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Abstract	The object of this research is to analyze the evolution of the maquiladora industry in Mexico and the multinational corporations in Malaysia. It is believed that there might be a similar behavior of these industries in both countries, because they have been characterized by a high growth of the industrial activity related to the exports. A shift – share analysis is undertaken for the Mexican case. Shift – share is a widely used technique for regional analysis. It easily allows seeing the performance of a region compared to the national average.

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Globalization effects on industrial location. Lessons from the Mexican maquiladoras and Malaysian experiences. A shift – share analysis.

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**Panel:
Economy and Globalisation**

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Introduction

Globalization's effects on industry location have been impressive lately (Grunwald and Flamm, 1985, Revenga, 1997, Hanson, 1998A, Hanson, 2002A). Multinational corporations in Mexico and Malaysia have been no exception to this (Perez and Sierra, 2004). In this sense, Mexican maquiladoras have been moving from one place to another in the recent years, moving from the northern region to the southern Mexico or abroad (Hanson, 1998B).

As a consequence, there have been important adjustments in the economic activity of the different regions in both countries. These adjustments have come as industry relocation, changes in wages, employment adjustments, different levels of economic integration and development (Wilson, 1992, Revenga, 1997, Hanson 1998B, Revenga and Montenegro, 1998, Robertson, 2000, Hanson, 2001, Robertson, 2001).

Since the 1950's, several economic development programs have been implemented in Malaysia. The New Economic Policy (NEP) and the National Development Policy (NDP) were adopted in 1971 and 1991, respectively, in order to liberalize Malaysian economy, through the manufacturing sector and to reduce poverty and inequality. The NDP has as its main goal the Vision 2020 program, by which Malaysia intends to become fully developed (Rasiah and Shari, 2001).

The object of this research is to analyze the evolution of the maquiladora industry in Mexico and the multinational corporations in Malaysia. It is believed that there might be a similar behavior of these industries in both countries, because they have been characterized by a high growth of the industrial activity related to the exports (Chacko, 1997; Chiquiar, 2001).

A shift – share analysis is undertaken for the Mexican case. Shift – share is a widely used technique for regional analysis (Acs and Ndikumwami, 1998; Dinc and Haynes, 1999; Esteban, 2000). It easily allows seeing the performance of a region compared to the national average.

The rest of the paper is structured as follows. Section two is focused on a background of the maquiladora industry in Mexico. Section three explains the evolution of the Malayan economic development programs. Section four describes the evolution of the Mexican maquiladoras. Section five shows some exploratory data on the Malaysia's manufacturing industry and finally, section six concludes and presents future lines for further research.

A background on the maquiladora industry.

The Maquiladora industry (assembly factories), began in Mexico in 1942 under a governmental program called the “Braceros Program”, or International Accord of Migratory Workers” (Asociación de Maquiladoras y Exportadoras de Chihuahua, 2003). Under this program, several employments were created and Mexico started to attract investors, helping its economy. This Program remained until 1965.

In 1965, it was renamed as the “duty-free export assembly program”, and it helped transform Mexico’s economy from a closed economy into the world’s 13th-largest exporter (Smith, 2002). In the following two decades, maquiladoras evolved from low-end garment or small appliance assembly outfits into higher-end manufacturing goods. (Smith, 2002).

Mexico continued to open its economy in 1985 by joining the General Agreement on Trade and Tariffs (GATT) (Hanson, 2002B). Internationally oriented policies continued, lowering barriers to imports, removing restrictions on multinational firms and signing international treaties (Hanson, 2002B). The most important of these policies was the signing of the North American Free Trade Agreement (NAFTA), in 1994, with USA and Canada. Under this agreement, Mexican government compromised to strip maquiladoras off their duty-free status by 2001 (Smith, 2002). With NAFTA, new FDI arrived to Mexico via new maquiladoras establishments.

Since the early 1980’s maquiladoras in Mexico have been the most dynamic sector in the Mexican economy” (Hanson, 2002B; 5). “Foreign Direct Investment under the auspices of multinational corporations (MNC’s) has become one of the key elements in the process of economic and financial integration of the world economy” (Ramirez, 2002; 409). Low wages in Mexico attracted multinational firms creating country’s prosperity. Mexico has been attracting FDI mainly because its strategic economic and geopolitical relationship to the United States. FDI has flowed primarily to the newly-created manufacturing firms in the maquiladora sector along the U.S.- Mexico border (Ramirez, 2002).

The maquiladora industry led to a prolonged export boom in Mexico. This helped wages in the industry to be higher than wages in other manufacturing activities, spreading benefits of globalization to production workers with relatively modest skills (Hanson, 2002A).

However, Mexican economy is too closely tied to the North American. In 2000, the country sent 89% of its exports to and bought 73% of its imports from the United States (Hanson, 2002A). The commercial relation that Mexico keeps with the United States has caused extreme dependency. Since 2000 the maquiladora industry has begun to decline. From October 2000 to April 2004, the industry lost

255,000 jobs. Most of this decrease in employment is due to plant shutting down operations in Mexico in search of lower costs elsewhere (Hanson, 2002B).

The fluctuations in the U.S business cycle, the excess sensitivity of maquiladora output to changes in U.S. manufacturing activity, rising wages, Mexico's tax policy, Mexican government's passivity and economic openness of new emerging markets are thought to be some of the causes of maquiladoras' decline (Hanson, 2002B and Smith, 2002).

