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Political Science

TRADE, PROXIMITY AND GROWTH:
THE IMPACT OF ECONOMIC INTEGRATION ON MEXICO'S REGIONAL DISPARITIES

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A thesis presented by
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Abstract

Trade theories have stressed the importance of international exchanges in producing benefits for the nations involved. However, neo-classical models have not addressed the plausible spatial implications of trade. More recently, the new economic geography has argued that the benefits of trade can be either concentrated in few places or dispersed, subject to the levels of transportation costs. This thesis explores the case of one country to shed light over these theoretical issues.

Mexico followed a development model based on import-substitution industrialisation (ISI) until the mid 1980s. This approach was replaced for an export-led strategy, initially based on trade liberalisation when it accessed the General Agreement on Tariffs and Trade (GATT) and later on membership of the North American Free Trade Agreement (NAFTA). These changes make of Mexico an ideal case to explore the impact of trade liberalisation and economic integration on territorial inequalities.

Patterns of convergence during ISI and of divergence during GATT and NAFTA were identified through σ and β-convergence analyses. The results show that whereas the final stages of the ISI period were dominated by convergence trends, GATT and NAFTA have led to divergence. In particular, economic integration is related to divergence. Regression analyses show that the above transformations have led to greater concentration of economic activity and territorial polarisation. These changes have profoundly altered the factors associated with regional growth, mainly linked to oil exports, migration and distance to Mexico City at the demise of ISI. Most of these variables are less significant in explaining growth after GATT. NAFTA leads to a shift

in the relevant market from Mexico City to the USA and exports are now supported by a dynamic maquiladora industry heavily concentrated in border-states.

The above results are confirmed by the study of two regions. The states selected were Chihuahua in the North and Oaxaca in the South, which depict convergence/divergence trends. The northern state has profited from both trade-related periods, whereas the southern has declined after the opening up of the economy. Although industrialisation in the border is relatively more advanced than in the South, the latter seems to be heading in that direction. However, the type of industrial processes locating in both states could signal greater disparities in the future. The cases also show the emergence of regional and local governments as political actors having greater power in shaping territorial growth and the possibility of an emerging knowledge-based economy.

"Our Knowledge Can Only Be Finite,

While Our Ignorance Must Necessarily Be Infinite"

Karl Popper (1965)

To Cynthia,
The Angel God Sent To Watch Over Me

To Andrés,
The Little Swirl That Snatched My Heart

In God I Trust

To Antonio,
My Strength

To Lucila,
My Refuge

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Javier
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List of Abbreviations and Acronyms

ADE *Acuerdo de Apoyo Inmediato a Deudores/ Agreement for Immediate Support to Debtors.*

APEC *Asia Pacific Economic Co-operation.*

ARIPO *Artesanías e Industrias Populares del Estado de Oaxaca/ Handicrafts and Popular Industries of the State of Oaxaca.*

BANAMEX *Banco Nacional de México/ National Bank of Mexico.*

BANCOMEXT *Banco Nacional de Comercio Exterior/ National Trade Commission.*

BANXICO *Banco de México/Mexico's Central Bank.*

CANACINTRA *Cámara Nacional de la Industria de la Transformación/ National Chamber of the Transformation Industry.*

CEMEX *Cementos Mexicanos.*

CETES *Certificados de la Tesorería/ Treasury Bonds.*

CEPAL *Comisión Económica para América Latina y el Caribe/ Economic Commission for Latin America and the Caribbean.*

CIES *Centro de Información Económica y Social del Estado de Chihuahua/ Centre for Economic and Social Information of the State of Chihuahua.*

CMS *Computer Management Services.*

CNIE *Comisión Nacional de Inversiones Extranjeras/ National Commission for Foreign Investment.*

CONACYT *Consejo Nacional de Ciencia y Tecnología/ National Council for Science and Technology.*

CONAGO *Conferencia Nacional de Gobernadores/ Governors' National Conference.*

CONAPO *Consejo Nacional de Población/ National Council of Population.*

CONASUPO *Compañía Nacional de Subsistencias Populares/ National Subsidised Staple Products Company*

EMU *European Monetary Union.*

EU *European Union.*

FIDEAPO *Fideicomiso para el Desarrollo de las Actividades Productivas del Estado de Oaxaca/ Trusteeship for the Development of Productive Activities in the State of Oaxaca.*

FIDELO *Fideicomiso para el Desarrollo Logístico del Estado de Oaxaca/ Trusteeship for the Logistic Development of the State of Oaxaca.*

FOBAPROA *Fondo de Protección al Ahorro/ Savings Protection Fund.*

FOGAIN *Fondo de Garantía y Fomento a la Industria Mediana y Pequeña/ Fund of Guarantee and Promotion of the Small and Medium Industry.*

FONDEPORT *Fondo Nacional para el Desarrollo Portuario/ National Fund for Port Development.*

FTA *Free Trade Agreements.*

GATT *General Agreement on Tariffs and Trade.*

GMC *General Motor Company.*

GRUMA *Grupo Maseca.*

IDB *Inter-American Development Bank.*

IMF *International Monetary Fund.*

INEGI *Instituto Nacional de Estadística, Geografía e Informática/ National Institute of Statistics, Geography and Information Systems.*

IPAB *Instituto para la Protección al Ahorro Bancario/ Institute for the Protection of Banking Savings.*

ISI *Import-Substitution Industrialisation.*

MERCOSUR *Mercado Común del Sur/ Southern-Cone Common Market.*

NAFIN *Nacional Financiera.*

NAFTA *North American Free Trade Agreement.*

OECD *Organisation for Economic Co-operation and Development.*

PAN *Partido Acción Nacional/ National Action Party.*

PEMEX *Petroleos Mexicanos/ Mexican Oil Company.*

PIPSA *Productora e Importadora de Papel S. A./ Producer and Importer of Paper Co.*

PNR *Partido Nacional Revolucionario/ National Revolutionary Party.*

PRI *Partido Revolucionario Institucional/ Institutional Revolutionary Party.*

PROCAPTE *Programa de Capitalización Temporal/ Temporary Capitalisation Programme.*

PRONASOL *Programa Nacional de Solidaridad/ National Programme of Solidarity.*

PTA *Preferential Trade Agreements.*

QMIB *Quebec Mexico Information Bank.*

RCA *Radio Corporation of America.*

ROO *Rules of Origin.*

SAGAR *Secretaría de Agricultura, Ganadería y Desarrollo Rural/ Ministry of Agriculture, Cattle Raising and Rural Development.*

SAM *Sistema Alimentario Mexicano/ Mexican Food System.*

SARH *Secretaría de Agricultura y Recursos Hidraúlicos/ Ministry of Agriculture and Hydraulic Resources.*

SECOFI *Secretaría de Comercio y Fomento Industrial/ Ministry of Commerce and Industrial Promotion.*

SIEM *Sistema de Información Empresarial Mexicano/ Mexican System of Entrepreneurial Information.*

SPP *Secretaría de Programación y Presupuesto/Ministry of Programming and Budgeting.*

TABAMEX *Tabacos Mexicanos/ Mexican Tobacco Company.*

TELMEX *Teléfonos Mexicanos/ Mexican Telephone Company.*

TRW *Thompson Ramo Wooldridge.*

UDI *Unidades de Inversión/ Investment Units.*

VAT *Value-Added Tax.*

WTO *World Trade Organisation.*

1. The Problem

Faster cultural exchange, ever-improved technologies and planet-embracing communication systems provide the basis for intensified relationships between countries. Increasing economic interdependence is particularly evident when we consider a world of transnational companies enabling an international division of labour, the accelerated dispersion of new technologies and knowledge, as well as the standardisation of production processes. At the core of these global trends is the belief that free trade entails benefits to the nations involved. Trade's relevance is paramount: between 1970 and 1991, world exports as a proportion of gross domestic product (GDP) increased from 10.1 to 15.4 per cent (Markusen et al., 1995). In fact, trade as a proportion of GDP, measured in purchasing power parity (PPP), increased from 21.2 to 28.3 per cent between 1988 and 1998 (World Bank, 2000).

