

XI

Industrial Structure and Conditions of Work in Manufacturing

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This chapter will analyze the changes in the socio-technical base of productive processes in manufacturing in Mexico, i.e the technological and organizational levels, labor flexibility, labor force profiles, as well as chains of production. What we are aiming at is whether economic liberalization, specifically NAFTA, has translated into a broader and more consistent modernization of the industrial apparatus as a result of greater market competition; we will also focus on the repercussions it had upon working conditions in the manufacturing sector during the nineties. Our main source of information is the National Employment, Wages, Technology and Training Surveys (Encuesta Nacional de Empleo, Salarios, Tecnología y Capacitación / ENESTYC) conducted by INEGI and the Mexican Labor Department in 1991, 1994 and 1998 that provide us with a representative sample of formal manufacturing establishments at a national level.

INDUSTRIAL STRUCTURE AND SOCIO-TECHNICAL BASIS OF PRODUCTIVE PROCESSES IN MANUFACTURING

Within Mexico's model of neoliberal reform, manufacturing industry became the growth axis for all the economy. In the year 2000, manufacturing accounted for 28.7% of the total production, only surpassed by trade, restaurants and hotels. It is the most dynamic sector, accounting for 87.3% of the total exports in the year 2000. The maquiladora industry occupies a central position within manufacturing, representing 47.9% of the exported manufactured goods that year. Economic liberalization, however, translated into such an accelerated increase not only of manufacturing exports, but also of manufacturing imports (mainly inputs and capital goods) so that, in the end, the trade balance for manufactures was always in deficit for most of the nineties. This deficit had increased when the late 1994 crisis came about, it momentarily dropped due to the large peso devaluation that followed (1995 and 1996), and then began to grow at an accelerated rate since 1997, reaching the levels it had before the great crisis by the end of the decade. It is export-oriented maquiladoras that are the major responsible for this behavior, since their imported inputs increased up to 34% of the total imports in the year 2000.

There is also a high concentration of Mexican exports by consortium and manufacturing branch. Since 1996, when exports exploded, 67.3% a sizeable portion of total exports is made up by three sectors: the auto and auto parts industries, electric and electronics, and machinery and special equipment. Seven hundred firms (only 2% of all exporting companies) gathered 80% of total exports (in 1996, there were 27,924 exportation companies out of a national total of 2,186,655 establishments of all kinds and in 1993, there were 266,033 manufacturing establishments).

Within large establishments, there was a particular increase of imported raw materials (measured in percentage) from 35.0 to 39.5% between 1991 and 1998. In medium and small establishments this also increased, but not as much (table XI.1.).

Between 1988 and 1998, sales destined for the domestic market by manufacturing establishments reached their peak in 1994; however large establishments decreased their sales by 11 percentage points in those years, while medium-sized establishments decreased theirs by 8 percentage points, whereas small and micro establishments kept on relying on domestic buyers, the former maintained a high 93% level, the latter of 99% (table XI.2.). This is but a first aspect of the

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polarization between manufacturing establishments according to their size: the larger firms are increasingly oriented to foreign markets, whereas small and micro establishments remain subject to the domestic market.

Table XI.1. *Percentage of Imported Raw Materials in Manufacturing arranged by Size of Establishment, 1989, 1992 and 1998*

<i>Size</i>	<i>Large</i>	<i>Medium</i>	<i>Small</i>
1998	39.5	26.1	14.1
1991	35.0	25.5	16.2
1988	32.7	23.0	11.8

SOURCE: INEGI (1989, 1992, 1999) ENESTyC

During the nineties, the percentage of large manufacturing establishments went from 1.5% of the total in 1988 to 0.9% in 1998; the percentage of medium-sized and small establishments also decreased. This was not the case with micro establishments which actually were the only ones to increase their importance (table XI.3.). It is well known that micro establishments, and within this group those with less than five workers, i.e., the vast majority, should be viewed not as proper firms but as part of the survival strategies of a large part of the population facing a lack of well-paid formal jobs (Bolvitnik, 1998).

Table XI.2. *Manufacturing Establishments: Percentage of Sales destined to the Domestic Market, 1988, 1991, 1994 and 1998*

<i>Size</i>	<i>Total</i>	<i>Large</i>	<i>Medium</i>	<i>Small</i>	<i>Micro</i>
1998	80.2	69.5	81.1	93.4	99.2
1994	86.5	79.6	89.6	93.6	96.2
1991	83.4	78.4	89.6	93.7	99.2
1988	81.1	75.4	89.7	93.4	99.3

SOURCE: INEGI (1989, 1992, 1995 and 1999), ENESTyC

Table XI.3. *Manufacturing Establishments: Composition by Size*

	<i>1988</i>	<i>1993</i>	<i>1998</i>
Large	1.5	0.86	0.9
Medium	1.9	1.2	1.1
Small	9.7	6.2	5.4
Micro	86.9	91.7	92.6

SOURCE: INEGI (1989, 1994, and 1999) Censos Económicos.