China, Vietnam, India, Costa Rica and Guatemala are some of the countries where maquiladoras are establishing (Smith, 2002; Celaya, 2004). Mexico is losing its competitiveness, mainly because of restrictions in the national market, fiscal complexity, overregulation and low investment promotion, among others (Infosel Financiero, 2003)

Mexico's maquiladora industry is facing the most critical period in its history due to internal and external troubles. These troubles are translated into lower (or even negative) rates of economic growth for some of the regions in the country, especially those close to the northern border with the United States (Smith, 2002).

The Malaysian Manufacturing sector

Malaysia is a growing economy in the South East Asian region with an average growth of Real Gross Domestic Product (GDP) of 3.33 per cent per year for the last seven years.

Since its independence from Great Britain in 1957, Malaysia has industrialized rapidly, transforming itself from an economy whose livelihood relied primarily on the production of mineral and agricultural export commodities into an economy dominated by manufacturing and services. It has achieved remarkable progress in its economic and social development through a series of five year plans since 1957. Since that year, Malaysia's industrial policy can be categorized into two main strategies: import - substitution and export-orientation (Rasiah, 1996).

The New Economic Policy (NEP) was launched in 1971 and focused on the socio-economic planning of the country. Its objectives included the reduction of poverty by increasing income levels, the maintenance of high sustainable growth, low unemployment rates and ensure the stability of economic factors such as inflation. Also, the NEP pursued "a more effective utilization of the country's limited resources and attainment of enhanced levels of social well-being" (Salih and Colier, 2000). The NEP sought to eradicate poverty and to restructure

society. The basic philosophy was to "grow with equity" with national unity as the overriding objective (Economic Planning Unit, 2003).

The twenty year period of NEP ended in 1990. A new program, the National Development Policy (NDP) replaced the NEP when it expired. The NDP maintained the basic policies of the NEP, based on the favorable experiences obtained in the past twenty years. This program is in line with the objective of Vision 2020 which envisions Malaysia to be an industrialised and a fully developed country in the next 3 decades. The NDP provides a framework and its aligned with the Mahathir's Vision 2020 program.

During the pre-NEP period, the *laissez faire* policy was adopted. The emphasis was on economic and rural development aimed at promoting growth with strong emphasis on export market.

Malaysia has had eight development plans since 1966. Before the First Malaysia Plan, two more plans were applied. The First Malaya Plan (1956-1960) and Second Malaya Plan (1961-1965) were aimed at providing the basic needs and facilities to the people in order to achieve economic expansion.

The First Malaysia Plan (1966-1970) was also concerned with population issues involving health and education facilities. The Second Malaysia Plan (1971-1975) "saw the formulation of the New Economic Policy (NEP) which was a socio-economic policy designed to achieve national unity through the two-pronged objectives of eradicating poverty. The Third, Fourth and Fifth Malaysia Plan which spread over the 1976-1990 period advanced the implementation of the NEP (Mat and Ahmad, 2001).

The Sixth Malaysia Plan (1991-1995) saw the emergence of the National Development Policy (NDP), which aimed to achieve national unity and balanced development.

The Seventh Malaysian Plan (1996-2000) tried to create skilled workers and stimulate a more technology-oriented culture to effect the structural transformation towards productivity driven economy (Mat and Ahmad, 2001).

The Eight Malaysian Plan (2001-2005) sets out policies, strategies and programmes to achieve the National Vision Policy's objective of building a resilient and competitive nation. The focus of the Eighth Plan is to raise the level of development and generate the sustainable growth needed for the private sector to be dynamic and to spearhead economic growth. During the first three years of the Eight Malaysian Plan a Package of New Strategies to bring fiscal stimulation is stipulated. "In the manufacturing sector, the domestic-oriented industries benefited from fiscal stimulus packages and low interest rates and became the main contributors to growth in the sector" (Mohamad, 2003).

Mahathir Mohamad launched his Vision 2020 program to propel Malaysia into the ranks of developed industrialized nations by year 2020. This would require the nation to maintain a 7-plus percent growth rates for the next 25 years. This is expected to be achieved by raising workforce quality. Developing expertise in sophisticated industries are decisive elements in the country's road to economic success and development.

Vision 2020, claims for lower state intervention in the economy in order to be competitive. The country has been characterized for being continuously attracting foreign investment and developing as a major center of electronics manufacturing since the 1990s. This has created in Malaysia a comparative advantage in regard to other countries. By the year 2001 electrical and electronics products accounted for 49.8 billion dollars or 56.6% of Malaysia's total exports and remained the largest contributors in 2001 (Malaysian external trade development corporation, 2001). In the year 2003, 50.5% of the 78.3% of the manufacture sector were electrical and electronic products, an industry valued in 42,247.75 million dollars (Malaysia External Trade Development Corporation, 2003).

Maquiladora's employment and Value Added growth in the 90's. A shift share analysis

A traditional shift-share technique is used in this section in order to analyze the change in the distribution of the maquiladora's employment and added value from 1991 to 2001 for 20 mexican regions (states). This period of time is split into two periods, from 1991 to 1994 (pre NAFTA and 1995 economic crisis) and from 1995 to 2001 (Post NAFTA) in order to illustrate the impact of the 1995 financial and economic crisis and the NAFTA signing in the maquiladoras relocation.

Shift Share analysis has been widely used in regional economics studies (Acs and Ndikumwami, 1998). The essential idea is to analyze the extent to which the difference in growth between each region and the national average is due to the region performing uniformly better than average on all industries or to the fact that the region happens to be specialized in fast growing sectors (Esteban, 2000).

