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**Segmentation of Skills and Social Polarization In
Tijuana's Assembly Plant Industry**

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I. INTRODUCTION

A General View of the Industrialization on the Northern Border of Mexico

The Mexico-United States border is 3,200 kilometers long and goes from the Pacific to the Atlantic Ocean. In the sixties, the main economic activities in Tijuana and Ciudad Juárez were limited to trade and services or to agriculture in Matamoros (Hualde and Mercado, 1996; Quintero, 1997). During the late sixties, workshops manufacturing garments, and electronic products, among others, begin to appear in some Mexican frontier municipalities along the Mexico-U.S. border.

These workshops, known as maquiladoras, import parts, components and pieces from different productive processes in order to assemble and re-export the final product to the United States. The maquiladoras were born protected by laws in coordination with the Mexican and North American governments by exempting temporary imports from taxes (González Aréchiga and Ramírez, 1990; Hualde, 1997). The legal framework evolved, during the eighties and nineties, in order to facilitate trade among maquiladoras in both sides of the border.

Thus, employment was created on the Mexican side, whereas the products were sold on the U.S. side at low price, due to cost differentials both in wages and rent or utilities (electricity, water, etc.). The location of the cities along the border line facilitated operations and reduced transportation costs.

The maquiladoras are considered to be an Export Processing Zone like those that exist in Central America and the Caribbean and in some Asian countries. The main difference with respect to other zones is the fact that this region shares the longest border in the world with the U.S. economy. What started as a relatively unplanned activity gradually grew in the mid-eighties when growth skyrocketed and the maquiladoras experienced interesting transformations. Although from the very beginning, important firms such as RCA ,among others, settled in this region, this cannot be compared with the importance the maquiladoras took on since the mid-eighties.

Critical Visions

In the seventies and the first half of the eighties, the plants were highly criticized by politicians and scholars since the entry of foreign capital through the northern Mexican border was considered to have negative effects. Prevailing nationalistic beliefs, along with the protectionist regime of import

substitution, clashed with what it was considered a part of foreign capital penetration. Besides, particularly academic circles condemned the treatment received by female workers in the border plants. Finally, as a local and regional strategy, the maquiladoras were criticized for the small amount of the productive chains they created (Carrillo and Hernández, 1985; Fernández Kelly, 1983; González Aréchiga and Ramírez, 1990).

A lot of these critiques keep reappearing, and not only in Mexico, but particularly in crucial moments of economic negotiation, such as during 1993 and 1994, with the signing of the North Free Trade Agreement (NAFTA). The trade unions and environmental associations in Canada and the United States also based their opposition to the agreement on the working conditions and environmental damage produced by the maquiladoras (Hualde, 1997). After the signing of NAFTA, complains addressed to the National Administrative Offices reflect the disagreements of unions and workers on work conditions in the maquiladoras.ⁱ

Likewise, it is necessary to note that the maquiladoras have went through significant changes in the last decade as a result of the restructuring processes in the international economy as well as to the dynamic existing in the regions with more maquiladoras. Besides, there are affiliates of large television transnational corporations, -such as Sony, Samsung, Philips, Hitachi, and U.S. and Japanese auto parts-, which are organizationally more complex and require technological equipment that has nothing to do with the workshops of the seventies. In addition, it is important to mention that linked to the plants have emerged many local business: packaging industries, professional services as consulting offices in human resources, software business, customs lawyers and so on.

These innovative features opened up the possibility of transforming the border into a different kind of manufacturing process. Local and educational bodies, as well as business associations wish to move toward institutionalization, which has been weak and scattered for years. It was often thought that frontier municipalities could draw more technology-intensive investment, whereas labor-intensive plants would tend to move or invest in central and southern regions of Mexico.

In this way, the consideration for the maquiladoras' role was changing. For many years, governmental organisms estimated the plants located in the border to be solely an important quantitative mean for creating formal jobs when the manufacture industry and the whole Mexican labor market stagnated. (Dussel, 1997: 224 and ss).ⁱⁱ

After a series of aggravating events emerging as from the end of the year 2000, the possibility of *upgrading* the maquiladoras has been challenged. Below there, a list of the most important events:

a) An employment crisis due to the U.S. recession. In Mexico, since October 2000 and up to the beginning of the year 2002, one out of every five jobs in the maquiladoras was eliminated, totaling 200,000 (INEGI, 2002). In cities like Tijuana, this figure reached around 40,000 (the number of plants in this city went down from 820 to 718).ⁱⁱⁱ **(Tables 1 and 2)**

b) Asian maquiladoras, which represent in Tijuana an important number of jobs, threatened to abandon the border if NAFTA related regulations continue to be so confusing, unstable and detrimental to import the Asian components. The firms consider that the confusion prevailing around these regulations is both damaging and unfavorable against third parties.^{iv}

c) Export competitiveness was affected by the strength of the Mexican peso between 2000 and the first half of 2002.

d) Some border cities experience an atmosphere of insecurity (robberies, thievery) so the maquiladoras consider to go against the investment continuity.

In this uncertain and paradoxical context, this work refers to the transformations that have taken place in the assembly plant industry from the perspective of the skills developed by the different strata of workers: direct workers, technicians and engineers. Our main argument is that, although the maquiladoras have created jobs that require different skills in some professional and technical sectors, an important segment of direct workers continue to be devoted to the simple routine tasks (Hualde, 2002b). Professional and technicians are on their turn a minor part of a labor market characterized by educational low levels with stagnated wages and skills through the nineties. Data also indicate that the labor market is increasingly polarized. Highly educated people and professionals improved their incomes in the nineties in contrast to the less educated.

Increasing differences among strata occupied in the maquiladoras, help to reproduce the preexistent inequality in Tijuana and other frontier municipalities. Those differences can also impede the evolution to more competitive and fair (ζ) production systems.

This article is organized as follows: The first section presents the dilemma of the regions face vis-à-vis globalization and their development options in the light of theoretical developments of economic sociology and industrial geography. The second section describes the transformations occurred in the employment in the Tijuana's labor market in the nineties. The third section analyzes the skills developed by different strata of workers through their careers: direct workers, technicians and engineers. Lastly, it comes up with a series of conclusions related to the Transnational Corporations role as actors that contribute to create knowledge in cities and regions and the risks, limitations and challenges associated to that role for regions.

II. REGIONS, GLOBALIZATION AND TRANSNATIONAL CORPORATIONS.

There is a general consensus among scholars of different disciplines about the importance the region has been gaining as a center of economic development in times of globalization. There is a dialectical movement in the configuration and transformations of the space-time axis (Giddens, 2001). It is necessary to analyze the co-presence but also its relation with the way in which remote places connect almost simultaneously by making use of the new information technologies and communication systems.

On the other hand, the region is thought of as a stakeholder endowed with the potential to orient its own development (Boscherini and Poma, 2000; Benko and Lipietz, 1994; Dini, 1996; Florida, 2000). The regions "re-emergence" in the movement which has been called "new regionalism" is a symptom of the existing differences. The new role granted to regions is not based on uniformity, but on these differences.

As far as frontier municipalities are concerned, some of the elements needed for the regions development are present: there are networks among professionals, the representatives of business associations work or have worked as managers in the maquiladoras and the educational institutions sign agreements with the most important plants.

