The Employment of Women in the Manufacturing Industry after NAFTA. Discrimination and Segregation

By María Elena Cardero, Miguel Angel Mendoza & Pablo Galán

Introduction- During the NAFTA negotiations, the impact that the execution of this Agreement would imply was comprehensively speculated and investigated. It was guaranteed, among other things, that Mexico would be the country with the greatest impact and a significant number of analysts pointed out that said impact would be positive (Lustig, 1992). While it was additionally mentioned that there would be some problems in sectors such as agriculture —where Mexico would be a losing country—, overall it was argued that there would be a greater growth for our country, that also the reforms initiated with the assumption of the Washington Consensus were going to be secured1 Since the early 1980s the country began to experience very important reforms regarding the previous growth model. Along with the accelerated openness that started in the mid-1980s with the entrance to the GATT, public companies began to be privatized (the government productive, financial and services capacity was reduced from 1090 entities, in the beginning of 1984, to 258 in 1994), the structure of public expenditure was modified, and the high public deficit became a surplus, fighting inflation and financial openness were prioritized and deregulation of the economy started., that the country would grow more, that most of the jobs would be created in Mexico and that there would even be a resource mobilization towards Mexico.

THEEMPLOYMENTOFWOMENINTHEMANUFACTURINGINDUSTRYAFTERNAFTADISCRIMINATIONANDSEGREGATION

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The Employment of Women in the Manufacturing Industry After NAFTA. Discrimination and Segregation[1]

María Elena Cardero [α], Miguel Angel Mendoza [σ] & Pablo Galán [ρ]

I. Introduction

During the NAFTA negotiations, the impact that the execution of this Agreement would imply was comprehensively speculated and investigated. It was guaranteed, among other things, that Mexico would be the country with the greatest impact and a significant number of analysts pointed out that said impact would be positive (Lustig, 1992). While it was additionally mentioned that there would be some problems in sectors such as agriculture —where Mexico would be a losing country—, overall it was argued that there would be a greater growth for our country, that also the reforms initiated with the assumption of the Washington Consensus were going to be secured[2], that the country would grow more, that most of the jobs would be created in Mexico and that there would even be a resource mobilization towards Mexico.

It was expected (Hufbauer and Schott, 1993) that —in terms of employment, wages, exports and foreign investment— NAFTA had positive effects for Mexico, with a migration reduction from Mexico to the United States.

It was also stated that one of the positive aspects of entering into NAFTA would be that many of the jobs created would be for women since, considering that they were "less unionized," they would be mostly hired in the new jobs.

However, not all opinions and evaluations were so positive, some authors (Blecker 2006; Moreno-Brid *et al*. 2005; Puyana and Romero 2005; Casares and

Sobarzo 2004; Weintraub 2004) thought it could be possible to create a deindustrialization process and that no instruments —as in the case of the European Union (such as protectionist agricultural policies, resource transfers to the most underdeveloped areas, free labor mobility across borders, etc.)— that could mitigate the negative effects of an agreement of this nature were being developed.

The validity of this Agreement began in January 1994 and, in the same month of that year, an uprising (Zapatista Army of National Liberation or *Ejercito Zapatista de Liberación Nacional*) occurred in southeastern Mexico, followed by various political and economic events that resulted in a deep crisis that caused a fall in the GDP, in 1995, of over 6 percentage points and an exchange modification above 100 percent.[3]

The combined effect of devaluation, fall in production and greater openness caused by NAFTA resulted in a rearrangement of the supply's structure thus increasing imports to 25% of the GDP in 1995 and exports to 27% of such GDP without stopping the fall in production. The composition of exports changed dramatically, with a relative decline in oil sales abroad and in agricultural products that, during the 1950s, 1960s and 1970s, had been the main foreign exchange provider[4], therefore, the manufacturing sector became the determining factor of the composition and evolution of the external sector, not only because of the growing importance manufacturing exports had, but also because of the imports of inputs associated to exports that began to double every two years and that nowadays account for 78% of exports (Romero, 2009)[5].

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[2] Since the early 1980s the country began to experience very important reforms regarding the previous growth model. Along with the accelerated openness that started in the mid-1980s with the entrance to the GATT, public companies began to be privatized (the government productive, financial and services capacity was reduced from 1090 entities, in the beginning of 1984, to 258 in 1994), the structure of public expenditure was modified, and the high public deficit became a surplus, fighting inflation and financial openness were prioritized and deregulation of the economy started.

[3] The openness, started in mid-eighties, accelerated the pace of growth of the trade deficit, which cumulative balance (1988-1993) was 34.5 billion dollars, and the following year such deficit amounted to 18.4 billion dollars, a portion of which was financed by foreign investment and by investment in bonds with currency hedging or denominated in foreign currencies

[4] Agricultural exports accounted for 45% of total exports of goods in 1950; 50.6% in 1960; and 42.6% in 1970. Barrón Antonieta (1997) *Impacto del tlc en el empleo femenino rural (Impact of NAFTA on rural women's employment)*. Working paper

[5] In 2005, imports accounted for 30% of the GDP, but gross fixed investment had fallen from 23.2% in 1981 of the GDP to 14.4% in 2005. While between 1970 and 1981 the GDP grew at a real annual rate of 6.9 percent and there was a trade deficit of 2.4% of the GDP, the international debt crisis and the collapse of oil prices resulted in a drop

Changes made during the 1980s and early 90s that were "tied" (made) with the signing of NAFTA, only generated, since then, a very modest growth of the economy: 3.4% (1994-2000); 2.2% (2001-2011); and only 1.1% in 2013. This profoundly affected productive structure, agriculture, employment of men and women and their salaries [6].

The purpose of this research is to evaluate the impact that NAFTA has had on overall growth and on employment of men and women. Particularly, the industrial manufacturing sector, which generates 80% of exports and probably a higher proportion of imports, is analyzed herein. A review of the manufacturing industry and its participation in the national value added is made and the employment of women and men in the manufacturing industry is studied, with a focus on wage discrimination and occupational segregation nationwide and within manufacturing industry.

II. Industry in Mexico (1994-2014)

Over 20 years (1994-2013), Mexico's GDP grew at a very slow rate of only 2.3% at 2008 prices. Besides the strong fall of the GDP in 1995 (-6.8%), the GDP fell again (-0.9%) between 2000 and 2001, and fell again consecutively in 2008 (-1.3%) and 2009 (-1.2%).

Table 1 : National GDP and from the Manufacturing Industry. Millions of pesos from 2008

| Year	1994	2000	2005	2010	2014e
National GDP	83018.7	101584.28	108423.31	118498.59	133048.23
GDP Manufacturing Industry	13964.96	18997.23	18732.15	19325.29	22435.17
Food Subsector	3202.34	3921.04	4296.12	4625.82	4916.7
Beverages and Tobacco Subsector	576.86	754.05	849.19	909.4	1030.36
Textile Products Subsector	81.78	140.35	130.09	113.36	119.83
Wood Subsector	238.96	297.86	206.49	180.97	212.52
Paper Subsector	234.38	327.89	355.13	412.83	453.06
Oil-Derivative Products Subsector	693.78	851.42	902.21	838.2	754.43
Chemical Subsector	1946.84	2551.88	2615.76	2572.19	2585.87
Products Made of Non-metallic Minerals Subsector	735.86	880.25	1036.35	980.64	1069.19
Basic Metals Subsector	972.87	1504.66	1494.07	1343.77	1627.94
Machinery and Equipment Subsector	396.35	498.73	611.11	674.76	889.01
Other Industries Subsector	349.48	418.76	397.75	440.6	478.33

Estimated value. Source: Own calculations based on INEGI. BIE.

Participation of the Secondary Sector (Figure 1) and particularly the manufacturing industry sector (Figure 2), which had shown an increase as a proportion of the GDP by the end of the 1990s, began to be reduced, thus its contribution became stagnant since 2003 (16.5%) keeping at that level (16.6%) until early 2014 (Figure 2).

in production that began in 1982 —worsened by trade openness— and in the falling of the average growth rate to only 1.6% between 1982-1993, with a positive trade balance of 2.1% of the GDP. In the first 10 years of NAFTA (1994-2005) real GDP growth was barely 2.9%, with a a trade deficit of 1% of the GDP.