Although large establishments in this sector, as we already said, only represented 0.9% of manufacturing firms in 1998, in terms of occupation, they accounted for almost 50% of the total personnel employed, and although this percentage dropped between 1988 and 1998, it did not decrease as much as in the small and medium-sized establishments. Micro establishments, however, increased their importance in occupation by increasing from 14.1% in 1988 to 20.8% in 1998 (table XI.4.).

Table XI.4. *Percentage of Total Occupied Personnel According to Size of Manufacturing Establishment*

	<i>1988</i>	<i>1993</i>	<i>1998</i>
Large	50.4	44.2	48.3
Medium	18.7	15.4	14.1
Small	19.8	20.4	16.8
Micro	14.1	20.4	20.8

SOURCE: INEGI (1989, 1994, and 1999) Censos Económicos.

If the importance of occupation in large establishments is great none the less is their participation in the total gross manufacturing production: between 1988 and 1998 their share

slightly increased from 68.1 to 70.3%, whereas medium-sized and small establishments decreased their contribution to the total gross production in those years, micro establishments did also increase their contribution slightly (table XI.5.).

Although the physical volume of manufacturing production increased considerably in the nineties, (except for 1995, the crisis year), manufacturing employment has followed a different trajectory (ACLAN, 1998a). The 1993 occupation levels had not yet been recovered in the year 2000, despite the fact that the growth of employment in the maquiladora industry had been sustained just up to the beginning of the 2001 recession (table XI.6.). This might be due, on the one hand, to an increase in work productivity that grew 46.3% between 1993 and the year 2000, but also to the displacement of non-maquiladora workers by the competition of imported goods in the domestic market and to the disarticulation of the old chains of production (ACLAN, 1998).

Table XI.5. *Percentage of Total Gross Production in Manufacturing by Size of Establishment*

	1988	1993	1998
Large	68.1	62.3	70.3
Medium	14.2	14.3	13.3
Small	13.3	14.1	11.5
Micro	4.4	9.2	4.9

SOURCE: INEGI (1989, 1994, and 1999) Censos Económicos.

Table XI.6. *Volume of Manufacturing Production Index, Occupied Personnel and Labor Productivity (base year 1993)*

	Volume	Occupied Personnel	Productivity
1993	100	100	100
1996	109.6	90.5	124.9
1997	120.5	94.7	131.2
1998	129.4	98.2	136.4
1999	128.4	98.8	139.9
2000	134.8	99.7	146.3

SOURCE: Statistical Annex President Fox's First Government Report (2001).

In fact, net fixed assets by occupied worker in manufacturing at constant prices increased by 254.5% between 1993 and 1998. However, the fact that these increases were higher in medium-sized, small and micro establishments than in large establishments might indicate, as we shall analyze below, that it was mainly due not to technological innovation but work intensification, with or without changes in organization that essentially explains this increase in productivity (the indexes in table XI.7. only express the relative growth of the fixed assets by occupied worker according to the size of the manufacturing establishment, but do not express the differences between these strata that are highly favorable to larger establishments).

Table XI.7. *Index of Net Fixed Assets by Total Occupied Personnel in Manufacturing, 1994 Prices*

	1993	1998
Total	100	254.5
Large	100	141.5
Medium	100	246.8
Small	100	221.6
Micro	100	393.9

SOURCE: INEGI (1989, 1994, and 1999) Censos Económicos.

In the nineties, Mexican manufacturing did not change its tendency to devote a minimal part of its income to research and development: less than 1%, regardless of establishment size (table XI.8.). Neither were there large-scale changes via the simple acquisition of machinery and modern equipment. The percentage in the value of machinery and modern equipment, automated equipment, numerical control machine tools, computerized and robotic numerical control machine

tools did not change in the nineties, except for a certain increase in numerical control machine tools.

Table XI.8. *Percentage of Income Devoted to Research and Development in 1991 and 1998*

	<i>Total</i>	<i>Large</i>	<i>Medium</i>
1991	0.8	0.7	0.9
1998	0.5	0.4	0.3

SOURCE: INEGI (1992, and 1999) ENESTyC.