Despite its widespread use, shift – share analysis has some limitations. It shows which regions are growing (or declining), but it doesn't tell why these regions are growing (or declining) (Dinc and Haynes, 1999).

With the shift –share technique the growth in a determined variable can be broken into three components, the national growth component, the industry mix component and the competitive or regional share component.

Following Acs and Ndikumwami (1998), let the National growth component be the employment (Value added) change in region j and industry i assuming i is growing at the national growth rate. Also, let the actual growth be the difference between employment (value added) in 2001 and 1991 for industry i and region j. The net relative growth is the difference between the national growth and the actual growth. Formally, for employment:

$$NRG_j = \sum (r_{ij} - s) Emp_{ij} \quad (1)$$

where

NRG_j = Net Relative Growth of employment for region j between 1991 and 2001

Emp_{ij} = 1991 employment for industry i and region j

r_{ij} = Employment growth rate for industry i and region j between 1991 and 2001

s = Employment growth rate for all industries and regions between 1991 and 2001.

Some regions are more populated than others. This may cause results to be somehow distorted. To control for the size of a region, a new variable is introduced, labor force. Labor force is defined as the average of the labor force in each region in 1991 and 2001. Formally, the Controlled Net Relative Growth remains as follows:

$$CNRG_j = \frac{NRG_j}{LF_j}$$

The net relative growth measures the shift of jobs in and out a region. This measure is influenced by two components, the industry mix (IM) and the regional share or competitive component (CC).

The industry mix is predisposed by the growth in a given industry. Formally, the industry mix is:

$$IM = \sum (s_i - s) emp_{ij} \quad (2)$$

where

s_i = national employment growth rate for industry i

The IM measure is adjusted to the size of the region in the following equation:

$$CIM_j = \frac{IM_j}{LF_j}$$

The last component of the shift – share, the competitive component measures the portion of a region's growth that is explained by its competitiveness. Suppose that regions A and B have the same industry structure and industry mix, but A has a bigger growth rate just because it is more competitive than B. The equation of the competitive component is:

$$CC_j = \sum (r_{ij} - s_i) emp_{ij}$$

And the controlled competitive component:

$$CCC_j = \frac{CC_j}{LF_j} \quad (3)$$

To analyze the shift of the VA growth, it is just needed to substitute employment and employment growth rates in equations (1), (2) and (3) by value added and value added growth.

Controlled NRG, IM and CC are introduced in the study to remove any bias that may due to the size of the region (Acs and Ndikumwami, 1998).

Data

Data from the Instituto Nacional de Estadística Geografía en Informática (INEGI) was used for this application. Data in the INEGI contains annual information on maquiladora's employment and value added from 1991 to 2001 for most of Mexican states. Data was also available by divisions of activity.

In the computation of the shift share analysis, 20 mexican states were included, after eliminating those regions in the country which had no information available in 1991. Figure 1 shows the composition of the mexican states.

A quick view to data shows clearly that northern states (Chihuahua, Baja California, Tamaulipas, Sonora and Coahuila) prevail as the main contributors to employment creation and value added in both periods, while center states (Puebla, Aguascalientes, Tlaxcala and Morelos) show an important growth along those 11 years in both categories. Table 1 ranks the final 20 states considered by employment and added value in both 1991 and 2001 as well as their growth rate.

Figure 1. Geographical division of Mexico



Table 1 Employment, value added and growth rates in the period 1991 - 2001

Employment				Value Added			
	1991	2001	Growth rate		1991	2001	Growth rate
Chihuahua	144,717	289,185	99.83%	Chihuahua	3,051,769	6,280,724	105.81%
Baja California	88,958	261,497	193.96%	Baja California	1,952,167	5,606,180	187.18%
Tamaulipas	73,267	172,459	135.38%	Tamaulipas	1,860,867	4,572,621	145.73%
Sonora	38,236	99,387	159.93%	Sonora	764,945	1,971,666	157.75%
Coahuila	35,327	108,307	206.58%	Coahuila	564,444	1,703,876	201.87%
Nuevo León	18,547	59,408	220.31%	Nuevo León	431,495	1,264,270	193.00%
Durango	7,292	18,255	150.34%	Jalisco	252,102	913,146	262.21%
Jalisco	7,177	29,131	305.89%	Durango	93,391	216,372	131.68%
Guanajuato	5,374	14,624	172.13%	Guanajuato	83,987	201,491	139.91%
Yucatán	3,330	31,801	854.98%	México	52,971	278,205	425.20%
México	2,352	12,140	416.16%	Yucatán	45,386	374,538	725.23%
San Luis Potosí	2,193	10,635	384.95%	San Luis Potosí	36,515	253,718	594.83%
Querétaro	1,640	2,839	73.11%	Querétaro	26,766	66,495	148.43%
Puebla	1,154	36,991	3,105.46%	Puebla	13,958	512,017	3,568.27%
Aguascalientes	828	23,106	2,690.58%	Morelos	13,159	132,825	909.39%
Baja California Sur	733	1,684	129.74%	D.F.	11,371	50,825	346.97%
D.F.	647	2,114	226.74%	Aguascalientes	9,779	276,704	2,729.57%
Sinaloa	506	457	-9.68%	Sinaloa	8,178	11,956	46.20%
Tlaxcala	332	6,876	1,971.08%	Baja California Sur	7,828	26,393	237.16%
Morelos	316	4,797	1,418.04%	Tlaxcala	4,387	84,077	1,816.50%

It is worth noting that the only state to show a negative growth rate was Sinaloa with -9.68% in employment. This state had also the lowest growth rate of added value.