[6] The ratio of wages, with regard to the GDP, in real terms fell from 36.2 (1970-1981) to 30.4 (1982-1993) and to 30.3 (1983-2004).

Figure 1
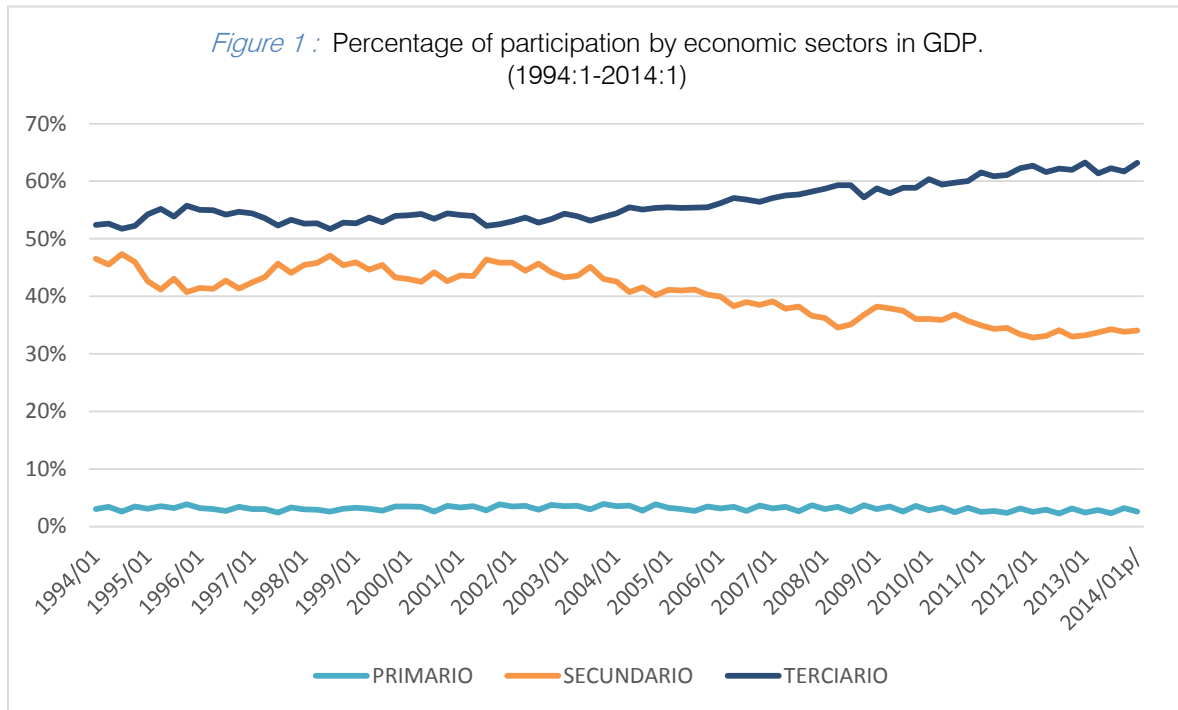
Figure 1 : Percentage of participation by economic sectors in GDP. (1994:1-2014:1)

Source: Own calculations based on BIE INEGI. Figures in millions of constant pesos as of 2008, for the first quarter of each year. First quarter of 2014, preliminary data.

Figure 2 : Percentage of participation of the manufacturing industry in GDP. (1994:1 2014:1)
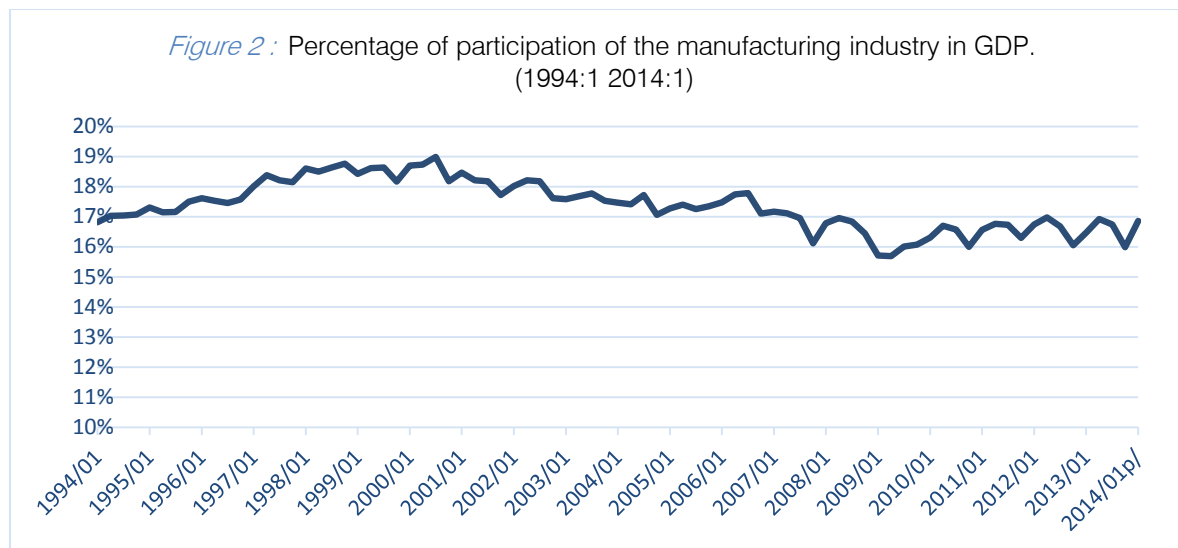
Source: Own calculations based on BIE INEGI. Figures in millions of constant pesos as of 2008, for the first quarter of each year. First quarter of 2014, preliminary data

Only some manufacturing sectors experienced sustained growth during 1994 and 2014 as occurred with the food sector (Figure 3); other sectors, such as the chemical subsector also grew, but to a lesser extent. However, in general most sectors had a lower growth or became stagnant.

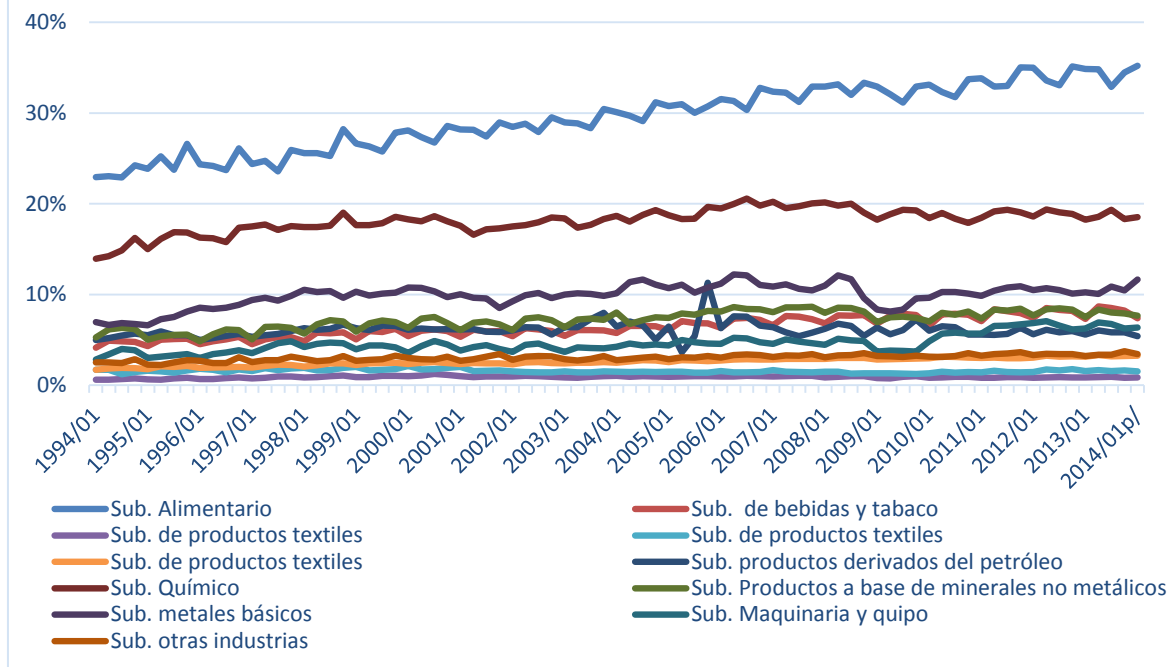Figure 3 : Percentage of participation of each subsector in the manufacturing industry. (1994:1-2014:1)

Source: BIE INEGI. Figures in millions of constant pesos as of 2008, for the first quarter of each year. First quarter of 2014, preliminary data

While we analyzed the structure of the processing industry, with the purpose of understanding the fall of its participation in the GDP and employment, we found that a significant part of this fall is due to the low participation of the leading exporting subsectors in the national value added.

