Global Change and Local Economic Restructuring: The Case of Mexico City

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by

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To Tomas & Chela

Acknowledgements

...it takes a lot of things to change the world:
anger and tenacity, science and indignation,
the quick initiative, the long reflection,
the cold patience and the infinite perseverance,
the understanding of the particular case and
the understanding of the ensemble.
Only the lessons of reality can teach us to transform reality.

Bertolt Brecht, *Einverstandnis*

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Abstract

This thesis is about economic transformation in Mexico City between 1980 and 2000. It explores the extent to which Mexico City's economic restructuring process has been caused by trade liberalisation. The thesis assesses the extent to which industries located in Mexico City reacted to a reorientation in production focus, characterised by the shift from national to international markets. It analyses in detail the pace and geography of neo-liberal economic change, and its effects upon a specific location. It also evaluates the role played by global economic agents in gauging the forces influencing economic restructuring in Mexico, and particularly in Mexico City. At the core of this restructuring process is the change in regional industrial location patterns in Mexico, as well as the decline of manufacturing – with regard to production and employment – in Mexico City and its rise as a service centre.

The thesis therefore engages with current debates on new economic geography on the one hand and globalisation on the other, focusing attention on the possible emergence of a group of "global" urban centres embedded in a broader network of cities in developed and developing countries alike, which connect global production circuits and coordinate global/regional markets. More concretely, the thesis focuses on the automotive and consumer electronics industries with the aim of understanding the causes and effects of economic events in terms of location decisions, particularly those made by transnational corporations. By placing the empirical processes of economic restructuring within the theoretical context of trade liberalisation and globalisation, I seek to make an original contribution to social science debates about the way industry reacts to economic signals and how global processes, despite taking place in specific locations, have wide-reaching effects upon social welfare, mainly though the transformation of local labour markets.

Contents

List of Tables

List of Figures

List of Boxes

List of Acronyms

ALTEX	Empresas Altamente Exportadoras (High Exporting Firms Programme)
AMIA	Asociación Mexicana de la Industria Automotriz (Mexican Automotive Industry Association)
ANIE	Asociación Nacional de la Industria Electrónica (National Electronics Industry Association)
BANCOMEXT	Banco de Comercio Exterior (Bank of Foreign Trade)
BANAMEX	Banco Nacional de México (National Bank of Mexico)
BIE	Banco de Información Económica (Economic Information Database)
BIP	Border Industrialisation Programme
BMV	Bolsa Mexicana de Valores (Mexican Stock Market)
CANACINTRA	Cámara Nacional de la Industria de la Transformación (National Chamber of Manufacturing)
CANEME	Cámara Nacional de Manufacturas Eléctricas (National Chamber of Electrical Manufacturers)
CANIECE	Cámara Nacional de la Industria Electrónica y de Comunicaciones Eléctricas (National Chamber of the Electronics and Electric Communications Industries)
CANIETI	Cámara Nacional de la Industria Electrónica y de Telecomunicaciones y Tecnologías de la Información (National Chamber of the Electronics Industry, Telecommunications and Information Technology)
CONAPO	Consejo Nacional de Población (National Population

	Council)
CV	Capital Variable (Variable Capital)
DDF	Departamento del Distrito Federal (Federal District Department)
DF	Distrito Federal (Federal District)
DOF	Diario Oficial de la Federación
EU	European Union
FDI	foreign direct investment
FTA	free trade agreement
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
ILO	International Labour Origanisation
IMF	International Monetary Fund
INEGI	Instituto Nacional de Estadística y Geografía (National Institute of Statistics and Geography)
ISI	import substitution industrialisation
ISIC	International Standardised Industrial Classification
IT	Information Technology
MAMC	Metropolitan Area of Mexico City
M&As	mergers and acquisitions
NID	new industrial districts
NIDL	New International Division of Labour
NAFTA	North American Free Trade Agreement
OECD	Organisation for Economic Cooperation and Development
OEM	original equipment manufacturer
PAN	Partido Acción Nacional (National Action Party)
PCA	principal component analysis
PEMEX	Petróleos Mexicanos
PITEX	Programa de Importación Temporal para Producir Artículos de Exportación (Programme of Temporary Imports to Produce Export Goods)
PRD	Partido de la Revolución Democrática (Democratic Revolution Party)

PRI	Partido Revolucionario Institucional (Institutional Revolutionary Party)
R&D	research and development
RTA	regional trade agreement
SA	Sociedad Anónima (Limited Company)
SECOFI	Secretaría de Comercio y Fomento Industrial (Secretariat of Trade and Industrial Promotion)
SEDESOL	Secretaría de Desarrollo Social (Ministry of Social Development)
SEDUE	Secretaría de Desarrollo Urbano y Ecología (Secretariat of Environment and Urban Development)
SE	Secretaría de Economía (Secretariat of Economy)
SHCP	Secretaría de Hacienda y Crédito Público (Secretariat of Finance and Public Credit)
SIEM	Sistema de Información Empresarial Mexicana (Mexican Enterprise Information System)
TNC	transnational corporation
UK	United Kingdom
UN	United Nations
UNCHS	United Nations Centre for Human Settlements
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organisation
US	United States
WTO	World Trade Organisation

Chapter One: Introduction

OVERVIEW

This thesis explores the relationship between Mexico City and the most recent set of economic processes to influence Mexico, namely economic liberalisation and globalisation. It assesses the extent to which industries reacted to the shift from national to a more global economic orientation, leading to a process of transformation of Mexico City's economy. The thesis seeks to answer the question: to what extent has the process of industrial decentralisation characterised by the decline of manufacturing in Mexico City been caused by trade liberalisation and globalisation? To address this question, the thesis engages with debates about globalisation and the pace and geography of neo-liberal economic change, particularly on the associated effects of a trade regime to urbanisation and vice versa.[1] A theme running through the thesis, therefore, is the importance of spatial restructuring as a consequence of economic change. This restructuring is indicated by the fact that Mexico City at the end of the 20th century is no longer the nation's manufacturing hub and its most dynamic economic location, a role that it had performed for more than four decades. At the heart of this restructuring process is Mexico City's transformation into a service-sector-dominated labour market while retaining a significant manufacturing base.

[1] Neo-liberal policies, also known as the "Washington Consensus", include the promotion of central bank autonomy, stabilisation of exchange rates, privatisation programmes and deregulation of financial and trade activities (Maxwell 1999; Stiglitz 2002; Williamson 1997).

CONTEXT

Between 1940 and 1980, successive national governments introduced protectionist measures in an approach broadly known as import substitution industrialisation (ISI), an economic development strategy based on state intervention in the economy through combinations of credit controls, subsidies, direct public ownership of key economic sectors and selective trade barriers to protect industry from international competition. The implementation of these policies allowed Mexico to build a relatively strong industrial sector between the 1950s and the 1970s, a period known as *desarrollo estabilizador* (stabilising development) during which Mexico enjoyed high GDP growth rates, low inflation and moderate external debt accumulation.[2] At the same time, accelerated economic growth drove a shift from a rural to a largely urban society (see Table 1.1) and transformed the organisation of economic activities, resulting in an agglomeration of industrial activity centred on Mexico City and surrounding states.[3]

Table 1.1: Population Distribution by Locality Size

Locality size		1940	1950	1960	1970	1980	1990	2000
1	4,999	72.5%	65.4%	57.0%	52.0%	39.9%	34.4%	31.0%
5,000	49,999	13.9%	15.9%	17.5%	18.2%	15.8%	16.5%	17.3%
50,000	99,999	3.4%	3.6%	5.1%	5.1%	3.5%	4.7%	4.7%
100,000	499,999	2.8%	6.5%	8.0%	12.7%	17.0%	22.4%	21.0%
500,000	and more	7.3%	8.7%	12.4%	12.0%	23.9%	22.0%	26.0%

Source: Author's calculations from census data (INEGI 1940, 1950, 1960, 1970, 1980, 1990 and 2000).

[2] During the late 1970s, this stability came to an abrupt end (see Crook 1990; Dietz 1985; Ortiz Mena 1980; Solis 1981).
[3] When referring to Mexico City, I refer to the Federal District and its 16 *delegaciones* (boroughs). Mexico City bordering states are the State of Mexico and Morelos.

Between 1955 and 1980 the industrial sector grew at an average rate of 7.5% per annum, and in 1980 over half (56%) of national manufacturing output was located in the Metropolitan Area of Mexico City (MAMC) (INEGI economic censuses (various years); World Bank 1991).[4] According to economic census data, the contribution of the industrial sector to GDP went up from 26% in 1950 to 38% in 1980. Simultaneously, the cities with the highest population growth rates from the 1950s were the larger manufacturing centres: Mexico City, Monterrey and Guadalajara grew on average 6% annually between 1940 and 1960. Mexico City's population of 1.6 million inhabitants in 1940 reached 2.9 million in 1950, gaining an additional 130,000 people every year.[5] At the beginning of the 1950s Mexico City was the largest city in the country, with a population seven times greater than Guadalajara (401,000) and eight times greater than Monterrey (354,000) (INEGI 1940; 1950).

Under its protectionist policies, the government targeted economic incentives and public infrastructure towards these three cities, with emphasis on Mexico City as not only the largest production centre but also the largest consumer market, thus reinforcing further growth. As a consequence, Mexico City captured a growing share of an increasing

[4] The MAMC refers to the Federal District plus municipalities in the State of Mexico conurbation. Official documents on the period 1970–1990 present different definitions of which municipalities are considered part of the MAMC. In 1995 28 municipalities were finally considered to define the area for the National Urban Development Programme (*Programa Nacional de Desarrollo Urbano*) 1995–2000 that became the standardised definition for all federal public offices including CONAPO and INEGI. These municipalities are: Acolman, Atenco, Atizapán de Zaragoza, Coacalco, Cuautitlán, Cuautitlán Izcalli, Chalco, Chicoloapan, Chimalhuacán, Ecatepec, Huixquilucan, Ixtapaluca, Jaltenco, La Paz, Melchor Ocampo, Naucalpan, Nextlalpan, Nezahualcóyotl, Nicolás Romero, Tecamac, Teoloyucan, Tepotzotlán, Texcoco, Tlalnepantla de Baz, Tultepec, Tultitlán, Valle de Chalco-Solidaridad and Zumpango.

[5] A figure equal to the total populations at the time of cities such as Tampico and San Luis Potosí, ranked the seventh- and eighth-largest cities in 1950 (INEGI 1995).

investment budget between 1960 and 1980, reaching a peak between 1965 and 1970, when infrastructure spending located in Mexico City represented 65% of national infrastructure investment (INEGI 1995). According to Aguilar (1993), Brambila and Salazar (1984), Ramos Boyoli (1976), and Ramos Boyoli and Richter (1976), especially for the period 1959–1974, public investment was oriented not towards regional development but rather towards satisfying short-term industrial infrastructure needs in favour of the more advanced regions, particularly Mexico City, thus increasing incentives for concentration.[6] These studies conclude that this pattern of public spending was not only to the detriment of more balanced regional development but also affected economic efficiency, contradicting the classic dilemma between aggregate economic growth and a reduction in regional inequalities (Smith 1995).

The perception of large regional inequalities, including in terms of industrial concentration, led to the first decentralisation efforts. According to Bustamante (1983), Cabrero (1998), Rodríguez (1997) and Looney and Frederiksen (1981) it became increasingly necessary for the government to intervene in order to deal with "over-concentration" of investment, productivity and income. As a response, the federal government put in place policies aimed at economic decentralisation in three different ways: (i) urban policies that aimed to slow urban and economic growth in the MAMC; (ii) policies aimed at modifying the economic environment for some industries in order to influence location decisions and encourage

[6] See also Looney and Frederiksen (1981, 1982); Palacios (1986, 1988); Rodríguez y Rodríguez (1982).

movement out of the central part of Mexico through modification of select trade policy barriers; and (iii) urban and regional policies and legislation aimed at generating a more even national spatial organisation. A set of policy tools including trusts, tax incentives, and urban and regional plans and programmes was created, albeit not systematically, to promote decentralisation, inhibit population growth and migration to Mexico City, and generate economic incentives and infrastructure in order to influence business location decisions (Graham 1990; Rodríguez 1997).

After three decades of strong economic growth and despite decentralisation efforts to attain a more geographically even development path, at the beginning of the 1980s decentralisation policies appeared to have delivered limited success (Aguilar-Barajas 1993). Between 1980 and 2000, however, Mexico City began to lose its dominant position in the country's economic life and declined in terms of GDP national industrial share, showing a steep decrease in manufacturing output and jobs (see Table 1.2). These years coincide with an ambitious programme of economic reforms undertaken by the federal government which aimed at trade and investment liberalisation. Central Mexico – defined as the Federal District plus the capitals of the five neighbouring states of Mexico (Toluca, 624,362), Hidalgo (Pachuca, 261,533), Morelos (Cuernavaca, 331,170), Puebla (Puebla, 261,533) and Tlaxcala (Tlaxcala, 76,182) – accounted in 1980 for 27.3% of the national population and more than

50% of total manufacturing employment.[7] This situation changed over the following decades as industry appeared to decentralise.

Table 1.2: Manufacturing Employment in the Federal District and States of Central Mexico, 1980–1998

Manufacturing	Employees 1980	Percent 1980	Employees 1998	Percent 1998
National	2,701,357	100%	4,175,380	100%
Federal District	839,311	31.1%	477,197	11.4%
Hidalgo	46,529	1.7%	73,089	1.8%
State of Mexico	363,554	13.5%	486,035	11.6%
Morelos	22,216	0.8%	40,544	1.0%
Puebla	91,686	3.4%	224,359	5.4%
Tlaxcala	20,582	0.8%	56,187	1.3%
Central region	1,383,878	51.2%	1,357,411	32.5%

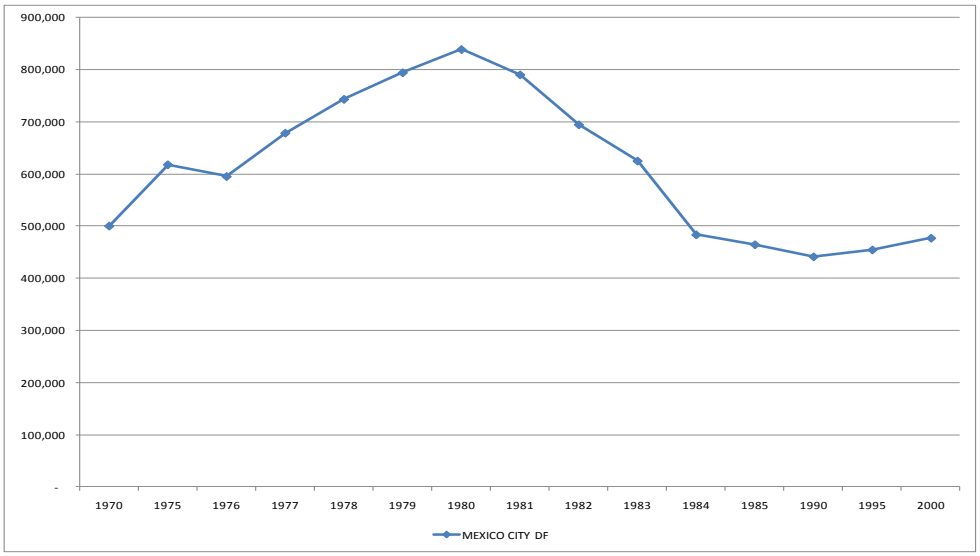
Source: Author's calculation based upon information presented in economic censuses (INEGI 1981; 1999).

What factors produced the more even economic and urban pattern remain unclear. Was the decentralisation of manufacturing the direct result of policies or the result of economic processes associated with liberalisation? I provide a review of decentralisation in Chapter Three, but suffice it to note here that by the early 1990s Mexico had a more complex urban system, with some cities experiencing higher industrial growth rates than the older large manufacturing centres of Mexico City, Guadalajara and Monterrey. This trend of industrial de-concentration was focused on more than 100 cities with important roles as regional centres, including 58 medium-sized cities and state capitals of between about 100,000 and one million inhabitants, and 106 smaller towns throughout the country (SEDESOL 1998).[8] Some cities in the central region, such as Puebla,

[7] Author´s calculations based upon data presented in CONAPO (2002), DDF (1996) and INEGI (1980).
[8] A study of census data by CONAPO identified 364 cities, 31 metropolitan areas and 333 towns of more than 15,000 inhabitants (CONAPO 2000).

Querétaro, and Toluca, maintained high growth rates during the 1990s (4.4%, 5.9% and 4.7% per annum respectively), as did key cities along the border (Tijuana, Mexicali, Ciudad Juárez) and in the north (Saltillo and Durango), west (Guadalajara, Guanajuato) and south (Mérida, Cancún, Campeche), which grew at an average rate of 6% per annum (Aguilar and Olvera 1991; Aguilar 1997, 1998, 1999; Calva 1995; Delgado 1988, 1991; Iracheta 1988, 2000; Johns 1997; Legorreta 1983; Pradilla and Castro 1989). These high growth rates outside of Mexico City were in sharp contrast with the growth rates for Mexico City, which experienced a contraction in manufacturing jobs. By 2000, manufacturing accounted for 477,197 jobs in Mexico City compared with 839,311 jobs recorded at the beginning of the 1980s, a decline of nearly half over 20 years (see Figure 1.1).

Figure 1.1: Manufacturing Employment in Mexico City, 1970–2000



Source: Author's elaboration based upon data from economic censuses (INEGI various years) and CANACINTRA (2000).

These trends raise important questions about a range of national economic policies and unplanned outcomes in other fields, such as urban and regional planning, as to what extent trade policy holds an influence on industrial location and hence urbanisation. Generally, urban and regional effects are rarely considered as part of trade policies or vice versa. Indeed, in the second half of the 20th century the formation of new towns and cities, or the expansion of existing centres, took place with little attention to the trade regime (Browder and Godfrey 1999). Similarly, trade policy rarely took account of the impacts on particular regions other than in the promotion of opening new commodity markets in, for example, oil (Garza 1986; Gilbert 1997). As I will discuss later in more detail, to some extent Mexico is an exception – especially in terms of the Maquiladora Programme, which was designed so that reformed trade regulations (liberalisation) would promote the development of northern Mexico.[9]

In the case of Mexico, I will propose that trade liberalisation brought dynamism to regional development as it opened up local producers to international competition and new market opportunities. Industries that

[9] Formally launched in June 1965 as part of the Border Industrialisation Programme (BIP) implemented by the Díaz Ordaz government (1964–1970), the maquiladora programme set out a series of free trade areas along the US border. Spurred on by high levels of unemployment in the northern states, the programme was a response to the need to attract foreign direct investment without altering the government's ISI policies for the rest of the country. The maquiladora programme allowed companies to be set up with foreign capital participation of up to 100% and special customs treatment, allowing machinery (including a broad range of equipment) to be imported temporarily free of duty, subject only to a bond guarantee that the goods would not remain in Mexico permanently (hence the maquiladora is also known as in-bond production). The programme allowed products to be assembled and finished in Mexico, with the possibility of re-exporting semi-finished or finished goods to the country of origin or to a third country. Maquiladora production is only liable to tax on the value added created in Mexico. During the 1990s, maquiladoras became the second most important economic export activity after oil and raised employment by almost 20% in some years (Calavita 1992; Craig 1971; Sklair 1993).

were no longer protected were forced to modernise and compete under a new environment dominated by post-Fordist production arrangements, outsourcing, relocation of affiliate companies, strategic ventures, mergers and acquisitions, and a general transition towards more capital-intensive production. In just three years in the 1980s, after four decades of ISI protection, the government lowered most trade barriers. Table 1.3 shows annual average tariffs and import licence coverage by industry for the period 1984–1990. In 1985, the national average tariff was 23.5% and import licence requirements covered 92% of national production. By 1987, the average tariff was reduced to 11.8%, with a maximum rate of 20%, and import licence coverage had been reduced to 25% of national production (SECOFI 1992).

Table 1.3: Average Tariff Requirements for Industry, 1984–1990

Industry (ISIC)		1984	1985	1986	1987	1988	1989	1990
Food products	Average tariff rate	42.9%	45.4%	32.1%	22.9%	14.8%	15.8%	16.2%
	Share of production subject to quota	100%	80.1%	62.2%	33.3%	20.8%	20.6%	16.8%
Textiles, apparel	Average tariff rate	38.6%	43.2%	40.4%	26.6%	16.8%	16.6%	16.7%
	Share of production subject to to quota	92.9%	66.8%	38%	31.1%	2.8%	1.1%	1%
Wood products	Average tariff rate	47.3%	48.5%	44.9%	29.9%	17.7%	17.6%	17.8%
	Share of production subject to quota	100%	75.6%	25.7%	0	0	0	0
Paper, printing	Average tariff rate	33.7%	36.5%	34.8%	23.7%	7.7%	10.1%	9.9%
	Share of production subject to quota	96.7%	54.1%	11.2%	9.5%	3.4%	4.1%	0
Chemicals	Average tariff rate	29.1%	29.9%	27%	20%	13.4%	14.3%	14.4%
	Share of production subject to quota	58.7%	54%	21.1%	4.8%	0	0	0
Basic metals	Average tariff rate	37.1%	38.5%	33.8%	22.4%	13.8%	14.3%	14.3%
	Share of production subject to quota	99%	53.1%	5.2%	0	0	0	0
Non-metallic minerals	Average tariff rate	13.6%	16.7%	18.4%	13.8%	7.9%	11%	11%
	Share of production subject to quota	93.3%	47.4%	0	0	0	0	0
Metal products	Average tariff rate	43.1%	46.3%	30%	20.8%	14.1%	15.9%	16.1%
	Share of production subject to quota	90.7%	74.8%	54.7%	51.4%	42.7%	44.1%	44.1%
Other industries	Average tariff rate	40.9%	42.9%	40.5%	27.5%	17.1%	18.1%	18.4%
	Share of production subject to quota	100%	50%	0	0	0	0	0

Source: SECOFI 1992, p. 7.

The government also abolished export controls and devalued the nominal exchange rate.[10] Although Mexico's trade reform was unilateral at this stage, the fact that it had reduced import barriers, and that this in turn had reversed the lack of incentives for exports, meant that *de facto* Mexico had opened the economy to trade and set the conditions for the incorporation of Mexico into the General Agreement on Tariffs and Trade (GATT) in 1986 and for the signing of the North American Free Trade Agreement (NAFTA) in 1993 (Aspe 1993; Lustig 1998).

The manufacturing sector's share in total exports increased from 35% to 56% in 1986 alone. Over the period of this study, from 1980 to 2000, the net increase in the total value of exports was 1,059%.[11] The increase in exports, however, was insufficient to maintain a balance of trade surplus. During the first half of the 1990s, Mexico's trade balance registered a large deficit as imports increased; this was encouraged by an overvalued peso against the US dollar, which in turn reduced the cost of inputs to goods that Mexico exported and introduced fierce competition to Mexican manufacturing as import barriers for some manufacturing goods were removed and some maquiladora production was allowed to be sold domestically under new trade regulations (WTO 2002). Statistics indicate that international trade as a percentage of GDP increased from 24% in

[10] For further discussion of Mexico's trade liberalisation policies that led to accession to GATT and to the signing of NAFTA, see Aspe (1993); Lustig (1998); and Omahe (1995a).
[11] Although the sharpest increase in manufacturing exports as a share of total exports was accentuated in 1985 by a drop in international oil prices, exports increased by a factor of 10 from US$1.111 billion in January 1980 to US$11.252 billion in January 2000, whereas oil exports as a share of total exports went from 59.9% in January 1980 to 10.6% in January 2000 (BIE 2005).

1980 to 48% in 1995 and 50.6% in 2000, but a quick glance at foreign trade figures for the period gives an idea of the extent of the impact of NAFTA as a boost to trade with the US and Canada. The total share of exports to NAFTA countries went from 68% in 1980 to 90% in 2000, with exports to the US accounting for 73% of total Mexican exports, and imports from NAFTA countries went from 68% in 1980 to 75% in 2000 (BANCOMEXT 2000).[12]

Although these trends are dramatic and indicate one dimension of economic adjustment, in terms of increases in total foreign trade activity, a breakdown of the data by sector, company, region and city reveals that the trends are not uniform. The differentiated responses of certain industries to trade liberalisation hint at more complex economic interactions. In this regard, Mexico City's transition from manufacturing to a service-sector-dominated economy over a period of 20 years, and its newly acquired economic primacy by the end of the study period, underlines the complexity of economic interactions between liberalisation, government policy, company decision-making and spatial balance.

This brief survey of the context for the research raises two questions as points of departure. First, to what extent does the trade regime determine industrial location patterns and therefore trends of industrial

[12] These increases in foreign trade with NAFTA countries were at the expense of Latin American and European countries, with the latter witnessing a fall in relative trade activity with Mexico over the period, reducing its share in exports from 16.8% in 1980 to 3.9% in 2000 and its imports from 18.7% in 1980 to 9.6% in 2000. However, countries in the Pacific Rim dramatically reduced their share of Mexican exports from 10.2% to 1.2% while increasing their uptake of Mexican imports from 7.3% to 11.3% over the same period (BANCOMEXT 2000).

concentration and ultimately urbanisation? Second, how does trade liberalisation influence location decisions and outcomes as one component of a complex economic process that includes global economic integration?

THE RESEARCH HYPOTHESIS: KRUGMAN'S TRADE REGIME AND INDUSTRIAL CONCENTRATION

To explore these questions, the thesis draws on, and critiques, an influential paper by Krugman and Livas (1996) that developed a theoretical economic model, inspired by the case of Mexico City, to explain the size and primacy of the "Third World metropolis". The paper pointed to agglomeration economies and location decisions that arise when manufacturing tries to serve a domestic market under ISI. The authors argued that a trade policy that closes off the domestic market leads to the emergence of a central megacity, while a policy of opening can lead a metropolis to lose its dominant position. Using Mexico City as a case study, Krugman and Livas argue that Mexico underwent a process of decentralisation as it liberalised trade, further arguing that the change in patterns of agglomeration in Mexico is associated with a shift in trade regime and that with extended trade liberalisation a shift from central Mexico to northern states would follow, leading a process of economic decentralisation from Mexico City.

A major reason for the concentration of manufacturing in Mexico City, Krugman and Livas argue, was the powerful backward and forward linkages the site offered.

> Firms manufacturing for the Mexican domestic market had an incentive to choose production sites with good access to consumers; the huge and relatively affluent population concentration at Mexico City ensured that sites close to the capital offered the best market access. So the size of the national metropolis is the result of a self-reinforcing process of agglomeration… (Krugman and Livas 1996, p. 39)

The argument relies critically on the assumption of significant economies of scale and industrialisation oriented primarily toward the domestic market under an import substitution regime. According to Krugman (1995) the megacity formation depends on the assumption that industrialisation is inward-looking, primarily oriented towards the domestic market. Correspondingly, the shift away from such policies may limit future growth and eventually result in cities shrinking as manufacturing relocates. Economic integration through the facilitation of trade will tend to increase the tendency towards agglomeration in regions closer to the newly opened markets (Krugman and Livas 1996). A shift towards concentration or decentralisation will depend therefore on the balance between economies of scale and the transaction costs imposed by space (including, for example, tariff barriers as well as transport costs).

Similar conclusions to Krugman and Livas were reached by Hanson (1996a), who examined how trade liberalisation and economic integration between the US and Mexico affected the location of economic activity in Mexico. To Hanson, NAFTA was likely to contribute to the expansion of bi-national production centres along the US–Mexican border as trade barriers become progressively lower. Moreover, as manufacturing activity tended to be relocated from the US to Mexico as a consequence of NAFTA,

so complementary manufacturing activity would relocate from the interior of Mexico, in particular the MAMC, to border cities. Hanson (1996a) argued that trade liberalisation had contributed to the decline of the manufacturing belt in and around Mexico City and the reorientation towards specialised industrial centres in the north, reflecting their lower transportation costs to the US market. He found that some agglomeration externalities are associated with clustering of supply industries, but not with agglomeration of firms in the same industry.

An important dimension of Krugman's argument is that the shift (decentralisation) in manufacturing away from Mexico City toward, in general terms, the northern states would have unfolded even if there were no special locational advantage to production in the north. As Krugman and Livas put it:

> …before the beginnings of import substitution Mexico City was far less dominant in Mexico's economy and manufacturing sector than it was later to become, and … since liberalization began in the 1980s there has been a dramatic shift of manufacturing away from Mexico City, especially to the northern states. Admittedly, the Mexican experiment is not as pure as we would like: the northern states are not only less congested than Mexico City, they are also closer to the US border. Our informal argument suggests, however, that much the same history would have unfolded even if there were no special locational advantage to northern production, and that trade liberalization will shrink metropolises in other Third World countries as well. (Krugman and Livas 1996, p. 140)

Their argument is that access to markets under a free trade regime reduces the transport costs of border cities, triggering circular cumulative causation. Economic decentralisation therefore occurs eventually because reliance on the domestic market declines sufficient to make the backward

and forward linkages strong enough to support the concentration of production, and a cumulative unravelling process takes place.

Considering the timing of the liberalisation of trade and of the decentralisation of industrial activity away from central Mexico, Krugman and Livas's and Hanson's analyses may have been premature. At the time of their publication, their arguments could only be conjecture based on the early phases of trade liberalisation that started in 1986 when Mexico joined the GATT, and were unable to take into account the impact of NAFTA, which began only two years before. With the benefit of greater data availability and more time for firms to make decisions according to the new economic and policy conditions, considering the changes from the vantage point of the 2000s seems more reasonable. Krugman and Livas's work therefore serves as a hypothesis suitable for testing.

AN ALTERNATIVE HYPOTHESIS: GLOBALISATION, POST-FORDISM AND CITIES

In using Krugman and Livas's work, I am aware of an important set of critiques and dissenting viewpoints, especially from economic geography (see Boddy 1999; Dymski 1996; Martin and Rogers 1994a, 1994b; Martin and Sunley 1996; Scott 1992a; 1998; 2000). These authors have welcomed the attention to space from orthodox economists but question their awareness of existing analyses of the "space economy". The Krugman and Livas model neglects to take into account a range of variables that might influence location decisions and how these may affect urban and regional distribution. Broadly, these "neglected" processes relate to economic

globalisation; changes in trade and investment regimes, vertical disintegration under post-Fordism, and the motives of regional and local clusters; de-industrialisation and the rise of the service sector; and the role played by non-national economic agents such as multi- or transnational corporations (TNCs).[13] A broad church of literature has considered economic agglomeration using these processes (see Cooke 1988; Harvey 1990; Hirst and Zeitlin 1989; Piore and Sabel 1984; Porter 1990; Sassen 1991; Storper 1997).

Krugman's approach has also been criticised for its abstract universalism and mathematical determinism (Boddy 1999; Martin and Sunley 1996), yet its appreciation of spatial definition is rather under-determined. Krugman does not offer a definition of an urban area or a "city". No limits or boundaries are suggested to help disentangle the "urban" from the "rural" or "suburban". As such, "urban agglomeration" obscures not only the differential and dynamics of economic interactions, but also the linkages and webs that connect cities together as well as connecting them to regions and nations. As a number of influential academics have noted, cities and regions are key nodes in the global economy (Castells 1996; Friedmann 1986, Knox and Taylor 1995; Parnreitier 2001; Sassen 1991; Storper 1997). Moreover, these authors note that while urban and regional economies have long been core components of the international economic system,

[13] The symbolic starting point of Fordism dates back to 1914, when Henry Ford launched the assembly line method of production. The technological and organisational innovation introduced by Ford was a continuation of existing economic trends. The corporate mode of business organisation had, for example, been developed by the railway industry over the 19th century and spread rapidly after economic partnerships such as the Trust and the Cartel appeared and flourished at the end of the century (Lipietz and Massey 1987).

globalisation has been seen to reinforce in dynamic ways the economic use and necessity of geographic centralisation and consolidation (Sassen 1991).

In particular, this perspective is at odds with Krugman and Livas's focus on trade costs and their neglect of other factors that determine company location decisions. Scholars such as Harvey (1982), Power (2000), Sassen (1991) Scott (1992b), and Thrift and Leyshon (1994) have noted how contemporary investment flows tend toward the localisation or embedding of production activities in certain "nodes" – or "command centres", in Sassen's language – of the global economy, resulting in systems for the provision of a whole range of specialised "producer" services (Sassen 1991). Importantly, these new services involve a relation with "place" where processes of global economic management, knowledge creation and dissemination and exchange occur (Pryke and Lee 1995). It is suggested, therefore, that there is a range of processes under conditions of liberalisation that would continue to oblige firms to retain established locations, to locate to more than one site and to "link up" with new or expanded service sectors.

The insights of these authors point to what I consider to be an *alternative hypothesis* to that of Krugman and Livas; namely, that the complex and dynamic nature of the spatial economy under globalisation is the foremost explanation of manufacturing change in Mexico. From this standpoint, industrial decentralisation from Mexico City is not the result of trade liberalisation alone, as Krugman and Livas have argued, but the result of complex interactions in a dynamic global environment rooted in new

business practices such as post-Fordism and vertical disintegration; an international division of labour; and finally the dynamics of new determinants of localisation under a new logic of global market economic integration. Subject to the limitations imposed by the data, the thesis will test this alternative set of ideas.

METHODOLOGICAL APPROACH

The research for this thesis adopted a deductive approach combining quantitative and qualitative methods. The quantitative analysis was focused at the company level. This is a major innovation over the work of Krugman and Livas, which does not consider sectors, much less firms, in any detail. This level of analysis was chosen because variations within any sector or industry captured by aggregate data are based on average figures for production, value added and employment and do not capture cross-variable interactions which can only be disentangled when looking at particular firms – their histories, business profiles, economic activities and business decisions that may be associated with policies.

The research used a unique set of firm-level data. The Top 500 Companies database compiled by the journal *Expansión* ("Las 500 empresas más importantes de México") was selected as a reliable and comprehensive compilation of data[14]. The database appeared for the first time in 1975,

[14] *Expansión* Journal is a Mexican magazine focused on the Economy and Finance based in Mexico City. It is characterised as a planning guide for businesses in Mexico. It provides coverage of the Mexican business character and the ideas that drive the private sector in Mexico and is recognised as one of the leading business magazines in Latin America. It started operations in 1966 and it was redesigned in 1999, currently it is a major publication targeting audiences and global businesses in Mexico and the Hispanic business community in the US. *Expansión* is owned since 2005 by media giant Time Warner, publishing division, Time Inc, and in 2007 *Expansión* launched, along with

with only the top 350 companies and a ranking based on total sales figures. A revised format was produced in 1979, the first year in which the database was computer-generated and 500 companies included. Given the absence of publicly verifiable data at the time, the original listing was produced from 40,000 questionnaires, interviews conducted by the *Expansión* team, and individual companies willing to participate because of the positive publicity derived from appearing in or advertisement contracts with *Expansión*. The 500 companies on the listing have sales figures that represent close to 70% of Mexican GDP.

From 1975, data collected in the listing have expanded to include information from the Mexican Stock Exchange and the Mexican Banking Association. The early list was weakened by companies declining to provide all relevant information due to commercial disclosure policies. As more companies have become listed on the Mexican Stock Exchange and with other public information measures, the *Expansión* list has become more systematic and robust. For the purposes of the present study, the databases for 1980 and 2000 were originally selected, marking approximate pre-liberalisation and post-NAFTA periods. But, as the 2000 base was limited as a benchmark to assess the impact of changes during the 1990s, to which some firms may have been slower to adapt, the database for 2006 was also acquired. The 2006 dataset from *Expansión* adopted a broader definition of firm size and included financial services.

CNN, CNNExpansion.com, a website specialised in economics, finances and businesses in Mexico and Latin America, adapting the model CNNmoney.com to the Hispanic market. *Expansión* has achieved editorial success over the lifespan of 40 years as the leader of business press in Mexico. *Expansión´*s annual publication *"Las 500 Empresas más importantes de México"* is the flagship publication of Expansión Editorial Group.

According to *Expansión* the inclusion of financial companies in the database was necessary because of their total sales, the principal variable for company selection, which have remained consistent over time.[15]

The research explores the profile of companies through the analysis of the main economic variables contained in the *Expansión* database. The records provided include (i) sales, (ii) exports, (iii) imports, (iv) type of company (i.e., Mexican private company, public company and transnational corporation), (v) location of company headquarters,[16] (vi) total employment, (vii) share of foreign capital, (viii) origin of foreign capital, (ix) source of financial resources (banking, Mexican Stock Exchange), (x) details of receipt of export promotion programme funds, (xi) export destination, (xii) origin of imports, (xiii) total assets, (xiv) total debt, (xv) year of starting operations, and (xvi) sector of the economy.

The quantitative methods used in this thesis vary from simple descriptive methods such as frequencies, cross-tabulations, measures of central tendency (mean, media and mode) and logarithmic growth rates to more complex quantitative techniques that require a little more explanation. First, the research used a concentration coefficient, a measure that allows for comparisons between sets of subgroups and the total, in this case between the share of manufacturing as part of the economy at state level and the share of manufacturing as part of the national economy. Second, tests were designed to determine the significance of differences between

[15] Interview with Elise Lemaire, Commercial Manager of *Expansión y Dinero Inteligente*, CNN-Expansión.
[16] Which, according to Mexican government regulations, is also the fiscal address.

two or more groups. Bi-variate analysis explores whether the differences between the distributions of two variables are statistically significant. As most of the datasets record ordinal or interval/ratio data, the most appropriate test was a parametric test allowing a comparison of parameters, specifically the statistical parameter of *means* of, for example, TNCs versus Mexican corporations or export-oriented companies against non-exporters.

The third technique is principal component analysis (PCA), a data reduction technique designed to represent a wide range of attributes on a smaller number of dimensions, which enables an assessment of the degree to which items measuring the same phenomenon (electoral preferences, job satisfaction, poverty, etc.) reflect the same concept.[17] PCA provides an assessment of the factorial validity of questions that make up scales by indicating the extent to which these measure the same concepts or variables. PCA also helps with a large number of variables by determining the degree to which they can be reduced to smaller sets. The most common use of factor analysis is to explain the relationships between a number of variables without determining the extent to which they fit into a particular model.

For the present research, PCA is useful in order to determine how information from various indicators (variables) can be combined to measure a firm's relative "global economic orientation" status (globality),

[17] PCA is a type of factor analysis. In statistical terminology, both terms are used interchangeably.

associated to free trade regime. It is important to remember that PCA is primarily concerned with describing the variations or "variance" shared by elements based on three or more variables. The result of PCA is the creation of a single *Globality Index* which assigns a specific value or score to each sample firm representing the company's global status in relation to all the other companies in the sample. The index consists of a combination of individual indicators with a significant correlation to one another based on shared underlying global components. PCA can be used to identify from a group of indicators the underlying components that can at least partially explain why, for the purposes of the present research, the indicator values differ between companies. Each component is assumed to capture single attributes that are shared by companies. One of the reasons why companies have different values for each of the variables is because of their relative global status. The objective for using PCA in the globality assessment exercise, therefore, is to extract the "global component" that can be used to build a company-specific index of relative globality. In Chapter Three, PCA is applied to indicators that are found to show a strong correlation with the defined global benchmark indicators (foreign trade and foreign capital flows). Filtering out the indicators in this way leads to a reliable global indicator that correlates consistently and strongly to relative globality. To complete the filtering process all the variables registering a significant level of correlation are added to the list of globality indicators (see Chapter Three). The model was constantly refined and the results were robust and statistically significant.[18]

[18] With a Kaiser-Meyer-Olkin measure of sampling adequacy of >.80 and a Bartlett's test of spherisity significance of >.0005.

The main reason behind the decision to conduct PCA tests was to produce empirical evidence using a strong statistical tool to create parameters, not only to allow descriptive analysis but also to analyse the processes involved. The PCA was constructed to include most of the variables associated with the global factors mentioned above.[19] The statistical significance of the model was high, and the results were consistent when contrasted with individual cases. The results were then ranked. The analysis is presented with a special focus on the top 100 companies in the ranking (most globally oriented companies).

A different methodological approach is adopted in Chapters Four and Five, which present case studies of two important sectors of the Mexican economy. A qualitative approach at sector level was conducted in order to analyse decentralisation trends, selecting two sectors with different characteristics and patterns of concentration (see Appendix 1). The automotive and consumer electronics sectors were chosen because they present the highest growth trends in output and exports after trade

[19] Factor analysis is primarily concerned with describing the variations or variance shared by element scores (people, units, etc.) based on three or more variables. The Kaiser-Meyer-Olkin measure of sampling adequacy tests an index for comparing the magnitudes of the observed correlation coefficients with the magnitudes of the partial correlation coefficients. The smaller the value of the index, the less appropriate the model. In general, scores above 0.60 are acceptable, above 0.70 are good, and above 0.80 are commendable, here the model score is (0.775). The Bartlett test for sphericity, if significant (as it is here), means that the dependent measures of two or more variables are correlated.
In the component matrix the first component that is "extracted" accounts for the largest amount of variance shared by the test. The second factor consists of the next largest amount of variance which is not explained by the first one. In this case the variance accounted for by the first factor is 0.77 or 77% of the total variance. In the component matrix the first factor extracted from an analysis is that which accounts for maximum variance. Since the object of the factor analysis is to reduce the number of variables we have to handle, this would not be achieved if we used all of them. This is really a question of how many of the smaller factors we should retain, as it is the first few that explain most of the variance.

liberalisation. For a time they represented the most dynamic sectors of the economy under the new economic regime, a situation confirmed by the Globality Index and the scores for firms in both sectors, which ranked at the top end of global companies.

These two sectors also present different characteristics to be considered together as candidates for the qualitative research. For example, the automotive sector has a long tradition in Mexico and has gradually integrated into the Mexican economy in spite of being a sector dominated by TNCs, with high value added levels, whereas consumer electronics, also a sector dominated by TNCs, has a low level of integration in the productive chain and low levels of value added. Both sectors were concentrated in the manufacturing belt of Mexico City before the period of liberalisation, and over the 1990s have changed their location distribution. The automotive sector, although not exclusively, has re-concentrated in the cities of central Mexico, and consumer electronics, notably, in cities along the Mexico–US border.[20]

The qualitative information for these chapters was gathered through 30 interviews conducted with officials at the Mexican Ministry of Economic Affairs, as well as officials at companies specialising in machinery and metal production, and staff and managers of automotive companies (Nissan, Volkswagen, Ford and General Motors) and consumer electronics companies (including Philips, Daewoo, Sony and Sanyo). A number of

[20] With the exception of Coahuila and Sonora, the largest share of automotive employment is located in non-border states.

interviews were also conducted with local suppliers to the automotive or consumer electronics sectors. A full list is available in Appendix 5.

Finally, a range of national and local newspapers and specialist magazines was consulted. These included, *inter alia*, the *Automotive Year Book*, *Electronics Times*, *Expansión* and *Mundo Ejecutivo*. Material held in the following archives was also collected: the Asociación Mexicana de la Industria Automotriz (AMIA, Mexican Automotive Industry Association)[21]; Asociación Nacional de la Industria Electrónica (ANIE, National Electronics Industry Association); Cámara Nacional de Manufacturas Eléctricas (CANEME, National Chamber of Electrical Manufacturing); Cámara Nacional de la Industria de la Transformación (CANACINTRA, National Chamber of Manufacturing); and Cámara Nacional de la Industria Electrónica y de Telecomunicaciones (CANIETI, National Chamber of the Electronics and Telecommunications Industries).

CONCLUSION AND THESIS ORGANISATION

The thesis sets out to examine the transformation of Mexico City against a context of economic policies, particularly those related to changes in the trade regime. Broadly, the thesis is motivated by questions regarding the long-standing debate about the consequences of the so-called neo-liberal policies. By having a Mexico City-centred approach and by looking at industrial change, my aim is not to look at the process of decentralisation per se or to assess the success of regional policies in promoting a more

[21] AMIA annual reports are referred to in the text by their individual year of publication, and are referenced in the bibliography as a set.

even regional development. The first aim of the research is to contribute to the debate on the so-called consequences of liberalisation policies in Mexico by focusing on the deep changes seen at the urban level, notably in Mexico City, which was the nation's economic hub for so long.

Chapter Two provides a synoptic critique of the key literature underpinning the research. One of the most prominent debates in the social sciences at the beginning of the 21st century has concerned free trade and the transition from protectionist regimes. Paul Krugman has been prolific in debating free trade ideas and suggesting the industrial and regional changes that occur as a consequence of trade liberalisation and economic integration, and his joint work with Raúl Livas about Mexico City provides inspiring ideas that form the basis to my main hypothesis. The chapter also reviews writing on globalisation and draws attention to debates from economic, sociological and geographical studies, which focus on post-Fordism, the new international division of labour (NIDL) and the role of centrality in the global economy.

Chapter Three puts forward the context in which the process of economic liberalisation in Mexico took place, focusing particularly on trade liberalisation. It looks closely at how this economic process led to changes in the balance of Mexico's national economy, and explores the relationships between global economic integration and regional restructuring processes in Mexico. An empirical analysis comparing Mexico City with the northern part of the country, the latter arguably the most dynamic region under the aegis of free trade, is also presented in

Chapter Three. Using national aggregated data and company-level data from the Top 500 Companies list, my aim is to present empirical evidence of the regional transformation described briefly in Chapter One.

The aim of Chapters Four and Five is to analyse the effects of trade liberalisation in Mexico and test Krugman's ideas for two specific industries. This analysis aims to explore, at the most disaggregated level of economic activity, localisation patterns over time, from the ISI period onward. By analysing industrial sector performance, from the general to the particular of the company level, these chapters assess concentration trends in order to provide a more specific insight into the Krugman argument that liberalisation promotes industrial decentralisation.

Chapter Six considers decentralisation from the perspective of Mexico City. The chapter looks at how the city has been affected by economic change and, by examining the effects of these changes on the case study automotive and consumer electronics sectors, attempts to understand how the city's decline as a location that is attractive to industry has played out. Rather than investigating the consequences solely from the position of labour in manufacturing, the analysis looks at the standards of living for the Mexico City population. Trade liberalisation, to follow the logic of the principal hypothesis, suggests industries will restructure but outlines no analysis, or concern, for those actually or formerly employed in the

original centres of manufacturing. [22] Using survey data, more fully explained in Chapter Six, from age group cohorts that were economically active at the time of economic restructuring (1982), the chapter aims to gather opinions on how the 20-year transformation affected peoples' everyday lives. The views gathered on labour conditions and practices, social mobility and opportunities were particularly helpful in trying to contextualise concepts such as globalisation and trade liberalisation and form conclusions from a broader and more pragmatic perspective.

Chapter Seven presents the conclusions to the thesis. These will focus on the research implications of location being an outcome of economies of scale and transaction cost interactions in a transitional economy that has moved from a closed trade regime to an open one, contrasting Krugman and Livas's forecasts with the thesis findings.

[22] A number of authors have looked at social and economic change in Mexico City over or within the period 1980–2000, but none have done so from the perspective adopted in this thesis (see Coulomb and Schteingart 2006; Parnreitier 2001).

Chapter Two: Production, Markets and the Role of Centrality in the Global Economy

OVERVIEW

This chapter provides a critical review of the debates concerning new economic geography and globalisation in order to establish a theoretical framework within which to place the research. In the first section, I present a review of the new economic geography literature, including the ideas of Krugman, in more detail. In the second section a historical perspective is put forward, with the aim of providing a time frame and outlining the circumstances under which processes of globalisation emerged. The third section draws attention to debates on economic agglomerations absent in the new economic geography literature. This section analyses the role that centrality plays in the process of globalisation and what is termed the global cities hypothesis.

The main focus of this chapter is to identify different analytical approaches to the understanding of economic agglomerations associated with the rise and decline of industry and interactions with the trade regime. This discussion is a prelude to a more detailed review of Mexico City's transformation as the result of trade liberalisation and the globalisation of the Mexican economy.

THE NEW ECONOMIC GEOGRAPHY

Paul Krugman's innovative ideas have brought a new approach to mainstream economics' construction of explanatory models of the relationship between economic agglomerations and geographic space. Krugman, under what he has branded the "new economic geography", has developed a series of models that have explored, from a formal economic perspective, central place theory, market potential, the free trade regime, increasing returns and externalities, the localisation of economic activity, and the idea of circular and cumulative causation deriving models of economic clustering and industrial agglomeration (Krugman 1991a, 1991b, 1991c, 1993a, 1993b, 1995, 1997). In particular, Krugman (1995) emphasises the role of the trade regime in generating spatial agglomeration of economic activity based on a model of increasing returns and spatial transaction (transport/trade) cost.[23] Both international trade and the location of economic activity more generally are, according to Krugman (1997), characterised by external economies. He argues that hitherto the focus on equilibrium models has led to a neglect of the spatial dimensions of economics and especially a "lack of attention within mainstream economics to urban and regional economics" (Krugman 1995, p. 25).

Krugman's (1991a) approach aims to demonstrate that economic agglomeration can result from the interaction of increasing returns and

[23] Krugman appears to use the terms "transport costs" and "trade costs" interchangeably to denote a general idea that distance matters in determining companies' access to markets and therefore their locational decisions and the evolution of agglomerations.

transaction costs. Using formal mathematical models, he derives single-cluster and multi-cluster outcomes. The basic economic principles involved are circular causation, increasing returns, transport costs and the weight of the externalities. In the presence of economies of scale, Krugman argues, firms have incentives to concentrate production at one site. If, furthermore, transport costs also exist and demand is not uniformly distributed, the optimum location is where demand is greatest. However, as demand may be greatest where firms are already located, we are faced with circular causation that can result in the formation of an industrialised core (Krugman 1991b, 1991c, 1993a).

Krugman sets out to explore the idea that increasing returns represent a key factor in international trade and in the localisation of economic activity by arguing that:

> ...increasing returns affects economic geography at many scales. At the bottom of the scale, the location of particular industries clearly often represents the 'locking in' of transitory advantages. At an intermediate level, the existence of cities themselves is evidently an increasing returns phenomenon. At the grand level, the uneven development of whole regions can be driven by cumulative processes that have increasing returns at their root. (Krugman 1991b, p. 10)

Krugman considers the most striking feature of the geography of economic activity to be geographical concentration, which is "clear evidence of the pervasive influence of some kind of increasing returns" (Krugman 1991b, p. 5). The new trade theory argued that "much trade represents arbitrary specialisation based on increasing returns, rather than an effort to take advantage of exogenous differences in resources or productivity i.e. increasing returns rather than comparative advantage" (Krugman 1991b,

p. 7). In *Geography and Trade*, Krugman (1991b) also develops a parallel argument linking the localisation of economic activity to Marshallian-type external economies.[24] This represents a complementary explanation on the nature of agglomeration, suggesting that agglomeration based on scale economies operates at a broader national or regional level while external economies apply at a more localised level (Krugman 1991b, pp. 70–71).

Krugman's theoretical lines of thought have been followed by other scholars in what is now known as the new economic geography (see Abdel-Rahman and Fujita 1990; Allen 1999; Fujita 1988, Fujita and Thisse 2002; Hanson 1996a, 1996b, 2005; Hanson and Harrison 1999; Venables 1996, 1998, 2001; Venables and Limao 1999). Krugman, Fujita and Venables have been central figures associated with attempts within economics to get the "mainstream" of the discipline to pay attention to the long-neglected role of geography in accounting for the pattern and nature of economic phenomena. The new economic geography scholars attempt to analyse this seeming "fact" of economic life by providing a formalised economic account of the spatial economy, thereby offering a starting point for explaining "where economic activity takes place and why" (Fujita 1995, p. 1).

[24] Marshallian external economies refer to intra-industry economies of localisation. These are most commonly: (i) economies of specialisation, (ii) labour market economies or (iii) knowledge spillovers. Specialisation refers to a localised industry that can support a greater number of specialised local suppliers of industry-specific intermediate inputs and services, thus obtaining great variety at a lower cost. Labour market economies are localised industries that attract and create pools of workers with similar skills, smoothing the effects of the business cycle both on unemployment and on wages through scale. Knowledge spillovers relate to information flows about innovation among agents located within the same area thanks to social bonds that foster reciprocal trust and face-to-face contact. Clusters offer more innovation opportunities than scattered locations (Marshall 1994; Krugman 1991a).

A defining issue of the new economic geography is how to explain the formation of a large variety of economic agglomeration (or concentration) in geographical space (Fujita et al. 2001). The new economic geography is based around two broad questions: when is a spatial concentration of economic activity sustainable, and when is a symmetric equilibrium, without spatial concentration, unstable (Fujita et al. 1999, p. 9)? The approach is based upon the three-way interaction of increasing returns with the mobility of productive factors and the cost of transportation. In conjunction with this interaction the authors define the model of the development and sustainability of industrial agglomerations on the basis of defined centripetal forces that are loosely based around Marshall's trinity of external economies (Marshall 1920) and centrifugal forces such as immobile production factors, land rent and pure dis-economies.

The resulting account is that firms become drawn towards centres of population and demand, and develop interdependencies within their respective industries. Hence, the existence of economic agglomerations and cities is explained: "the world tends to organize itself into zones of industrial specialisation: Spatial structure need not be imposed, because it evolves of its own accord" (Fujita et al. 1999, p. 325). Furthermore, because of increasing returns and the interdependence of firms' location decisions, the thesis suggests that a "lock-in" situation exists which makes this evolving spatial structure, within a certain range, quite robust to changes. In creating and sustaining spatial concentrations, we are told it is backward and forward linkages that play perhaps the key role: in a world where increasing returns and transport costs are both important, forward

and backward linkages can create a circular logic of agglomeration. In other words, all things being equal, producers want to locate close to suppliers and to their customers, which means that they will locate close to each other (Krugman 1991a, 1991b, 1993b, 1998a; Krugman and Livas 1996).

Krugman's approach has been criticised for its abstracted universalism, reductionism and mathematical determinism (Boddy 1999; Dymski 1996; Knox and Agnew 1994; Martin and Sunley 1996). In particular, the basic geographic units of analysis used throughout the new economic geography literature are simplistic in that they assume space to be something that can be abstracted from social, political and cultural constructions and practices. A first criticism is that Krugman's urban growth approach presents no definition of what constitutes an urban area or a city. As Boddy argues:

> There is no attempt here to recognise the fact that the city can be many different things, as Krugman and Livas´use of the term appears to simply refer to a large concentration of population and industry. Such definitions not only hide the differential and place-bound dynamic construction of such interaction, but also the linkages and webs that connect cities together as well as connecting them to each other, their regions and their nations. (Boddy 1999, p. 835)

In essence, Krugman sees the city as a "container" for economic activity. Second, by focusing on trade or transport costs and neglecting to unpack the complexity of exchange or interaction costs, Krugman and others are in danger of missing out on central elements of firms' location decisions. They do not allow for the idea that as technology changes both the nature of production and the nature of transport (for example, through

subcontracting in different locations), the possibilities for companies' "transport" may change in such a way that transport costs become a much less significant factor. Third, the models have both "firms" and "labour" opting in and out of locations on the basis of maximisation and equilibrium, but "labour", like "firms", operates with a diverse number of ties and barriers to entry and exit that make the categories themselves as well as the assumption of perfect mobility unrealistic (Martin and Sunley 1996). Finally, this approach neglects ideas of internal transaction costs within firms that are important to understanding both divisions of labour and economic agglomerations (Storper 1997).

