, there is no spin-off process like those in California documented by Stoper and other researchers. Identity in Californian production is based on a heavy emphasis on professionalization. That, together with individualist values and a tendency to take the risk of start-ups means many engineers become entrepreneurs. Today, the most important professional identity reference point for Tijuana engineers is becoming salary earners in the maquiladora industry, even if it be at management level.¹⁰

Ciudad Juárez, on Mexico's Texas border, does offer interesting examples of technicians and engineers who previously worked in the maquiladora industry and now own workshops that supply parts to the maquiladoras. An important professional learning process took place when Delphi, a General Motors company, set up a large auto design center there. These are two examples of technological learning processes in different parts of production.

Our point of view
is that there has been
no real transfer of technology
as long as there
are no economic bodies
which completely
dominate the technological
processes.

Some innovations by workers have been documented in the maquila industry, but it is really not possible to argue that they increase competitiveness. Some authors, like Godínez and Mercado, point out that maquila competitiveness is based above all on achieving economies of scale and quality control. In any case, in no way can these innovations be compared, for example, with the Italian districts in California where researchers have documented a "diffuse innovative capacity" both in the product and in the process. Neither are they comparable with experiments with new materials and the strong links among companies in the textile industry.

INNOVATION AS A TECHNOLOGICAL POLICY

On the Baja California border, the maquiladora industry seems to be the forefront of technology, especially in recent years when Mexico has practically had no industrial policy. However, 100 kilometers away, in Ensenada, several public institutions sponsored a company incubator.¹¹ Initially, the projects had a high technology content related to the specialties offered by the Ensenada Center for Scientific Research and Higher Education (CICESE): marine sciences, oceanography and physical sciences. The idea was to "transfer" scientists to the entrepreneurial sphere and make good use of Ensenada's marine resources. However, the incubator lacked a strategy for linking it up with existing industry in the state. Therefore, and aside from a few isolated successes, it has had no important impact on production.

Innovative efforts through the construction of networks and the establishment of specialized service centers—like company incubators—are limited by their initial conditions. Therefore, the logic of production and current conditions of manufacturing processes should jibe with technological development efforts. In the following section, we will go a little more into the existing dynamics and their possible utilization.

In order to be internally coherent, each logic of production requires different kinds of innovation. In Tijuana, two logics of production dominate. Stoper and Salais would conceive of them as the world of industry and the world of commerce.

The world of industry—basically mass production with some variations—is the largest. All branches include companies which are part of this logic of production. The idea is to aim for large-scale production, using simple, automated processes that require low skilled or unskilled workers. On the northern border, as we have already pointed out, goods are completely mature and therefore could be significantly improved only with great difficulty. Effort is seemingly concentrated on bettering assembly processes. A relatively important number of engineers design "mixes," assembling processes and even some complete products. They also adapt products to the technological capabilities of local plants.

The possibility of generating extraordinary profits is linked to innovation centered on product standardization and/or recently created processes. However, this is not possible in maquiladoras because

innovating efforts are only made where corporations operate logistically. New standardized products are introduced in their home production areas and only when extraordinary profits drop because of competition do they relocate to low-wage areas.

Neither can we expect maquiladoras to innovate by introducing standardized products. Given that their framework is limited to managing the goods they work with, their improvements are oriented to perfecting the product itself or the production process.

The world of commerce, called “market-driven productive chains” by Gereffi, is characterized by meeting the changing demands of the market. The relationship with the market is unlike the one in the world of industry which has a consolidated demand and the consumer is an abstraction. In the world of commerce, the producer-market relationship is direct, even though it is expressed in the creation of standardized goods from products which respond to variations in demand. Contracting out tends to dominate in these sectors and workers tend to play a more active role.

Innovation in these sectors is based on the innovation of processes: the opportunities for innovation are generally part of new kinds of equipment and intermediate inputs, originating with firms whose main activity is outside these sectors. Rapid responses and the firms’ ability to assimilate new technology and to move the product to higher price and quality curves are the essential elements of innovation. In this kind of sector, which is often design-intensive, scale or research and development costs are not an obstacle since the problem is

not creating new machinery but rapidly incorporating available machinery and using it differently. In Tijuana and other parts of the border area, a great many small Mexican-owned maquiladoras work as sub-contractors. These companies operate in the logic of the “world of commerce,” but their potential is limited by the way they interact with their clients. Building a coherent world of commerce should be the aim of a technological development policy for the region.

For the logic of commerce to develop its potential, the interaction between subcontractor and consumer should be direct, unlike in Tijuana, where subcontractors relate directly to and depend upon producers who, in turn, relate to consumers. In Gereffi’s words, in the first case we have market-driven chains and in the second, producer-driven; in the first case, they are independent and create their own networks and the second they are subordinate and lose control over their linkages.