This decline of industry in the national value added, was largely stimulated by the intense geographical fragmentation of production worldwide, which in the last two decades has been accelerated with the reduction of tariff barriers and transport costs, as well as with the advances in information and telecommunications.

In major Mexican export industries —such as the automotive, electronic and aeronautical industries— there is a growing tendency that final goods will not be produced in a single country anymore. The activities ranging from product's research and development to its recycling, including its production, support services, distribution, marketing, finance and after-sales services, are performed in several countries, through the interaction among subsidiaries of a single multinational company or transactions made between them and their external suppliers. Consequently, the countries participating in these chains, rather than specializing in the full production of final goods or services, specialize in certain tasks or segments of the production process, regionally distributed in the "factory of North America," in

the European Union ("factory of Europe") and in the ASEAN + 3 ("factory of Asia")[7].

Within the value chains the main value added lies in the knowledge-intensive activities —such as design and research and development—, which is increasingly linked to intangible aspects —such as quality, timeliness, connectivity, innovation, patentability and registration of trademarks, traceability, safety, environmental conservation, carbon footprint and energy efficiency—, while at the opposite end are the provision of raw materials and assembly activities. The countries which production is classified in the above last section only capture a small part of the value added created in chains. Most of the value is taken by multinational companies usually through transfer pricing, or repatriation of income from their charges related to technology, capacity building and escalation, while countries where value added of exports is very low have to cover social effects, including effects on working conditions, occupational safety and health.

The trade in value chains has several features — the first is its close relationship with foreign direct investment; the second is its intense exchange of intermediate goods; the third is the increased import content of exports; and the last is the fundamental role of a wide range of services (financial, legal, logistics,

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[7] ASEAN + 3 is China, Japan, South Korea, Hong Kong, Macao and Taiwan

design and communication, among others), many of which are incorporated as inputs of final traded goods.

In the case of Latin America (ECLAC 2013), Brazil and Mexico recorded an increase in the relative content of imported inputs in their exports between 1995 and 2011, but when comparing the weight of imported inputs it was found that in Mexico this is significantly higher than in Brazil (30% and 12%, respectively, in 2011), implying that the proportion of the domestically generated value is less in the case of Mexico. This reflects a higher integration of Mexico on links of the production chain involving activities of assembly of final goods that incorporate low value added.

At the sectoral level, ECLAC (2014) notes that major Mexican chains of export to the United States are those linked to the automotive industry, especially the chain of parts and accessories of motor vehicles that, in 2011-2012, accounted for 19% of total exports of intermediate goods of this kind. Second in importance are groups of electricity distribution equipment, electrical devices for splicing and internal combustion engines. Together, these four industries accounted for 43% of total exports of intermediate goods from Mexico to the United States in 2011-2012. Also, industries producing capital goods as non-electrical machinery, medical equipment, heating and cooling equipment, pumps and compressors, civil engineering machinery and equipment, among others, stand out, which mainly supply parts and components to companies of the "factory of North America," especially located in the United States. Special mention goes to groups of intermediate products corresponding to industries of high-technology capital goods, such as telecommunications equipment, machinery and electrical devices, measuring instruments and devices.[8]

Intra-industry trade in Mexico, regarding intermediate goods, made by trading partners, according to the Grubel-Lloyd index is 63% with the United States, 17% with Latin America, 15% with the European Union and 8% with ASEAN+3. Among the countries of the Latin America region, Mexico is the one which keeps a more vigorous relationship of intra-industry trade with the United States. During 2000-2001 the share of exports associated with this kind of trade was 77%, which was reduced to 53% in the 2011-2012 biennium as a result of the competition Mexico is facing in the US market for similar products imported from China. The share of total Mexican exports to the United

States has declined from 88% in 2000 to 79.5% in 2012, whereas exports to other countries have been increased. ECLAC (2013).

According to INEGI[9] in the Mexican case the contribution of Global Manufacturing Production in Exports of goods from Manufacturing Industries was 76% in 2003 and 69.8% in 2012, and in manufacturing output was 28% in both years. However, the Export Value Added of Global Manufacturing (VAEMG in Spanish)[10] as a proportion of manufacturing production did not surpass 11% between 2003 and 2012. This VAEMG consisted of automotive and truck manufacturing (31.3%); manufacturing of parts for motor vehicles (18%); manufacturing of electronic components (8%); audio and video manufacturing (2.7%); manufacturing of computers and peripheral equipment (1.4%) and others (38.5%). Jobs created by these global manufacturing companies averaged 1,133,000 people during these years, with a slight tendency to stagnation; i.e., the Mexican economy has shifted from labor-intensive goods to intensively imported intermediate goods, despite the low level of wages that prevail in the country[11]

III. Employment in the Manufacturing Industry in Mexico

From the 119 million Mexicans living in Mexico republic in 2014 (ENOE, INEGI), 88.5 million are over 14 years old, 51.7 million are Economically Active Population and 49.3 million are Employed Population (EP), of which about 59% work informally[12]. From such

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[8] The Mexican aviation industry has experienced a strong growth in recent years, so that the country ranks first in aeronautical manufacturing investment worldwide, with about US$36 billion from 1990 to 2012, and an annual average growth of goods exports of 14% in the last decade. Likewise, the United States is the main destination for Mexican exports of aeronautical products (74% of the total), a significant portion goes to Canada (8%), which is also a member of the "factory of North America;" other destinations of the industry are France, the UK and Japan.

[9] INEGI: (April 2014) Export Value Added of Global Manufacturing 2003-2012,

[10] The Export Value Added of Global Manufacturing is obtained from companies which inputs come from abroad and its production is aimed at exports; as for companies with foreign majority ownership, and for companies not considered above their exports are intermediate goods.

[11] A group that is not listed among the top 20 is the group of products of the yarn and clothing chain (Dussel and Gallagher, 2013). The items that make up this industry are consumer (clothing) and intermediate (textile) goods, segments in which Mexico has traditionally played an important role in the US market. However, competition from similar products of Chinese and Vietnamese origin in that market has determined the loss of competitiveness of the sector in all segments of the chain (yarn, textiles and clothing). Exports of groups corresponding to textiles and clothing fell by half between 2000 and 2012, being reduced from US$8.3 billion to US$4.2 billion.

[12] Informality refers to the **type or nature of the Economic Unit:** when it is engaged in the production of goods and/or services for the market and operates from home resources and without keeping basic accounting records; and from the **labor perspective,** refers to any work being performed without the protection of the legal or institutional framework, regardless of whether the economic unit that uses their services are unregistered companies or businesses of formal homes or companies. Therefore, the integrated concept of informality includes both employment in the informal sector —and other traditional phenomena related to informality (self-employment in subsistence agriculture and **unpaid work**)—, and informality or employment streams with no protection of social security which services are used by economic

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informal employed people, 10% are unpaid workers; 34.1% are self-employed; 3.1% are employers; and 52.8% are subordinate and paid workers. As for the

minimum daily wage that in early 1994, measured at 2010 prices, was $81.26 pesos, in 2014 it had fallen to 58 pesos per day[13].