Table 2 ranks the different regions according to employment and value added growth for both sub periods of 1991 – 1994 and 1995 - 2001.

Table 2. Employment and value added growth rates for the 1991 – 1994 and 1995 – 2001 periods.

1991 - 1994				1995 - 2001			
Employment		Value Added		Employment		Value Added	
Aguascalientes	551%	Aguascalientes	605%	Tlaxcala	1220%	Tlaxcala	996%
Puebla	384%	Puebla	489%	Morelos	916%	San Luis Potosí	505%
Querétaro	75%	Querétaro	185%	Yucatán	427%	Morelos	446%
Yucatán	74%	Tlaxcala	73%	Puebla	388%	Yucatán	390%
Tlaxcala	72%	Jalisco	67%	Aguascalientes	183%	Puebla	363%
Sinaloa	65%	Coahuila	56%	Jalisco	172%	México	168%
San Luis Potosí	61%	México	54%	San Luis Potosí	169%	Nuevo León	126%
Coahuila	43%	Tamaulipas	53%	México	162%	Aguascalientes	122%
México	40%	Yucatán	52%	Nuevo León	128%	Jalisco	99%

Tamaulipas	37%	Sinaloa	37%	Baja California	104%	Baja California Sur	95%
Jalisco	35%	Baja California	37%	Coahuila	103%	Baja California	83%
Baja California	34%	Durango	36%	Sonora	90%	Chihuahua	83%
Durango	28%	D.F.	31%	Guanajuato	88%	Sonora	79%
Sonora	25%	Sonora	29%	Chihuahua	63%	Guanajuato	62%
Nuevo León	25%	Chihuahua	23%	Tamaulipas	54%	Coahuila	58%
		Baja California Sur	20%	Baja California Sur	52%	Tamaulipas	47%
D.F.	21%	Guanajuato	18%	Durango	40%	Sinaloa	38%
Guanajuato	17%	Nuevo León	11%	D.F.	11%	D.F.	31%
Chihuahua	13%	Morelos	5%	Querétaro	-3%	Durango	26%
Morelos	10%						
Baja California Sur	-8%	San Luis Potosí	1%	Sinaloa	-39%	Querétaro	-26%

Puebla, Queretaro, Tlaxcala (center states) and Yucatan show the biggest growth rates in the pre NAFTA period (1991 – 1994), whereas Guanajuato, Chihuahua and Baja California Sur had the lowest rates of growth for both variables. In the post NAFTA period (1995 – 2001), Tlaxcala, Morelos and Yucatan have the major increases, while Sinaloa, DF and Queretaro have the worst performances. It is worth noting the case of Sinaloa. This State had increases of 65% and 37% in employment and value added in the pre NAFTA period and a reduction of 39% in employment in the post NAFTA period. Queretaro had a similar behavior, growing 75% and 185% in both variables in the 1991 – 1994 period and reductions of 3% and 26% in the 1995 – 2001 period.

Results

Employment

Table 3 presents the results for the 1991 – 2001 period. The Controlled Net Relative Growth shows the number of jobs moved in and out the maquiladora industry controlling for the size of the state. The Controlled Industry Mix illustrates the performance of a region due to its industry mix, while the Controlled Competitive Component captures the number of jobs gained or lost because the region is competitive (Acs and Ndikumwami, 1998).

Of the 20 states under study, only the northern states of Nuevo Leon, Baja California, Tamaulipas and Chihuahua had negative industry mix, meaning they lost jobs because of their maquiladoras' sectoral mix. Ten of the states lost jobs because of their lack of competitiveness.

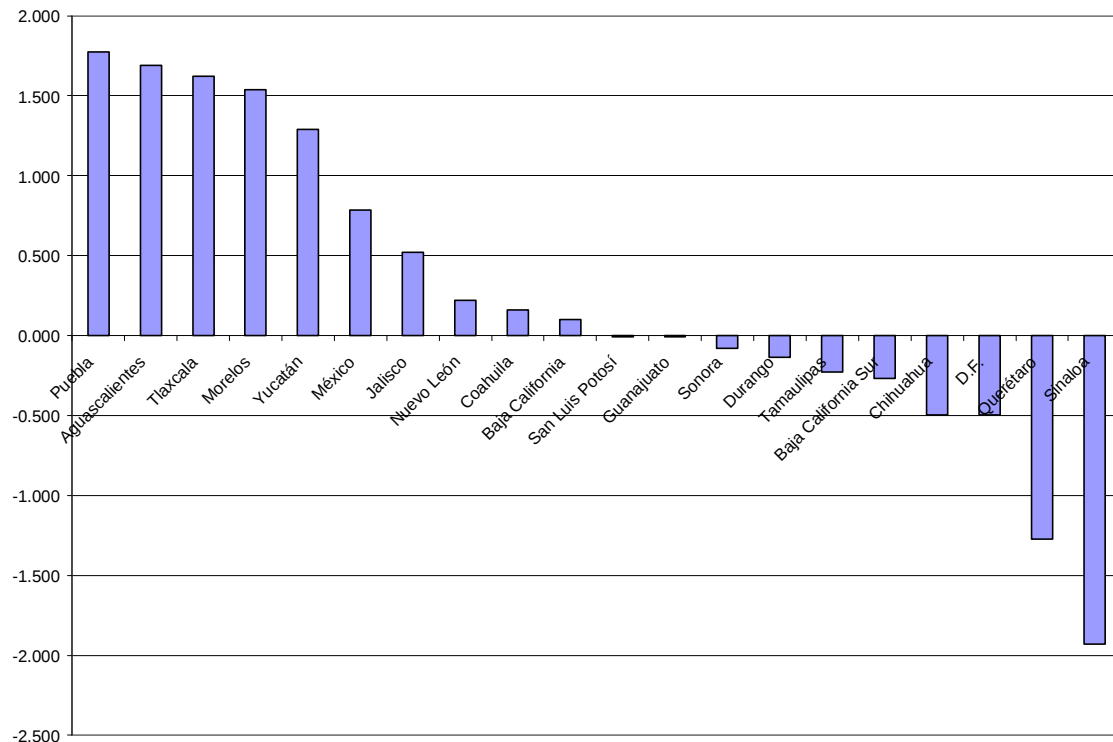
Table 3. Net Relative Growth, Industry Mix and Competitive Component for the 1991 – 2001 period.