However, an important part of the plants' dynamic is explained by global phenomena of a sectorial or commodity-oriented nature. The large plants still depend on strategic decisions taken in Asia, in the United States or in other world's regions. As far as knowledge in the plants is concerned, which undoubtedly has been emerging in recent years, most is still concentrated in the technical sectors, mainly among the engineers and managers.

The lack of an industrial tradition along with the creation of a labor market mainly composed by an important fraction of migrants with no industrial experience, has lead to paradoxical consequences: On one hand, it deprives the city of the specialization that may bring competitive advantages on the international markets. On the other hand, it opens the possibility to establish industries in different branches, as well as more diversity in the industrial learning; Considering the characteristics of the assembly and production process in the maquiladoras, as well as the work force's abilities, learning began from the most basic levels: discipline, learning to work in more complex organizations, building as labor force with basic technical, organizational and social skills.^v

In this sense Tijuana cannot be considered a knowledge society. In developed countries to reach that kind of society is a goal in order to lower levels of unemployment and/or compete with low-waged industrializing countries. Support to education is shared by different ideological perspectives: the left sees education as a mean to achieve more equity and foster democracy; from the right perspective education is considered as an individual investment which in a long term will help the state to make savings in unemployment social policies (Crouch et al, 1994:4).

In the border region, in uncertain times as those of 2001-2002, the evolution towards a more intensive knowledge system would be socially desirable. But this goal must be concreted in specific policies.^{vi}

Work, Labor Market and Turnover.

Speaking qualitatively, the maquiladoras in Tijuana present two interrelated characteristics that make them different from other frontier municipalities: the importance of electronic plants and the presence of Asian plants.

According to the Mexican Department of Trade and Industrial Promotion (SECOFI), out of the 1,025 maquiladoras existing in the state of Baja California in 1998, the 20% (i.e. 203 plants) belong to the electronic sector. Of these, the 70%, a total of 143, were located in Tijuana. Employments in the electronic sector in the state reached slightly over 55,000 jobs of which the 70% (around 40,000) were located in Tijuana. The other important branches in the state were the plastic products

(representing the 7% of the total employment), wood products, textiles and metallic products, each representing around the 6% of the total employment.

The dramatic growth experienced in the nineties in the maquiladoras, however, was abruptly interrupted by the U.S. recession and the September 11th events. Between October and the beginning of the year 2000, Mexico lost **more than** 200,000 jobs, almost the 20% of the total. **(Table 3)**

Since October 2000 to April 2002, in Baja California, the number of lost jobs reached a net loss of about 75,000 from 290,613 to 215,837 (<http://dgcnesyp.inegi.gob.mx/cgi-win/bdi.exe>), of which about 50,000 were lost in Tijuana. In Baja California these losses in the plants started later in October 2001 from 1,244 to 1,033 in April 2002. Of the large Asian plants, Sony seems to be one of the most affected, being forced to concentrate all its operations in one of the four plants it had at the end of the nineties.

This crisis has also translated into an average reduction in the hours per person worked in Mexico, from 45 hours in the last years of the nineties to 43 hours in the year 2002. The branches that have been affected most are workers in the auto part and the assembly of electronic parts, with an average of 39.3 hours worked (INEGI, 2002).

In Mexico the direct workers on the maquiladoras represent about the 80% of the employed labor force. Technicians vary between the 11 and 12% and the so-called employees (administrative workers and managers who are not involved in the production process) represent around the 7%.

These figures experienced a slight evolution in the nineties, observing an increase in the technicians and administrative workers. In the table 3, technicians represented the 11% of the employed personnel in 1994 whereas in the year 2001, they represented the 12.8%. Administrative workers went from the 7.09% in 1994 to almost the 8% in the year 2002. Carrillo and de la O (2002), quoting official sources noted that technicians represented the 13.7% of the employed personnel.

In 1993, there were 8,374 production technicians in Tijuana. Five years later, that figure almost doubled. In 1998, there were a total of 17,532 technicians. In July 2000, the number of technicians had increased to 21,009, representing approximately the 11% of the employed personnel.

The number of administrative workers increased even more in the same period: from 4,908 in 1993 to 11,053 in 1998 (INEGI, 1999) and in July 2001, they accounted for 13,524 administrative positions, i.e. the 7% of the employed personnel. The maquiladoras in Tijuana therefore have an employment structure similar to the national average.

However, the labor market structure reveals that gender differences are very acute. In 1998, slightly more than half of the workers were women; in contrast among production technicians only the 25% of women were found, 4,531 in a total of 17,352 technicians (Hualde, 2001d: 65).

During the 2000-2001 crisis the most important maquiladoras considered that they had spent a lot of money on hiring administrative and technical employees. In addition, Tijuana's maquiladoras intended to reduce those positions in about the 15% in order to save costs.^{vii}

Heterogeneity of Plants and Employment

Employment structure is very different among plants. In a representative sample for local electronics with 73 plants, 53 have 10% of technicians and 4 do not have technicians at all among their personnel (Colef, 2002)^{viii}. However, a small group of eight plants, has more than the 20% of technicians among their personnel. Among the administrative workers, the mode is the 10%, but 7 plants account for more than the 20% of the administrative workers, whereas in 28 plants just 5% of their employees or less are administrative.

Finally, the mode for the managers is 5% in 20 plants. It should be noted that 8 plants claimed they did not have managers or executive directors, 16 plants only have 1 person in that position and another 12 only have 2 people. *In other words, half of the plants that were interviewed have 2 people as maximum in the managerial or directive positions.*

To summarize, the percentage of direct workers continues been high on the average, but a group between 12 and 15 plants have important ratios of technicians and administrative workers and consequently have an employment structure with less workers.

III. EDUCATION AND OCCUPATIONS IN THE LABOR MARKET^{ix}

The inequality is also a very relevant data that in the structure of the local labor market. According to the National Survey of Urban Employment (ENEU), The Economically Active Population (PEA) in the Tijuana's labor market displays the following distribution: the 31.3% have levels of primary, the 28.2% have made studies of junior high school and the 16.6% have high school studies. The professionals reach the 15.2% of the population, the technicians the 4.40% and there is a 4% of the PEA has not gone to the school. (Table 4)

This information slightly improves during the nineties: The percentages of workers without any education or with grade school studies slightly diminish, and the percentages of workers with high school studies, as well as the professionals increase about three points.