Table 2 : Economically Active Population, Employed Population, schooling, average hourly income and informal employment, 2014

Indicator	Total	Men	Women
Total population	119 224 847	57 734 965	61 489 882
14 years and over population	88 595 829	42 109 633	46 486 196
Economically Active Population (EAP)	51 790 637	32 171 182	19 619 455
Employed	49 305 839	30 645 359	18 660 480
Unemployed	2 484 798	1 525 823	958 975
Employed population by sector of economic activity	49 305 839	30 645 359	18 660 480
Primary	6 660 593	5 966 908	693 685
Secondary	11 957 708	8 908 656	3 049 052
Tertiary	30 420 552	15 578 104	14 842 448
Unspecified	266 986	191 691	75 295
Average schooling of the economically active population	9.6	9.3	10
Average income per hour worked of the employed population (Pesos)	31.3	31.6	30.9
Unemployment rate	4.8	4.7	4.9
Labor informality rate. Rates calculated against employed population.	58.2	57.8	58.8

Source: Own calculations based on ENOE, INEGI.

Note: Data contain the expansion factors adjusted to population estimates showed by 2010-2050 demographic projections of CONAPO, updated in April 2013.

From the signing of NAFTA employment in the manufacturing industry began to grow, reaching a peak of 7.3 million people in 2000, but was reduced by more than 2.3 million in 2009 and recovered to 7.9 million of employed people in 2014.

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units different to those of the informal sector. Informality, understood in its broadest sense, is the set of economic activities carried out by individuals who, due to the context in which they work, they cannot invoke in their favor the legal and institutional framework.

[13] The minimum wage in the last 34 years was reduced from 166 pesos in 1980 to only 58 pesos a day in 2014.

Table 3 : Total employment in manufacturing industry, 1995-2014

Year	Men	Women	Total
1995	3515074	1507217	5022291
1996	3707631	1866873	5574504
1997	3888434	2110710	5999144
1998	4308905	2389063	6697968
1999	4504136	2561960	7066096
2000	4631865	2752611	7384476
2001	4500583	2757097	7257680
2002	4330112	2566906	6897018
2003	4306454	2536945	6843399
2004	4357285	2563964	6921249
2005	4282004	2616949	6898953
2006	4277370	2664814	6942184
2007	3453881	1786708	5240589
2008	3511392	1790342	5301734
2009	3365010	1738501	5103511
2010	4510304	2591031	7101335
2011	4511215	2566042	7077257
2012	4705685	2672669	7378354
2013	4819461	2701721	7521182
2014	5040197	2854762	7894959

Source: Own calculations based on ENE y ENOE, INEGI.

Between 2005 and 2014 total employment in manufacturing industry increased by 1 million people and most of these jobs (757,000) were for men.

Table 4 : Employed population by manufacturing subsectors, men and women (2005- 2014)

	2005			2010			2014		
	Women	Men	Total	Women	Men	Total	Women	Men	Total
Food industry	704174	741731	1445905	789744	952832	1742576	807239	944399	1751638
Beverage and tobacco industry	30653	155750	186403	41372	195549	236921	48952	214071	263023
Manufacturing of textile inputs	99339	100029	199368	40999	94831	135830	64501	75440	139941
Manufacturing of textile products, excluding clothing	162205	74493	236698	158369	42767	201136	168026	41913	209939
Manufacturing of garments and clothing accessories	562428	294937	857365	538626	265809	804435	424103	263938	688041
Manufacturing of leather products	82893	175275	258168	99992	191446	291438	80327	163136	243463
Wood industry	23818	137713	161531	12011	106758	118769	9514	123004	132518
Paper industry	38674	87191	125865	35628	104728	140356	45855	105896	151751
Printing and related									

industries	53494	136143	189637	45670	121202	166872	45274	111830	157104
Manufacturing of mineral coal and oil derivatives	7404	50886	58290	13248	56750	69998	14381	49813	64194
Chemical industry	116644	187060	303704	66802	167734	234536	119529	231732	351261
Plastic and rubber industry	75684	142264	217948	103043	175535	278578	112923	211363	324286
Manufacturing of products made of non-metallic minerals	59535	294229	353764	51761	272856	324617	69649	293851	363500
Basic metal industries	27156	166604	193760	10132	105107	115239	7701	100867	108568
Manufacturing of metal products	53994	427504	481498	40834	470711	511545	51395	588592	639987
Manufacturing of machinery and equipment	13907	47425	61332	19449	66592	86041	29194	95744	124938
Manufacturing of computer and communication equipment.	104875	104572	209447	95311	108202	203513	135729	140416	276145
Manufacturing of electric generation equipment	91584	137855	229439	75366	141183	216549	77902	137761	215663
Manufacturing of transportation equipment	152850	314575	467425	167638	336003	503641	329816	617732	947548
Manufacturing of furniture and related services	61152	385550	446702	43710	389229	432939	36714	392862	429576
Other manufacturing industries	94169	119406	213575	140071	140244	280315	176038	134142	310180
Total	2616632	4281192	6897824	2589776	4506068	7095844	2854762	5038502	7893264

Source: Own calculations based on ENOE, INEGI.

From the 7.9 million of employed people in the manufacturing industry in 2014 (5 million men and 2.8 million women) slightly less than half work informally, with a higher proportion of women (47%) who work informally compared to men (36%).

Table 5 : Population employed in the secondary sector by activity subsectors, according to gender and formality and informality condition (2014)									
Economic activity subsector	Gender and formal or informal								
	Employed population			Men			Women		
	Total	Formal	Informal	Total	Formal	Informal	Total	Formal	Informal
Total secondary sector	11,957,708	5,918,089	6,039,619	8,908,656	4,260,266	4,648,390	3,049,052	1,657,823	1,391,229
Total Manufacturing Industry	7,894,959	4,744,406	3,150,553	5,040,197	3,230,598	1,809,599	2,854,762	1,513,808	1,340,954
Food industry	1,751,638	706,501	1,045,137	944,399	487,853	456,546	807,239	218,648	588,591
Beverage and tobacco industry	263,023	193,609	69,414	214,071	162,719	51,352	48,952	30,890	18,062
Manufacturing of textile inputs	139,941	87,520	52,421	75,440	61,955	13,485	64,501	25,565	38,936
Manufacturing of textile products, excluding clothing	209,939	36,875	173,064	41,913	17,479	24,434	168,026	19,396	148,630
Manufacturing of garments and clothing accessories	688,041	257,401	430,640	263,938	114,374	149,564	424,103	143,027	281,076
Manufacturing of leather products	243,463	119,871	123,592	163,136	78,262	84,874	80,327	41,609	38,718
Wood industry	132,518	54,252	78,266	123,004	50,588	72,416	9,514	3,664	5,850
Paper industry	151,751	119,319	32,432	105,896	91,432	14,464	45,855	27,887	17,968
Printing and related industries	157,104	101,455	55,649	111,830	70,350	41,480	45,274	31,105	14,169
Manufacturing of mineral coal and oil derivatives	64,194	62,247	1,947	49,813	48,171	1,642	14,381	14,076	305
Chemical industry	351,261	302,742	48,519	231,732	197,084	34,648	119,529	105,658	13,871
Plastic and rubber industry	324,286	277,332	46,954	211,363	182,291	29,072	112,923	95,041	17,882
Manufacturing of products made of minerals	363,500	167,185	196,315	293,851	135,204	158,647	69,649	31,981	37,668

Basic metal industries	108,568	100,180	8,388	100,867	93,547	7,320	7,701	6,633	1,068
Manufacturing of metal products	639,987	318,252	321,735	588,592	275,709	312,883	51,395	42,543	8,852
Manufacturing of machinery and equipment	124,938	116,660	8,278	95,744	87,912	7,832	29,194	28,748	446
Manufacturing of computer, communication, measuring and other equipment, electronic components and accessories	276,145	271,554	4,591	140,416	138,619	1,797	135,729	132,935	2,794
Manufacturing of electric generation equipment and electrical devices and accessories	215,663	209,198	6,465	137,761	131,539	6,222	77,902	77,659	243
Manufacturing of transportation equipment and parts for motor vehicles	947,548	921,951	25,597	617,732	600,086	17,646	329,816	321,865	7,951
Manufacturing of furniture	429,576	143,507	286,069	392,862	118,993	273,869	36,714	24,514	12,200
Other manufacturing industries	310,180	175,100	135,080	134,142	84,736	49,406	176,038	90,364	85,674
Unspecified branches from the secondary sector		1,695	1,695	0	1,695	1,695	0	0	

Source: Own calculations based on ENOE, INEGI.