Although traditional trade theory[1] argues that there are basically two types of gains from trade (those of specialisation and those of exchange), the precise link between trade and growth has only recently begun to be addressed. On the one hand, models such as the one developed by Deardorff (1999) have pointed out that per capita income inequalities between nations can increase regardless of the level of trade. Disparities then, are simply the result of diverging populations and the presence of endogenous growth. On the other hand, models that include learning-by-doing and trade in an industrialising economy, as presented in Wong and Yip (1999), argue that the pattern of sustained

[1] Traditional trade theory refers to models based on factor abundance as developed by Heckscher and Ohlin.

growth in a country will be affected by external growth, through trade. This approach allows for the possibility of lagging behind or catching up subject to the level of growth in other countries. Although the debate is still underway, some studies have suggested the existence of a direct relationship between trade and growth. According to the Organisation for Economic Co-operation and Development (OECD), there is evidence of a connection between trade and development progress;[2] open economies achieve greater growth rates while reducing poverty, than those based on closed strategies (OECD, 1999). Since 1970, income growth in open-developing nations has been higher than the average of the OECD, while in closed-developing countries the rate of growth has been slower (OECD, 1999). Moreover, there is empirical evidence that the impact of investing in human capital is not only positive but greater in open economies than in closed ones (OECD, 1999). Despite this evidence, the relationship between trade and growth has not yet been fully explained.

If the relationship between trade and growth has only recently been addressed, the spatial implications of trade have not enjoyed greater fortune. Although concentration of economic activity and specialisation of regions are evident in cases such as the Third Italy (Piore and Sable, 1984), Silicon Valley (Storper, 1997), Route 128 (Saxenian, 1994), the financial districts of London and New York or even Hollywood's film industry (Storper, 1997), the plausible spatial consequences of trade have been overlooked. Ironically, further concentration of economic decisions and the mobility of capital have provided fertile ground for sub-national powers to flourish. On the one hand, financial centres in metropolitan areas –chiefly New York, London and Tokyo– have increasingly concentrated economic decisions (Rodríguez-Pose, 1998). On the other hand, economic

[2] "Development, while closely linked to economic growth, is a much broader notion than growth. It involves a fundamental transformation of society, in which both governments and markets play important roles" (OECD, 1999: 15).

integration and the internationalisation of production have challenged the supremacy of nation-states and have led to the emergence of regional entities as powerful political and socio-economic forces.

Moreover, trade theory verges on location theory. According to Ohlin (1933), to question ourselves the reasons for exchange between countries is tantamount to looking for the underlying motives that lead to certain patterns of production across countries. Trade theory "must be founded upon the general localisation theory; indeed, it consists of a localisation theory which gives special attention to circumstances arising from the existence of a number of countries" (Ohlin, 1933: 243).[3] Although Ohlin himself emphasised the relevance of looking at geographical aspects of trade, the theory has concentrated on other effects such as those on income and factor prices.[4] It was not until the early 1990s that the new economic geography concentrated on linking trade and space. Propelled by the development of new modelling techniques,[5] the theory was able to construct such a new framework. Imperfect competition and increasing returns to scale allow the counteraction of two sets of forces, which produce concentration or dispersion of economic activity subject to the level of transportation costs. The relevance of this core-periphery model[6] is that it provides the theoretical framework to analyse the relationship between trade and geography.

Several questions arise from the above discussion. Is it possible that growth trends are shaped by trade? Furthermore, are territorial inequalities altered by free exchanges among economies? Are the forces considered by the new economic geography, real

[3] The geographical aspect of trade is so important that international exchanges are based on localisation of industry, since "countries are special types of regions" (Ohlin, 1933: 243).
[4] The Heckscher-Ohlin propositions such as the Rybczynski, the Stolper-Samuelson and the factor-price equalisation theorems are discussed in Chapter Two (See also Heckscher, 1919).
[5] Mainly due to the contributions made by Dixit and Stiglitz (1977).
[6] The model is fully described in Chapter Two.

determinants of the transformation of regional inequalities? The present study thus, sheds light on the spatial impact of trade, an area of research that as argued above, has recently gained momentum. However, in attempting to provide answers to the above questions, this research has focused on the territorial transformations of a particular economy: Mexico.

2. The Case

Mexico is an ideal case to explore the impact of trade on territorial inequalities. The country's development has traditionally been marked by policies leading to territorial imbalances. Polarisation has varied according to the economic model followed at any given time by the country. In turn, the model has importantly rested on trade policies, namely those supporting either a closed or an open approach to trade. Mexico attempted industrialisation by substituting imports for domestic production until the mid-1980s when trade was introduced through its accession to the General Agreement on Tariffs and Trade (GATT). More recently, economic integration between Canada, Mexico and the United States of America (USA) through the North American Free Trade Agreement (NAFTA) has provided an additional element to the unique case of Mexico. As will be shown in later chapters, regional growth and, thus, disparities have been profoundly altered by these events.

Similar shifts in trade policies have occurred in Asia-Pacific nations such as South Korea, Latin American countries such as Brazil and the economies in transition of Eastern Europe such as the Czech Republic to name a few. Nevertheless, Mexico is one of the few countries that has not only liberalised its economy but has also undertaken a process of economic integration. It is true that some of the aforementioned cases are also attempting economic integration, as in the case of the Latin American economies that have signed up to the *Mercado Común del Sur* (MERCOSUR). However, Mexico is probably the only case in which the size and degree of development across the integrating economies have, as will be shown in subsequent chapters, played a significant role influencing investment flows, industrial location and regional specialisation. Not only do the three countries integrate the world's largest market, but the inequality in terms of their economic sizes and income have raised important questions on its feasibility, benefits and drawbacks (Venables and Van Wijnbergen, 1993). In fact, NAFTA is the only agreement that includes both developed and developing countries (Bulmer-Thomas, Craske and Serrano, 1994).

3. Research Question and Hypothesis

Based on the above discussion and taking into account changes in Mexico's approach to trade, the present research explores whether freer trade has led to an increase in regional disparities in Mexico. The answer to the research question will provide a contribution to the understanding of the effects of trade on growth and geography. The thesis expects to find confirmation of the hypothesis: the impact of trade liberalisation has been to exacerbate regional inequalities amongst Mexican states.

4. Scope, Sources and Methods

In order to explore the evolution of regional disparities and the pattern of regional growth, as well as changes in the weight of territorial growth determinants, the study examines three periods related to the trade approaches adopted by Mexico. The first period refers to import-substitution industrialisation (ISI), which lasted until the mid-

1980s. Although ISI actually started during the 1930s, the available data limited the integration of the period to its last years (1970-85 for GDP figures and 1980-85 for all other variables). The second period considered is the 1986-93 interval, which featured the trade liberalisation process imposed by accession to GATT. The third period comprises the first five years of NAFTA (1994-98).

Regional inequalities are measured in per capita GDP and its values are provided by official data published by Mexico's National Institute of Statistics, Geography and Information Systems (INEGI/*Instituto Nacional de Estadística, Geografía e Informática*). Other variables are based on the propositions of the new economic geography and on elements of the applicable growth theories. The sources of data for such variables are chiefly official, including figures published by the *Banco Nacional de Comercio Exterior* (BANCOMEXT/National Trade Commission), *Banco de México* (BANXICO/Mexico's Central Bank), INEGI, *Petroleos Mexicanos* (PEMEX/Mexican Oil Company), the *Presidencia de la República* (The Office of the President) and *Secretaría de Comercio y Fomento Industrial* (SECOFI/Ministry of Commerce and Industrial Promotion) amongst others. Empirical evidence is based on calculations made using the above variables and employing Ordinary Least Squares (OLS) techniques.

The approach that this research deploys is interdisciplinary. It is based on economic theories such as those of trade, growth and the new economic geography. It also draws on historical material that provides the background and contextual elements of the case. Finally, it has also involved the use of economic geography, as well as employing the use of descriptive and inferential statistics.

5. Limitations

Several obstacles had to be overcome in order to carry out the research. First, it was necessary to narrow down concepts and simplify the problem. Second, it was also crucial to find appropriate and reliable data. In the case of Mexico this was sometimes hard to accomplish. In what follows, the discussion specifies the ways in which concepts, the definition of the problem and the availability of data limited the scope of the study.

As argued above, traditional trade theory has paid little attention to the plausible geographical implications of commercial exchanges. The possible variations that scholars have applied to trade models include different number of countries, goods, sectors and factors, as well as the type of sector, the intensity at which factors are used and their inherent mobility. Despite the endless combinations of the above modelling elements, the theory has continued to overlook spatial effects. In fact, it is not possible to derive geographical implications from Heckscher-Ohlin-based models. Trade models are based on particular assumptions such as the number of sectors, goods, factors and countries. The theory becomes then casuistic, atomised and fragmented. Thus, the insights emerging over the years from the international trade theory were not applied to this research, limiting the scope and reach of the present study. Furthermore, developing the spatial implications of traditional trade theory was a task that was beyond the reach of this thesis.