When examining the schooling by economic activity sector we find that the transformation industry (which in Tijuana is as to say the maquiladoras) shows different educative averages that those from the city as a whole. The majority of the workers in the transformation industry, 36.4%, have carried out studies of junior high school which are greater than the average of the city in six points. Certainly, the average of the workers that studied grade school is also greater, while the percentage of technicians is slightly smaller and the percentage of professionals is much smaller, just the 7.2% in the manufacture facing the 15% in the city. The previous thing means that, even when the professionals and technicians employed in the maquiladoras have enlarged in the nineties, the assembly plant is a sector less professionalized than the local labor market as a whole. **(Table 5)**

The educational situation is neither favorable for Tijuana when compared with the most important industrial cities of the country. As observed in the table, the data indicate that the frontier municipalities of Tijuana and Ciudad Juarez have lower educational levels than the other three considered cities, Monterrey, Puebla and Guadalajara. **(Table 6)**

The averages per economic sectors for Tijuana -and for the rest of the cities- indicate that the manufacturing occupies an intermediate place, with schooling levels superior to the farming sector, the construction and the personal services, clearly inferiors than the producer's services, the

government and the social services, which in all the cities is the economic sector with higher schooling averages. **(Table 6)**

Finally, if we take for five cities three characteristic occupations of the manufacture as “craftsmen and manufacturing workers”, “operators of fixed machinery in continuous movement”, “chief and craft supervisors”, is observed that the Tijuana’s schooling averages are generally lower than other cities such as Ciudad Juarez, Monterrey, Puebla and Guadalajara. **(Table 7)**

Wages, education and occupations in Tijuana

During the nineties the monthly incomes of the Mexican population -as a whole- were affected by the 1994 devaluation and crisis. Subsequently, at the end of the nineties the incomes recovery places them to similar levels to those at the beginning of the decade. In Tijuana, the tendencies agree in general lines with what happens at national level. In this matter, there are two interesting aspects: people with high educational levels perceive higher average income than the low ones; the gap is important among the professional and other educational levels. Likewise, the gap increases in the nineties since the only ones that perceive wages slightly -more at the end of the decade- are the professionals with superior studies. **(Table 8)**

However, the incomes of the workers of the different educative levels are different according to the activity sector in which they are employed. Is remarkable that the professionals in the manufacture have a higher income than the average in other economic sectors. On the contrary, the technicians perceive higher income in the trade and services of the local market **(Table 9)**. Both data are consistent with the results that we will expose about the professional trajectories of both occupations.

IV. WORK ON THE LINE.

The previous data offers an orientation framework for the general characteristics of the employment in the Tijuana’s labor market, as well as its relation with the education and the evolution of wages in the nineties. In this section we will describe the aspects of the work in the maquiladoras as of the research carried out by the author and other colleagues.

What is revealed by the information on the workers' specific labor activity in Tijuana plants?^x It shows that most work is manual, although, it is sometimes carried out with instruments or machines that do not require workers with great technical knowledge; such as electric soldering or microscopes. This description corresponding to the assembly industries which produce electric/electronic products, medical instruments and toys, that are the economic activities where employment has been concentrating progressively. There is also a smaller set of workers in the garment maquiladoras that are difficult to locate in Tijuana.^{xi} There are also furniture and wood accessory plants where the carpentry-related tasks are carried out.

Assembly work along classical lines is, therefore, not the only form of work in the border plants. There is also more individualized manual work, in workstations where several operations are carried out: the workers are more *multi-task* operators, rather than *multi-skilled*.^{xii} To understand the meaning of this type of work, it is useful to look into two different dimensions: evaluating whether the different operations imply any great technical complexities; and checking whether carrying out the different operations implies a compensation in wages, which according to what has been observed in the maquiladoras, does take place. It is nevertheless doubtful that the different operations result in greater task complexity.^{xiii}

But, work on the line is not the only activity carried out by direct workers. Since firms aim to improve product quality, they increase the number of workers devoted to inspection, supervision and quality control, others do measuring tasks and even simple programming them (Hualde, 1999). The type of task they carry out to a large extent depends on the product. Sound systems, for example, are checked in closed chambers in order to detect loudspeaker fidelity.

In general, these operations demand care, concentration and in some cases manual skill of which many managers claim the women are more capable. In this sense, *gender images* continue operating, although employment of men as direct workers in Tijuana is progressively reaching the 50%. These images are constructed and reproduced in two directions. On one hand, they are part of the employers' or managers' discourse that considers women to be more talented of performing some kinds of work. On the assembly line, this means the kind of jobs we have just mentioned that, according to this discourse, require qualities that men do not have. In qualified positions, from supervisors to industrial relations or engineering management, other qualities -also attributed to women- give them advantages over men (Hualde, 2001c). These qualities are mainly communication skills and forms of sociability that concretize in management styles that are

different from men's. But, sometimes the *advantages* linked to gender images translate into having preferential access to badly paid tasks and posts (Abramo and Todaro, 1998).

For example, Tiano (1994:92) interviewed managers as part of a survey on apparel and electronics, first in 1982 and later in 1990. She found that the original preference for young, single and childless women had become a preference for older women with children since they were considered to be more responsible.

In Nogales, Kopinak (1996:82-85) found that women's exclusion from technical jobs was demonstrated by an analysis of job announcements in the eighties and through interviews with workers and managers in 1991. More than two thirds of all the positions requesting a specific gender, asked for women. Besides, the 89% of the positions requesting women were for unskilled jobs. The surveys of workers and managers showed that among direct workers -men more often-, had jobs that could be defined as highly skilled or semi-skilled (25%) than women (10%). This is due to the fact that managers tended to define women's jobs as jobs requiring low skills because men received training and went up the wage scale due to seniority more often than women (quoted in Carrillo and Kopinak, 1999).

The discourse about differentiated qualities, however, is not only a result of the managers' discourse, but is also shared subjectively by some female employees. That is why they have a certain pride for a job well done, even when wage and labor conditions are almost precarious.^{xiv} Expressing satisfaction at work is reinforced when management grants symbolic acknowledgements such as medals or awards.

Another *positive* dimension of work on the assembly line coexists with other less friendly realities of everyday work. Excessive attention and concentration on detailed tasks produces tiredness, boredom and may even cause occupational injuries and disease (Kouros, 1998). On the other hand, this type of work lacks the characteristics of enriched work: variation, creativity and autonomy. In general, it is not recognized in a more tangible and beneficial way with implications on the workers life conditions.

The clean and illuminated facilities that large and modern companies have today undoubtedly represent a move forward with regard to previous precarious work places. Management professionalism and courses in human relations for supervisors probably humanize everyday work

in the maquiladoras in Tijuana. But, there are basic rights, such as collective bargaining, that have not evolved substantially.^{xv} Besides, there is a huge lack of knowledge related to the important issue of the evaluation of work conditions: the intensification or relaxation of work rhythm. We are short of a comparative perspective that allows us to know whether the old or modern plants tend to increase the work rhythm. We also lack understanding about what repercussions this has on the workers' remunerations. This is applicable not only to Tijuana. International studies about different countries seriously question whether the new forms of production organization eliminate repetitive work. In France, work in industries that employ highly-skilled male workers and use techniques such as just-in-time, present an increasingly higher intensity (Hirata, 1998:9).

We could summarize the observations made above noting that, although in some areas the work in the maquiladoras presents more favorable conditions than in previous stages, it is clear that the situation continues to be more deficient with regard to the *employment conditions*. Research into this reality has undoubtedly found elements that coincide with other situations that are far away in time. The *proletarian condition* in the frontier municipalities is characterized by: an income that does not allow the workers to consume what is not indispensable (except young single female workers); the weak nature of the relation with the firm; and a legal guarantee, the collective bargaining agreement, with little relevance to ensure employment stability or other working conditions (Castel, 1995: 328).