Combining these points raises an awareness that Krugman's work and the new economic geography would benefit from modification to accommodate present conditions. The relative neglect of technological innovation and knowledge inputs into the models of productive process gives the models the feel of 19th-century writings that stressed transport, labour and natural resources; the models therefore fail to explain agglomeration in contemporary knowledge-based industries such as finance and Information Technology (IT).[25] My research is concerned with agglomeration or dispersal of economic activity under conditions of global market economics, technological change, TNCs and the NIDL, particularly the rise of the service sector and producer services.

[25] The assumption of the central place and transport costs in firm behaviour explicitly links the analysis with earlier work within classical location theory (such as Von Thünen 1966, orig. 1826) and regional science (Dimski 1996; Martin and Rogers 1994a, 1994b; Martin and Sunley 1996; Scott 2000).

THE GLOBALISATION DEBATES

A different account of economic activity to that of Krugman has come from attention to globalisation, captured by a multitude of terms such as Dicken's "global shift" (1992), Giddens' "action at a distance" (1990), Harvey's "time-space compression" (1990) and Ohmae's "accelerating interdependence" (1995b). Most observers agree that globalisation is not a new phenomenon but the continuation of developments that have been going on for a considerable time, and that it should therefore be considered an ongoing process.

The precise depth and timing of the globalisation process, however, has been subject to considerable debate. To Sachs and Larrain (1993) globalisation must encompass the idea of "macroeconomic unification", which means that the world is now a single economy in the macroeconomic sense; the main determinants of income and employment can now only be understood at a global level. According to Cohen and Zysman (1987) globalisation marks a structural shift in international markets and the production base of advanced countries, which changes how production is organised, where it occurs and who plays what role in the process (Cohen and Zysman 1987, p. 79). Cohen and Zysman, and Drucker (1989), argue that fundamental and possibly irreversible change has occurred in the world economy.

Similarly, Dicken (1992) has argued that we are witnessing the emergence of a new "geo-economy" that is qualitatively different from past processes of integration, in which "processes of globalisation, internationalisation and deep integration" coexist (Dicken 1992, p. 8). To Harvey the reshaped world economy has the capacity to work as a unit in real time (Harvey 1990; Held et al. 1999). Harvey argues that the impetus behind globalisation was the post-Second World War restructuring that involved a search for new forms of production and market niches. The *flexible production system* (or post-Fordism), Harvey argues, was the response of the market to the rigidities of the Fordist production-line system, which was adopted as the standard manufacturing system during the first part of the 20th century (Harvey 1990). Post-Fordism relies on a combination of outsourcing production – the physical fragmentation of the production process – and mass consumption patterns, a process where TNCs have played a key role in leading the transformation of a new geography of production (Lipietz 1993; Lipietz and Massey 1987; Sassen 1991).

In this regard, a number of theorists argue that the global economy evolves when core processes and elements of the economic productive system have the capacity to work as a unit in real time on a global scale under a flexible specialisation regime (Dunning 1992; Drucker 1989; Held 1999). According to these authors, technology and the externalisation of transactions, and thus the disintegration of large firms and the rise of outsourcing processes undertaken by smaller, less specialised and locally networked ones, creates a tendency towards spatial re-agglomeration on the one hand, and regionalisation counteracting the tendency towards

dispersion on the other – two apparently contradicting trends, but coexisting economic expressions of the global economy. In relation to flexible specialisation, Storper and Thomadakis argue:

> "it now seems that a new, hegemonic model of industrialisation, urbanisation and regional development has been making its historical appearance in the US and Western Europe" (1998, p. 21).

The post-Fordist production system relies on the fragmentation of production and new ways of providing services to producers (financial services, insurance, marketing, consulting) rather than to consumers, and this trend naturally creates regional networks of specialised services (Shaw 2002). According to Marcussen (1999), most of the empirical work done on flexible specialisation has been confined to particular localities and industrial sectors; this means that these studies offer a weak basis for generalisation as production techniques and organisational practices change with geography and culture, and between industries.

Many scholars agree that the concept of flexibility is multidimensional and can mean different things. The literature employs numerous terms to refer to flexible specialisation (Browne et al. 1984; Gupta and Goyal 1989; Upton 1994; Yashuhiro 1993; Zelenovic 1982) – among the two most popular are "lean production" and "Toyotism". According to Willaiams et al. (1992), lean production is based on low inventories (known as "just-in-time"), exacting quality control, flexibility and rapid response to changing consumer preferences. In the same way, Monden (1995) uses "Toyotism" to refer to a system whose goal is to maintain a continuous flow of products in order to adapt to fluctuations in demand. The basic elements

of this system are: (i) just-in-time production; (ii) automation of the principle, a process where defective units are never passed on to a subsequent work station; (iii) production smoothing, which allows many varieties of a product to be made in a single day; (iv) workforce flexibility, which means that multifunctional workers rotate jobs and their number is varied to meet changing production quotas; (v) short machine set-up times and changes to facilitate a continuous and viable flow of products; and (vi) standardised jobs and operations.

Nevertheless, strong evidence can be found to argue that flexibility is becoming a major competitive advantage and even a condition for adaptation and survival for companies operating at a global level (De Groote 1994; Ettlie and Stoll 1990; Mansfield 1993; Upton 1994). To Massey (1995), the new possibilities of fragmenting the productive process and reallocating each part according to comparative advantage is determined by the price of labour (see also Gordon 1988). As Fröber et al. (1980) argue, the traditional international division of labour in which less developed countries were relegated to being producers of raw materials has changed as TNCs have established a global manufacturing system based on labour-intensive export platforms in low-wage areas.

The New International Division of Labour (NIDL) thesis, however, does not explain the decision of TNCs to touch down where labour is relatively costly (Fernández 1989). Indeed, although labour costs are an important component of overall production costs, the recent trend towards more capital-intensive production suggests that other factors such as

macroeconomic stability, infrastructure, the availability of skilled labour (necessary for a more flexible production system), legal framework, relative productivity, worker attitudes, and crime and security play major roles in location decisions, especially for TNCs (Porter 1990; Beccattini 1992). Porter (1990) distinguishes between multi-domestic industries, which are characterised by relatively independent national markets, and global industries, which target cross-national customer desires using global supply chains. In global production industries, similarity in product demand allows firms to reap the benefits of economies of scale through standardisation. Greater standardisation in turn facilitates the international integration of operations and encourages the pursuit of farther-flung economies through production centralisation at fewer locations, leading to the creation of industrial clusters (DeWitt and Meyer 1998; UNCTAD 1994).[26]

To writers such as Harvey (1990), Dicken (1992) and Ohmae (1995a), these changes are only the "surface appearance" of capitalism, with the underlying logic of capitalist accumulation remaining the same. What has changed, these authors argue, is the institutional basis of this new global order, which was formalised at the international conference promoted by the US and Western European countries at Bretton Woods, New Hampshire, in 1944. The conference resulted in the creation of two international financial institutions: the International Monetary Fund

[26] Subsidiaries have become an important means for firms to respond to more open economies, with some firms becoming corporate groups of subsidiaries (Zey and Camp 1996) organised through an array of joint ventures, strategic alliances and production consortia. The proliferation of new networks of corporate affiliates means that the traditional structure of the firm has become blurred (OECD 1996a).

(IMF) and the International Bank of Reconstruction and Development (later renamed the World Bank). The primary objective of the Bretton Woods system was to stabilise and regulate international financial transactions between nations on the basis of fixed currency exchange rates, with the US dollar playing the anchor role. The collapse of Bretton Woods in 1973 with the adoption of floating exchange rates shifted the emphasis toward fiscal and financial policies as means to ensure national economic stability (Bird and Killick 1995; Edwards 1995a; Van den Bulcke et al. 2001).

The other major pillar of the post-war international economic order was the notion of free trade. This led to the creation in 1947 of the GATT, which was charged with reducing tariff barriers and prohibiting trade discrimination. Its rulebook called on member countries to further the expansion of multilateral trade (multilateralism) by dismantling all but minimum barriers to trade and reducing import tariffs and quotas (Burtless et al. 1998; Ohmae 1994; Reich 1991).[27] Successive negotiations between the contracting parties, known as rounds, were held with the aim of reducing tariff levels. The first meeting was held in Geneva in 1947, and the eighth, the so-called Uruguay round of trade negotiations, was begun in 1986 and concluded in 1993. The earlier rounds dealt mainly with tariff

[27] The economic tools available to a government to restrict the inflow of imports vary between countries; the most common are tariffs, quotas and non-tariff barriers. Import tariffs are taxes imposed on commodities and they may be levied on an *ad valorem* basis – i.e., as a certain percentage of value or on a specific basis as an amount per unit. Quotas in international trade are the quantitative limits placed on imports of specified commodities. The protection afforded by quotas is more secure than that obtained by raising import tariffs, as the effect of the latter will depend on the price of the imported commodities. Non-tariff barriers may include regulations that favour domestic products over imported products, such as health, environmental or political regulations that affect international trade flows.

reductions, but later negotiations included other areas such as anti-dumping and non-tariff measures. The later rounds culminated in the creation of the World Trade Organisation (WTO) in 1995 and its extension to include countries such as China (WTO 2002).[28]

A key feature of global economic integration, facilitated by greater liberalism, was the increased importance of international capital through foreign direct investment (FDI). During the 1980s the real net flow of funds was from highly indebted developing countries that received less international financing for their own development but were transferring resources to developed countries (Maxwell 1999). During the latter part of the 1980s and through the 1990s, actions were taken to reverse these flows and attract FDI.[29] Unlike trade rules, financial services remained largely unorganised during economic restructuring. Saturated by currency liquidity and fearful of a return to crisis, financial markets rejected and avoided any kind of collective control. Rather, a series of broadly complementary policy recommendations from international organisations, some of which were imposed as so-called "IMF conditionality" arrangements, created a general consensus (Maxwell 1999; Santín 2001). The consensus, a range of neo-liberal policies inspiring the epithet of "Washington Consensus", included central bank autonomy, anti-inflation

[28] The transformation of the GATT to the WTO was made possible with the end of the Cold War, which dramatically changed the configuration of world order and strengthened neo-liberal ideas.

[29] This change was coterminous with the rise of institutional investors such as pension funds and the "securitisation" of funds (allowing firms to borrow directly from the markets rather than through banks) that increased the supply of tradable financial assets. To mention just one figure, in 2000 the daily average of international stock market activity was about $1.2 trillion per day or 50 times the total value of annual international trade (Mathieson and Schinasi 2001).

policies and deregulation of financial and trade activities (Williamson 1993). While net FDI has been channelled to a number of developing countries, there is much debate about the allocation of capital to financial services and the threat of sudden withdrawal. As the financial crises in Mexico in 1994–95 (the Tequila crisis) and in Asia, Russia and Brazil (1998) and Argentina (2001–04) indicate, the potential for financial instability in national and regional economies remained (Edwards 1995a, 1995b).

The Organisation for Economic Cooperation and Development (OECD) stresses an important distinction when it comes to understanding the geographical dispersion of industrial and service activities and the cross-border networking of companies such as TNCs (OECD 1992). The OECD distinguishes globalisation from internationalisation, the latter being the simple extension of economic activities across national boundaries, a single dimension referred to as market integration that leads to a more extensive geographical pattern of economic activity. By contrast, globalisation takes market integration a stage further to a functional network of productive activities (global production) underpinned by the development of worldwide systems of transport and communication, increasing the speed at which the world can exchange goods, information, capital and people. Globalisation reflects the emergence of interregional networks between communities, states, international institutions, non-governmental organisations and TNCs. As proposed by Reich (1991) and Ohmae (1995b), this argument leads to the idea of a borderless world in which nation-states are no longer significant actors or meaningful

economic units, and in which consumer tastes and cultures are homogenised and satisfied through the provision of standardised global goods produced by corporations with no allegiance to place or community in a truly international division of labour (Massey 1983).

In making the shift from internationalisation to globalisation, technological change has played a crucial role through its impact on the economics of production and on the flow of information (Dicken 1992). Technology reduces transport and information costs and strengthens the formation of a free market system. In the previous stage of capitalism, the productive system relied on physical infrastructure – roads, electricity and transport – whereas in the global economy, Dicken believes, the infrastructure is telematics, or as he puts it, the "great growling engine of change" (1992, p.73). It is argued that technological trends are reconfiguring the location, ownership, and management of productive activities among countries and regions. The increasing ease with which technical and market knowledge, capital, physical goods and managerial control can be extended around the globe has made the integration of economic activity between far-flung locations possible (Guile and Brools 1987).

Castells (1996) takes this argument further, coming up with a theory of a new world order by asserting that we are now living in an "informational" society where global forces mediated by the IT and communications revolutions are reshaping states, ethnicity and ideology around the world. According to Buzan and Little (2000) the "interaction capacity" defined

primarily but not exclusively by communications technology increases the potential velocity of the global diffusion of goods, information, capital and people that may be more or less regularised through networks or sites of power (Castells 1996; Mann 1986).[30]

Other authors are more sceptical or more cautious as to the exact timing and extent of globalisation. Perhaps the most well-known critique is offered by Hirst and Thompson (1999), who agree that the world economy was more open and more integrated between 1870 and 1913, when an open regulatory framework dominated, short- and long-run capital movements were unsupervised, and citizenship was freely granted to immigrants. Hirst and Thompson argue that under these conditions markets linked a growing share of world resources and output, exports outgrew domestic output in the majority of capitalist countries, and migration levels were unprecedented. Their argument receives qualified support from Gordon (1988) and Glyn and Sutcliffe (1992), who argue that while in relative quantitative terms the world economy was perhaps at least as integrated economically before 1913 as it is today, the nature of integration was qualitatively different and, in particular, the spatial organisation of production has changed over the 20th century.

Another group of concerns relates to the governance of globalisation, and specifically whether nation-states are being eclipsed by private corporations and larger political structures such as multi-country regional

[30] These ideas owe their origin to McLuhan's notion of a "global village" (McLuhan and Powers 1989), which describes the impact of radio in the 1920s in bringing faster and more intimate contact (see Drucker 1989).

trading blocs like NAFTA, the European Union or Mercosur (Kothari 1995; Luard 1990). Hirst and Thompson (1999) argue that the world economy is dominated by uncontrollable market forces, and that it has as its principal economic actors and major agents of change truly transnational corporations which owe allegiance to no nation-state and locate wherever in the global market advantage dictates (1999, p. 17). As reported by Berger and Dore (1996), Koechlin (1995) and Mann (1997) national political structures remain important even as economies internationalise or globalise. Indeed, according to Giddens (1990) and Held (1999), globalisation requires the concerted effort and agreement of states that are in command of national market regulation and therefore are ultimately responsible for the policies that lead to the creation of regional and global markets.[31] There is also evidence that while tariff barriers have been lowered on average, non-tariff barriers such as local content rules have been more scrupulously monitored while liberalisation agreements for sectors such as agriculture, energy and steel have been resisted (WTO 2002; Stiglitz 2002).[32]

From this standpoint, the state appears to have retained considerable leverage over the specific location decisions of firms (Cox 1993, 1997;

[31] There is an argument for new regionalism indicated by the relative declines in inter-bloc trade even as intra-bloc trade increases (Emmerij 1992; Johnson 1991; Sturgeon 2001).

[32] Protectionist voices can still be heard – for example, with regard to nurturing "infant" industries, including IT, and countering 'dumping' (the sale of a commodity in a foreign market at below the production cost in order to gain a competitive advantage in the new market), and as retaliation against restrictive measures imposed by other countries (WTO 2002). In addition, a new set of protectionist barriers known as "rules of origin" has been introduced as the result of the consolidation of the trade blocs. These rules usually measure the percentage of value added produced and traded within countries bound by free trade agreements against those which were not produced within the bloc (WTO 2002).

Massey et al. 1992; Shoenberger 1994; Storper 1997). As pointed out by Stiglitz (2002), certain nations and regional blocs have managed to determine the form and means of achieving globalisation:

> The critics of globalisation accuse Western countries of hypocrisy, and the critics are right. The Western countries have pushed poor countries to eliminate trade barriers, but keep up their own barriers, preventing developing countries from exporting their agricultural products and so depriving them of desperately needed export income ... the West has driven the globalisation agenda, ensuring that it garners a disproportionate share of the benefits, at the expense of the developing world. (Stiglitz 2002, p. 6).

Stiglitz was pointing to asymmetrical outcomes, especially for developing countries. The observation is supported by Goldsmith and Mander (2001) and Morris (2001), who charge that the changing integration of economies through trade increases income inequality. Trade liberalisation, they argue, allows developed countries to export goods that intensively use the production factors with which they are abundantly endowed (skilled labour) and import goods that use the production factors which are relatively scarce in these countries (unskilled labour). In such conditions it is not surprising that so many authors were pessimistic that globalisation would enhance equitable economic growth, social mobility and improved welfare (Gray 1998; Hirst and Thompson 1999; Stiglitz 2002).

Yet despite recent advances in growth theory, the effect of trade and economic integration on national and regional economic growth is still very much a matter of debate (Rodrik 1999). Authors such as Wood (1994) and Krugman (1991a) assert that there is a positive association between trade liberalisation and a reduction in regional economic disparities. Contrary to this vision, other authors (Goldsmith and Mander 2001; Gray

1998; Hirst and Thompson 1999; Sassen 1991) consider that liberalisation of trade leads to greater concentration of economic activity and greater polarisation. They assert that world trade is organised under conditions that favour only rich nations, leaving poor countries unable to compete against often subsidised goods and products, with negative social and environmental consequences for poor countries (Retallack 2001).

Finally, the idea that globalisation might "close the gap" between developing and developed countries has been critiqued for the effect that globalisation has on the prospects for internal equality. For a number of authors, the primacy of freer private investment may be good for growth, but it will be achieved at the price of rising inequality (Christopherson and Hovey 1996; Panuco 1999; Sen 1999). Data show that for most OECD countries, including Germany, the Netherlands, New Zealand, Norway, Japan, Sweden, the US and the UK, there has been an increase in wage and income inequality (Milanovic 2005). Aghion and Howit (1998) explain the increase in income inequality as being due to changes in wages (expected to be a factor in a globalised economy), which in turn can be broken down into four elements: (i) an increase in the level of education wage differentials – i.e., in wage inequalities across different education cohorts; (ii) an increase in occupational wage differentials; (iii) an increase in age-related differentials; and (iv) an increase within group wage inequality. Rather than putting the emphasis on wage premiums following skills as technology is taken up, as Aghion and Howit do, others have argued that inequality through globalisation is due to simple labour exploitation through an erosion of working conditions in the South and greater

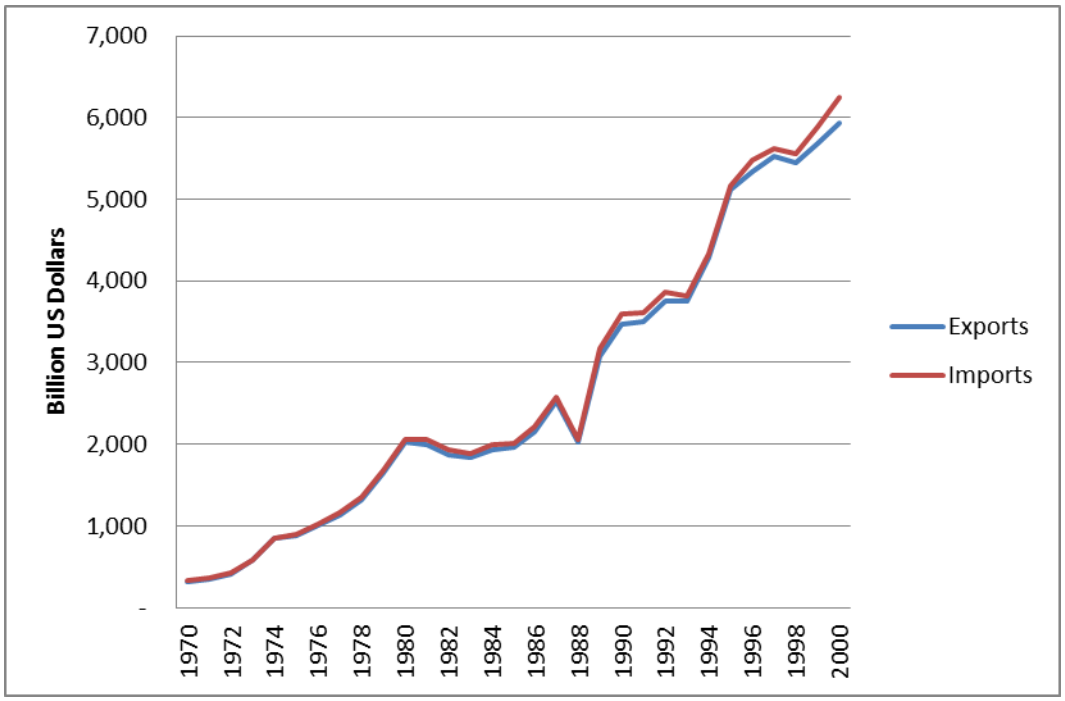
accumulation of high-value-added activities in the North (Hay and Marsh 1999; Rifkin 2001; Sassen 1991).

GLOBALISATION AND REGIONALISATION OF MARKETS

Current debates on globalisation have centred on the degree of integration of the global economy and its effects. A crucial theoretical argument present in debates is the distinction between two different, interactive economic processes: globalisation of markets and globalisation of production. In broader terms, as has been argued above, globalisation refers in general to the globalisation of capitalism. In this sense, it can mean one of two things: the spread of capitalist production relations (global production networks), or an increase in the international interdependence of the world economic system (expansion of global trade).

It is a general practice that governments regulate overseas trade via a combination of import tariffs and quotas, export subsidies or incentives, and influence exchange and interest rates in order to favour foreign trade, and to consider exports as a dynamic growth engine (Hanson 1996b). Figure 2.1 shows how world trade has increased dramatically from the late 1970s to the end of 2000, the end point for this thesis. Exported goods grew on average by 6% annually from 1950 to 2000 (OECD 2001b). This trade is also "freer". Since 1945–47, tariffs on industrial products have fallen and were close to 4% on average in OECD countries by the start of the 21st century.

Figure 2.1: Total World Trade 1970-2000



Source: Author's elaboration using data from UNCTAD 2002. See http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx

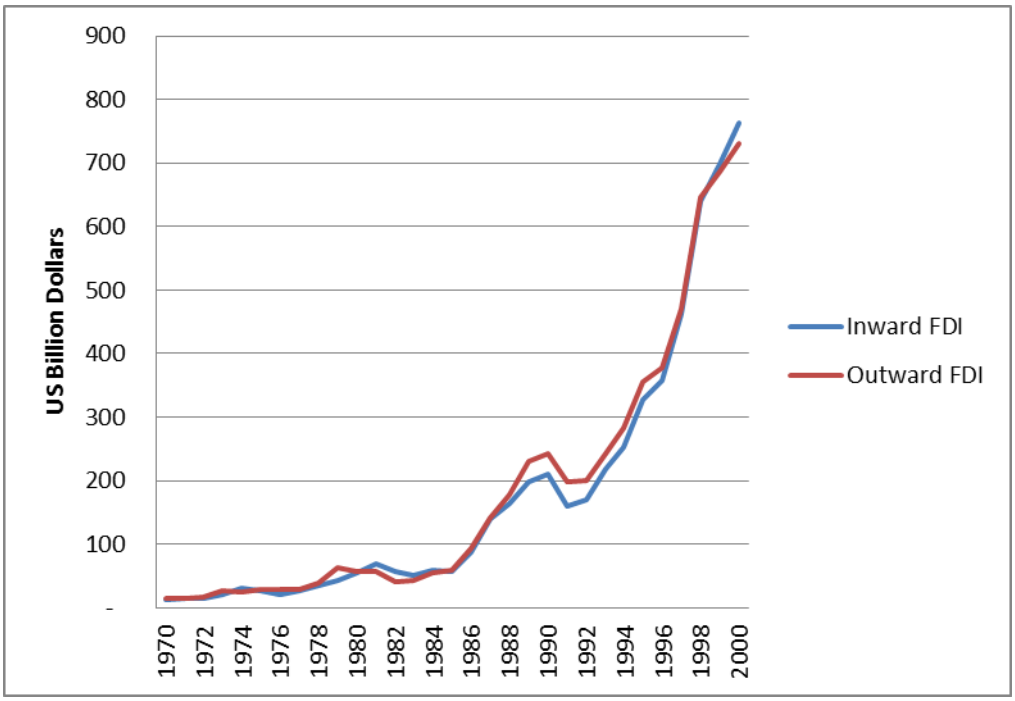
Although trade liberalisation has been recognised as the leading edge of globalisation, the organisation of proximate countries into regional trade blocs has appeared as an apparently contradictory trend as one of the direct consequences of trade liberalisation (Buzan and Weaver 1998; Nierop 1994). Most countries around the world are members of regional trade agreements (RTAs), customs unions, free trade areas or other preferential arrangements. Over 200 RTAs have been signed under the GATT or WTO over the last 50 years and there were over 150 by the start of the 2000s, most of which had been drawn up in the previous decade (WTO 2002). The jury of opinion is undecided on whether regionalisation is in opposition to contemporary globalisation or whether regionalisation

and globalisation are mutually reinforcing. Do regional arrangements, for example, bring economic integration closer? According to Article 24 of the GATT, if a free trade area or customs union is created, duties and other trade barriers should be reduced or removed from all sectors of trade in the group and non-members should not find trade with other group members any more restrictive than before the group was set up. Similarly, Article 5 of the GATT provides for economic integration agreements in the service sector and provisions in the WTO agreements allow developing countries to enter into regional or global agreements permitting the reduction or elimination of tariffs and non-tariff barriers on trade amongst themselves (WTO 2002).

In 1996, the WTO General Council created the Committee on Regional Trade Agreements to assess whether regional groups are consistent with WTO rules and to examine how regional arrangements might affect the multilateral trading system (WTO 2001). In the view of the WTO, "to a much greater extent than is often acknowledged, regional and multilateral integration initiatives are complements rather than alternatives in the pursuit of more open trade" (WTO 1995, p.1). One factor to take into consideration is that regionalisation can create the necessary kinds of economic, social and physical infrastructures that facilitate and complement the deepening of globalisation. In this regard, I argue that economic regionalisation has not been a barrier to globalisation but rather is one of its foremost expressions.

According to Ostry (1990), we are now in a phase of globalisation that is dominated both by trade and by FDI under the aegis of TNCs. Data show that TNCs are the most important single economic agent responsible for world trade and flows of foreign investment worldwide. Since the mid-1980s, the level of worldwide FDI has grown at a considerable rate – tenfold between 1982 and 2000 (see Figure 2.2) – and has doubled as a percentage of world GDP to 9%, as well as increasing its share in world output from 5% to 6% over the same period (UNCTAD 2000).

Figure 2.2: Total FDI Flows, 1970–2000



Source: Author's elaboration using data from UNCTAD 2000. See http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx.

Through the mid-1990s, FDI growth levels accelerated mainly through the rapid increase of mergers and acquisitions (M&As), which jumped 19% to a new record level of US$400 billion, while outflows reached US$424

billion (UNCTAD 1998).[33] According to Mytelka (1990), FDI in the late 1980s grew at an average annual rate almost three times higher than that of trade and four times greater than world output. The 1990s are thus characterised as a decade in which international production by TNCs, financed through FDI, gradually began to replace trade between firms as the mode through which economies were interlinked (OECD 1994a).

THE ROLE OF CENTRALITY IN THE GLOBAL ECONOMY AND THE GLOBAL CITY HYPOTHESIS

The geography and composition of global networks of trade and production appear to be traversed by three simultaneous trends: dispersion, regionalisation (within and among countries) and concentration or re-concentration of economic activity (Castells 1996; Dicken 1992; Friedmann and Wolf 1982; Sassen 1991). Indeed, while the global economy may have become more decentralised, it is not decentred. Even in a world with better communications, Amin and Thrift (1992) argue that centres are needed to generate and disseminate information, to test and track innovations and to identify gaps in the market. This is the basic assumption underpinning at least two broad bodies of literature: global cities and new industrial clusters/global city regions. In providing a review of each I aim to focus attention on how the combination of spatial dispersal of production processes and global integration of markets has created a new strategic role for cities – first, as nodes of information

[33] M&As have become the dominant form of corporate entry to a country, exceeding green-field entry by a wide margin in value terms. For OECD countries, M&As rose to 86% of the value of inward FDI by the end of the 1980s (Cooke 1988). The main motivating factors for these mergers appear to be diversification, regional market consolidation and technological innovation (OECD 2001a).

networks needed to manage and coordinate global/regional market integration, or what Sassen calls the "command functions" of the global economy; and second, as global production sites embedded in a network of specialised, multi-production circuits. These two basic "global functions" take place because global production circuits are increasingly more decentralised and less hierarchically governed, contributing to problems of integration and coordination.

Recent urban studies emphasise a select group of cities where unique cultural, social and economic processes take place, and the way in which trade and production shape networks (Allen 1999; Borja and Castells 1997).[34] Picked up by Hall (1977) as a useful descriptor and by Friedman and Wolff (1982) as a valuable means of unpicking the features of different categories of city, "world" has become increasingly replaced by "global". In setting out to define this category of cities, studies have identified a range of criteria, including national standing, cultural function and, primarily, their role in the global economy. This economic determination is closely tied to world systems theory and to an interest in identifying the transnational business connections of a new global economic order (Beaverstock and Taylor 1999; Fainstein 2001; Friedman and Wolff 1982, 1986; Knox and Taylor 1995; Scott 2001; Sassen 1988, 1991, 1994a, 1994b, 1996; 1999, 2001; Taylor 1997). According to Sassen:

> ...with the partial unbundling or at least weakening of the national as a spatial unit due to privatisation and deregulation and the associated strengthening of globalisation, comes conditions for the ascendance of other spatial units or scales. Among these are the sub-national,

[34] Although regarded as a quintessential feature of the late 20th century city, the phrase "world city" was coined by Patrick Geddes in 1915, (Geddes 1915).

> notably cities and regions … I locate the emergence of global cities in this context and against this range of instantiations of strategic scales and spatial units. In the case of global cities, the dynamics and processes that get territorialized are global… (Sassen 2001, p. xviii)

Global cities, then, capture a distinctive feature of the current phase during which a spatially dispersed global economy requires locally based and integrated organisation, and this, Sassen suggests, takes place in cities (Sassen 1988, 1991, 1994a, 1994b). As Sassen has noted:

> "Apart from issues related to capital, labour markets, goods and services are becoming increasingly globally traded, in this regard, cities around the world are rising as 'regional centres' connecting the network of interactions on which the global trade is based ground outwards" (Sassen 1991, p. 3).

To Sassen, globalisation is driving forward a process that connects advanced services, producer centres and markets in a global network, and all of them function in relation to the consolidation of a global market.

Sassen identifies changes in international banking and finance, a series of advanced producer services and the concentration of corporate headquarters in certain "command centres" as being the main forces behind the formation of global cities (see also Botchie et al. 1995). Although advanced services are present in all large cities and in nearly all countries, it is claimed that the higher levels of concentration of advanced service networks can be seen only in particular "nodes" (Beaverstock and Taylor 2000; Baum 1999; Fu Chen and Yue Man 1998; Hamnett 2002; Thornley and Rydin 2001). The notion of the command centre is a useful tool so long as it is limited to the identification of (market) "command processes", of the dynamics and interaction between different actors

taking place in these cities, and of the networks of cities and the power and economic hierarchy associated to them.[35]

However, as indicated in the work of Borja and Castells (1997), the interaction networks on which the global economy is based are being ordered around new "regional centres". Borja and Castells point out that as soon as a region becomes integrated into the global economy, the setting up of the urban node for advanced services becomes necessary, invariably around an international airport, a satellite telecommunications system, luxury hotels with appropriate security systems, and local and regional government offices capable of providing information and infrastructure to back up international investors. Similar research by Thrift and Leyshon (1994) and Beaverstock and Taylor (1999, 2000) on the location patterns of producer services provides empirical evidence of the validity of the notion of a hierarchy of emerging global city regions.

GLOBALISATION AND ECONOMIC AGGLOMERATIONS

Driven by the new geography of globalisation (i.e., the dispersion of production and the rise of new production sites), at the end of the 1990s there was a renewed interest in the phenomenon of the formation of economic agglomerations and particularly in the geography of industrial clusters, or what was termed new industrial districts (NIDs) theory. From

[35] Sassen considers that at the top of the global city hierarchy are New York, London and Tokyo, which have "joint dominance" in international finance and in most consulting and business services of international scope, referring again to purely market functions. These three centres are referred to as the command centres that together cover the spectrum of time zones for the purpose of financial trading and work largely as a unit in the same system of endless transactions, with a number of regional centres rapidly joining the network as emergent markets. Please note that Sassen again is referring to markets.

disciplines such as economic geography (Scott 1998), sociology (Lazerson 1988), political science (Hirst and Zeitlin 1989; Sabel 1993) and international management (Porter 1990), best known is the work of Piore and Sabel (1984), who coined the term "flexible specialisation" for networks that are characterised by an extensive horizontal and vertical division of work among relatively flexible companies with a tendency to concentrate on their core competencies and agglomerate around highly specialised activities. In this view, clusters of customers and suppliers are embedded in regional infrastructures of cooperation and supply, and it is from these that local networks emerge. Based upon the successful expansion of mature industries in the Emilio Romagna region in Italy, Piore and Sabel (1984) argue that NIDs owe their success to the role of small, innovative firms, embedded within a regional cooperative system of industrial governance which enables them to adapt and flourish within a global competitive environment. Most NIDs theorists claim that certain production centres have emerged as global production nodes (Piore and Sabel 1984; Scott 1988; Raco 1988). This change, it is argued, implies a return to place, a dependence on location proximity between different agents embedded in a broader production circuit.

Contrary to the emphasis on small firms in NIDs formulation, some alternative models demonstrate the continued power of the state and/or TNCs to shape and anchor industrial districts. According to Marcussen (1999) this power provides the "glue" that makes it difficult for smaller producers to leave, encouraging them to stay and expand, attracting newcomers into the region and thus reinforcing agglomeration trends.

Marcussen's model exhibits greater propensity for networking across rather than within district lines, and suggest that industrial clusters have a greater tendency than in the NIDs formulation to be exogenously driven within a global economy framework.

Drawing upon the same line of argument, Scott (1998) says that these nodes constitute distinctive sub-national (i.e., regional) social formations whose local character and dynamics are undergoing major transformation due to the impact of globalisation. NIDs and the global city region thesis thereby contradict Krugman's hypothesis that a fall in the cost of transportation and communications from a removal of trade barriers would lead to a more diffuse pattern of industrial agglomeration or a relocation of some industries, as the industries of these regions have become so closely tied to physical infrastructures and to clustered flexible networks of firms that by virtue of the agglomeration economies are able to compete in increasingly extended (global) markets (Allen 1999; Scott 2000).

The main point to address here is how from different assumptions and methodologies (i.e., new economic geography *vis-à-vis* NIDs or NIDL) there is some convergence of observation, particularly on how location decisions are much more complex than Krugman's work on regional analysis through the interpretation of factors such as distance to markets, trade barriers, wages and infrastructure would suggest. Among the most important factors highlighted, and which go against the current of arguments from the NIDL theorists, is the relevance of low wages in

driving the relocation (migration) decisions of firms from rich to poor countries. As Fujita, Krugman and Venables argue:

> ...low wages in the South are not enough to attract manufacturing because of the lack of sufficient forward and backward linkages. Eventually, however, further reductions in transport costs move the world into a globalisation phase. The value of proximity to customer and supplier firms diminishes as transport costs fall, and so the sustainable gap between North and South narrows. (Fujita et al. 2001, p. 254)

Agglomerations are formed and survive because of the economic benefits derived from interaction (agglomeration economies), in which spatial concentration itself creates the favourable economic environment that supports further and continued concentration. Producers want to choose locations that have good access to large markets and to suppliers of goods that they or their workers require (Scott 2000). A place that already has a concentration of producers tends to offer a large market, a good supply of inputs and consumer goods (some of which are made by producers that are already there). Because of what are essentially backward and forward linkages, spatial concentrations of production tend to persist once established. Thus the relevance of centrality is that these geographical centres are place-bound communities in which agglomerations and interaction between firms, institutions and social groups act to generate and reinforce an "industrial atmosphere". This atmosphere nurtures the knowledge, communication and innovation structures required for retaining competitive advantage in a given global production circuit.

CONCLUSION

Krugman and Livas's "migration to the north" hypothesis is useful in understanding the process of manufacturing decline and growth in Mexico City and Northern cities, but by focusing on trade or transport costs alone and neglecting to unpack the complexity of exchange or interaction costs they are in danger of missing out on central elements of firms' locational decisions. In a world where consolidated markets lead to specialisation driven by the competitive advantages of specific economies, firms will get increasingly involved in globalised production to serve local or global markets. More integrated markets reduce production costs and allow firms to compete globally, thereby providing incentives to engage in global production. This distinction is important because it allows us to understand that globalisation may advance regardless of how quickly free trade regimes develop.

Krugman and Livas do not allow for the idea that as technology evolves both the nature of production and the nature of transport (for example, by outsourcing in different locations under a free trade regime brought about by globalisation of production), the possibilities for companies' "transport" may change in such a way that transport costs become a much less significant factor. "Labour", like "firms", however, operates with a diverse number of ties and barriers to exit that make the categories themselves as well as the assumption of perfect mobility unrealistic. Also, this approach neglects ideas of internal transaction costs within firms that are important to understanding both divisions of labour and economic agglomerations, and there is no account of global markets economics, technological change,

the role of TNCs or the NIDL, or particularly the rise of the service sector, crucial in understanding the new configuration Mexico City has acquired as a service sector global centre, but also as a manufacturing hub, in the aftermath of economic liberalisation.

If global production requires decentralised coordination and control, the "de-verticalisation" of the division of labour between independent but interlinked units, greater workforce task flexibility, a greater reliance on innovation and skills, and the elimination of time and waste in supply and delivery, then proximity between agents would seem to be more, not less, important. The literature on industrial location talks up the re-emergence of local economies. This literature is associated with a flexible production model that recognises the importance of emerging global corporate networks and considers that production globalisation is taking place (and is rooted) in a series of dense nodes scattered across the world. Regardless of the construct used when referring to urban agglomerations (these are understood independently of their political delimitations and include clusters, agglomeration, functional urban regions or city regions), cities are increasingly viewed as offering a series of advantages upon which a system of production can draw within a globally organised structure. Echoing the factors first identified by Alfred Marshall (1842–1924) in his work on small firms (see Davenport 1935), these advantages are said to include the build-up of a local pool of expertise and know-how and a culture of labour flexibility and cooperation resulting from dense social interactions and trust, lower transport and transaction costs, and the growth of a local

infrastructure of specialised services, distribution networks and supply structures, which in a way are the basis of Sassen's global cities hypothesis.

Sassen's argument is relevant for placing in perspective the "global cities studies" that present detailed analyses broken down by sector of the economy, analysing the characteristics of sectors of the economy that successfully adjusted to the new economic environment and grew in the aftermath of the liberalisation process through the interconnection of economic activity in cities dispersed around the world. In this sense, the enhancement of specialisation that follows on from the liberalisation of trade, increased competition, the upgrading of productive processes and so on, is destructive as well as creative, as it has been argued that it leads to an exclusionary dynamic and income inequality. The relationship between inequality and per capita income in OECD countries suggests that income inequality is largely due to changes in wages and to technological innovation that has caused an increase in the demand for skilled labour relative to unskilled, since this has enhanced differences in ability among workers, across or within education cohorts. This situation can be potentially aggravated by a decline in manufacturing jobs accompanied by an increase in service sector jobs, as was witnessed in Mexico City after 1980.

Chapter Three: Global Integration and Economic Restructuring in Mexico

OVERVIEW

The aim of this chapter is to test Krugman's hypothesis that trade liberalisation and relocation effects have led manufacturing companies to move out of Mexico City, mostly to the border region. By looking at aggregate economic census data for employment and economic units (firms), and later at disaggregated company-level data, the aim is to explore the effects on patterns of concentration and de-concentration, and to assess the degree to which trade liberalisation and globalisation have led to changes in the regional distribution of economic activity in Mexico. Specifically, the chapter is focused on two questions:

- What is the relationship between trade liberalisation and the relocation patterns of manufacturing companies moving out of Mexico City?
- To what degree is trade liberalisation strong enough to explain forces of attraction in the border states up to the point of competing with Mexico City as the most attractive location for export companies, as suggested by Krugman?

The methodological approach used to answer the first question is based upon Sassen's global cities hypothesis and on her proxies to measure the relative importance of locations in the context of the globalisation of the

economy. Location proxy is defined according to Sassen's work on global cities and refers to patterns of concentration of national and transnational corporations' headquarters and the changes of these location patterns as a proxy for decentralisation of the economy. The location becomes relevant in the concentration of TNC headquarters as it denotes certain levels of infrastructure, provision of goods and services, and access to suppliers and markets.

In the second part of this chapter, Sassen's methodological approach is explored in order to specify a proxy variable for changes in location using the *Expansión* database of the Top 500 Companies' headquarters. Following Sassen's "new conceptual architecture" on global cities, the globalisation of economic activity entails a new form of organisational structure that requires a new type of conceptual architecture. There have long been cross-border economic processes – flows of capital, labour, goods, raw materials and tourists – but to a large extent these have taken place within the inter-state system, where the key articulators have been national states. This arrangement has changed over the last decade as a result of privatisation, deregulation, digitalisation, the opening up of national economies to foreign firms, and the growing participation of national economic actors in global markets. It is in this context, Sassen argues, that we can see a rescaling of strategic territories that articulate the new system, with the ascendance of other spatial units or scales. Among these are the subnational, notably cities and regions; and cross-border regions encompassing two or more subnational entities, i.e. global digitalised markets and free trade blocs (Sassen 2001, p. xx).

There are seven hypotheses by which Sassen organises the data and the theorisation of the global city model. I will present four in order to offer a way of presenting a more precise justification as to why I chose to use headquarters location as a proxy of centralisation/decentralisation of economic activity in Mexico City. According to Sassen's "The Global City Model: Organizing Hypotheses":

> First, the geographic dispersal of economic activities that marks globalization, along with the simultaneous integration of such geographically dispersed activities, is a key factor feeding the growth and importance of central corporate functions. The more dispersed a firm's operations across different countries, the more complex and strategic its central functions – that is, the work of managing, coordinating, servicing, financing, a firms network of operations.
>
> Second, these central functions become so complex that increasingly the headquarters of large global firms outsource them. They buy a share of their central functions from highly specialized services firms: accounting, legal, public relations, programming, telecommunications, and other such services. Thus while even then years ago, the key site for the production of these central headquarters functions was the headquarters of a firm, today there is a second key site, the specialized service firms contracted by headquarters to produce some of these central functions or components of them. This is especially the case with firms involved in global markets and non-routine operations. But increasingly the headquarters of all large firms are buying more of such inputs rather that producing them in-house.
>
> Third, those specialized service firms engaged in the most complex and globalized markets are subject to agglomeration economies. The complexity of the services they need to produce, the uncertainty of the markets they are involved with either directly or through the headquarters for which they are producing the service, and the growing importance of speed in all these transactions, is a mix of conditions that constitutes a new agglomeration dynamic. The mix of firms, talents, and expertise from a broad range of specialized fields makes a certain type of urban environment function as an information center. Being in a city becomes synonymous with being in an extremely intense and dense information loop. This is a type of information loop that as of now still cannot be replicated fully in electronic space, and has as one of its value-added features the fact of unforeseen and unplanned mixes of information, expertise and talent, which can produce a higher order of information. This does not hold for routinized activities which are not as subject to uncertainty and non-standardized forms of complexity. Global cites

> are, in this regard, production sites for the leading information industries of our time.
>
> A fourth hypothesis, derived from the preceding one, is that the more headquarters outsource their most complex, unstandardized functions, particularly those subject to uncertain and changing markets and to speed, the freer they are to opt for any location, because less work actually done in the headquarters is subject to agglomeration economies. This further underlines that the key sector specifying the distinctive production advantages of global cities is the highly specialized and networked services sector. In developing this hypothesis I was responding to a very common notion that the number of headquarters is what specifies a global city. Empirically it may still be the case in many countries that the leading business center is also the leading concentration of headquarters, but this may well be because there is an absence of alternative locational options. But in countries with a well-developed infrastructure outside the leading business center there are likely to be multiple locational options for such headquarters. (Sassen 2001, p. xxi)

The *Expansión* database results are consistent with Sassen's approach, as more than half (296) of the firms in the Top 500 Companies list are either national/international conglomerates of companies or affiliates of national/foreign companies with multi-location production sites. My analysis, therefore, will consider the degree to which location patterns can be explained from the perspective of Mexico City as a "global" location with supremacy over the rest of the country as a preferred location in certain economic sectors at the beginning of the period of study. However, I will suggest that analysing the distribution of headquarters of the Top 500 Companies over a period of time can add explanatory value beyond the trade hypothesis suggested by Krugman and others.

The second part of this chapter presents the empirical results of a quantitative analysis tracing location patterns associated with (foreign) trade activity at the company level. As such analysis is not possible using aggregate data, the Top 500 Companies database for 1980, 2000 and 2006

is used in order to explore business profile and performance. The analysis looks at particular economic factors – foreign trade, foreign investment, labour and financial practices – that appear to be the most influential in "unleashing attraction forces" with regard to the changing regional balance of Mexico and industrial location patterns, looking at Mexico City's economic dynamism in contrast to the border states. The main variable under scrutiny is foreign trade, as this relates directly to Krugman's argument, with the expectation that companies with high export levels (as a percentage of total sales) should be located closer to the border with the US. According to the literature on globalisation, we might expect to find companies that have high foreign investment shares, participate in the Mexican Stock Exchange and operate through labour-intensive processes among the list of more export-oriented companies.

KRUGMAN'S LIBERALISATION OF TRADE HYPOTHESIS

In order to test Krugman's ideas, economic census data were examined to discover regional economic growth trends for labour and economic units in the manufacturing sector. The idea was to contrast systematically Mexico City with the six states of the Mexico–US border: Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas. Data for Mexico City are the sum of figures for the Federal District (DF, Distrito Federal) and the State of Mexico as recorded by the economic census data for 1970 to 1998.[36]

[36] Data for economic census of 2008 are included to carry forward trends as relevant to specific points.

Between 1940 and 1970 Mexico developed a relatively large, although highly inefficient, manufacturing sector founded on import substitution and protectionist practices. Particularly in Mexico City and its surrounding states, manufacturing became the main source of employment and the leading sector of the economy. Trade liberalisation brought new market opportunities for Mexican products, but also fierce competition, triggering, according to the principal hypothesis of this research, a process of industrial transformation. The first signs were seen in Mexico City's manufacturing sector as it declined over the 1980s. Mexico City's share of manufacturing GDP declined from 1980, when it represented 25.2%, through 1985 and 1994, when it represented 21% and 19.8% respectively, to 1998 when 18.5% of manufacturing GDP was based in the capital (Table 3.1).[37]

Over the same period, the border increased its share of manufacturing GDP from 19% to 28.5%. The border states combined showed a manufacturing GDP growth rate of 4.1% on average between 1980 and 1994, and of 8% between 1994 and 1998 (see Table 3.2). For the same period the rate for Mexico City fell below the national average, with a decline of –1.9% between 1980 and 1994, and moderate growth of 1.5% between 1994 and 1998, according to economic census data. The net result was an increase in manufacturing output for the border region and a

[37] Data are from the Mexico´s economic censuses, which is a comprehensive survey of manufacturing establishments by state and four-digit (ISIC) industry.

decline for Mexico City between 1980 and 2000, the period of the most intense trade liberalisation and the time frame covered by this research.

In terms of employment, the regional trends need to be understood in the context of the national trend of 57% manufacturing employment growth between 1980 and 1998. Some border states registered especially high growth rates – Baja California, for example, had a growth rate of 358%, while Chihuahua registered 352% – and there was a 157% increase in employment for the border region as a whole, contrasting with a dramatic decline in absolute numbers for manufacturing employment in Mexico City (the only region of the country to record a decline) of –41%, from 839,311 in 1980 to 477,197 in 1998. Over the period 1980-1998, Mexico City's share of national manufacturing employment fell from 44.5% to 23.3%, while the border region's share increased from 21.1% to reach 34.1% in 1998 (Table 3.2). In general terms, these trends in the data lend support to a Krugman-type hypothesis – the aggregate data indicate a "magnetic" attraction toward the border states.

Table 3.1: Share of Manufacturing GDP by Region, 1980–1998

Region	1980	1985	1994	1998
Border	19.0%	19.4%	27.1%	28.5%
North	6.6%	7.4%	6.2%	6.1%
Bajío/Pacific	13.1%	13.5%	12.5%	11.6%
Centre	18.2%	19.0%	26.0%	28.2%
Mexico City	25.2%	21.0%	19.8%	18.5%
South	17.6%	19.8%	8.39%	7.1%

Source: Author's calculations based upon data presented in economic censuses (INEGI 1981,1986,1994,1999).

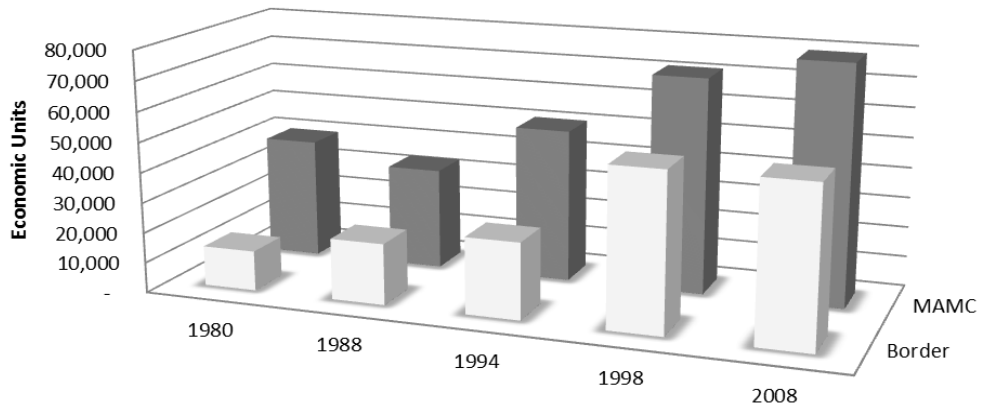
Table 3.2: Average GDP Growth Rate and Regional Employment Share by Region – Manufacturing Sector, 1980–1998[38]

Regional employment shares				Average Manufacturing GDP growth		
Region	1980	1994	1998	Region	1980–1994	1994–1998
Border	21.1%	29.8%	34.1%	Border	4.1%	8.0%
North	5.0%	7.1%	6.9%	North	4.0%	4.7%
Bajío/Pacific	11.1%	14.5%	15.6%	Bajío/Pacific	3.5%	6.7%
Centre	8.3%	10.7%	11.5%	Centre	3.4%	6.7%
Mexico City	44.5%	28.7%	23.3%	Mexico City	-1.9%	1.5%
South	10%	9.1%	8.5%	South	0.6%	3.9%

Source: Author's calculations based data presented in economic censuses (INEGI, 1981; 1994 and 1999).

[38] These figures are calculated by summarising employment changes at the regional level, grouping Mexico's 32 states into six regions, running north to south: (1) border, (2) north, (3) centre, (4) Mexico City region, (5) Bajío/Pacific and (6) south. Border states include Baja California, Sonora, Coahuila, Chihuahua, Nuevo León and Tamaulipas; the north includes Baja California Sur, Sinaloa, Durango, Zacatecas, San Luis Potosí and Aguascalientes; Bajío/Pacific includes Nayarit, Jalisco, Colima, Guanajuato, and Michoacán; the centre contains Puebla, Querétaro, Hidalgo, Tlaxcala and Morelos; Mexico City contains the State of Mexico and Mexico City; and the South contains Veracruz, Guerrero, Oaxaca, Chiapas, Yucatán, Campeche, Quintana Roo and Tabasco.

Figure 3.1: Manufacturing Economic Units, 1980–2008 – MAMC vs Border States[39]



	1980	1988	1994	1998	2008
Border	13,276	20,273	25,309	52,297	52,386
MAMC	39,827	33,549	50,618	71,278	79,090

Growth rates	1980–1988	1988–1994	1994–1998	1998–2008
MAMC	–15.8%	50.9%	40.8%	11.0%
Border states	52.7%	24.8%	106.6%	0.2%

Source: Author's elaboration based upon data presented in economic censuses (INEGI various years).

The trend is not uniform, however, and a number of points need further explanation. First, it is not clear how we should understand Mexico City remaining an attractive location for manufacturing companies. The decline in Mexico City's share of manufacturing output (see Table 3.1) and employment was not uniform across sectors, and overall economic units showed positive growth (Figure 3.1). These results suggest a qualitative change in labour productivity over the sector for the period, or at least less labour-intensive activity in the new economic units. Activities such as printing and publishing, petrochemicals, pharmaceuticals, and food and

[39] "Economic units" refers to manufacturing plants – according to INEGI methodology, a single location with a minimum of five people engaged in manufacturing production.

tobacco showed a positive growth trend in terms of output, employment and an increase in economic units (as updated figures until 2008 confirm). These results raise questions about the continuation of patterns of location and specialisation associated with trade liberalisation suggested by Markusen (1999), Martin and Rogers (1994a) and OECD (2002).

Second, Krugman argued that companies in the border region would export to the US and Canada. Indeed, he put considerable emphasis on transport/trade costs and access to markets as a result of trade liberalisation as the most influential forces determining location. However, general data on the changing manufacturing regional balance does not take into consideration whether all companies moving to the border are engaged in exports or whether they are more likely to do so compared to those located elsewhere. The counter-analysis also needs to be considered; namely, companies that remain in or locate to Mexico City during the period of trade liberalisation may also be exporters or may be located in the city due to other factors. As it is not possible to conduct such an analysis with aggregate data, I chose to focus on a sample of companies. The Top 500 Companies list for 2000 and 2006 as recorded by *Expansión* allows for detailed analysis due to the presentation of a large number of variables for individual companies.