In addition, the use of economic growth theory was also curtailed by the availability of data and although that problem is addressed below, it is important to mention in what way the elements of the theory have been partially incorporated to the thesis. As is argued later, the main debate amongst growth theorists lies between those that support the neo-classical view and those that favour endogenous growth approaches. Both theories contemplate capital accumulation and human capital in their arguments. Similarly, both streams of literature argue that growth is also determined by technological advancement. However, endogenous growth theorists postulate that the nature of the latter is endogenous. Neo-classical growth theory views technological progress as an exogenous factor affecting growth, and thus in such models long-run growth is limited by constant or decreasing returns to scale. In contrast, according to endogenous growth theory, technology is an endogenous factor of the model, which also allows for the presence of increasing returns to scale; as a result, long-term growth can be sustained. Empirically endogenous growth theorists have used research and development (R&D) data to include the effect of technology on growth. To take into account elements from the endogenous growth theory in this thesis would have required R&D data at a regional level for all three periods assessed. Unfortunately, such information was not available, which in turn limited the full use of growth theories.

Similarly, the new economic geography rests on the opposing action of two sets of forces, namely, centripetal and centrifugal; the former favouring dispersion, while the latter spurs concentration. Some of the forces, on both sides, were excluded from the analysis, since, once again, data was not available. Although the study incorporates labour mobility, it lacks a measure of capital mobility. Also absent from the study were such variables as congestion costs, since their inclusion required the creation of a special measure to gauge such diseconomies of scale; such an undertaking, however, lay beyond the scope of this thesis.

Data availability has been the most significant obstacle from the outset. As will be argued in Chapters Three and Four, regional GDP levels were limited to some years starting in 1970 and issued usually every five years. Similarly, the analysis presented in Chapter Five was limited not only in terms of the number of years that were available, but also of the aforementioned curtailed measures. What is more, there was also the issue of the reliability of the data used; despite this being officially produced, it contained some flaws that were even often corrected by the issuing institution.[7]

This study is not however, about the social impact of trade policies on Mexico, nor does it aim to provide a theoretical paradigm with which to investigate the relationship between trade, growth and space. It has been an attempt to empirically test the elements contemplated by the new economic geography using the case of Mexico for the reasons given above.

6. Structure of the Thesis

The thesis explores the way in which the elements of regional concentration or dispersion put forward by the new economic geography are appropriate to understand the pattern of regional growth. For the reasons given above, the case chosen to test the theory empirically was Mexico. Thus, the first two chapters of the thesis are devoted to addressing the relevant theoretical issues, as well as to determining the evolution of regional disparities in Mexico. Having a theoretical and a contextual framework in mind, the thesis explores regional growth trends and discusses the differences between trade liberalisation and economic integration; the relevance of such a discussion, as is argued below, lies in the fact that such a distinction is the basis for using three periods in this

[7] For instance, the state GDP for 1993 displays different values depending on the publication that is taken into

thesis instead of a before-and-after-trade scenario. The thesis then goes on to analyse the reasons for growth performance differentials amongst regions. Subsequently, two particular regions were selected to determine the effects of trade policies at a local level, highlighting their growth patterns and location.

Chapter Two explores the theoretical framework outlined above, placing particular emphasis on the interrelations between trade, geography and growth. At the outset, the chapter establishes the reasons for trade and goes on to give a brief account of the classical ideas on trade based on specialisation. Subsequently, the four main models of the neo-classical approach[8] are discussed paying particular attention to the theorems based upon the Heckscher-Ohlin (H-O) model. However, the chapter emphasises that the theory does not address spatial issues and thus its use in the thesis is limited. In contrast, the propositions of the new economic geography are explored, which provides the core elements of theoretical discussion for the study. In order to provide a rounded account of the interrelationships mentioned above, the main ideas on growth are also presented. Finally, theoretical and empirical considerations on convergence are discussed at the end of the chapter.

The historical facts that conditioned the evolution of regional disparities in Mexico are then explored in Chapter Three. This section of the thesis is divided according to the development models and trade policies pursued by Mexico during specific periods. The objective is to explore to what extent certain historical conditions have determined territorial imbalances in Mexico and whether trade liberalisation and economic integration have been associated with an increase in regional inequalities. The chapter

account. Data can be contrasted using INEGI (1997a and 2000)

[8] Namely, the exchange, the Ricardian, the Heckscher-Ohlin and the specific-factors models.

finds that although territorial imbalances have always existed in Mexico, they have been exacerbated by trade liberalisation and NAFTA.

Chapter Four examines the concepts of trade liberalisation and economic integration, analysing in depth the process of liberalisation in the country under analysis and the differences in protectionist methods used by Mexico. The objective is to present the debate on whether trade agreements, in contrast to multilateral trade, violate the principle of efficiency by inducing diversions in the pattern of trade. The relevance of such debate resides in the fact that establishes that trade liberalisation and economic integration are different processes that could entail different results. The chapter also gives a detailed account of the processes of liberalisation with GATT and of integration with NAFTA, demonstrating that both processes have been gradual and that their full impact is yet to be known. Regional growth trends observed throughout the three periods are explored in a subsequent segment. The chapter ends with convergence analyses with the aim of clarifying state growth trends.

The model in Chapter Five was developed blending elements from the ongoing debate on growth with contributions provided by the new economic geography. The model contemplates not only variables stemming from these theories, but also the use of potentially biasing variables such as *maquiladora*[9] activity and oil production. OLS regression analyses were conducted for all three periods and all 32 Mexican states. The objective is to establish the underlying reasons for differences in growth amongst states, which in turn determines regional disparities.

[9] From this point forward, the word 'maquiladora' will not be in italics due to its frequent use.

Chapters Six and Seven refer to cases studies of the states of Chihuahua and Oaxaca that not only provide further evidence of the process of exacerbation of territorial inequalities in Mexico, but also offer insight into local-level transformations brought about by trade policy alterations. The cases were selected based on their geographical location (one from the North and one from the South), as well as on their pattern of growth throughout the periods. The objective is to identify local effects of the transformations observed at a national level. The role of the State, as well as regional and local-level policies are highlighted by the cases, which conform part of the explanation that statistical analyses usually discriminate. Finally, a set of conclusions is presented in Chapter Eight.

Chapter Two
The Spatial Distribution of the Gains from Trade

1. Introduction

Discovering the effect of trade on growth and income is a concern that is far from new. In fact, the first propositions date back as far as Adam Smith and David Ricardo. Thereafter, neo-classical perspectives have dominated the debate. However, the theory had not until very recently addressed growth-related issues, nor has it tackled spatial aspects. On the one hand, "in its present state, trade theory provides little guidance as to the role of trade policy and trade strategy in promoting growth" (Krueger, 1990: 95). In contrast, there is overwhelming empirical evidence indicating important links between trade and growth (Krueger, 1990). On the other hand, in research such as that carried out by Gallup, Sachs and Mellinger (1998), geography emerges as the central piece linking the two. What is more, Frankel and Romer (1999) have argued that the traditionally undetermined direction of the causation between trade and growth is related to the lack of geographical considerations; their results provide evidence to support the positive effect of trade on growth. Likewise, the work by Irwin and Treviö (2000) provides stronger evidence for the Frankel-Romer argument.

Despite such recent empirical findings, neo-classical-based models have not established a clear-cut link between trade and growth, nor do they consider the potential spatial implications of trade. Neo-classical studies have proved effective for determining the pattern of trade, as well as income and factor-price effects. The neo-classical approach can be subdivided into four main models: the exchange, the Ricardian, the Heckscher-

Ohlin (H-O) and the specific-factors models. These models differ in the specification of factors and commodities, as well as in the degree of intersectoral factor mobility that is acknowledged. There are however, some common properties to all neo-classical approaches, particularly the fact that initial endowments can be related to commodity prices and national product. Moreover, a common set of assumptions can be identified (Jones and Neary, 1984). One of the most notorious implications of this approach is the factor-price-equalisation tendency, which is unleashed by exchange in commodities. Heckscher (1919) addressed income-distribution effects through linking changes in factor prices to contractions or expansions of trade. Later on, the Stolper-Samuelson theorem formalised such a relationship. However, the spatial aspects of trade were not taken into account.