These three aspects that Castel mentions help to introduce the theme that for us decisively conditions the character of the employment in Tijuana's maquiladoras: the instability that still persists in the firms that have settled there. The instability comes from many different aspects:

- a) In the first place, it is derived from the latent or explicit possibility to transfer the process to another place of the world.
- b) Execution of different processes and products by investments or capitals mergers. This has been observed in the American plants which change these processes with great speed.
- c) Is derived from the rotation given in the plants' managing staff, which is institutionalized among Asians: the managers do not remain any more than three or four years. The prize to his/her effort is the return to his/her native country, or to another country that have more advantages, or to a plant with greater responsibilities.

- d) It has to see with the rotation of the direct workers that is the subject that we will develop next.

With the notable exception of Matamoros, the border maquiladoras have been characterized by high rates of labor force turn-over, at least until the 2000-2002 crisis (Canales, 1995; Aguilar, 1996). Although several explanations of turn-over have been suggested, it is important to consider those having to do with the employment conditions: long working days at their post, low pay, and conflict with supervisors. There are other reasons that refer to the prevailing labor force profile. Turn-over would especially be associated with the female worker's life cycle which would interrupt the work one or more times in order to dedicate to caring for her children. Different reasons provide effective explanations of turn-over in Tijuana's labor market. There are, however, several aspects that need to be considered in this multi-causal and certainly complex phenomenon: On one hand, the great demand for labor, and, on the other hand, the characteristics of the firms' productive cycle. In third place, the type of industrial relations. In Matamoros, where unions have a more active role, turnover has been traditionally lower.

In fact, turn-over has been influenced by the workers' certainty that if they abandon the firm, they will soon find another job in another plant. To prove this hypothesis developed by some managers, it is necessary to measure turn-over in two periods: a period of employment expansion, and another period of employment contraction. In the late nineties, turnover in Tijuana was calculated between the 12 and 15%. In the survey mentioned in the electronic sector in 2001 -when the crisis began to have its first effects-, the average was of 13.5%, reaching the 21.3% in those of less than 100 employees (Colef, 2002, III:7). In 2002, the calculation descended to a 3%.^{xvi}

However, these are not the only work and labor market characteristics that influence labor force turn-over, but also fluctuations in production. In some cases, such as in the toy industry, the production is seasonal and the firms, therefore, take advantage of turn-over in order to not carrying out legal offs and to have to pay the indemnifications provided by the law. The same thing happens when there are abrupt drops in production in productive cycles that are not seasonal.

The turn-over, of course, cannot be considered as an adjustment instrument in labor markets, although it can very well play that role. In large plants, high turn-over rates force the firm to spend money on hiring and training costs since the Human Resources Department is almost exclusively

devoted to interviewing people who wish to be hired. But, this does not necessarily affect the plants that introduce more complex processes and operations. These plants have a nucleus of more stable workers devoted to this kind of work and a periphery of workers who turn over time.

Turn-over can also be seen from a perspective that seems more transcendental for employment relations, as an expression of the lack of stable employment guarantees, or numerical flexibility in the Tijuana labor market. As has been analyzed, the collective contracts reflect that instability.

With the passing of time, when a relative aging of the labor force takes place, turn-over may descend. Based on the specific evidence, it could be hypothesized that the most vulnerable sectors of the labor market, such as single mothers, after a certain age maintain a more stable relation with certain plants. However, the cases of stability that take place outside the legal guarantees are only based on the personal relationship between the worker and management. This creates a characteristic figure of these times: *the permanent temporary workers*, who can be fired, but renew their contract again and again (Castel, 1995). Although, age is one of the limitations since many plants do not wish to have workers over 45 years old.

From the workers' perspective, turn-over between the plants and the instability have several social costs. They cannot accumulate seniority rights. They may interrupt learning processes. Turn-over as a permanent characteristic of the labor market hinders the creation of labor organizations. The instability in the labor market in Tijuana hinders the creation of collective identities linked to a job, to a company or to a career. However, some authors have also indicated that the rotation between the plants can be part of working and vital strategies of workers, which take advantage of the positive aspects of the employment, although the characteristics of insecurity are present.^{xvii}

Some authors claim that workers employed in the large plants that compete internationally - characterized by technological complexity- do not receive high pay (Bensusán and Reygadas, 2000; Quintero, 2001). Quintero noted in a study of a large plant with high technology in Matamoros (Deltrónicos) that the wages the workers make are only slightly higher than in the other maquiladoras. Most workers are devoted to assembly tasks.

In a study of five plants in Chihuahua, Bensusán and Reygadas (2001) attribute the low wage level to a lack of institutions, trade unions, and the labor authorities that establish a clearer

correspondence between wages and productivity. These authors refer to wages in the maquiladoras as "artificially depressed wages".

Technicians

There are three types of technicians in the border maquiladoras: engineers who have not completed their studies; technicians graduated from middle and higher education colleges and the so-called empirical technicians (Hualde, 2001). The maquiladoras demand technicians specialized in electro-mechanics, electronics and maintenance. To a lesser degree, they also require technicians in machinery, tools and production. Their main functions are equipment installation, maintenance, repair and programming (Colef, 2002).^{xviii}

The labor and the life trajectories followed by those graduating from technical courses vary considerably. Many of them went into higher studies because they considered that technicians faced limited job opportunities. A recent survey with 202 technicians in Tijuana and Mexicali showed that almost half of those who had study nonprofessional technical were studying a career; of them, almost the 80% were studying engineering.^{xix} This indicates that the job positions out of non-professional technical studies do not satisfy the expectations of many young people they are currently studying in Tijuana.

The interviews also indicate that in some cases, male technicians in particular have long professional careers. In cities like Tijuana, young people often work and study at the same time in long days; those initiate at 6 a.m. and conclude at 10 a.m.^{xx}

Some technicians start to work in the maquiladoras as operators, then get a technical degree and later they graduate as engineers (Hualde, 2002a). It should nevertheless be noted that the plants have not foreseen any mechanisms for this type of professional upgrading. The technicians negotiate the conditions under which they can work and study with their employers on an individual basis. They usually request more flexible schedules. However, they do not always get what they want and in any case their negotiating power derives from good personal relations with engineers and manager. It is not clear whether upon returning with their technical degree they will immediately get a significant increase in their wages.^{xxi}

As we said before, the technicians' main tasks are repairs and maintenance. The education they get is essentially practical, although some large plants offer longer courses which, for some technicians, compensate for their low wages.^{xxii}

There is also an important difference between graduates from technological schools, those who are currently studying engineering, and those seeking to become more specialized technicians. The latter are not limited to the tasks they have been appointed, they adjust equipment and may even introduce minor innovations.

Engineers

Without a doubt, engineers -whether they work as such or as managers- are the stratum with the most solid and long-lasting careers in the border plants. They also receive the most interesting training both from a technical and organizational point of view.

Training is the way in which the plants try to close the gap between acquired knowledge and the knowledge the plant requires. But, this does not mean that the most deficient professionals receive more training. The opposite is the case. The plants offer greater training opportunities to the engineers who progress most, who show a greater interest and learning capacity. Many of them request the firm to send them to courses they find out about through fax, e-mail, or other means. In other words, the training to a certain extent depends on the workers' strategies.

Reducing learning to training is a second mistaken idea. Learning involves different dimensions and is acquired through a variety of means. So-called informal learning continues being essential in the maquiladoras and external mobility enriches it.