THE MEXICAN ECONOMY ACCORDING TO THE TOP 500 COMPANIES

This section investigates how trade liberalisation in Mexico has led to changes in industrial location using firm-level data from the *Expansión* database. The section presents, first, the results of a statistical analysis of

the main economic variables available in the database, paying particular attention to the location of the Top 500 Companies by looking at the year of starting operations in order to identify the most attractive industrial location after the liberalisation of trade from 1986. The next section develops the Globality Index, briefly described in Chapter One, to provide a score for each firm in the sample, ranking companies according to a set of global characteristics in order to identify the location pattern for the most "global" companies under the new economic regime. Instead of building an econometric model, reliant on proxy data, the section tests Krugman's trade liberalisation and location arguments from a variety of different angles using actual data. In setting out this analysis my hypothesis is for there to be a positive correlation between manufacturing companies exporting to the US and relocation to the border states.

The *Expansión* database composition for 1980 is as follows: the primary sector represents 6% of companies in the sample, manufacturing 68% and service/commerce 26% (Table 3.3).[40] The variation in the composition of the sample in 2000 was not large: primary sector companies represented 3.6% (–2.4 percentage points) of the sample, manufacturing 65% (–3 percentage points), and services 31% (+5 percentage points). In 2006, due to the inclusion in the database of the financial sector, manufacturing was reduced to 149 companies in relation to the 2000 database; this meant a

[40] These *Expansión* sector shares differ from national shares, with an over-representation of manufacturing and an under-representation of services both in 1980 and 2000. The composition of the Mexican economy in 1980 using GDP data from INEGI's economic censuses (INEGI 1981 and 1999) was 5.1% primary activities, 37.4% manufacturing and 57.4% service. In 2000 the primary and manufacturing sectors showed a decline and there was an increase in the service sector nationwide, with data of 3.8% (a difference of –1.3 percentage points), 34.9% (–2.5 percentage points) and 61.2% (+3.8 percentage points) respectively.

proportional reduction of nearly half of the manufacturing subsectors represented in the sample, but interestingly the reduction is not uniform as some subsectors such as automotive and auto parts showed an increase in 2006.

Table 3.3: Top 500 Companies Profile, 1980–2006

Top 500	1980	2000	2006
Company status			
State-owned	33	6	9
National private companies	307	417	315
Transnational corporations	160	77	176
Sector			
Agriculture, livestock, forestry, hunting and fishing	11	10	11
Oil & mining	18	9	6
Electricity	2	2	2
Total primary sector	**31**	**21**	**19**
Non-metallic minerals (cement)	10	21	14
Metallic industries (includes iron & steel)	48	18	54
Chemical & pharmaceutical	71	53	35
Textile	25	14	3
Food, beverage and tobacco	41	78	36
Machinery and equipment	88	49	12
Automobile	7	7	2
Auto parts	25	16	3
Printing and editorial	26	18	10
Total manufacturing	**341**	**274**	**169**
Transport	5	20	16
Communication	4	7	31
Wholesale	54	65	52
Construction	29	44	23
Professional services & real estate	7	32	16
Hotels and restaurants	4	14	13
Financial services	0	0	149
Other services	25	23	12
Total services	**128**	**205**	**312**
Stock market			
Yes	95	180	313
No	405	320	187
Location			
Mexico City	393	258	348
Border states	78	164	101
Other	29	78	51

Source: Author's elaboration from *Expansión* database, "Las 500 empresas más importantes de México", 1980, 2000, 2006.

There appears to be a noteable transformation in the ranking of the Top 500 Companies between 1980, 2000 and 2006 with regard to changes in ownership status. The size of the public sector had grown significantly as a result of a government policy aimed at acquiring bankrupt private companies with the intention of guaranteeing employment (and supplies) during the ISI period, and growth was especially intense between 1979 and 1981. This situation led to an increase in public-owned companies from 272 in 1970 to 1,115 in 1982, and as a proportion of GDP from 6.5% to 13.5% over the same period.[41] By the end of 1988 the government held 560 companies, including commercial banks that had been in its hands since nationalisation in 1982. In total, public companies in Mexico accounted at their peak in 1982 for 18.5% of GDP and employed nearly one million people or 10% of the total formal sector workforce (Rogozinski 1998, p.76). Of the 1,155 firms under state control in 1982, by the end of 1996 the government had divested itself of 936 through public bid processes, closures, mergers, or transfers to the private sector (see Table 3.4).[42]

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[41] In 1973, the Federal Congress approved the *Ley para Promover la Inversión Mexicana y Regular la Inversión Extranjera* (Law to Promote Mexican Investment and Regulate Foreign Investment). This law set a maximum of 49% for a foreign stakeholding in any given company in Mexico. Nevertheless, it provided room for exceptions "for sectors of the economy, and regions or special cases where it might be convenient for the development of the country" (Article 8). The decree also created the *Comisión Nacional de Inversiones Extranjeras* (National Commission of Foreign Investment) to regulate and control foreign investment. TNCs in the consumer electronics sector were the direct beneficiaries of this law and particularly enjoyed the benefits of discretionary treatment.
In terms of FDI, secondary legislation was passed in May 1989 modifying the law of 1973, with the provision of a clear non-discretionary framework aimed at favouring the development of projects involving the transfer of technology, the generation of net foreign exchange earnings and the creation of employment. Investments that contributed to the decentralisation of economic activity and to higher rates of capital formation were also given priority (Aspe 1991; Rogozinski 1998).

[42] By the end of 1991 these represented cumulative sales of US$15 billion (around 5% of GDP); this increased the margin for manoeuvre in the public sector, as it provided the government with resources and transferred a quarter of a million employees to the private sector. As a result of the privatisation process, the importance of the public sector was sharply reduced in terms of total employment and production within the national

Table 3.4: Evolution of State-Owned Companies in Mexico, 1920–1996

Years	Net increase	Cumulative number
1920–1934	15	15
1935–1940	21	36
1941–1954	108	144
1955–1962	62	206
1963–1970	66	272
1971–1975	232	504
1976–1982	651	1,155
1982–1988	–595	560
1988–1994	–298	252
1994–1996	–33	219

Source: SHCP 1997, cited in Rogozinski 1998, p. 75.

Privatisation is generally considered by scholars (Dicken 1992; Sassen 1991, 1994a; Drucker 1989) to be a leading factor fostering global production because, in the context of a recently opened economy, privatisation provides opportunities for global players, usually TNCs, to become more involved in national economies. Throughout the 1990s there was a worldwide trend for governments to pursue privatisation as a means to attract foreign investment, and state companies (usually large companies and mostly natural monopolies) were seen as a source of significant ("fresh") resources, giving governments an economic incentive to facilitate these operations. However, according to the Top 500 Companies list, Mexico followed a different direction.[43] The Mexican

economy. In 1996, participation of publicly owned enterprises in total production had gone down from a high of nearly 25% in 1983 to less than 8% (Rogozinski 1998).

[43] Mexico's alternative direction was seen as a necessary condition for the permanent correction of public sector finances and the development of an efficient, productive base, and hence the sale, liquidation, merger or transfer of small public sector entities was initiated by the Mexican authorities in 1983. This process was continued and intensified

context is remarkable because over the period of privatisation, the most important companies were acquired by other Mexican companies, strengthening the endogenous business community. The best case is Teléfonos de México (a telephone company), sold to Grupo Carso.[44] According to the *Expansión* data, publicly owned companies went from 33 in 1980 to six in 2000, indicating the extent of the privatisation process, and the numbers rose only slightly to nine by 2006 as public sector financial institutions joined the Top 500 list.

Looking at the Top 500 Companies list, one can see the extent to which privatisation has affected the national economy. In 1980, among the top ten companies, five were state-owned (see Table 3.5).[45] Contrary to an intuitive expectation, following the privatisation process the number of TNCs within the database as whole declined in 2000. TNCs were important in the top ten: in 2000 three American Automobile companies were among the top ten companies (General Motors, Chrysler and Ford). But Mexican private companies increased their numbers in the *Expansión* list from 307 in 1980 to 417 in 2000, and TNCs declined from 160 to 77 over the initial liberalisation period. The trend was reversed by 2006, when the number of TNCs rose to 176. This increase is partly explained by

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during the administration of Carlos Salinas (1988–94), when larger and more complex privatisation operations were completed. From 1983 to 1991, the government divested itself of practically all areas of economic activity, from sugar mills, hotels and airlines to telecommunications, banks and manufacturing companies (Rogozinski 1998).

[44] According to Dresser (1993), Mexico's privatisation strategy deliberately promoted a 'nationalistic' entrepreneurial coalition that was more supportive of government public policies than the traditional northern entrepreneurs, especially those from Monterrey. Consequently, regime stability supported nationally owned companies over TNCs, a trend that in the first instance contradicts the globalisation hypothesis that associates economic liberalisation policies with an increase in the number of TNCs.

[45] Petróleos Mexicanos, Comisión Federal de Electricidad, Altos Hornos de México, Teléfonos de México and Conasupo.

the inclusion of the financial sector in the 2006 database; however, out of 149 financial sector firms, 78 are Mexican majority capital and 71 are TNCs. In 2006, the sector distribution of the top ten gives an idea of the diversification of the Mexican economy over the last decade, with two state companies (PEMEX and Comisión Federal de Electricidad, both large monopolies in oil and electricity respectively), two from the telecommunications industry (Telmex and América Móvil), two automotive firms (General Motors and DaimlerChrysler), one from the wholesale retail sector (Wal-Mart), one from the food and beverage sector (FEMSA), and the largest financial group in México BBVA-Bancomer.

Table 3.5: The Top Ten Companies, 1980–2006

1980	2000	2006
1. Petróleos Mexicanos	1. Petróleos Mexicanos	1. Petróleos Mexicanos
2. Grupo Sidermex	2. Carso	2. América Móvil
3. Grupo Industrial Alfa	3. Teléfonos de Mexico	3. Comisión Federal de Electricidad
4. Comisión Federal de Electricidad	4. DaimlerChrysler	4. Wal-Mart de México
5. Valores industriales	5. General Motors	5. CEMEX
6. Conasupo	6. Volkswagen de México	6. Teléfonos de México/ Telcel
7. Fomento Industrial Somex	7. Wal-Mart de México	7. General Motors de México
8. Empresas ICA	8. Cementos Mexicanos	8. Fomento Económico Mexicano
9. Chrysler	9. Ford Motor Company	9. DaimlerChrysler de México
10. Ford Motor Company	10. Group Carso	10. BBVA-Bancomer

Source: Author's calculations from *Expansión* database, "Las 500 empresas más importantes de México", 1980, 2000, 2006.

The Top 500 sample also indicates the effects of deregulation on foreign investment. In 2000 there were 152 companies in the sample with some

degree of foreign capital. In addition to the TNCs, 70 "Mexican" companies out of 417 (16.8%) had a degree of foreign capital. The amount of foreign participation varied from 99% to 1%: in 2000, only Black & Decker retained the capital restriction of 1% Mexican capital (Table 3.6).[46]

Table 3.6: Percentage of Foreign Capital Shares in Top 500 Companies in Mexico in 2000

Percentage of foreign capital as percent of total	Number of companies	Percent	Cumulative percent
1–10	11	7.1	7.1
11–20	10	6.6	13.7
21–30	16	10.5	24.2
31–40	10	6.6	30.8
41–50	32	21.1	51.9
51–60	2	1.3	53.2
61–70	4	2.6	55.8
71–80	2	1.3	57.1
81–90	1	0.7	57.8
91–100	64	42.1	100.0
Total	152	100.0	

Source: Author's calculations from *Expansión* database, "Las 500 empresas más importantes de México", 2000.

If we consider the origin of capital, the US ranks first for capital share, with investment in 72 companies (47% of companies recording FDI), followed by Europe, with capital holdings originating in Germany (12 companies), Spain (ten companies), France, Switzerland and the UK (four companies each, together 22%), and Japan (six companies).[47] Results show that the average percentage of foreign capital in TNCs in Mexico is

[46] A throwback to the ISI period when regulations restricted foreign investment in Mexico, particularly in sectors of the economy considered by the Constitution to be "strategic" (i.e., energy and natural resources). In reality, most foreign companies were granted government permission to operate in Mexico, with the loophole that 1% of capital was domestic (Mexican).

[47] Six companies do not report foreign capital origin.

92%, whereas the average percentage of foreign capital in Mexican companies as a whole is only 6%. In 2006 there was a substantial increase in the number of companies with foreign capital shares, from 152 to 190, and a diversification in countries of capital origin; in 2000 there were eight countries represented, increasing to 21 countries in 2006 (Table 3.7), with the US still top of the list but with the inclusion of, for example, Singapore and Chile as countries of origin.

As mentioned in Chapter One, one indicator that an economy has become more open would be if companies shifted to exports. By 2000, 270 companies (54%) were engaged in export activities and 306 companies (64% of the total sample) conducted import activities. Of companies that recorded export activity, 80% (216) exported to the US, 2.8% exported to the European Union, 12.6% (34) registered export activity to Latin America and only 0.7% exported to Asia.[48] According to the 2000 *Expansión* database, a total of 306 (61.2% of the Top 500) recorded import activity, 36 more than those that recorded export activities. Some 51.6% of

[48] As would be expected, the strongest (t-test score) relation between export activity (as a proportion of total sales) and export destination country is that of the US. The t-test can be used to compare differences between distinct groups within the same variable. This test helps us to explain differences within the sample. For most of the economic indictors in this assessment, the number of possible values for a variable will be too large to make use of a cross-tabulation table. This is particularly the case for most of the ordinal variables. One way to test the significant differences between different groups within the sample (i.e., Mexican Companies vs TNCs; export vs non-export companies, etc.) is to compare by means of a variable for the two different groups. Here the mean differences between the groups and the deviation from the mean within each group are used to derive a t-value. This value can then be compared with what is called the "critical t-value" and, if higher, the groups can be considered different. On the other hand, if the calculated t is lower than the critical t-value, one can conclude that there is no difference between the two groups regarding the variable in question. If the actual t-value is above the critical t-value, the level of significance will be .05 or less.

these 306 companies were involved in imports from the US and 9.2% from Europe.[49]

Table 3.7: Countries of Origin of Foreign Investment in the Top 500, 2006

Country	2006	Percent
US	88	46
Spain	27	14
Germany	14	7
Switzerland	9	5
France	8	4
Holland	8	4
UK	8	4
Canada	5	3
Japan	5	3
Sweden	3	2
Brazil	2	1
Chile	2	1
Germany	2	1
Italy	2	1
Denmark	1	1
Belgium	1	1
Ireland	1	1
Korea	1	1
Luxemburg	1	1
Singapore	1	1
The Netherlands	1	1
Total	190	100

Source: Author's calculations based on *Expansión* database, "Las 500 empresas más importantes de México", 2006.

In 2006 there was a reduction in the number of companies recording foreign trade. Exporter numbers were reduced from 270 to 119 and importers from 306 to 109. This shift is partially explained by the inclusion of 149 financial sector companies in the database, although the reductions exceed this difference. In relative terms, not considering companies from the financial sector in the sample, 21% of companies exported (compared

[49] Some companies have exports/imports to or from more than one destination/origin.

with 43% in 2000) and 23% imported (from 64% in 2000). The results contradict national aggregate trends for foreign trade, since in this case companies recording exports and imports in a six-year period decreased. Two possible interpretations of this situation are: (i) the increase in companies in the service sector within the 500 companies, particularly those in telecommunication and producer services, which became the largest companies by sales; and (ii) the increase in chain values and intra-firm trade, along with the rules of origin leading to more Mexican content in products in order to comply with NAFTA regulations, and the end of government export promotion programmes and incentives.[50]

There is support for this second point from worldwide data that points to certain forms of trade having become spatially significant in the context of globalisation. International sourcing (the purchase of intermediate inputs from foreign sources) grew faster than domestic sourcing between 1990 and 2000 accounted for at least one-half of all imports by major countries (UNCTAD 2002). Intra-firm trade kept pace with total trade and grew rapidly in countries with high levels of foreign investment. Intra-industry trade rose significantly in almost all OECD countries over the 1990s (OECD 1996a, 2001a). For Mexico, the most obvious manifestation of this shift concerns the Maquiladora Programme. In the 2000 sample there were 16 maquila companies, all exporting to the US, with 14 importing from the US and only two importing materials from elsewhere: namely, Germany, with one company involved in the automotive sector and

[50] In 2004, export promotion programmes such as the Maquiladora Programme, PITEX and ALTEX came to an end according to NAFTA provisions.

another in electronics. Out of the 16 companies, six were TNCs with 100% foreign capital and ten were controlled by Mexican (domestic) capital with less than 40% of foreign capital share.

The Top 500 database also allows for an exploration of company location over time. The data reveal that in 2000 the trend for the top companies was similar to the relocation patterns for economic activity shown by the census data: a decline between 1980 and 2000 in companies located in Mexico City (from 393 to 258) and a significant increase in companies located in states with a long-standing manufacturing role – Jalisco with 42 and Nuevo León with 50. The border states increased their presence – for example, Chihuahua, which had no Top 500 ranking companies in 1980, gained 17 by 2000 – as did some other states. In 2000 there were 17 companies in Baja California, 12 in Tamaulipas, ten in Coahuila and six in Sonora. In 1980 there were 78 companies in the border states, and the number rose 120% by 2000. However, except for Nuevo León, the border states do not show significantly different economic growth trends than other states located outside the region for companies in the Top 500 over the period 1980–2000. Three states, for example, that failed to register any companies in the 1980 database but are not border states recorded a significant presence by 2000: ten companies were located in Veracruz, ten in Durango and nine in Sinaloa.

In the 2000 sample, Mexico City records 258 companies compared with 164 in the border states, indicating the strong appeal of Mexico City. In absolute numbers in 2000 Mexico City remained the lead location, hosting

51.6% of the Top 500 Companies, despite the fact that this figure means a significant reduction from 393 in 1980 (–34.4%). In 2006 the number of companies located in Mexico City increased to 348, mostly due to the different composition of the database. So, while the border has experienced an increase in numbers as Krugman predicted, the effect on Mexico City is not clear, at least not to the degree expected by Krugman and Livas; and, the increase in company presence at the border is not exclusive, as other states emerged onto the list just as strongly. This simple descriptive and comparative analysis, therefore, points to a more complex explanation for change to the national regional economy than trade liberalisation can provide alone.

The next section therefore presents a more detailed comparison between companies located in Mexico City and companies located in the border region in order to test Krugman's argument. The analysis looks at the year of starting operations and trade – exports to the US – to test whether location decisions can be related to trade liberalisation post-1986 (when Mexico became a full GATT member). According to Krugman, companies starting operation in Mexico after 1986 with export activity to the US would be expected to locate in the border region. Companies located in Mexico City would be expected to have lower (or no) export activity compared with those located in the border region.

Mexico City vs Border Region: Trade and Location

Krugman (1995) considers that the transition to an open economy affects the location of economic activity. A reduction of trade barriers lowers

transport costs between domestic and external markets, prompting some firms to relocate in response to transport costs. In a closed economy, the location of an industrial centre may be determined by the interaction of transport costs, increasing returns and congestion costs, implying that firms are most likely to agglomerate in a single region (Krugman and Livas 1996). As the economy moves from closed to more open conditions, firms have to consider their location options. According to Krugman, if external demand for goods manufactured in the economy is sufficiently large, then firms will have an incentive to relocate to regions that have relatively low-cost access to the external market. If, however, the existing industrial centre formed during the closed economy is located far from the least-cost region, then firms may be reluctant to improve access to foreign markets if they have to forego the benefits of being near to established suppliers, or industries from which they derive externalities, and domestic demand (Krugman 1991a). Therefore, in the case of Mexico one might expect that Krugman's argument, although uncertain for companies already located in Mexico City (and therefore subject to detailed research in the case study chapters), would apply to new companies starting operation after trade liberalisation in 1986.

In order to compare both locations I will start with an overview of the general features of companies located in Mexico City and the border states in 2000. Looking at the characteristics of companies located in Mexico City, this location ranks better in absolute numbers compared to the border region in terms of export and import companies, TNCs and companies listed on the Mexican Stock Exchange. Seen from a different

perspective, it is also worth noting that 76.3% of all the companies with shares on the Mexican Stock Market are located in Mexico City and only 23.7% are located in the border region. In relative terms, manufacturing companies make up a larger share of total companies in the border region than in Mexico City, where service sector companies make up a higher share of total companies (See Table 3.8).

Table 3.8: Companies Profile: Mexico City vs Border States, 2000

		Location		
		Mexico City	**Border states**	**Total**
Type of	State-owned	3	0	3
company	Private Mexican company	205	104	309
	Transnational corporation	50	10	60
	Companies with export activity	154	71	225
	Companies with import activity	162	83	245
	Companies in the Mexican stock market	119	37	156
	Companies with foreign capital shares	88	29	117
Sectors of the	Agriculture, livestock, hunting and fishing	0	2	2
economy	Oil, electricity, mining and water industries	8	1	9
	Food, beverage and tobacco	21	21	42
	Garment, textile amd shoe industries	9	3	12
	Printing and editorial industries	9	3	12
	Chemical, petrochemical and pharmaceutical industries	32	10	42
	Non-metallic minerals	7	9	16
	Basic metal industries	4	8	12
	Metallic products, machinery and equipment	39	20	59
	Other manufacturing industries	5	0	5
	Construction	27	9	36
	Wholesale	38	11	49
	Hotel, restaurants and leasure	10	1	11
	Transport and warehouse	12	4	16
	Telecommunication and media	6	1	7
	Real estate	5	0	5
	Professional services	19	6	25
	Other services	7	5	12

Source: Author's calculations based on Expansión database, "Las 500 empresas más importantes de México", 2000.

An interesting feature of the companies located in Mexico City is the higher proportion with foreign capital involvement compared with those

located at the border. If we look at the percentage of Mexican companies with participation of foreign capital for Mexico City and the border region, the data show Mexico City to be the location for 75.2% (88 out of 117 companies with some participation of foreign capital in the database), greater than the border region, with 24.8% (29 out of 117 companies with some participation of foreign capital in the database). Moreover, the average share of foreign capital as a percentage of total social capital (for Mexican companies) is significantly higher for those companies located in Mexico City (34%) compared with those located at the border (20.7%).[51] From the total number of export companies within the 500 database (287), 225 are located in Mexico City and the border states; 154 in Mexico City (53.7% of all export companies) and 71 (24.7%) in border states. What these data suggest is that companies located in Mexico City are more internationally oriented, at least in one sense, than those at the border.

Table 3.9, below, presents the companies in the border states and Mexico City with exports to the US, cross-tabulated with companies' starting operation years. The first feature is that of the 219 companies with export activity to the US, Mexico City (with 49.3%) and the border states (with 29.3%) represent 78.6% of companies, leaving one-fifth (21.4%) of companies with exports to the US distributed over the other states. Looking at the year these companies started operations is revealing, as out of the 219 companies exporting to the US in 2000, 77 started operations in

[51] Foreign capital shares is the variable with the highest t-test score, suggesting the strongest statistical relationship with the location variable. In other words, the higher the foreign capital shares in any given company, the more likely the company is to be located in Mexico City, according to these results.

Mexico after 1986, meaning that 142 US-export companies (almost double the 1986 figure) were already established in Mexico in 2000 and started operations before trade liberalisation took place. This suggests that these companies went into a market orientation transformation, a shift from producing for the Mexican market to an export-oriented model.

If we consider the date of starting operation and look at company location, one expectation according to Krugman's hypothesis might be to find more companies located in border states than in Mexico City (see Table 3.9). However, the number of companies starting operations after 1986 and locating in Mexico City is greater (37) than the number of companies locating in border states over the same period of time (23), challenging Krugman's claims. Two situations contradict Krugman's argument. First, based on the analysis of the 500 top companies, 65.3% of companies exporting to the US and Canada were established in Mexico before the liberalisation of trade in 1986; and second, the fact that the number of export companies starting operation in Mexico after 1986 and exporting to the US is larger in Mexico City than in the border states also contradicts Krugman's ideas. Therefore the nature of Mexico City's centripetal force on the 37 companies with exports to the US and Canada that located in Mexico City after trade liberalisation in 1986, and particularly the seven that did so after the start of NAFTA, requires further research.[52]

[52] Sassen's ideas on the global city hypothesis will be used to explore further the economic features that make Mexico City an attractive location under an open, more global economic regime in Mexico.

Table 3.9: Year of Starting Operations, Location and Export to NAFTA Region

Companies Exporting to NAFTA											
Location		Before 1900	1901-1950	1951-1960	1961-1970	1971-1980	1981-1985	1986-1990	1991-1995	1996-2000	Total
Mexico City (DF +	Count	2	24	14	12	13	6	15	15	7	108
Metropolitan State	% within location	1.9%	22.2%	13.0%	11.1%	12.0%	5.6%	13.9%	13.9%	6.5%	100.0%
of Mexico)	% within starting operations	50.0%	60.0%	58.3%	48.0%	38.2%	37.5%	60.0%	44.1%	41.2%	49.3%
Baja California	Count	0	0	0	0	2	2	1	4	1	10
	% within location	0.0%	0.0%	0.0%	0.0%	20.0%	20.0%	10.0%	40.0%	10.0%	100.0%
	% within starting operations	0.0%	0.0%	0.0%	0.0%	5.9%	12.5%	4.0%	11.8%	5.9%	4.6%
Chihuahua	Count	1	2	0	0	3	0	1	1	4	12
	% within location	8.3%	16.7%	0.0%	0.0%	25.0%	0.0%	8.3%	8.3%	33.3%	100.0%
	% within starting operations	25.0%	5.0%	0.0%	0.0%	8.8%	0.0%	4.0%	2.9%	23.5%	5.5%
Coahuila	Count	1	1	0	0	0	0	0	1	0	3
	% within location	33.3%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	100.0%
	% within starting operations	25.0%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	0.0%	1.4%
Nuevo León	Count	0	11	5	1	5	2	1	7	0	32
	% within location	0.0%	34.4%	15.6%	3.1%	15.6%	6.3%	3.1%	21.9%	0.0%	100.0%
	% within starting operations	0.0%	27.5%	20.8%	4.0%	14.7%	12.5%	4.0%	20.6%	0.0%	14.6%
Sonora	Count	0	0	1	0	2	0	0	1	0	4
	% within location	0.0%	0.0%	25.0%	0.0%	50.0%	0.0%	0.0%	25.0%	0.0%	100.0%
	% within starting operations	0.0%	0.0%	4.2%	0.0%	5.9%	0.0%	0.0%	2.9%	0.0%	1.8%
Tamaulipas	Count	0	0	0	1	1	0	0	1	0	3
	% within location	0.0%	0.0%	0.0%	33.3%	33.3%	0.0%	0.0%	33.3%	0.0%	100.0%
	% within starting operations	0.0%	0.0%	0.0%	4.0%	2.9%	0.0%	0.0%	2.9%	0.0%	1.4%
Rest	Count	0	2	4	11	8	6	7	4	5	47
	% within location	0.0%	4.3%	8.5%	23.4%	17.0%	12.8%	14.9%	8.5%	10.6%	100.0%
	% within starting operations	0.0%	5.0%	16.7%	44.0%	23.5%	37.5%	28.0%	11.8%	29.4%	21.5%
Total	Count	4	40	24	25	34	16	25	34	17	219
	% within location	1.8%	18.3%	11.0%	11.4%	15.5%	7.3%	11.4%	15.5%	7.8%	100.0%
	% within starting operations	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: SPSS output, author's calculations based on *Expansión* database, "Las 500 empresas más importantes de México", 2000.

ECONOMIC RESTRUCTURING AMONG THE TOP 500: CONSTRUCTING A GLOBAL INDEX

The results of the previous section signal a trend towards de-concentration of industrial activity from Mexico City but also a new concentration of economic activity in Mexico City over the same period of time. A question arises, therefore, as to why Mexico City did not lose its position as a leading location and continued to attract existing and new industries, contrary to Krugman's argument. Using the Top 500 Companies databases

for 2000 and 2006, this section examines the trend of ecnomic localisation between Mexico City and the rest of the country. I am interested in testing the free trade location argument for Mexico City to consider what economic factors beyond the free trade regime are important to location decisions; for example, the presence of TNCs, flows of foreign investment, labour availability and financial specialisation.

In pursuing this analysis I consider Sassen's ideas and the alternative hypothesis outlined in Chapter One in order to explore a statistical association between the globalisation of companies' business activities and location. The aim is to identify the economic factors that make one location more attractive than others under the free trade regime which in the case of Mexico can be described as a "global regime" as a consequence not only of trade but also financial liberalisation, economic deregulation and economic integration into North America. Testing Sassen's "global city" ideas using multivariate analysis, I compare Mexico City's "global economic factors" with other Mexican states.

The multivariate econometric model was used to generate an index in order to construct a new ranking for the top 100 companies in terms of global characteristics, aiming at identifying the companies with the highest levels in globally oriented activity.[53]

[53] The sample was reduced to 100 companies in order to analyse only those with a "global reach" – companies involved almost entirely with the domestic market would produce a zero or very low global score. Using the top 100 companies in global terms allows statistical consistency and comparison.

A PCA model was constructed based on variables that reflect dimensions of globalisation and applied to determine how indicators can be most effectively combined to measure a firm's relative "global" status (globality). Hence, the application of PCA used indicators that showed strong correlations with the defined "global benchmark" indicators such as foreign trade and foreign capital flows.[54] Filtering the indicators in this way provided a stronger measure of globality. To complete the filtering process, all other variables registering a significant level of correlation were added to the list of globality indicators. The linear correlation coefficient – a statistical procedure used to measure the degree to which two variables are associated – is the primary means of filtering global indicators to determine which variables appear to be the strongest for capturing differences in the relative globality of firms. The correlation coefficient can determine the level and direction of a relationship between two variables.[55] The indicators listed in Table 3.10 can be considered measures of the level of global activity for each company in the Top 500 sample. Table 3.10 explains the "global dimension" that is considered to be measured by each variable as a justification for inclusion in the model. In brief, the results indicate that 26 out of 40 variables correlated with exports, imports and FDI were found to be significantly (statistically) associated. Output from the analysis has been summarised in Table 3.11,

[54] Usually used in globalisation literature as proxies to measure economic globalisation.
[55] Linear correlation does not require that the units used in each variable be the same. The values of the correlation coefficient range from –1.00 to +1.00, and their sign and magnitude indicate how the two variables relate to each other. A coefficient value at or near –1 indicates that the variables are inversely related, or that a higher value for one is associated with a lower value for the other. In contrast, a value at or near 1 suggests a strong positive relationship between the two variables. Coefficient values at or near 0 suggest that no strong relation exists between the variables.

listing all indicators tested and ordered according to the strength of the association.[56]

Table 3.10: List of Global Proxy Variables

Variable	Global dimension measured
1. Exports	Foreign trade
2. Imports	Foreign trade
3. Total sales	Size of the company
4. Foreign capital	Degree of foreign direct investment and international networks
5. Total assets	Productivity of capital when divided by total sales
6. Total employment	Productivity of labour when divided by total sales
7. International liabilities	Source of financial resources and access to foreign capital
8. Participation in Mexican Stock Market	Source of financial resources
9. Transnational corporation	Global networks, global affiliates
10. Company with public sector with some % as shareholders	Nature of public sector participation in the economy in an open economic context.
11. Company with foreign capital with some % as shareholders	International networks
12. Company with Mexican private sector with % as shareholders	Nature of public sector participation in the economy in an open economic context.
13. Manufacturing sector	Sector of the economy – expected to have a more export orientation
14. Services sector	Sector of the economy – expected to have a more national market orientation, inverse relationship with globalisation
15. Maquiladora	Whether or not the company is listed in the public sector programmes allowing temporary imports for re-export purposes
16. ALTEX/PITEX	Whether the company receives government support such as tax credits and tax exemptions as support to develop an export platform
17. Starting operation year	Expecting newcomers to be more globally oriented than long-standing companies
18. Origin/destination of foreign trade	Degree of diversification of markets
19. Geographical region	Expecting to find association with border location when trade activity is higher and with Mexico City where global factors appear to be significant
20. Employment	Expecting higher association with border location variable; expected higher labour-intensive activity associated with export production associated to labour cost differentials in border region

Source: Author's elaboration.

[56] Most were at less than p=0.01, indicating a 99% certainty that the correlation is not random. It is also important to note the sign of the correlation coefficient, in order to identify if the relationship was found to be negative or positive.

Linear Correlation Results

An intuitive expectation, subsequently confirmed by the statistical results, is that exports are associated positively with the following proxy variables: employment, imports, total sales, total assets, total international liabilities and manufacturing industries (see Table 3.11). The first unexpected finding is that the operation start-up year and exports variables are negatively correlated, suggesting that the older the company, the more likely it is to have a higher share of export activity as proportion of total sales. This is contrary to what might have been expected and goes against the idea that global companies arrived in Mexico under liberalisation to take advantage of the new economic relations with the US and world economy. Furthermore, this finding seems to challenge an earlier point about firms in the 1980s not exporting and instead producing for the national market under the ISI regime. (In fact, the two case studies discussed in the following chapters suggest that in order to survive or take advantage of export/import conditions during the 1980s, firms shifted to a pro-export position). Finally, a high correlation between publicly owned companies (state capital variable) and exports suggests that the six publicly owned companies in the sample have high levels of export activity.[57]

[57] Apart from Petróleos Mexicanos, Mexico's biggest company, the other publicly owned companies at this time were in more globalised sectors such as telecommunications and transport (for example, AeroMéxico, Mexicana and Satélites Mexicanos).

Table 3.11: Variable Correlations

Variable	Exports Pearson correlation	Total imports Pearson correlation	FDI Pearson correlation
Exports	1	.769**	0.081
Position in total sales	.247**	.332**	.261**
Sales	.875**	.684**	0.074
Export to NAFTA zone	.160**	.211**	.195**
Export to European countries	0.075	0.08	.137**
PITEX (temporary imports for export programme)	.104*	.151**	.208**
Foreign capital as percent of total	0.038	.090*	.527**
Total assets	.808**	.608**	0.045
Total liabilities	.852**	.575**	0.024
National liabilities as percent of total	–.278**	–.203**	–.287**
Internal liabilities as percent of total	.208**	0.269	.113**
Total employment	.596**	.532**	0.056
Starting operations year	–.160**	–.171**	–0.003
Capital goods industries: machinery and equipment	0.223**	0.217**	0.147**
Manufacturing sector	–0.006	0.009	.118**
Metropolitan area of Mexico City	0.041	0.062	.107*
Foreign direct investment	0.08	.178**	.906**
CS_EST (company with public sector capital as shareholders)	.314**	.181**	–0.023
CS_PRIV (company with Mexican private sector capital as shareholders)	–.195**	–.219**	–.810**
CS_EXT (company with foreign capital as shareholders)	.096*	.167**	.859**
Foreign investment	0.081	.137**	1
Mexican national companies	–0.086	-.148**	–.637**
TNC	0.086	.148**	.637**
Import from NAFTA	0.088	.145**	0.049
Import from Europe	–0.019	–0.022	.109*
Total imports	.769**	1	.137**

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS output, author's calculations based on Expansión database, "Las 500 empresas más importantes de México", 2000.

In the case of the imports variable, some results are worth noting. First, contrary to expectations, the variable measuring government programmes to support export activity (PITEX, ALTEX [58] and the Maquiladora Programme) by giving tax exemptions to companies that import goods temporarily for re-export (intermediate goods), appears to have a stronger

[58] Like PITEX, ALTEX is a government programme of tax incentives for companies with high exporting activity (*empresas altamente exportadoras*).

correlation to import than to export variables. This suggests companies taking advantage of these programmes do not export all the resulting products as the subsidy requires. This may be due to the complexity of the PITEX quantification procedure or the lack of enforcement measures. In the same way, the import variable is more strongly correlated to exports within the NAFTA region. This could be explained by the fact that export companies under maquiladora "business practices" still operate under temporary import schemes assembling products in Mexico to be re-exported to the US and Canadian markets. Second, the positive correlation between imports and TNCs confirms the idea of global production circuits where TNCs import a large number of products in the supply chain (often intra-firm trade) from home-country affiliates and produce final products bound for the Mexican market. This is confirmed by the exports variable being uncorrelated to TNCs and the presence of foreign capital in Mexican companies.

Introducing a spatial dimension to FDI flows, the analysis provides statistical grounds to confirm that business location in Mexico City is highly correlated with foreign capital flows, and that no other region is statistically significant. This variable is strongly associated with the high share of foreign investment for both TNCs and Mexican capital companies (suggesting larger shares of foreign capital in both types of companies) located in Mexico City, and furthermore confirms the leadership position

of Mexico City as having the largest number of TNCs with operations in the country.[59]

PCA EMPIRICAL RESULTS

The objective for using PCA in the globality assessment exercise is to extract the "global component" that can be used to build a company-specific index of relative globality. Therefore, a company can rank highly for a single global factor such as net exports or imports (i.e., CEMEX, PEMEX), or as a TNC subsidiary with a high percentage of foreign capital (i.e., Sears Roebuck), or be top of the list of sales (i.e., Carso Telecom), and still get a low score due to the importance given by the model to a combination of factors that express some degree of globality.

As shown in Appendix 2, the top ten companies according to the global score are, in order: Ford Motor Company; Wal-Mart; Grupo México; Grupo Modelo; DaimlerChrysler; Hewlett-Packard; Gruma Alimentos; Hylsamex; Kimberly-Clark; and Grupo Minero.[60] The ten most global companies according to factor analysis are companies that share the following characteristics: eight out of ten are located in Mexico City; nine have strong export activity (the only exception being Wal-Mart); nine have received foreign investment, for which the main source is from the US; six

[59] This finding runs in parallel with disaggregated trends by state 1994–2000, which confirm that Mexico City (DF) has consistently been the main recipient of FDI. According to official data from the Dirección General de Inversión Extranjera Secretaría de Economía, FDI into Mexico between 1994 and 2000 was on average US$11.4 billion, and the average of that amount going to Mexico City (DF) was 54.8%. Total FDI in 2006 was US$20.05 billion, of which 49.8% went into Mexico City (Secretaría de Economía 2008).
[60] For the full list of the top 100 global companies see Appendices 2 and 3.

out of ten are listed on the Mexican Stock Exchange; and four are subsidiaries of TNCs.

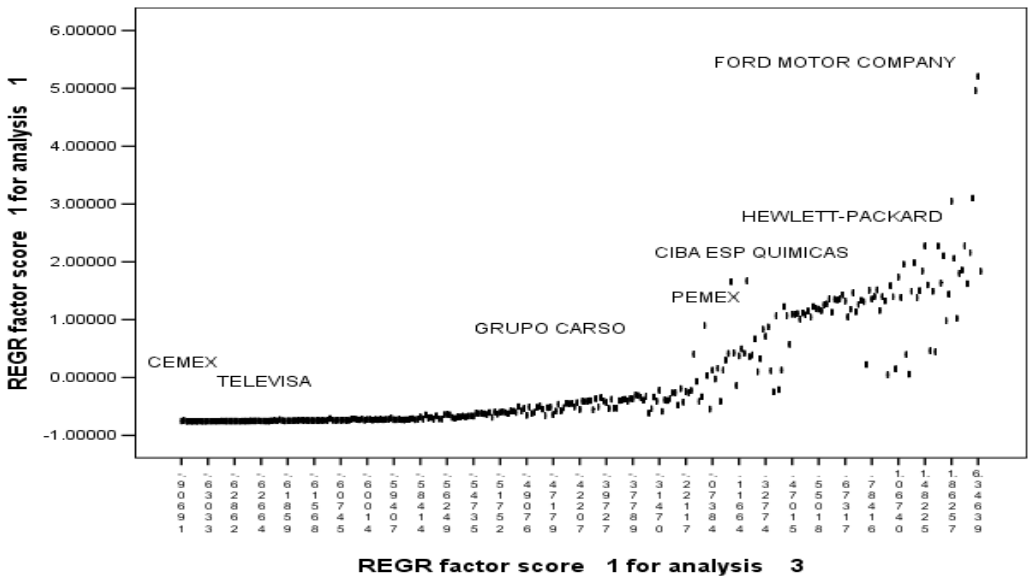
Table 3.12: Factor Analysis Model

KMO and Bartlett's Test

Kaiser-Meyer-Olkin measure of sampling adequacy		.775
Bartlett's test of sphericity	Approx. chi-square	1878.143
	df	28
	Sig.	.000

Source: SPSS output, author's calculation based on *Expansión* database, "Las 500 empresas más importantes de México", 2000.

Figure 3.2 Regression Factor Score for Selected Companies



Source: SPSS output, PCA based on *Expansión* database, "Las 500 empresas más importantes de México", 2000.

To dig a little deeper into the location patterns of the 100 top companies, I compared the main variables depicting global economic activity of companies against the full sample of 500 companies. I analysed first the

particularities of companies according to what scholars of globalisation would identify as key variables: (i) sectors of the economy; (ii) starting operations year; (iii) foreign trade, i.e., exports and imports as a percentage of total sales; (iv) financial activity, i.e., foreign capital as a percentage of total shares, international liabilities as a percentage of total liabilities, and participation in the Mexican Stock Market as percentage of total social capital (TNCs); (v) total employment and productivity measures as sales divided by total number of employees; and (vi) location. The results of this analysis show:

(i) According to the analysis, manufacturing companies are those with the highest global scores. Comparing the samples, there is an increase in the proportion of manufacturing companies in the top 100 sample, from 56% to 79%, and a consequent reduction in the percentage of companies in the service sector, from 31% to 19%. Particular over-representation in the top 100 sample is seen in the following manufacturing sectors by those with higher global scores: automotive industry, consumer electronics, office and computing machinery, and chemical and petrochemical. This confirms some studies which point to these sectors as the most globalised manufacturing sectors (OECD 1994b; 1996a). The reduction in the number of service sector companies is logical if we consider that the sector, in general, has a national market scope. Also, most of the trade agreements do not consider the provision of services as part of the trade negotiations (at least not the ones signed by Mexico until 2000). However, following Sassen's ideas, the increase in global services is seen as an important component of the global production network. Therefore it is worth noting

that among the top 100 global companies in 2000 there are 19 service sector companies, among them companies in the transport sector, professional services, hotels and restaurants, and communications, most of the sectors correctly pointed to by Sassen.[61] A reduction in the representation of sectors between the two samples reflects these least globally oriented activities, which are those that aim to serve the national market, such as food, beverages and tobacco; construction; wood and wood product industries; and real estate. The last three do not appear in the top 100 global sample (see Table 3.13).

(ii) One might expect to find those companies with higher global scores among those that started operations after liberalisation of trade. It would therefore be expected that the average starting operations year would be significantly higher – closer to 2000 – for the top 100 global companies than the average for the Top 500 Companies list for the same year. One would expect to see "newcomers" having a more global character than those "old established" companies in Mexico. Yet according to PCA results, the average year for both samples is the same: 1972. This can be interpreted to mean that after the liberalisation of the economy there was not a massive influx of "global companies" arriving in Mexico. Most important is the conclusion that the old established companies operating under a closed regime did not disappear, or collapse, with the

[61] Sassen points to the financial sector as crucial to globalisation of the economy, and commonly refers to insurance and financial services as the leading sectors in global cities. The 2000 database does not include financial sector companies, but the rest of the industries in the "global services sector" to which Sassen makes reference appear in the top 100 with high global scores.

liberalisation of the economy. What these data suggest is that large firms have adapted to economic restructuring.

(iii) One might expect to have in the subsample of the most global companies a higher number of companies with imports and exports, and a higher share of this foreign trade activity as a percentage of total sales. The data results confirm both cases. First, the percentage of exporting companies in the Expansión 500 is 56.4% compared with 86% in the top 100 companies, and import figures marginally increase between the Expansión 500 and top global 100 from 63.2% to 66% (see Table 3.14). However important these variations are, among the top 100 companies exports are shown to be higher than imports, thereby characterising companies in this sample as export-oriented. These export companies have on average more than double the export activity (56.6% of total sales) of the Top 500 (21.6%).

Table 3.13: Top 500 and Top 100 Distribution by Sector, 2000

Top 500 Companies	No.	%	Top 100 global	No.	%	Variation
Agriculture, livestock, silviculture, hunting and fishing	9	1.8	Agriculture, livestock, silviculture, hunting and fishing	1	1	−0.8
Oil and mining	9	1.8	Oil and mining	2	2	0.2
Food, beverages and tobacco	78	15.6	Food, beverages and tobacco	9	9	-6.6
Garment, textile and shoe industries	14	2.8	Garment, textile and shoe industries	2	2	−0.8
Wood and wood products industries	1	0.2	Wood and wood products industries	0	0	−0.2
Printing and editorial industries	18	3.6	Printing and editorial industries	6	6	2.4
Chemical, petrochemical, plastic and caucho industries	53	10.6	Chemical, petrochemical, plastic and caucho industries	13	13	2.4
Non-metallic minerals	21	4.2	Non-metallic minerals	2	2	−2.2
Basic metals industries	18	3.6	Basic metals industries	7	7	3.4
Metal products	15	3	Metal products	2	2	-1
Non-electrical machinery	3	0.6	Non-electrical machinery	2	2	1.4
Machinery and equipment	2	0.4	Machinery and equipment	2	2	1.6
Radio, TV and communications equipment	3	0.6	Radio, TV and communications equipment	2	2	1.4
Office and computing machinery	6	1.2	Office and computing machinery	5	5	3.8
Electrical machinery	13	2.6	Electrical machinery	6	6	3.4
Electrical apparatus	1	0.2	Electrical apparatus	1	1	0.8
Motor vehicles	24	4.8	Motor vehicles	13	13	8.2
Transport equipment	1	0.2	Transport equipment	0	0	-0.2
Professional and scientific goods	4	0.8	Professional and scientific goods	2	2	1.2
Other manufacturing industries	6	1.2	Other manufacturing industries	2	2	0.8
Construction	44	8.8	Construction	0	0	−8.8
Water and power industries	2	0.4	Water and power industries	2	2	1.6
Wholesale	65	13	Wholesale	2	2	−11
Hotels and restaurants	14	2.8	Hotels and restaurants	4	4	1.2
Transport and warehouse	20	4	Transport and warehouse	6	6	2
Communications	7	1.4	Communications	2	2	0.6
Real estate	7	1.4	Real estate	0	0	−1.4
Professional services	28	5.6	Professional services	4	4	−1.6
Other	14	2.8	Other	1	1	−1.8
Total	500	100	Total	100	100	0

Source: Author's calculations based on *Expansión* database, "Las empresas más importantes de México", 2000.

Table 3.14: Main Characteristics of the Top 100 Global Companies and Expansión 500, 2000*

Top 100 global	N	%	Minimum	Maximum	Mean
Sales	100	100	1492	7,316,414	582,417.70
Starting operations year	100	100	1890	1999	1972
Percentage of companies that conduct exports (mean value represents exports as percentage of total sales)	86	86	0%	100%	56.6%
Percentage of companies that conduct imports (mean value represents imports as percentage of total sales)	66	66	0%	100%	55.0%
International liabilities (as % of total capital)	95	95	0%	100%	54.9%
Total Employment	100	100	28	70,700	4,748
Productivity	100	4	9869	9,869	252
Companies in the manufacturing sector	79	79	79	79	-
Companies in the service sector	19	19	19	19	-
CS est (public capital)	1	1.0	0%	100%	100.0%
Mexican Capital	54	54	1%	100%	39%
Foreign Capital	80	80	0%	100%	57.8%
State owned company	1	1	-	-	-
Mexican private company	47	47	-	-	-
Transnational corporation	52	52	-	-	-
Percent of total capital in the stock market	20	20	0%	100%	8.1%
Valid N (listwise)	100	100			

500 Expansión Companies	N	%	Minimum	Maximum	Mean
Sales	500	100	825	35,020,530	451,979.10
Starting operations year	500	100	1847	1999	1972
Percentage of companies that conduct exports (mean value represents exports as percentage of total sales)	282	56.4	1%	100%	21.6%
Percentage of companies that conduct imports (mean value represents imports as percentage of total sales)	316	63.2	4%	100%	22.2%
International liabilities (as % of total capital)	362	72.4	1%	100%	34.9%
Total Employment	500	100	1	128,159	3,937
Productivity	472	94.4	2	55,452	266
Companies in the manufacturing sector	281	56.2	0	281	281
Companies in the service sector	155	31	0	155	155
CS est (public capital)	6	1.2	0%	100%	1.7%
Mexican Capital	423	84.6	1%	100%	79%
Foreign Capital	276	55.2	0%	100%	19.3%
State owned company	6	1.2	-	-	-
Mexican private company	417	83.4	-	-	-
Transnational corporation	77	15.4	-	-	-
Percent of total capital in the stock market	180	36	0%	100%	24.9%
Valid N (listwise)	500	100			

Source: Author's calculations based on *Expansión* database, "Las 500 empresas más importantes de México", 2000.

* It was not possible to conduct this analysis for 2006 *Expansión* database as the database does not include the same variables.

(iv) If we explore the type of company by distinguishing TNCs from Mexican capital companies we would expect to see an increase in the

percentage of TNCs in the top 100, as many scholars point to the business practices of TNCs as the main force behind the globalisation of the economy. These companies are usually responsible for the largest amounts of foreign trade (much of it intra-trade among affiliates) and the largest amounts of foreign investment. Results confirm that the proportion of TNCs increases from 15.4% to 52% between the Top 500 and Top 100, confirming that TNCs are influential economic agents (or "carriers") of the globalisation process. But also important is the fact that 80% of the top global companies have at least some degree of participation of foreign capital, and this would include the 52% of TNCs and nearly 30% of Mexican companies that have on average 57% of foreign capital, almost three times the average percentage for the 276 companies within the Top 500 sample with some degree of foreign capital.

Data on the financial practices of the top 100 companies in 2000 show that a large number receive financial support from institutions outside of Mexico. It was a surprise to see that 316 companies (out of 500 in 2000) had international liabilities, and also worth noting was the figure for international liabilities as a percentage of total liabilities for 362 of the Top 500, at 34.9%, underlining the global character not only of the TNCs but of the Mexican companies too. Within these data we can note that for the top 100 companies, 95 have international liabilities, representing an average of 54.9% of total liabilities. These data seem to confirm that integration which goes beyond "pure trade and investment" will extend to further transnational business practices, which also confirms the results related to the participation of the Top 500 in the Mexican Stock Exchange.

Due to the "global" nature of the stock exchange one would expect to see a larger number of companies in the Top 100 *vis-à-vis* the Top 500 list to be publically-quoted companies with a higher share of capital in the Stock Exchange as a percentage of total capital. The data indicate otherwise: 36% of companies listed in the Stock Market in 2000 in the Top 500 fell to 20% in the Top 100. Moreover, their share in the stock market in terms of total capital was also smaller; the average share of capital for the 180 top 500 companies listed on the Mexican Stock Exchange was 24.9%, whereas for the 20 top 100 companies the share was only 8.1%. The result is related to the previous point on international liabilities – if a company gains access to finance from abroad, it is rational for that company to take up this option.

(v) Comparing the location of the top 100 global companies in 2000 to the top 100 in 2006 reveals a higher dispersion of companies in 2000; there were 13 states with companies in the top 100 list in that year, against nine states in 2006. Mexico City is the location with the largest number of top 100 global companies, with 61 in 2000 and 73 in 2006 (see Table 3.15). The border states that appeared on the list with companies among the top 100 in 2000 are: Baja California (4), Chihuahua (2), Nuevo León (14), Sonora (1), and Tamaulipas (1). The 2006 top 100 global list showed a reduction in the number of the states represented, the number of companies located in the border states (from 23 to nine) and the number of border states represented (from five to three: Nuevo León (6), Chihuahua (2) and Sonora (1)).

Table 3.15: Top 100 Companies in 2000 and 2006

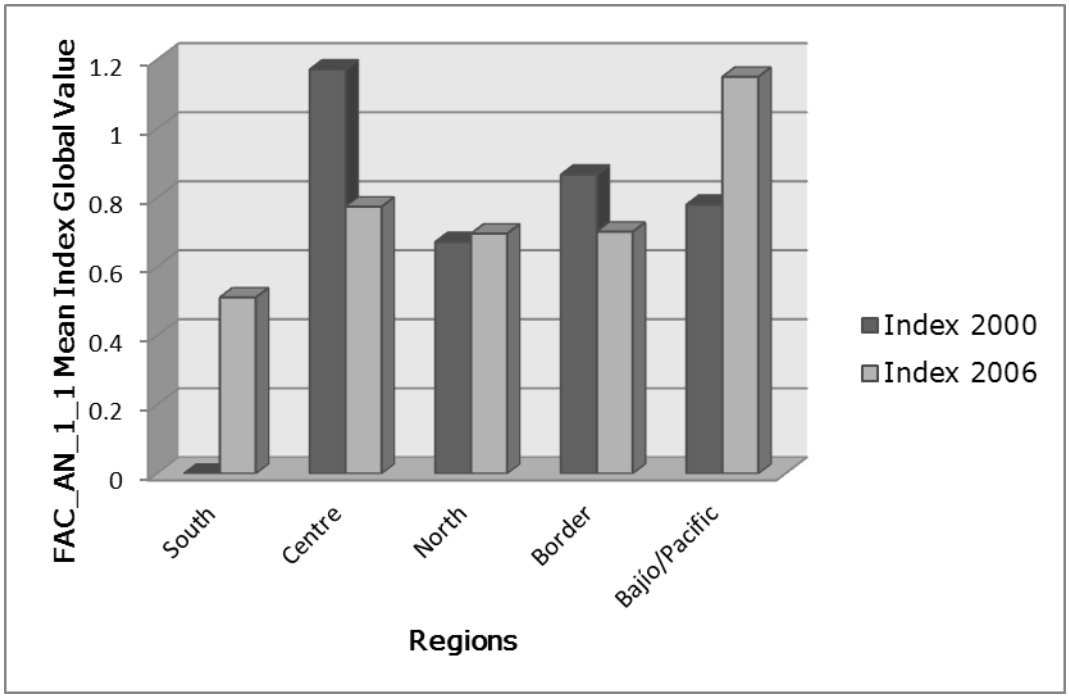
2000	Mexico City	Border region
	61	23
State-owned	1	0
Mexican private company	25	14
TNC	35	19
Export activity	50	23
Import activity	46	23
Stock market	12	5
Foreign investment	50	14
2006	**Mexico City**	**Border region**
	73	9
State-owned	1	0
Mexican private company	30	4
TNCs	42	5
Export activity	48	9
Import activity	51	9
Stock market	70	2
Foreign investment	64	5

Source: Author's calculations based on *Expansión* database, "Las empresas más importantes de México", 2000 and 2006.