During the 1980s, a body of literature called 'new trade theory' or 'strategic trade policy' was developed with the aim of tackling some of the most limiting assumptions made by the neo-classical approach: constant returns to scale, perfect competition and product homogeneity. Although the literature applied some of the new elements developed by Dixit and Stiglitz (1977) to address imperfect markets, geographical aspects were still not addressed by the theory.

However, in recent years a stream of literature called the new economic geography has taken spatiality into account. It pays particular attention to the way in which the interaction of two countervailing forces, namely centripetal and centrifugal, determines the concentration or dispersion of economic activity. In fact, the theory not only deals with localisation-related issues, but also integrates trade into the analysis. One implication of the theory is that territorial divergence could result from reduced transportation/trade costs. However, it also leaves some scope for the equalising possibility.

The chapter initially compares free trade and autarky in order to explore whether there are gains from trade. Thereafter, the neo-classical approach to trade is explored, paying particular attention to the H-O model and related theorems. The most restrictive assumptions of the H-O model are relaxed in the new trade theory section. However, as no spatial implications are found in either theory, the chapter will concentrate on the propositions of the new economic geography. An antagonistic set of factors enables the possibility of further concentration or dispersion of activity, resulting in either convergence or divergence. In order to explore, later in the thesis, the patterns and determinants of regional growth in Mexico, this chapter will outline the main growth theories. Finally, some considerations on convergence and divergence are put forward in light of the theories explored in the chapter.

2. The Reasons to Trade

Trade supporters argue that the free flow of goods increases welfare. Improvement of welfare conditions is spurred through a more efficient allocation of resources stemming from the specialisation of production. Furthermore, increased competition will result *ceteris paribus*, in lower prices, enabling greater consumer benefit, which is typically measured through the consumer's surplus (Varian, 1992). Similarly, free trade will offset the negative effects that tariffs and other barriers to exchange introduce by producing inefficiencies such as deadweight losses; more precisely, an inefficient and unproductive allocation of resources. In fact, overall welfare is somewhat improved by trade (Markusen et al., 1995). Nevertheless, not all individuals will necessarily benefit from trade, since uneven distribution of the gains is possible. In other words, the gains-from-trade theorem[10] shows that the economy as a whole is better off than in autarky; yet, as will be explained below, some room is left for winners and losers with the emergence of trade.

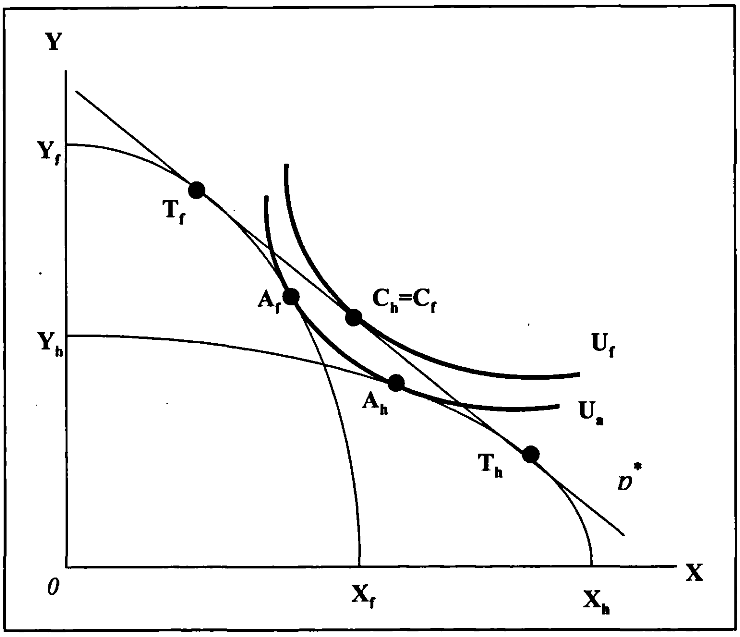
Free Trade Versus Autarky

Consider Figure 2.1 in which two Production-Possibility Curves (PPC) concave to the origin are displayed; one for the home country (h) and another for the foreign country (f). Under autarchic conditions, maximum production combinations (between goods X and Y) for both countries are displayed at points A_h and A_f[11]. The price ratio at which the two countries trade is represented by the p^* straight line. Similarly, Ua and Uf depict utility functions for autarky and free trade respectively. Since an autarchic economy implies that foreign production does not enter the domestic market, the utility function efficiently achieved by autarky will necessarily lie tangent to the PPC. Alternatively, regardless of the price ratio between domestic and foreign prices under free trade, the utility function delivered by the absence of barriers to trade will always lie above the utility function of autarky, which, in turn, means a higher level of welfare is implicit with free trade. In Figure 2.1, the utility function reached by the exchange (U_f) allows the two countries to achieve consumption point C while producing at points T_h and T_f. Despite the specific characteristics of an economy, trade will always deliver a higher level of welfare than remaining in autarky (Markusen et al., 1995).

[10] ***The gains-from-trade theorem:*** Suppose that the value of production is maximised at free trade prices. Then the value of free trade consumption at free trade prices exceeds the value of autarky consumption at free trade prices. The free trade consumption bundle must thus, be preferred to the autarky bundle, because if it were not, consumers would pick the cheaper autarky bundle (Markusen et al., 1995).

[11] In autarky, efficiency and clearing market conditions imply equal levels of production and consumption.

Figure 2.1: Gains from Trade



The above graphic analysis can also be expressed formally. Let subscripts t and a, denote, as above, conditions of free trade and autarky respectively; in turn, let p and c correspond to production and consumption. In a two-good scenario, the above figure shows that the value of free-trade production, at free-trade prices (p*) must be higher than that of autarky:

$$p_x^* X^t_p + p_y^* Y^t_p > p_x^* X^a_p + p_y^* Y^a_p \qquad \text{(Equation 2.1)}$$

The Gains-from-trade theorem will ensure free-trade consumption is preferred to that of autarky. Balance-of-trade constraints under free trade and market-clearing conditions in autarky will ensure that production quantities exhibited in Equation 2.1 are transformed into consumption ones:

$$p_x^* X^t_c + p_y^* Y^t_c > p_x^* X^a_c + p_y^* Y^a_c \qquad \text{(Equation 2.2)}$$

Moreover, Samuelson (1939) showed that the gains from trade are possible even under restricted trade, as long as free-trade prices diverge from autarky prices; that is, any other relative prices produce benefits compared to autarky prices. What is more, it can be argued that the more the prices diverged, the greater the benefits (Samuelson, 1939; Kemp, 1962). Both Samuelson (1939) and Kemp (1962) showed that gains from trade are possible for large and small economies (Corden, 1984).

However, the gains from trade are not necessarily distributed evenly amongst all members of a society. In fact, it is possible that they might benefit some groups, while worsening the situation of others; that is, not delivering a Pareto optimum. One of the reasons for such possibility lies in the fact that a society does not exhibit homogeneous tastes. The relative price of one of the commodities (in a two-good model) is raised when trade is introduced, a feature that eventually promotes specialisation. By distinguishing preferences, the reduced availability of the relatively more expensive good would worsen the situation for individuals choosing a bundle constituting relatively more of those goods. The result is an uneven distribution of the gains. A second way to achieve an uneven distribution of trade benefits is by differences in endowments, or better, as stated by Heckscher (1919), by a non-uniform distribution of factors of production amongst individuals. Trade induces changes in relative prices, which bring about specialisation. The implied shift in the production of one of the commodities (again, in a two-good model) would raise the demand for, and consequently the price of, the factor employed intensively in the production of the good favoured by specialisation. Unequal factor prices imply a worse-off situation for the less intensively used factor. As will be explored below in relation to the Stolper-Samuelson theorem, income-redistribution effects may emerge based on endowment differences in society.

Two Types of Gains

The benefits from trade can be, for analytical reasons, divided into gains from exchange and gains from specialisation (Smith, 1784). The former recognises that differences in endowments or preferences can lead both parties to profit from trading with each other. The latter refers to the fact that specialising in a narrow range of activities results in efficiency.[12] In that sense, specialisation is related to Ricardo's idea that a pattern of comparative advantage exists regardless of an absolute advantage of one country over another in all goods.