One of the interviewees systematized his way of seeing learning with the following words:

"I consider that what I have learned is due to three factors: sharing with people who have more experience, the every day problems we have that push us to use or create new problem-resolution methods as well as the basic methods we learned from school". (E. V., manufacturing engineer, 4 years experience).

In subsequent studies conducted on local engineers employed in Tijuana and other cities along the northern Mexican border, we have noted various important characteristics (Hualde, 1995, 2001a, 2001b). These are:

- There is an important variety of tasks: logistics, production, manufacture, human resources management, process engineering and even product design.
- Ascending professional trajectories up to the most highly recognized management and general management, mainly in plants with North American capital (Contreras, 2001). Asians reserve the highest positions for Asians exclusively.
- Turn-over between different plants with the objective of completing the learning provided. There are cases of local engineers being recruited by headquarters in the United States after working in frontier municipalities.
- Training in the plant and headquarters. Asian plants send certain groups of engineers -as well as technicians and workers- to train at their headquarters.
- Among the engineers, there is a web of social networks that enables the creation of flexible teams in different plants. This type of collective can be compared to what has been called "action communities" (Zarifian, 2001) or practice communities.

Around the networks that relate the maquiladoras with the educational sector, there is a "sense of community" that, apparently, shares a series of objectives in relation to the professional career.

However, this community bonded to the maquiladoras has in the engineers' expectations two important future limitations: on one hand, some of them only see a promising future in those plants exceeding the assembly, by selling and renewing its own product. Some engineers are conscious of the plants' limitations which they are working nowadays. The second important limitation is more subjective. The engineers have a project that frequently consists of remaining in the maquiladoras around fifteen years and later install their own business. They think that around the age of 45 years the professional progress in the industry is exhausted and, as of there they need to be dedicated to something else. The female engineers are more explicit when they indicate that the maquiladoras

are *stressful*, it require great availability and also difficult the possibility of combining the work with the family care (Hualde, 2001c).

V. FINAL REFLECTIONS

Since the mid-eighties, the northern Mexican frontier municipalities have been experiencing a large growth in electronic, auto part and other plants through the investment of the capital from the U.S. and Asia, particularly Japan.

These plants show important differences with regard to the maquiladoras in the seventies, which are more like workshops with a very elementary organization, precarious work and deficient facilities.

Large plants with a lot of workers have hired thousands of technicians and professional employees that statistically do not translate into a more professionalized employment structure. The hiring of this type of personnel is concentrated in a few big plants with a larger number of technicians and engineers.

Research shows that the personnel assembly line perform more than purely manual assembly tasks. However, most of the tasks they carry out are not based on technical knowledge like that of a skilled worker. Some do adjustment tasks and check specifications that need care and attention and some knowledge of elementary calculus. One of the aspects that has a greater influence on training is precisely the need to care for product quality. On the other hand, the relative enhancement of tasks among certain strata of workers does not imply that plants develop wage-scale and incentive structures that encourage promotion. Job conditions are based on fragile conditions of legality: the collective contracts are very flexible, they allow extensive possibilities of action to the businesses, the workers do not even know that they have been affiliated with an union and the labor courts are usually slow in their resolutions (Quintero, 1997, Carrillo and Kopinak, 1999).

Technicians mainly carry out maintenance, adjustment and repair tasks. However, in interviews conducted in Tijuana, it was seen that learning mostly depended on individual efforts and the relation with the boss, usually an engineer. The promotion in the plant is conditioned by organizational characteristics. In the large plants tend to be intense competition for promotion. The

technicians with more initiative aim to study engineering because this seems to be a clear means for promotion.

At least until the year 2000, the engineers were the stratum with a greater variety of tasks and with greater possibilities of reaching well-paid positions. Although cases of stagnant professional careers have certainly been found, many of the young people graduating from local institutions become manufacturing, materials and quality managers. Asian plants send them to Japan or Korea to take courses or to learn about new product characteristics and American plants send them to the headquarters. Two types of professional areas seem to be more promising for this sector that is still a minority: First, areas related to information and communication technologies. Second, developments linked to product designs that are being tried out in some of the large plants.

In any case, without looking down on the collective learning of these professionals and the importance this has for the city and region, the large differences between the workers (with only elementary school or junior high school) and the professionals, is an obstacle for collective learning, which could be even more advantageous for the region. Authors, such as Sorge (1987), have underlined the need to reduce the differences between workers and engineers. Although Nonaka and Takeuchi (1995:151) give greater importance to the assembly line managers, middle managers and top level managers, they claim that everybody in a company must create knowledge. One of the conditions to create it, is that information should flow, which assumes a different kind of hierarchy from that existing in the plants analyzed (Von Krogh et al: 2001).

In the learning economy and society, it is emphasized the need to have a common language in innovative processes, as well as the need to dominate common communicative codes; the certification processes as ISO 9000 are also related to the intensification of the coordination and communication in the organizations as a whole. An important educational gap among the distinct segments of employees reduces the possibilities of such learning.

The crossroad in which Tijuana and the Mexican border region are can be analyzed not just through the direct analysis of such reality, but also through international analyses that have carried out comparisons among countries.

A report of The United Nations Commission for Trade and Development (UNCTAD) that analyzes the Mexican electronics -mainly in Jalisco and the border-, as well as electronic industry from

Malaysia and Thailand indicated that Mexico, due to its proximity with the United States, will continue to be a regional electronic center in the future, although if Mexico's technological capacities are deepened, -Mexico has a human capital base stronger than Malaysia-, the transnational ones can develop their facilities to also serve the Latin-American market.

That report also said that the transnational potential to develop abilities is potentially important (sic): Many foreign companies in developing countries pay local higher salaries than their local counterparts and invest more in training. They tend to be more aware of the training tendencies as well as the necessity to create new forms of abilities; they can use training materials and state of the art techniques; and its training is oriented to the global markets.

However it also aware: "the guests countries cannot depend on the Transnational Corporations (TNC) to satisfy their extensive or emergent qualification necessities. The TNC use the technologies that are appropriate for the local levels of education and train people in order to create efficient operators of such technologies, *but they do not tend to invest in creating the abilities needed for higher technological levels when these arise*. Such investments are generally more expensive and long term, and here is where the educational institutions have to satisfy these necessities. In other words, the improvement of the general level of qualification and ability as well as the provision of high level specialized training is something that the guest countries must do for themselves. In fact, such *upgrading* must be used as both to attract direct foreign investment of higher quality and to induce the existing investors to turn to more complex activities."

Martinelli (2002:9) also emphasizes that the impact of the TNC in the economies and the societies is ambivalent. On one hand, as it is in the border, they introduce advanced technologies, organizational models and corporative strategies and they pay more than the national companies. On the other hand, they exploit the fragmentation of the markets regarding the work and the resources. Their technologies, strategies and structures may not be appropriate for the necessities of the society and the local economy, particularly in the least developed countries. Although some of these corporations assume its responsibility with regard to the communities, the governments, workers and consumers where they settle the conclusion is critical:

"In spite of different behaviors, however most TNC enjoy power without responsibility, since most of their decisions are accountable only to shareholders and not to all the other many individuals and groups affected by them."