The food industry generates the greatest number of jobs (1.8 million, 22% of the total) from which 1.0 million are informal jobs and only 706,000 are formal; most of informal jobs (588,000) are done by women. The manufacturing of transportation equipment is the second largest generator of jobs, but in this area the number of informal employed people is low (26,000). By contrast, branches of manufacturing of textiles and clothing are jointly generate 898,000 jobs, from which 67% of workers are informal and from the total of informal workers (603,000) 71% are women.

72% of female jobs are concentrated in only a few branches: food industry, textile and clothing industry, manufacturing of computer equipment, transportation equipment and their parts, and other industries.

a) *Formal and Informal Employment*

Among men, informal jobs in some branches have a very high participation such as in furniture manufacturing (70%), in the manufacture of textiles and clothing (57% and 58% respectively), in the manufacturing of products made of non-metallic minerals (54%) and of metal products (53%). Although the percentage in the food industry is less than half (48%), in absolute numbers is where we find the largest number of male informal workers (456,000 people). As for women, 73% of informal jobs are in the food industry (589,000 women), 88% in textile manufacturing, 66% in clothing and 49% in other manufacturing industries.

b) *Educational Levels in the Processing Industry (IT, in Spanish)*

Education levels in manufacturing industry are, in general, low and disparate. 42% of people who in 2014 are working in manufacturing industry (MI) have completed secondary school, 20% primary school, 15% high school, 12% are professionals and the rest did not complete primary or not specified. On average, educational levels of men are slightly higher than those of women, particularly in high school education and among professionals. Both among men and among women the highest number of professionals are located in the food and chemical industry, in the manufacturing of transportation equipment and in the manufacturing of computers and communication.

c) *Hourly income*

Table 6 : Average hourly wage of the employed population (EP) by subsectors and position in 2014 employment

Sector and subsector of economic activity		Total			
	Total	Employer	Own account	Wage earner	Pieceworker
Secondary sector	30.4	50.0	31.4	29.3	26.2
Food industry	25.8	41.6	28.4	24.1	21.3
Beverage and tobacco industry	27.3	37.1	51.6	25.7	28.8
Manufacturing of textile inputs	18.8	41.7	5.6	25.1	0.0
Manufacturing of textile products, excluding clothing	12.4	76.9	9.1	21.9	18.6

Manufacturing of garments and clothing accessories	20.7	37.8	22.8	20.1	18.0
Manufacturing of leather products	26.7	43.7	32.1	25.5	25.9
Wood industry	23.8	48.1	25.9	22.4	25.7
Paper industry	27.0	16.1	28.3	26.4	42.3
Printing and related industries	38.9	60.4	58.5	34.4	24.5
Manufacturing of mineral coal and oil derivatives.	78.8	93.0	0.0	78.5	0.0
Chemical industry	39.1	0.0	14.0	40.2	34.8
Plastic and rubber industry	29.3	54.9	47.3	29.0	21.5
Manufacturing of products made of non-metallic minerals	27.7	51.7	21.8	28.5	22.5
Basic metal industries	37.4	75.0	32.0	37.3	0.0
Manufacturing of metal products	36.2	55.9	56.7	29.4	35.8
Manufacturing of machinery and equipment	34.3	75.2	31.0	32.6	69.4
Manufacturing of computer, communication, measuring and other equipment, electronic components and accessories	32.3	0.0	45.5	32.3	16.7
Manufacturing of electric generation equipment and electrical devices and accessories	30.2	145.3	0.0	29.9	23.4
Manufacturing of transportation equipment and parts for motor vehicles	29.9	0.0	0.0	29.8	35.7
Manufacturing of furniture	27.8	35.4	31.9	25.2	38.3
Other manufacturing industries	28.9	43.5	29.1	28.9	15.8

The average hourly income in the industry is $30 pesos; the highest level of hourly income is paid in the oil industry: $78.80; and the lowest is paid in the textile industry, except for clothing, $12.4 pesos. On average, there is no other sector that pays income as high as the oil industry, because the sector that follows is the chemical industry, which is nearly half $39.1, followed by the primary metals industry $37.4. By type of employment those who obtain higher revenues are employers, particularly manufacturers and generators of electrical devices and accessories ($145.3 pesos) followed by manufacturers of mineral coal and oil derivatives ($93.8 pesos), of textile products, excluding clothing ($76.9) and of machinery and equipment ($75.2). Wage earners, on average, earn $29 pesos, however, wages range between $20 and $40 pesos except in the oil industry, which they amount to $78 pesos.

IV. Employment with Wage Discrimination and Occupational Segregation

In order to make the wage discrimination analysis, the Blinder-Oaxaca (1973) model is used, which calculates the pay gap between men and women based on the linear theory of wage determination proposed by J. Mincer. The Blinder-Oaxaca method is based on two assumptions:

1. All individuals have the same characteristics and skills.
2. It is understood that, as they are facing the same labor market, thus they are facing the same employment opportunities. From a theoretical point of view, an equal increase in any of the characteristics studied between two workers should provide the same, and in the same magnitude, for both.

Based on Mincer's function, the natural logarithm of income (LnY) depends positively on education (S), on work experience (X) and on work experience squared (X^2). The effects of human capital stock on the level and distribution of income coming from labor earnings are given by the coefficients that go together with these variables, being specifically β_1 the rate of return on education and β_2 the rate of return on work experience:

$$LnY_i = \propto + \beta_1 S_1 + \beta_2 X_i + \beta_3 X_1^2 + u_i$$

$$\beta_1 \, y \, \beta_2 > 0$$

$$\beta_3 < 0$$

The independent variables can be grouped into a single matrix (X'), and β will be the column vector of coefficients corresponding to such matrix, which must be estimated. If we build this equation for men (H) and another for women (M) the result is:

$$Y_H = \hat{\beta}_H X'_H + u_H$$

$$Y_M = \hat{\beta}_M X'_M + u_M$$

Where u_H and u_M are the error terms. With the estimation of these coefficients, the quantifying of the capital stock effect over labor income is obtained.
We thus obtain the double breakdown of the pay gap, where we can distinguish its two components:
Q: Difference explained
U: Discrimination and effect of unobserved variables[14]

The age variable was measured with the age that the individual was when the survey was conducted. Age squared means that the more the age increases the more income will also increase; however, there comes a moment when the increase starts to decrease.

The years of schooling are measured as the accumulated years of education per school year (primary, secondary, high school, college and postgraduate studies). While both men and women have increased their years of schooling, employed women have shown, throughout the analysis period, a nationwide average education level higher than men.

Work experience is measured by the years that the individual has been working in the same company. Employed men have more years of almost constant experience during all the years observed and nearing 8 years of experience. The average work experience of women is approximately six years. Experience squared is used to remove the decreasing effect of the original variable, i.e., as the work experience of the individual increases, his/her salary tends to increase but in a smaller amount throughout the time.

Training is measured by the hours that the individual has devoted to training courses, where

women show, from 2005 to 2011, more hours of training to tend to converge with the training of men from 2011 onwards.

The level of unionization of Mexican workers is generally very low, and a decrease in the number of unionized men, from 2006 to 2014, is registered from 10.8% to 8% and from 14% to 10% among women.