Table XI.9. *Percentage of the Value of Modern Machinery Operating in Manufacturing 1992 and 1998*

<i>Type</i>	<i>1991</i>	<i>1998</i>
Automatic Equipment	25.7	23.9
NCMT	6.5	13.4
CNCMT	6.2	5.5
Robots	1.3	1.4

SOURCE: INEGI (1992, 1995 and 1999).

NCMT: Numerical Control Machine Tools.

CNCMT: Computerized Numerical Control Machine Tools.

Changes in work organization have increased more since 1993. However, the more technical forms, such as Just-in-Time and Process Statistical Control so far have been introduced in a highly limited way in establishments of all sizes (table XI.10.).

Table XI.10. *Percentage of Manufacturing Establishments Carrying Out Changes in Work Organization since 1994 and 1997*

	<i>Just in Time</i>		<i>Process Control</i>		<i>Statistical Team Work and Quality Circles</i>	
	<i>1994</i>	<i>1997</i>	<i>1994</i>	<i>1997</i>	<i>1994</i>	<i>1997</i>
Total	3.5	1.9	3.9	4.2	21.3	0.7
Large	7.0	5.1	10.7	5.1	30.4	7.9
Medium	5.9	6.4	9.7	6.4	26.9	7.3
Small	6.0	7.0	9.5	7.0	23.6	4.9
Micro	2.8	1.5	2.2	1.5	20.2	0.3

SOURCE: INEGI (1992, 1995, 1999) ENESTyC

The large establishments have introduced more of these organizational forms, which decrease as the size of the establishment decreases. The high statistical presence of quality circles and team work in small and micro establishments might be due to pre-Taylorist forms with a low division of labor, rather than to new managerial notions (De la Garza, 1993).

With regard to labor flexibility, full-time workers still represent the vast majority of the workers employed in the formal manufacturing sector, without a significant increase in temporary workers, subcontracted workers, and workers by the hour or by fees (table XI.11). This may be explained by widespread low wages, training problems and unions that are not protective of labor (De la Garza, 1993a) to such an extent that the firms have not enough incentives to step into a scheme of labor instability (De la Garza, 1997).

From 1988 to 1998, total remunerations per worker occupied in manufacturing diminished by 45.9% in real terms. This decrease took place in establishments of all sizes, though it was larger amid the smaller establishments; and although, after rock bottomed in 1996, remunerations have tended to grow in real terms since the year 2000, by the year 2001 they had not yet reached the level they had in 1994 (table XI.12.). It should be kept in mind that the highest historical wages were reached in 1976 and that deterioration was of around 80 per cent between that year and the end of the twentieth century.

This drop in wages, as well as the labour rationalization measures, was reflected in the nineties in a decrease of labor costs among total cost for manufactures, particularly in large establishments in which they only represented 16.9% of total costs in 1994 (table XI.13.) (ACLAN, 1997a). In 1998, the percentage of total remunerations in relation to the total gross manufacturing production remained low, in spite of the real growth of wages in those years (table XI.14.).

Table XI.11. *Percentage of Full-Time Workers, Part-Timers, Subcontracted Workers, Workers by the Hour and by Fees in 1991 and 1999*

		<i>Total</i>	<i>Large</i>	<i>Medium</i>	<i>Small</i>	<i>Micro</i>
Full-Time	1991	85.6	86.5	86.2	89.1	77.1
	1999	88.2	87.1	86.2	90.0	89.7
Part-Time	1991	0.5	0.2	0.3	0.8	1.3
	1999	0.7	0.2	0.4	1.0	1.2
By the Hour	1991	0.1	0.03	0.06	0.4	0.1
	1999	0.4	0.1	0.1	0.8	0.6
Subcontracted	1991	1.9	1.8	.6	1.7	2.7
	1999	1.0	2.1	0.9	1.0	0.2
By Fees	1999	0.8	0.2	0.3	1.0	1.8

SOURCE: INEGI (1992, 1999) ENESTyC

Table XI.12. *Total Remunerations per Total Occupied Personnel in Manufacturing (base year 1994)*

	<i>1988</i>	<i>1993</i>	<i>1998</i>
Total	34.2	23.2	18.5
Large	28.5	32.7	25.7
Medium	31.2	25.8	19.3
Small	38.5	19.7	14.9
Micro	10.3	5.6	4.5

SOURCE: INEGI (1989, 1994, and 1999) Censos Económicos.