Although the learning can grow in all kinds of regions and companies, Storper (1997) has established at least two restrictions: one derived from each region's point of departure, which means that business and territories need a minimum accumulation of capacities and competences. A second important restriction is originated by the imitation that is observed between the companies which take them to a *minimalist pragmatism*. This means that their Management systems do not privilege the solid learning, the quality strategies and regions loyalty. Rather it is observed a predominance of the competence by salary costs and, consequently, a territory entrance and exit strategy. In a co-evolution vision, territories before this type of strategies tend to deregulate, to be little demanding with the conditions that the companies impose both to be installed and to remain in the territory. The difference between the ones who learn and *lean learners who are* inclined to the volatility, delimits the new division between center and periphery.

However, thirty five years after their installation in the border, the maquiladoras cannot be analyzed outside the context in which they are inserted or out of the legal frame in which they act. The region's economy is influenced by its history, its productive specialization, its predominant conventions and their relation with others regions and countries.

Considering the previous judgments, it is clear that cities as Tijuana need to evaluate the limitations that the maquiladoras present nowadays regarding to the learning and the social costs derived from the mentioned limitations. The public centers of education –in the end the whole society - are those that support the economic weight of the formation for the work; although the installed plants provide of differentiated and unequal way additional knowledge and contribute equipment to certain schools.^{xxiii}

However, the family and social costs are expressed in different ways: a) Among the direct workers by the scarce wage of improvement in their professional trajectories, which is specially acute in women who do not have any social support -nurseries, transportation- to work in the assembly plant and their own home; b). Among the technicians and medium frames due to the long journeys of study and job that are not necessarily translated in recognition on the part of the plants in better wages and positions; c) Finally, for the engineers, the assembly plant is a working place with wages and learning rewards, with costs and limitations: among them, stressing work, strong availability of schedules and limitations to the professional progress toward the forty-five years of age.

In spite of the distances with more evolved processes, the qualifications model in the maquiladoras, remember to the so called Anglo-Saxon model observed for the United States and Great Britain and described by Crouch et al (1999:86).

“In both countries, the level of statutory labor protection being low, most employment security is provided by employers; they are concerned to provide this for employees whom they want to retain, which mainly means well-educated staff in whom the firm is therefore willing to invest a good deal of training. At the other end of the scale, a large number of low skilled workers can be employed and easily disposed of if they are not needed, with little attention to their training and with a frequent recourse to the external labor market.”

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ⁱ The ACLAN authorizes that a country evaluates and investigates labor subjects of another country. The ACLAN grants to the governments of all the three countries, through the offices created for the effect, the Administrative Offices (OAN), the faculty to investigate the subject that considers necessary. Also authorizes the right to any person or organization to make a complaint against another country for the breach of its own labor legislation, complaints that can even give place to ministerial consultations and monetary sanctions (Hualde y Ramírez, 2001).

The most frequent subject of the communications is the freedom of association and the right of organization. Other problems denounced in the communications are the conditions of work that exist in the maquiladoras, discriminatory policies against employee women in those plants and the lack of protection of the labor rights of the Mexican migratory workers on the part of the authorities and the United States legislation (Hualde and Ramirez, 2001).

ⁱⁱ Thus, between 1991 and 1997, just the 15% of the new created jobs corresponded to the transformation industry no to the assembly plant (Rendón and Salas, 2000:46).

ⁱⁱⁱ In an interview in August of 2002 with the Vice-president of the Association of the Industry Assembly plant of Tijuana, the engineer César Lopez indicated that the last number of registered plants ascended to 644.

^{iv} It seemed that the Mexican government tried -in the summer of the 2002- to solve this uncertainty for the assembly plant allowing the duty free import of more than 200 tariff fractions (Border, July 28th, 2002).

^v Managers still consider that turn-over and absenteeism are the main problems in labor force management. Direct worker knowledge is still a secondary factor in terms of restricting production.

^{vi} The idea to attract maquiladoras with more technology is the formula in which the representatives of the local enterprise associations use to refer to this change for the region. A programmatic proposal for the border region is in the Regional Development Program of the North Border 2001-2006 elaborated by the Commissioner of Subjects of the North Border. In the case of the industry the main proposals talk about to the creation of productive chains in the industry maquiladoras and the support to the Small and Medium companies, ideas that already had been expressed in previous administrations.

^{vii} Personal communication of the Human Resources manager in Tijuana with fifteen years of experience in the assembly plant.

^{viii} The data form of the investigation report, Colef (2002), "To a joint between the educative profiles and the necessities of the regional development, Hualde, Alfredo (coordinating academic), Tijuana. The study counted on the financing of the Center of Economic Development of Tijuana (CDT) and in one of its phases of the State Department of Education.

^{ix} The statistical data are in Colef (2002), op. Cit, in the chapter elaborated by Rodolfo Cruz.

^x The description of the tasks of the line workers comes from different sources and methodologies: direct observation of the author in about 25 plants of several sectors: televisions, components for televisions, toys, workshops of schemed, medical products, furniture. Interviews with workers made in a sample with a total of 705 workers. The author made interviews in 1996 with a dozen of women supervisors in a plant of headset located in Tijuana. At the end of the 2002 he carried out a work of consultancy for a medical products company interested in the rotation subject where he interview about 25 workers asking to them the activity who carried out the degree of difficulty of the same one and the reasons to leave the plant. About the perceptions of the managers in relation to the workers, has been systematized information of the interviews with managers and engineers who soon we will detail. Other sources can be consulted in works made by other colleagues like Kopinak (1996), De la O (1994), Reygadas (2000), Contreras (2001).

^{xi} In Baja California the most part of the textile maquiladoras settled down in Ensenada. These types of plants were very affected by the recession of the 2001-2002.

^{xii} The workers diversify their knowledge, but without broadening their cognitive basis to carry their tasks out.

^{xiii} The plants organize the salaries and categories for the different workers in five or six categories. To ascend they combine a series of criteria: the antiquity, the operation domain and, in the case of supervisors, the capacity and coordination of control, responsibility and similar aptitudes.

^{xiv} These observations come from interviews with the workers in Tijuana.

^{xv} The conflict in Han Yon, a Korean firm, is the most recent significant example of a conflict that derived into an attempt to create independent trade unions in Tijuana (Carrillo and Kopinak, 1998).

^{xvi} Verbal Information of a representative of the Association of Tijuana's Industrial Relations (ARITAC)

^{xvii} This idea points at the fact that the insecurity has other objective and subjective component; also, the insecurity is a risk perception. These perceptions are determinate by the age, the familiar situation or the labor conditions. For that reason, to assume the insecurity as something subjectively uniforms in the case of the maquiladoras is very simplifying, although the observable "objective" security in works contracts is little (Standing, 2000: 48-49). Standing mentions international surveys as according to which the perception of the security in the employment in Mexico is greater than in Spain and the labor security greater than in Spain, Sweden and Japan.

^{xviii} With the technicians and engineers two surveys in Tijuana and Ciudad Juarez were carried out during 1993 and 1994. In each of them one interviewed hundred technicians and engineers in every city. Later, in 2001 one returned to interview 100 technicians in Tijuana and Mexicali cities. In both phases of the field work –in the middle of the nineties– was made depth surveys with technical personnel who showed especially successful trajectories or slightly related to their technical studies. In each of these phases one interviewed 15 technicians. The principal aims of the work refer to the characteristics of their educational and professional path. Important aspects are: a) The valuation of the studies and the relation with its employments; b) The type of labor activities that carry out; c) The coherence of the educational and professional path; d) The knowledge valued by the plants and the recognition that they obtain.