	CNRGj	CIMj	CCCj
Puebla	1.774	0.099	1.675
Aguascalientes	1.691	0.118	1.573
Tlaxcala	1.623	0.157	1.466
Morelos	1.538	0.135	1.403
Yucatán	1.291	0.164	1.127
México	0.786	0.233	0.554
Jalisco	0.522	0.007	0.515
Nuevo León	0.221	-0.101	0.322
Coahuila	0.161	0.070	0.091
Baja California	0.102	-0.117	0.219
San Luis Potosí	-0.008	0.374	-0.381
Guanajuato	-0.009	0.046	-0.055
Sonora	-0.078	0.063	-0.140
Durango	-0.134	0.973	-1.108
Tamaulipas	-0.230	-0.095	-0.134
Baja California Sur	-0.268	0.965	-1.233
Chihuahua	-0.494	-0.005	-0.489
D.F.	-0.498	0.512	-1.010
Querétaro	-1.273	0.545	-1.818
Sinaloa	-1.929	1.148	-3.077

Puebla gained a relative total of 1.774 jobs during the 1991 – 2001 period, mainly because of a strong regional competitiveness. By the other hand, Sinaloa had a positive industry mix, but lost jobs overall because of their poor regional competitiveness. On the contrary, Baja California had a positive competitiveness indicator, but a negative industry mix pushing for a general loss of jobs.

It is interesting to note that four of the five most winning states are located in the center of the country close to Mexico City. Graph 1 shows the controlled net relative growth of employment for the 20 states during the 1991 – 2001 period. Chihuahua, which is the state with the most employment creation of all Mexican states is situated in the seventeenth place out of twenty, with a relative loss of -0.494 jobs.

Graph. Controlled Net relative Growth of employment for the 20 states during the 1991 – 2001 period



Puebla, the state with the most employment gaining, is not in the first place in any of the two sub periods considered, whereas Aguascalientes stands in the first position for the first period and Tlaxcala for the second. Seven states lost jobs because of their industry mix during 1991 – 1994 and five in the 1995 – 2001 periods. Only the state of Baja California keeps losing jobs in both periods due to the industry mix. However, Nuevo Leon, Sonora, Chihuahua and Tamaulipas, all northern states, worsen in the 1995 – 2001 period.

Regional competitiveness was a positive factor for gaining jobs for 13 states and for 11 states in each period, with Nuevo Leon and Sonora improving to positive numbers in the 1995 – 2001 period.

Finally, in both periods four of the first five gainers, Tlaxcala, Aguascalientes, Yucatan and Puebla are repeated, while three of the biggest five jobs losers, Queretaro, Baja California Sur and D.F. are repeated as well.

Table 4. Net Relative Growth, Industry Mix and Competitive Component for the 1991 – 1994 and 1995 - 2001 periods.

1991 – 1994				1995 - 2001			
	CNRGj	CIMj	CCCj		CNRGj	CIMj	CCCj
Aguascalientes	1.389	0.044	1.345	Tlaxcala	1.558	0.085	1.473
Puebla	1.214	0.031	1.183	Morelos	1.478	0.325	1.153

Yucatán	0.324	0.029	0.294	Yucatán	1.071	0.148	0.923
Tlaxcala	0.312	0.121	0.191	Puebla	1.009	0.266	0.743
Sinaloa	0.268	-0.331	0.599	Aguascalientes	0.479	0.331	0.147
Coahuila	0.116	0.008	0.108	Jalisco	0.431	0.012	0.419
México	0.087	0.023	0.064	San Luis Potosí	0.418	0.514	-0.096
Tamaulipas	0.068	0.003	0.065	México	0.388	0.298	0.090
Jalisco	0.051	0.008	0.043	Nuevo León	0.224	-0.062	0.286
Baja California	0.037	-0.016	0.052	Baja California	0.081	-0.078	0.160
Durango	-0.010	0.143	-0.153	Coahuila	0.075	0.056	0.019
Sonora	-0.036	0.009	-0.045	Sonora	-0.010	-0.016	0.006
Nuevo León	-0.037	0.002	-0.039	Guanajuato	-0.023	0.098	-0.121
Guanajuato	-0.110	-0.121	0.011	Chihuahua	-0.217	-0.045	-0.172
Chihuahua	-0.153	0.011	-0.163	Tamaulipas	-0.298	-0.074	-0.224
Morelos	-0.183	-0.417	0.235	Baja California Sur	-0.311	0.610	-0.921
Querétaro	-0.197	-0.228	0.031	Durango	-0.434	0.550	-0.984
Baja California Sur	-0.383	0.053	-0.436	D.F.	-0.760	0.682	-1.443
San Luis Potosí	-0.584	-0.336	-0.248	Querétaro	-1.096	0.241	-1.337
D.F.	-1.133	-0.398	-0.736	Sinaloa	-1.625	2.255	-3.880

Added Value

Table 5 presents the results for the 1991– 2001 period. The indicators shown have the same explanation as before, but in regard of the added value creation.