Table XI.13. *Percentage of Labor Costs Related to Total Costs Established in Manufacturing in 1989 and 1994*

	<i>Size</i>	<i>Percentage</i>
	1989	1994
Total	24.7	16.9
Large	25.2	15.4
Medium	24.9	17.2
Small	27.3	19.4
Micro	17.9	18.3

SOURCE: INEGI (1992, 1995) ENESTyC

Table XI.14. *Total Remunerations for Occupied Personnel as a Percentage of the Total Gross Production in Manufacturing in 1998*

<i>Branch</i>	<i>Percentage</i>
Total	8.5
Textiles, Garments and Leather	17.9
Wood and Wood Products	14.9
Paper, Printing and Publications	13.9
Chemicals, Coal, Rubber, Plastic & Oil-Derived Products	10.2
Mineral Non-Metallic Products	11.4
Basic Metal Industry	4.2
Machinery and Equipment	11.6
Other	22.4
Car Industry	6.3

SOURCE: INEGI (1999) Censos Económicos.

The decrease in the rate of profits towards the end of the century heralding the overproduction crisis of the year 2001 and the dropping demand for manufactures in the US. is a result of the path based on work rationalization, partly on organizational changes, but also on labor intensification to reduce costs and become more competitive. This path is also expressed in indicators such as an increase in capital intensity that does not necessarily indicate technological innovation, it might be expressed as organizational changes or simply an increase in labor intensity reflected in workers mobilizing greater fixed capital by occupied worker. The path based on labor intensification, whether under its Taylorist or Toyotist form is limited first by the workers' physical resistance to the wearing out of their labor force and then by social resistance that in Mexico is not expressed by union-led collective action, but by the workers individually filing lawsuits and, particularly by the high level of voluntary external rotation (De la Garza, 2001). This resistance can also be seen in a decrease of the surplus rate at the end of the past decade, only partly impacted by an increase in real wages that even by the year 2001 had not yet reached the 1993 level, but mainly due to limitations in the employers' rationalization strategies (table XI.15.).

Table XI.15. Indicators of Capital Accumulation in Manufacturing (1980 prices)¹²

	1988	1998
Profit Rate	28%	21%
Capital Intensity	100	767
Variable Capital / Worker	100	89.7
Surplus Rate	2.5	1.7

SOURCE: The author's own estimates based on the 1988 and the 1999 Economic Census.

With regard to the chains of production, the imports of raw materials and components, as well as the prevalence of intra-firm trade among transnational filials and particularly the impact of inputs imported by maquiladoras are important stumbling blocks to the re-construction of the chains of production and to the dissemination of the export-oriented model among segments of companies that cannot become direct exporters on their own (Carrillo, 1993). Rigidities in the use of labor force that companies find in other contexts and that leads them to externalize part of their production, were relativized by the aforementioned factors: low wages in large establishments, enough functional flexibility and unions that do not really protect the workers (ACLAN, 1997). Although the percentage of the value of outsourced production in manufacturing increased between 1994 and 1998, it continues being extremely low, except for micro establishments, but since they do not produce with quality and timeliness, outsourcing would seem to remain in a precarious production circuit. Something similar can be said about the percentage of establishments that hired maquiladoras in Mexico and of the outsourcing companies.

At the beginning of NAFTA (1994), the Universidad Autónoma Metropolitana conducted research into the characteristics of the Mexican industrial structure in 14 industrial areas (the MIM survey) ("Modelos de industrialización en México", UAM-I, 1998, National Award in Labor Research of the Mexican Department of Labor in 1997). It concluded that the Mexican industrial apparatus was polarized as could be seen by its technological levels, forms of labor force organization and management, labor relations, the labor force profile and back and forth links between companies. The results are similar to those of the National Employment, Technology and Training Survey: the situation seems to have changed deeply during the past decade (De la Garza, 1998; De la Garza, Salas and Torres, 2000).

We could say that a pole of around 10% of the large establishments of the restructured manufacturing industry (over 250 workers) have been favored by NAFTA. These are companies with

¹ Capital intensity and variable capital per worker are baseline indexes 1988=100

Tg = Total Gross Production - (Total Inputs + Fixed Assets/15) - Total Remunerations / (Inputs + Fixed Assets/15) + Remunerations

Ik = Fixed assets / total occupied personnel

Cc/T = (Inputs+ Fixed Assets /15)/ Total Occupied Personnel

Cv/T = Total Remunerations / Total Occupied Personnel

Tp=[(Total Gross Production - (Inputs+Fixed Assets /15) - Remunerations)] / Remunerations.

high or medium technology that partly apply total quality and Just-in-Time, with medium levels of labor flexibility and bilaterality, but without important links with their area.