International trade theory shows, using Figure 2.1 and Equations 2.1 and 2.2, that there are, in fact, gains from trade. Similarly, models developed using neo-classical approaches such as the H-O model consider that the initial endowment of factors of production can determine benefits from trade for the parties involved. However, the assumptions underpinning such model are rather restrictive. Amongst the more limiting are: perfect competition, constant returns to scale, homogeneous preferences and perfect mobility of factors of production. The next section will focus on developing the neo-classical ideas by presenting basic principles of the four models mentioned above.

3. Neo-classical Approaches to Trade

Trade theory has its roots in Adam Smith's consideration that the main condition for growth is a division of labour induced by trade (Evans, 1989). It is the possibility of exchanges that spurs people to specialise in certain activities, improving productivity to

[12] The standard of living of everyone will be much lower if every person produced their own food, made their own clothes or built their own houses; similarly, countries can benefit from specialisation (Markusen et al., 1995).

exchange the product of one man's labour for that of another. Thus, exchange is the ultimate motive for specialisation and division of labour. In the same way that individuals do so, nations specialise and exchange on the basis of a division of labour. According to Smith (1784), trade is driven by absolute advantage; to be precise, a country will export the commodities in which it has an absolute advantage. However, Ricardo (1817) takes the analysis further by stating that trade is determined by comparative rather than absolute advantage; specifically, relative factor productivities shape trade. Trade will be beneficial to both countries concerned as long as there are productivity inequalities across countries and goods (Ricardo, 1817). However, the comparative advantage notion has not succeeded in explaining factor-productivity discrepancies between countries and goods. That is, the source of comparative advantages remained unclear.

Neo-classical Models

Thereafter, neo-classical ideas have tried to explain the source of comparative advantage. However, the theory can be regarded as eclectic, since a variety of models are used, each one suited to a limited, but no less important set of questions (Jones and Neary, 1984). Within the neo-classical perspective, four models can be distinguished: the exchange, the Ricardian, the Heckscher-Ohlin (H-O), and the specific-factors model. However, it could be argued that the first model is actually a simplified version of the Ricardian, while the last one can be regarded as a variant of the H-O.

The exchange model ignores the production process and concentrates on the demand-side effects of trade.[13] The problems tackled by the model are related mainly to stable equilibrium and the effect of exchange on the terms of trade, which are solved by isolating demand effects to find that both are related to income (Samuelson, 1952). Nevertheless, the model suffers from a complete failure to acknowledge supply-side effects. In addition, the hampered mobility of factors of production and the rigid assumption of having specific factors dedicated to single-production structures seriously limit the model's scope.

The Ricardian and the exchange models consider contrasting conditions. While the latter assumes fixed-sectoral factors and thereby omits the possibility of resource transfer, the former allows for perfect factor mobility. In fact, the emphasis on demand-side questions placed by the exchange model is reversed here, since the Ricardian model focuses on production changes induced by trade, without overlooking demand-side influences. The Ricardian model is a useful scheme to pinpoint technology asymmetry and uneven-scale production between countries (Jones and Neary, 1984). As mentioned above, the model predicts benefits from trade stemming from specialisation based on comparative advantage.

Of those models based on the neo-classical approach, the H-O model is the most frequently used. Moreover, the importance of the H-O model eclipsed the emergence of the specific-factors model (Jones and Neary, 1984). The basic H-O model incorporates elements left out by the Ricardian model. The former expands the number of factors of production to two, instead of one contemplated by the latter. The

[13] It considers two sectors where two goods are produced with a distinctive and specific factor; thus, it does not allow for factor migration across sectors. Although disregarding the supply side may appear to be rather restrictive, it is a useful vehicle to study demand-behaviour problems (Jones and Neary, 1984).

inclusion of an additional factor of production allows for differences in factor-proportion utilisation across countries and industries. Countries vary in their endowments of factors of production, but not in technologies.[14]

From the H-O model, scholars have derived four theorems: the Stolper-Samuelson, the Rybczynski, the Heckscher-Ohlin and the factor-equalisation theorems. As discussed earlier, the Stolper-Samuelson theorem examines the effect of trade on both, factor prices and income distribution. Liberalisation of trade raises the relative price of the factor used intensively, while reducing the price of the other (Kenen, 1994). The shift in factor prices is greater than that experienced in commodities.[15] Income distribution effects can be deduced by observing that the abundant factor will have a greater bearing on national income than the one that is scarce.

The Rybczynski theorem explores variations in output resulting from factor-endowment changes. If prices are constant, an increase in the endowment of only one of the factors will increase the output of commodities that intensively use that factor and will reduce the production of commodities that intensively use the other factor (Evans, 1989). The reason for the necessary contraction in capital-intensive production is the fact that even the labour-intensive industry needs a proportion of capital.[16]

The H-O theorem presents the possibility that patterns of comparative advantages and trade are determined by differences in factor endowments (Markusen et al., 1995). It

[14] The implication of this is that according to the H-O theorem, if the production of a particular commodity is capital intensive in one of the countries, it will be assumed that identical technologies must also be capital intensive in the other country (Yarbrough and Yarbrough, 1988).
[15] The reason for the magnified effect on labour demand stems from the fact that a unit of labour-intensive production will require more labour than a unit of capital-intensive output. Thus, real wages will rise, whereas real returns to capital will fall. The result will be the opposite if capital-intensive production is considered.

states that a country will export the commodity that intensively uses the relatively abundant factor, while it will import commodities supplied by the industry that intensively employs the non-abundant factor (Leamer, 1984; Suranovic, 2000). Trade flows will continue until the prices of the two goods are equalised in both countries.

According to the factor-price equalisation theorem, each country will supply one distinctive good, which in turn is produced making intensive use of the abundant factor. Free trade allows the exchange of, and thereby an increase in the demand for, the good produced with the abundant factor, which, in turn, raises its price. In contrast, the price of the non-abundant factor falls;[17] hence factor prices are equalised. In fact, exchange in commodities is a substitute for factor mobility across countries, since the equalisation of their prices is achieved (Salvatore, 1983). Furthermore, trade and factor mobility are substitutes for one another (Mundell, 1957).

The minimal version of the specific-factors model contemplates two sectors; in addition, one of the factors of production (typically capital), is considered specific to a particular industry.[18] Although the assumptions of this model differ from H-O in just this respect, the properties of the two models can be contrasted. First, a change in the relative price of one of the commodities brings about an increase in output of that good, which in turn employs more labour. It follows that wage rates must raise relatively less than commodity price increases. By way of contrast, the returns on both industries' specific factors rise relatively more than the increase in commodity prices. In

[16] With the endowment of capital held constant, the only way to obtain additional capital, which will enable the labour-intensive industry to take advantage of the expanded labour force, is through the release of capital from the capital-intensive industry (Yarbrough and Yarbrough, 1988).
[17] When no extraordinary profits are made from the production process, as in perfect competition, the price of the good is comprised of factor payments. If there is an increase in the price of a particular commodity, this will be transferred to factor prices.

such a case, capital returns will be greater than labour returns, which will eventually entail a redistribution of income. Second, a change in factor endowments has an ambiguous effect on wages. The returns to labour are reduced first by the labour-force growth, while they are raised by the endowment of either specific factor. With more factors than commodities, in the specific-factors model, trade does not lead to absolute, but rather to partial factor-price equalisation (Jones and Neary, 1984).

Extensions of the H-O Model: Relative Equalisation

The two-goods-two-factors-two-countries model explored up to this point, was not the original idea behind Heckscher and Ohlin's work. In fact, "the two-factor assumption especially deviates sharply from the original Heckscher-Ohlin theory. These theories assumed many factors right from the beginning" (Harbeler, 1977: 3). The basic model has been used as an effective illustrative example. What is more, factor of production "does not refer simply to the broad categories land, capital, and labor but to the different qualities of each of these. The number of factors of production is thus practically unlimited" (Heckscher, 1919: 48). To put it another way, "labour and capital are not homogeneous masses, but can and have to be subdivided in various ways" (Baldwin, 1972: 142).