Nationally, the professional variable —and in line with the education variable— shows a higher percentage of employed women with bachelor's or engineering degrees, where 1% is the average of this percentage during the observed period, and 0.9% for men.

Also, binary variables are added —where the value of 1 is given if the characteristic is presented and 0 if it is not presented— in order to identify whether the individual is married or not, whether he/she is head of household or not, whether he/she belongs to a union and whether he/she is a professional employee or not, considering that said person has higher education studies.

On average 70% of men participating in the labor market are married, this percentage being reduced to 51% for women. The number of married women increased from 49% in 2006 to 53% in 2014.

Within the period 2005-2014, 66% of employed men are heads of household, while women have an smaller percentage although it has increased in recent years — ranging from 19% in 2006 to 23% in 2014.[15]

In the case of Mexico, at national level, the gender pay gap is evident, and has been present for the past nine years remaining always in favor of men even when it has been reduced in 4.49 percentage points from 2005 to 2014.

Table 7 : 2005-2014 Gender Pay Gap

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Wage differential (%Men/Women)	7.41	3.33	4.37	5.97	4.66	4.05	2.63	2.76	3.53	2.92
P>z	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Compiled from INEGI's data.

The portion of the gap to be related to the observable characteristics tells us that, if discrimination did not exist in Mexico, there would be a pay gap in favor of women. From 2005 to 2011, employed women have a schooling level higher than that of men, and

employed men have higher levels of work experience throughout the period, thus favoring the increase in the pay gap. However, this variable has diminishing returns so, as the number of years of work experience increases, salary will increase but to a lesser extent.

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[14] The source of information for the construction of the variables is the National Survey on Occupation and Employment (ENOE) of the National Institute of Statistics and Geography (INEGI) for the period 2005-2014. Differentials of hourly wage income between men and women were built considering only the national working population between 14 and 65 years of age, for the first quarter of each year.

[15] It is noteworthy that the calculation of this variable is made by asking directly to the individual if he/she is the head of household, so it should not be interpreted that the head of household is the person who earns more within the household.

With the unionization variable we can deduce that most people who work and are affiliated with a union are women, although this coefficient is very small and, moreover, the number of unionized men is close to that of women.

Among the features where the male gender is dominant, there are the married and head of household variables.

The coefficient of the age variable changes its sign in 2009, i.e., from 2005-2008 the age of men working in Mexico is above the age of women, but from 2009 the situation changed women being older.

The second part offered by the Blinder-Oaxaca methodology is the part of wages that is not explained by the observable characteristics, which is considered gender discrimination. Table 8 shows the portion of the pay gap that is considered as discrimination.

Table 8 : 2005-2014 Gender Pay Discrimination

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Discrimination	9.05	6.56	5.04	7.32	7.44	6.65	5.24	5.90	7.19	5.83
P>z	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Compiled from INEGI's data.

If we observe Table 9 we can see how this discrimination is distributed among the different variables selected for the study.

Table 9 : 2005-2014 Gender Pay Discrimination by Characteristic

Variable	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Schooling	-8.39	-7.49	-6.52	-5.75	-6.47	-6.09	-3.75	-7.49	-6.44	-3.19
P>z	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.05
Experience	-8.12	-6.06	-3.92	-4.58	-5.00	-6.15	-4.51	-2.39	-6.02	-5.93
P>z	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.16	0.00	0.00
Experience^2	0.92	0.18	-0.65	0.53	-0.91	1.87	-0.10	-0.49	0.80	1.78
P>z	0.33	0.87	0.40	0.57	0.33	0.03	0.92	0.59	0.34	0.04
Training	0.08	-0.26	-0.24	-0.45	-0.35	0.03	-0.16	0.03	0.17	-0.08
Variable	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
P>z	0.56	0.13	0.16	0.01	0.00	0.85	0.27	0.84	0.17	0.48
Age	-2.38	-3.81	-17.13	2.47	-13.60	12.93	-16.87	2.99	34.71	17.04
P>z	0.86	0.33	0.23	0.86	0.30	0.32	0.22	0.82	0.01	0.19
Age^2	6.82	7.55	10.87	-1.17	11.25	-6.24	12.44	0.39	-13.32	-8.32
P>z	0.34	0.31	0.14	0.88	0.10	0.36	0.09	0.96	0.05	0.23
Married	-3.41	-3.04	-4.23	-4.38	-2.94	-3.92	-4.16	-3.44	-5.23	-3.95

P>z	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unionized	-1.14	-0.71	-0.73	-0.73	-0.81	-1.25	-1.08	-0.96	-1.00	-1.03
P>z	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Head of household	-0.77	0.43	-0.40	-0.39	0.07	0.04	0.49	0.00	-0.72	0.04
P>z	0.05	0.28	0.34	0.40	0.86	0.93	0.24	0.99	0.08	0.93
Professional	0.22	0.05	0.20	0.19	0.19	0.26	0.08	0.14	0.13	0.08
P>z	0.00	0.62	0.01	0.00	0.01	0.00	0.28	0.10	0.11	0.27
Constant	25.23	29.72	27.78	21.57	26.01	15.19	22.84	17.13	4.12	4.12
P>z	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.49	0.49

Source: Prepared in accordance with the Blinder-Oaxaca methodology and data of ENOE, INEGI.

The schooling and experience variables show a wage discrimination in favor of women. The married variable shows that the fact women are married helps to improve their wage, since there is a favorable discrimination against them in this variable — married women are better paid than married men. The last variable showing a discrimination in favor of women is the degree of unionization, i.e., affiliated women are better paid than affiliated men.

Again, it bears mentioning the situation of the age variable, which is no longer significant, i.e., we can say that there is no discrimination in terms of age.

The age and head of household variables, which are significant in the observable characteristics are not on discrimination.

Having analyzed the two components of the gender pay gap we see that all variables we have used indicate a pay gap in favor of women, which is not real. As can be seen most of the weight of this gap is related to the model constant, which leads us to believe some possible reasons:

1. There are variables that have not been taken into account in the analysis, with a strong discrimination in favor of men and the constant is absorbing such weight.
2. That women have access to jobs belonging to branches or sectors with very low wages, and men to branches or sectors with higher wages.
3. It is also possible that this constant is absorbing the effect of the difference in the hours worked, as women spend fewer hours in paid activities than men.

When making the Blinder-Oaxaca breakdown into the three major sectors of activity in Figure 8, the total pay gap by sectors and years is presented; most of the pay gap occurs in the secondary sector, also presenting a high discrimination level, which makes up more than 50% of said gap.

*Figure 5 :* 2005-2014 Composition of the Pay Gap by Major Sectors
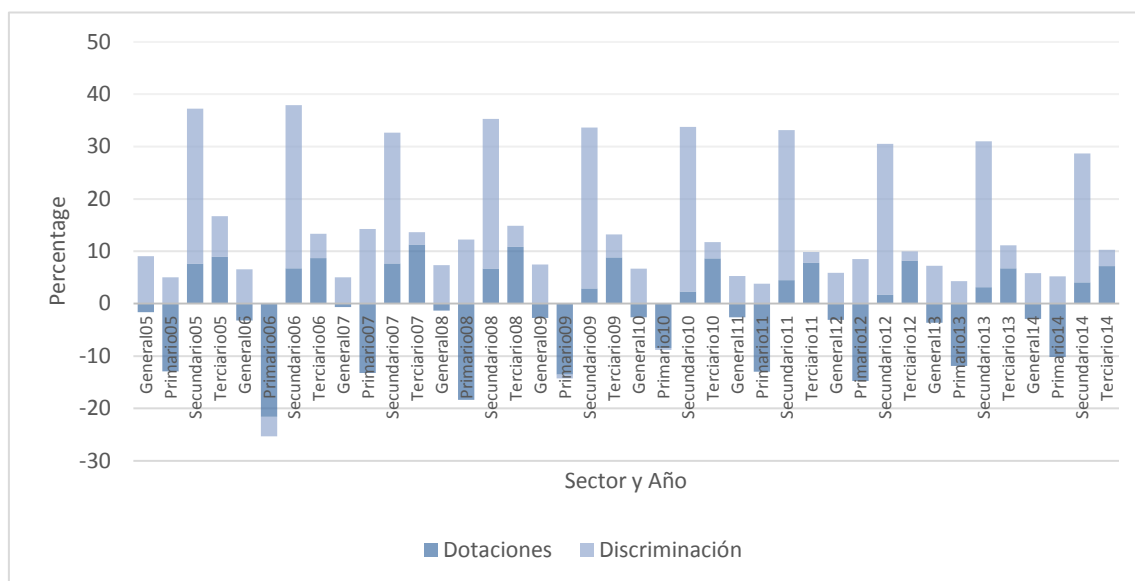
Source: Prepared in accordance with the Blinder-Oaxaca methodology and data of ENOE, INEGI.