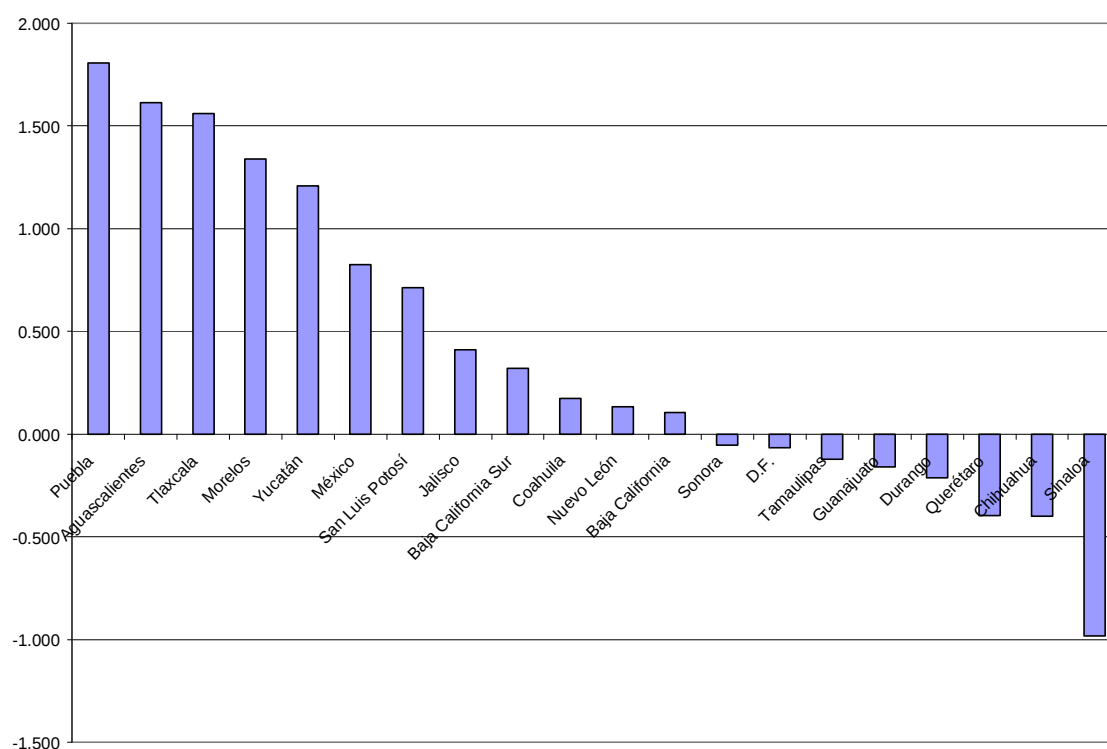
Table 5. Net Relative Growth, Industry Mix and Competitive Component for the 1991 – 2001 period.

	CNRGj	CIMj	CCCj
Puebla	1.805	0.094	1.711
Aguascalientes	1.612	0.115	1.497
Tlaxcala	1.560	0.167	1.393
Morelos	1.338	0.464	0.874
Yucatán	1.207	0.141	1.065
México	0.826	0.203	0.623
San Luis Potosí	0.712	0.648	0.064
Jalisco	0.412	-0.010	0.422
Baja California Sur	0.321	0.841	-0.521
Coahuila	0.173	0.064	0.110
Nuevo León	0.132	-0.059	0.191
Baja California	0.104	-0.113	0.217
Sonora	-0.052	0.092	-0.144
D.F.	-0.067	0.942	-1.009
Tamaulipas	-0.123	-0.084	-0.039
Guanajuato	-0.160	0.024	-0.184
Durango	-0.213	1.018	-1.231
Querétaro	-0.395	0.731	-1.126
Chihuahua	-0.401	0.012	-0.412
Sinaloa	-0.982	2.092	-3.074

Baja California, Nuevo Leon, Tamaulipas and Jalisco had negative industry mix, meaning they reduced added value because of their maquiladoras' sectoral composition, while nine of the states decreased their added value because of their lack of competitiveness.

Puebla increased a relative total of \$1.805 in added value during the 1991 – 2001 period (see graph 2), mainly because of a strong regional competitiveness, whereas Sinaloa had a positive industry mix, but reduced its added value overall because of their poor regional competitiveness, just as in the employment case.

Graph. Controlled Net relative Growth of employment for the 20 states during the 1991 – 2001 period



Ten states reduced added value in the 1991 -1994 period. Chihuahua, Baja California Sur, San Luis Potosi and D.F. had both negative industry mix and regional competitiveness. For the 1995 – 2001 period, only seven states reduced added value.

San Luis Potosi had an important positive increase, being the 19th state in the 1991 – 1994 with a relative reduction of \$1.023 period and the second added value raiser in the 1995 – 2001 period.

Finally, central states dominate the added value enlargements for both periods, being four of the first five places. Table 4 shows these results

Table 4. Net Relative Growth, Industry Mix and Competitive Component for the 1991 – 1994 and 1995 - 2001 period.