It is worth noting that the concentration pattern of companies in 2000 reveals a tendency to be highly concentrated in Mexico City, a trend that was accentuated in 2006. Companies located in Mexico City had the highest scores in 2000, but this situation changed in 2006 when, despite Mexico City increasing in number of companies, the highest global scores by region were companies in the Bajío/Pacific area (See Figure 3.3), where

the states of Jalisco, Guanajuato, Aguascalientes and San Luis Potosí are located. Along with Querétaro, these states had become, according to economic census data, the most dynamic in manufacturing terms between 1998 and 2008 (INEGI 1999 and 2009).

Figure 3.3: Regional Distribution of Top 100, 2000 vs 2006 (Average Score of the Global Index Variable)



Source: Author's elaboration based on PCA using *Expansión* database, "Las 500 empresas más importantes de México", 2000 and 2006.

The border region ranks second on the average global score for companies in 2000. The lowest scores overall went to the southern region, with no companies ranked among the top 100 global companies in 2000 and only two in 2006, meaning that the main indicators of globality record low values for companies located in this region and suggesting that the south is a non-preferred location for global-related activity.

Focusing on manufacturing specifically, one could argue that some degree of industrial decentralisation has taken place over the 20 years studied here. Among the top 100 global companies, for example, employment trends follow a pattern suggested by the international division of labour hypothesis – i.e., that global companies look for less developed regions to take advantage of the low labour costs that in an appropriate business environment account for an important part of total production costs. The results are consistent comparing the total number of employees that on average are in companies located in Mexico City against companies in the border states within the top 100. It was found that companies in the border states have a higher number of employees (4,784) on average in comparison to companies in Mexico City (3,937). This suggests that companies located in border states have on average more labour-intensive production, with lower levels of labour productivity compared to those in Mexico City.[62]

But is this decentralisation per se? Are location decisions made to take advantage of less expensive, less congested locations and more labour-intensive production? The "migration to the border" hypothesis for export companies seems to be only partially supported, as most of the companies with international trade activity are still located far from the border and mostly within the central region. And even though it is true that the border region hosts a good number of the most global companies, the score in terms of the Globality Index is far lower than for the central part of the

[62] This productivity is measured by dividing total sales by total number of employees. The figure is US$251,990 per employee for companies in the border states against US$296,060 for companies in Mexico City.

country and in particular Mexico City. The border region does indicate a strong correlation with imports and exports, and other trade-related variables. For the top export companies, the higher their export ranking, the more likely they are to be located in a border state.

CONCLUSION

It is possible to draw an initial set of conclusions concerning the transformation of the Mexican economy between 1980 and 2000. The data show the leading economic role for Mexico City and the border but also highlight differences in structure and timing of change between the two. The drift to the border began before global drivers were present – that is, in the early 1980s – and therefore suggests that other forces, possibly government programmes to support maquilas, were important to bring change. The analysis also reveals that despite liberalisation of trade and new manufacturing centres that made the border more attractive for export/import-oriented companies, especially those with the US as the final destination for manufacturing products, Mexico City remains the nation's major manufacturing centre. Companies located in Mexico City record high scores on the Globality Index.

The analysis provided in this chapter offers a critical reflection on the hypothesis prompted by the work of Paul Krugman. It should be clear that transport costs and access to markets do not determine alone, or even in the main, the regional shape of the national economy. Missed by Krugman is the extent to which the changing structure and geographical location of economic activity in the 1980s, which he attributes to economic "opening",

had already begun in a *de facto* sense. The data also suggest that when reform did take place, long-established companies were able to adapt to a shift in market focus from national to global. Companies located in border states in 2000 were more likely to be exporters, but contrary to Krugman's ideas, they were not newly established companies. Indeed, some of the oldest established companies in Mexico were among the top exporters by 2000 and 2006, and more remarkable is that some were not located in the border region but in Mexico City.

The data presented in this chapter confirm that Mexico City's dominant role in manufacturing has decreased in relative terms, but the city has maintained its position as the largest manufacturing centre in terms of employment and output. Although the Top 500 database methodology changed between 2000 and 2006, the data show the preference of financial services to locate in Mexico City, displacing manufacturing as the driver of the city economy, and that Mexico City is the preferred location for TNC headquarters. Thus, Mexico City is the preferred location for global companies overall, and especially for those engaged in more globally oriented activities, following the trends described in Sassen's global cities hypothesis.

Finally, a comment on method. The main reason behind the decision to conduct PCA tests was to produce empirical evidence using a strong statistical tool to create parameters, not only to allow descriptive analysis but also to analyse the processes involved. The PCA also enabled interaction within the trade liberalisation process, which involves a large

number of economic factors and economic agents. The PCA was constructed to include most of the variables associated with the economic liberalisation process, and was used to identify underlying components that can at least partially explain why the indicator values differ between companies. A result of the PCA was the creation of a single index which assigns a specific value to each firm representing global status in relation to all the other companies in the sample. The statistical significance of the model was high (.775), and the results were consistent when contrasted with individual cases and with national trends. The analysis was presented with a special focus on the top 100 companies in the ranking in order to focus on those companies that access foreign markets – i.e., exports associated with companies with foreign capital and with access to foreign financial services, mostly TNCs. It is important to remember that the PCA is primarily concerned with describing the "variance" shared by elements based on three or more variables (i.e., export, imports, foreign investment, etc.); therefore, some companies with only one high value in exports, contrary to expectations, did not necessarily received a high score. This was the case for companies such as PEMEX and CEMEX.

Chapter Four: Global and Local Actors, Economic Restructuring and Location Decisions: The Case of the Automotive Industry

OVERVIEW

This and the next chapter present case studies of the automotive and consumer electronics sectors. The aim of these chapters is to analyse the effects on Mexico's regional geography brought about by the trade liberalisation of the Mexican economy, which I argue to be the leading factor explaining industrial restructuring in Mexico City. I am interested especially in companies that have been affected by economic liberalisation but have managed to compete effectively in world markets. According to the Globality Index, the manufacturing metal products sector (ISIC 38) has the highest global scores, and within that sector automotive and consumer electronics are the industries (subsectors) that rank the highest. Therefore these two subsectors were chosen as case studies to help narrow down the analysis hitherto conducted at the national scale, and to consider the industrial sector and company level. The aim is to identify whether the de-concentration of Mexico City's manufacturing sector is a consequence of trade liberalisation, the main hypothesis of the research, or is the result of different economic factors and economic trends other than trade liberalisation alone, the alternative hypothesis as outlined in Chapter One. More specifically, in looking at the automotive sector I want to test whether the trade liberalisation proposed by Krugman and Livas as the

explanation for a "migration to the north" is robust now that data are available to unpack the location decisions of the automotive assembly TNCs in Mexico.

THE AUTOMOTIVE INDUSTRY: A CASE FOR GLOBALISATION

The automotive sector has been one of the most dynamic sectors worldwide for growth in production, trade and investment, and has been one of the manufacturing sectors with the highest rates of economic growth in Mexico from the period of liberalisation of trade at the end of the 1980s (Schlie and Yip 2000). This period of growth is the latest phase in a century-long transition from manual assembly plant production to the manufacture of automobiles according to a single design for all markets, the so-called "world car", with minor local adaptations and operating with assembly-line methods associated with Fordism. This pattern was first applied by US companies that expanded internationally through direct car exporting and then through FDI, mainly in Europe and later in Latin America (Van Biesebroeck 2003). This export strategy was also adopted by Japanese firms in the initial stage of their international expansion (Mortimore 2000).

The main forces shaping patterns of production, trade and sourcing in the automotive industry are related to technological evolution and new approaches to organisation, including "Toyotism" or "lean production" (Yasuhiro 1993). Technological and organisational innovations facilitate production flexibility and enable a wider range of products to be produced

efficiently and rapidly to meet new consumer, energy, safety and environmental demands. The new production methods are based on low inventories, known as "just-in-time" inventories (Sakakibara et al. 1997; Sturgeon and Lester 2004), which allow for quality control, flexibility and rapid response to changing consumer preferences. These methods have fostered the introduction of new models of production differentiation and contribute toward changes to the geographical distribution of operations as producers are able to locate production in major markets and respond more efficiently to changing consumer tastes.

Another related development is the externalisation of the previous internal production of goods and services by assemblers, a process known as "vertical disintegration", driving further changes in industry structure and new patterns of investment and production (Holmes 1999). The industry is characterised by extensive foreign investment and international alliances,[63] with high levels of intra-firm and intra-industry trade and international sourcing. High levels of trade in components and parts to supply foreign affiliates and final assembly plants are a notable feature of the industry. These patterns may, however, change as producers of parts and components establish extensive production facilities abroad in order to supply more parts locally with just-in-time delivery (Ruigrok 1991).

[63] International alliances include Mercedes-Benz and BMW in the US, Daihatsu and Toyota, Isuzu and GM, and Rover and initially Honda, then from the end of 1993 Rover and BMW.

Table 4.1: Top Automotive Producers, 1981–2000

Company	Headquarters	1981 rank	2000 rank	Production in 2000 (millions of units)	Share of global production in 2000 (percentage)	Cumulative share of global production (percentage)
General Motors	US	1	1	7.6	13.6	13.6
Ford Motor Co.	US	2	2	6.7	12.0	25.6
Toyota Motor Corp.	Japan	3	3	6.0	10.9	36.5
Volkswagen AG.	Germany	5	4	5.1	9.2	45.7
Chrysler Corp./DaimlerChrysler	US	*a*	5	4.4	7.8	53.5
PSA Group Peugeot - Citroen	France	8	6	3.1	5.6	59.1
Honda Motor Corp.	Japan	6	7	2.7	4.8	63.9
Nissan Motor Corp.	Japan	4	8	2.6	4.6	68.5
Hyundai	South Korea	n.a.	9	2.5	4.5	73.0
Fiat Group	Italy	7	10	2.4	4.3	77.3
Renault	France	6	11	2.4	4.3	81.6
Mitsubishi M. Corp.	Japan	10	12	1.6	3.0	84.6
Suzuki	Japan	9	13	1.5	2.8	87.4
Other manufacturers				7.0	12.6	100.0
Total				56.0	100%	100%

a Result of merger between Daimler-Benz and Chrysler Corporation in 1998.
Source: Organisation Internationale des Constructeurs d'Áutomobiles (www.oica.net).

As a result of new production techniques and changing market conditions, automotive production is dominated by a few firms and growing output. Table 4.1 shows the high concentration of production in only a few companies for the period covered by this thesis. This process has been underpinned by the need to establish top-to-bottom integrated assembly operations covering design, development, engineering and component sourcing in each region.[64] According to Womack et al. (1990), government policies related to inward investment and foreign trade policies have also hastened relocation as investors look for the best opportunity to gain access to new markets under the most advantageous conditions (Moody 1995; Mortimore 2000).

[64] This has been the case especially in North America, Europe and East Asia. In the case of Mexico, regional integration within NAFTA was given a ten-year period – from 1994 to 2004 – to guarantee 65% of local content.

Data from major passenger car manufacturers show the importance of production in countries outside of the company headquarters location (see Table 4.2). The data provide an indication of how large firms have globalised their operations. By 1993, most of the top ten firms had located considerably more than 15% of their production outside of their country of origin, with Japanese producers having the lowest share (Toyota, Mitsubishi). Foreign production as a share of total production was highest for Ford and General Motors, the two largest car producers, at around 60% and 50% respectively. By 2000 foreign production accounted for over 30% of output at Volkswagen, Nissan, Chrysler and Honda, and the *Automotive Times* reported in 2002 that all major firms without foreign car production were either starting or planning to start foreign production (Automotive Times 2002). The share of foreign production compared to domestic production continued to rise during the sales recession of 1990–92, and was higher for most producers in 1998 (OECD 1996a). The data show that the automotive industry in Latin America has the largest foreign firms measured by sales. In 1998, seven of the ten largest foreign corporations (by consolidated sales) operated in this region.

Table 4.2: Domestic and Foreign Production of Passenger Cars by the World's Leading Producers, 1998

	Domestic production	Foreign production	NAFTA	US	Canada	Mexico	Europe	South America	Other
	%	%		%	%	%	%	%	
Ford	41.1	58.9	24.6		9.3	15.3	25.3	4.9	4.03
General Motors	52.4	47.6	12.3		9.4	2.9	28.6	4.6	2
Chrysler	54.3	45.6	44.6		28.2	16.4			2
Volkswagen	57.1	42.8	8.6			8.6	17.9	16.2	
Honda	66.9	33	33	26.4	6.6				0.7
Nissan	68.8	31.1	19.3	13.1		6.2	11.1		
Fiat	74.8	25.1						25.1	
Renault	76.9	23					17.9	5.1	
Mazda	79.7	20.2	20.2	20.2					
PSA	81.1	18.8	0				18.8		
Mitsubishi	83.2	16.7	16	16					
Toyota	85.2	14.7	12.6	10.5	2.1				
Hyundai	98.1	1.8	1.8		1.8				
Suzuki	99.3	0.6	0.6		0.6				
BMW	100								

Source: UNIDO 2003, p. 10.

By 1998, total world imports and exports of finished cars amounted to US$436 billion and US$385 billion respectively, up from US$299 billion and US$265 billion in 1991. Trade in finished cars is strongly concentrated within the OECD area, which accounts for over 90% of imports and exports combined. According to a 2001 OECD report, trade in this sector was in some cases subdued, reflecting import regulations, investment flows and the establishment of car assembly plants in major markets, as well as cyclical factors (OECD 2001a). In relation to foreign trade by regions, in the mid-1990s Europe was the leading region in terms of both share of imports and exports, followed by the NAFTA area and, in third place, the Asia-Pacific region (see Table 4.3). Trade in parts and components remained predominantly concentrated within the OECD area, with Western Europe being the largest exporter (43% in 2000) and a major importer (54%). The NAFTA region accounted 32.2% of world exports and over 25% of imports in 1995. At this time a major characteristic of trade in automotive products, both for finished cars and

for parts and components, was regional market concentration in the NAFTA region and Europe (Table 4.4). The intra-regional automotive trade in Europe, in the NAFTA region and East Asia combined represented a steady 60% of the worldwide total (OECD 2001b). In particular, intra-European and intra-NAFTA exports (US, Canada and Mexico) grew faster than the total automotive trade for these regions.

Table 4.3: The Automotive Industry: Shares in International Trade by Region

Share in imports	1990	1995	2000
Europe	54.7%	53.5%	49.3%
NAFTA	20.4%	25.5%	29.2%
Asia-Pacific	22.0%	17.5%	16.4%
Other	2.9%	3.5%	5.1%
Share in exports	**1991**	**1995**	**2000**
Europe	48.1%	43.1%	38.6%
NAFTA	32.0%	32.2%	33.7%
Asia-Pacific	3.7%	5.1%	7.2%
Other	16.2%	19.6%	20.5%

Source: Author's elaboration using information from OECD (2001b).

Table 4.4: Passenger Vehicle Sales (million of units) and Market Share by Automaker Home Country: Western Europe, Japan and US, 1982–1995

a) Western Europe sales and market share by automaker home country			
Passenger vehicles	1982	1990	1995
Total sales (million of units)	11.4	15	13.5
US share	21%	22%	24%
European share	69%	66%	63%
Japanese share	10%	12%	11%
b) Japan sales and market share by automaker home country			
	1982	1990	1995
Total sales (million of units)	5.3	7.8	6.9
US share	0	0	1%
European share	1%	2%	3%
Japanese share	99%	97%	96%
c) US sales and market share by automaker home country			
	1982	1990	1995
Total sales (million of units)	10.4	14.2	15.1
US share	76%	72%	73%
European share	5%	4%	4%
Japanese share	18%	24%	22%

Source: Sturgeon and Florida 1999, pp. 44–45.

Note: In the orginal source not all columns add to 100% and Table excludes data for South Korea which represents 1% share in some years.

The assumption, however, that the automobile industry has been subject to a complete relaxation of regulations determining trade is not correct. The 1980s, for example, witnessed the application of restrictive trade policies that forced the Japanese TNCs to set up local production facilities, first in the US and later in Europe. For Datton (1991) and Mortimore (1995) these protection pressures represented the first phase of expansion of the international integrated production system implemented by Toyota and other Japanese companies. During the period 1987–91, Japanese TNCs increased their market share in the US to 25% (Datton 1991). Banerji and Sambharya (1998, p. 41) argue that by 1989 the Japanese automotive TNCs operating in Japan were the most competitive, followed by Japanese

automotive TNCs operating in the US, with US firms operating in the US in third place and European firms in fourth place. This Japanese challenge to the global automotive market provoked sharp reactions from competitors, especially from the US, which sought to compete by seeking to establish more efficient production facilities in Mexico (Mortimore 1995).

THE AUTOMOTIVE INDUSTRY IN THE NAFTA REGION

Douglas Bennett and Kenneth Sharpe (1979; 1985) trace the development of the automobile industry through its expansion from developed country markets to its internationalisation to developing country markets. With a particular focus on Latin America, Bennett and Sharpe delineate the transition paths through three stages: (1) the pre-industrial stage, in which vehicles were imported as kits to be assembled; (2) the ISI stage of manufacture partially taking place in the domestic market; and (3) the export stage of vehicles or components. These authors assert that the automobile industry is often a centrepiece for the promotion of industrialisation (Bennett and Sharpe 1979, p. 225).

With reference to the case of the automobile industry in Mexico, at the end of the 1970s, before trade liberalisation and under restricted (maquiladora) export and import policies, Bennett and Sharpe argued that:

> the Mexican car industry proves interesting to study the potential for shifting from an import substitution to an export promotion strategy, having been an important substitution focus in the early

> 1960s and now seen as 'an overprotected and inefficient industry (Bennett and Sharpe 1979, p. 181).

According to Bennett and Sharpe the Mexican government's attempt to shift to export promotion in 1969 brought certain difficult problems.

> The experience has shown that such a policy may be difficult to carry through a) because of demand rigidities … b) because of … decision dependency … c) because of certain difficulties in enforcing such a policy should it encounter recalcitrance … and because of d) the unequal distribution of benefits it may produce between foreign-owned and domestically-owned firms… (Bennett and Sharpe 1979, p. 200).

According to Delbridge (1998), the decision to build motor assembly facilities in Mexico allowed US companies to reap a triple benefit: they could take advantage of lower labour costs in a labour-intensive activity; they could organise a system of subcontracting (outsourcing) which would be easy to relocate; and they were producing high-value-added products. The latter factor was very important since the companies had to provide financial compensation for imports (Mortimore 2000). Although labour costs tend to be higher in the car industry than in manufacturing in general, the average dollar-indexed hourly rate of pay for new workers in Mexico in 2000 amounted to US$4.18 per hour (ILO 2000; OECD 1996b). This is extremely competitive compared with wages in Mexico's NAFTA partner countries, Europe and Japan. Labour costs for unskilled workers in the automotive industry in Mexico range from 9.2% to 15.5% of US costs for the period 1993-2000 (see Table 4.5).

Table 4.5: Hourly Compensation Costs for Production Workers in Motor Vehicles and Equipment Manufacturing, Selected Countries, Various Years (US$)

Country	1993	1994	1995	1996	1997	1998	1999	2000
Germany	-	-	-	-	-	35.4	34.9	31.6
United States	25.5	26.4	26.6	27.2	28.0	26.4	26.7	28.0
Japan	23.9	26.3	29.1	25.8	24.5	22.8	26.4	27.8
United Kingdom	15.2	16.0	16.7	18.7	18.7	20.1	20.3	19.5
Canada	20.8	20.6	20.8	21.0	20.8	20.5	19.3	-
France	17.3	17.9	20.0	19.6	17.8	17.9	17.8	16.7
Italy	16.6	16.6	17.2	17.9	17.8	17.6	17.1	15.1
Spain	16.2	15.3	16.7	14.9	14.9	14.1	15.2	13.9
Ireland	10.4	1.1	12.1	12.3	12.3	12.1	13.4	12.4
Brazil	-	-	-	15.4	15.8	16.8	11.5	11.5
South Korea	7.3	8.8	10.8	12.4	10.0	8.1	10.6	11.8
Taiwan	6.6	6.7	6.9	6.7	7.1	6.5	7.0	7.1
Mexico	3.9	4.1	2.5	2.5	2.9	3.0	3.5	4.2

Source: Bailey (2005), p. 45.

Aside from cheaper labour, energy, real estate and transport costs are also significantly lower in Mexico than in the major developed countries, particularly the US, making Mexico a cost-attractive location for new plant (Fraser and Dickinson 1992). During the 1980s, moreover, significant increases in efficiency were achieved in Mexican plants operated by TNCs, to the point that productivity and quality both attained similar levels to those prevailing north of the border. Under such circumstances, according to Kathleen Ligocki, Ford CEO in Mexico, Mexico occupies a strategic production spot not only for the North American market but for Latin America and Europe as well (*Expansión* 2001). In the case of the Ford Motor Company, Ligochi notes that Mexico offers cheap labour, until the mid-1980s the main comparative advantage, as well as an important supply of engineers and technicians who are currently in short supply in the US and Canada. Mexico even provides a good network of producer services including design, marketing and business consultancy, traditionally carried out at Ford's headquarters in Dearborn, Michigan,

making Mexico more attractive than other locations in the less developed world. Since 1994, proximity to the US market has been reinforced by the preferential treatment afforded to Mexico via membership of NAFTA (Carrillo and Hualde 1997).

To a number of scholars these trends appear to be proof of a spatial division of labour, and these authors assert that the decentralisation of labour-intensive production is driving late industrialisation in countries like Mexico (see Massey 1983). For instance, Carrillo and Hualde (1997) assert that Mexico offers ideal conditions for US companies, which can reduce production costs by transferring labour-intensive operations across the border. This view, however, is opposed by officials at Ford and Volkswagen, who argue that access to markets (especially the NAFTA area), the domestic market, and the availability of skilled labour and service supplies are equally important (Karig 1999; Jackonkkari 2000).[65] Furthermore, the labour cost argument is vulnerable to the possibility of price convergence with economic integration. Although some prices in Mexico, notably energy, are likely to remain significantly below US levels in the future, the price of some other services has been relatively high.[66]

Transportation costs used to be comparatively high in Mexico because of a lack of adequate railway infrastructure and insufficient port capacity. As a result, companies were forced to rely heavily on more expensive highway transport. While this provided indirect benefits to the Mexican trucking

[65] Volkswagen production is oriented mainly to Veracruz port for export purposes.
[66] Electricity costs in Mexico amounted to 80% of US costs in the early 1990s, while oil was available at nearly half the US price (De Maria y Campos 2002).

industry, it was to the disadvantage of the Mexican car assembly industry. The US-based automotive firms operating in Mexico complained that the country's high transport and associated costs in many cases outweighed Mexico's overall lower manufacturing costs for automotive assembly (Gray 1992). Significant efforts were made to solve this problem during the second part of the Salinas administration and then during the Zedillo administration, including opening up the highway industry to private sector participation, and the privatisation of both ports and railways (Carrillo and Hualde 1997). Miles Bryand (2000), CEO of DaimlerChrysler Mexico, recognised in an interview that the rail and highway systems in Mexico had been improved and therefore the losses and damage had been reduced. But, he cautioned, "although significant improvements have been made in highway infrastructure that reduced costs, there is still a significant shortage in physical infrastructure that needs to be looked at by the government, particularly ports and airports".

In spatial terms the literature on the automotive industry argues that the reaction to globalisation which Mexico witnessed at the end of the 20th century led to the emergence of a "three-tier" industry (Mortimore 1995, 2000; Carrillo and Hualde 1997). The first tier is the most modern and export-oriented, along the border with the US; the second is located in states midway between Mexico City and the border, where the modern plants supplying the national market would be located; and the third, the oldest and most inefficient, is nationally oriented (towards the south) and located in the states neighbouring Mexico City. Macario (2000) predicted that the greater outward orientation and its associated increases in

efficiency would extend to a large share of firms in the productive sector, small as well as large, traditional as well as modern, and those located in less developed regions of the country, thus benefiting a broad segment of the population.

The aim of this chapter is to look at the competing arguments associated with the NIDL and Krugman's prioritisation of trade liberalisation by considering what is happening at the company level. The example of Ford is revealing. Table 4.6 shows that plants in Mexico have a lower productivity rate, suggesting that they are more labour-intensive compared with those in the US and Canada. But there are discrepancies. First, even though Mexican plants are generally low in productivity, the lowest productivity rate is at Ford's Wixom assembly plant in Michigan, and the AutoAlliance Ford plant, also located in Michigan, is just three places higher. Thus, while the findings support the general hypothesis of manufacturing migration to less developed countries, the argument is challenged by the performance of specific plants. Second, one might expect that the plants located in Mexico would be larger than those in developed countries, to take advantage of labour-intensive assembly while US plants focus on research, design and specialist manufacture. However, the largest Ford plant in Mexico, at Cuautitlán, had 3,479 employees in 2000, despite being significantly smaller than the biggest plant in the US, located in Kansas City, Missouri, with 5,114 employees. Third, and most damaging for the Krugman perspective, is the fact that during the 1970s and 1980s Ford continued to build new plants in the US even though the liberalisation process had begun in Mexico. The AutoAlliance Flat Rock

plant in Michigan was built in 1987 immediately after the Hermosillo and Chihuahua plants were built in Mexico, and after Mexico joined the GATT.[67]

Table 4.6: Ford Productivity Levels in North American Plants

Plant	State/ Country	Country	Built	1997 Output	Workforce	Productivity
Lorain	Ohio	US	1958	271,581	2,335	116.3
Louisville	Kentucky	US	1955	375,849	3,588	104.8
Ohio Assembly, Avon Lake	Ohio	US	1974	333,217	3,273	101.8
Norfolk	Virginia	US	1925	233,622	2,360	99.0
Atlanta	Georgia	US	1947	248,147	2,649	93.7
Chicago	Illinois	US	1924	239,524	2,675	89.5
Oakville, Ontariio	Ontario	CANADA	1953	287,086	3,261	88.0
San Louis Assembly, Hazelwwod	Missouri	US	1948	228,501	2,621	87.2
St. Thomas	Ontario	CANADA	1967	228,705	2,723	84.0
Edison, New Jersey	New Jersey	US	1948	127,254	1,541	82.6
Kansas City	Missouri	US	1951	419,585	5,114	82.0
Ontario Trucks Assembly, Oakville	Canada	US	1965	109,517	1,339	81.8
Twin Cities Assembly, St. Paul	Minnesota	US	1925	160,246	1,984	80.8
Wayne Assemby	Michigan	US	1952	277,454	3,551	78.1
Kentucky Truck, Louisville	Kentucky	US	1969	275,403	4,567	60.3
Dearborn	Michigan	US	1918	108,344	1,903	56.9
Hermosillo	**Sonora**	**MEXICO**	**1986**	**128,520**	**2,409**	**53.3**
Michigan Truck assembly, Wayne	Michigan	US	1964	343,103	6,510	52.7
Monterrey	**Nuevo León**	**MEXICO**	**1988**	**16,722**	**330**	**50.7**
AutoAlliance, Flat Rock	Michigan	US	1987	100,648	3,112	32.3
Cuautitlán	**Mexico**	**MEXICO**	**1970**	**102,970**	**3,479**	**29.6**
Chihuahua	**Mexico**	**MEXICO**	**1983**	**50,000**	**1,800**	**27.8**
Wixom Assembly	Michigan	US	1957	15,716	3,390	4.6

Source: Author's calculations based on data presented in Ford Motor Company annual reports, various years.

The fourth complication is the performance of the automotive industry in relation to the regulations set out by government in the formulation and instrumentation of the NAFTA agreement. Specifically, the rules of origin establish the conditions under which merchandise and products qualify for preferential treatment under NAFTA, with the requirement that products must have up to 60% NAFTA content. As a consequence, the trade regime

[67] The planning and construction of a major auto manufacturing plant are lenghtly processes; it is likely that the planning for the Flat Rock plant preceded trade liberalisation in Mexico by many years.

discriminates against products with high levels of content from outside the NAFTA region, promoting the growth of industrial productive chains, especially in those industries that used to have high levels of content from outside the NAFTA region – typically Asiatic and European companies operating under the Maquiladora Programme – with lower levels of Mexican value added. I will return to the issue of NAFTA later, but for the moment I would argue that these rules have disrupted the simple Krugman formulation of trade liberalisation and the force of attraction of the border regions due to their proximity to the US market, and have supported industrial regionalisation according to a wider set of criteria.

THE AUTOMOTIVE INDUSTRY IN MEXICO

This section reviews the economic regulatory framework and policy actions directly affecting the automotive sector, from just before the period of import substitution to NAFTA. This discussion is relevant for assessing the time of decentralisation of the automotive industry, from a territorial perspective and in relation to specific policies of trade liberalisation. I aim to explore how the economic regime set by government intervention generated incentives for, or inhibited, the location decisions of companies in the automotive sector, with the intention of testing Krugman's ideas.

In October 1925, the Mexican government issued a provision which cut the duty on the import of automotive parts by 50% and placed high quota restrictions on imported automobiles assembled abroad. The change was designed to encourage the import of unassembled vehicles and to boost the

assembly industry in Mexico; in other words, one of the aims of the decree was to create employment for Mexican workers and to give impetus to national assembly companies. This began a process of trade protectionism under the guise of import substitution (Camarena 1981). By 1951, due to pressure from assembly companies, restrictions on the importing of automotive parts were lifted, but a strict price control for imported vehicles was fixed by the government. Also, a minimum Mexican content of 20% was established for relatively simple components – this can be seen as the first attempt on behalf of the Mexican government to vertically integrate the industry (Camarena 1981).

By 1954, the implementation of an import quota system for each company was in operation, creating incentives for the incorporation of national parts in the assembly process with a view to restricting the number of models produced by each company. This aimed to prevent segmentation in the car industry and enable industry production to reach more efficient levels through economies of scale. Paradoxically, although the economies might have driven prices down, to the benefit of consumers if not labour, the change drove an increase in vehicle prices as the import quota system restricted product offer, which was of benefit to foreign producers. This was reflected in the proliferation of foreign assembly plants; by 1958 there were 19 manufacturers, of which 12 were assembly plants and all were vehicle importers, representing 75 different brands and approximately 117 different vehicle models for sale.[68]

[68] Author's analysis based on information presented in AMIA annual reports, various years.

The Mexican government's "support" for the automotive sector remained inconsistent through the 1950s and 1960s. In 1958, a new rule froze the price of vehicles on the national market. This cut into the profits of foreign producers and once again made the Mexican market less attractive for the automotive industry.[69] In 1962, the importing of finished vehicles was subjected to an increase in the percentage of nationally produced parts for vehicles assembled in Mexico in a compensatory system of the sector's trade balance (*Diario Oficial de la Federación* (*DOF*), 23 August 1962). At the end of the 1960s and the start of the 1970s, the expansion of the domestic market, combined with the pressure put on assembly companies to increase the national content of automotive manufacturing above the legal minimum, led to an increase in imports and a deficit in the balance of payments in the industry.

The lack of success of the 1962 and 1963 decrees in promoting the automotive industry – given that the industry now recorded a balance of trade deficit – motivated the publication in 1972 of a new decree (*DOF*, 20 October 1972). Exporting was now set as a condition for assembly companies to be able to operate in the country. Moreover, the export of engines was favoured, with the decree stipulating that assembly companies producing more than one kind of engine for cars had to export 60% of their total engine production. As a consequence of this measure, which was

[69] Author's analysis based on information presented in AMIA annual reports, various years.

aimed mainly at TNCs operating in Mexico, a series of investments in engine production plants began, mainly in the north of the country.

The 1980s witnessed trade reforms aimed at the automotive sector in line with the joining of the GATT (*DOF*, 15 September 1983). In 1984, the total value of imports subject to tariffs and permits was reduced from 100% to 55%. A programme of tariff reductions was implemented in four stages, starting with a maximum 74.8% tariff in 1984 and ending in 1988 with a maximum import tariff of 14.1%.[70] In 1989, measures set out that the regional content of vehicles had to be 50%, while the national value added was set at 30% for the automotive parts industry and 36% for the assembly companies and national producers (*DOF*, 11 December 1989). Tariffs for finished vehicles were set at 20% and 14% on average for automotive parts. The most important measure stipulated that the industry trade balance must be in surplus. Specific regulations were also directed towards granting TNCs some important privileges, notably the decision to allow 20% of maquiladora production to be sold on the domestic market for the first time (Truett and Truett 1994).

In January 1994, NAFTA came into force. The implications for the Mexican automotive industry were reflected in the set of regulations gradually applied from 1994 and ending in 2004. Starting in January 1994, the minimum content of national value added was reduced in a transitional ten-year period for the automobile industry and for auto parts. For the automotive parts companies authorised by the Secretaría de

[70] As part of the GATT, Mexico set a maximum trade tariff of 50% from 1986.

Comercio y Fomento Industrial (SECOFI, Ministry of Trade and Industry), the minimum content for national value added was reduced from 30% to 20%, with the aim of reducing it to zero by 2000. For the automotive assembly industry, the minimum content was reduced from 36% to 29% in 1994. For 2004, the minimum national value added was set at zero. The national rule of content was transformed into a regional rule, and since 2004 all automobiles must have at least 62.5% of regional value added as the minimum rule of content.[71]

Regulations requiring firms to export were reduced. All automotive assembly plants over the period 1994–2004 were required to export at least 55% of total production in order to be granted permission to import finished cars, although the restriction to import finished cars was to be removed by 2004. Automobile import permits are also no longer exclusively granted to assembly plants but are granted to individual consumers from 2004. Additionally, the import tax on new cars was reduced from 50% to 20% in 1994, to 7% in 1997 and to zero in 2004. From 1998, 82% of all auto parts products had an import tariff of zero while the remaining 18% were granted a five-year transition period to reach a zero import tariff by 2003.[72]

In summary, at the end of the transition period in December 2003, the Decree of the Automotive industry and the Automotive Industry Law (Reglamento) was removed. The national rule of content was transformed

[71] Author's analysis based on information presented in SECOFI (1994).
[72] Idem

into a regional rule of content for the NAFTA countries, and companies under the Maquiladora Programme were authorised to sell up to 100% of total production in the national market.

AUTOMOTIVE INDUSTRY TRENDS IN MEXICO

By the beginning of the 21st century, Mexico's car assembly industry was dominated by a few TNCs: DaimlerChrysler, Ford, General Motors, Nissan-Renault and Volkswagen. In 1991, Ford and Volkswagen accounted for 50.6% of car production in Mexico and by 2000 General Motors and Volkswagen together accounted for 46.6% of total production (see Table 4.7). The arrival of the TNCs took place in what I classify as three waves, all of which showed similar location patterns.

The first wave started between 1920 and 1940, when the "big three" from the US – General Motors, Ford Motor Company and Chrysler – were established in Mexico; the second wave occurred during the 1960s, with European and Japanese TNCs following the US firms and clustering around them; and the third wave happened as a reaction to the new economic regulations during the post-NAFTA period, when Honda and BMW moved into Mexico. During this third period, a number of companies also became involved in increased M&As and strategic alliances with effects at the local level. This was the case for Renault, which acquired a large share of Nissan, the merger of Mercedes and Chrysler, and Volvo's acquisition by Ford.

These waves can be traced in data on production levels. The sector expanded during the 1970s in output terms, peaking in 1981, falling between 1982 and 1988 and demonstrating improved performance thereafter mostly on the basis of a stronger focus on exports. Since the mid-1980s annual vehicle output has exceeded one million units, and it was close to two million by the end of 2001 (AMIA 2000; Erie 2004). This shift is more remarkable considering the contraction of the US market, the main destination for Mexican exports, during some years. Initially aimed mainly at the domestic market and imposing a severe burden on the balance of payments, the automotive sector emerged in the late 1980s as a major contributor to industrial output, employment and export earnings. In 1990 the industry accounted for about 9% of manufacturing GDP, 14% of industrial output and 20% of Mexico's manufacturing exports. The volume of automotive assembly in Mexico by 1990 amounted to 15% of global production, and by the end of the 1990s it amounted to around 22% of global production.[73]

Table 4.7: Major Car Producers in Mexico, 1991 and 2000[74]

Company	1991	2000	1991	2000	1991	2000
	Units		Percentage		Rank	
VW	197,078	425,703	27.4	22.8	1	2
Ford	167,004	280,585	23.2	15	2	5
Daimler-Chrysler	132,488	404,637	18.4	21.6	3	3
GM	125,663	444,670	17.4	23.8	4	1
Nissan	98,151	313,496	13.6	16.8	5	4
Total	720,384	1,869,091	100	100		

Source: Author's elaboration from data presented in AMIA annual reports, various years.

[73] Author's analysis based on information presented OECD (1996a, 2001b) and UNIDO (2003).

[74] Units refer to number of vehicles.

During the 1990s, the sector continued to register high levels of growth. From 1990 to 1991 alone car production increased by 20.5% and exports by 29.2% and over the decade by 130.1% and 417.7% (Table 4.8). These increases were helped by macroeconomic conditions. The two monetary crises in 1982–83 and 1994–95, with devaluations of the Mexican peso exceeding 100%, provided national producers with a price advantage. Prior to 1980 Mexico exported fewer than 20,000 units per year, but by 1990 this figure had grown to 276,869 units for export (AMIA annual reports various years). The 1994 devaluation had a similar impact, with exports increasing at more than 50% in just one year. During 1995 and 1996, as most of the non-exporting national industries were struggling to survive, the export market surpassed the national market for the first time in modern history, and since 1995 more than 50% of domestically produced cars have been exported while car imports have fallen to negligible levels (BANAMEX 2000; Erie 2004; Mortimore 2000; Schlie and Yip 2000).

Table 4.8: Vehicle Production, National Sales and Exports, 1980–2000

Year	Production (units)	National market (units)	Export (units)	National market	Export	Total
1980	490	472	18	96.3%	3.7%	100%
1981	597	583	14	97.7%	2.3%	100%
1982	473	457	16	96.6%	3.4%	100%
1983	285	263	22	92.3%	7.7%	100%
1984	358	324	34	90.5%	9.5%	100%
1985	459	400	59	87.1%	12.9%	100%
1986	341	269	72	78.9%	21.1%	100%
1987	395	232	163	58.7%	41.3%	100%
1988	513	339	174	66.1%	33.9%	100%
1989	641	445	196	69.4%	30.6%	100%
1990	821	544	277	66.3%	33.7%	100%
1991	989	631	358	63.8%	36.2%	100%
1992	1081	697	384	64.5%	35.5%	100%
1993	1081	609	472	56.3%	43.7%	100%
1994	1123	556	567	49.5%	50.5%	100%
1995	935	154	781	16.5%	83.5%	100%
1996	1211	236	975	19.5%	80.5%	100%
1997	1339	356	983	26.6%	73.4%	100%
1998	1428	456	972	31.9%	68.1%	100%
1999	1494	420	1074	28.1%	71.9%	100%
2000	1889	455	1434	24.1%	75.9%	100%

Source: Author's elaboration from data presented in AMIA annual reports, various years. Units is thousands of vehicles.

Although assembly was dominated by a few TNCs, car components were being produced by approximately 400 companies in the 1980s and 600 companies by 1998. Nevertheless, the domestic market showed a strong tendency towards concentration, with the 40 largest firms supplying two-thirds of all components, and while there were 200 small component producers, about 80–90% of small components were manufactured by just three companies (AMIA 2000). High concentration rates were recorded in the industries producing clutches and shock absorbers, where 40% of the market was covered by three and four firms respectively. Mexican firms accounted for 45% of the country's component production, whereas the remaining 55% was produced by locally established TNCs and consisted mostly of engines and components for export. Mexico has become one of the world's largest producers of engines, with more than two million

produced in 2000. Increasingly, vehicle production in Mexico was for export (see Table 4.9). In 2000, DaimlerChrysler exported 500,000 units, Volkswagen 550,000 and Nissan 690,000.

Table 4.9: Exports of Motor Vehicles by Destination, 1980–2000

Units	US and Canada	South and Central America	Africa	Asia	Europe	Other	Total
1980	1	4,853	2	308	13,062	19	18,245
1981	3	4,841	1	1	9,198	0	14,044
1982	623	767	0	845	13,584	0	15,819
1983	203	3,733	1,521	269	16,730	0	22,456
1984	13,448	4,269	0	702	15,120	96	33,635
1985	47,197	7,974	0	99	3,153	0	58,423
1986	60,466	10,909	0	707	347	0	72,429
1987	145,658	16,668	0	377	370	0	163,073
1988	153,040	19,700	92	4	311	0	173,147
1989	170,270	24,141	125	717	746	0	195,999
1990	251,360	23,376	289	1,201	399	244	276,869
1991	328,321	29,299	121	803	55	67	358,666
1992	342,113	40,070	50	885	156	100	383,374
1993	422,706	43,057	0	5,432	20	697	471,912
1994	497,454	50,325	32	13,481	0	5,026	566,318
1995	704,532	66,872	148	1,411	0	8,119	781,082
1996	865,106	86,603	276	12,425	4	10,994	975,408
2000	1,774,328	154,794	0	0	0	5,805	1,934,927

Percentages	US and Canada	South and Central America	Africa	Asia	Europe	Other	Total
1980	0	26.6	0	1.7	71.6	0.1	100
1981	0	34.5	0	0	65.5	0	100
1982	3.9	4.8	0	5.3	85.9	0	100
1983	0.9	16.6	6.8	1.2	74.5	0	100
1984	40.0	12.7	0	2.1	45.0	0.3	100
1985	80.8	13.6	0	0.2	5.4	0	100
1986	83.5	15.1	0	1.0	0.5	0	100
1987	89.3	10.2	0	0.2	0.2	0	100
1988	88.4	11.4	0.1	0	0.2	0	100
1989	86.9	12.3	0.1	0.4	0.4	0	100
1990	90.8	8.4	0.1	0.4	0.1	0.1	100
1991	91.5	8.2	0	0.2	0	0.0	100
1992	89.2	10.5	0	0.2	0	0.0	100
1993	89.6	9.1	0	1.2	0	0.1	100
1994	87.8	8.9	0	2.4	0	0.9	100
1995	90.2	8.6	0	0.2	0	1.0	100
1996	88.7	8.9	0	1.3	0	1.1	100
2000	91.7	8.0	0	0	0	0.3	100

Source: Author's elaboration from data presented in AMIA annual reports, various years and BANCOMEXT 2000.

The largest market for Mexico's exports is the NAFTA area, which had a 92% share in 1991, of which the US accounted for 73% and Canada 19%. In 2000, the US alone was the recipient of 90% of automotive exports, while the rest was shipped to South America (6%) and Central America (2%), and only 0.3% of all exports went outside the American continent. Mexican producers of components did not show the same dynamism at the beginning of the liberalisation period, but according to the president of the AMIA, they had been able to penetrate the international TNC supply network on a large scale by the end of the 1990s. The traditional reluctance to procure components from Mexican producers beyond the legally required minimum level has changed dramatically (Mortimore 1995). Here corporate strategies and the rules of origin have played a very important part in the establishment of a large car component industry. In the case of Volkswagen, nearly 60% of total auto component purchases are made from 260 national suppliers that are mostly, according to Thomas Karig (1999), subsidiaries of European companies. In this particular case, the number of national suppliers rose due to the high costs of importing auto parts from Europe and the price advantage of the Mexican market.[75]

The introduction of NAFTA brought drastic changes to the structure governing the automotive sector in Mexico. The agreement gradually eliminated barriers to vehicle, engine and auto parts trade over a ten-year period, ending in 2004. It also eliminated (1) restrictions on foreign investment in the sector, particularly in Mexican auto parts producers, (2)

[75] Components produced in Mexico by TNCs are not usually directed at the Mexican car industry but constitute a part of inter- or intra-industry trade within car manufacturing groups.

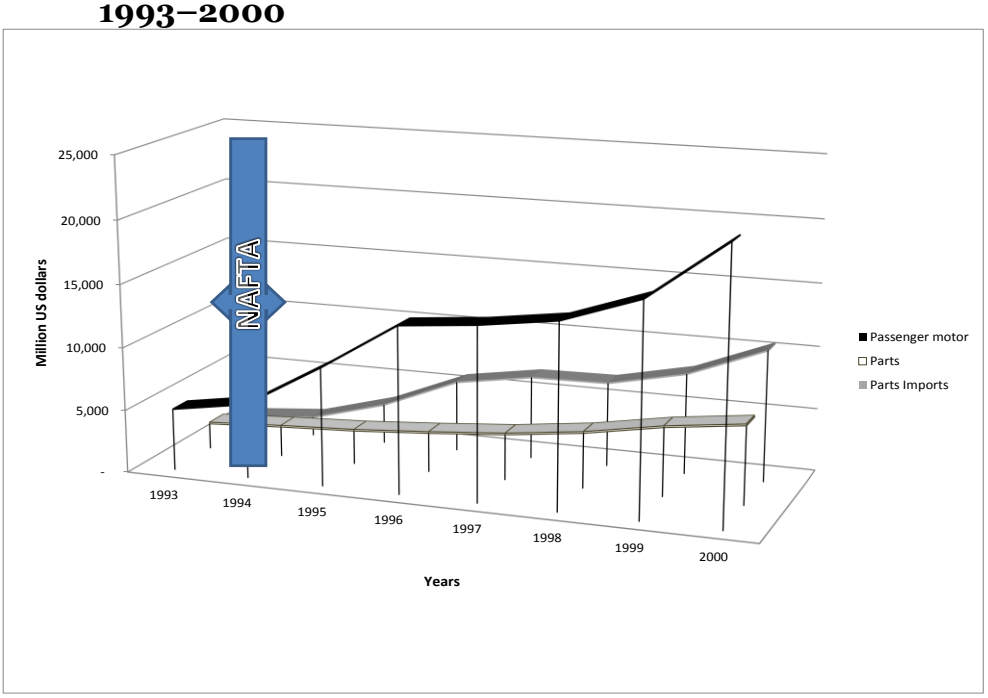
domestic sales and trade balance requirements, and (3) domestic value-added requirements (but inserted regional rules of origin). Each NAFTA country was expected to phase out all duties on imports of North American automotive goods during the transition period. Canada and the US eliminated tariffs on their vehicle trade under the Canada–US free trade agreements. [76] The elimination of restrictions applies to trade and investment to and from the US and Canada, but not with third countries such as Japan (Hufbauer and Schott 1993; Weintraub 1994).

NAFTA changed the rules of origin, giving precedence to supply from within the North American region over Mexican rules that specified a minimum local content of 36% for all cars sold in the country. In order to avoid import duty, by 2002 the new rule required that passenger automobiles and light trucks as well as engines and transmissions for these vehicles built in any of the NAFTA countries but sold in one of the other two had to have a minimum 62.5% North American parts content, and 60% for other vehicles and automobile parts (Dobell and Neufeld 1993). In calculating the content level of automobile goods, the value of parts imported from outside the NAFTA region is traced through the production chain to improve the accuracy of content calculation. In accordance with NAFTA investment provisions, Mexico must immediately permit "NAFTA

[76] Under NAFTA, for its imports from Mexico, the US would: (1) immediately eliminate its tariffs on passenger automobiles; (2) immediately reduce its tariffs on light trucks to 10% and phase out the remaining tariffs over the next five years; and (3) phase out its tariffs on other vehicles over the next ten years. Regarding imports from Canada and the US, Mexico would: (1) immediately reduce its tariffs on passenger automobiles by 50% and phase out the remaining tariffs over ten years; (2) immediately reduce its tariffs on light trucks by 50% and phase out the remaining tariffs over five years; and (3) phase out its tariffs on all other vehicles over the next ten years. Canada would eliminate its tariffs on vehicles imported from Mexico following the same schedule as Mexico would follow for imports from Canada and the US.

investors" to make investments of up to 100% in Mexican "national suppliers" of parts, and up to 49% in other automotive part companies, increasing to 100% after five years.[77] Industry experts suggest that NAFTA produced a burst of FDI in the Mexican automobile industry by automotive TNCs and parts suppliers (Carrillo and Hualde 1997; Mortimore 1999; AMIA 1999).[78]

Figure 4.1: Post-NAFTA Automotive Industry Exports in Mexico, 1993–2000



Source: Author's calculations based on data in BANCOMEXT, various years.

As shown in Figure 4.1, the post-NAFTA period was characterised by dynamic growth in foreign trade of parts as well as passenger automobiles. Nevertheless, we should note that the automotive sector has been subject to greater export orientation and import penetration. In 1980, Mexico was

[77] Mexico's threshold for screening takeovers in the automotive sector is governed by the "NAFTA investment provisions". Previously, the Federal Competition Commission was responsible for ruling over foreign investment activities.
[78] The automotive sector had experienced a sharp increase in FDI prior to Mexico signing the GATT in 1985.

not linked to the North American vehicle market. It exported 18,245 vehicles, 3.7% of total vehicle production, with 98% of vehicles exported to Latin America and Western Europe (UNIDO 2003). By 1990, the profile of vehicle exports had completely altered. Total exports had increased to 276,869 units, 33.7% of total vehicle production, with 90% now exported to North America. By 2001, total vehicle exports had risen to 1.8 million units. NAFTA has also opened up vehicle imports into Mexico. Up to 1995, the domestic market was protected; while Mexico exported more than 250,000 vehicles in 1990, it imported only 5,376 vehicles (less than 1% of domestic vehicle sales). Under NAFTA, vehicle imports began to increase (UNIDO 2003).

THE AUTOMOTIVE INDUSTRY AND THE KRUGMAN HYPOTHESIS

Mexico City has long been a key location for the automotive sector. The three longest established car manufacturers in Mexico – Ford Motor Company, General Motors and Chrysler, which started operations in 1925, 1937 and 1938 respectively – began in Mexico City. In 1932, seven years after starting operations, Ford began operation of a plant in the northern *delegación* (borough) of Gustavo A. Madero. Not far away from Ford's plant was General Motors which began operations at its plant in the Cuauhtémoc *delegación* in 1937. The third-oldest company in Mexico, Chrysler (today DaimlerChrysler), also opened up in Mexico City, starting operations in 1938 at a site that remained in operation until 2006 as the general offices of Chrysler de Mexico.[79]

[79] Chrysler closed the plant in 2006 and a shopping centre was developed on the site.

The second wave of automotive TNCs that came to Mexico during the 1960s were all non-US companies: Volkswagen (Germany), Renault (France) and Datsun (later Nissan, Japan). The critical issue here is that all three non-US companies decided to build plants outside of but still near to Mexico City: Puebla (Puebla), Cuernavaca (Morelos) and Ciudad Sahagún (Municipality of Tapealulco, Hidalgo). In 1954 Volkswagen imported its first car into Mexico, and in 1962 the first Mexican Volkswagen assembly plant was built in Xalostoc (State of Mexico), but it only operated until 1966. In 1965, construction of the Puebla plant started and Volkswagen gradually shifted operations to the new plant, which was officially inaugurated in 1966. Renault arrived in Mexico in 1956 and started operations in association with the public-owned company Dina at Dina's plant in Ciudad Sahagún in 1960. In 1959, Nissan Motor Company arrived in Mexico as a distribution company for the Datsun brand. In 1961 it changed its name and began operating as Nissan Mexicana S.A. (NISMEX), an importer and distributor of Datsun vehicles. In 1966, Datsun Motor Company established its first plant in Cuernavaca.[80]

In 1962 Ford set up a production facility in Mexico City's neighbouring municipality of Tlalnepantla, only 10 km from its Mexico City plant.[81] Soon after, in 1963, GM built assembly production facilities in Toluca (State of

[80] According to AMIA reports NISMEX had invested $US12 million by the end of the 1960s in the Cuernavaca plant.

[81] This facility was bought from Studebaker. Studebaker Corporation was a US wagon and automobile manufacturer based in South Bend, Indiana. Founded in 1852 under the name of the Studebaker Brothers Manufacturing Company, the firm was originally a producer of wagons for farmers, miners and the military. Studebaker entered the automotive industry in 1912. The South Bend plant ceased production on 20 December 1963, and the last Studebaker car rolled off the assembly line in Hamilton, Ontario, Canada on 16 March 1966 (Hendry 1972).

Mexico), and Chrysler completed the building of a plant there in 1968. In 1970, Ford gradually started transferring its operations to a new plant in Cuautitlán (State of Mexico); the shift was not fully completed until 1984, but the plant has since become the core of Ford's Mexican production.

The late 1960s and 1970s were mostly characterised by the absence of new international arrivals into the automotive sector and by the consolidation of existing ones. During this period all existing TNCs started to build facilities to increase their productive capacity. This was particularly the case for US-origin TNCs, which remained loyal to the metropolitan municipalities of Mexico City.[82] At this time, decentralisation represented a shift within the metropolitan area motivated by the modernisation and consolidation of manufacturing capacity, rather than a move away from Mexico City. Indeed, most of the municipalities where plants were built in the 1960s and 1970s were metropolitan municipalities located in the four neighbouring states of Mexico City: Diesel Nacional and Renault in the state of Hidalgo; Nissan in Morelos; Volkswagen in Puebla; and Ford, GM and Chrysler in the State of Mexico. In all cases, plants were located in municipalities within a 150 km radius of Mexico City.[83]

The beginning of the 1980s marked a period of more pronounced decentralisation to the north by the subsidiaries and production facilities

[82] It is important to mention that between 1954 and 1966, under three different presidents, Mexico City was governed by Ernesto P. Uruchurtu (known as the "iron mayor"), a period characterised by the mayor's inflexibility in allowing new settlements. This led to the rapid urbanisation of the neighbouring municipalities of the State of Mexico, which is exactly where new automotive manufacturing plants began to locate (Gamboa de Buen 1994; Davis 1994; Ward 1986, 1990, 1998).
[83] Analysis by the author based on AMIA annual reports, various years.

of most TNCs that had previously arrived in Mexico. The location decisions were motivated by an export strategy focused on the US market, reacting and taking advantage of the government's export promotion policies, in particular the Maquiladora Programme, and the price competitive advantage generated by the devaluation of 1982. The three US-origin TNCs, as well as Renault and Nissan, all began moving northwards during the ISI period and long before trade liberalisation, starting in the 1980s. Ford, GM and Chrysler built manufacturing plants in the border states of Sonora, Chihuahua, Coahuila and Nuevo León, but now the main facilities were relocated to border municipalities.

In 1981, GM inaugurated a manufacturing plant after an investment of US$250 million in Ramos Arizpe (Coahuila), 408 km from the border with the US and 869 km from Mexico City, becoming the first TNC in the automotive sector to build a facility outside Mexico City's manufacturing belt and the furthest away from it in terms of distance. In the early 1980s, Ford also began an export strategy that led to the construction of plants in Chihuahua in 1983, in Hermosillo (Sonora) in 1986 and in Monterrey (Nuevo León) in 1988, on average 300 km from the border. The Sonora plant was the furthest from Mexico City at 2,002 km. Renault and Nissan followed the northwards migration, but still remained far from the border. In 1982, Renault built a plant in Gómez Palacio in the northern state of Durango, closer to the border than to Mexico City. Nissan remained loyal to the central part of the country, building its new plant in the state of Aguascalientes, some 504 km north of Mexico City, in 1982. Table 4.10

summarises the years of starting operations and the distances of new locations to Mexico City and to the closest point of the border.