Instead of considering two goods as in the models above, an alternative could be to regard them as groups of goods such as manufactured commodities or agricultural produce. If more than two goods are introduced factor-intensity ratios could produce non-unique results. That is, in the ranking of factor-intensity ratios the country well-

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[18] A factor can be industry-specific if it was specifically designed in the case of capital – or specifically trained in the case of labour – to be used in a particular production process. Thus, it could be impossible or at least costly, to move across industries.

endowed with capital will export capital-intensive goods and the relatively labour abundant will export labour-intensive commodities, but some indeterminacy will emerge with respect to the third good which has a relatively intermediate composition of capital. In other words, the second term in Equation 2.3 would yield an undetermined result.

$$Ky/Ly > Kz/Lz > Kx/Lx \qquad \text{(Equation 2.3)}$$

It is possible that as a result of having a third factor, the capital-abundant country could export capital or labour-intensive commodities, or even production with intermediate levels of capital intensity (Markusen et al., 1995). Therefore, "results such as those given by the Stolper-Samuelson theorem and the Rybczynski theorem, which make use of bilateral comparisons, do not easily generalise to higher dimensions" (Markusen et al., 1995).[19] Moreover, the two theorems are not easily generalised when the more-goods-than-factors case is taken into account; as a result, "there are only very restrictive or weak generalized propositions to test or to apply" (Flam, 1981: 19). A model of this kind (two-good, three factors of production with mobility) was presented in Jones and Easton (1983), showing that the extent to which substitution between the middle factor and the other two is the key determinant of output and factor prices. However, as long as the number of goods equals the number of countries, the main results of the H-O model – including the factor-price equalisation theorem – will hold.

In the so-called 'even' case, an equal number of factors and goods would yield a variety of results related to the Stolper-Samuelson-theorem generalisation (Jones and Neary, 1984). In a different vein, Ethier (1974) has argued that less restrictive assumptions regarding technology, would result in stronger evidence for supporting the 'even' case, as long as all factors are used to some extent (Jones and Neary, 1984). However, the 'even' case is a particular scenario and altering the balance can yield very different results. On the one hand, a model comprising more factors than commodities would increasingly approach factor-price equalisation, to the extent that commodities, the prices of which fluctuate freely, are reduced. On the other hand, a greater number of commodities than factors, as mentioned above, would bring about production indeterminacy, which in turn will be resolved by allowing specialisation or by introducing non-supply-side considerations (Jones and Neary, 1984).

Trade theory becomes then, a casuistic theory replete with exceptions and assumptions. Indeed, "the picture which emerges is that of a mosaic of interrelated, overlapping and occasionally conflicting theories and models, each applicable to certain situations" (Harbeler, 1977: 10). It is no longer easy to generalise results in terms of factor prices, income and trade patterns in light of different goods-factors proportions and when including n-number of countries. In fact, the Heckscher-Ohlin theorem "is valid only in the highly abstract environment of the two-factor, two-good, two-country model that has been the mainstay of trade theory for half a century" (Deardorff, 1982: 683). According to Deardorff (1982), the H-O-theorem proof, employing factor content of trade for any number of factors, goods and countries, has resulted in additional restrictive assumptions. One of them is the absence of factor-intensity reversals; that is, the possibility that a particular industry finds it relatively easier to substitute capital for labour without altering its production levels. An approach adopted by some scholars has been to address limited questions in the context of general models, rather than the opposite, which as explained above, becomes restrictive.

[19] This requirement has been known as the Heckscher-Ohlin-Vanek theorem or the factor-content theorem.

Other extensions of the neo-classical model allow for geographical mobility of factors; the result is, again, an equalisation of factor prices. However, it is worth mentioning that these extensions are based on a more relative equalisation than the absolute proposition forwarded by the factor-price equalisation theorem. Accordingly, the less restrictive assumption of a tendency towards (rather than actual) equalisation can be labelled the 'relative factor price convergence' (Wood, 1994). Consequently, whether an absolute or a relative equalisation is taken into account, the resulting proposition is that an eventual convergence of factor prices results from trade. Finally, none of the neo-classical models explored in this section directly addressed spatial considerations. Although the issues of income and factor prices discussed above are related to space, they are not directly linked in the theory. Thus, in the effort to connect trade theory and spatial transformations, it seems that the most the neo-classical models have done, as is explained below, has been to acknowledge the intimate relationship between trade and the location of activity.

Factor-Price Equalisation, Location and Income Convergence

Trade allows countries to exchange the commodities that they produce. Factor-endowment effects on comparative advantage, as discussed earlier, determine specialisation of production and exchange. Such endowments differ both across countries and within countries. Therefore, trade theory, at least implicitly, refers to the location of production (Johnson, 1981). Moreover, trade theory verges on location theory; questioning the reasons for exchange between countries is tantamount to looking for the underlying motives for a certain array of production between countries (Ohlin, 1933). However, neo-classical theory has not explicitly tackled localisation-related issues, nor has it addressed the question of geographical convergence of income.

The sole premise postulated by the factor-price equalisation theorem is that there is an eventual convergence of factor prices across countries. Thus, the neo-classical theory signals the possible relationship between trade and geography, but it has not yet devised any framework to analyse such aspects.[20] In light of the lack of spatial insight gained in the most prominent theory of trade, this section turns to a brief exploration of more recent developments.

New Trade Theory

As argued above, trade theory has undertaken the analysis of particular questions with variations of general models. Moreover, as argued by Brander (1995), traditional trade theory could not explain some real-world phenomena such as intra-industry trade or exchange between similar countries. Therefore since the 1980s, international trade economists have begun to introduce imperfect-competition features such as oligopoly, in order to address the situations discussed above. Neo-classical models also have failed to incorporate considerations such as increasing returns to scale and research and development (R&D), amongst others (Brander, 1995). New trade theory or strategic trade policy, as it is often known, has employed models featuring increasing returns to scale, imperfect competition and product differentiation as seen in Krugman (1980), Venables (1987) and Helpman and Krugman (1989), to try to respond to some of these questions. Similarly, it has addressed real-world phenomena, such as the increasing role played by multinational enterprises, as in Markusen and Venables (1995). The central argument is that intervention can alter interaction amongst oligopolistic firms; thus,

[20] It might appear that the revision of traditional trade theories is largely irrelevant. However, as the theory predicts liberalisation leading to specialization based on a country's comparative advantage and since industry is not localised evenly across regions, trade will bring about different impacts for different regions. Although this type of analysis is not possible for all regions in Mexico, since it implies a third data dimension (variables, regions and sectors), the cases analysed later in the thesis use this theoretical standpoint and data on effective rates of protectionism.

government interaction is used to maximise national welfare. It is not the intention of this chapter to give a thorough review of this stream of literature, but simply to indicate that neither the neo-classical theory nor the new trade theory have addressed the spatial issues examined in this chapter. Nevertheless, the recent emergence of a new body of literature that focuses explicitly on geographical aspects has resulted, as is explored below, in a formal attempt to link trade theory and economic geography.

4. The New Economic Geography's Core-Periphery Model

The Assumptions

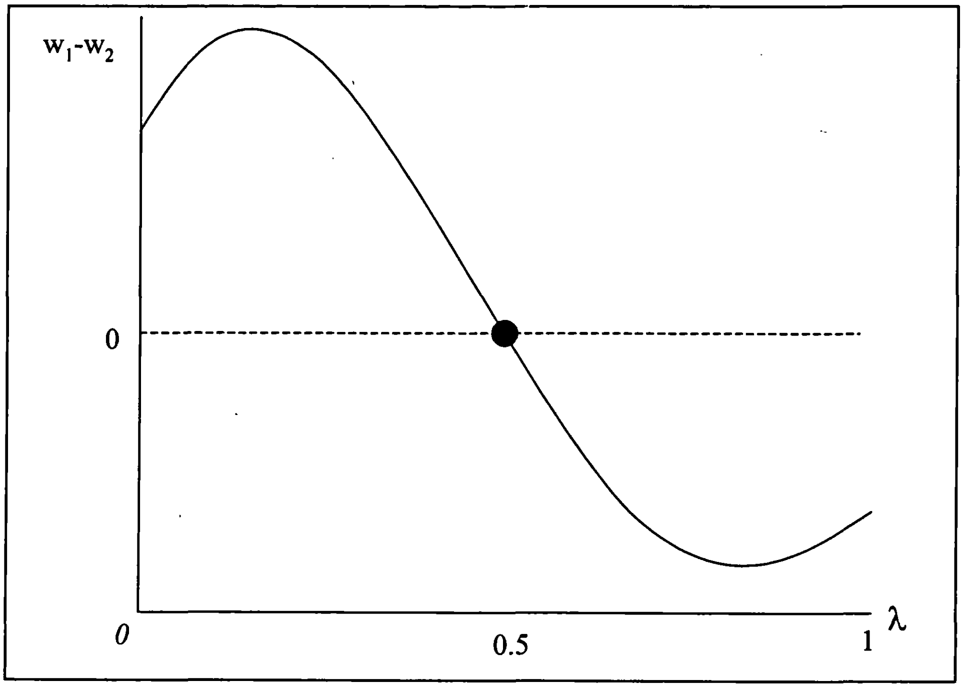
The basis for dealing with increasing returns to scale is provided by the framework developed by the Dixit-Stiglitz monopolistic competition model. Spatial versions of the model have been developed and are being included in the new economic geography literature (Krugman, 1991a and 1992; Krugman and Venables, 1995; Fujita, Krugman and Venables, 1999). Although there are extensions of the model, which relax some of the assumptions presented below, initially the two-regions-two-sector model assumes that manufacturing faces imperfect competition, whereas agriculture operates under no market distortions, as is the case in Krugman (1991c) and Krugman and Venables (1995). Labour is the only factor employed by both sectors, and its endowment is the product of an exogenous and fixed supply. Although that is not the case later on when trade is introduced, for now, manufacturing-employed labour is mobile over time.