The other pole is constituted by the medium and large industries that have not been restructured with Taylorist-Fordist processes, and micro, small and part of the medium establishments with non-scientific work administration, low or medium-level technologies, primitive flexibility or bureaucratized productive processes (De la Garza, 1998).

Table XI.16. *Percentage of the Production Value Carried Out by Outsourcing, Percentage of Establishments that Hired Maquiladora Services and Outsourced Production and were Outsourced in Manufacturing in 1994 and 1998*

	1988	1994	1998
Percentage of the Production Value Outsourced	ND	4.2	7.54
Percentage of Establishments Hiring Maquiladoras & Outsourcing	8.7	ND	0.96
Percentage of Outsourced Establishments	ND	ND	0.99

SOURCE: INEGI (1988, 1994, 1998) ENESTyC.

SOCIODEMOGRAPHIC PROFILE AND CONDITIONS OF WORK OF THE LABOR FORCE IN MANUFACTURING

In this section, we will analyze the sociodemographic, labor and wage profile of manufacturing workers in the nineties. We will use three *National Employment, Wages, Labor and Training Surveys*, and their complementary surveys: the *National Manufacturing Workers Survey* and the *National Education, Training and Employment Survey*, as well as the *National Employment Surveys*.

In the early nineties, young workers aged between 20 and 34 already predominated in manufacturing, almost reaching 60%, whereas workers over 50 were a small minority. In this same period, the majority of the manufacturing workers were married or living with a partner, male workers tended to be heads of family, whereas female workers tended to be daughters (table XI.17.).

Table XI.17. *Percentage of Manufacturing Workers According to Civil Status, Age Groups and Position in the Family Structure in 1992*

	<i>Civil Status</i>		<i>Percentage</i>			
	<i>Single</i>	<i>Married or Living Together</i>	<i>Other</i>			
	37.8	59.1	3.1			
<i>Percentage of Manufacturing Workers According to Age Group (years)</i>						
Age Group	12-19	20-34	35-50	50		
Percentage	10.7%	59.9	23.5	5.9		
<i>Position</i>	<i>Head of Family</i>	<i>Son/Daughter</i>	<i>Brother/Sister</i>	<i>Husband/Wife</i>	<i>Other</i>	<i>None</i>
Men	70.9%	24.4	1.4	0.3	2.8	0.2
Women	24.4%	45.9	2.8	24.5	2.3	0.1

SOURCE: INEGI (1992) National Manufacturing Workers Survey (Encuesta Nacional de Trabajadores Manufactureros).

In the year 2000, 57.3% of all manufacturing workers had a schooling level higher than elementary school. According to ENESTyC, in 1999 this figure increased to 67.2% in all large establishments (table XI.18.).

Table XI.18. *Percentage of the Occupied Population in the Manufacturing Industry According to Years of Schooling*

Year	Years of Schooling					
	No Schooling	1-5	6	7-9	9	n.e
1992	2.1%	8.8	21.9	31.1	35.9	0.2
2000	5.8	13.3	23.6	30.6	26.7	0.1

SOURCE: INEGI (1992, 2000) National Employment Surveys.

What about gender issues? The proportion of women increased in the nineties as it passed from 28.9% of the occupied population in manufacturing in 1992 up to 37.6% in the year 2000 (table XI.19.). In other words, the sociodemographic profile of manufacturing workers in the nineties shows the prevalence of workers with middle education, who were young, married, male and heads of family (in the case of the female workers, they tended to be daughters). On a second level are the single workers, particularly women, although mature men with basic education, married and heads of family are still very much present.

Table XI.19. *Percentage of Men and Women in Manufacturing*

Year	Men	Women
1992	71.1	28.9
2000	62.4	37.6

SOURCE: INEGI (1992, 1999) ENESTyC

Note: Other sources show data with similar tendencies: the National Urban Employment Survey in 1991 shows 40% are women, and in 1997 women accounted for 44%; Industrial Censuses show that in 1988 26.1% of the workers in manufacturing were women, in 1998, women accounted for 33.3%; National Employment Survey, with comparability problems, showed that in 1991 34.8% of the workers in manufacturing were women, and in the year 2000, women accounted for 37.8%; and the General Population Census for the year 2000 shows that 30% of the labor force in manufacturing were women.

With regard to labor profiles, unqualified workers widely prevailed in establishments of all sizes, although the larger the establishment, the higher the qualification level (table XI.20.).

In 1999, 40.1% of the workers in total manufacturing were qualified and 59.8% of the total workers were unqualified, that is, there was a slight increase in the number of qualified workers, but the unqualified workers continued prevailing (table XI.20.).