The trends in the automotive industry in the post-NAFTA years can be characterised by a huge increase in production and exports on behalf of existing companies, the arrival of new players and, to a lesser extent, the relocation of some of the leading companies. Existing large TNCs expanded their operations during this period. Chrysler opened two assembly plants, in Silao in central Mexico (state of Guanajuato) in 1995 and in Saltillo (state of Coahuila) in 1997, and General Motors closed its Mexico City plant in 1995 and transferred operations to Toluca .[84]

Table 4.10: Automotive Plants in Mexico: Starting Operations, Locations and Distances

Company	Year	City/Municipality	State	Mexico CityKm	Border**Km
Ford	1932	Madero	Mexico City	0	1024
General Motors	1935	Cuautémoc	Mexico City	0	1024
Chrysler	1938	Cuautémoc	Mexico City	0	1024
Renault	1960	Cd. Sahagún (Tepelulco)	Hidalgo	88	936
Ford	1962	Tlalnepantla	State of Mexico	10	1014
Volkswagen	1962	Xalostoc (Ecatepec)	State of Mexico	22	1004
General Motors	1963	Toluca	State of Mexico	66	1090
Nissan	1966	Cuernavaca/Civac	Morelos	85	1119
Chrysler	1968	Toluca	State of Mexico	66	1090
Mercedes	1975	Santiago Tianguistengo	State of Mexico	25	1049
Volkswagen	1980	Puebla	Puebla	125	1023
General Motors	1981	Ramos Arizpe	Coahuila	869	408
Nissan	1982	Aguascalientes	Aguascalientes	504	1031
Renault	1982	Gómez Palacio	Coahuila	989	587
Ford	1983	Chihuahua	Chihuahua	1445	375
Ford	1984	Cuautitlán	State of Mexico	10	1014
Ford	1986	Hermosillo	Sonora	2002	275
Ford	1988	Monterrey	Nuevo León	989	225
BMW	1995	Lerma	State of Mexico	66	1090
General Motors	1995	Silao	Guanajuato	432	887
Chrysler	1997	Saltillo	Coahuila	869	408
Honda	1998	Guadalajara/El Salto	Jalisco	580	1002
Renault/Nissan	1999	Cuernavaca/Civac	Morelos	85	1119
Ranault/Nissan	1999	Aguascalientes	Aguascalientes	504	1031
**Nogales, Reynosa, Juárez					

Source: Author's calculations based on company information presented in AMIA annual reports, various years.

[84] Author's analysis based on information presented AMIA annual reports, various years.

The major new players in the third wave of automotive TNCs to Mexico were Audi, BMW, Honda, Mercedes, Volvo and Renault. Three of these entered Mexico courtesy of global mergers, with Volvo cars being produced at Ford plants, Audi output supported by Volkswagen, and Mercedes-Benz working with Chrysler. Honda and BMW were by far the most important new players, establishing new production facilities in Mexico with no previous presence. Honda set up production facilities in El Salto, a part of the metropolitan region of Guadalajara, in 1998, deciding not to locate in any of the states with automotive clusters or a presence of automotive TNCs but instead choosing one of the most dynamic manufacturing regions in the country in recent years.

Opting for a different strategy to Honda, BMW set up a production facility in Toluca in 1995, where an automotive cluster (Ford, Chrysler, Chevrolet) was well established. The greatest transformation, however, was that of Renault, which exited Mexico in the 1980s (along with its US plants) when accumulated debt almost bankrupted the parent company. In 1999, Renault bought 36% of Nissan Motor and 22.5% of Nissan Diesel, with the option to increase the share four years later. This merger allowed Renault to re-enter the Mexican and North American markets, and immediately propelled it to the position of fourth-largest global producer with 9.1% of global production. Renault made its comeback by assembling its first cars in the Nissan Cuernavaca Plant (Morelos) and at the Nissan plant in Aguascalientes. As explained by Louis Schwitzer, president of Renault Mexico, “After 14 years we are back with a consolidated, strong and solid

company" (interview in *Expansión*, 25 October 1998). In the period 1999–2005, Renault decided to make an investment in Mexico worth a total of US$400 million.

THE TOP 100 COMPANIES IN THE AUTOMOTIVE INDUSTRY

I was interested to discover whether the location patterns of auto parts firms were related to the location decisions made by TNCs in the automotive sector. To do so, I gathered data from AMIA and SECOFI on the top 100 parts companies in the automotive sector. One of the clearest ways to ascertain a location link was by looking at the timing of decisions made by companies to locate in Mexican states in relation to the presence of TNCs.

From the data, I ranked states according to concentration of firms in the automotive sector. At the top of the list are the states of Aguascalientes, Puebla, Jalisco, the State of Mexico and Mexico City. Although this might seem unsurprising as these are established locations for assembly plants, the ranking suggests that the automotive sector displays a highly concentrated location pattern. Table 4.11 provides initial support for the idea that flexible production patterns are less relevant in Mexico than might be supposed, as the strong concentration pattern suggests a high level of manufacturing integration.

Table 4.11: National Distribution of Automobile Plants at State Level, 2000

State	Number of plants
Aguascalientes	2
Chihuahua	1
Coahuila	4
State of Mexico	6
Guanajuato	1
Jalisco	1
Mexico City	3
Morelos	2
Nuevo León	2
Puebla	1
Sonora	1

Source: Author's calculation based on data from AMAI annual report, 2003.

With these data I was interested in comparing information on the starting dates of TNC operations, the number of employees, and these factors' relation to the location patterns of the top 100 supplier companies. Unfortunately, no records are available for component parts companies until the 1950s. The first company was *Bujías Mexicanas*, established in 1951 in the State of Mexico and soon followed by two more companies in the State of Mexico and one in Mexico City during the 1950s. In 1959 Federal Mogul set up in Puebla, but through the 1960s the State of Mexico continued to dominate the sector with four new companies. During the 1970s several companies began operations in Aguascalientes, whereas in the 1980s Jalisco had the highest number of company start-ups with seven, followed by Mexico City with five and Puebla with four. In the 1990s, when almost half the 45-company sample was established in Mexico, this situation changed as Puebla took the lead with eleven companies followed by Aguascalientes with nine (Table 4.12). It is worth

mentioning that states like Jalisco, San Luis Potosí, Tamaulipas and Querétaro, which do not have TNC assembly plants, have clusters of parts companies serving national and international markets, most of them under the Maquiladora Programme (AMIA 1993; BANCOMEXT 2000).

The increase in the number of companies in the auto parts sector in recent years goes hand in hand with the transformation of production systems in the automotive industry towards post-Fordism. It does not necessarily imply a more scattered pattern of production, as confirmed by concentration patterns and through interviews conducted with officials from the different TNCs. According to Ford officials, outsourcing has been a necessity from the 1980s onwards, and whole parts of the production process are increasingly given to providers and outside contractors. This specialisation trend has led to the reduction of labour-intensive practices, particularly at the Cuautitlán plant (Maceda 2000).

Table 4.12: Location of the Top 100 Automotive Companies in Mexico**

Location * decade of starting operations cross-tabulation

			Decade of starting operations					
			1951–1960	1961–1970	1971–1980	1981–1990	1991–2000	Total
Location	Aguascalientes	Count			4	3	9	16
		% within decade of starting operations			36.4%	11.5%	20.0%	16.0%
	Baja California	Count				1		1
		% within decade of starting operations				3.8%		1.0%
	Chihuahua	Count			1		3	4
		% within decade of starting operations			9.1%		6.7%	4.0%
	Chiapas	Count				1		1
		% within decade of starting operations				3.8%		1.0%
	Coahuila	Count		2	1	1	1	5
		% within decade of starting operations		15.4%	9.1%	3.8%	2.2%	5.0%
	Colima	Count		1				1
		% within decade of starting operations		7.7%				1.0%
	Mexico City	Count	1	1		5		7
		% within decade of starting operations	20.0%	7.7%		19.2%		7.0%
	Durango	Count				1	1	2
		% within decade of starting operations				3.8%	2.2%	2.0%
	Edo Mex	Count	3	4	1	2	1	11
		% within decade of starting operations	60.0%	30.8%	9.1%	7.7%	2.2%	11.0%
	Guanajuato	Count			1		1	2
		% within decade of starting operations			9.1%		2.2%	2.0%
	Jalisco	Count			2	7	6	15
		% within decade of starting operations			18.2%	26.9%	13.3%	15.0%
	Morelos	Count		2	1		2	5
		% within decade of starting operations		15.4%	9.1%		4.4%	5.0%
	Nuevo León	Count		2				2
		% within decade of starting operations		15.4%				2.0%
	Puebla	Count	1			4	11	16
		% within decade of starting operations	20.0%			15.4%	24.4%	16.0%
	Querétaro	Count					2	2
		% within decade of starting operations					4.4%	2.0%
	San Luis Potosí	Count				1	4	5
		% within decade of starting operations				3.8%	8.9%	5.0%
	Tamaulipas	Count		1			3	4
		% within decade of starting operations		7.7%			6.7%	4.0%
	Tlaxcala	Count					1	1
		% within decade of starting operations					2.2%	1.0%
Total		Count	5	13	11	26	45	100
		% within decade of starting operations	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Author's calculation based upon data presented in SIEM (SECOFI 2000).
** Note: Each cell contains two data. "Count" shows the number of companies starting operation by decade with a breakdown by state and the percent refers to column percent which in the last row show 100% of cases for that decade.

PATTERNS OF EMPLOYMENT CONCENTRATION IN MEXICO'S AUTOMOTIVE SECTOR

In order to identify the level of concentration in Mexico City and forward-backward linkages in the automotive industry during the 1980s, I decided to look at the industrial classification (also known as class level) data.[85] By analysing different economic activities within the automotive sector, I was able to pinpoint the concentration of activities to states where particular TNCs are located. For instance, "manufacturing of motor vehicles" (384110), which covers assembly and final production activity, was highly concentrated: in 1980, Mexico City, the State of Mexico and Hidalgo accounted for 82.9% of employment share (Table 4.13). Classification 384110 therefore appears strongly linked to the location of three US companies in Mexico City and the State of Mexico, and Renault in Hidalgo.

With regard to parts manufacturing, Mexico City, the State of Mexico and Nuevo León accounted for over 50% of employment for each economic activity within the automotive sector. Two cases stand out in terms of activity concentration: Puebla, with 45.7% of jobs in manufacturing engines and parts (384122); and the State of Mexico, with 49.5% of jobs in transmission parts production (384123). Also worth noting are Coahuila, Chihuahua, Puebla and Sonora, which were in the process of building assembly plants (384110) that had yet to come on stream but which were producing automotive parts.

[85] The automotive industry is classified as four-digit according to ISIC (3840). Class level disaggregates automotive manufacturing activities into their various components as shown in Table 4.17.

Table 4.13: Employment Shares, Selected States, Branch-Level Information on Concentration Patterns in the Automotive Sector, 1980[86]

1980	384110	384121	384122	384123	384124	384125	384126
Coahuila	-	1.4%	1.9%	13.4%	-	-	0.7%
Chihuahua	-	2.3%	-	-	-	-	0.2%
Mexico City	29.9%	22.4%	14.3%	23.5%	26.4%	42.1%	28.0%
Hidalgo	26.9%	0.8%	0.1%	-	-	-	-
Mexico	26.1%	26.9%	32.5%	49.5%	20.0%	43.0%	37.2%
Morelos	9.2%	-	0.2%	-	-	-	0.5%
Nuevo León	6.1%	26.7%	1.1%	5.0%	16.6%	5.9%	19.1%
Puebla	-	0.5%	45.7%	-	-	-	0.3%
Sonora	-	2.2%	0.5%	-	-	-	-
	98.1%	83.3%	96.3%	91.3%	63.0%	91.0%	85.8%

384110 Motor vehicles
384121 Bodies and coachwork
384122 Engines and engine parts for motor vehicles
384123 Transmission parts for motor vehicles
384124 Suspension parts for motor vehicles
384125 Breaks systems for motor vehicles
384126 Parts and accessories for motor vehicles

Source: Author's calculations based on data presented in economic census (INEGI 1981).

In interviews with Nissan (Yoshioka 1999), Volkswagen (Jackonkkari 1999) and Ford (Maceda 1997) officials, it was established that the main strategy pursued by TNCs relocating outside Mexico City during the 1970s was spurred on by competition for a qualified labour force, the avoidance of congestion costs, and stringent regulations that prevented the expansion of production facilities in Mexico City. In contrast, the first reason for

[86] Industrial Classification Hierarchy: Division: 38 – Manufacturing of Metalic Products, Machinery and Equipment; Group: 3841 – Automotive Industry Branch: 3841** Explanatory note. The manufacture, assembly, re-building and major alteration of complete motor vehicles such as passenger automobiles, commercial cars and buses, lorries and truck trailers, universal carriers, special purpose motor vehicles; vehicle-drawn caravans; motorised sleighs; specialised manufacture of motor vehicle parts and accessories such as engines, brakes, clutches, axles, gears, transmissions, wheels and frames (INEGI 1981).

locating in the nearby surrounding states was that at the time of the de-concentration process, approximately 60% of the Mexican market was located in the Metropolitan Area of Mexico City (MAMC) – according to Nissan and Ford officials this figure is still high, at around 40%. The second reason was related to the supply chain: as the central part of Mexico was where most of the parts suppliers were concentrated, moving far away was a gamble that no company was willing to take. However, with the dismantling of trade protections, most companies could source supplies from abroad, and thus central Mexico lost its pull. In this respect Krugman's ideas on access to markets gain some support, even if not as he foresaw it – access to consumers – but because trade liberalisation granted access to suppliers for car producers in Mexico. This change alone, of course, might not have triggered de-concentration, but it seems to have determined new location patterns, as was seen with the TNCs entering Mexico during the 1990s. Nevertheless, although automotive and supply companies started to build plants closer to the US border in order to start operating under the Maquiladora Programme, there were no signs of any company closing down in central locations and moving northwards, and most of the companies with significant investments in the northern part of Mexico are US companies.

By the end of the 1990s, 36% of total jobs in the automotive sector nationwide were concentrated in the border states; this industry is now dominated by exports, especially to the US. Also, according to BANCOMEXT (2000), by the end of the 1990s the automotive industry exported nearly 75% of total production, which makes the balance and

concentration towards more central and southern locations somewhat counterintuitive and goes against the northern migration hypothesis. The data do not support the idea that geographical location is directly related to export orientation as Krugman argues. I identified locations from which company exports originate in order to test the hypothesis that only plants located in the border export to the US and those in the south produce for the national market. This simple division appears to have little validity. In Toluca, GM produces mainly for export to the US while the Ramos Arizpe plant in Coahuila, 225 km from the US border, mostly exports to Japan, Canada and Central America rather than the US (GM 2000).

For both Ford (Ford 2000) and Daimler Chrysler (Daimler Chrysler 2000), their northern and central locations specialise in different parts of the production process. In Saltillo (Coahuila), Chrysler opened two assembly plants in 1995 and 1997 producing engines both for national consumption and for export, although the latter takes precedence, while the company's Toluca plant has been producing vehicles for domestic and export markets (US and Canadian) since it started operations. At the Ford Hermosillo plant, engines are produced to supply the two other Ford plants in Mexico as well as for export to the US Ford plants (AMIA 2000).

The example of Volkswagen, located approximately 1,000 km from the closest crossing point of the US border in Puebla, illustrates the limitations of the post-Fordist fragmentation hypothesis. All the elements of the production chain for the plant are located nearby. In 1997, a process of specialisation got under way and Volkswagen began to assemble the first

car to be produced entirely in Mexico for the world market. The Puebla plant is now geared for exports, with a car that contains the highest percentage of national content of any produced in Mexico. This transformation goes against Krugman's "migration to the north" hypothesis. It also goes against the flexible production system argument, as the Puebla plant was an export leader in 2000 and only one-fifth of its total production went to the Mexican market.[87]

A slightly different pattern applies to Nissan. Production is based at the Cuernavaca assembly plant, opened in 1966, although materials came mainly from Japan (Hiroshi 2000). Exports of both components (stampings, engines etc.) and finished cars to Latin America began in 1972, and by 1995 Nissan Mexicana was designated as the regional sales centre for the Americas, with 60% of total exports to Latin America coming from Mexico. In 2000, with an annual vehicle production capacity of more than 300,000, Nissan vehicles produced in Mexico were exported to 35 countries around the world. However, Mexico City "is still the biggest market", according to Nissan Mexico official Mr. Yoshioka (2000), accounting for 40% of the plant's output. The link with Renault has opened the North American market to Nissan, according to Yoshiharu Hanawa (1999), president of Nissan in Mexico, while interviewees at Renault claimed that the interest in entering the North American market was due to the attraction of the big auto parts companies and global suppliers.

[87] Author's analysis based on information presented in AMIA annual report 2000.

Using employment data for the 1998 industrial census it was possible to calculate a Concentration Index for the automotive industry.[88] As Table 4.14 indicates, by the late 1990s employment was increasingly concentrated in the north and border region, with a significant share remaining in the centre. The Concentration Index shows the importance of Aguascalientes, Puebla and Coahuila (Table 4.15). The most important finding is that the first two states are home to TNCs from outside the US, i.e., Nissan and Volkswagen. These companies must fulfil the rules of origin set up by NAFTA. Interviewed about this particular issue, the CEO of Nissan Mexico commented that this is not a problem for Nissan due to its high integration in the Mexican economy: 70% of its suppliers (all of them Japanese) were already located in Mexico. Volkswagen officials declined to offer a precise figure but stated that the figure is over the 70% given by Nissan, but the remarkable fact is that none of them are companies with German capital. From the US companies' point of view, the rules of origin have minor relevance; however, they have clustered in certain cities, not for the sake of complying with the rules of origin, but to gain from specialisation and cooperation among US firms. It is no coincidence that the three are nested in two states: the State of Mexico and

[88] The concentration coefficient is a measure that allows for comparisons between sets of subgroups and the total, in this case between the share of automotive manufacturing, measured in terms of employment, as part of the state economy, and the share of automotive manufacturing as part of the national economy. The formula is:

$$\left(\frac{Pmi/GDPi}{Pmt/GDP} \right)$$

where Pm is automotive manufacturing employment, i is the state and t is total. A coefficient equal to 1 for a state means that the proportion of manufacturing in the state and in the country as a whole is the same. If greater than 1 (>1), the concentration of the activity is higher than the national average, while if the index is less than 1 (<1) it is lower. The coefficient is used to compare the degree of concentration of an economic sector in different states.

Coahuila. According to Ford officials, US companies have deliberately located in the same states so that they can develop strong cooperative links and alliances (Ligocki 2001).

Table 4.14: Share in Automotive Employment by Region, 1980–1998

Region	1980	1998
Border	13.9%	36.1%
North	1.9%	7.1%
Centre	33.7%	20.5%
Mexico City	45.9%	27.9%
Bajío/Pacific	4.6%	8.1%
South	0	0.5%
	100%	100%

Source: Author's calculations based on data presented in economic censuses (INEGI 1981, 1999).

Table 4.15: Labour Concentration Index for the Mexican Automotive Industry, 1998

Rank	State	Concentration, 1998
1	Aguascalientes	2.593
2	Puebla	2.403
3	Coahuila	2.067
4	Querétaro	1.933
5	Mexico	1.819
6	Tamaulipas	1.518
7	Morelos	1.501
8	San Luis Potosí	1.266
9	Nuevo León	1.058
10	Chihuahua	0.761

Source: Author's calculations based on data presented in economic census (INEGI 1999).

CONCLUSION

What conclusions can be drawn from the data on the formation, concentration and transformation of the automotive industry in Mexico? Are there any grounds for suggesting that the automotive industry is

organised according to the new trade regime suggested by Krugman, or is it a rather a more complex set of factors associated with a broader global economic context? The answer seems ambiguous. On the one hand, in terms of production fragmentation, a pattern emerges of specialisation and horizontal integration within a more de-concentrated production pattern, with parts and engines produced in Mexico being exported to the US but also sent to Mexican plants. On the other hand, the trade liberalisation arguments point towards an increase in import flows of auto parts for producers on the Mexican side irrespective of the destination of car production. According to the data, access to suppliers, not access to markets, has played a stronger role as the force of attraction when considering plant location for automobile producers.

The data provide little evidence to support the idea that the industrialisation of the border was the result of NAFTA as suggested by Krugman and Livas (1996). In the case of Ford, for example, a shift away from central Mexico was timed with the early days of liberalisation during the GATT period after 1986. Nevertheless, Ford retained its location near Mexico City and, more specifically, the Ford plant at Cuautitlán delivers 45% of Ford's total assembly employment in Mexico. The Mexico City plant remains hugely important and is still, in the words of Ford's manager, "the core of Ford's Mexican production" (Maceda 2000).

Looking at the automotive sector at the company level casts considerable doubt on the hypothesis forwarded by Krugman and Livas, mainly because of their failure to take into account factors such as forward and backward

linkages, the availability of skilled labour, physical infrastructure and even factors such as social and political stability, most of which are scarce in the border states of Mexico, as confirmed by trends in FDI. The results presented in this chapter indicate that the industrial concentration of the automotive industry has undergone gradual modifications since the 1960s – and not dramatic shifts since the mid-1980s or after 1994 – although economic liberalisation was a partial factor in these earlier changes. The policies and programmes undertaken by successive federal governments since the 1980s in pursuit of the promotion of export activities, and especially the Maquiladora Programme, could claim some credit for relocation patterns in Mexico. But this chapter has shown that these programmes helped to consolidate a trend that had started in the 1960s rather than the 1980s or 1990s.

Even so, one of the most important effects of economic liberalisation in the automotive sector has been the regional re-concentration outside of the central part of the country, where in addition to trade liberalisation other less obvious factors have played an important role. All interviewees agreed that these include, in descending order of importance: (1) availability of physical infrastructure, (2) access to suppliers and a more efficient supply of inputs from local contractors, (3) over-congestion in Central Mexico, (4) labour shortages, (5) new long-term investments (and therefore commitments from local authorities), and (6) access to markets.[89] The

[89] Although not as crucial, some of the interviewees mentioned federal, state and municipal tax incentives, including tax rebates and local tax exemptions such as the Impuesto Predial (Property Tax), or electricity (under state control), as playing a minor role in deciding whether to remain in a current location or to relocate.

huge investment made by leading companies in their current locations is strong evidence of their commitment. Therefore, there is no evidence to suggest that the spatial structure of manufacturing at state level will be different in the near future. Within the new economic environment, not only could labour costs be reduced, but also a wide range of new production processes could be introduced to combine different economic factors at a time of adjustment. These factors include: the development of new (local) suppliers, low labour costs, lower infrastructure costs and the right combination of national and international suppliers in order to take advantage of cheaper options brought about by NAFTA.

Chapter Five: Transformation at the Sector Level: The Case of the Consumer Electronics Industry

OVERVIEW

This chapter presents a second case study in my analysis of the changes brought by trade liberalisation or globalisation to the Mexican economy. By looking at the performance of the consumer electronics sector, my intention is to test Krugman's ideas by exploring the association between trade liberalisation and industrial location patterns for one of the most dynamic industrial sectors in the world, a sector driven by constant innovation and technological change. Specifically, I chose the consumer electronics sector because it ranks top, along with the automotive industry, in the Globality Index outlined in Chapter Three, and is the highest-ranked sector in terms of global trade and investment according to national statistics (BANCOMEXT 2000; Secretaria de Economía 2001). The fact that in Mexico consumer electronics has been a highly dynamic sector, both under ISI and since the beginning of the trade liberalisation process, also made it a good candidate for a case study.

Data were gathered from the Sistema de Información Empresarial Mexicana (SIEM, Mexican Enterprise Information System) on the top 100 companies in the consumer electronics sector, including subsectors ISIC 383206 (assembly of consumer electronics products) and ISIC 383204

(manufacturing and assembly of parts). The intention was to identify location patterns by state and to see whether they are related to the starting date of the company's operations. The expectation was that a significant majority of companies in this sector would be localised in the US border states and that the start of operations date would be linked to the different stages of the trade liberalisation process (over the 1980s and 1990s according to Krugman's argument). A review of the economic regulatory framework and policy actions affecting the consumer electronics sector in Mexico was also conducted; this review looked for associations between the regulatory framework and location decisions in the consumer electronics sector, which in comparison to the automotive sector could have been more directly influenced by policy and regulation as this sector is less disaggregated into subsectors, with fewer inter-industry networks and with a lesser degree of manufacturing value added in Mexico than the automotive sector. A systematic review of the archives of the Cámara Nacional de la Industria Electrónica y de Comunicaciones Eléctricas (CANIECE, National Chamber of the Electronics and Electric Communications Industries), predecessor of the Cámara Nacional de la Industria Electrónica y de Telecomunicaciones y Tecnologías de la Información (CANIETI, National Chamber of the Electronics Industry, Telecommunications and Information Technology), was conducted, looking for industry trends and particular company information.

The question underpinning this chapter is: to what extent has trade liberalisation influenced the relocation of industrial activity in Mexico's consumer electronics sector? The case study tests Krugman's hypothesis

that behind the decline of industrial manufacturing in Mexico City and the concentration of industrial activity along the US border was the removal of trade barriers that took place in Mexico over the 1980s and 1990s. I am also interested in contrasting the findings against the alternative hypothesis, that Mexico's economic and spatial restructuring was not a direct consequence of liberalisation of trade but a consequence of a broader economic change associated with globalisation. In this regard I am interested in following the post-decline process in order to understand the extent to which de-concentration was spurred by the conditions set under the new global economic environment. The first section of the chapter outlines a series of key facts relating to the consumer electronics industry at the global level before shifting the focus to Mexico and to Mexico City.

THE GLOBAL CONSUMER ELECTRONICS SECTOR

Consumer electronics constitutes one of the four main subsectors of the electrical and electronics industry, according to the International Standard Industrial Classification (ISIC 383).[90] Consumer electronics (ISIC 3832) includes audio products such as radio broadcast receivers, TV sets, VCRs, DVD and CD players, portable audio equipment, in-car entertainment systems and video cameras. Over the 1990s the bulk of the industry's production value was made up of colour TVs and VCRs.[91]

[90] The other three are: electrical appliances and consumer products (white goods – ISIC 3827), industrial electronic equipment, which includes computers and communication systems (ISIC 3825), and electronic components and devices (ISIC 3833).
[91] A number of professional items, including telephones and faxes, CD-based information systems and personal computers, are increasingly a part of the consumer electronics sector and in some national statistics are already considered to be so, although not in this particular analysis.

Before looking at production in more detail it should be noted that the global trade in consumer electronics grew rapidly over the period covered by this thesis, with above average rates of expansion, during the 1980s. Over the study period, data suggest that OECD countries are the main consumers, although their share decreased over the 1990s (OECD 2001a). The major growth of consumer demand in the OECD area took place during the 1960s and 1970s with the development of new technologies that allowed mass production and the reduction of prices that followed. Consumer growth in this sector increasingly came from developing countries, especially those in South-East Asia, Latin America and the Middle East (OECD 1992; 1994b; 1996a).

The production process itself consists of three principal stages. First, the design stage, which is research-intensive. Indeed, the emergence of the consumer electronics industry, usually dated from around 1947, is the result of research aimed at developing radio sets and gramophones. A fundamental technological breakthrough came with the development of the transistor by a group of scientists at AT&T Bell Laboratories in Murray Hill, New Jersey. [92] This allowed substantial reductions in product dimensions and improved quality and productivity, and paved the way for further innovations (Lucent 2001). It is worth noting that these

[92] The transistor was the result of efforts to develop a better amplifier and a replacement for mechanical relays. The vacuum tube had amplified music and voice during the first half of the 20th century, and it had made long-distance calling practical, but it consumed a large amount of power, became hot when used and burned out rapidly. The telephone network required hundreds of thousands of relays to connect circuits together to complete calls. Cheaper to make than the vacuum tube and far more reliable, the transistor cut the cost and improved the quality of phone service and, seemingly overnight, spawned countless new products and whole new industries. Dr. John Bardeen, Dr. Walter Brattain and Dr. William Shockley discovered the transistor effect, and as a result were awarded the Nobel Prize in Physics in 1956 (Bell 2000).

innovations, originally intended for the consumer segment, have had other increasingly widespread consumer and industrial applications, building upon the increasing convergence between technologies as part of the telecommunications revolution.

The second stage, the manufacture of components, is highly capital-intensive and is subject to economies of scale and a high minimum efficient scale of production. Components are essential for the production of consumer electronics items.[93] Parts and component manufacturing and final assembly are often carried out in different locations by different companies, and most of the time the high-value-added activities associated with R&D and technological innovation in this sector are conducted by leading TNCs in their main headquarters, the majority of them located in East Asia. The third and final stage is assembly, which is the most labour-intensive and lends itself most to the employment of large numbers of unskilled workers, representing a very slim share of total value added in this sector. Outsourcing is conducted mainly in less developed countries, following the trends suggested by the international division of labour scholars (Harvey et al. 2001; Massey 1995; Sturgeon 2003; Todd 1990).

Global production is highly concentrated, and the growing international character of consumer electronics goods has been driven by the activities of TNCs. Most consumer electronics are produced by companies from developed countries, with Japan, the US and Western Europe together

[93] Principally the production of semi-conductors, integrated circuits and cathode tubes (Sturgeon 2003).

accounting for 68% of production by value, estimated to be US$1.064 trillion in 2000. Japan was by far the largest producer, accounting for 32.3% of global output in 2000, followed by South Korea at 19.6% and the US at 17.5%.[94] The EU's overall share at this time was around 27%. The data also record the rapid annual growth of the sector at 7% between 1990 and 2000, making it one of the fastest-growing sectors of the global economy. In absolute terms the sector ranked first in global exports for the period, with growth from US$59 billion in 1990 to US$284 billion in 2000.[95]

A major shift between 1970 and 2000 was represented by the increasing competitiveness of production from Japan and South-East Asia, which also focused much earlier and more intensely than European and US producers on consumer-oriented electronic goods. The US electronics industry was the world leader in the mid-1950s in terms of output, employment, technological invention and innovation, and international trade, with well-known firms such as RCA, Zenith, Motorola, Admiral, Magnavox, General Electric, Sylvania and Philco (Sobel 1993; Harvey et. al. 2001). Not far behind were European firms such as Telefunken, ITT, Saba, Dual, Siemens and Grundig in Germany; Ferguson, Thorn EMI and Warwick from the UK; Bang & Olufsen from Denmark; Thomson and Oceanica of France; Nokia from Finland; and Philips from the Netherlands. By the mid-1960s Matsushita, Sony and Sanyo from Japan, and Taiwan's Tatung, were becoming better known and taking increased market share. This growth of

94 Author´s calculations using data from European Electronic Market Forecast 2000; OECD (2001b); UNCTAD Industrial database 2000.
95 Author´s calculations using data from OECD (2002); UNCTAD (2000).

firms from South-East Asia is more remarkable if we consider that in the 1960s most companies from the region lacked technological adaptation and the ability to produce critical electronics components (Feenstra 1998). At the time they required licensing agreements and joint ventures with US and Western European companies. Nevertheless, from the mid-1960s it was US and European manufacturers that were forced to rationalise, cut jobs and concentrate on key production areas in order to compete. The 1970s saw a rapid expansion of Japanese and South Korean companies locating to Europe and the US.[96] In 1972, Sony was the first Japanese company to assemble TVs in the US, followed by Tatung of Taiwan in 1976 and the first South Korean company, LG Electronics, in 1981 (Harvey et. al. 2001; Steinfeld 2004; Sturgeon 2003). By the end of the 1980s there were 32 Japanese-owned plants making or assembling electronic items in the EU, 18 of which were in the UK. South Korea's "big three" – LG Electronics, Samsung and Daewoo – followed during the second half of the 1980s. In 1991 there were 68 Japanese and South Korean plants in the EU (against 108 European firms), employing around one-sixth of the total consumer electronics workforce. At the end of the 1990s the UK remained the preferred European location of consumer electronics manufacturing plants, followed by Germany, Spain and France (*Electronics Times* 1999; Sturgeon 2002, 2003).

[96] According to Harvey (1990), in the 1950s US companies failed to fully utilise transistors because they wanted to protect their investments in vacuum tubes. This paved the way for companies like Sony to make transistor radios. Throughout the 1960s the leading firms in the electronics distribution industry grew by acquisition. In its 1969 annual report, Arrow's management sketched the future of the electronics distribution industry: it would soon be dominated by "those few substantial distribution companies with the financial resources, the professional management, and the modern control systems necessary to participate in the industry's current consolidation phase" (Arrow Electronics 2001, p1).

According to Zampetti et al. (1994), the Japanese presence in European markets was a reaction to restrictive trade policies such as those in the US wherein government introduced minimum local content rules of 50% on the assembly consumer electronics sector, designed to protect US producers from Japanese competition. Darin (1996) adds that the enormous increase in foreign investment was partly due also to the imposition of anti-dumping duties by the US at the end of the 1980s against cathode tubes imported from Japan, South Korea, Singapore and Canada. A different view is taken by Todd (1990), who argues that the strong Yen provided a powerful economic incentive for locating plants offshore and taking advantage of the exchange rate. Japanese companies began investing abroad much later than Philips. The industry leader Matsushita, albeit admittedly quite a "conservative" firm, had been particularly slow in shifting production abroad, at least until the mid-1980s. In 1985 overseas production only accounted for 12% of its worldwide sales, but this figure had reached 18% by 2003 (Sturgeon 2003).

Regardless of motive, however, Japanese firms not only relocated but also quickly transformed the industry by combining economies of scale, lean production techniques and design improvements driven by heavy R&D investment.[97] The establishment of large-scale component plants linked via just-in-time procurement networks of owned, independent and semi-independent suppliers operating under subcontract and original equipment manufacturer (OEM) arrangements gave Japanese firms a

[97] The bulk of Japanese R&D is carried out in Japan (Kazis 1988).

competitive advantage (Gregory 1985; Zampetti et al. 1994). According to Zampetti, OEMs were instrumental in controlling price, the quality of outsourced products and the speed of delivery. By the mid-1990s, Japan's labour productivity in consumer electronics was estimated to be 15% higher than that of major firms in the US and 28% higher than German producers (McKinsey Global Institute 1993).

Regional economic policy and export promotion policies supported the relocation of companies, especially those from South-East Asia, to Western Europe (Humphrey and Schmitz 2002; Mortimore 2000; Romijn and Albaladejo 2002; Sturgeon 2002, 2003, 2007). A key concern for governments was that the dynamism of the electronics sector would propel job creation and become an important employment generator. However, due to the capital-intensive nature of this sector, increases in jobs over time have followed a decreasing return of scale pattern (Sturgeon 2002). Despite being very dynamic over the 1960s and 1970s, none of the leading countries in this sector had a significant increase in job creation between 1980 and 2000, and some record falls in absolute numbers of electronics sector jobs. Between 1980 and 2000 the US experienced significant growth in terms of employment in this sector, which increased from 905,000 in 1980 to over 941,270 jobs in 2000. In contrast, in Germany employment in the sector dropped from 464,000 to 404,501 over the same period of time, while Japan also fell from 1,111,530 employees in 1980 to 1,106,000 in 2000. The effect is that with manufacturing sector employment declining over the period in the OECD (Table 5.1), employment in

electronics fell in absolute numbers in some countries but increased as a percentage of total manufacturing sector jobs (Table 5.2).

Table 5.1: Manufacturing Employment, Annual Average Growth Rate, 1980–2000

	1980–1985	1986–1990	1990–1995	1996–2000
Japan	1.0%	0.8%	–0.5%	0.5%
US	–1.1%	–0.1%	–0.4%	–0.5%
France	–2.5%	–0.9%	–2.5%	–2.0%
Germany	–1.5%	1.1%	–2.8%	–1.1%
Italy	–3.3%	0.3%	–2.4%	–1.8%
Korea	3.5%	4.2%	–0.7%	2.3%
Mexico	0.1%	1.4%	–1.3%	0.0%
UK	–4.8%	–0.2%	–1.7%	–2.3%

Source: Author's calculations using data from *OECD STAN Database for Industrial Analysis 1978–2000*, 2002.

Table 5.2*:* Consumer Electronics Employment as Percentage of Total Manufacturing, 1980–2000

	1980	2000
Japan	6.8%	8.2%
US	4.5%	5.1%
France	4.1%	4.4%
Germany	5.3%	5.3%
Italy	1.7%	1.5%
South Korea	7.9%	10.7%
Mexico	5.9%	6.0%
UK	4.9%	5.2%

Source: OECD STAN Database for Industrial Analysis 1978–1997, 2002.

According to Sturgeon (2003), US industrial policy created a paradox. On the one hand, governments set out to attract companies from Japan, South Korea and Taiwan in order to maintain employment while, on the other, these same companies were more productive than domestic producers. This approach introduced fierce competition that led to closures of some

US companies. This eventually resulted in the emerging dominance of Asiatic companies in the sector but achieved the goal of maintaining employment levels (Table 5.2). By 2000, there had been a steep decline in the number of US companies in the electronics sector, whereas European production remained significant and Japanese, South Korean and Taiwanese companies had grown in dominance (Tables 5.3).

Table 5.3: Top Global Consumer Electronics Companies, 1980–2000

Top 10 in 1980	Country	Top 10 in 2000	Country
1. General Electric	US	1. Matsushita/Panasonic	Japan
2. RCA	US	2. Toshiba	Japan
3. Philips	Netherlands	3. Sony	Japan
4. Zenith	US	4. Hitachi	Japan
5. Thomson	France	5. Philips	Netherlands
6. Telefunken	Germany	6. Samsung	South Korea
7. JVC	US	7. LG Electronics	South Korea
8. Radio Shack	US	8. Sanyo	Japan
9. Hitachi	Japan	9. Thomson Multimedia	France
10. Motorola	US	10. Sharp	Japan

Source: Electronics Times Various Years.

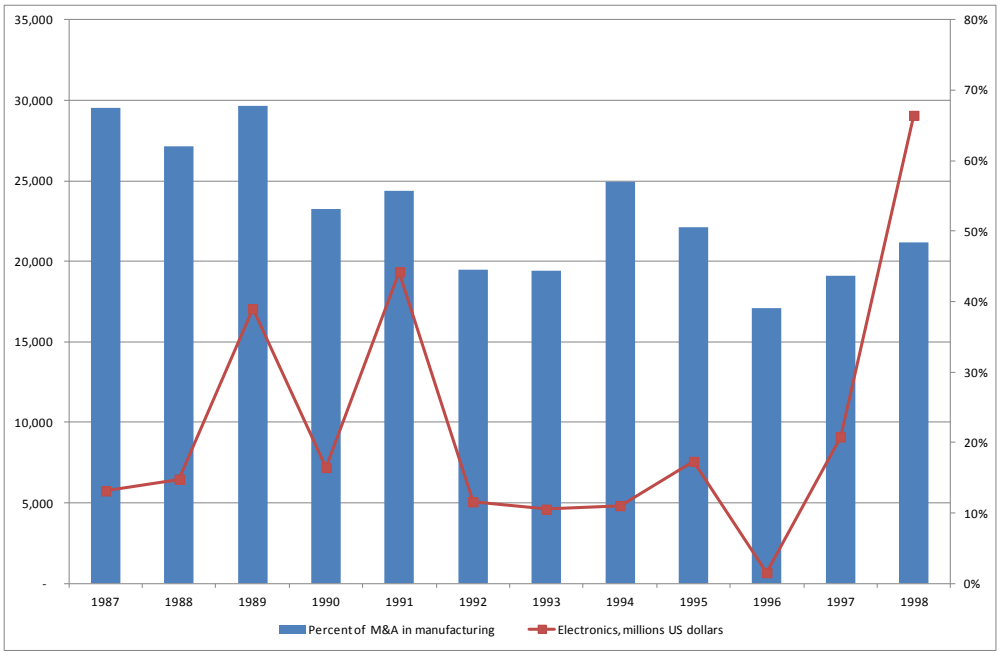
To ensure the functioning of production networks and to coordinate outsourcing production, many TNCs established a series of international purchasing offices in the Asia-Pacific region, Latin America and some Eastern European countries (Dicken 1992; Massey 1995). The 1990s saw a trend towards regionalisation of overseas operations, with more management decisions, product development and manufacturing operations being transferred to the main regions, which were increasingly seen as autonomous of central office control. Sony, for example, separated the management of its domestic operations from that of its three main

markets, while Thomson and Matsushita adopted a tripolar system of headquarters across Europe, North America and Asia (*Electronics Times* 1998 p. 21). Regionalisation also involved extensive restructuring, in particular via M&As, resulting in the consolidation of a single production system (see Figure 5.1). US and European producers were affected significantly: virtually all US manufacturers in the consumer electronics sector were taken over by either Japanese, South Korean or European competitors. In 1974, Matsushita acquired the TV division of Motorola (and its brand Quasar); Philips purchased Magnavox that same year and in 1980 bought the Sylvania and Philco brands. Thomson acquired Nordmende, Saba, Dual and Telefunken between 1978 and 1983, and the consumer electronics divisions of Thorn EMI and General Electric in 1987, GE having absorbed RCA a year earlier. In 1984 Philips acquired Grundig (Grundig had started operations in 1979), and in 1990 it bought a minority stake in Bang & Olufsen. In 1987, Nokia became the third-largest European consumer electronics company through the acquisition of shares in Oceanica and ITT. In 1977 Sanyo acquired Warwick and in 1996 LG Electronics purchased Zenith.[98] By 1996, not one of the 27 US consumer electronics producers that had existed in 1960 had survived.[99]

[98] As will be discussed later, as a result of the Sanyo takeover all Warwick operating plants in Mexico were closed. This illustrates how an event beyond national boundaries can have effects in a distant location.

[99] Author's analysis of information from Electronic Forecast, various years; *Reed Television Digest*, various years; *European Electronics Markets Forecast*, various years.

Figure 5.1: Cross-Border M&As in Manufacturing and Electronics, 1987–1998



Source: Author's calculations based on UNCTAD databases, various years.

At the end of the 1990s, the structure of the sector was also transformed by company alliances aimed at bringing new products to the market. Consumer electronics manufacturers Philips and Sony combined forces to create TriMedia Technologies, which developed semiconductors for digital video products. EchoStar, Gilat and Microsoft formed a partnership to develop Gilat-to-Home two-way broadband satellite internet access. Scientific Atlanta and Eastman Kodak began to coordinate a project to send images from digital cameras through digital cable boxes to TVs. Sun and Cisco operated several "smart home" alliances and Sony joined Fujitsu and Hitachi in a plasma display panel venture to meet increased demand for flat-screen TVs.[100] The increasing use of digital technology in consumer

[100] Author´s analysis with data from European Electronics Markets Forecast, various years.

applications makes it possible to use the same components for different markets and products, allowing companies to produce at a more efficient scale and therefore providing a strong incentive for M&As (Mortimore 1999). Innovation combined with reduced labour costs and automatisation that spurred M&As in the 1990s may have been a factor encouraging the reopening of assembly product manufacture back to developed countries (Humphrey and Schmitz 2002; Massey 1995; Sturgeon 2002, 2003).[101]

As Table 5.3 suggests, Japanese firms had become dominant in the sector by around 2000, accounting for 55% of world production and being the origin of seven of the top ten consumer electronics TNCs (Philips of the Netherlands was the only non-Japanese TNC among the top five). Japanese companies accounted for almost 75% of sales among the top 300 consumer electronics firms (Reed Business Information 1998; Cahners 2001). At the beginning of the 21st century, European- and Japanese-owned companies accounted for about 35% each of total US production of consumer electronics, and South Korean and Taiwanese manufacturers share the remaining 17% (Motorola 2000). The dominance of Japanese TNCs in employment and employment growth was equally marked.

Over the course of 30 years, the geography of the consumer electronics sector has changed dramatically. National economies have given way, in part, to TNCs as the means by which to gauge economic performance and change. By the late 1990s, for example, Japan was no longer the world's

[101] For example, Nokia shifted some production from Singapore to Germany (Sturgeon 2003).

leading exporter, as its share of exports fell to 13.84% in 2000 from 23.4% in 1990 and from 21% in 1980 (see Table 5.4). Rather, Japanese companies became leading producers through non-national production, although Japan remained second in the world ranking of main component export as 64.2% of its Consumer Electronics production exports in 2000 was to electronic componets and devices (see Keisai Koho Centre 2000).

Table 5.4: World Ranking and Share of Consumer Electronics in Electronic Exports , 2000

Rank	Country	Share in World Exports
1	United States	15.5%
2	Japan	9.5%
3	Netherlands	7.4%
4	Malaysia	5.6%
5	South Korea	5.3%
6	China	5.0%
7	Ireland	4.7%
8	Germany	4.6%
9	Hong Kong, China	4.4%
10	France	2.7%

*Source:*Author calculations based on data presented in UNCTAD (2000)

The top export position in 2000 belonged to the US, which accounted for 15.5 % of exports, but it too witnessed a fall in global share from 20.2% in 1980 and 17.3% in 1990. In 2000 Japan had fallen to second place in terms of world exports, followed by Netherlands, Malaysia, and South Korea.[102]

[102] Author calculations based on data presented in UNCTAD 2000.

Rather, Asia as a whole was the leading export region, accounting for 47.3% of global exports, an increase from 45.9% in the early 1990s. Looked at regionally, Europe was a distant second with 28.7% of global exports in 2000 (from 32% in 1990), followed by the NAFTA region with 18.2%. These three regions together accounted for 94.2% of global exports in the sector in 2000.[103]

THE CONSUMER ELECTRONICS INDUSTRY IN MEXICO

Consumer electronics production in Mexico began during the 1930s with the assembly of radios. By the 1950s Mexican firms had started to manufacture transistor radios and black-and-white TVs, and through the 1960s a large number of Mexican companies and TNCs emerged in the electronics sector. The first TNC to set up production facilities in Mexico City was General Electric in 1929, followed by RCA, which arrived in 1935.[104] Most consumer electronics firms at this time were located near Mexico City and primarily supplied the growing domestic market: during the early 1970s, 85–90% of the total value of colour TV sales was produced in Mexico (Nuñez 1990). Fairly atypical were companies such as Majestic, which started production in 1957 as a conglomerate of 57 Mexican firms located in and around Mexico City and became the largest Mexican manufacturer of radios and TVs, selling products across Latin America with parts sourced from throughout Mexico (*Business Week* 1970, p. 49).

[103] All figures are author's calculations from UNCTAD industrial database, 2000. Note: the EU shows the strongest concentration of regional trade within the consumer electronics sector, with 72.2% of total exports going to countries within the region. This is especially high compared with Asia, which has just 44.6%, and the NAFTA region's 22.1% (authors analysis with data from UNCTAD 2000).
[104] Author's analysis from CANIEC annual reports, various years.

Table 5.5: Consumer Electronics Average Growth Rate, 1981–1996

	Growth rate		
	Output	Value added	Employment
1981	–1.9%	–3.8%	1.7%
1982	–18.8%	–17.4%	–12.0%
1983	–13.0%	–13.9%	–9.3%
1984	4.1%	3.5%	2.7%
1985	–0.3%	–0.6%	–5.3%
1986	0.6%	2.5%	0.0%
1987	3.9%	3.3%	2.1%
1988	–3.7%	–1.5%	1.4%
1989	15.0%	13.5%	2.7%
1990	7.9%	8.7%	5.3%
1991	–6.9%	–4.4%	0.6%
1992	0.3%	1.7%	2.5%
1993	–0.3%	1.8%	4.3%
1994	24.8%	13.6%	4.7%
1995	69.8%	0.5%	2.2%
1996	8.3%	3.2%	15.3%

Source: Author's calculation based on data presented in OECD industrial database, various years.

Growth of the sector was positive in general over the period of this thesis but inconsistent year on year (see Table 5.5). By 2000, Mexico was near to the top of the list of world producers for a number of electronic products. With an estimated Mexican export production of nearly ten million TV sets in 1998, Mexico ranked first among OECD countries with a market share more than twice that of its closest competitor, the UK. Production in Mexico was geared to the US export market (Table 5.6), and Mexico became the principal final electronic goods product supplier to the US, followed by Japan, China and Malaysia.[105]

[105] Author's analysis from Electronic Forecast, various years; *Reed Television Digest*, various years; *European Electronics Markets Forecast*, various years.

Table 5.6: Mexican Exports to the US, 1993–2000

		1993	2000	Avg. Annual growth rate
Sound recorders		3.2%	0.3%	-21.3%
VCRs		0.9%	3.3%	33.1%
Parts and accessories		1.0%	0.5%	4.4%
Radios		19.0%	16.3%	12.8%
Television sets		36.2%	41.4%	16.8%
	Printed circuits	5.5%	2.0%	0.7%
	Semiconductors	4.5%	5.2%	17.0%
	Integrated circuits	6.2%	12.1%	24.6%
	Other	23.5%	18.9%	
Total consumer electronics		100%	100%	

Source: Author's calculations based on data presented in BANCOMEXT 2000.

Electronics goods represented 13% of total manufacturing exports, second only to automotive products with 20%, as Mexico became a world-class producer of colour TVs, VCRs and audio equipment. Finished goods exports in TVs, radios, and VCRs grew faster than imports over the 1990s, with the largest share taken up by TV sets at 16.8% average annual growth rate, followed by radio broadcasting receivers at 12.8% (BANCOMEXT 2000). Television sets alone accounted for 12.7% of total Mexican exports in 2000 and 12.3% of total Mexican exports to the US (BANCOMEXT 2000).

Table 5.7: Mexican Foreign Trade in Consumer Electronics, 1993–2000

	Exports, finished goods	Imports, finished goods	Balance
	(Thousands US dollars)		
1993	2,783	1,108	1,675
1994	3,749	1,499	2,250
1995	4,554	1,221	3,333
1996	4,995	1,226	3,769
1997	6,149	1,356	4,792
1998	7,285	1,679	5,606
1999	8,055	1,620	6,435
2000	8,675	1,911	6,764
Avg. growth	16%	8%	

Source: Author's calculation based on data presented in BANCOMEXT 2000.

While this situation was achieved, broadly, by the interface of global economic changes that transformed the sector and the rather haphazard pattern of regulatory prohibition and support for the sector offered in Mexico, a more direct form of support came with the Maquiladora Programme. At the end of the period of study, of about 612 consumer electronics companies (both foreign and Mexican), 20.5% were registered under the Maquiladora Programme, the second-largest sector after textiles and clothing (28.1%) (INEGI 1999). Back in 1971, the federal government issued a decree to promote "industries of national utility" – industries that were expected to "foster regional development".[106] The intention was to strengthen the national market and to promote import substitution and the integration of foreign companies to the Mexican economy through the creation of productive chains to encourage employment and national value added (*DOF*, 23 November 1971). In 1979 the government modified the *Ley de Valoración Aduanera* (Law of Customs Valuation),[107] resulting in the substitution of the "Control Import Permits" by a *tariff system* operating under the Maquiladora Programme. This meant a shift from an industrial protection system to a more open system intended to stimulate the national manufacturing sector, with direct implications for the consumer electronics industry (Kim and Nelson 2000).

[106] *Decreto que Declara de Utilidad Nacional para el Establecimiento y Ampliación de Empresas de Sectores Económicos Estratégicos* (decree that states the national utility of strategic economic sectors and allows the location of new companies; includes consumer electronics sector), *DOF*, 14 January 1971.
[107] *DOF*, 27 December 1979.

In fact, according to a 1981 CANIECE report this modification of the trade policy hit the consumer electronics industry because import permits under the Maquiladora Programme were granted for some products that were manufactured nationally. Subsequently, representatives of the consumer electronics sector (Luis Vera-Vallejo, president of CANIECE) filed a request to the government asking it to modify the tariff policy with an increase reduction in the import taxes to several tariffs that affected consumer electronics supply. The aim was to reduce foreign inputs to a minimum and to allow only those products for which supply chains were insufficient. According to a 1981 CANIECE report the electronic industry was "in a very deep crisis", without enough proper supply, subject to unfair competition against foreign products and on its way to collapse:

> The macroeconomic policies of the 1970s left Mexico's electronics sector highly vulnerable to internal and external conditions. These conditions have sharply turned against all manufacturing products produced in Mexico in the early 1980s, and caused the worst decline in the electronic sector, particularly of those companies relying upon foreign supplies. At the beginning of the 1980s, the manufacturing sector faces higher interest rates, rising inflation, a chronically devalued peso (affecting imports), and a deteriorating demand for Mexican products in Mexico as the result of unfair commercial practices to foreign products imported with the support of an insensitive government trade policy. This disequilibrium, along with the virtual disappearance of complete chains of production, has placed in jeopardy this sector's future within the Mexican economy. (CANIECE 1981, p. 5)

As these takeovers were of companies that had become established in Mexico City, at a time when production was dedicated mostly to the national market and relied on local clusters for the supply of parts, and in the midst of an economic downturn, their closure hit the consumer electronics cluster in Mexico City hard (AMIE 2001). By the late 1980s

only 25% of the original audio manufacturers and 47% of video equipment makers continued to produce for the domestic market. Some surviving firms were forced out of manufacturing altogether and focused instead on assembly and distribution of imported Asian products (Harvey et al. 2001).

In response to pressure from the (Mexican) private sector and in preparation for Mexico's joining the GATT, the federal government initiated a number of important reforms to the maquiladora rules in 1984 (Sklair 1993). In that year, the total value of imports in the consumer electronics sector under tariffs and permits was reduced from 100% to 55%. A transitional period for reduction of tariffs was implemented in four stages, starting with a maximum 74.8% tariff in 1984 and ending in 1988 with a maximum import tariff of 14.1% (SECOFI 1992).[108]

Particularly important was considered the decree which allowed maquiladoras to sell up to 20% of their national production to the national market – this decree had the most detrimental effect on the "traditional nationally oriented Mexican electronics industry" as it accelerated the dismantling of the traditional consumer electronics industry that was by then in severe crisis and facilitated the transformation into the new export-oriented consumer electronics sector (Fernández 1989; Sklair 1993).[109] Over the 1990s approximately one-third of all maquiladora plants were engaged in some form of electronics production, with most being foreign-

[108] As part of the GATT, Mexico set a maximum trade tariff of 50% from 1986.
[109] *Decreto que Regula la Maquila de Exportación*, *DOF*, 15 August 1983.

owned and absorbing a large part of the increase in FDI in the electronics sector, which rose from US$3.044 billion in 1988 to US$45.355 billion in 2000 (Banxico 2000). The initial investments in consumer electronics maquiladoras were made by US companies: in 1971 Mexico hosted 293 predominantly US-owned maquiladora plants and in 1978 there were 540, of which 32% were in the electrical/electronics industries (Fernández 1989).