Up to this point, the model appears to be a combination of the one-factor Ricardian model and the relevance of endowment considered by H-O model. Nevertheless, it is novel at least in that it introduces imperfect competition in one of the sectors.

Furthermore, the introduction of transport costs is central to the story (Krugman, 1998). Using iceberg transport costs as first presented in Samuelson (1954), the model assumes that a part of the production in manufacturing to be exchanged between regions simply melts away in transit. However, at least initially, the transportation of agricultural production is assumed costless. In addition, agricultural wages are the same in both regions since its production exhibits constant returns to scale and can be transported freely. It is assumed that workers move towards the region that offers higher real wage rates.

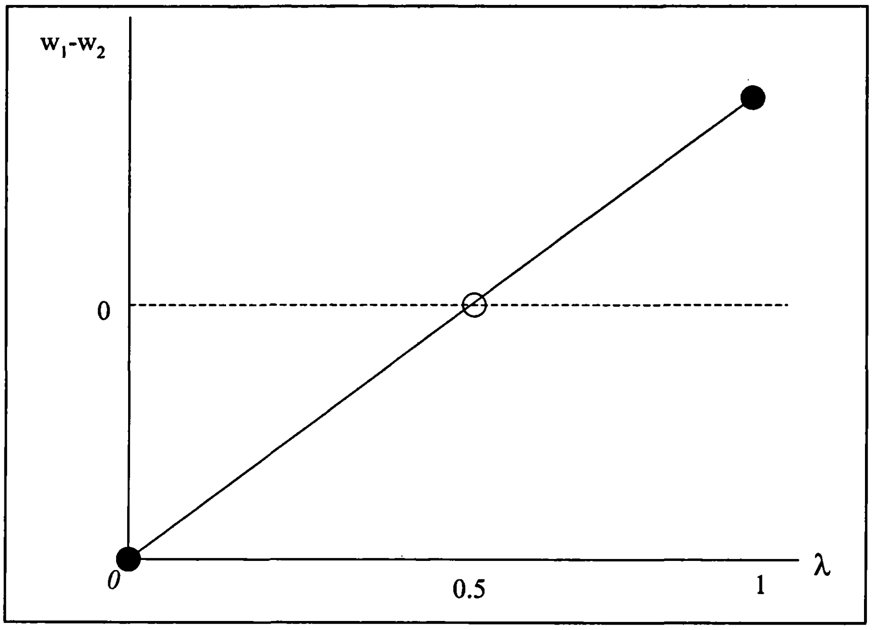
The Model at Work

Figure 2.2: Equilibrium with High Transportation Costs



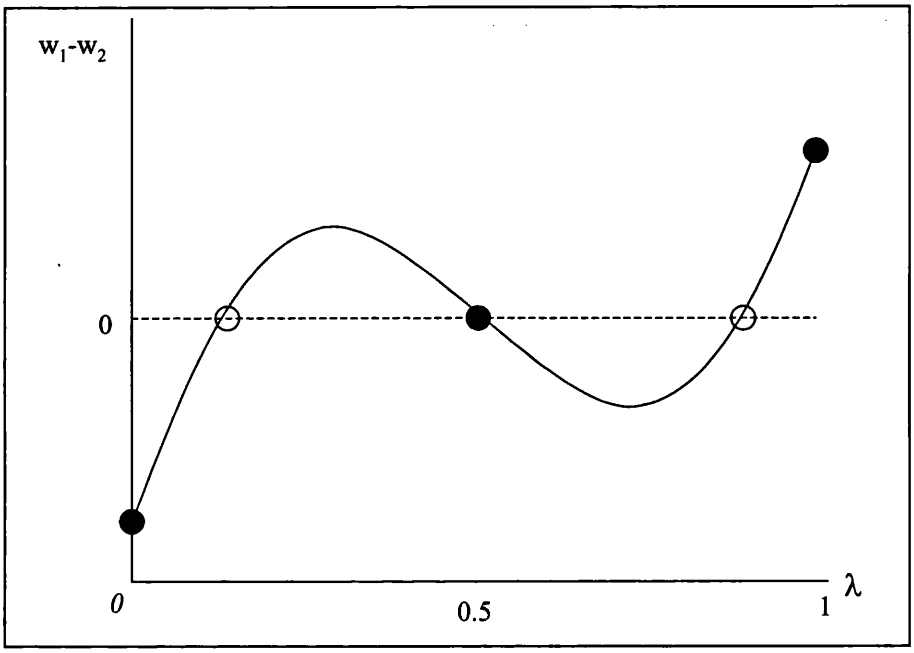
Let us consider that the agricultural labour force is evenly distributed between the regions. There are different equilibria arising from the model, depending on the level of transportation costs. For high-level transportation costs there is a single and symmetrical equilibrium, as shown in Figure 2.2. Manufacturing employment (represented by λ) is evenly distributed between the two regions and wage (represented by w) differentials are zero. The reason for this is that the regional differential of wages is negative for the region that has more than half the manufacturing labour and positive for the region that has less; thus, workers will migrate to the region with the highest wage level increasing its share and equalising factor prices once again.

Figure 2.3: Equilibria with Low Transportation Costs



By contrast, when transport costs are low, production will concentrate in either of the two regions, as in Figure 2.3. There is now an incentive for firms to locate close to each other and produce for both regions; thus, backward and forwards linkages[21] act to establish agglomeration. The higher the manufacturing share of a region the higher wages it will offer, which in addition to the lowered prices induced by the wider variety of products available from the locally agglomerated industry, will produce further concentration. Although the symmetric equilibrium is still possible, it is unstable; that is, as soon as there is a slight disparity in the size of the two regions' manufacturing shares, the above-described concentration process will be set in motion.

Figure 2.4: Equilibria with Intermediate Transportation Costs



For intermediate levels of transport costs, a five-equilibria scenario as depicted in Figure 2.4 emerges. The symmetric equilibrium is stable, but it is flanked by two other unstable equilibria; if the manufacturing employment share starts from a sufficiently high or low level, concentration will take place (Krugman, 1992 and 1998; Venables, 1993; Fujita, Krugman and Venables, 1999). The concentration outcome resulting from lowering transport costs to either intermediate or low levels is recognised by the theory as the core-periphery pattern. Such a pattern is sustainable when a certain transport cost value has not been reached. However, that value can vary depending on the elasticity of

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[21] Advantages for firms that choose to locate near to each other to gain access to larger markets and supplies

substitution amongst manufacturing varieties; the core-periphery critical value can be stretched by elasticity increases, and be shrunk by decreases. Likewise, a large manufacturing sector will extend the range of values that sustain agglomeration, whereas a small one will reduce it (Krugman, 1991b; Fujita, Krugman and Venables, 1999).

Extensions of the Model: Relaxing the Assumptions

From the model described here, it can be observed that agglomerations are the product of the interaction of economies of scale at the level of the firm, transport costs and factor mobility. There is also a notable tension between centrifugal and centripetal forces, namely linkages and factor immobility respectively (Fujita, Krugman and Venables, 1999). However, some of the assumptions upon which the core-periphery model is based restrict its efficacy.

Extensions of the model include the expansion of the number of regions considered in the analysis, as well as the introduction of agricultural transport costs. The inferences of the original model are virtually unchanged. First, the introduction of additional number of regions results in a symmetric equilibrium with high transport costs, concentration with low costs, as well as concentration and symmetrical equilibria arising from intermediate levels.