Table XI.20. *Percentage of Manufacturing Workers According to Qualification Level (1992)*

Establishment	Professional Workers	Specialized Workers	General Workers
Micro	4.4	18.3	77.3
Small	7.1	25.1	67.8
Medium	11.1	25.8	63.1
Large	9.6	27.2	63.2
Total	8.5	24.9	66.6

SOURCE: INEGI (1992) ENESTyC

In 1998, the average working week in manufacturing, according to ENESTyC was 47 hours in total and by establishment size, which coincides with ENE data that reports that in the year 2000, 73.9% of the occupied workers in the transformation industry had working weeks of more than 40 hours (table XI.21.). The wearing out of the labor force in manufacturing not only comes from increased work intensity, but also from the fact that long working days prevail.

The population that does not work or that works less than 15 hours per week, both in the transformation industry and in the total occupied population, is not very significant and has not shown any important variations in nine years. The problem is rather due to the surplus working hours per week: in the year 2000, 25% worked more than 48 hours, and for 91.8% of these workers, this was their normal working week. In nine years, the working weeks that increased most

in the transformation industry were the working weeks of more than 48 hours per week through overtime or double shift.

Table XI.21. Working Week in the Transformation Industry in the Year 2000

<i>Working Week</i>	<i>Percentage of the Occupied Population</i>
Does Not Work	2.7%
Less than 15 Hours	4.8
15 – 40 Hours	18.6
More than 40 Hours	73.9

SOURCE: INEGI (1997) National Employment Survey. Aguascalientes.

As far as the wage profile is concerned, according to ENESTYC, the income levels of most workers employed in the manufacturing industry are between one and two minimum wages, regardless of establishment size. These data correspond to the 1998 National Employment Survey: the wage mode of the manufacturing workers was one or two minimum wages, similar to the general waged workers. This survey also shows that the most frequent wage level does not undergo changes with schooling level either. Except unqualified workers and professional workers with higher education, all the other schooling levels have a wage mode of between one and two minimum wages.

Social benefits in total remunerations in manufacturing represented 24%, but out of the population employed by the transformation industry, 42% did not receive any economic benefits in the year 2000.

The broad policy of productivity agreements signed between companies and unions promoted by the Mexican Labor Department arose in 1994 (De la Garza and Bouzas, 1998). In 1994, 50.7% of the wage bargaining at a federal level (equivalent to 78% of the hired workers at a federal level) incorporated productivity agreements (Samaniego, 1997). But in later years, the number of new agreements has hardly grown (De la Garza, Salas and Torres, 2000). However, global results regarding an increase in workers' incomes were discouraging: 90% of the agreements signed in 1994 granted a 2% rise for productivity, the same rise was granted to minimum wages with scanty repercussions on wages (Ruiz Durán, 1998). Towards 1995, the policy to recover the real wages through a productivity bonus lost power in the face of a 51.9% inflation and an average of 1.2% of productivity bonuses (ACLAN, 1997).

Trade liberalization has not implied a positive correlation between real wage growth and productivity growth; that is, the negative evolution of real wages cannot be attributed to the low productivities of manufacturing companies in Mexico.

To summarize, in the nineties the profile of the manufacturing labor force was workers who were young male heads of family with junior high schooling. Unqualified workers prevailed with long working hours and extremely low wages.

A high proportion of workers worked in microbusinesses (companies with 15 workers or less): out of the total percentage of employed workers, those who worked without a working place increased from 8.2% in 1988 to 19.7% in the year 2000; 23% of the total waged and piecemeal workers in manufacturing worked in micro establishments in the past year. 33% of the waged workers in the transformation industry had no written contract, whether collective or individual.

From earlier research we have also concluded that the productive apparatus in Mexico is polarized between modernized businesses, whether in technology, work organization or labor relations, and those businesses that have not made important changes in the past ten years (De la Garza, 1998). Likewise, the labor force is more homogeneous in its labor and wage characteristics, but not in sociodemographic terms. We can speak of an old working class constituted by mature male workers who are relatively stable (in spite of the cutbacks due to privatization and company rationalization), specialized in one sole machine and located in traditional work processes or re-converted into some sophisticated form, and a "new working class", young, semi-qualified, with a high presence of women, low stability in employment, one part occupied in precarious employment and another in state-of-the-art modernized companies. This new working class is clearly the vast majority in manufacturing, particularly due to its presence in the maquiladora industry.

Some profile characteristics of the labor force may present variations related to geographic region, age of the company and whether it exports, type of capital and productivity level (De la

Garza, 1998).