An important wave of US companies entered Mexico over the 1960s as the result of the Maquiladora Programme. American electronics companies were using Mexico to manufacture products more economically and escape the high-labour market in the US. According to Weber (1969), low-cost labour competitive with that in Asia and Europe was the key reason leading US manufacturers to "flood" Mexico with financial, technical and production personnel in order to boost their production bellow the border.

> Proximity to the Mexican border, particularly to Tijuana and Mexicali and to their low-cost labor market yelled the marriage between US companies and American-financially supported but Mexican-owned firms. Many view Mexico's industrialization as a three-step process involving: 1) American capital investment 2) Infusion of Mexican capital into firms started by Americans; 3) American technical and production advisers and consultants training Mexican labor… (Weber 1969, p. 8)

The use of OEMs further enhanced the cost advantages of Mexico, especially as the electronics sector began to adopt system-level or so-called "box-built" services. System-level final assembly processes are very labour-intensive and rely on direct-order fulfilment, which fits well with Mexico's

strength as a low-cost manufacturing base and proximity to the US. Box 5.1 describes the organisation of an OEM in Nuevo Laredo, Tamaulipas. Data show that these cost regimes provided maquiladoras with increasingly high productivity levels, a fact also confirmed in interviews with Mexican OEM producers (Couttolenc 2000; Hidalgo 2000; Mata 2000).

Box 5.1: Mexican OEMs: The Case of Sony in Nuevo Laredo

The Nuevo Laredo (Tamaulipas) plant exemplifies how OEMs operate. An affiliate of Japanese corporation Sony, the plant started producing audio cassettes in 1979 employing 70 workers. Over the following years, new products were introduced (plastic components, magnetic computer disks, refurbishing of electronics equipment, lithium batteries and micro-cassettes), and by 2000 the plant employed more than 2,400 people.

From 1979 to 1996 the company was called Magnéticos de México S.A. de C.V. During this phase, production was based on labour-intensive operations. A plastic injection plant for the production of plastic components and magnetic disks for computers was then inaugurated, thus fortifying the company's presence on the international market. In the period 1996–2000 a significant transformation took place as authorisation was granted by the corporation to add the title "Sony" to the legal name, becoming Sony Magnéticos de México S.A. de C.V.

During this period one billion floppy disks for computers were produced and 1.5 million audio cassettes. In April of 1996, an audio parts and components plant and a refurbishing centre for audio and video electronics equipment were simultaneously inaugurated. The first took over audio and moulding operations, and the second offered possibilities for refurbishing equipment such as wireless telephones and personal stereos. In 1997 Noboyuki Idei, president of the Sony Corporation, presented Sony Magnéticos de México with an award for being one of the most efficient manufacturing companies in the world (Sony 2000). On 15 June 2000 the corporation officially authorised a change of the company's legal name to Sony Nuevo Laredo S.A. de C.V. (SNL).

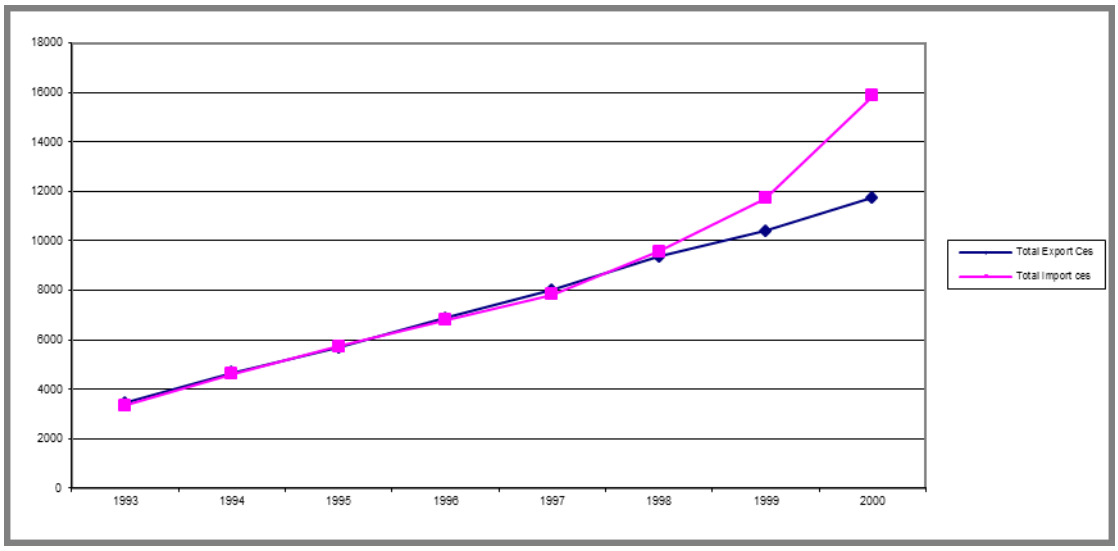
Following in the steps of Krugman's argument – although unwittingly, one suspects – Sklair (1993) has suggested that location in the border zone gave maquilas preferential access to the US market.[110] According to Fernández (1989), increasing labour costs in the US and the appreciation of the yen relative to the dollar stoked the development of the Maquiladora Programme (see also *European Electronics Markets Forecast* 1996).

[110] The location advantages of the maquiladoras have been enhanced by clustering. In Tijuana, for example, the IMEC Corporation based in National City, San Diego, set up assembly lines on behalf of 24 US firms, including Hughes Aircraft, ITT, TRW and Xerox. IMEC started five plants, provided each with assembly equipment, gathered the workforce, managed inputs and ensured the prompt delivery of the assembled products (*Electronics Times* 1997).

By focusing the analysis at the product level and on import origin and export destination, we can understand the process of production fragmentation brought about by trade liberalisation. During the past 20 years, Mexico has become a major exporter of consumer electronics (Figure 5.2). In particular, exports have gone to OECD countries and the US: 64% of imported TVs to the US in 2000 originated from Mexico. Mexico contributed 27.2% of US imports compared with 26% from Japan, 18.9% from China, 10% from Malaysia and 3% from Indonesia (*Electronic Market Data Book* 2000). From 1993 to 2000, exports of consumer electronics to the US grew at an annual average rate of 14.9%, from US$4.8 billion in 1993 to US$13.74 billion in 2000 (BANCOMEXT 2000). This growth was in both finished goods and electronic parts, as can be seen in Figure 5.3. Finished and intermediate goods produced in Mexico were often re-exported to the location of TNC headquarters in a circuit of flexible production. Thus, imports of electronic parts have grown 26% annually, higher than total exports of electronic parts (22%), suggesting that Mexico has become not just a location of assembly for export but also a place where intermediate goods are being produced within a global production circuit.[111]

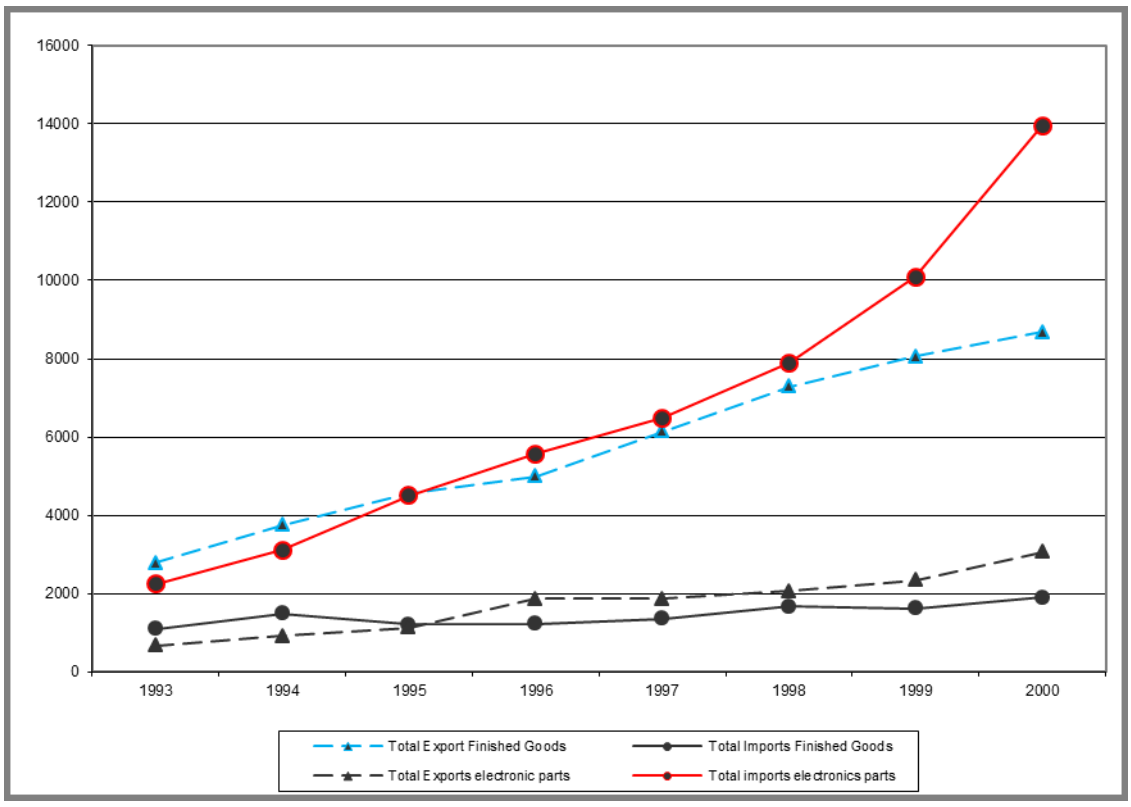
[111] Again, the flows are regional in that around 80% of the integrated circuits imported to Mexico come from the US (*Electronic Market Data Book* 2000).

Figure 5.2: Total Exports/Imports in Consumer Electronics, 1993–2000 (Millions of Pesos at 1990 Value)



Source: Author's calculations based on data presented in BANCOMEXT (2000).

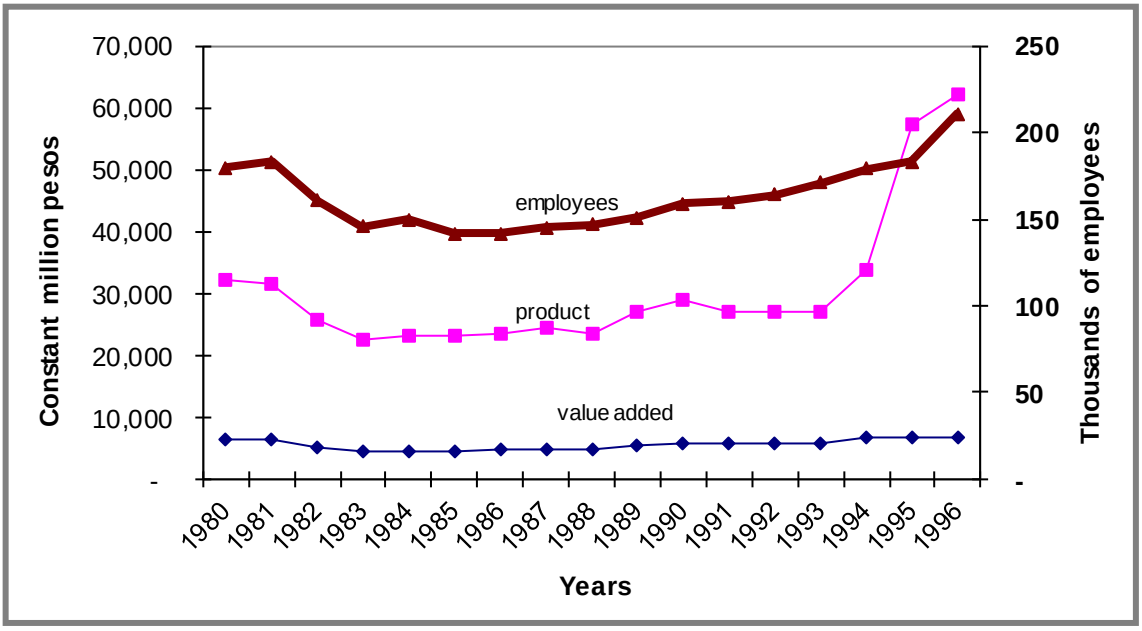
Figure 5.3: Maquiladora and Total Foreign Trade in Electronics in Mexico, 1993–2000 (Millions of Pesos at 1990 Value)



Source: Author's calculations based on data presented in BANCOMEXT information, various years.

We should avoid the conclusion, however, that the consumer electronics sector in Mexico during the study period experienced unbroken, positive and even growth. As already indicated, the electronic sector has had periods of 'inconsistency', even "crisis". Indeed, we need to note the following general trends. Annual average product growth during the 1980s was 5.6%, whereas employment growth was 1.2%, while growth of value added was 0.7%. In specific years, however, the trends for these processes were downward: during the early 1980s, product, value added and employment declined, recording a fall of nearly 20% in 1982 (Figure 5.4).

Figure 5.4: Product, Value Added and Employment in the Consumer Electronics Sector in Mexico, 1980–1998



Source: Author's calculation based on data presented in OECD industrial database, various years.

This decline was unrelated to the opening of the economy to foreign trade, but rather was connected to deteriorating macroeconomic conditions (the

debt and oil crises of the 1970s and 1980s) and a more general crisis of the ISI model. The sector's performance moved up and down between 1984 and 1988 and was at almost 15% in 1989.[112] While still showing some volatility, the sector posted positive growth rates between 1990 and 2000, especially in employment and output, and in 1995 the growth rate for product value was 69.8%, boosted by the devaluation of the peso.

If we interpret these data we might note that value added has remained far more stable than the general increase in product (value of production). The most likely explanations are, on the one hand, the lack of a vertically integrated industry, and on the other, the maquiladora mode of production that provides producers with incentives to keep the Mexican value-added component as low as possible as it is only the value added in Mexico that is liable to taxation at the moment of re-export. Hence in most years the value of total imports is almost equal to that of total exports, and since 1998 imports have surpassed exports, creating the first trade deficit in consumer electronics.[113] This shift might partly be explained by a reform of maquiladora regulations that allows companies to sell part of their production to the national market.[114]

[112] Author's calculations based upon data presented in economic censuses (INEGI various years).
[113] Author's calculations based on data presented in BANCOMEXT 2000.
[114] Two notes of caution are required about the quality of data on the maquiladoras. First, with so many reforms affecting the sector – for example, allowing companies beyond the border industrial zone to enjoy the benefits of the Maquiladora Programme – it is difficult to measure change over time as geographical boundaries have expanded and existing plants have re-registered as maquiladoras. Guadalajara has become the hottest spot in Mexico for electronics manufacturing, with companies possibly attracted by the infrastructure, a qualified workforce and a customer base (CANACINTRA 2000). Second, companies have reorganised to capture the various federal benefits on offer. One manager interviewed confirmed that his plant of 2,000 employees was working under four different legal names in order to draw down different incentives (Couttolenc 2000). He confirmed that this strategy generated duplications in economic census surveys.

THE CONSUMER ELECTRONICS SECTOR AND MEXICO CITY'S INDUSTRIAL DE-CONCENTRATION

During the 1980s, TNCs that already had a presence in Mexico began a restructuring process to improve their existing production facilities and build new ones, a situation that led to the de-concentration of the consumer electronics industry. Leading companies including Panasonic, Sony and Philips expanded operations and adjusted to the new economic environment. At the same time, new TNCs began to arrive in Mexico. In order to assess the consumer electronics market and how companies reacted to the changing economic environment, I analysed the sector in three different ways. First, regional concentration at the beginning and then at the end of the 20-year research time span were explored. Second, I looked at location patterns for the top 100 companies in the sector according to SIEM (SECOFI 2000) to see if they were related to trade liberalisation. Finally, I examined specific companies at the top of the hierarchy with the aim of identifying the reaction to the new economic environment and drew conclusions from these three different perspectives.

Looking at regional concentration, from 1980 to 1985 the consumer electronics sector went from being concentrated in 11 states to having a presence in 15 in 1993, and in 23 by 1998.[115] In 1980, 91.5% of the assembly of consumer electronics products (ISIC 383204) was concentrated in Mexico City and the State of Mexico, while Tamaulipas and Chihuahua, both border states, ranked first and second in terms of electronic parts manufacturing concentration (ISIC 383206). There were

[115] Author's calculations based on SIEM (SECOFI 2000).

no assembly plants at that time in any of the border states apart from Tamaulipas, although this state had only minimal participation in assembly and parts manufacturing (a situation that would change dramatically), suggesting that its position was the result of the integration of the consumer electronics parts industry with its US counterpart.

In employment terms, Mexico City, the State of Mexico, Tamaulipas and Chihuahua accounted for 79.5% of total employment in 1980.[116] By the end of the 1990s, by contrast, 77.6% of total employment in electronic parts production (ISIC 383206) was concentrated in the border states. This situation meant that by 1985, Mexico City had fallen in the employment concentration ranking within the sector from first to fourth place.[117] This trend continued between 1985 and 1993, with Baja California and Nuevo León recording the highest growth rates as Mexico City and the State of Mexico followed a downward path in consumer electronics employment. By 1993, the supremacy of the border states in consumer electronics employment terms was becoming clear. Chihuahua, Baja California, Tamaulipas and Sonora accounted for 76.5% of total employment, with Mexico City in fifth place registering a modest 6.9% of national employment and the State of Mexico ranking sixth with 4.7%.

In terms of both company location and employment, therefore, the relocation of the consumer electronics industry started long before the

[116] Figures in this paragraph refer to author calculation based upon data presented in economic censuses (INEGI various years).
[117] According to Garza (1980), in the early 1970s consumer electronics manufacturing was the third-ranked industry in terms of output in Mexico City with 6% of total DF output, only surpassed by chemical product manufacturing (15.1%) and the automotive industry (7.6%).

process of trade liberalisation, by which time industrial concentration in the manufacturing belt around Mexico City had already declined. While by 2000 a pattern of industrial concentration of the consumer electronics industry in the states along the US border was apparent, the Concentration Index shows this process well under way from the 1980s (Table 5.8).

Table 5.8: Labour Concentration Index in the Consumer Electronics Industry, 1980–1998[118]

Concentration Index 1980			Concentration Index 1998	
1.Baja California	4.313		1. Baja California	14.979
2. Sonora	3.228		2. Sonora	8.274
3. Tamaulipas	3.034		3. Chihuhua	6.207
4. Chihuahua	2.621		4. Tamaulipas	5.681
5. Mexico	1.632		5. Querétaro	1.787
6. Coahuila	1.100		6. Jalisco	1.474
7. Tlaxcala	0.982		7. Coahuila	1.403
8. Federal District	0.981		8. Nuevo León	1.276
9. Nuevo León	0.953		9. Aguascalientes	0.975
10 Jalisco	0.462		10. Morelos	0.268

Source: Author's calculations based on data presented in INEGI (1981, 1999).

In 1998, all six border states were among the top eight in terms of their concentration of consumer electronics employment. Remarkably, not a single state from the former manufacturing belt around Mexico City was among them. At the beginning of the 1980s, although consumer electronics production was highly concentrated in Baja California, Mexico City, the State of Mexico and Tlaxcala were among the top consumer electronics producers with the largest numbers of jobs in the sector. According to the Concentration Index for 1998, the State of Mexico and Mexico City ranked 12th and 13th, falling from fifth and eighth place respectively, in the early 1980s. This trend reflects not only the

[118] It is important to reiterate that if the Concentration Index is greater than 1 (>1) the concentration of activity is higher than the national average, while if the index is less than 1 (<1) it is lower.

industrialisation of the border region but also, more importantly, the manufacturing decline and employment de-concentration of Mexico City.

Comparing the location patterns between the consumer electronics and automotive sectors, it can be seen that the former is concentrated in fewer states. In 2000, the top 100 companies in the automotive sector (according to SIEM 2000) were located in 18 states, with Puebla and Aguascalientes possessing the highest number at 16 companies each. In the case of consumer electronics, there were only eight states with companies in the top 100, with a striking 58 in Baja California, 45 of which were located in Tijuana, ten in Mexicali and three in Ensenada (see Table 5.9).

Table 5.9: Top 100 SIEM Companies in Consumer Electronics Sector by State, 2000

State	Percent
1. Baja California	58
2. Mexico City	13
3. State of México	5
4. Jalisco	20
5. Morelos	1
6. Querétaro	2
7. Nuevo León	1
Total	100

Source: Author's calculations based on data presented in SIEM (SECOFI 2000).

Table 5.10 shows the location patterns of the consumer electronics sector from 1950. It reveals the incipient emergence of Baja California between 1961 and 1980, before the liberalisation of trade in 1986, when five companies were established, and which compared with three start-ups in Mexico City for the same period. The growing dominance of Baja

California and relative shift away from the Mexico City region increased during the 1980s spurred by the maquiladora programme when eleven companies established in the border state compared with just four in Mexico City. From 1991, Baja California was the dominant location for the most important electronics companies established in Mexico. Mexico City and the State of Mexico continued to be an attractive location with six new companies, but was overtaken by Jalisco as the second most important region for electronic company start-ups.

Table 5.10: Company Start-up (Decade) vs Location (State), 1950-2000

	Starting operations					
Location	**1951-1960**	**1961-1970**	**1971-1980**	**1981-1990**	**1991-2000**	**Total**
Baja California	0	3	2	11	42	58
Mexico City	2	0	3	4	4	13
State of Mexico	2	1	0	1	1	5
Jalisco	0	0	3	1	16	20
Morelos	0	0	0	2	0	2
Querétaro	0	0	0	1	0	1
Nuevo León	0	0	0	0	1	1
Total	4	4	8	20	64	100

Source: Author's calculations based on data presented in SIEM (SECOFI 2000).

As many as ten US companies began subsidiary arrangements or affiliates in Mexico at the end of the 1960s: Ampex de México, Centron Radio, Audio Magnetics, Philco, Packard-Bell de México, Audio Electronics, Stereo Jet de México, Admiral de México, Minnesota Manufacturera de México, and Asetatos Profesional de México-Crown Fairchild TEAC. One of the most aggressive US firms was Warwick, a low-quality, low-cost OEM that was the first US assembler of TVs to move to Mexico. Warwick became a pioneer through its decision to transfer the majority of its operations to Tijuana in 1966, and opened two additional facilities for the

assembly and production of components in Tijuana in 1968 and 1974, holding the position of largest electronics assembler in Mexico until the mid-1970s. Telectronics started operations in 1969 in Matamoros. In the early 1970s, Nogales housed plants owned by Magnavox and General Electric, and in 1975, 17 of the 37 maquiladoras in Nogales manufactured electronics components. Of these, eight had parent corporations or plants in Arizona, California or Texas. Also in 1975, Zenith moved the greater part of its assembly operations from the US to Matamoros, Tamaulipas. In 1992, Zenith closed its US plants and relied on its factories in Mexico, a move that practically represented the end of domestic production by US-owned TNCs.[119]

In the mid-1970s, however, maquiladora investment shifted from Nogales to Tijuana, and subsequently to Ciudad Juárez and Reynosa. An important part of this shift was the decision of RCA to open in Ciudad Juárez in the late 1970s, which consolidated an incipient electronics cluster in the city (Sklair 1993). But unlike the earlier investments in Tijuana and Nogales, which were mainly by smaller independent parts suppliers, it was the leading US consumer electronics firms that headed for Ciudad Juárez and Reynosa.[120]

From the 1980s, however, South-East Asian firms became more prominent – by the end of 1994, South Korean companies had pumped US$650 million and the Japanese US$400 million into both Tijuana and Ciudad

[119] Author's analysis of information presented in Electronic Forecast, various years; *Reed Television Digest*, various years; *European Electronics Markets Forecast*, various years.
[120] *Ibidem*.

Juárez, and total FDI from South-East Asia had reached US$1 billion (UNCTAD 1998). Companies such as Toshiba (the first Japanese consumer electronics company to arrive in Mexico) and Samsung located first in Mexico City, then moved to the border. Toshiba started operations in 1963 importing consumer electronics products and in 1968 built a semiconductor plant in Cuautitlán Izcali, State of Mexico. It was not until 1986, relatively late compared with the sector leaders, that it opened a plant in Ciudad Juárez under the Maquiladora Programme, producing TV sets, video recorders and parts for export to the US. The plant became vertically integrated with other Toshiba production facilities in the US, in particular with Toshiba's Texas plant. Samsung's Mexico City plant was opened in 1988 and in the same year the company began a plant registered as a maquiladora in Tijuana.[121]

In 1970, according to Bruce Weber (1990, p.21), labour costs were the main reason for US companies to locate in Mexican border states. Factory workers were paid on average between 300 and 400 pesos a week (US$24–US$32) including all fringe benefits, about one-fifth the rate paid under union contract in the US. The economic factors evolved over time; in 1997, the managing director of Sanyo (Mexico), Daisuke Kutsunugi, was motivated by the fact that production costs in Mexico were half those found in other locations in the 1980s. Moreover, he considered then that proximity provided supply-line advantages. Consumer electronics TNCs no longer had to wait 22 to 28 days for shipping of products from Asia; these were "now only eight hours by road from the US market" (*Electronics*

[121] Based on company information from the CANIETE/CANIECE archives.

Times 1999, p. 1398). Managers at Samsung Electronics in Mexico claimed that the new production plant set up in Ciudad Juárez in 1995 cut shipping time to the US market from four days by plane or eight days by ship from plants in the Philippines, Malaysia and Taiwan to as little as two days (*ibidem*).

Most of the Tijuana plants produced electronics components and parts that were shipped directly to final goods assemblers in the US in line with the trade liberalisation hypothesis; however, all began under the liberalisation kick-started by the maquiladora regulation in the 1970s and not in the 1990s as Krugman's approach suggests.[122]

The majority of companies started operations during the 1990s, suggesting a completely new industry with no relationship to the previous industry located in the central part of Mexico. A company is less likely to appear in the top 100 the earlier it was started: 64% began operations in the 1990s, 20% in the 1980s, and the remaining 16% in the 1950s, 1960s or 1970s as discussed earlier in relation to data presented in Table 5.10. The 1980s and 1990s constituted the period when the highest number of companies in the consumer electronics sector started operations. This observation can be interpreted in different ways. First, new global companies in this sector flourished in the new economic free trade environment. Second, only a small group (16%) of the older companies were able to endure the Mexican

[122] By 1973 there were already over 100 electronics maquiladora operational in Baja California and Sonora (Mexican American Review 1974).

economic crisis and the liberalisation process and adjust their operations to suit the new economic environment.

When looking at the arrival trend of the top global companies in the sector this might seem contradictory to the previous data related to the top 100 companies, as out of 34 top global companies, 18 firms were established in in Mexico before the 1980s and only 15 firms were established during the 1980s-1990s plus one in the 2000 (see Table 5.11). The first eleven companies to be established in Mexico all set up in Mexico City, before Motorola decided to establish an additional plant in Sonora in 1966.

Table 5.11: Companies by Production, Plant Start-up and Location

	Country	Year	Location
General Electric	US	1928	Mexico City
RCA	US	1935	Mexico City
Philips	Netherlands	1939	Mexico City
Philco	US	1950	Mexico City
Magnavox	US	1951	Mexico City
Zonda	Mexico	1951	Mexico City
Sylvania	US	1956	Mexico City
Majestic	Mexico	1957	Mexico City
Admira	US	1959	Mexico City
Toshiba	Japan	1963	Mexico City
Motorola	US	1963	Mexico City
Motorola	US	1966	Sonora
Warwick	US	1966	Baja California
Warwick	US	1968	Sonora
RCA	US	1971	Chihuahua
Magnavox	US	1971	Sonora
Warwick	US	1974	Sonora
Zenith	US	1975	Tamaulipas
Sanyo	Japan	1982	Baja California
Sony	Japan	1985	Baja California
Toshiba	Japan	1986	Baja California
Philips	Netherlands	1987	Chihuahua
Matsushita	Japan	1988	Baja California
LG Electroncis	Korea	1988	Baja California
Samsung	Korea	1988	Chihuahua
Samsung	Korea	1989	Mexico City
Matsushita	Japan	1990	Baja California
Daewoo	Korea	1991	Sonora
Philips/General Electrics	Netherlands/Korea	1993	Durango
Matsushita	Japan	1994	Baja California
Samsung	Korea	1994	Baja California
Samsung	Korea	1999	Mexico City
Sony	Japan	1999	Baja California
LG Electroncis	Korea	2000	Mexico City

Source: Author's calculations based on data presented in CANIETI/CANIECE annual reports.

When comparing those companies located in Mexico City that started operations during the 1950s with those founded in the 1990s, there is a shift from nationally owned companies to TNCs.[123] However, this change of ownership composition and scale of operations does not mean an equally radical shift toward export orientation. Typical of companies set up in the 1950s are Manufacturera de Sinfonolas, which made coin-operated jukeboxes, and Compañía General Electronic, which made electronic parts. Both were nationally oriented and not technologically innovative.

By contrast, in the 1990s a set of globally oriented TNCs including Samsung Electronics de México, Audionick Compañía and Manufacturera Wilka arrived. All were started with foreign capital and import products, but at the time had no export activity. Looking at the top 100 companies located in Mexico City from the 1950s and 1990s, it is possible to observe that 12 of the 13 had no export activity.[124] At the opposite end of the scale, in Baja California only six out of 58 companies had no export activity.[125]

It is worth noting that according to the CANIECE archives, as the result of M&As as company production strategy, manufacturing plants were either closed or relocated. This was the case for Warwick's plants – as a result of

[123] Again, some caution is required as seven of the top ten companies over the 1950s and 1960s were non-Mexican. Companies starting up at this time included Philco (1950), Magnavox (1951), Telefunken (1951), Sylvania (1956), Admiral (1959) and Stromberg Carlson (1967), all with production facilities in Mexico City.
[124] The exception was Hilma, founded in 1986, which produces microphones for the national and export markets.
125 Hoyu Taiwa de México, Jiko Mexicana, Olympia de México, Aromat Mexicana Electrónica, Vanguad Electro Opticas and Superior Inchang de México. In all cases these are companies operating in the parts sector, so are most likely to be outsourcing for bigger local export companies.

the Sanyo takeover, all Warwick operating plants in Mexico were closed. Warwick was a US company with plants in Tijuana, Mexicali and Mexico City, producing TV sets for the US market. In 1993 Samsung announced an aggressive investment programme in Mexico, opening a new plant in Tijuana in 1994 and another in 1997 before opening new facilities in Mexico City and branches in Guadalajara, Monterrey and Mérida in 2000.[126]

Most newly arrived companies in the 1980s, and notably Japanese companies, went straight to the border, especially Baja California, attracted by the incentives offered under the Maquiladora Programme (CANIECE 1981). In 1982 Sanyo launched operations in Tijuana, at a plant that was integrated with Sanyo plants on the US side of the border. Since then Sanyo has established six divisions with nine production plants employing more than 5,000 people (Sanyo 2001). Similarly, Sony established operations in Mexico as a direct result of internal production and operations restructuring. Sony transferred its production plant from San Diego to four plants set up in Tijuana in 1985 (Sony 2000).[127] In 1996 Sony opened a plant in Mexicali, investing more than US$20 million and hiring 2,000 employees to manufacture TV sets and components. That same year a new division of the Sony corporation launched operations in Tijuana. In an unusual southwards move, Sony opened plants in

[126] The investment in new plant in Mexico has probably supported the development of high-skilled operations such as R&D in the southern US. Sony, Matsushita and JVC have engineering and support bases in southern California where they develop component production techniques and innovations that vertically integrate with subsidiaries and production facilities in Mexico (Harvey et al. 2001).
[127] Sony products manufactured in Tijuana are mainly sold in the US, Asia, Mexico, Chile and Panama.

Guadalajara and Mexico City in 2000; this actually contradicts Krugman's argument, particularly due to the fact that Jalisco developed a bold electronics cluster, the top companies arriving over the 1990s.[128]

De-concentration was also fuelled by the increase in M&As mentioned earlier in this chapter. In 1987, for example, Thomson acquired three companies with long traditions of manufacturing in Mexico: General Electric (in Mexico since 1948), RCA (1935) and Telefunken (1951). With takeover these companies disappeared from the Mexican scene as Thomson took a strategic decision not to extend its Mexico production base, reading that the Mexican economy in 1987–88 was still in a crisis situation (Zampetti et al. 1994).[129] A similar situation can be illustrated by the case of Philips, a company that arrived in Mexico in 1939 when it began importing products from Europe, formally starting production in 1945 as Philips Mexicana, S.A. In 1952 Philips opened a distribution centre in Monterrey, in 1957 production facilities were opened in Mexico City and in 1958 a new plant was opened in Monterrey. In 1974 Philips purchased Magnavox, in 1981 it took over Sylvania and in 1984 it acquired Philco, all three companies with production facilities in Mexico City. According to interviews with Philips officials, the acquisitions meant that facilities were closed (Magnavox's plant in Nogales was shut) or downgraded to warehouses and distribution centres, with a consequent high number of redundancies (Hidalgo 2002). According to company information, after

[128] Author's calculation based on data presented in CANIETI annual reports, various years.
[129] According to Zampetti, this was a rather unexpected decision by Thompson. In Zampetti's view this was a reading that the Mexican economy in 1987–88 was still in a crisis situation (Zampetti et al. 1994).

border controls were eased in 1987, Philips Mexicana reorganised its industrial strategies to take advantage of the Maquiladora Programme. Specifically, Philips now sought to integrate the Mexican plants with its US plants (Hidalgo 2002). It moved to Tijuana and Juárez and increased operations at its Monterrey plant, leaving non-electronic production (domestic appliances manufacturing) to its Mexico City divisions. Philips also entered into OEM agreements with Mexican companies producing for the US market.[130]

The exceptions to this process indicate a stay of execution, but not for long. In 1972, Matsushita acquired Motorola's consumer electronics division, making it a global player (Matsushita 2000). Motorola had started distribution operations for consumer electronics products in 1960 and in 1963 decided to begin manufacturing operations, locating both the distribution and manufacturing plant in Mexico City. In 1966 it registered a plant under the Maquiladora Programme in Nogales and in 1969 it started a semiconductor manufacturing plant in Zapopan, Jalisco (subsequently sold to Texas Pacific in 1999). The Matsushita takeover saw Motorola exit the consumer electronics sector. Matsushita operated Motorola's former OEM plants in Mexico City as part of its arrival strategy, then opened a new plant in Tijuana in 1976; a further three assembly plants began operations in the city in 1988, 1990 and 1994.[131]

[130] Philips's acquisition of Magnavox, Sylvania and Westinghouse (in 1983) also made it a a powerful player in the US economy.
[131] In 1997 Matsushita started audio exports to Latin America and in 1998 it announced the assembly of its one millionth TV set.

Post-NAFTA, location and de-concentration seems to be motivated less by production concerns and more by opportunities for international trade and investment flows. The geography of production has been reappraised, with a more diversified pattern and an orientation away from the US market alone. As already noted, after NAFTA a number of companies that had located in Mexico began to export to Latin America, and even to South-East Asia. The orientation to more global markets had made locations away from the border more attractive. In 1988, for example, LG Electronics entered an agreement with a local Mexican assembly partner in Mexicali to distribute imported products. In 1994 LG set up offices in Mexico City in order to control marketing, sales and distribution strategies locally. In 1995 LG acquired the US TV manufacturer Zenith and its assembly facilities in Reynosa, with 17,000 employees; this was followed by the opening of regional offices in Guadalajara, Monterrey and Mérida.[132] In 2000 LG started operations in Cuautitlán, 10 km from Mexico City. According to company information, this move back toward Mexico City was intended to achieve higher standards for the merchandise brought in from South Korea and other production sites around the world. LG also regarded Mexico City as a stronger base from which to develop the Mexican market (Spencer 2000).

[132] In 1998 Goldstar changed its global brand and name to become Lucky-Goldstar or LG. LG now assembles all of its worldwide TV sets in Mexico, with a yearly production of three million, and has even started producing parts to supply other Asian TV manufacturers located in Mexico.

CONCLUSION

We have seen that consumer electronics production in Mexico began during the 1930s and was boosted significantly both in terms of output and new investment in the 1960s, when an important set of foreign firms arrived. During the following decades, industrial regional organisation was modified as a result of a broader business context associated with global business practices including innovation, M&As and production fragmentations, more than trade liberalisation alone. In the border region by the beginning of the 1990s, under a new economic environment, clusters of highly efficient, high-quality Japanese producers occupied a space formerly taken by relatively inefficient low-quality US companies, a movement that had its origins before the liberalisation of trade but that also highlights the effects of a partial trade opening brought about by the maquiladora regulation. Mexico, and especially the border region, became a key location for global consumer electronics firms.

In spatial terms, the transformation pattern is akin to a shift from a monocentric to a polycentric clustering of economic activities, determined in most cases by the market orientation strategies of specific companies and their long-term investment decisions, fostered by a combination of factors: geography of production, trade regulation, access to markets, and price differentials. In this regard, one of the main factors that could take credit for such a transformation of the economic environment in terms of market orientation and investment decisions was the Maquiladora Programme. Many of the companies that first located in Mexico City remained there, while those interested in starting operations under the

Maquiladora Programme opened extra plants in northern Mexico in a move that Krugman characterises as being made in order to gain access to markets, although in this case access to suppliers seems to be as relevant. The company histories show that it is not the case that Mexico City facilities were closed down and new ones established elsewhere; rather, Mexico City closures were a combination of economic crisis and global restructuring of the industry, mainly through M&As, which provoked significant de-industrialisation directly and through cluster effects on suppliers. To illustrate the importance of these explanations, the de-industrialisation of the consumer electronics cluster in Mexico City was repeated by companies along the border in Nogales and Reynosa as the result of global M&As: global factors affect specific locations. Again, however, we should note that de-concentration through M&A restructuring took place before the opening-up of the economy and the dismantling of trade protection barriers. The de-concentration of consumer electronics away from Mexico City also appears to be unrelated to federal decentralisation programmes.

Although the consumer electronics and automotive sectors were selected because of their rankings in the Globality Index, one can now see a contrast in terms of integration into the Mexican economy. These sectors exemplify two different forces brought about by globalisation that were discussed in Chapter Three; on the one hand, the fragmentation of productive processes driven by standards of technological innovation and the resultant build-up of global production circuits (usually referred to in the literature as “centripetal forces”), and on the other, the “centrifugal

forces" that reinforce location concentration patterns. These forces run in parallel with those claims made in the NIDL and globalisation literature, particularly in relation to the claim that high-value-added activities are kept in developed countries and less value-added, highly labour-intensive activities are sent to less developed countries. The broad picture of consumer electronics sector transformation challenges the ideas set out by Krugman. The electronics sector exemplifies how under the broader framework of a free trade regime, global processes (i.e., M&As, technological innovation, production fragmentation) can lead to the transformation of specific locations, regardless of the intentions of local players. Regarding regional restructuring processes, this sector analysis has made clear that restructuring in the central part of the country, and particularly the de-industrialisation of Mexico City, is not related to the market (demand) and transport cost claims made by Krugman and Livas. Rather than liberalisation of trade, and the access to markets that sparks a "migration to the north", the relocation of the consumer electronics industry in Mexico is mostly explained by processes taking place at the global level.

Chapter Six: The Transformation of Mexico City

OVERVIEW

This chapter focuses on the economic restructuring of Mexico City. For over a century Mexico City concentrated the country's wealth and income, manufacturing base and political power. As such it was an indicator of national fortunes, through crisis and opulence, growth and recession. In a period of less than 20 years, however, the dominance of Mexico City has been threatened. Entire industrial sectors have moved or been dismantled. In part this change has come about as a consequence of federal government policy which has promoted industrial decentralisation, but as this thesis has explored, the shift has been associated to varying degrees with trade liberalisation and globalisation. Considering the effect of these processes on Mexico City is crucial to understanding liberalisation and globalisation, and their effects.

This chapter does three things. First, it presents material from the automotive and consumer electronics case studies to explore the association between manufacturing decline in Mexico City and industrial location dynamics that point toward the border states and the central part of Mexico as the preferred locations in the post-trade liberalisation period. Second, the chapter develops this analysis by looking more closely at Mexico City's economy over the post-trade liberalisation period in order to discuss how the deep transformation in the city's economy has led to a concentration of certain economic activities, notably in the financial

sector. Finally, the chapter explores the social effects of transformation and presents empirical information to assess how residents who have lived through the "economic transition" perceive the consequences in terms of social cohesion, social polarisation and politics. Here I use primary data from questionnaires given to a group selected by a probabilistic sample that identified people over 40 years old, a population which entered the workforce just prior to Mexico's neo-liberalisation and has lived through economic restructuring over the time frame of this thesis. Fieldwork interviews were conducted on 5–30 May 2000.[133]

MANUFACTURING DECLINE IN MEXICO CITY

The two previous chapters have looked at possible trade liberalisation or globalisation effects in the automotive and consumer electronics sectors. The units of analysis were the sector and the company. Here, I am interested in considering the impact of the location decisions of companies in these two sectors on Mexico City. These decisions take place in the context of considerable growth for both sectors, at rates higher than for manufacturing in general nationally. In terms of employment, for example, the automotive sector grew by 495.7%, an annual growth rate of 9.3%, and the consumer electronics sector by 56.1%, an annual growth rate of 2.4%, between 1980 and 2000.[134]

The first observation is that the automotive and consumer electronics sectors follow different growth and localisation trends. By 2000 the

[133] The questionnaire is presented in Appendix 4.
[134] Author's calculations from data presented in economic censuses (INEGI various years).

consumer electronics sector had almost disappeared from the central region and showed a high level of concentration in the border states. The presence of the consumer electronics industry in the border predates trade liberalisation. The automotive sector remained an important sector in central Mexico, but was less important in Mexico City per se. Data for the automotive sector show that it followed a pattern similar to the manufacturing sector generally: a relatively important decline in Mexico City total employment terms, with a strong remaining presence within the metropolitan area municipalities (the wider MAMC). In 1980 the MAMC accounted for 59.8% of total national automotive employment, with 50.9% of total national employment concentrated in just six municipalities: Azcapotzalco (12.8%), Miguel Hidalgo (8.3%) and Gustavo A. Madero (6%) in the DF and Tlalnepantla (10%), Naucalpan (7.9%) and Cuautitlán (5.9%) in the State of Mexico (see Table 6.1).[135] These six municipalities formed an industrial cluster. At the national level by 2000, jobs in the automotive sector had increased by 495.7% (in absolute numbers from 72,661 to 432,836), with high growth in Aguascalientes and Coahuila and positive but lower rates of growth in states with an existing automotive presence.[136] Mexico City plus metropolitan municipalities of the State of Mexico had 36,764 employees and represented 8.4% of national automotive employment in 2000, a decline of 15.6% from 1980 and a significant relative decline as a share of all employment in the larger automotive sector. Importantly, this decline was not the same between the

[135] Azcapotzalco alone had 9,274 workers directly employed in the automotive sector in 1980, the highest-ranking single location nationally for employment in the sector.

[136] Author's calculations from data presented in economic censuses (INEGI various years).

DF and metropolitan municipalities of the State of Mexico: automotive employment in the DF declined 45.7% (from 25,207 to 13,696) over the period, and the "rest" of the MAMC grew 26.7% (from 18,212 to 23,068).[137] As measured by employment, the automotive sector decentralised from Mexico City, partly by establishing capacity in the State of Mexico (see Table 6.1). This redistribution was not sufficient to compensate for the decline of employment in the DF. Rather, the nearly five-fold increase in employment is the result of relocation and increased capacity in plant outside the MAMC, including in the states Puebla, Morelos and Hidalgo, and the North.

[137] 'Rest' refers to the MAMC minus the DF, ie. the metropolitan muncicipalities of the State of Mexico.

Table 6.1: Automotive Employment, Selected Municipalities, 1980–1998

		Total Employees 1980	Percent of National	Percent of MAMC	Cum Percent			Total Employees 1998	Percent of National	Percent of MAMC	Cum Percent
Automotive industry											
National		72,661	100%			National		434,836	100%		
MAMC		43,425	59.8%	100%		MAMC		36,764	8.5%	100%	
Municipality	State					Municipality	STATE				
1 Azcapotzalco	DF	9,274	12.8%	21.36%	21.4%	1 Cuauhtitlán Izc.	MEX	4,766	1.1%	12.96%	12.96%
2 Tlalneplantla	MEX	7,295	10%	16.80%	38.2%	2 Naucalpan	MEX	4,090	0.9%	11.13%	24.09%
3 Miguel Hidalgo	DF	6,035	8.3%	13.90%	52.1%	3 Tlalneplantla	MEX	4,034	0.9%	10.97%	35.06%
4 Naucalpan	MEX	5,741	7.9%	13.22%	65.3%	4 Azcapotzalco	DF	3,717	0.9%	10.11%	45.17%
5 Gustavo A. M.	DF	4,371	6%	10.07%	75.4%	5 Miguel Hidalgo	DF	3,544	0.8%	9.64%	54.81%
6 Cuauhtitlán Izcalli	MEX	4,262	5.9%	9.81%	85.2%	6 Ecatepec	MEX	3,533	0.8%	9.61%	64.42%
7 Iztapalapa	DF	1,725	2.4%	3.97%	89.1%	7 Tultepec	MEX	2,251	0.5%	6.12%	70.54%
8 Iztacalco	DF	1,084	1.5%	2.50%	91.6%	8 Tultitlán	MEX	2,046	0.5%	5.57%	76.11%
9 Ecatepec	MEX	925	1.3%	2.13%	93.8%	9 Iztapalapa	DF	1,682	0.4%	4.58%	80.69%
10 Cuauhtémoc	DF	772	1.1%	1.78%	95.6%	10 Cuauhtémoc	DF	1,565	0.4%	4.26%	84.95%
11 Coyoacán	DF	550	0.8%	1.27%	96.8%	11 Iztacalco	DF	1,055	0.2%	2.87%	87.82%
12 Xochimilco	DF	538	0.7%	1.24%	98.1%	12 Gustavo A. M.	DF	817	0.2%	2.22%	90.04%
13 Benito Juárez	DF	404	0.6%	0.93%	99%	13 La Paz	MEX	735	0.2%	2.00%	92.04%
14 Alvaro Obregón	DF	215	0.3%	0.50%	99.5%	14 Atenco	MEX	721	0.2%	1.96%	94.00%
15 Atizapan	MEX	160	0.2%	0.37%	99.9%	15 Alvaro Obregón	DF	618	0.1%	1.68%	95.68%
16 Venustiano C.	DF	44	0.1%	0.10%	99.9%	16 Tláhuac	DF	248	0.1%	0.67%	96.35%
17 Nezahualcoyotl	MEX	27	0.0%	0.06%	100.0%	17 Tepotzotlán	MEX	231	0.1%	0.63%	96.98%
18 Tlahuac	DF	3	0.0%	0.01%	100%	18 Nezahualcoyotl	MEX	187	0.04%	0.51%	97.49%
19 Acolman	MEX	-				19 V. Carranaza	DF	175	0.04%	0.48%	97.97%
20 Chicoloapan	MEX	-				20 Cuautitlán	MEX	151	0.03%	0.41%	98.38%
21 Chiconcoac	MEX	-				21 Huehuetoca	MEX	110	0.03%	0.30%	98.68%
22 Chimalhuacán	MEX	-				22 Tizayuca	DF	78	0.02%	0.21%	98.89%
23 Huehuetoca	MEX	-				23 Benito Juárez	DF	56	0.01%	0.15%	99.04%
24 Huixquilucan	MEX	-				24 Coyoacán	DF	52	0.01%	0.14%	99.18%
25 Isidro Fabela	MEX	-				25 Coyotepec	MEX	50	0.01%	0.14%	99.32%
26 Ixtapalucan	MEX	-				26 Tlalpan	DF	43	0.01%	0.12%	99.44%
27 Jaltenco	MEX	-				27 Xochimilco	DF	41	0.01%	0.11%	99.55%
28 Jilotzingo	MEX	-				28 Texcoco	MEX	29	0.01%	0.08%	99.63%
29 Atenco	MEX	-				29 Chalco	MEX	21	0.00%	0.06%	99.69%
30 Melchor O.	MEX	-				30 Nextlalapan	MEX	20	0.00%	0.05%	99.74%
31 Nextlalapan	MEX	-				31 Nicolás Romero	MEX	19	0.00%	0.05%	99.79%
32 Nicolás Romero	MEX	-				32 Acolman	MEX	16	0.00%	0.04%	99.83%
33 Papalotla	MEX	-				33 Zumpango	MEX	16	0.00%	0.04%	99.87%
34 La Paz	MEX	-				34 Chicoloapan	MEX	12	0.00%	0.03%	99.90%
35 San Martín Pirám.	MEX	-				35 Tecámac	MEX	9	0.00%	0.02%	99.92%
36 Tecámac	MEX	-				36 Valle de Chalco	MEX	7	0.00%	0.02%	99.94%
37 Temamatla	MEX	-				37 Coacalco	MEX	6	0.00%	0.02%	99.96%
38 Teoloyuca	MEX	-				38 Magdalena C.	DF	5	0.00%	0.01%	99.97%
39 Teotihuacán	MEX	-				39 Chimalhuacán	MEX	4	0.00%	0.01%	99.98%
40 Tepotzotlán	MEX	-				40 Ixtapalucan	MEX	2	0.00%	0.01%	99.99%
41 Texcoco	MEX	-				41 Melchor O.	MEX	2	0.00%	0.01%	100%

Source: Author's calculations based on data presented in economic censuses (INEGI 1981;1999).

The transformation of the consumer electronics sector over the studied period represents the flip side of the coin when compared to the automotive sector. First, the consumer electronics industry appears to have been more affected by a restructuring process taking place at a global scale, especially in terms of TNC domination and in relation to technological innovation. Decisions taken at global level, such as M&As,

have had almost immediate effects in terms of production and business organisation at specific locations. As was shown in Chapter Five, at the beginning of the 1980s the consumer electronics industry was strongly concentrated in the central part of Mexico: the MAMC accounted for 40.3% of consumer electronics jobs, with the DF being the location for 28.6% (25,058) of employees and the state of Mexico 26.4% (23,109) of employees. However, and as distinct from the automotive industry, a significant proportion of jobs (34,140 representing the 39.1%) in consumer electronics were already located in border states.

Prior to the 1980s but increasingly so afterwards, consumer electronics production was organised into a two-tier system: one oriented to the national market, located in the central part of the country, notably in Mexico City; and the other export-oriented, operating under the Maquiladora Programme. This arrangement suggests a different set of operational circumstances to those envisaged by Krugman but confirms nevertheless the principle of trade barriers and access to markets as a force of attraction for export companies. The rapid decline of the consumer electronics industry in the central part of the country, where most companies were producing for the national market, illustrates what happens to a nationally oriented industry when trade liberalisation introduces competition and global business practices in a short time to a hitherto protected and inefficient industry (see Table 6.2).

Table 6.2: Automotive and Consumer Electronics Employment Nationally and in the MAMC, 1980–1998

	Total employment 1980	Percent of national	Percent of MAMC	Total employment 1998	Percent of national	Percent of MAMC	Var % 1980 –1998
Automotive							
National	72,661	100%		434,836	100%		498.4%
MAMC	43,425	59.8%	100%	36,764	8.5%	100%	–15.3%
Federal District	25,207	34.7%	58.1%	13,696	3.2%	37.3%	–45.7%
Rest	18,218	25.1%	42.0%	23,068	5.3%	62.8%	26.6%
Consumer Electronics							
National	84,140	100%		131,304	100%		56.1%
MAMC	33,889	40.3%	100%	748	0.6%	100%	–97.8%
Federal District	17,729	21.1%	52.3%	135	0.1%	18.1%	–99.2%
Rest	16,160	19.2%	47.7%	613	0.5%	82.0%	–96.2%

Source: Author's calculations based on data presented in economic censuses (INEGI1981;1999).

**Note: "Rest" refers to all the metropolitan municipalities of the State of Mexico.

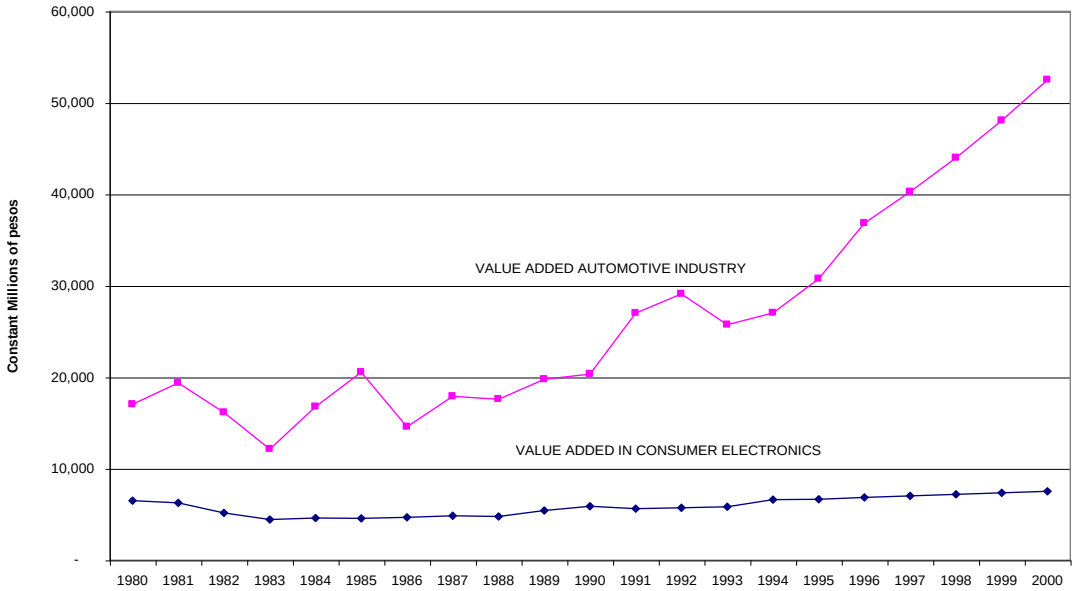
Nationally the jobs in both sectors had a bold increase as automotive went from 72,661 to 434,836 and consumer electronis from 84,140 to 131,304 however the growth was shown in location outside Mexico City so the impact on the jobs structure of the MAMC was dramatic. In 1980 the MAMC had 33,889 consumer electronics jobs that represented 40.3% of the national figure, with 21.8% of total consumer electronics employment concentrated in the three municipalities of Azcapotzalco (DF), Ecatepec (State of Mexico) and Naucalpan (State of Mexico). According to census data for 2000, however, the whole MAMC had only 748 jobs or 0.6% of national consumer electronics employment, a net loss of 33,141 jobs.[138]

As both sectors are dominated by TNCs, a question arises as to the differentiated nature of localisation trends. This might be explained by the degree of production integration into the national economy and the level of

[138] Of the remaining 748 jobs, most were located in Ixtapalucan (613) in a firm making coin-operated jukeboxes, with the remainder working on electronic music appliances such as speakers. Author's calculations based on information in SIEM (SECOFI 2000).

value added involved for each sector (see Figure 6.1). This observation is in tune with claims made by Krugman's trade liberalisation hypothesis, because a low value added for an industry is associated with higher foreign trade activity and therefore the higher a company's exports and imports are, the more likely is its proximity to the US border. This might explain why an industry more integrated into the Mexican economy and therefore with higher levels of value added, such as the automotive industry, has developed industrial clusters far away from the US border. Nevertheless, precisely where to locate remains open to question to some extent. As the data reveal, and as the analysis in Chapter Four suggests, for the automotive sector, investment took place in new locations away from Mexico City but not at the border, allowing some retention of jobs in Mexico City by comparison with consumer electronics, for example. The chapter now turns to the wider impacts on Mexico City.