In most years the primary sector has a pay gap in favor of women but with reduced discrimination and with almost 100% of the gap in connection with the characteristics observable during the years of study.

The tertiary sector has a situation similar to that of the secondary sector's situation since the pay gap in this sector is presented in favor of males, but it is different because it is made up primarily by the effect of characteristics observable on wage.

In view of these sectoral data, it can be said that the secondary sector is the one that makes the difference and creates a high pay gap formed mostly by issues of discrimination (or factors affecting this sector specifically, which are not being considered), given that the tertiary and primary sector move in opposite directions and are made almost in the same way, thus the secondary sector remaining as the main cause of the pay gap in Mexico.

In general, in the processing industry there is high discrimination as well as an average wage differential of 32% with decreasing trend, since in 2005 it has a value of 38% while in 2014 its value is reduced to 29%.

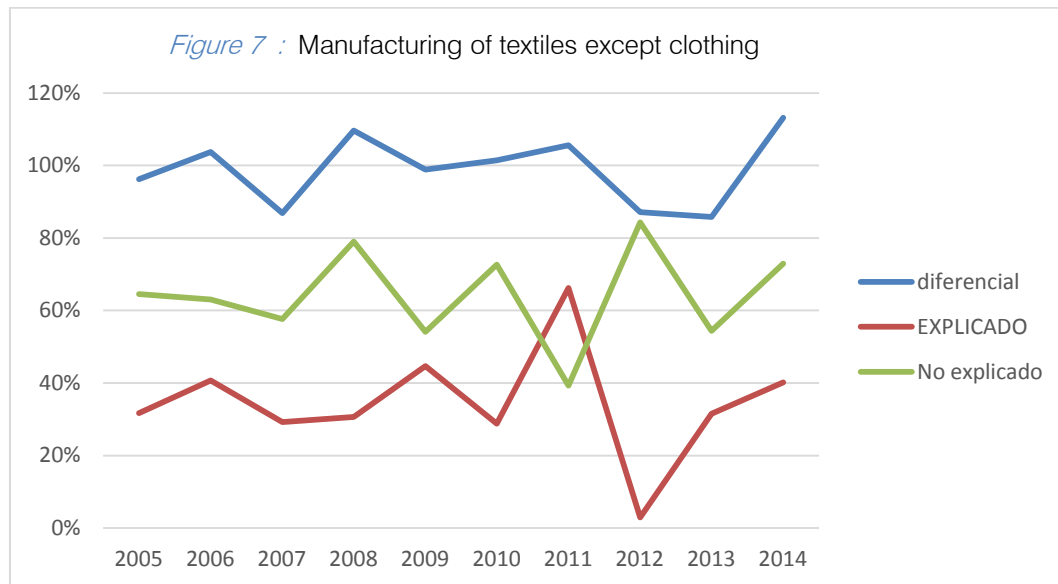Figure 6 : Wage differential in the manufacturing industry
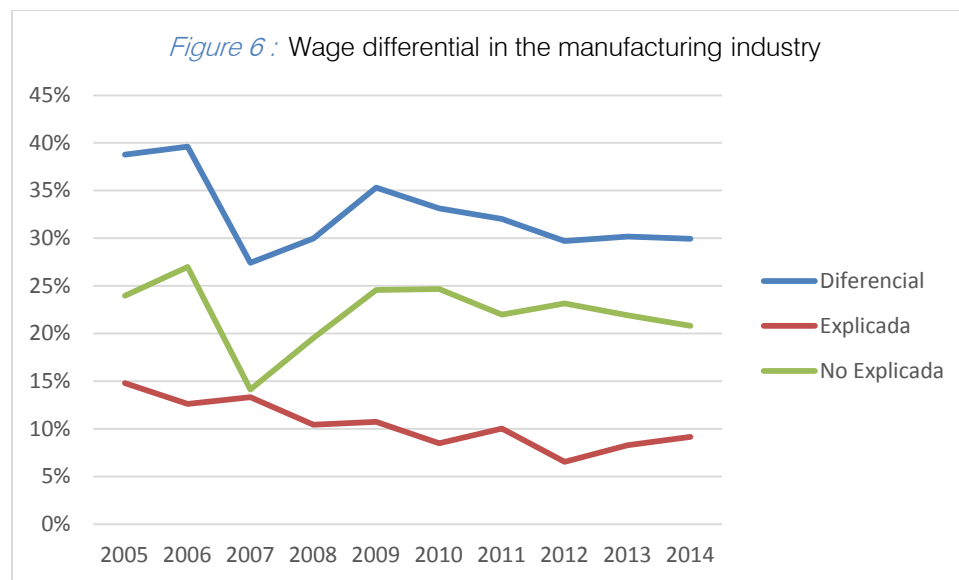
Wage discrimination —as occurs with the differential— tends to be decreasing with an average value of 22%.

When analyzing the industry by branches significant differences were found. Not in all branches unexplained discrimination is found or statistical differences are not significant. The branches in which unexplained differences (discrimination) are high are the textile inputs industry, the textile industry —except clothing— and the clothing industry.

For example, in the textile industry the wage differential ranges around 100% between men and women, in which the explained portion (allocations) is on average 30%, while the unexplained portion (discrimination) is 70%.

Figure 7 : Manufacturing of textiles except clothing

In the manufacturing of leather products the differential tended to decrease in the intermediate years, being increased again in 2013 and 2014; the explained portion of this differential averaged 7.6% for the allocations of each individual, while discrimination was 15%.

In the branch of manufacturing of computer equipment and communications the differential on average is quite high (26.8%), the explained portion ranged between 8 and 24% and the unexplained between 7 and 17% in some years, in order that the statistical difference is reduced and not significant at the end of the period studied.

In the transportation equipment industry an average wage differential of 25.8% is observed and such differential is explained by 14% for each individual's allocations and by 12% for wage discrimination between men and women. It is highlighted that the wage differential leads to a decreasing trend throughout the period while discrimination is stabilized between 9 and 14%.

Figure 8 : Manufacturing of transportation equipment
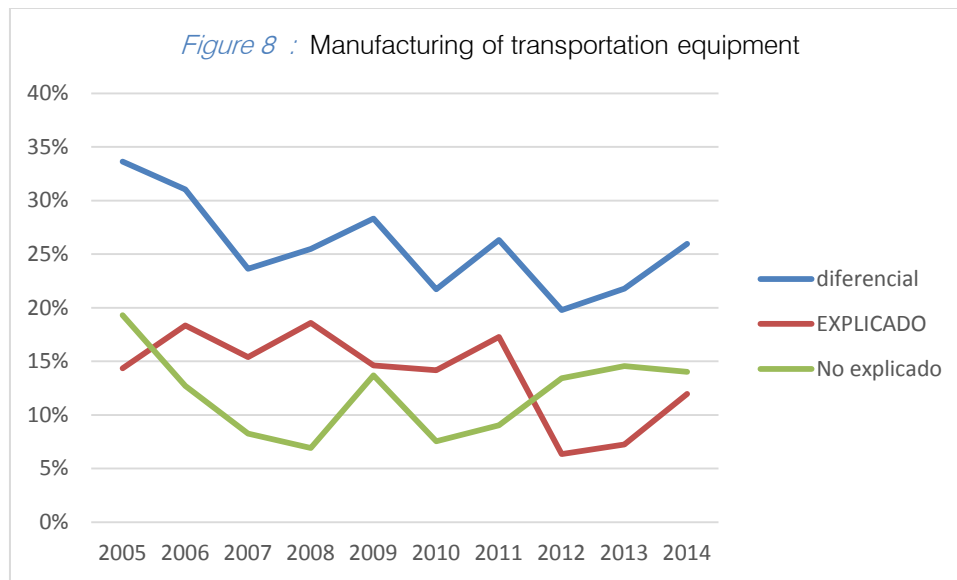
V. Concluding Remarks

The results show that, despite the optimistic forecasts made during the NAFTA negotiations, results have been fairly poor. Indiscriminate and quick openness transformed the model of import substitution into an importer-exporter model and deeply integrated to the factory of "North America" in value chains where the added value of these chains in Mexico is, in recent years, barely 11%. NAFTA did not resulted in more jobs neither for women nor for men, nor led to the creation of better wages.