In spite of the theory of flexible specialization, the data we have contributed on the establishments' socio-technical configurations according to size point to the productive superiority of larger establishments over micro and small establishments. We will next look into the relations between establishment sizes and variables related to labor force profile.

The relations between establishment size and labor force profile would be as follows: the size differences of the manufacturing establishments have a weak relation with women's participation in the labor force, and this situation remained the same in the nineties; the relation between size and schooling level was initially negative in the early nineties and ended with a strong correlation by the end of the century. With regard to the labor profile, the relation with the percentage of workers in total employment, full-time work, absenteeism and turnover was initially hardly significant, but the correlation between size and percentage of workers in the total occupied personnel and full-time workers turned out to be high, possibly due to the importance the intense labor force wear out processes have acquired. There was, however, an extremely high correlation with the length of the working day during the nineties. With regard to the percentage of specialized and professional workers, the correlation is low, but has tended to increase. As far as the wage profiles are concerned, the relation between remunerations per worker and establishment size has passed from low to high, that is, the large establishments increasingly pay more than the smaller establishments. As was to be expected, the relation with the unionization rate is high (table X.22.). We should clarify that the existence of high correlation coefficients does not necessarily mean that the average differences among strata of the analyzed variables are extremely high, as in the case of wages.

Table XI.22. *Correlation Coefficients between Establishment Size and Sociodemographic, Labor and Wage Profiles, and the Unionization Rate of the Labor Force in the Manufacturing Industry*

	1991	1998
Percentage of Women	0.2	0.162
Seniority	-0.18	ND
Schooling Level	-0.12	0.994
Percentage of Workers	0.1	0.8
Percentage of Full-Time Workers	0.03	0.7
Percentage of Professional and Specialized Workers in		
Total Workers	0.08	0.4
Working Week	1.0	0.77
Turnover Rate	-0.06	ND
Absenteeism Rate	-0.01	-0.85
Workers' Average Remuneration	0.14	0.98
Percentage of Personnel Costs in the Total Costs	0.25	ND
Unionization Rate	ND	0.97

SOURCE: The author's own estimates based on ENESTyC-92 and ENESTyC-99 Surveys.

EXPORT AND FOREIGN CAPITAL COMPANIES AND LABOR FORCE

With regard to the differences between export and non-export companies, as well as national and foreign capital companies, from previous research (De la Garza, Salas and Torres, 2000) we can state that:

- a) Foreign companies have an important intra-firm exchange of goods and a high content of foreign inputs.
- b) NAFTA and liberalization in general have not translated into an extension of the high technological level, although foreign companies have a slight advantage over national companies.
- c) The labour division within foreign firms would seem to tend more toward stricter Taylorist-Fordist schemes than within national firms, possibly because of a greater presence of non-scientific administration; likewise, foreign companies tend more to formalize work in a Taylorist sense (Garza, Salas and Torres, 2000).

- d) As far as work flexibility levels are concerned, there do not seem to be any differences between the different types of companies (De la Garza and Bouzas, 1998).
- e) Wages are low in all types of companies (less than five minimum wages).
- f) The only difference in labor force is that in foreign companies, the labor force is younger with lower seniority; in all these companies, the workers' schooling level is increasing.

The condition of being a foreign or national company was more significant than whether it was export-oriented or not in terms of the variables of the socio-technical basis of the productive processes that were considered. This situation is important precisely because we are considering that the companies with foreign-capital participation within manufacturing activities represent 22.4% of all employment in this sector. In this sense, NAFTA might be causing changes in the companies, but with a strong adaptation to the Mexican industrial relations systems: with low levels of protection to labor (De la Garza, 1992). Foreign companies in Mexico seem to arrive with Taylorist-Fordist organization schemes mixed with partial applications of total quality and Just-in-Time, but in the end they arrive with a labour division that continues giving the workers almost unqualified tasks as opposed to the tasks given to technicians and engineers. In this sense, the important shift in the labor force at a global level is not the creation of an important layer of re-qualified workers, but the inclusion of a younger female labor force with high external turnover and low wages and qualifications.

It is likely that all of the above will contribute to keep industrial development in an unvirtuous loop. Large companies, now essentially export-oriented, increasingly import their inputs and do not use internal outsourcing, thus small and middle-sized companies are not driven to modernize, change technology, organization or to embrace just-in-time operating schemes, nor they are pushed to perform with acceptable quality levels. This loop does not close either because industrial districts and clusters have not been distributed more widely. The maquiladoras in the north of the country are a clear example of this behavior that disarticulates chains of production, clients and providers. In spite of the official discourse on clusters, the proportion of national inputs has been kept low since the beginning of the current economic model.