^{xix} The sample was made between graduated Electronics, Maintenance, Electromechanical, Technical in Production and Industrial Productivity.

^{xx} This is an observation from the work of field. Many of the technicians do not have time to be interviewed by the distribution of their daily day between the work and the studies.

^{xxi} These are results of a training project, "Industrial Learning, employment and Training of technicians and workers in the maquiladoras industry" currently being implemented with funds provided by the Mexican Council of Science and Technology (Consejo Nacional de Ciencia y Tecnología), Reference Number 35049-S.

Table 1

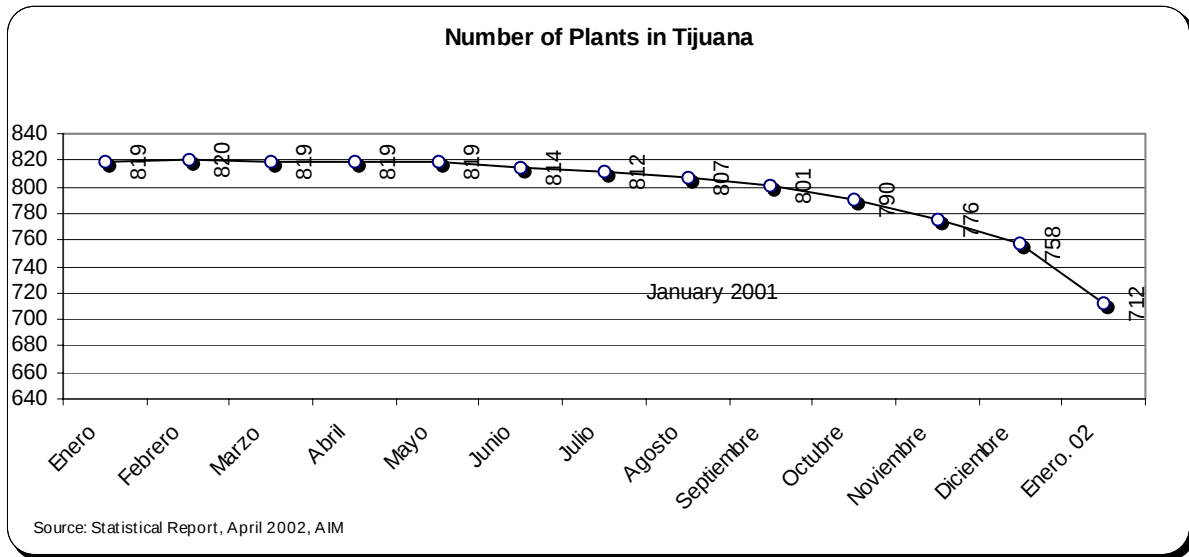


Table 2

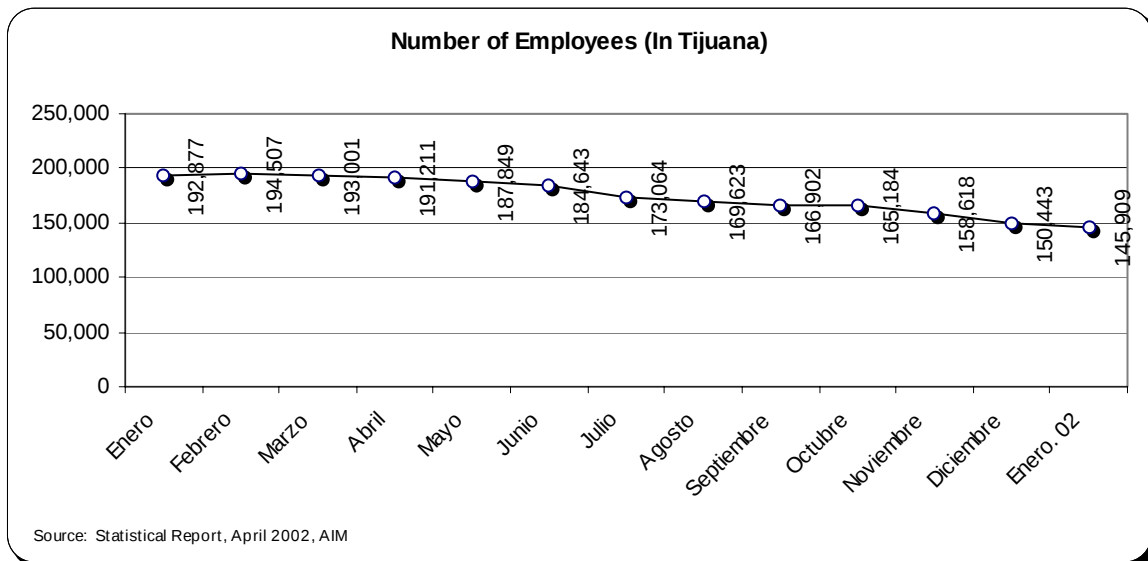


Table 3

PERSONNEL OCCUPIED IN EXPORT-ORIENTED PLANTS IN MEXICO BY THEIR JOB POSITION						
PERIOD	TOTAL	WORKERS			PRODUCTION TECHNICIANS	EMPLOYEES
		SUBTOTAL	MEN	WOMEN		
1994	583,044	477,031	192,991	284,041	64,656	41,357
1995	648,263	531,729	217,557	314,172	71,098	45,436
1996	753,708	616,617	257,575	359,042	82,795	54,296
1997	903,528	735,349	312,457	422,892	103,855	64,324
1998	1,014,006	823,561	357,905	465,656	118,516	71,929
1999	1,143,240	922,876	408,432	514,444	138,246	82,119
2000 ^{p/}	1,285,007	1,040,077	466,004	574,073	152,622	92,308
2001	1,201,575	959,518	433,044	526,474	150,136	91,921
2002	1,071,710	848,840	386,314	462,526	137,555	85,315

p/ preliminary figures based on the date shown.

Source: Statistic of The Maquiladoras Industry of Export, INEGI.

Table 4

ACTIVE ECONOMICAL POPULATION BY EDUCATIVE LEVEL						
TIJUANA 1990-2000						
EDUCATIVE LEVEL	1990	1992	1994	1996	1998	2000
Unenlightened	4.10	3.30	3.30	3.70	3.10	4.00
Grade school	32.20	34.00	33.40	32.70	33.60	31.30
Technicians	10.40	9.30	6.70	6.40	6.80	4.40
Junior high school	27.10	27.60	28.20	26.50	28.40	28.20
High school	13.10	13.10	15.30	16.10	14.70	16.60
Professionals	12.30	12.30	13.00	14.60	13.40	15.20
Total	100.00	100.00	100.00	100.00	100.00	100.00
	291,739	317,289	329,325	387,863	449,891	518,459
Source: Colef (2002), based in ENEU, National Survey of Urban Use, second trimester.						