The processing industry is characterized by:

- A very small growth in the last ten years

- Its employment levels fell by more than 2 million jobs from 2005 to 2009, recovering 1 million in 2014.

- There is a high informality in the industry and particularly in the branches where women work (food, clothing and apparel, etc).

- Educational levels are quite low, especially compared with other sectors.

- And income per hour worked, especially among employees, is also very low — particularly in the more traditional branches.

The results, in terms of segregation and wage discrimination, point out that in this subsector is where higher levels of discrimination exist throughout the Mexican economy. There is also a significant employment segregation since the bulk of female employment is concentrated in only 7 branches.

There are significant differences by branches, since unexplained discrimination was not found in all branches, or statistical differences are not significant. The branches in which unexplained differences (discrimination) are very high are the textile inputs industry, the textile industry —except clothing— and the clothing industry.

Almost 60% of employment in Mexico is informal. The absence of unemployment insurance and low employment growth are two main causes of this phenomenon and its persistence; and probably one of the causes of this discrimination is the high level of informality that prevails in these manufacturing sectors. However, there is also wage discrimination in areas with low levels of informality —for example in the automotive industry—, so that this phenomenon of informality cannot be generalized as the cause of discrimination.

Informality is a widespread phenomenon in the Latin American region. In fact, Mexico is one of the countries with the "lowest" levels of informality especially when compared to countries such as Bolivia. The solution of informality depends on many factors and specific policies to address it, some of which have been already applied in Mexico, but the results are still unknown.

In this essay we have tackled employment and its low growth, together with the low economic growth of economy in recent years. Both phenomena are closely related and, in order that one can be increased, there must be a higher economic growth and higher wages.

Undoubtedly for the above reasons Mexico must establish a consistent and long-term policy for job creation — well-paid jobs that expand national and local demand of goods produced domestically and that not only encourage imports of final and intermediate goods. Therefore, one of the many things that must be done is to establish policies that promote re-industrialization of Mexico, favoring the restoration of national value chains with horizontal and vertical industrial policies [16], the creation of new companies, their linking with national research and technology centers that may foster their

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[16] Please refer to the IDB report.

growth and national research and development. It is not just about being part of the value chains, the challenge is to increase the share of value added generated locally and to elevate the chain hierarchy, moving from simple activities to other more complex. This process is not simple or spontaneous. Depends crucially on effective public policies and on having a commitment to this objective. For example, it is necessary to have a critical mass of skilled human resources, a quality infrastructure in terms of logistics and telecommunications and an appropriate business environment, including a proper protection of intellectual property. The challenge is to build differentiating components, beyond the endowment of natural resources or low labor costs.

Wage discrimination against women and their employment segregation must be fought in all industries where higher levels exist (textiles and clothing industry, among others). Probably it will be necessary to also increase the educational level of many of those women because the analysis showed that, unlike what exists nationally in several industrial branches, lower educational levels are recorded.

Bibliography

1. BLECKER, R. A. (2006), "Macroeconomic and Structural Constraints on Export-Led Growth in Mexico," unpublished paper prepared for the 2006 LASA Conference, San Juan, Puerto Rico. Center for North American Studies, American University, Washington.
2. Blinder, A., 1973. Wage Discimination: Reduced form and Structural Estimates. *Journal of Human Resources,* Nº 8, pp. 436-455.
3. Casares E, y Sobarzo, H (2004) Diez años del TLCAN en México. Una perspectiva analítica. FCE México
4. CHANG, H.-J. (2002), *Kicking Away the Ladder Development Strategy in Historical Perspective*, Anthem Press, London.
5. CEPAL 2014 (Integración regional. Hacia una estrategia de cadenas de valor inclusivas)
6. CEPAL (2013) Durán Lima José y Dayna Zaclicever. *América Latina y el Caribe en las cadenas internacionales de valor. Serie Comercio Internacional*
7. INEGI (Valor Agregado de Exportación de la Manufactura Global 2003-2012, abril de 2014)
8. Hufbauer, Gary Clyde and Jeffrey J. Schott, (2005) NAFTA Revisited: Achievements and Challenges. Washington, DC: Institute for International Economics.
9. Lustig Nora (1993) El impacto del libre comercio en América del Norte. México CIDE
10. MORENO-BRID, J. C., P. RUIZ-NÁPOLES and J. C. RIVAS-VALDIVIA (2005), "NAFTA and the Mexican Economy: a look back on a ten year relation", *The North Carolina Journal of International Law and Commercial Regulation*, University of North Carolina, Vol. 30, No. 4, pp. 997-1023.
11. MORENO-BRID, J. C., E. PÉREZ CALDENTEY and P. RUIZ-NÁPOLES (2004-5), "The Washington Consensus: A Latin American perspective fifteen years later," *Journal of Post Keynesian Economics*, Vol. 27, No.2, pp.345-65.
12. Oaxaca, R., 1973. Male-Famale Wage Differentials in Urban Labor Markets. *International Economic Review,* Octubre, 14(3), pp. 693-709.
13. OMC (Organización Mundial del Comercio) *Informe sobre el Comercio Mundial 2013. Factores que determinan el futuro del comercio*, Ginebra.
14. OMC (Organización Mundial del Comercio) *La participación de las economías en desarrollo en el sistema mundial de comercio. Nota de la Secretaría*, Ginebra, 14 de octubre, 2013
15. OMC (Organización Mundial del Comercio) International Trade Statistics 2013, Ginebra.
16. OMC (Organización Mundial del Comercio) Informe sobre el Comercio Mundial 2011. La OMC y los acuerdos comerciales preferenciales: de la coexistencia a la coherencia, Ginebra.
17. PUYANA A. y J. ROMERO (2005), *Diez años con el TLCAN. Las experiencias del sector agropecuario mexicano*, FLACSO-El Colegio de México, México.
18. Romero José (2009). *Medición del impacto de los acuerdos de libre comercio en América Latina: el caso de México* Serie Estudios y perspectivas CEPAL No 114, Octubre.
19. UNCTAD (Conferencia de las Naciones Unidas sobre Comercio y Desarrollo) (2014), *Global Investment Trends Monitor*, Nº 15, 28 de enero [en línea] http://unctad.org/en/PublicationsLibrary/web diaeia2014d1_en.pdf.
20. UNCTAD (Conferencia de las Naciones Unidas sobre Comercio y Desarrollo) (2013a), *Informe sobre las Inversiones en el Mundo 2013*, Ginebra [en línea] http://unctad.org/es/PublicationsLibrary/ wir2013overview_es.pdf.
21. UNCTAD (Conferencia de las Naciones Unidas sobre Comercio y Desarrollo)
22. (2013b), *Global Value Chains and Development. Investment and Value Added Trade in the Global Economy*, Ginebra [en línea] http://unctad.org/en/ publicationslibrary/diae2013d1_en.pdf.
23. WEINTRAUB, S. (2004), *NAFTA's Impact on North America The Fist Decade*, The Center for Strategic and International Studies, Washington, D.C.