1991 – 1994				1995 - 2001			
	CNRGj	CIMj	CCCj		CNRGj	CIMj	CCCj
Aguascalientes	1.411	0.019	1.392	Tlaxcala	1.466	0.118	1.348
Puebla	1.312	0.006	1.306	San Luis Potosí	1.219	0.353	0.866
Querétaro	0.461	-0.117	0.578	Morelos	1.147	0.892	0.255
Tlaxcala	0.264	0.056	0.208	Yucatán	1.066	0.190	0.876
Jalisco	0.224	0.025	0.200	Puebla	1.022	0.407	0.615
Coahuila	0.149	-0.002	0.151	México	0.504	0.406	0.098
México	0.135	-0.040	0.175	Nuevo León	0.309	-0.043	0.352
Tamaulipas	0.122	0.014	0.107	Aguascalientes	0.292	0.516	-0.224
Yucatán	0.116	-0.028	0.145	Jalisco	0.157	-0.048	0.205
Sinaloa	0.002	-0.398	0.400	Baja California Sur	0.134	0.605	-0.472
Baja California	-0.001	-0.021	0.021	Baja California	0.052	-0.070	0.122
Durango	-0.012	0.061	-0.073	Coahuila	0.051	0.065	-0.014
Sonora	-0.072	0.009	-0.081	Sonora	0.027	-0.001	0.028
Chihuahua	-0.127	0.015	-0.142	Guanajuato	-0.104	0.267	-0.371
Baja California Sur	-0.152	-0.019	-0.133	Chihuahua	-0.135	-0.024	-0.111
Guanajuato	-0.177	-0.204	0.027	Tamaulipas	-0.228	-0.084	-0.144
Nuevo León	-0.244	0.012	-0.256	Sinaloa	-0.310	2.415	-2.725
Morelos	-0.312	-0.461	0.149	D.F.	-0.384	0.812	-1.195
San Luis Potosí	-1.023	-0.469	-0.553	Durango	-0.440	0.718	-1.157
D.F.	-1.140	-0.408	-0.732	Querétaro	-1.260	0.059	-1.319

An exploratory analysis of Malaysias' manufacturing evolution

The manufacturing industry remains as one of the most important economic activities in Malaysia. According to the Department of Statistics, this industry represents 32% of the GDP.

Manufacturing industries relocation has been a common practice in Malaysia also. For the period between 1995 and 2000, approximately 2,000 establishments left the country of closed. However, some industries, such as the manufacture of semi conductors and other electronic components grew in number of establishments.

Relocation seems to be present within the country. While Peninsular Malaysia lost establishments in the 5 –year period, Sabah and Sarawak both had slight increases in manufacturing facilities. Table 1 shows this behavior.

Table 5. Number of manufacturing facilities in Malaysia for the 1995 – 2000 period.

	Peninsular Malaysia	Sabah	Sarawak
1995	19,285	1,400	1,768
1996	16,963	1,377	1,864
1997	19,571	1,484	1,974
1999	18,640	1,364	1,887
2000	17,047	1,555	1,853

In contrast to that, employment grew in approximately 200,000 people between years 1995 and 2000 in Malaysia, mainly in peninsular Malaysia in contrast to a reduction of 8,000 jobs in Sabah. This is shown in table 6

Table 6. Employment conformation in Manufacturing industry for the 1995 – 2000 period.

	Peninsular Malaysia	Sabah	Sarawak
1995	1,229,946	76,150	63,055
1996	1,281,453	80,856	69,906
1997	1,243,980	82,060	72,130
1999	1,211,335	83,197	72,624
2000	1,417,835	68,144	74,943

As a result of this relocation, manufacturing establishments tend to be larger in peninsular Malaysia and smaller or rather similar in Sabah and Sarawak. An other interesting feature is that salaries and wages paid have increased in all three areas, but specially in peninsular Malaysia, where the increase was of 39%, well above the inflation rates.

Table 7. average establishment's size and average manufacturing salaries and wages paid for the 1995 – 2000 period.

	Average establishment's size			Average salaries and wages		
	Peninsular Malaysia	Sabah	Sarawak	Peninsular Malaysia	Sabah	Sarawak
1995	64	54	36	12,452	7,695	8,960
1996	76	59	38	13,945	8,002	9,355
1997	64	55	37	15,293	8,896	10,342
1999	65	61	38	16,600	7,080	10,258
2000	83	44	40	17,367	9,553	11,329

Within the manufacturing sector, the electric and electronic components industry (E&E) prevails as one of the most important. It represents 4.4% of the total manufacturing establishments, 26.6% of the manufacturing employment and

salaries and wages paid are 9% above the manufacturing average (Department of Statistics of Malaysia).

Conclusions and further research

Maquiladora industry in Mexico has been changing in the last years. This shift was illustrated in this paper. First results showed that the center regions in the country have notably increased their maquiladora activity in both employment and added value.

A further analysis allows us to see this change by phases. We believe that NAFTA signing and the 1995 crisis had an effect on the industry's relocation. Shift share permitted us to describe this pattern. In general terms there are not many important changes in the ranking of the winning and losing regions for both the 1991 – 1994 and 1995 – 2001 periods, except for the added value creation in San Luis Potosi. We believe it is very important to keep further researching in this area.

Shift – share analysis allows us to describe the changes that have happened in the maquiladora industry in the last 11 years, but it doesn't give us any evidence to may explain the reason of these changes. We believe that there are other factors besides NAFTA and the 1995 economic crisis, such as the regional economic development, different fiscal incentives, regional specialization, and closeness to transport infrastructures, and to the country's industrial belts among other. These remain as open lines of research.