Finally, we shall analyze some characteristics of the manufacturing workers profile in export-oriented companies with foreign capital, considering that modernization and conditions of work could differ between these companies and non-export-oriented companies with national capital.

Table XI.23. *Correlation Coefficients between Percentage of Exports and the Labor Force's Sociodemographic, Labor and Wage Profiles between 1991 and 1999*

	1991	1999
Percentage of Women	0.09	0.19
Seniority	0.03	0.05
Schooling Level	-0.14	0.27
Percentage of Full-Time Workers	0.04	-0.17
Percentage of Professional Workers in Total Workers	0.01	0.08
Average Remunerations	0.12	0.02
Percentage of Bonuses in Remunerations		0.14

SOURCE: The author's own estimates based on INEGI's ENESTyC-92 and ENESTyC-99 Surveys.

The correlation between exports (percentage of sales in foreign markets) and female employment tended to grow between 1991 and 1999; whereas there is practically no correlation with seniority, labor force mobility, high external rotation. Schooling level in export-oriented companies has increased while the percentage of full-time workers in the correlation, however became negative. The correlation of the percentage of qualified workers in total workers hardly increased. This is an important indicator of the type of process and work organization used. In the same sense, the correlation with workers' remunerations tended to decrease in NAFTA years (table XI.23.).

With regard to the correlations with foreign property of manufacturing capital, seniority tended to increase in foreign companies; whereas with the percentage of full-time workers the

correlation turned negative, as well as the percentage of qualified workers and the correlation with the workers' real remunerations tended to decrease between 1994 and 1999.

CONCLUSIONS

Let us broadly characterize the most significant profiles of the labor force in the Mexican manufacturing resulting from the nineties:

- 1) According to sociodemographic factors
Profile I: The old labor force both in terms of age and seniority, male workers with stable base-jobs and elementary schooling.
Profile II: The new labor force both in terms of age and seniority, male or female workers with stable base-jobs and junior high schooling (in this labor force the feminine component is more important than in profile I).
- 2) According to strict labor issues
The substantial differences are not whether the workers are temporary or full-time base-employed workers, but their qualification scope and contents.
Profile A: Qualified workers or workers specialized in a specific type of machinery (the old labor force may have become qualified on the job itself) mostly composed of mature workers although there might be a minor segment of the new labor force with new qualifications.
Profile B: Unqualified workers may predominate among the new labor force.
- 3) According to the level of income (wages)
There would only be two:
Profile X: Low wages.
Profile Y: Medium wages.
Both lack productivity incentives.

The wage level may imply segmentation by gender, and be higher in the old labor force than in the new one. It should be added that the relation between productivity and wages in the new labor force is not clear.

The main polarization is between the old working class (profile I + profile A + profile X or Y) and the new working class (profile II + profile B + profile X). It is true that within the new working class there may be a further polarization between an unqualified majority and a male minority with new qualifications, better wages and training.

The most important conclusion is that there is an increasing polarization between the old and the new working class. In the middle, however, a small segment of the restructured working class may be identified. At the same time, the old working class tends to disappear and thus homogenize toward the new working class.

This leads us to think that labor force's sociodemographic profile has not been clearly developed for exportation, type of capital, size of establishment or productivity. The difference in qualification requirements in the traditional sense and the company's specific personnel policies seem to have a greater influence. Likewise, policies that in spite of introducing elements of quality and Just-in-Time continue segmenting conception from implementation seem to predominate among workers and middle management, engineers and technicians with its repercussions on low training, extremely general qualifications and low wages. This model, however, based on either Taylorist or Toyotist work intensification, seems to have reached one of its limits toward the year 2000. Externally because of a drop in the demand in the North American market and internally because of the accelerated wearing out of the labor force with low wages and long working hours that translate into high external turnover and absenteeism with repercussions on the growth of productivity towards the year 2001.

ACRONYMS

INEGI: Instituto Nacional de Estadística, Geografía e Informática (National Institute of Statistics, Geography and Informatics)

STYPS: Secretaría del Trabajo and Previsión Social (Mexican Labor Department)

UAM-I: Universidad Autónoma Metropolitana campus Iztapalapa (Autonomous Metropolitan University, Iztapalapa campus)

We used the official definition of establishment sizes: micro establishments, with less than 15 workers; small establishments, with between 15 and 100 workers; medium establishments, with between 101 and 250 workers; large establishments, with over 250 workers.

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