Taking into account these observations, we can formulate some strategic proposals for the region with an eye to developing innovation networks in production.

The first objective would be to establish direct links among commercial establishments, for example, between Tijuana’s large retail stores and the subcontractors, without going through the U.S. producers. This requires the generation of know-how and the ability to relate directly to market. Conditions for this do not exist today because local businessmen have kept away from any direct market contact.

Secondly, centers for monitoring technology and efficient productive practices should be set up and local producers rapidly made aware of their existence.

A third objective would be to create design centers that would also monitor products in target markets. This would aid in keeping products within changing tastes and filling specific market niches when detected.



The majority of maquiladora jobs in Tijuana are low-skilled.

A fourth objective would be to set up joint offices to represent producers and create common brand names to identify the product and aid in distribution.

Lastly, the most important objective is to create a more highly skilled work force that would get involved in the production process and whose technical skills and knowledge of the product increase value added and reduce the possibility of substituting it for another work force elsewhere.

A skilled work force plus specialized service centers would create the conditions for keeping products on an ascendent quality and price curve. To maintain that curve, you would also have to avoid succumbing to the temptation of totally standardizing products.

It is important to point out that the traditional practice of being interme-

diaries should be dealt with in order to generate direct and active links between subcontractors and consumers. To do this, "experimental" relations would have to be set up and publicized among all possible participants. Precedents would have to be set among businessmen themselves and between the business community and government agencies involved.

We also propose that the construction of a coherent world of commerce is based on specific products like wood or textiles and not in abstract categories like "small companies." Doing this means working on what has already been built and trying to move these producers toward better conditions of production.

That way, objectives are not divorced from local conditions or impossible to achieve. We already have a group of

local producers in these sectors, producers who work these goods and are familiar with the details of their organization.

The task would be to create relationships with them, initiating collaborative efforts and building trust. This would make it possible to make the productive chains more independent and more profitable.

Collaborative efforts, as we have said, should aim for creating specialized design and market and technology monitoring services. The idea is not to set up centers or incubators to service the whole maquiladora industry, but highly specialized centers which only monitor, for instance, the furniture industry. All this requires an ad hoc funding policy as well, but that would have to be dealt with in another article. ■■■

NOTES

¹Just in Tijuana, Baja California, maquiladora jobs rose from 89,625 to 106,766, or about 15 percent a month, between October 1994 and October 1995.

²Industry figures put total worker income (including benefits) at between Mex\$250 and Mex\$270 a week, or between U.S.\$30 and U.S.\$35 (Industrial Relations Association). Also, real income in pesos dropped after December 1993, in 1994 and in 1995 (INEGI, January 1996).

³Here, "relocation" means moving industries to areas where they are more profitable than where they were operating before. [Editor's Note.]

⁴Despite the fact that certain technologies permit downsizing production, this is relative because it is necessary to distinguish between the scale of production of the product, the plant and the company as a whole.

⁵From the economic point of view, "vertical" means there is "subordination" in the productive chain, seen in the hierarchy and power relations in economic negotiations. This is a complex point which requires much more thought since it is a differentiated phe-

nomenon. It is not the case of large supermarkets, for example, which are all the same company. "Vertical" is applied more to the relationship of small Mexican companies with the United States.

⁶The process of cooperation, negotiation and complementing each other is not necessarily positive in and of itself. To set up a subcontracting maquiladora plant, the parties to the agreement, both local and foreign, have to negotiate the relationship and overcome the uncertainties inherent in any economic transaction. Collaboration and complementing each other has, then, a conventional character built upon this negotiation between the two parties. What it is important to emphasize here is that the functioning and evolution of maquiladoras cannot be explained exclusively as an imposition of foreign capital on local actors.

⁷This was not the case exclusively of Tijuana. The birth of Mexican unionism is fraught with Mexican workers' protests about the privileges given to foreign workers, particularly from the United States.

⁸The difference between local activities and those linked to interaction with the United States has been

at the root of different conceptualizations such as those proposed by Margulis and Tuirán, who classified economic activities in the area as border activities and non-border activities. Another classification talks about three categories: domestic processes, transnational processes and transborder processes.

⁹Storper has called the idea of installing equipment in an attempt to substitute for "the laborious social and intellectual side of the development process" the "modernist illusion." M. Storper, "Desarrollo territorial en la economía global de aprendizaje: el desafío para los países en desarrollo," *EURE* 20 (no. 60) Santiago de Chile (August 1994).

¹⁰This does not mean that Tijuana engineers have not tried to become independent. However, the ones who have not met with success or have kept to non-innovative products. In any case, neither the number nor the quality of the new companies is competitive in the local economy.

¹¹A company incubator is a specialized service center that services several companies from different branches of industry. [Editor's Note.]