Table 5

PERCENTAGE DISTRIBUTION OF POPULATION ECONOMICALLY ACTIVE BY SECTOR ECONOMIC AND EDUCATIVE LEVEL, TIJUANA 2000							
Economic sector	Unenlightened	Grade school	Technicians	Junior high school	High school	Professional superior	Total
Transformation	3.50%	33.80%	3.90%	36.40%	14.60%	7.20%	100.00%
Construction	14.00%	51.70%	1.80%	21.70%	5.30%	5.50%	100.00%
Services to the distributor	3.70%	32.10%	5.10%	27.30%	21.20%	10.60%	100.00%
Services to the producer		11.00%	6.50%	12.00%	20.00%	50.30%	100.00%
Social service	0.90%	5.40%	8.00%	8.20%	14.50%	63.00%	100.00%
Government	1.40%	16.10%	5.30%	19.90%	21.10%	36.30%	100.00%
Personals services	4.90%	41.90%	3.80%	31.60%	12.90%	4.90%	100.00%
Total	19,946	154,263	21,836	134,118	75,277	73,633	480,250
	4.20%	32.10%	4.60%	27.90%	15.70%	15.30%	100.00%
Source: idem.							

Table 6

AVERAGE OF ANUSES SCHOOLING OF POPULATION ECONOMICALLY ACTIVE BY ECONOMIC SECTOR, 2000					
Economic sector	Tijuana	Juarez	Monterrey	Puebla	Guadalajara
Farming and Mining	6.07	5.59	9.47	5.94	9.18
Electricity and Construction	6.95	7.06	7.98	7.53	7.71
Manufacture	8.02	8.22	9.97	9.32	8.87
Distributives services	8.84	8.67	10.03	9.45	9.07
Services to the producer	10.71	11.25	12.59	13.05	12.56
Social services	13.19	13.47	13.86	14.28	13.56
Personal services	7.56	7.62	8.27	7.85	7.89
Government	10.87	10.72	11.54	12.58	11.87
Total	8.58	8.62	10.21	9.95	9.58

Source: Colef (2002) It shows of 10% of the Census of Population and House 2000.		
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Table 7

POPULATION ECONOMICALLY ACTIVE PER YEARS AVERAGE OF SCHOOLING BY TYPE OF OCCUPATION TIJUANA, 1990-2000					
Occupation	Tijuana	Juarez	Monterrey	Puebla	Guadalajara
Chief, craft supervisors	9.57	10.53	12.08	12.56	11.54
Manufacturing craftsmen and workers	7.08	8.59	7.89	7.48	7.53
Operators of fixed machinery in continuous movement	7.26	6.33	8.82	8.27	8.11
Total	8.58	8.62	10.21	9.95	9.58
Source: Colef (2002) It shows of 10% of the Census of Population and House 2000.					

Table 8

AVERAGE OF MONTHLY REAL ENTRANCE OF POPULATION ECONOMICALLY ACTIVE BY EDUCATIVE LEVEL						
Educative level	1990	1992	1994	1996	1998	2000
Without instruction	1,120	964	854	887	944	865
Grade school	1,574	1,212	1,086	860	1,110	1,087
Technicians	1,589	1,599	1,297	1,036	1,265	1,348
Junior high school	1,313	1,184	1,132	895	1,154	1,147
High school	1,891	1,414	1,367	1,098	1,600	1,576
Superior professional	2,509	2,537	2,624	2,199	2,359	2,587
No specific	1,462	1,750		677		836

Total	1,627	1,414	1,334	1,106	1,359	1,410
Source: Colef (2002) based in National Survey of Urban Use, second trimester.						

Table 9
AVERAGE OF MONTHLY REAL ENTRANCE OF POPULATION ECONOMICALLY ACTIVE
BY EDUCATIVE LEVEL AND ECONOMIC SECTOR

Schooling	Economic sector	1990	1992	1994	1996
Without instruction	Manufacture	1,238	945	795	621
	Commerce	1,267	716	781	1,284
	Services	731	816	880	728
	Other economic sectors	1,396	1,304	927	820
	Total	1,120	964	854	887
Grade school	Manufacture	1,129	1,074	1,024	751
	Commerce	2,361	1,310	1,278	1,018
	Services	1,415	1,200	978	789
	Other economic sectors	1,217	1,359	1,083	1,069
Source: Colef (2002) based in National Survey of Urban Use, second trimester.					

Table 10

AVERAGE OF MONTHLY REAL ENTRANCE OF POPULATION ECONOMICALLY ACTIVE							
BY EDUCATIVE LEVEL AND ECONOMIC SECTOR							
Schooling	Economic sector	1990	1992	1994	1996	1998	2000
		1,238	945	795	621	745	788
		1,267	716	781	1,284	1,238	729
		731	816	880	728	719	857
		1,396	1,304	927	820	1,274	1,062
		1,120	964	854	887	944	865
		1,129	1,074	1,024	751	848	895
		2,361	1,310	1,278	1,018	1,135	1,221
		1,415	1,200	978	789	920	1,188
		1,217	1,359	1,083	1,069	1,868	1,116
		1,574	1,212	1,086	860	1,110	1,087

		1,480	1,558	1,197	964	981	1,220
		2,073	1,488	1,234	1,236	1,276	1,434
		1,371	1,542	1,439	953	1,300	1,422
		1,803	2,314	1,246	1,068	1,920	1,068
		1,589	1,599	1,297	1,036	1,265	1,348
		1,158	1,005	985	753	881	1,033
		1,393	1,190	1,142	1,148	1,091	1,272
	Services	1,420	1,313	1,241	869	1,055	1,159
	Others economic sectors	1,263	1,310	1,364	942	2,087	1,293
	Total	1,313	1,184	1,132	895	1,154	1,147
High school	Manufacture	1,882	1,365	1,140	1,005	1,004	1,461
	Commerce	2,385	1,467	1,512	1,051	1,314	1,803
	Services	1,505	1,364	1,279	1,232	1,397	1,420
	Others economic sectors	1,808	1,611	1,865	1,153	3,350	1,644
	Total	1,891	1,414	1,367	1,098	1,600	1,576
Superior	Manufacture	2,719	2,777	2,358	2,327	2,427	2,622
	Commerce	2,408	2,510	2,181	1,985	1,931	2,573
	Services	2,294	2,411	2,769	2,121	2,150	2,586
	Others economic sectors	3,347	2,844	2,837	2,830	3,301	2,566
	Total	2,509	2,537	2,624	2,199	2,359	2,587
Total	Manufacture	1,328	1,263	1,131	896	992	1,153
	Commerce	1,992	1,400	1,320	1,202	1,253	1,496
	Services	1,552	1,474	1,476	1,186	1,303	1,594
	Others economic sectors	1,647	1,591	1,477	1,315	2,328	1,392
	Total	1,627	1,414	1,334	1,106	1,359	1,410

Source: Colef (2002) based in National Survey of Urban Use, second trimester.

^{xxii} A technician of the Sony plant of Mexicali was carrying out a course paid by the company along with other thirty technicians with a duration of seven months (Interview of the author, April of the 2002)

^{xxiii} Eight or ten great maquiladoras financed jointly new equipment of machine-tools in borrowing for a Tijuana's technical school by a value of 40,000 to 60,000 dollars. Also, by means of an initiative of the Committee of Entailment company-industry is obtain that the used computers of the plants are destine to the juniors high schools of the city.