Figure 6.1: Value Added in the Automotive Sector vs the Consumer Electronics Sector, 1980–2000



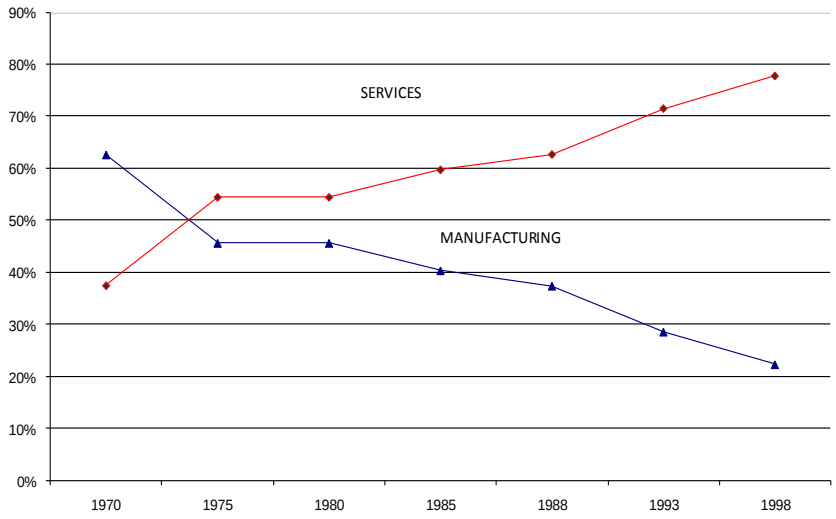
Source: Author's calculations based on data presented in OECD industrial statistics, in OECD Economies 2002.

THE RISE OF THE SERVICE SECTOR IN MEXICO CITY

With a structurally more fragmented and geographically more decentralised manufacturing sector, Mexico City has become increasingly oriented to the service sector. In employment terms the service sector grew from 354,447 jobs in 1980 to 1,887,059 in 1998 (INEGI 1981, 1999). Producer and financial services are highly concentrated in Mexico City. This is not the case for cities with high economic dynamism such as Guadalajara or Tijuana. Over the period that witnessed the decline of Mexico City as a manufacturing centre in general terms, and in two important sectors especially, the city has to some degree reinvented itself as the location for services and, once again, a location for a sector dominated by TNCs. The financial sector accounts for only 1.8% of the national labour force, 79% of which is located in Mexico City and represents 7% of Mexico City employment.[139] A Concentration Index constructed using data from economic censuses shows that only seven states record an index above 1 – meaning that participation is above the national average – with Mexico City leading the list. This section considers the effects of the deep transition from a highly concentrated manufacturing sector dominating the local economy to a transformation into a service-sector-dominated economy (see Figure 6.2).[140]

[139] Author's calculations based on data from economic censuses (INEGI 1999).
[140] In contrast to the myriad attempts to create a more balanced regional industrial pattern in Mexico or to decentralise government employment, there has been no equivalent for the service sector. Thus, although imperfect as an indicator, considering the rise of Mexico City as a production and financial services sector offers insight into market-led location change.

Figure 6.2: Manufacturing Sector vs Service Sector as Percentage of Total Employment, Mexico City, 1970–1998



Source: Author's elaboration based on data presented in economic censuses (INEGI various years).

One explanation for the concentration of the service sector in Mexico City is, according to Sassen's global cities hypothesis, the availability and concentration of financial institutions, which generates a circular causation effect with large corporations. Interviews that I conducted with representatives of McKinsey, Bank of America, Edelman and Merrill Lynch based in Mexico City support and elaborate on this analysis (Camargo 2001; Casas 2001; Rivera 2001; Acosta 2001). They suggest that Mexico City combines a high level of business infrastructure arising from the stock market, the banking system, telecommunications, the international airport, international schools, and business clubs such as the Club de Industriales (Industrialists' Club) and Club de Banqueros (Bankers' Club). If we consider just one of these, the stock market, we can appreciate the

degree of historical contingency in terms of institutional infrastructure that is required for transformation to take place.

The Bolsa Mexicana de Valores (Mexican Stock Exchange) initiated operations in 1908, replacing the Bolsa Mercantil de México established in 1886. In 1933 a more modern stock market began with the promulgation of the Mexican Stock Market Law (*Ley Reglamentaria de Bolsas de Valores*), and the Bolsa de Valores de México S.A. started operating under the supervision of the also newly created National Commission of Stocks (BMV 2002). In 1975 the Federal Congress approved a reform that led to the consolidation of the stock market, changing its name to Bolsa Mexicana de Valores (Mexican Stock Market), and which involved the merger of the stock markets operating in Guadalajara and Monterrey. In 1986, a further reform made government bonds, and particularly those known as CETES (Certificados de la Tesorería), the dominant financial vehicle on the market and authorised the participation of foreign-owned companies. These reforms contributed to the maturity of the Mexican financial market during the 1990s and its connectivity to the global system (Burki and Edwards 1996). Yet a report by the World Bank indicated how far the Mexican securities market had to go even in the mid-1990s, and afforded tacit support for the privatisation of financial groups begun by Carlos Salinas that opened the sector to further foreign involvement:

> Mexico's securities market is still relatively small and has not yet developed into a sufficiently important mechanism to finance industrial firms. Comparatively few and mostly well-established large companies are listed. However, due to a series of reforms taken by the government over the past few years, and sharp increases in share prices, the market has grown rapidly, with the total value of shares

> traded reaching Mex$94,000 million in 1979… (World Bank 1997, p. 17)

By 2000, of 29 investment banks operating in Mexico, 16 had a majority of Mexican capital and 13 a majority of foreign capital (BMV 2002). A set of virtuous circumstances came together, therefore, with diversified providers of financial services in retail banking services, insurance and brokerage services, factoring and leasing services, asset and pension management, investment banking and financial advisory services growing rapidly during the 1990s (*Expansión* 1997). They seem to have done so, according to the BMV, because of the ability to float on the stock market. In 2000, most of the 172 companies with 'floated' stocks were Mexican companies, but 80 of those dealing in commercial paper (debt), including companies such as Ford and Banco Bilbao Vizcaya, were TNCs (BMV 2000).

TNC HEADQUARTERS AND THE FINANCIAL SECTOR IN MEXICO CITY

Although the picture is more complex than one purely of de-industrialisation and the rise of the service sector as the main transformation of economic activities in Mexico City, there is evidence that Mexico's and Mexico City's economies have become more globalised in regard to business practices in the past 20 years. This is the case for the presence of TNC headquarters, a frequently used measure to assess the importance of a city in terms of global economic activity (see Chapter Two, as well as Taylor 1997; Sassen 1991). Analyses tend to calculate and compare TNC headquarters across cities from an international perspective

and not relative to national contexts, and nor do they consider the reasons to locate in a particular city. This raises a question as to the extent to which globality and the location of TNCs in particular are linked to the financial sector as an important factor of attraction.

Taylor, for example, considers Mexico City to be part of a global network of cities interconnected in terms of financial and other advanced services, and ranks Mexico City in his intermediate category of "beta world cities" (Taylor 1997). This category includes Zurich, Toronto, Madrid, Chicago, Taipei, Johannesburg and Moscow, in terms of provision of global services such as marketing, law, accountancy and banking/finance. Taylor's list is made up of the total number of global producer service offices, with companies broken down by cities; for Mexico City the sample includes the following sectors: accountancy (5), advertising (11), banking/finance (14) and law (16). Mexico City ranks 18th out of 53 cities included in the study and higher than all other Latin American cities, including Sao Paulo, Buenos Aires, Santiago and Caracas, and some US cities usually considered to be regional global centres such as Miami (ranked 33rd) and Dallas (42nd). Disaggregating the data and looking at the rankings per activity, Mexico City ranks better for finance, where it jumps to 13th place.

As explained in Chapter Three, the experience of ISI or the "closed economy" was ambiguous in that the Mexican economy was for the majority of the 20th century open but protected. By contrast, for the period 1980–2000 deregulation was coupled with higher levels of openness and the dismantling of protectionist barriers. I had expected

therefore that a small number of TNCs would have arrived in Mexico during the 1980s, their location decisions triggered by the dismantling of the protectionist system. The data, however, suggest that this assumption was erroneous. During the early phase of so-called "opening", Mexico City was shown to be a preferred location for TNCs compared to the rest of the country. Using the *Expansión* database (used to develop the Globality Index in Chapter Three) it was decided to explore the concentration of TNCs further, at least between 1980 and 2000. The data confirm a pattern of limited variation over the period. In 1982, 287 of the *Expansión* Top 500 Companies were headquartered in Mexico City, a number that changed only slightly in the next decade. By 2000, Mexico City hosted 213 of the Top 500. So, while one might expect an increase in the number of TNCs headquartered in Mexico City as a result of globalisation, the data suggest otherwise. Rather, during ISI, TNCs were attracted by the expanding national market and needed to be located in Mexico City, whereas with market deregulation, privatisation and the restructuring of some industries, TNCs began to leave Mexico City or new members of the Top 500 decided against locating there. The reverse of this pattern can be seen in Nuevo León, or more specifically Monterrey – in 2000 the number of Top 500 Companies in the state of Nuevo León increased to 66 from 12 in 1980.[141]

Looking more closely at the data on headquarter locations for Top 500 firms it is possible to distinguish between foreign-owned and nationally

[141] Government officials at the city level especially worked hard to 'accommodate' TNCs in 'world class' business parks, notably Santa Fe, which required passing public authority to private organisations for planning and management (Camacho Solís interview 1999).

owned (private) companies. The data reveal that 42.6% of the firms recorded in the Top 500 were headquartered in Mexico City in 2000. Only 35% of companies owned by private Mexican capital had their main offices in Mexico City, while among the corporations dominated by foreign capital 56% had their headquarters in Mexico City.[142] Non-Mexican TNCs have a preference for locating in Mexico City relative to Mexican companies, but this observation does not in itself indicate a company's linkage to the national and/or global economy. Thus I decided to analyse Mexico City as a so-called "financial centre", linking TNCs' location patterns to their sources of capital using the Top 500 database. Using a t-test sampling I compared the average percentage of capital by type (stock market and foreign capital flows), and contrasted the central region of Mexico and the border. Statistically, the two regions were considered as two independent subsamples in order to see if there was a difference between them and, in so doing, assess whether there is a spatial link to specific financial activities. The results suggest a location pattern based on the way activities are financed, with the amount (percentage) of total capital also being important, as summarised in Table 6.3.

[142] Author calculations based on data present in *Expansión* database, "Las 500 empresas más importantes de México", 2000.

Table 6.3: T-Test Finance and Location, Mexico City vs Border

Independent sample test

		Levene's test for equality of variances		T-test for equality of means						
									95% confidence interval of the difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	Lower	Upper
STATE_CAP	Equal variances assumed	9.997	.002	1.554	395	.121	1.88	1.212	–.499	4.265
	Equal variances not assumed			2.381	320.025	.018	1.88	.791	.327	3.439
MEX_CAP	Equal variances assumed	24.772	.000	–2.516	395	.012	–10.03	3.986	–17.867	–2.193
	Equal variances not assumed			–2.808	269.155	.005	–10.03	3.572	–17.063	–2.998
FOREIGN_CAP	Equal variances assumed	15.641	.000	2.085	396	.038	8.07	3.869	.461	15.674
	Equal variances not assumed			2.293	258.934	.023	8.07	3.519	1.138	14.997
STK MKT_CAP	Equal variances assumed	35.257	.000	2.688	379	.007	13.21	4.912	3.547	22.863
	Equal variances not assumed			2.907	245.406	.004	13.21	4.542	4.258	22.152

Source: Author's calculations based on data presented in *Expansión* database, "Las 500 empresas más importantes de México", 2000.

The data provide a strong statistical difference when compared by location for the following variables: percentage of Mexican capital, percentage of foreign capital and percentage of capital in the stock market.[143] According to these results, the companies in the border region have on average a higher percentage of Mexican capital (85.4%) compared with the central region (75.4%), which *de facto* has a higher percentage of foreign capital (22.5%). Finally, the boldest statistical indicator was the difference of means (averages) in relation to the percentage of capital in the stock market, with the central region (33.5%) significantly surpassing the border region (20.3%). Considering only those companies with stock and foreign capital, the results for the centre region are the stock market's 83.5% versus the border region's 34.5%; in relation to foreign capital the results are 46.9% (n=36) for the central region and 26.6% (n=17) for the border region. The F-test significance (second column) of each variable shows the

[143] For all three, the F-test and the T-test are significant and strong, meaning the difference of means for the sub-samples are statistically different.

highest level of association (F=35.257 significance=.0000) for a company to have the highest level of stock market capital as a percentage of total capital, and be located in Mexico City.

Among those companies with the highest level of FDI are the automotive assembly companies, with up to 100% total foreign capital (DaimlerChrysler, General Motors, and Ford), the computer electronics sector (Hewlett Packard and Olivetti), the consumer electronics sector (Daewoo Electronics) and chemicals (Ciba Especialidades Químicas). In relation to those companies located in the central part of the country with the highest percentage of capital in the stock market, the Mexican industrial groups Carso, Desc Televisa and Gigante stand out. It is worth mentioning that this test was not statistically significant when looking for location patterns for other variables such as international financial activity (international liabilities), size of company (total employment) and start-up year, and all are non-statistically significant when compared by location.[144]

The analysis of the characteristics and profiles of companies locating in Mexico City confirms the ideas developed by Sassen in relation to the rise of Mexico City as an important production node for the provision of financial and producer services, suggesting a broader set of economic

[144] The only set of variables confirmed to be significant (as would be expected) was the difference in means between exports and imports, as those companies registered in border states have on average 48% and 53% of total sales dedicated to imports and exports respectively, compared with 13% and 12% for companies in the Mexico City region. This does not mean that companies located in the border region have higher international trade activity, but rather that their main market orientation is towards the US market, as compared with those located in the central part of the country, whose main market orientation is domestic.

interactions taking place in the city associated with the restructuring of the local economy.

Economic Restructuring and Social Polarisation in Mexico City

As capital, financial or industrial, moves around Mexico or does not, there will be impacts on resident populations, as workers or their dependents. Whether as a result of trade liberalisation or wider globalisation processes, the hypotheses that drive the research for this thesis as a whole, it is important to consider what impacts changes to manufacturing structure and the rise of financial services have had on social polarisation in Mexico City. It is a widely held view in Mexico that polarisation worsened (from already high levels) from the early 1980s to 2000, a view that is applied irrespective of whether the scales are national or international (Aguilar 1997; Dussel Peters 1996; Parnreiter 2001). Panuco, who conducted an analysis of income inequality in Mexico over this period, concluded that:

> ...the study of inequality has revealed that inequality between urban and rural areas increased, since the difference in development between both areas had widened. It was also observed that the increase in inequality at the national level was more an urban phenomenon than a rural one, since inequality in urban areas increased considerably, whereas inequality in rural areas remained more or less at the same level between 1984 and 1996... (Panuco 1999, p. 188)

Panuco's argument notes enhanced inequality over the period of trade liberalisation but contradicts Sassen by alerting us to a potential source of income inequality in metropolitan regions, as a "trickle-down effect" seems to lead to a more equal distribution within urban developed regions but a more unequal one between urban and rural areas.

There are few controlled data sets to back up these views, and this prompted me to conduct a quantitative analysis on "income distribution" using data from INEGI income expenditure surveys for 1983, 1989, 1992, 1996 and 1998. In order to analyse the changes that occurred in income distribution in Mexico City between 1983 and 1998 (the only surveys available to conduct a comparison of the analysis period), this section will look at inequality changes over time, using shares of total income and average income for each decile of income distribution and using the Lorenz curve to show distribution over time.

Before looking at Mexico City in detail it is important to consider the national context between 1983 and 1998, which shows more or less constant shares by decile (Table 6.4). There is a trend to polarisation at the end of the period, with the richest tenth decile and the poorest first decile showing growth and the remaining eight deciles showing a decrease in income share. The Gini coefficient does show sensitivity to these changes and increased from 0.45 to 0.5, meaning an increase in income inequality.[145]

[145] The Gini coefficient varies from 0 when income is completely equally distributed to a value of 1 when one person has all the income. An aggregate inequality measure such as the Gini oefficient can tell us how overall income inequality has changed, but does not show where in the income distribution the changes have been occurring.

Table 6.4: Income Distribution by Decile of Households in Mexico

	1983	1989	1992	1996	1998	1983-1989	1989-1992	1992-1996	1996-1998	1983-1998
I	1.3	1.6	1.6	1.8	1.5	0.3	0	0.2	-0.3	0.2
II	2.7	2.8	2.7	3	2.7	0.1	-0.1	0.3	-0.3	0
III	3.8	3.7	3.7	4	3.6	-0.1	0	0.3	-0.4	-0.2
IV	5	4.7	4.7	4.9	4.7	-0.3	0	0.2	-0.2	-0.3
V	6.3	5.9	5.7	6	5.8	-0.4	-0.2	0.3	-0.2	-0.5
VI	7.9	7.3	7.1	7.4	7.2	-0.6	-0.2	0.3	-0.2	-0.7
VII	9.8	9	8.9	9	8.9	-0.8	-0.1	0.1	-0.1	-0.9
VIII	12.6	11.4	11.4	11.5	11.5	-1.2	0	0.1	0	-1.1
IX	17.1	15.6	16	16	16	-1.5	0.4	0	0	-1.1
X	33.5	37.9	38.2	36.4	38.1	4.4	0.3	-1.8	1.7	4.6
Gini Coefficient	0.45	0.47	0.47	0.45	0.5					

Source: Author's calculations based upon data presented in Mexican Household Income and Expenditure Survey for the Metropolitan Area of Mexico City, various years (INEGI 1983; 1989b; 1992; 1998).

Turning to the data for income share of each decile and the top and bottom percentiles of total income for the MAMC, one can see that in 1983 the richest 10% had 26 times the income share of the poorest decile, a difference that had decreased slightly by 1998, when the top decile had 17 times the income share of the poorest decile.[146] The share of total income for the poorest decile (bottom 10% of the population) grew by almost one percentage point (69.2%) and the richest decile increased its share over this period, from 33.5% in 1983 to 37.3% in 1998 (see Table 6.5). The

[146] Municipalities considered as being part of the MAMC are different for each survey. There were no data for 1983, and calculations are based on national data in order to allow for comparisons. In 1989 the MAMC was formed of the 16 *delegaciones* plus 18 municipalities from the State of Mexico: Nicolás Romero, Naucalpan, Huixquilucan, Nezahualcoyotl, Texcoco, La Paz, Chimalhuacán, Ixtapaclucan, Chalco, Tepotzotlán, Cuautitlán, Melchor Ocampo, Tultepec, Tultitlán, Coacalco, Ecatepec, Tlanepantla and Atizapán. In 1986, nine municipalities from the State of Mexico were added: Chicoloapan, Teoloyucan, Melchor Ocampo, Tecamac, Acolman, Chiautla, Chinconcoac, Tezoyuca, and Atenco. For 1996 and 1998, the number of municipalities from the State of Mexico considered as part of the MAMC was reduced to 19: Atizapán, Coacalco, Cuautitlán, Chalco, Chiautla, Chimalhuacán, Ecatepec, Huixquilucan, Nicolás Romero, Naucalpan, Nezahualcoyotl, La Paz, Tecámac, Teotihuacán, Texcoco, Tultepec, Tlalnepantla, Zumpango and Valle de Chaco Solidaridad.

losers, as it were, over this time period were the middle income deciles (fifth, sixth, seventh, eighth and ninth deciles), which decreased their share of total income for Mexico City between 1983 and 1998. Each of the poorest four deciles increased its income share during the same period, albeit marginally, the poorest decile being the one with the highest growth rate. The absolute decrease for the fifth to ninth deciles equals 5.7, of which 3.8 was redistributed to the richest decile between 1983 and 1998, while 1.9 went to lower-income deciles (first to fourth deciles). However, the Gini coefficient does not seem to capture these changes, recording only a small decrease. In short, inequality in the MAMC according to this analysis was lower in 1998 than in 1983, in tune with Panuco's (1999) findings.

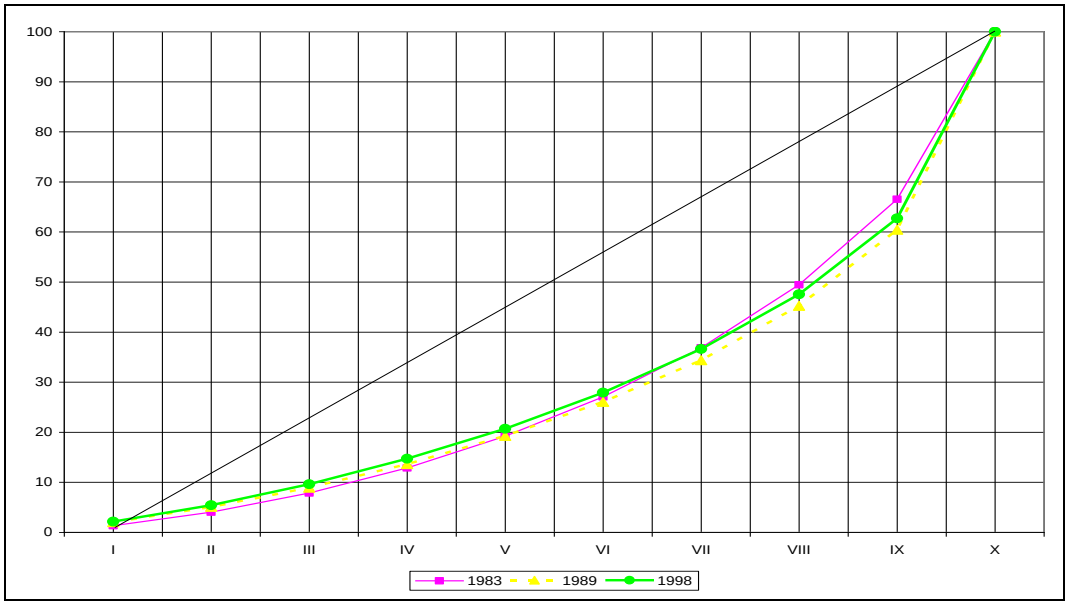
Table 6.5: Income Distribution by Decile of Households in Mexico City

	1983	1989	1992	1996	1998	1983-1989	1989-1992	1992-1996	1996-1998	1983-1998
I	1.3	2.0	2.2	2.4	2.2	0.7	0.2	0.2	-0.2	0.9
II	2.7	3.1	3.3	3.5	3.3	0.4	0.2	0.2	-0.2	0.6
III	3.8	3.8	4.1	4.3	4.2	0	0.3	0.3	-0.1	0.4
IV	5.0	4.7	5.0	5.2	5.1	-0.3	0.3	0.3	-0.2	0.1
V	6.3	5.7	6.0	6.2	6.0	-0.6	0.3	0.2	-0.2	-0.3
VI	7.9	6.8	7.0	7.2	7.2	-1.1	0.2	0.3	0	-0.7
VII	9.8	8.3	8.8	8.9	8.7	-1.5	0.5	0.1	-0.2	-1.1
VIII	12.6	10.9	11.4	11.4	10.9	-1.7	0.5	0.0	-0.5	-1.7
IX	17.1	15.2	16.8	16.1	15.2	-1.9	1.6	-0.7	-0.9	-1.9
X	33.5	39.6	35.6	34.6	37.3	6.1	-4.0	-1.0	2.7	3.8
Gini Coefficient	0.4	0.5	0.4	0.4	0.4					

Source: Author's calculations based upon data presented in Mexican Household Income and Expenditure Survey for the Metropolitan Area of Mexico City, various years (INEGI 1983; 1989b; 1992; 1998).

Comparing income distribution trends between Mexico (nationally) and Mexico City we can see that for both there has been a degree of polarisation. However, at the national level the redistribution from the middle to the top and bottom deciles is more dramatic, a trend that we might expect for Mexico City following Sassen's polarisation argument. Yet Figure 6.3 shows that the Lorenz curves for 1989 and 1998 cross the line for 1983 between the fifth and seventh decile. According to Figure 6.3, the poorest deciles - one to six - were better off in 1989 and 1998 in relation to 1983, suggesting an improvement in income inequality over the period as the lines for these two years are closer to the 45-degree line. However, this marginal improvement was undermined by the increased share of income to the richest deciles – eight to ten - in 1989 and 1998: the curves move away from the 45-degree line compared with 1983. The Gini coefficient, therefore, indicates an increased polarisation over the period but with the important caveat that a shift to increased income equality for poorer income-earners over the period measured was not replicated for higher-earners, who commanded increased shares of income in 1989 and 1998 than they had in 1983.

Figure 6.3: Lorenz Curves – Mexico, 1983–1998[147]



Source: Author's calculations based upon data presented in Mexican Household Income and Expenditure Survey for the Metropolitan Area of Mexico City, various years (INEGI 1983; 1989b; 1998).

This ambiguity prompted me to explore other methods in order to disentangle the extent of social polarisation and change for Mexico City. Consequently, I conducted a questionnaire survey with a random sample of households in Mexico City, with respondents who were over 40 years old (i.e., able to reflect back to 1980). The aim was to compare a group at the top and bottom of the income profile across sets of socioeconomic indicators (education, housing conditions and health service provision) and then contrast the results with variables associated with global factors. The hypothesis was that the "better-off" group, as "winners" in the economic restructuring process, would demonstrate improved scores for social indicators, hold more liberal economic views and reflect on

[147] On the horizontal axis, the Lorenz curves show the number of income recipients plotted as a proportion in ascending order, ranked from the poorest upwards. The vertical axis shows the share of total income that each proportion receives. If all incomes were identical – perfect equality – so that each 10% of the population received 10% of the total income, the Lorenz curve would follow the 45-degree line.

globalisation as a positive process (the questionnaire produced 50 variables in all). Conversely, I wanted to see whether the "worse-off" group would display relatively inferior socioeconomic indicators over time and hold views against the free market/globalisation of the economy. The tables present the total percentage of the specific response to any given question, and then the figure only for those who are at the top (high and upper middle income) and those at the bottom of the income scale (classified in the survey as lower middle and low income).

Here it should be noted that interviewees classified themselves within an income category, following in this case a discussion about "class".[148] A second question of income self-classification was introduced in order to gauge the income situation 20 years ago (before economic liberalisation). Table 6.6 shows the figures for each income category and how the perception of income level has changed. The results are not dramatic. In so far as an increase at the lowest level has been perceived, lending support to Sassen's arguments, the difference is slight and there is no increase at the top of the income hierarchy. It is worth noting that the percentage increase in the "working class" classification is very similar to the decrease for the "upper middle class", suggesting a perception of downgrading within this group, whereas other income levels remained stable.

[148] Self-classification is a well-used technique (see Blaikie 1988).

Table 6.6: Changes in Income Self-Classification

How would you define your personal situation?			
	1980	2000	Change
Working class	14%	19.8%	5.8%
Lower middle class	23.8%	23.8%	0.0%
Middle class	40.6%	41.4%	0.8%
Upper middle class	15.5%	9.4%	**-6.1%**
Upper class	2.2%	1.4%	-0.8%
No response	3.9%	4.2%	0.3%
Total	100%	100%	

Source: Author's calculations from survey results.

A reclassification into only two groups, combining "working class" and "lower middle class" as "bottom" and "upper middle class" and "upper class" as "top", compared social conditions including health, education, housing, computing skills and proficiency in English. This same classification was used to link across to perception of globalisation, here the perception of globalisation as "a great opportunity for the world´s development of the top group is twice as high (46%) as that of the bottom group (11.7%). When questioned about NAFTA, 43.7% of the top group agreed that NAFTA had generated positive opportunities for Mexico and Mexicans, whereas in the bottom group only 27.5% agreed with this option. Similar differences are shown for questions relating to perception of TNCs and the Mexican Stock Market. In all these cases responses are consistent with the association of the top group as more pro-global (Tables 6.7 and 6.8).

Table 6.7: Mexico City Survey Results

	Social Conditions	TOTAL	TOP	BOTTOM
1	Do you have public or private health insurance? (PERCENT WHO RESPONDED "Don't have any")	26.0%	18.9%	27.5%
2	Do you have public or private health insurance? (PERCENT WHO RESPONDED "Private")	15.4%	25.5%	11.5%
3	The majority of your dependents attend… (PERCENT WHO RESPONDED "Private schools")	28.9%	35.2%	23.0%
4	In the last 20 years your household has… (PERCENT WHO RESPONDED "Lived in the same house")	65.0%	51.9%	61.0%
5	In the last 20 years, your household has… (PERCENT WHO RESPONDED "Bought a better house")	17.6%	28.7%	21.5%
6	Do you speak/read English… (PERCENT WHO RESPONDED "Perfectly" + "Good enough")	18.1%	25.0%	15.5%
7	Do you speak/read English… (PERCENT WHO RESPONDED "None")	37.8%	29.6%	36.5%
8	Your skills at surfing the internet are… (PERCENT WHO RESPONDED "Perfect" + "Good")	27.2%	31.5%	25.5%
9	Your skills at surfing the internet are… (PERCENT WHO RESPONDED "None")	26.9%	21.3%	33.5%

Source: Author's calculations from survey results.

Table 6.8: Evaluation of Global Factors in Mexico City

	Global Indicators	TOTAL	TOP	BOTTOM
1	Globalisation is a great opportunity for the world's development	28.8%	46%	11.7%
2	Globalisation is a new form of colonialism and imperialism	43.4%	40.6%	43.2%
3	NAFTA has generated good opportunities for Mexico and the Mexicans (PERCENT WHO RESPONDED "Totally Agree" + "Agree somewhat")	35.9%	43.7%	27.5%
4	NAFTA has increased the number of people living in poverty (PERCENT WHO RESPONDED "Totally agree" + "Agree somewhat")	56.8%	56.6%	74.5%
5	NAFTA has sparked the arrival of TNCs and with that new jobs have been created (PERCENT WHO RESPONDED "Totally agree" + "Agree somewhat")	43.8%	76.6%	38.5%
6	What is your opinion towards TNCs? (PERCENT WHO RESPONDED "Positive" + "Very positive")	50.4%	80.6%	41.0%
7	What us your opinion towards the Mexican Stock Market? (PERCENT WHO RESPONDED "Positive" + "Very Positive")	34.6%	70.1%	28.3%
8	Compared with international manufactured goods sold in Mexico nowadays, how good would you say are Mexican manufactured products? (PERCENT WHO RESPONDED "Better than international goods")	26.2%	14.8%	33.5%
9	Compared with international manufactured goods sold in Mexico nowadays, how good would you say are Mexican manufactured products? (PERCENT WHO RESPONDED "Better than international goods" + "As good as international goods")	68.6%	67.6%	36.0%
10	And compared with Mexican products manufactured in Mexico 20 years ago? (PERCENT WHO RESPONDED "Better than 20 years ago")	61.1%	46.1%	48.5%

Source: Author's calculations from survey results.

A set of questions addressed how residents viewed the quality of products manufactured "today" in Mexico and those manufactured 20 years ago, when protectionism resulted in overpriced, low-quality output produced domestically, and few better-quality products imported. In short, as consumers, do residents feel better-off as a result of economic opening? The results indicate that 73.9% of interviewees considered Mexican products better than or as good as those manufactured in Mexico 20 years ago. This seems to support the idea that people believe free trade has transformed the consumer market. Indeed, transformation in the perception of national products compared to foreign is shown in Table 6.9, as 42.3% of people interviewed considered that Mexican products are as good as international products, a perception that is different to that of 20 years ago.

Table 6.9: Comparison of Perception of Mexican Manufactured Goods over 20-Year Period

…and compared with Mexican products manufactured in Mexico 20 years ago?	
Now are better than 20 years ago	46.1%
Now are worse than 20 years ago	25.4%
As good as 20 years ago	27.8%
NR	0.6%
Total	100.0%

Compared with international manufactured goods sold in Mexico nowadays, how good would you say are Mexican manufactured products?	
Better than international goods	26.2%
As good as international goods	42.3%
International are relatively better	23.0%
Worse than international goods	5.0%
NR	3.4%
Total	100%

Source: Author's calculations from survey results.

Although respondents generally believed that globalisation has benefited the economy (at least in the ways prompted by the questionnaire), there were indications of social polarisation. Two follow-up tests were carried out. One asked whether respondents considered changes to have been positive for Mexico City's residents' lives, and another asked whether there was a link to political beliefs. The attempt to test the social polarisation hypothesis had to first consider that perceptions of polarisation were rooted in an economic regime change that could be read from variables such as investment, foreign trade and forward and backward linkages. However, as there appeared to be no significant differences between the top and the bottom groups of the income scale in attitudes to these variables, income difference (polarisation) could be explained by factors such as economic crisis, migration, urban decline, political regime or social exclusion. In order to disentangle the nature and degree of the global economic adjustment from the labour market point of view, looking at the survey data I compared changes in employment share by occupation, sector, class identification and migration.[149] The first results, regarding occupation and sectors of the economy, are presented in Table 6.10. These suggest a decline in the formal sector, both public and private, and particularly a decline in manufacturing and a rise in service sector activity. The service sector, we should note, includes a significant number of self-employed and the informal sector; the shift to services also mirrors an increasing shift towards the informal economy.

[149] Using as a proxy the question "Have you always lived in Mexico City?" for the period in question.

Table 6.10: Occupation and Sector of the Economy – Variations, 1980–2000

OCUPATION	1980	2000	*Variation*
Public sector (federal/local)	15.5%	13.1%	*–2.4%*
Private sector (professional services)	9.0%	6.6%	*–2.4%*
Private sector employee (service/production)	9.7%	5.6%	*–4.1%*
Own business	14.9%	16.7%	*1.8%*
Self-employed	5.3%	10.0%	*4.7%*
Independet professional services	3.4%	7.0%	*3.6%*
Teacher	4.6%	7.0%	*2.4%*
Employed in agricultural sector	1.8%	1.0%	*–0.8%*
Pensioned	1.1%	4.8%	*3.7%*
House worker	13.8%	19.5%	*5.7%*
Student	10.3%	0.3%	*–10.0%*
Unemployed	2.7%	3.9%	*1.2%*
Other	2.9%	2.4%	*–0.5%*
NR	5.0%	2.0%	*–3.0%*
Total	100%	100%	*0%*

Source: Author's calculations from survey results

Beyond confirmation of the labour market trend at the sector level, I was interested in finding out whether labour market restructuring had an impact on social welfare. Accordingly, I conducted a statistical cross-tabulation analysis of the responses to questions related to labour activity and the self-classification of social class. The results suggest a deterioration of welfare for respondents in the manufacturing and services sectors. Interestingly, the bottom group (working class) presented the largest variation for the period, and the lower middle class represented the only group to record a significant increase in welfare dependent on service sector employment (see Table 6.11). There is little in these data to support Sassen's argument of higher social polarisation based on perception of welfare change.

Table 6.11: Cross-Tabulation Analysis: Manufacturing and Service Sector vs Social Class, 1980–2000

Manufacturing and services sector vs social class							
	Working class	Lower middle class	Middle class	Upper middle class	Upper class	NR	Total
Manufacturing 1980	14.2%	27.7%	41.9%	11.9%	2.3%	1.9%	100%
Manufacturing 2000	20.2%	22.8%	39.5%	10.7%	2.2%	4.7%	100%
Variation	6.0%	–4.9%	–2.4%	–1.2%	–0.1%	2.8%	0%
Services 1980	11.8%	22.2%	43.8%	19.6%	1.3%	1.3%	100%
Services 2000	16.8%	24.3%	42.9%	12.8%	1.3%	1.8%	100%
Variation	5.0%	2.1%	–0.9%	–6.8%	0.0%	0.5%	0%

Source: Author's calculations from survey results.

The survey does indicate, however, a degree of "lumpiness" in employment between the manufacturing and service sectors over the period (Table 6.12). In 2000, 96.4% of employees in the manufacturing sector reported working in the same sector in the 1980s, whereas only 3.6% came from the service sector. For those in the service sector in 2000, 78.6% of people were in the same sector in the 1980s, while 21.4% had changed job from the manufacturing sector. Despite an overall shift to service sector employment and a decline in manufacturing, for the respondents to the survey a striking feature is the high number of people remaining employed in the same sector over the period, a figure of 83% for manufacturing and 95.3% for the service sector. Furthermore – and contrary to Sassen and Massey, who suggest that social polarisation is down to changes at the lower end of the labour scale, especially as a consequence of a strong decline in manufacturing jobs leading to a shift to the informal service sector – survey data on inter-sectoral migration point towards changes in employment unrelated to social class mobility.

Table 6.12: Cross-Tabulation Analysis: Inter-sectoral Labour Migration between the Manufacturing and Service Sectors, 1980–2000

Sector in 1980 * sector in 2000 cross-tabulation

			Sector 2000		
			Manufacturing in 2000	Services in 2000	Total
Sector in 1980	Manufacturing in 1980	Count	161	33	194
		% within sector in 1980	83.0%	17.0%	100.0%
		% within sector in 2000	96.4%	21.4%	60.4%
	Services in 1980	Count	6	121	127
		% within sector in 1980	4.7%	95.3%	100.0%
		% within sector in 2000	3.6%	78.6%	39.6%
Total		Count	167	154	321
		% within sector in 1980	52.0%	48.0%	100.0%
		% within sector in 2000	100.0%	100.0%	100.0%

Source: calculation by the author.

These results display little evidence of social polarisation in Mexico City. However, there is some suggestion of political polarisation. The idea of political realignment in Mexico linked to a process of economic restructuring has been widely discussed. According to Whitehead (1996), the Mexican state's capacity for re-legitimisation through economic growth was drastically curtailed by the debt crisis, and in due course an alternative, market-oriented formula of economic management came to the fore (see also Molinar 1993; Mizrahi 1994; Loaeza 2000; Lujambio 2000; Berruecos 2003a, 2003b). In this context, the election of Mexico City's first mayor in 1997, Cuauhtémoc Cárdenas, from the centre-left Partido de la Revolución Democrática (PRD, Democratic Revolution Party), has been attributed to the harm caused by the restructuring process (fuelled by the 1994 economic crisis and a run of political assassinations and corruption scandals) and support from the city's lowest-income

groups.[150] This was how Mayor Cuauhtémoc Cárdenas explained it when interviewed after his term of office:

> I think that in a way any election is a referendum, so people voted, the majority against the PRI, what the PRI represented, against its economic policies; that's against the deterioration of living standards, against the increase of unemployment. Wages had lost at least 75% to 80% of their purchasing power in real terms. We have more than half of Mexico's population under the poverty line, so there was no reason to vote in favour of the PRI, and so I think that election in many ways was a referendum of what the government was doing or not doing, mainly in economic terms. (Cárdenas interview, 2002)

Tables 6.13a, 6.13b and 6.13c show a statistical analysis testing the hypothesis that political preferences in Mexico City are rooted in the conflict between the "better-off" and the "worse-off", making a case for a political polarisation with a social underpinning. The coefficients of the regression analysis show correlations between socioeconomic indicators and electoral preferences. Broadly, the Partido Acción Nacional (PAN, National Action Party) is predominantly the party of the "better-off" in terms of income and education – the party linked to the national economic restructuring "winners". The PRD, with its social agenda, is supported by those hit hardest by economic restructuring. The Partido Revolucionario Institucional (PRI, Institutional Revolutionary Party), as a party with a broad social coalition, is left unable to pick up support from either end of the spectrum. Three regression models are presented below.[151]

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[150] The election results were PRI 25%, PAN 15.5% and PRD 48.1%.

[151] The variable "political preference" was recoded and generated three new variables – "political preference PAN", "political preference PRI" and "political preference PRD" – to be used as independent variables for the regression models. The regression model combines a set of variables that may influence and in some cases explain political positions such as gender, age, maximum school level, income level, party identification, assessment of economic situation and the assessment of the president. Data come from survey information gathered in 2000; please refer to the political section of the questionnaire presented in Appendix 3.

Table 6.13a: Regression Model for Political Preference PAN, 2000

Coefficients[a]

Model		Unstandardised coefficients		Standardised coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.211	.067		3.153	.002
	Gender	3.593E-02	.019	.047	1.843	.066
	Age	-1.31E-04	.001	-.005	-.178	.858
	Maximum school level	4.928E-02	.009	.153	5.610	.000
	Income	1.462E-02	.005	.078	2.952	.003
	Party ID	-7.68E-02	.006	-.351	-13.771	.000
	Assessment of economic situation	-1.02E-02	.009	-.031	-1.117	.264
	Asssessment of Zedillo	-2.85E-02	.009	-.092	-3.311	.001

a. Dependent variable: PAN

Source: SPSS output, author's calculations from survey results.

According to the regression model for PAN voters, variables that explain the vote intention are, in the first place, if "maximum school level" is positive; this means that the higher the school level, the higher the probability of voting PAN. Unsurprisingly, in the same vein, income level is positively associated with a vote for PAN. The other variables in the PAN model do not shed further light on associations with PAN voters, but the association with the upper educated classes and PAN overshadows remaining variables such as age or assessment of economic situation, variables that were not statistically significant.

Table 6.13b: Regression Model for Political Preference PRI, 2000

Coefficients[a]

Model		Unstandardised coefficients		Standardised coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.357	.142		-2.507	.012
	Gender	.122	.042	.072	2.938	.003
	Age	3.935E-03	.002	.063	2.507	.012
	Maximum school level	-6.15E-02	.019	-.086	-3.284	.001
	Income	1.920E-02	.011	.046	1.818	.069
	Party ID	-6.53E-02	.012	-.134	-5.492	.000
	Assessment of economic situation	6.039E-02	.019	.082	3.107	.002
	Asssessment of Zedillo	.251	.018	.363	13.637	.000

a. Dependent variable: PRI

Source: SPSS output, author's calculations from survey results.

In the case of PRI voters, results confirm that the legitimisation of the system was strongly associated with economic results, as PRI voters are positively associated with variables related to the assessment of national economic performance. The most important variable associated with a PRI vote is the "assessment of President Zedillo", followed by the assessment of the "economic situation" (positively associated with a PRI vote, meaning that the more positive the evaluation of economic performance, the more likely the voter is to support the PRI). Two socio-demographic variables stand out in this analysis; the positive association of the PRI voter with "age", meaning that a vote for the PRI is associated with older people; and the negative statistical relationship between PRI voters and "maximum school level", meaning that the lower the school level, the higher the probability to vote PRI. The "income level" variable does not show statistical significance in explaining a vote for the PRI, meaning that PRI voters are distributed along the income scale, from the top to the bottom.

Table 6.13c: Regression Model for Political Preference PRD, 2000

Coefficients[a]

Model		Unstandardised coefficients		Standardised coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.875	.263		10.952	.000
	Gender	-.329	.077	-.110	-4.291	.000
	Age	-5.64E-03	.003	-.052	-1.951	.051
	Maximum school level	-6.02E-03	.035	-.005	-.174	.862
	Income	-8.10E-02	.019	-.111	-4.160	.000
	Party ID	.174	.022	.204	7.947	.000
	Assessment of economic situation	-7.07E-02	.036	-.055	-1.973	.049
	Asssessment of Zedillo	-.280	.034	-.231	-8.284	.000

a. Dependent variable: PRD

Source: SPSS output, author's calculations from survey results.

PRD voters are statistically associated with a negative perception of President Zedillo's performance, and particularly with a negative evaluation of the country's economic situation. In the same way, PRD voters have a strong negative association with income level – i.e., the lower the income level, the more likely a person is to be a PRD voter. Statistically, this confirms Cuauhtémoc Cárdenas's position that in a way the Mexico City election was a referendum, the majority going against the PRI and what it represented, as well as against its economic policies. Economic liberalisation rhetoric was highly criticised by politicians from the left, who characterised economic policy as neo-liberal imperialism, socially insensitive and interventionist. The economic crisis and the industrial restructuring over these years had hard-hitting effects on a large number of people who were left no other option but to support the protest movement against a system that had lost its legitimacy, which was based on economic stability and growth.

CONCLUSION

The decline of manufacturing in Mexico City DF compared to "the rest" of the MAMC suggests the emergence of two different economies within a functional economic area. But when broken down to the municipal level and for specific sectors (automotive and consumer electronics), the trends are less clear. Mexico City retains a significant manufacturing base, albeit much less so than in 1980, and in 2000 still held the national lead in absolute and relative terms of output and employment. Mexico City continued to rank in 2000 as the top location for manufacturing and, although this is not discussed here, remains a key location for specialised sectors such as printing, auto parts, chemicals, and food and beverages, some of which have a strong global orientation. When considering the period 1980–2000 and the broad trend towards de-industrialisation or decentralisation, we need to be cautious and consider the performance of subsectors of manufacturing and the local specificities of space.

But Mexico City is no longer the economic engine of the national economy. The collapse of the consumer electronics industry in the central part of the country, a process supported by Mexico's leading business players, probably constitutes the best example of what has happened to a single economic activity. Consumer electronics in Mexico City has suffered from M&As, the implementation of post-Fordist production and a shift to trade market orientation.

Nonetheless, Mexico City had developed a new influential role as a consequence of its transformation into a global hub of finance and producer services. In this new economic regime, the service sector in general, and "producer services" in particular, are increasingly important in putting together the parts to enable "global" production to take place. Sassen's ideas provided an important guide for my analysis, though trends in Mexico City suggest that the global city hypothesis is sometimes overrated, such as in the relevance given to TNCs in production circuits over the simply economic logic of supply and demand under a new post-Fordist production regime. Under this new regime, products and production circuits under a free market system show complex multidirectional intra-industry and inter-industry dynamics, sometimes dependent upon a particular city (Mexico City perhaps) but at others times dependent upon its own location networks.

However, according to my results, the so-called "command functions" are not uniform across sectors, and this agency is rooted in the nature of each economic activity and even in the particular production circuits. This explains why Mexico City hosts economic agents performing "command functions" in, for example, the automotive sector, but not for the consumer electronics sector, where Tijuana, Mexicali and Guadalajara have more influence. In this sense, Krugman and Livas's "migration to the north" hypothesis is too simple a representation of a more complex process rooted in a shift of economic regime. Relocation patterns, fragmentation and relocation of production seem to be rooted in a strong specialisation

pattern driven by a combination of global and local factors that explain de-concentration of activity out of Mexico City.

The factors present in global city literature can shed some light on the analysis: for example, identifying TNCs and financial services as the most distinctive agents of economic change (for better or for worse). This is where the polarisation argument becomes relevant. The data show that a small group has received a large share of the "gains" and that there is a very big group for whom neither economic liberalisation nor globalisation has brought about an improvement in social conditions. Results suggest that despite evidence of increasing accumulation of income at the top of the income scale, there have also been gains in middle-income groups that overall suggest that income inequality remained more or less constant over the period 1980–2000. Mexico City thus challenges the polarisation argument associated with the global city hypothesis.

Chapter Seven: Conclusions: The Effects of Centrality in a Global Economy

OVERVIEW

At the outset of this thesis, a set of research questions about the relationship between Mexico City and economic liberalisation and globalisation was posed. The thesis aimed to examine economic decentralisation characterised by the decline of manufacturing in Mexico City, and to consider how far this process could be attributed to trade liberalisation and/or globalisation. Two hypotheses were formed. First, Mexico's economic and spatial restructuring were a consequence of economic change driven by trade liberalisation. Specifically, this hypothesis followed the ideas of Paul Krugman, who argued that opening the economy and reducing transport costs would trigger circular cumulative causation and re-agglomeration in northern Mexico, and economic decentralisation. The second and alternative hypothesis argued that Mexico's economic and spatial restructuring were not the direct consequence of liberalisation of trade but a consequence of a broader economic change associated with the globalisation of the Mexican economy. This alternative hypothesis considers the nature of the new geography of production and trade brought about by the global economy, as a process different in nature and complexity to trade liberalisation as argued by Krugman.

In order to explore both hypotheses the research adopted a deductive approach combining quantitative and qualitative methods. The quantitative methods varied from simple descriptive statistics to more complex parametric tests and multivariate models. An original contribution of the thesis was the implementation of principal component analysis, a data reduction technique designed to represent a wide range of characteristics in a smaller number of dimensions. PCA proved useful to determine how information from various indicators (variables) can be combined to measure a firm's relative "global" status (globality). The result of PCA was the creation of a single Globality Index which assigns a specific value or score to firms representing the company's global status in relation to all the other companies in the sample, allowing for comparisons between companies and comparisons for the same companies over different periods of time. The aim of the PCA was to produce empirical evidence using a strong statistical tool to create parameters, allowing analysis of individual cases (companies) based on economic orientation (national vs global) and location.

A different methodological approach was adopted in Chapters Four and Five, which presented case studies of two important sectors of the Mexican economy: the automotive and consumer electronics sectors. These two sectors were selected according to results outlined in Chapter Three, in which aggregated trends revealed automotive and consumer electronics to be the most dynamic and the most globally oriented sectors in output and export terms since the trade liberalisation regime started in the late 1980s with the accession of Mexico to the GATT. The Globality Index provided

scores for companies in both sectors ranked at the top end of the global list. Both sectors had grounds for being considered candidates for further research as both were concentrated in the manufacturing belt of Mexico City before the period of liberalisation and changed their patterns of localisation and agglomeration thereafter. The automotive sector, although not exclusively, re-concentrated in the cities of central Mexico and consumer electronics in cities along the Mexico–US border over the course of the period studied in the research.

RESEARCH FINDINGS

In order to summarise my principal research findings I have organised this chapter around three points. First, I explore this thesis's contribution to the debate surrounding Krugman's ideas, which have informed the so-called new economic geography, and the importance of trade liberalisation as a single force capable of modifying location patterns and bringing a new regional industrial balance. Second, I explore the alternative hypothesis – namely, globalisation as an alternative explanation for manufacturing decentralisation in Mexico. Third, I consider Mexico City as an example of local economic transformation over a transitional period from a closed to open economy, by trade or globalisation, and relate these processes to original findings on patterns of social inequality and polarisation.

To consider the first of these three points, from the data and analysis undertaken for this thesis, Krugman's arguments must be regarded as speculative at best. Trends in the decentralisation of manufacturing industry in Mexico did not coincide with the main predictions outlined by

Krugman in his work on free trade and agglomerations (1991a, 1993a, 1993b, 1995, 1997, 1998a, 1998b). With Livas, and supported independently by Hanson (1996b), Krugman referred to changes along the US–Mexican border as paradigmatic of the impact of opening economies to trade. Foremost, these scholars argued that economic opening would lead to geographical restructuring, ending with the de-industrialisation of the regional centre. This, they claimed, would be replaced by the industrialisation of the border with the US because of the high transport costs on the Mexican side that might surpass the gains made using Mexico's cheap labour and access to markets. According to Krugman and Livas:

> The rough outline of Mexican economic history supports this view. Recent work by Hanson (1992) and Livas Elizondo (1992) shows that before the beginnings of import substitution Mexico City was far less dominant in Mexico's economy and manufacturing sector than it was later to become, and that since liberalization began in the 1980s there has been a dramatic shift of manufacturing away from Mexico City, especially to the northern states. (Krugman and Livas 1996, p. 140)

Yet the case studies presented in my research question the claims that border plants became integrated within US southern state economies, at least for the period under study.

Rather than being subject to the external economic incentives brought about by access to new markets and reductions in costs as a consequence of the removal of trade barriers, I found evidence that company relocation to the border region predates trade liberalisation, and in many cases dates back to the 1960s. By looking at the timing of the border industrialisation, we can see that most of the Tijuana plants producing electronics

components and parts – that were shipped directly to final goods assemblers in the US – started under the "quasi-liberalisation" kick-started by the maquiladora regulation in the 1960s and not in the 1980s as Krugman's approach suggests. For Mexico at least, Krugman underestimated the importance of the fact that within the closed economy model the Mexican government had set up institutional procedures such as the Border Industrialisation Programme and the Maquiladora Programme to allow some companies to adapt location models within a restricted foreign trade regulation. We might speculate that at the time labour costs would have been an important economic incentive for TNCs (mainly US corporations) to engage in production in Mexico, when labour-intensive production made labour costs an important share of total production costs. According to findings presented in Chapter Five, US electronic companies were using Mexico to manufacture products more economically and escape the high-labour market in the US.[152] The business model at the time was complex and required various factors to be present and aligned in order to make businesses viable on the border, taking advantage of government procurements and regulation. Among the most obvious of these factors were trade and investment regulation, international business contacts, access to finance and labour force.

Producers sought locations with access to large markets and to suppliers of goods and services that they or their workers required. These suppliers

[152] This seems in line with Weber's observation that "low-cost labour competitive with that in Asia and Europe was the key reason for US manufacturers to 'flood' Mexico with financial, technical and production personnel to boost their production below the border" (1969, p. 1).

were shifting operation slowly out of Mexico City, but the data do not suggest a dramatic and immediate shift of companies towards the north as a consequence of liberalisation of trade, neither in the late 1980s nor over the 1990s. Rather, companies seemed to deepen but not greatly extend the practice agreed between the federal government and certain companies from the 1960s, certainly as a result of a "conditional" and sometimes "exceptional" free trade regime.

An analysis of particular companies using the top 500 companies from the *Expansión* database was presented in Chapter Three. This tells the story of what happened over the transitional period from a company perspective. The data show that although it is difficult for a company to shift its market orientation, to engage in export production and ultimately to relocate, a large number of companies in Mexico survived this transitional period and underwent change under a different economic regime, some of them relocating, but the majority remaining in situ. As many as 133 out of a total of 219 companies exporting to the NAFTA region in 2000 in the Top 500 Companies list started operations before 1985, while 82 were not located in border states and as many as 30 had subsidiary manufacturing plants in border states. The data suggest that only 83 companies arrived in Mexico after the liberalisation reforms, and of these only 29 located in the border states.