By the other hand, relocation phenomena have also been present in Malaysia. This can be seen in this exploratory analysis. During the 5 – year period of 1995 – 2000 manufacturing facilities have been reduced in number, but in general, their size is bigger in terms of employment. It is to note that the E&E components industry is, in average, much bigger in company size than the average of the manufacturing industry, with 450 employees per establishment.

It has been argued the importance of the E&E industry to Malaysia (Chacko, 1997), but globalization has transformed the world's patterns of commerce and industry location. It remains as an open line of research to analyze its behavior in comparison to the rest of manufacturing industries along the country.

Malaysia and Mexico are becoming center of attention of multinational corporations because of their skilled labor. Several economic policies have been implemented in both countries to achieve an economic development.

In both cases, foreign direct investment is flowing supported by Malaysia's New Economic Policies and National Development programs as well as Mexican's economic development programs.

References

- Acs, Z. and A. Ndikumwami (1998) "High-Technology employment growth in major U.S. metropolitan areas". *Small Business Economics*. Vol. 10, pp. 47-59.
- Asociación de Maquiladoras y Exportadoras de Chihuahua (2003) "Antecedentes de la Industria Maquiladora de Exportación en México". Mexico.
- Chacko, G. (1997) "Toward continuous competitiveness: Expanding Malaysian electrical and electronic exports – macro perspective" *Asia Pacific Journal of Marketing and Logistics*. Vol. 9.
- Celaya, R. (2004) "Asia Pacífico: los flujos económicos intraregionales y los procesos de integración" *Comercio Exterior*, vol. 54, pp 121-131.
- Department of Statistics of Malaysia. Several statistics bulletins.
- Dinc, M. and K. Haynes (1999) "Regional efficiency in the manufacturing sector: integrated shift-share and data envelopment analysis". *Economic Development Quarterly*. Vol. 13, pp. 183-199.
- Economic Planning Unit (2003) " Development Planning Process in Malaysia". Available at: <http://www.epu.jpm.my/bi/aboutepu/DPP/Devplanningplans.htm>
- Esteban, J. (2000) "Regional convergence in Europe and the industry mix: a shift-share analysis". Vol. 30, pp. 353-364.
- Grunwald, J. and K. Flamm (1985) *The Global Factory: Foreign Assembly and International Trade*. The Brookings Institution: USA.
- Hanson, G. (1996) "Localization economies, vertical organization, and trade". *American Economic Review*. Vol. 86, pp. 1266-1278.
- Hanson, G. (1997) "Increasing returns, trade, and the regional structure of wages". *Economic Journal*. Vol. 107, pp. 113-133.
- Hanson, G. (1998A) "Regional adjustment to trade liberalization". *Regional Science and Regional Economics*. Vol. 28, pp. 419-442
- Hanson, G (1998B) "North American economic integration and industry location", *Oxford Economic Review of Economic Policy*. Vol. 14, pp. 30-44

- Hanson, G. (2001) "US-Mexico integration and regional economies: evidence from border city pairs". *Journal of Urban Economics*. Vol. 50, pp. 259-287.
- Hanson, G. (2002A) "Globalization and wages in Mexico". Mimeo, UCSD.
- Hanson, G. (2002B) "The Role of Maquiladoras in Mexico's Export Boom". Mimeo, UCSD.
- Infosel Financiero (2003) "Sugieren zonas libres para atraer maquilas" *Economía*,
http://mx.invertia.com/imprimir.asp?IdNoticia=200305151138_INF_914161
- Instituto Nacional de Estadística Geografía e Informática INEGI, Banco de Información Económica, accesible from internet: <http://www.inegi.gob.mx/>
- Malaysia External Trade Development Corporation (2003) "Economy, trade and industry". Available at: <http://www.matrade.gov.my/economy-trade/key-industries/electric.htm>
- Mat R. and S. Ahmad (2001) "Utilizing Census Results in the Malaysian Development Plan 2001-2005" Available at:
<http://www.ancsdaap.org/cencon2k/papers/malaysia/malaysia.pdf>
- Mohamad (2003) "Eight Malaysian Plan". Available at:
<http://www.kit.sabah.gov.my/budget/8MP-MTR.htm>
- Perez, A., and Sierra, I. (2004) "Malasia en las transformaciones del sudeste asiático" *Comercio Exterior*, vol. 54, pp 132-143
- Ramirez (2002) "Foreign Direct Investment in Mexico during the 1990s: An Empirical Assessment" *Eastern Economic Journal*, Vol.28, pp 409-415.
- Rasiah, R. (1996) "Manufacturing as engine of growth and industrialization in Malaysia" *Managerial Finance*. Vol 22. pp 87-92
- Reventa, A. (1997) "Employment and wage effects of trade liberalization: the case of Mexican manufacturing". *Journal of Labor Economics*. Vol. 15, pp. s20-43
- Reventa, A. and C. Montenegro (1998) "North American integration and factor price equalization: is there evidence of wage convergence between Mexico and the United States?" in S. Collins (ed) *Imports, exports and the American worker*. Brookings Institution Press: USA
- Robertson, R. (2000) "Trade liberalization and wage inequality: lessons from the Mexican experience". *World Economy*. Vol. 23(6), pp. 827-49.

- Robertson, R. (2001) "Relative prices and wage inequality: evidence from Mexico". Mimeo, Macalester, College.
- Smith, G. (2002) "The Decline of the Maquiladora", Business Week Magazine Online, http://businessweek.com/magazine/content/02_17/b3780078.htm
- Wilson, P. (1992) Exports and local development: Mexico's new maquiladoras. University of Texas Press: USA.