An important finding is that the regionalisation process suggested by Krugman and Livas (1996) and Hanson (1996a) has not influenced the rise of economic agglomeration over the US border, or in the northern states of

Mexico, but involved a rather more comprehensive integration between NAFTA economies regardless of sector of the economy or industrial location patterns. Evidence presented in Chapter Three suggests that preferential access to Mexican products to the US and Canada under NAFTA has been a strong economic incentive for non-NAFTA companies to locate in Mexico and take advantage of export opportunities with the intention of producing for the US and Canadian markets. This finding is in line with the argument of Krugman and Livas. However, the research found that 72 companies which started operations after 1986 were exporting to the US from locations far from the border.

According to interviews with senior company officials, a concentration of producers, a good supply of inputs and consumer goods, and the presence of producer services are among the factors that determine location decisions. Mexico City has continued to offer these conditions over the post-liberalisation period, as evidenced by 37 manufacturing companies arriving in Mexico City. Contrary to Krugman, therefore, access to markets is only one of the factors determining company location, but it seems not to be the most powerful determinant of per se location decisions and economic agglomeration formation.

The relative importance of automotive plants in Morelos and Puebla, about 1,000 km away from the border, and the manufacturing strength of the State of Mexico discussed in Chapter Four weaken Krugman's argument. So, as explored in Chapter Five, does the timing of consumer electronic cluster set-ups in the border region. It is worth noting that the case of

consumer electronics may be misleading as broad trends of decline (in Mexico City) and rise (in the border) could suggest the confirmation of Krugman's ideas. However, a closer analysis reveals that the process of consumer electronics location is better explained by an interaction of global factors such as M&As, innovation, transition from labour- to capital-intensive production, outsourcing and fragmentations, and more general global factors, than as a simple result of trade liberalisation policies.

The second point raised here concerns globalisation of the Mexican economy as an alternative hypothesis of the economic decentralisation. The case studies indicate that although labour costs per se were a very important factor in overall production costs over the 1960s and 1970s, trends towards more capital-intensive production seem unlikely to be a "single" crucial determinant in company location decisions. For instance, in Mexico, a tenfold rise in consumer electronics sector output between 1985 and 1998 did not increase employment by an equivalent amount. Over time, the industrial organisation brought by TNCs created more complex intra-industry and inter-industry relations and involved a combination of labour and capital factors. The automotive and consumer electronics sectors underwent profound economic restructuring with the intention of engaging in production networks not only to the US and Canada but also to global and more open markets, leading in some cases to geographical reorganisation and the rise of national and international production networks. According to the research findings, however, this geographical reorganisation is the result of a concatenation of global

factors including: new industrial practices such as fragmentation of production and outsourcing practices; a shift to less labour-intensive/more capital-intensive production; M&As; and a shift towards export-oriented production under a free trade regime. All of these factors are associated with the process of globalisation as described in the literature discussed in Chapter Three.

From the specific examples of the automotive and consumer electronics sectors, I conclude that trade liberalisation alone cannot fully explain the manufacturing decline away from Mexico City, as Krugman and Hanson argue. Despite the fact, as was noted in Chapter Three, that during the 1970s and 1980s the Mexican federal government launched several de-centralisation programmes aimed at halting the growth of the metropolitan area and promoting regional development, most of these efforts had little or no effect on the decentralisation of industry[153]. The transformation within the consumer electronics industry in Mexico as a result of global processes could not be more dramatic, from a nationally oriented model to one of the most dynamic production centres in the world. The consumer electronics industry went from being concentrated in Mexico City and dominated by US-owned TNCs working with an integrated production system producing to supply the national consumer

[153] In their study of the period 1959–74, Ramos Boyoli and Richter (1976) found that, in effect, public investment had been geared towards more developed states. These findings were corroborated by those of Palacios (1986), who analysed the six-year terms of Echeverría and López Portillo, and Rodríguez (1997), who covered the period 1959–80. The latter research confirmed that the different categories of public investment continued to favour the richer states, as a response to considerations of sectoral efficiency more than to those of regional development. A study by Looney and Frederiksen (1981) concluded that this pattern of public spending was not only to the detriment of regional development but also affected economic efficiency, contradicting the classic dilemma between aggregate economic growth and the reduction of regional inequalities.

market, to being concentrated in the border states and controlled by Japanese and Korean TNCs. According to the findings presented in Chapter Five, some of the companies' production plants located in Mexico City that survived the transformation ended up producing under OEM agreements. Only a handful of companies remained unchanged (as was the case for Philips and Toshiba), and a huge number simply closed down, Mexican and TNCs alike. The new consumer electronics industry was border-located, fully "globally" export-oriented (in effect only to US and Canadian markets, as found in Chapter Three), capital-intensive and dominated by Asian companies, with a high level of innovation and a fragmented production pattern.

Nonetheless, the single effect of trade liberalisation, as an essential component of the global economic regime, on spatial reorganisation needs to be considered. Trade liberalisation introduced fierce competition, but also opportunities. Most Mexican manufacturers had been producing at a scale that was inefficient in many cases because of lack of supply, but others simply as a by-product of the trade barriers. Therefore, companies that closed down were those that could not upgrade and compete, and these seem to be the less globalised companies and those in the more traditional sectors of the economy. Over the 1980s the manufacturing sector faced its worst decline, where newly introduced competition coincided with a deep national economic crisis. Interviews with managers in the manufacturing sector indicated that the option to decentralise as a method of cost reduction was ruled out as many companies found that

being located far away from suppliers and markets was not sustainable in the long run and decided to remain in Mexico City.

As discussed in Chapter Three, the key point related to industrial location centres on the global factors present in the Top 500 Companies operating in Mexico in 2000, and their influence on location decisions: M&As, labour productivity, foreign investment and export activity appear as the most significant. It was also unexpected to discover that "global characteristics" were present in a large number of Mexican companies with no significant differences to top-of-the-list TNCs. In relation to global factors as a cause of decentralisation the conclusion is that at the time of trade liberalisation, sectors dominated by TNCs and therefore subject to a process of M&As at a global level with local consequences for plants in Mexico City, where most of the industries were located, suffered the consequences of takeovers and consolidation of production. At the same time a transition from labour- to capital-intensive production took place which under the new economic regime favoured companies that could embark on a long-term project of physical infrastructure development. According to the case studies, as the result of this transition associated with relocation, the first choices were those locations with a pre-existing presence of sector companies, or in other words industrial clusters at an embryonic stage.

However, localisation trends differentiate the two case studies, one in border states (consumer electronics) and the other in central Mexico. This distinction might be explained by the degree of production integration into the national economy and the level of value added involved for each sector,

which is related to labour and capital productivity. This observation is in tune with claims made by Krugman's trade liberalisation hypothesis, because a low value added for an industry is associated with higher foreign trade activity and therefore the higher a company's exports and imports are, the more likely is its proximity to the US border. But also, according to Dicken (1992) this might explain why an industry more integrated into the Mexican economy and therefore with higher levels of value added, such as the automotive industry, has developed global production circuits interconnecting industrial clusters within Mexico and abroad. Nevertheless, the decision of where to locate remains open to some question. As the data reveal and the analysis in Chapter Four suggests, for the automotive sector, investment took place in new locations away from Mexico City but not at the border, allowing some retention of jobs in Mexico City in comparison with consumer electronics at least.

The third point to consider is the transformation of Mexico City. Extrapolating from the main theoretical distinction between free trade and global production, I conclude that according to the research, the Mexican economy more closely follows the trends suggested by globalisation scholars – that globalisation has produced the duality of a dispersed yet globally integrated organisation of economic activity, where centres are crucial places as connecting nodes within global production circuits. The pattern of industrial change in Mexico approximates the argument forwarded by Sassen (1991) on the role of centrality; the global economy may have become more decentralised, but it is not decentred.

Supporting this idea of a spatial dispersal of production processes and new strategic role for cities are the findings presented in Chapter Three. The number of TNCs headquarter located in Mexico City, the number of companies among the Top 500 sample participating in the Mexican Stock Market, and the share of foreign capital and export activity of companies located there suggest the high interaction of these global factors that makes Mexico City an important global trade and production node. In Sassen's words, the focus on trade taking place in cities is such that:

> Apart from issues related to capital, labour markets, goods and services are becoming increasingly globally traded in this regard cities around the world are rising as 'regional centres' connecting the network of interactions on which the global trade is based ground outwards (Sassen 1991, p. 3).

However, by the end of the 1990s high concentration was seen in some cities in Mexico – such as Aguascalientes, Puebla and Torreón for the automotive sector, and Tijuana for the consumer electronics sector – that may lend credence to this economic process led by economic specialisation. I found evidence through the Globality Index that companies at the top end of the global ranking were strongly associated with Mexico City as the preferred location, suggesting that the rise is global.

Findings presented in Chapter Three regarding company data analysis of labour and capital productivity suggest that perhaps the most influential factor triggering decentralisation was the shift to a new model of industrial organisation as a whole, according to new global standards, including such

practices as outsourcing and capital-intensive production embedded in global production networks. The new industrial organisation was more flexible, requiring fewer employees, with those advantages introduced by the digital telecommunications, as data of specific companies presented in Chapter Three suggests. Innovation, flexible production and capital-intensive production, plus pre-existent specialised industrial clusters in certain cities such as Tijuana for the consumer electronics sectors, fuelled by takeovers (mostly foreign companies injecting fresh financing in the middle of an economic crisis), paved the way for a relocation movement in the most globally oriented sectors of the economy. But many other companies remained in Mexico City, in most cases companies in nationally oriented sectors of the economy, with no economic incentives to relocate as Mexico City never stopped being the most important location for businesses in Mexico.

The effect of trade and economic integration on national and regional economic growth is still a matter for considerable debate (Morris 2001; Rodrik 1999; Sen 1999; Goldsmith and Mander 2001; Stiglitz 2002). The theories and empirical analyses put forward on the territorial impact of trade and economic liberalisation range from claims that trade leads to greater concentration of economic activity and greater polarisation (Krugman 1993a; Venables 1998; Venables and Limao 1999) to those who insist that economic liberalisation and increases in trade are likely to reduce regional disparities (Wood 1994). Strong counter-arguments are made by those who assert that economic globalisation is organised under conditions that favour only rich nations (Hirst and Thompson 1996; Gray

1998; Goldsmith and Mander 2001; Sen 1999), leaving poor countries unable to compete against often subsidised goods and products, with negative social and environmental consequences (Morris 2001; Retallack 2001; Sobhani 2001). The range of the debate indicates that the social outcomes of economic change are ambiguous. Even with the adoption of simplified notions of "winners" and "losers" or more globalised vs less globalised sectors, it remains difficult to discern the consequences of economic restructuring.

Hence, and finally, Chapter Six looked at Mexico City. It found that the polarisation of income and therefore social polarisation patterns are not a by-product of the city's globalisation. On the contrary, the Gini coefficient suggests a decline in the polarisation of income, although it is important to underline that Mexico City's polarisation remains at an unacceptable level for any standard of equality and social justice. However, another social phenomenon is associated with the restructuring process. Political polarisation, where ideological positions are defined by attitudes towards the "free market", shows strong divisions between the sectors of the population who might be deemed "winners" of globalisation and those sectors left behind during the restructuring process and unable to get privileged access to new rules of social access. Nevertheless, it would be wrong to be complacent, and even if I have argued that at the beginning of the new millennium Mexico City remained at the core of the national economy, it no longer performs the role of "engine" so much as that of coordinator (sufficient to deserve a place in the global network of cities). This process is unfinished, as evidenced by contemporary moves to reform

pensions, the tax system and the energy and oil sectors, and to devolve the responsibility for poverty – with 40% of the population, according to the World Bank (2005), beneath the poverty line – to states and cities.

Appendix 1: Performance of the Automotive and Consumer Electronics Sectors

The Global Index identified the sectors within the manufacturing industry with the highest number of companies and with the highest global scores. Two tests were then conducted: first, a frequency test to see how many manufacturing companies by subsector (ISIC) were included in the database. I found that the 500-company sample included 280 manufacturing companies, with the leading sectors being food, beverages and tobacco with 78 (27.9%); fabricated metal products with 71 (25.4%) and chemical products with 53 (18.9%). Table A1.1 summarises these results.

Table A1.1: Manufacturing Companies in the Top 500 by ISIC

		Frequency	Percent	Valid percent	Cumulative percent
Valid	31. Food, beverages & Tobacco	78	15.6	27.9	27.9
	32. Textiles, apparel & Leather	14	2.8	5.0	32.9
	Wood and wood products industries	1	0.2	0.4	33.3
	34. Paper, paper products & printing	18	3.6	6.4	39.7
	35. Chemical products	53	10.6	18.9	58.6
	36. Non-metallic mineral products	21	4.2	7.5	66.1
	37. Basic metals industries	18	3.6	6.4	72.5
	38. Fabricated metal products	71	14.2	25.4	97.9
	39. Other manufacturing industries	6	1.2	2.1	100.0
	Total	280	57.8	100.0	
Missing	System	220	44.0		
Total		500	100.0		

Source: Factor analysis results, calculations by the author based on *Expansión* database, "Las 500 empresas más importantes de México", 2006.

Second, I compared this distribution against the top 100 companies in the sample to see if the distribution of the total sample was replicated in the top 100. Results from Table A1.2 suggest that the distribution between the Top 500 is not replicated in the top 100 and that the three leading sectors change.

Table A1.2: Manufacturing Companies in the Top 100 Global Companies by ISIC

		Frequency	Percent	Valid percent	Cumulative percent
Valid	31. Food, beverages & tobacco	9	9.0	12.0	12.0
	32. Textiles, apparel & leather	2	2.0	2.7	14.7
	34. Paper, paper products & printing	6	6.0	8.0	22.7
	35. Chemical products	14	14.0	18.7	41.4
	36. Non-metallic mineral products	2	2.0	2.7	44.1
	37. Basic metals industries	7	7.0	9.3	53.4
	38. Fabricated metal products	*33*	*33.0*	*44.0*	*97.4*
	39. Other manufacturing industries	2	2.0	2.7	100.0
	Total	75	75.0	100.0	
Missing	System	25	25.0		
Total		100	100.0		

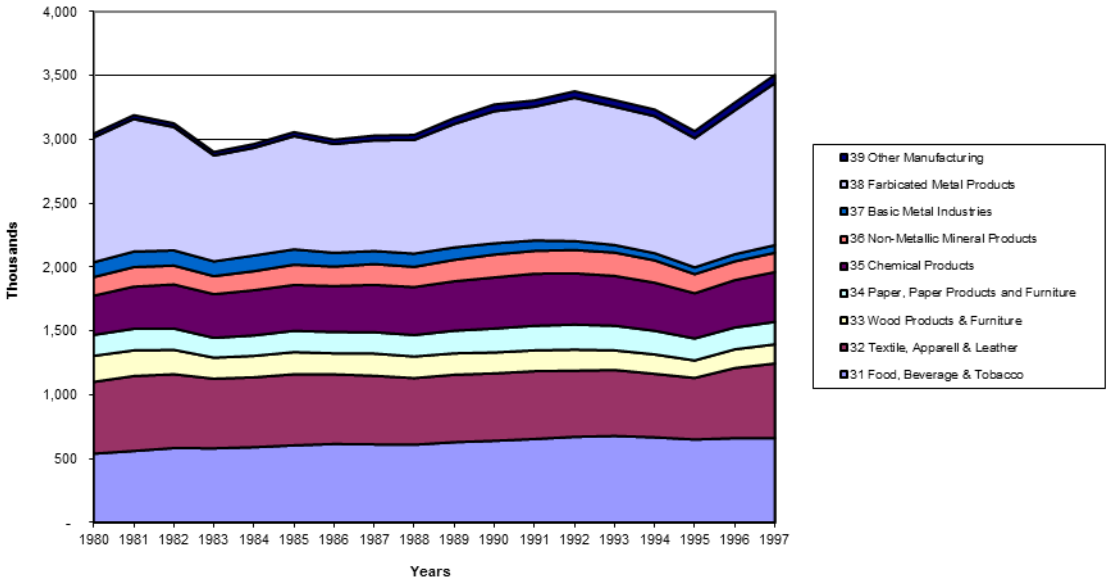
Source: Factor analysis results, calculations by the author based on *Expansión* database, "Las 500 empresas más importantes de México", 2006.

The same sectors appear in first and second places, but basic metal industries appears in third place, displacing chemical products (see Table A1.2). This is important when these results are contrasted against the global top 100, where fabricated metal products (ISIC 38) jumps from third to first place with 44%. It is especially important to mention that when comparing the Top 500 Companies and the Top 100 global firms,

75% of the companies in the latter category are classified in the manufacturing sector while in the former only 54% are from this sector. The more global a company is, the more likely it is to be found in the manufacturing sector, an argument consistent with that discussed in Chapter Three. According to these results the most global sector within manufacturing is the manufacture of fabricated metal products, machinery and equipment sector (ISIC 38). The task now became to select two sectors at branch level that could be used as case studies.

Figure A1.1 suggests that the fabricated metal products, machinery and equipment sector (ISIC 38) has been one of the most dynamic subsectors within manufacturing in Mexico over the period.

Figure A1.1: Manufacturing Employment by Subsector



Source: Author's calculations based on data presented in *OECD STAN Database for Industrial Analysis 1978–2000*, 2002.

The ISIC 38 industry had a total output of US$11 billion in 1980 and US$66 billion in 1998, an increase of about six times the levels of the early 1980s. Starting from a relatively high level (24.1% of total manufacturing), employment has shown dynamic growth (see Table A1.3). In terms of output value added, ISIC 38 increased at an annual average of 4.2% in real terms between 1980 and 1998, the highest of all manufacturing subsectors and almost twice as high as the total manufacturing average annual growth rate. Between 1986 and 1993 (GATT period) the average annual growth of sector ISIC 38 was the highest compared with all manufacturing industries; the same situation happened between 1994 and 1998 (the immediate NAFTA period), with a well over average annual growth rate of 8.8%.

Table A1.3: Average Annual Growth Rate in Manufacturing, 1980–1998

	Average growth rate (percent)			
VALUE ADDED	1980–1998	1980–1985	1986–1993	1994–1998
31 Food, beverages & tobacco	2.7	2.5	3	2.6
32 Textiles, clothing & leather	1.2	−0.1	0.2	4.9
33 Wood products & furniture	0.4	−0.5	−0.1	2.3
34 Paper, paper products & printing	2.8	2.4	3.2	2.5
35 Chemical products	3.3	4.5	2.3	3.7
36 Non-metallic mineral products	2.4	1.3	3.3	2.2
37 Basic metal industries	3.8	0.4	2.7	10.4
38 Fabricated metal products	4.2	0	4.6	8.8
39 Other manufacturing	1.8	0.2	1.8	3.6
Total manufacturing	2.9	1.4	2.7	5

Source: Author's calculations based on data presented in OECD STAN Database for Industrial Analysis 1978–2000, 2002.

Between 1980 and 1998, the average annual growth rate of employment in the ISIC 38 industries (1.8%) was among the highest of all manufacturing industries (Table A1.4). In 1998 ISIC 38 industries accounted for about 31% of employment in the sector, compared to about 29% in 1980, and they remain number one in employment terms.

Table A1.4: Manufacturing Employment Annual Average Growth Rate, 1980–1998

	Annual average growth rate (percent)			
EMPLOYMENT	1980–1998	1980–1985	1986–1993	1994–1998
31 Food, beverages & tobacco	1.2	2.3	1.5	−0.6
32 Textile, clothing & leather	0.3	−0.1	−0.9	3.3
33 Wood products & furniture	−1.7	−3.1	−1.4	−0.5
34 Paper products & printing	0.5	0.5	1.9	−2.2
35 Chemical products	1.6	3.2	1.1	0.1
36 Non-metallic mineral products	0.4	1.8	1.9	−4.5
37 Basic metal industries	−3.6	0.8	−8.4	0.6
38 Fabricated metal products	1.8	−1.6	2.6	4.4
39 Other manufacturing	5.1	2.1	6.5	5.8
Total manufacturing	0.9	0.2	1	1.6

Source: Author's calculations based on data presented in OECD STAN Database for Industrial Analysis 1978–2000, 2002.

The productivity ratio (value added per employee) was also higher over the period for ISIC 38 industries with above average rates seen especially after NAFTA (see Table A1.5).

Table A1.5: Productivity Ratio Average Annual Growth Rate

	Average growth rate (percent)			
PRODUCTIVITY	1980–97	1980–85	1986–93	1994–98
31 Food, beverages & tobacco	1.5	0.1	1.5	3.2
32 Textile, clothing & leather	0.9	0	1.2	1.4
33 Wood products & furniture	2.1	2.8	1.4	2.8
34 Paper, paper products & printing	2.2	1.8	1.2	4.7
35 Chemical Products	1.8	1.2	1.2	3.7
36 Non-Metallic Mineral Products	2.1	−0.5	1.4	6.9
37 Basic Metal Industries	8	−0.4	12.3	9.8
38 Fabricated Metal Products	2.2	1.2	1.8	4
39 Other Manufacturing	−3.1	−2.1	−4.2	−2.1
Total Manufacturing	1.9	1.2	1.7	3.3

Source: Author's calculations based on data presented in OECD STAN Database for Industrial Analysis 1978–2000, 2002.

Metal products and machinery (ISIC 38) also increased its share of foreign trade manufacturing exports from less than 10% of the country's total merchandise exports at the beginning of the 1980s to 58.8% of total exports in 1998 (from US$6 billion in 1980 to US$69.027 billion in 1998). At the beginning of the 1980s fabricated metal products represented Mexico's largest import category, accounting for almost one-third of merchandise imports; this figure rose to half in 1998. In 1979 imports of ISIC 38 were about US$3.6 billion compared to US$61 billion in 1998 (BANCOMEXT 2000). According to trade balance calculations, metal products and machinery were the significant contributors to both total imports (23% of the total, followed by general use machinery) and exports (27%, followed by the automotive industry with 16%) at the end of the

1990s. The majority of ISIC 38 exports are in the electrical machinery, electrical and electronic devices sector and the automotive industry (including automotive assembly, motors and auto parts) (see Tables A1.6 and A1.7).

Table A1.6: Import Growth Rate ISIC 38

IMPORT GROWTH RATE (Percent)	1990–2000	1990–93	1994–2000
FABRICATED METAL PRODUCTS ISIC 38	23.4	44.9	14.2
381 Metal products	31.6	68.9	15.7
382 Non-electrical machinery	19.2	27.1	15.79
383 Electrical machinery	37.6	78.3	20.2
384 Transport equipment	23.2	25	22.5
385 Professional goods	13.5	35.8	4.1

Source: Author's calculations based on data presented in OECD STAN Database for Industrial Analysis 1978–2000, 2002.

Table A1.7: Export Growth Rate ISIC 38

EXPORT GROWTH RATE (Percent)	1990–2000	1990–93	1994–2000
FABRICATED METAL PRODUCTS ISIC 38	36.6	74.6	20.4
381 Metal Products	29.6	65.5	14.2
382 Non-electrical Machinery	31.7	50.5	23.7
383 Electrical Machinery	146	441	19.4
384 Transport equipment	23.6	26.3	22.5
385 Professional Goods	54	129.7	21.5

Source: Author's calculations based on data presented in OECD STAN Database for Industrial Analysis 1978–2000, 2002.

Simple tabulations from the BANCOMEXT (2000) database suggest that the distribution of exports across two-digit industries remained relatively stable for the period 1993–1998; the metal products and machinery sector

was export-dominant within fabricated metal products (ISIC 38). The largest share of exports was in subsectors 3821 and 3822 (29.5% – electric machinery; sound, TV and telecommunication equipment and parts), and the automotive industry, which accounted for 17% of the total. Among the most dynamic industrial classes over the period stand class 3832 – radio, TV and communication equipment (consumer electronics) – and motor vehicles (automotive industry), and in looking at these dynamic sectors, I have attempted to disentangle the dynamics associated with location patterns. Electronic machinery represented 24.2% of value added in capital goods production, with the principal product lines divided between power transmission and distribution equipment, and small to medium-sized generating equipment. The automotive industry (cars and auto parts) accounted for 38.1% of value-added output. At the end of the 1990s, in value-added terms, the profound transformation at branch level within ISIC 38 was characterised by the plunge in metal product manufacturing, the increase in non-electrical machinery production and in the electrical, electronics and automotive industries' trends in value added. Employment shares are presented in tables A1.8 and A1.9 that confirm the dynamism of these sectors.

Table A1.8: Fabricated Metal Products Value-Added Share of ISIC 38

VALUE-ADDED SHARE (percent)	1980	1985	1990	1995	1996
381 Metal products	22.7	21.8	18.3	15.9	15.3
382 Non-electrical machinery	12.8	13.5	14.2	16.5	16.7
383 Electrical machinery	24.2	25.6	24	24.4	23.2
384 Transport equipment	38.1	36.7	40.3	39.6	41.5
385 Professional goods	2.2	2.4	3.2	3.7	3.3
TOTAL	100	100	100	100	100

Source: Author's calculations based on data presented in OECD STAN Database for Industrial Analysis 1978–2000, 2002.

Table A1.9: ISIC 38 Branch-Level Employment Share

EMPLOYMENT SHARE (percent)	1980	1985	1990	1996
FABRICATED METAL PRODUCTS ISIC 38				
381 Metal products	20.4	20.1	18.3	16.6
382 Non-electrical machinery	17.6	16.3	13.9	11.9
383 Electrical machinery	33.7	31.5	30.2	34.5
384 Transport equipment	26.6	27.8	33.1	31.9
385 Professional goods	1.8	2.3	4.4	5.1
TOTAL	100	100	100	100

Source: Author's calculations based on data presented in OECD STAN Database for Industrial Analysis 1978–2000, 2002.

Appendix 2: Top 100 Mexican Companies According to the Globality Index, 2000.

Global position	Company	Index	Sales position in the Top 500
1	FORD MOTOR COMPANY	6.91994	9
2	WAL-MART DE MÉXICO	6.34639	7
3	GRUPO MÉXICO Y SUBS	5.68112	24
4	GRUPO MODELO	4.17283	18
5	DAIMLERCHRYSLER	3.52299	4
6	HEWLETT-PACKARD DE MÉXICO	2.40685	28
7	GRUMA	2.27982	29
8	HYLSAMEX Y SUBS	2.13019	35
9	KIMBERLY-CLARK DE MÉXICO	2.0261	34
10	GRUPO MINERO MÉXICO Y SUBS	2.00689	47
11	COCA-COLA FEMSA	1.93118	32
12	QUÍMICA SUMEX	1.86257	356
13	GRUPO KODAK	1.76832	52
14	MABE	1.73993	45
15	TRANSPORTACIÓN MARÍTIMA MEXICANA	1.70039	103
16	SIEMENS	1.68682	48
17	INTERNACIONAL DE CERÁMICA Y SUBS	1.6862	119
18	ALPEK Y SUBS	1.6351	31
19	NESTLE MÉXICO	1.54981	26
20	CORPORACIÓN DURANGO	1.53606	39
21	JOHN DEERE	1.48676	77
22	ACER COMPUTEC LATINOAMÉRICA	1.48225	111
23	TUBOS DE ACERO DE MÉXICO	1.40338	82
24	SIGMA ALIMENTOS	1.38482	66
25	LEAR CORPORATION MÉXICO	1.3351	75
26	DERMET DE MÉXICO	1.3192	139
27	GRUPO SITUR Y SUBS	1.31141	84
28	AEROVÍAS DE MÉXICO	1.30054	37
29	GRUPO CONDUMEX Y SUBS	1.2979	44
30	DANA HEAVY AXLE MÉXICO	1.15693	201
31	CIA INDSUTRIAL DE PARRAS	1.08738	132
32	DELPHI DELCO ELECTRONICS SYSTEM	1.0674	218
33	UNIK Y SUBS	0.95455	50
34	GRUPO MINSA	0.92199	130
35	GRUPO BLACK AND DECKER DE MÉXICO	0.90337	230
36	CIA MEXICANA DE AVIACIÓN	0.90276	46
37	INDUSTRIAS JOHN DEER	0.87983	116
38	SATÉLITES MEXICANOS	0.84669	169
39	GRUPO SIMEC Y SUBS	0.82492	127
40	NO SABE FALLAR	0.79517	204

Appendix 2: Top 100 Mexican Companies According to the Globality Index, 2000.

Global position	Company	Index	Sales position in the Top 500
41	ALBRIGHTS & WILSON TROY DE MÉXICO	0.79201	160
42	ACCO MEXICANA	0.78416	333
43	INDUSTRIAS PILOT DE MÉXICO	0.72422	293
44	HYLSA	0.72002	49
45	GRUPO OLIVETTI MEXICANA	0.71866	166
46	GRUPO CHARTWELL DE MÉXICO Y SUBS	0.70714	209
47	DAL-TILE MÉXICO	0.70663	183
48	SCHNEIDER ELECTRIC DE MÉXICO	0.70648	121
49	MOLYMEX	0.70451	288
50	CIBA ESPECIALIDADES QUIMICAS DE MÉXICO	0.69533	136
51	MEXICHEM Y SUBS	0.68663	128
52	GRUPO CINEMEX	0.67317	211
53	GOLDSHMIDT QUÍMICA DE MÉXICO	0.64598	426
54	HAYES LEMMERZ MÉXICO	0.63571	306
55	PLASTICOS DUMEX	0.61434	386
56	EVEREST & JENNINGS DE MÉXICO	0.59949	450
57	KODAK DE MÉXICO	0.5888	148
58	BAJA ORIENTE	0.58541	372
59	GEODIS OVERSEAS	0.57928	415
60	EDELMAN DE MÉXICO	0.56627	465
61	GRUPO ECHLIN AUTOMOTRIZ	0.56319	207
62	PRODUCTOS DEL MONTE	0.55018	239
63	EDICIONES LAROUSSE	0.53165	324
64	STA-RITE DE MÉXICO	0.52849	437
65	BECTON DICKINSON DE MÉXICO	0.51903	174
66	PROGRESS SOFTWARE	0.50484	373
67	DAEWOO ELECTRONICS CORPORATION DE MÉXICO	0.50001	182
68	TELEMERCADEO INTEGRAL	0.49877	389
69	EDS DE MÉXICO	0.48224	153
70	BMG ENTERTAINMENT MEXICO DIV SONOPRESS	0.47965	307
71	MOORE DE MÉXICO	0.47894	298
72	REDWOOD SYSTEMS LOGÍSTICA DE MÉXICO	0.47015	406
73	GARLOCK DE MÉXICO	0.46782	430
74	OLYMPIA DE MÉXICO	0.44892	342
75	MABUCHI DE MÉXICO	0.44875	490
76	COPAMEX	0.39928	68
77	IMSA ACERO Y SUBS	0.39115	57
78	DALM'S DEL POTOSÍ	0.37635	475
79	CERVECERIA CUAUHTÉMOC MOCTEZUMA	0.37474	42
80	INVERSIONES SIDEK Y SUBS	0.36593	86

Appendix 2: Top 100 Mexican Companies According to the Globality Index, 2000.

Global position	Company	Index	Sales position in the Top 500
81	SABRE SOCIEDAD TECNOLÓGICA	0.34333	270
82	MERCK MÉXICO	0.32774	196
83	BLACK AND DECKER	0.31568	281
84	CIA SIDERÚRGICA DE GUADALAJARA Y SUBS	0.25894	126
85	NEMAK	0.23717	113
86	CIA OCCIDENTAL MEXICANA	0.23483	368
87	DIRONA	0.20808	161
88	GRUPO PI MABE	0.19418	145
89	PRICE PFISTER DE MÉXICO	0.19059	375
90	GRUPO COSTAMEX	0.18825	220
91	CORPORACIÓN NACIONAL DE RADIODETERMINACIÓN	0.14349	344
92	COSTAMEX	0.11664	295
93	GIRSA	0.10611	64
94	KURITA DE MÉXICO	0.09506	445
95	BD POWER TOOLS MEXICANA	0.07424	408
96	SISTEMA HORMIGA	0.07288	434
97	HERMI INGENIERIA	0.03611	384
98	GRUPO VIZ	–0.00873	146
99	AGROBIOS	–0.05621	72
100	TECNOLOGIA Y SERVICIOS DE AGUA	–0.05658	349

Source: Factor analysis results, calculations by the author based on *Expansión* database, "Las 500 empresas más importantes de México", 2000.

Entries for Black & Decker, Costamex and John Deere appear twice as in the *Expansión* database, referring to subsidiary companies in different economic sectors.

Appendix 3: Top 100 Mexican Companies According to the Globality Index, 2006.

Global position	Company	Index	Sales position in the Top 500
1	PETRÓLEOS MEXICANOS	6.4445	1
2	AMÉRICA MÓVIL	2.51066	2
3	TELÉFONOS DE MÉXICO	2.07355	6
4	GENERAL MOTORS DE MÉXICO	2.53046	7
5	DAIMLERCHRYSLER DE MÉXICO	2.65178	10
6	CEMEX	2.35537	5
7	SANMINA-SCI	1.9817	51
8	WAL-MART DE MÉXICO	0.51189	4
9	FOMENTO ECONÓMICO MEXICANO	0.91169	8
10	VOLKSWAGEN DE MÉXICO	1.80699	17
11	GRUPO CARSO	0.87261	15
12	GRUPO ALFA	1.31382	19
13	LUZ Y FUERZA DEL CENTRO	0.66549	37
14	GRUPO BAL	0.66113	18
15	GRUPO SALINAS	0.58376	32
16	GRUPO MÉXICO	0.94691	20
17	GRUPO BIMBO	–0.10048	25
18	COCA-COLA FEMSA	0.35161	27
19	GRUPO MODELO	0.8458	28
20	DELPHI AUTOMOTIVE SYSTEMS	0.02851	22
21	ORGANIZACIÓN SORIANA	0.09486	26
22	SISTEMA DE TRANSPORTE COLECTIVO	1.89555	276
23	GRUPO ELEKTRA	0.20185	52
24	MABE	0.30237	50
25	BODEGA AURRERÁ	0.01313	24
26	GRUPO SANBORNS	0.04938	62
27	FORD MOTOR COMPANY	0.53575	14
28	GRUPO XIGNUX	0.10053	56
29	INDUSTRIAS PEÑOLES	0.44893	46
30	WAL-MART SUPERCENTER	0.01466	30

Appendix 3: Top 100 Mexican Companies According to the Globality Index, 2006.

Global position	Company	Index	Sales position in the Top 500
31	CONDUMEX	0.28167	57
32	COPPEL	–0.01887	64
33	LEAR CORPORATION MÉXICO	0.01896	92
34	CONTROLADORA COMERCIAL MEXICANA	–0.01181	34
35	FEMSA CERVEZA	0.08971	47
36	GRUPO TELEVISA	0.34304	43
37	EL PUERTO DE LIVERPOOL	0.08128	40
38	GENERAL ELECTRIC	0.01011	54
39	TIENDAS SANBORNS	–0.00125	155
40	GRUPO GIGANTE	–0.13802	55
41	EMPRESAS ICA	–0.01396	82
42	VITRO	–0.0654	65
43	SAM'S CLUB	0.01738	29
44	SERVICIO POSTAL MEXICANO	–0.00423	281
45	DANONE MÉXICO	0.01664	146
46	ALTOS HORNOS DE MÉXICO	–0.02581	73
47	GRUPO IMSA	0.19756	45
48	TIENDAS ELEKTRA	–0.00046	85
49	INDUSTRIAS BACHOCO	–0.06423	101
50	TELCEL	–0.00875	9
51	CEMEX MÉXICO	–0.00511	39
52	SIGMA	–0.21146	88
53	ALPEK	0.10494	42
54	HOMEX	–0.09169	122
55	SEARS	–0.00125	116
56	CASAS GEO	–0.11162	121
57	FARMACIAS SIMILARES	–0.11994	168
58	US COMMERCIAL CORP.	–0.12922	44
59	MEGA	–0.00699	100
60	GRUPO VILLACERO	0.01518	80
61	DESC	–0.00413	81
62	COSTCO DE MÉXICO	0.01721	91
63	MINAS DE LA ALTA PRIMERIA	–0.02048	316
64	ELECTRÓNICA CLARION	–0.00839	297
65	LUISMIN	–0.00199	335
66	DANA CORP. MÉXICO	0.00047	295
67	GRUPO LANDUS	–0.01541	329
68	GRUPO EDITORIAL EXPANSIÓN	0.01081	444
69	TELEVISA NETWORKS	–0.01155	392
70	INDITEX MÉXICO	0.01282	166

Appendix 3: Top 100 Mexican Companies According to the Globality Index, 2006.

Global position	Company	Index	Sales position in the Top 500
71	FLEXTRONICS MANUFACTURING	0.01348	117
72	FIANZAS ATLAS	–0.008	588
73	SOLUZIONA	0.01633	238
74	VITRO ENVASES	–0.00633	114
75	EDITORIAL TELEVISA	–0.00625	271
76	HUBARD Y BOURLON	–0.0059	523
77	QUALTIA ALIMENTOS	–0.0055	257
78	CYDSA QUÍMICA Y PLÁSTICO	–0.00502	199
79	TELEVISA, TELEVISIÓN ABIERTA	–0.00498	84
80	TELEVISA INTERNACIONAL	–0.00463	305
81	API DE VERACRUZ	–0.00327	439
82	VILLAS DEL ÁLAMO	–0.00239	566
83	TOSHIBA DE MÉXICO	0.0215	222
84	TERNIUM	0.02159	61
85	GRUPO SANTILLANA	0.02216	403
86	CONTROLADORA MILANO	0.02233	266
87	PEPSICO DE MÉXICO	0.02242	49
88	KRAFT FOODS MÉXICO	0.02247	205
89	VITRO VIDRIO PLANO	0.00006	123
90	WRANGLER DE MÉXICO	0.00085	488
91	ADT SECURITY SERVICES	0.02474	411
92	CINEMARK DE MÉXICO	0.02628	432
93	VISTEON DE MÉXICO	0.02632	278
94	DINE	0.00699	390
95	SCHERING PLOUGH	0.03425	221
96	ERICSSON	0.0357	182
97	COMERCIAL MEXICANA	–0.00173	120
98	SIEMENS EN MÉXICO	–0.07934	95
99	COMPAÑÍA MEXICANA DE AVIACIÓN	–0.07235	87
100	PHILIPS MEXICANA	0.0215	96

Source: Factor analysis results, calculations by the author based on *Expansión* database, "Las 500 empresas más importantes de México", 2006.

Appendix 4: Social Indicators Questionnaire

ESTADO	
DELEGACIÓN/MUNICIPIO	
LOCALIDAD/COLONIA	
Nombre del Encuestador	
Fecha de levantamiento	

Buenos días/tardes. Mi nombre es **(decir el nombre y mostrar la identificación)**. Estamos haciendo un investigación sobre la Ciudad de México para la London School of Economics (UNIVERSIDAD DE LONDRES) ¿Me permite hacerle unas preguntas? sólo será cuestión de unos minutos.

ENCUESTADOR: SOLO ENTREVISTAR A PERSONAS EN EL RANGO DE EDAD 40-60 AÑOS

Intentos para conseguir la entrevista	1	2	3	4	5	6	7	8	9	10

the London School of Economics and Political Science

1. Me podría decir ¿cuantos años cumplidos tiene Usted?

1. Entre 40 y 60 años
2. No está en el rango de edad ***(SUSPENDER ENTREVISTA)***
3. No quiso contestar ***(SUSPENDER ENTREVISTA)***
4. NS / NC ***(SUSPENDER ENTREVISTA)***

EDAD (_____)

2. ¿Podría decirme en dónde trabaja o a qué se dedica actualmente?

1. Sector público o gobierno ***pase a la pregunta 7***
2. Iniciativa privada área administrativa
3. Iniciativa privada área de producción/servicios
4. Tiene negocio propio
5. Trabaja por su cuenta (taxista, vendedor, ambulante...)
6. Profesionista independiente (médico, abogado, contador)
7. Profesor o maestro
8. Trabajador del campo
9. Pensionado o jubilado
10. Ama de casa ***pase a la pregunta 7***
11. Estudiante ***pase a la pregunta 7***
12. Desempleado ***pase a la pregunta7***
13. Otro **(especificar)**_____
14. NS / NC (_____)

3. ¿Sector de la economía?

1. Agricultura y ganadería
2. Caza y pesca
3. Agua
4. Minería
5. Electricidad
6. Petroquímica y gas

7. Alimentos
8. Bebidas y tabaco
9. Textiles
10. Prendas de vestir
11. Calzado y piel
12. Productos de madera
13. Papelería y productos de papel
14. Imprenta y productos editoriales
15. Productos químicos
16. Farmacéutica
17. Jabones y perfumes
18. Productos de plástico y hule
19. Cemento
20. Industria del vidrio
21. Industria del acero
22. Minerales no ferrosos
23. Productos metálicos
24. Maquinaria y equipo no eléctrico
25. Maquinaria y equipo eléctrico
26. Aparatos electrónicos y sus partes
27. Muebles de oficina
28. Equipos de cómputo
29. Software y servicios de cómputo
30. Aparatos electrodomésticos
31. Industria automotriz
32. Industria de partes automotrices
33. Equipo de transporte
34. Equipo fotográfico
35. Construcción
36. Supermercados y comercio al mayoreo
37. Comercio al menudeo
38. Distribución, servicios de almacenaje y transporte
39. Restaurantes
40. Hoteles
41. Servicio de transportes, líneas aéreas y terrestres
42. Telecomunicaciones
43. Servicios inmobiliarios
44. Servicios profesionales
45. Servicios corporativos y de negocios
46. Servicios médicos
47. Servicios deportivos y de recreación
48. Servicios bancarios y financieros
49. Otros (_____)

4. La empresa a la que presta sus servicios es…

1. Empresa nacional
2. Empresa internacional-transnacional
3. NS/NC (_____)

5. El número total de empleados de la empresa en donde labora es de

1. Menos de 50
2. Entre 50 y 100
3. Entre 100 y 500
4. Más de 500

( )

6. En términos de su actividad laboral (o la de su empresa) ¿cuál diría Usted que es la ciudad más importante en México o el extranjero?

_____

7. ¿Podría decirme en dónde trabajaba en 1982 o a qué se dedicaba entonces?

1. Sector público o gobierno ***pase a la pregunta 9***
2. Iniciativa privada área administrativa
3. Iniciativa privada obrero
4. Tiene negocio propio
5. Trabaja por su cuenta (taxista, vendedor, ambulante...)
6. Profesionista independiente (dentista, médico, abogado.)
7. Profesor o maestro
8. Trabajador del campo
9. Pensionado o jubilado
10. Ama de casa ***pase a la pregunta 9***
11. Estudiante ***pase a la pregunta 9***
12. Desempleado ***pase a la pregunta 9***
13. Otro **(especificar)**_____
14. NS / NC (_____)

8. ¿En que sector de la economía (en 1982)? Ver catálogo de pregunta 3

(_____)

9. ¿Hasta qué año estudió Usted?

1. Ninguno
2. Primaria
3. Secundaria / SecundariaTécnica / Técnica SIN Sec.
4. Carrera Técnica CON Secundaria
5. Preparatoria / Bachillerato / Normal
6. Universidad
7. Posgrado
8. NS / NC (_____)

10. En general ¿usted cree que la situación en México va en la dirección correcta o en la dirección equivocada?

1. Dirección correcta
2. Dirección equivocada
3. NS / NC (_____)

11. Y hablando concretamente de su situación personal ¿En general usted cree que está mejor ahora que hace 20 años o antes estaba mejor?

1. Sí
2. No
3. En parte sí
4. NS / NC (_____)

12. ¿Durante los últimos 20 años ha estado en el desempleo en búsqueda de trabajo por más de 6 meses?

1. Si
2. No pase
3. NS / NC (_____)

13. En que año(s) _____

1. NS / NC

14. Recuerda por qué razón

1. Recorte de personal/crisis económica
2. Cerró la empresa/planta o cambió de dueño
3. Cambio de sexenio
4. Problemas personales con el grupo de trabajo
5. Era demasiado trabajo y muy mal remunerado
6. NS / NC (_____)

15. ¿Podría por favor decirme hace cuantos años que vive en la Ciudad de México?

1. Toda la vida he vivido en la Ciudad de México
2. Hace menos de 10 años ***pasar a 15a***
3. Hace menos de 20 años (pero más de 10 años) ***pasar a 15a***
4. NS / NC (_____)

15 a. ¿En qué Estado/país/ciudad donde vivía antes?

1. _____
2. NS / NC

16. ¿Por qué razón se vino a vivir a la ciudad de México?

1. Razones de trabajo
2. Razones familiares
3. NS / NC (_____)

17. Cambiando de tema ¿Cuál diría que es el principal problema a que se enfrenta actualmente usted y su familia?

1. Inseguridad Pública
2. Falta de empleo
3. Precios altos
4. Crisis económica
5. Servicios Públicos (alumbrado, basura, pavimento)
6. Contaminación
7. Corrupción
8. NS / NC (_____)

18. Del 0 al 10 como en la escuela ¿qué calificación le daría al trabajo que está haciendo el Presidente Vicente Fox?

(_____) ....No sabe / No lo conozco

19. Y del 0 al 10 ¿qué calificación le daría al trabajo que ha hecho el Andrés Manuel López Obrador?

(_____) ....No sabe / No lo conozco

20. Pensando en su situación económica ¿cómo diría Usted que ha sido en los últimos seis meses?

1. Muy buena 2. Buena
3. Mala 4. Muy Mala
5. NS / NC (____)

21. Y ¿cómo cree Usted que será en los próximos seis meses?

1. Mucho mejor 2. Mejor
3. Peor 4. Mucho peor
5. NS / NC (_____)

22. Una vez más ¿Pensando en su situación económica cómo diría Usted que ha sido en los últimos 20 años?

1. Muy buena 2. Buena
3. Mala 4. Muy Mala
5. NS/NC (____)

23. Pensando en la situación política de México, ¿Usted diría que la situación actual es tranquila, preocupante o peligrosa?

1. Tranquila
2. Preocupante
3. Peligrosa
4. NS / NC (_____)

24. Independientemente el partido por el que vota ¿Usted se considera Panista, Priísta o Perredista?

1. Panista
2. Priísta
3. Perredista
4. Verdeecologista
5. Petista
6. Otro
7. NS/NC (_____)

25. De los tres partidos más importantes en el país (PAN, PRI, PRD) ¿por cuál de ellos jamás votaría?

1. PAN	2. PRI
3. PRD	4. NS / NC (____)

26. Y pensando en la gestión del Presidente de la República, ¿Usted está de acuerdo con la forma de gobernar del Presidente Fox?

1. Acuerdo 2. Acuerdo en parte
3. Desacuerdo 4. Desacuerdo en parte
5. NS / NC (_____)

27. Y yéndonos hacia atrás, ¿está Usted de acuerdo con la forma en que gobernó Ernesto Zedillo?

1. Acuerdo 2. Acuerdo en parte
3. Desacuerdo 4. Desacuerdo en parte
5. NS / NC (_____)

28. ¿Y está Usted de acuerdo con la forma en que gobernó Carlos Salinas de Gortari?

1. Acuerdo 2. Acuerdo en parte
3. Desacuerdo 4. Desacuerdo en parte
5. NS / NC (_____)

29. ¿Y qué tan de acuerdo está con la forma en que gobernó Miguel de la Madrid?

1. Acuerdo 2. Acuerdo en parte
3. Desacuerdo 4. Desacuerdo en parte
5. NS / NC (_____)

30. Y por último ¿qué tan de acuerdo está Usted con la forma en que gobernó José López Portillo?

1. Acuerdo
2. Acuerdo en parte
3. Desacuerdo
4. Desacuerdo en parte
5. NS / NC (_____)

Ahora le voy a leer algunas afirmaciones. Por favor dígame si usted está MUY de Acuerdo *(1)***, ALGO de Acuerdo** *(2)***, ALGO en Desacuerdo** *(3)* **o MUY en Desacuerdo** *(4)* **con cada una** (ENCUESTADOR: Rotar el orden y repetir opciones cada TRES frases)

31. Pese a las críticas, el gobierno del Presidente Fox es mejor que el que teníamos con el PRI porque está cumpliendo.	1. (_____) 2. NS / NC
32. Hay que reconocer que, dígase lo que se diga, el PRI hizo muchas cosas buenas como gobierno.	1. (_____) 2. NS / NC
33. El Tratado de Libre Comercio con Estados Unidos y Canadá ha generado buenas oportunidades para los mexicanos	1. (_____) 2. NS / NC
34. El Tratado de Libre Comercio ha aumentado la pobreza en que viven millones de los mexicanos	1. (_____) 2. NS / NC
35. El Tratado de Libre Comercio ha hecho que lleguen a México más empresas transnacionales y con ello se han generado nuevos empleos	1. (_____) 2. NS / NC

36. ¿Qué opinión tiene de las empresas transnacionales?

1. Muy Buena
2. Buena
3. Mala
4. Muy mala
5. NS / NC (_____)

37. ¿Y qué opinión tiene de la Bolsa Mexicana de Valores?

1. Muy Buena
2. Buena
3. Mala
4. Muy mala
5. NS / NC (_____)

38. ¿Cuál diría Usted que es la ciudad más importante de México para negocios (nacionales e internacionales)?

1. Ciudad de México
2. _____
3. NS / NC (_____)

39. Pensando en un factor de desarrollo económico ¿cuál diría Usted que es el factor (marcar sólo uno) más importante para el desarrollo económico de una ciudad en el largo plazo?

1. Acceso a proveedores
2. Acceso al mercado de consumidores
3. Aeropuerto
4. Mano de obra calificada
5. Gobierno Federal/Gobierno Local
6. Inversionistas
7. Sistema Bancario
8. Profesionistas independientes (contadores, abogados)
9. Mercado inmobiliario

10. Casa de Bolsa
11. Servicios públicos
12. Fuentes de empleo
13 Ninguno
14 Otro_____
15. NS / NC (_____)

40. Entendiendo el nivel de vida en términos de lo que a una familia le alcanza para comprar con el salario del jefe de familia, ¿Usted diría que en general las familias mexicanas que usted conoce están mejor ahora que hace 20 años o hace 20 años se vivía mejor con el salario del jefe de familia?

1. Antes se vivía mejor
2. Ahora se vive mejor
3. NS / NC (_____)

41. ¿Si el día de hoy fueran las elecciones presidenciales por que partido votaría?

1. PAN
2. PRI
3. PRD
4. PVEM
5. PT
6. Convergencia
7. Ninguno
8. Otro
9. NS / NC (_____)

42. En términos de seguros médicos Usted y su familia

1. No tienen ninguna cobertura
2. Cotizan a algún servicio público tipo IMSS/ISSSTE
3. Cuentan con un seguro de gastos médicos mayores
4. NS / NC (_____)

43. La mayoría de sus hijos asiste a escuelas

1. Públicas
2. Privadas
3. NS / NC (_____)

44. La casa donde habita la mayoría de su familia es

1. Propia
2. Rentada
3. Prestada
4. NS / NC (_____)

45. En términos de vivienda Usted y su familia durante los últimos 20 años…

1. Viven en la misma casa de siempre
2. Compraron una mejor casa
3. Vendieron casa propia y compraron una más barata
4. Vendieron su casa propia y ahora rentan
5. Rentaban una mejor casa y ahora rentan una casa más económica
6. Ahora viven en casa prestada
7. NS / NC (_____)

46. ¿La empresa en donde Usted trabaja importa o exporta algún producto?

1. Sí
2. No

3.NS / NC (_____)

47. En caso de ser así cual país concentra el mayor volumen de intercambios comerciales

1_____
2. NS / NC (_____)

48. Recordará que hace 20 años la inflación era muy alta y había devaluaciones recurrentes. ¿Cómo cree usted que está la economía de México: está mejor que antes, peor que antes o igual que antes?

1. Mejor que antes
2. Igual de bien que antes
3. Igual de mal que antes
4. Peor que antes
5. NS / NC (_____)

49. ¿Qué tan bien habla Usted inglés?

1. Perfecto (bilingüe)
2. Bien
3. Regular
4. Mal
5. Nada
6. NS / NC (_____)

50. ¿Que tan bien maneja Usted el Internet?

1. Perfecto
2. Bien
3. Regular
4. Mal
5. Nada
6. NS / NC (_____)

51. Si tuviera que escoger algo que ha cambiado profundamente a nuestro país en los últimos años qué escogería: ¿el triunfo de Fox, el Tratado de Libre Comercio o el Internet?

1. El triunfo de Fox
2. El tratado de Libre Comercio
3. El internet
4. NS / NC (_____)

52. ¿Comparados con productos internacionales de venta en México, qué tan buenos diría Usted que son el día de hoy los productos mexicanos?

1. Muy buenos
2. Buenos
3. Regular
4. Malos
5. NS / NC (_____)

53. ¿Y con respecto al pasado (hace 20 años) Usted cree que los productos mexicanos de hoy son mejores que los productos mexicanos que se vendían antes o antes eran mejores?

1. Los productos mexicanos son mejores que los de antes
2. Los productos mexicanos son peores que los de antes
3. Los productos mexicanos eran iguales antes que ahora

4. NS / NC (_____)

54. ¿Recuerda cuál era la marca del automóvil familiar de hace 20 años?

1. No recuerda/No tenía
2. _____
3. NS / NC (_____)

55. ¿Recuerda la marca del televisor familiar de hace 20 años?

1. No recuerda/No tenía
2. _____
3. NS / NC (_____)

56. ¿Me podría decir la marca de su automóvil actual?

1. No tiene auto
2. _____

NS / NC (_____)

57. ¿Me podría decir la marca de su televisor actual?

1. No tiene televisor
2._____

NS / NC (_____)

58. ¿Con cual de estas frases está usted más de acuerdo?

1. La globalización económica es una gran oportunidad para el desarrollo económico de la humanidad
2. La globalización económica es una nueva forma de imperialismo y colonialismo
3. NS / NC (_____)

59. ¿Cómo definiría su situación económica actual?

1. Baja 2. Media Baja
3. Media 4. Media Alta
5. Alta 6. NS / NC (___)

60. ¿Cómo definiría su situación económica hace 20 años?

1.Baja 2.Media Baja
3.Media 4. Media Alta
5. Alto 6. NS / NC (___)

HORA DE TERMINO DE LA ENTREVISTA ____ :_____-

FIRMA DEL SUPERVISOR: _____

Appendix 5: List of Interviews

1. Acosta, Jorge. Edelman International. On the service sector and the role of international consulting firms' agglomeration in Mexico City. Mexico City, 29th August 2001.
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