Second, the introduction of iceberg costs in agriculture has two distinct effects, caused by the fact that wages and prices in the sector are no longer equalised. On the one hand, the region with higher agricultural wages is able to attract more manufacturing through

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(Fujita, Krugman, and Venables, 1999).

its enhanced income. On the other hand, the higher prices of agricultural products in the region lead to labour out-migration. The tension between these two effects will determine whether agglomeration or equalisation is attained. However, the essential implications of the model are again unchanged. Low transport costs will favour the core-periphery pattern. Intermediate levels, although with a reduced range of transportation costs, still allows agglomeration. High transportation costs again support a symmetrical division of labour. Nonetheless, the level of transportation costs at which agglomeration takes place is influenced by such parameters as the size of the manufacturing sector and the elasticity of substitution amongst manufacturing varieties. In the case of the former, a higher share of mobile workers through greater demand levels fosters backward linkages that in turn enable the emergence of concentrations. The latter has the opposite effect, higher levels of substitution reduces the range of values at which agglomeration is sustainable (Fujita, Krugman and Venables, 1999).

The Underlying Factors in the Model

The core-periphery model allows the new economic geography to predict equalisation or concentration based on the tension between centripetal and centrifugal forces, as well as on the interaction between increasing returns to scale and factor mobility when transportation costs vary. The two underlying factors of the model are the presence of increasing returns to scale and factor mobility, since they represent the basic structure upon which the model operates.

The existence of increasing returns to scale makes it profitable to locate production in few sites; hence, a supply-side incentive for concentration emerges. In addition, factor mobility provides a demand-side incentive that encourages the process of agglomeration

(Krugman, 1979). Transportation costs play a more active role in determining the outcome. Indeed, different levels of transportation costs, as argued above, can produce either concentration or equalisation. In addition, due to transportation costs, the best locations turn out to be the ones with access to the market and other firms that can provide intermediate goods. Such backward and forward linkages attract producers and mobile factors to the agglomeration (Krugman, 1992).

Centripetal Versus Centrifugal Forces

While comparative advantage, stemming from factor endowment differentials and non-homogeneous technologies, is important, so too is specialisation, which is driven by external economies and firm-level increasing returns to scale (Krugman, 1993). Moreover, external economies are shown to be more important than increasing returns. In addition, the perfect competition scenario is abandoned in favour of an imperfect competition scheme allowed by monopolistic competition models (Spence, 1976; Dixit and Stiglitz, 1977). Such external economies are typically backward and forward linkages that arise from firms' closeness to the market and suppliers respectively. Therefore, an analysis of the way in which these work, as well as the elements operating against them, is of paramount importance.

Based on ideas developed by Marshall (1920), we can identify a core-periphery pattern that fosters not only a concentration of manufacturing in successful regions in the centre, but also a periphery that supplies agricultural goods to the core (Krugman, 1991a). The reasons for the conformation of such agglomerations are identified by Krugman (1991a) as: pecuniary externalities, rather than the purely technological ones implied by Marshall (1920); proximity to large markets, to reduce transportation costs;

and the existence of a pooled labour market. The main departure from Marshall's ideas intended by Krugman (1991a) is that the explanation for concentration patterns, and thereby disparities amongst regions, lies in the relation between core and periphery regions. Pecuniary externalities are associated with demand or supply linkages rather than just with technological spillovers. In fact, the distinction between backward linkages, which influence firms to locate near the market, and forward linkages, which represent supply forces that attract firms to locate close to each other, is the essence of Krugman's approach to external economies (Venables, 1998).

On the other hand, centrifugal forces have been identified as being: immobile factors; land prices or commuting; and congestion or other pure external diseconomies (Fujita, Krugman and Venables, 1999). However, for the sake of simplicity in the core-periphery model only two forces have been included thus far. The models considered by the new economic geography typically regard backward and forward linkages as the centripetal forces and factor immobility as the centrifugal one (Krugman, 1991a, 1991b and 1992; Fujita, Krugman and Venables, 1999).

Historical Accident Versus Self-fulfilling Expectations

There is an additional factor, which can be best summed up by a question: If the core-periphery pattern emerges due to the interaction of the above-mentioned elements, what region will become the core? The most logical answer is that region that manages to achieve a head start. However, this is not necessarily the case, since someone's prospects can generate a process where factors start to behave according to expectations; that is, in the manner of a self-fulfilling prophecy (Krugman, 1991c). Therefore, expectations can reinforce the role of history or can actually produce the rise or fall of urban centres and other agglomerations. In fact, expectations can reverse a historically determined situation only if the costs are offset by the discounted future value of the benefits (Krugman, 1991d). However, in reality factors will hardly move quickly enough to offset history; expectations can at most reinforce the effect of history (Krugman, 1991c and 1991d). Moreover, concentrations depend on initial conditions, since under increasing returns to scale history matters (Krugman, 1979). Increasing returns are an incentive for production to locate in few sites, which leads to the already-described process of agglomeration, which will in turn be influenced by history and expectations (Krugman, 1991b).

Introducing Trade in the Core-Periphery Model

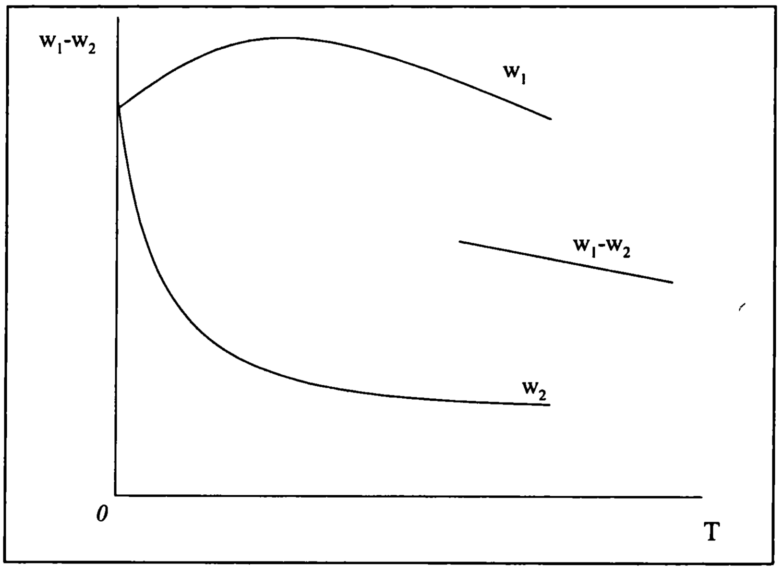
Until now, the core-periphery model has provided an explanation for agglomeration in which increasing returns, transportation costs and factor mobility interact. Centripetal and centrifugal forces determine whether equalisation or concentration is attained. However, as mentioned in the neo-classical section, location-theory concerns are virtually equivalent to the issues tackled by international trade theory (Ohlin, 1933). The following section will outline an international trade model that will provide an explanation for regional imbalances.

When considering international trade, one should bear in mind that nations hinder factor mobility not only through tariffs and quotas, but also through other trade costs such as transportation costs, language and cultural differences, communication difficulties and government-imposed costs, among others (Krugman and Venables, 1990). Otherwise, a reduction not only in traded goods, but also in factor-mobility costs across countries could lead to reduced trade, since the labour-intensive country might end up losing labour (Norman and Venables, 1993). However, the inclusion of trade barriers usually implied by the existence of different nations represents a central element in the international version of the model. In that case, the mechanics of the core-periphery model do not necessarily work here, since factor mobility partly determines concentration. Nonetheless, the model is adapted to take on board international-factor immobility imposed by the fact that we are dealing with nations. The model considers two countries and intermediate goods substitute the role played by factor mobility in the previous version. Manufacturing is, in addition to labour, an input; thus, manufacturing is both a downstream industry that produces for final consumption, as well as an upstream industry that is used as input for other varieties (Venables, 1993; Fujita, Krugman and Venables, 1999). Demand for manufactured goods comes from both consumers and producers. The greater the number of firms located in a particular region, the larger the demand for intermediate goods. Moreover, an increased number of firms will also result in a greater total expenditure on manufacturing. Labour is assumed to be intersectorally mobile, but also, as already mentioned, internationally immobile.

Under these circumstances, let us consider an increase in the manufacturing labour supply operating in one of the countries. Four forces interact to produce further concentration. First, agricultural employment migration to manufacturing would rise the marginal product in the former, which in turn would reduce the incentives for further concentration. Second, an increase in manufacturing's employment could be associated with an expansion in the number of varieties produced, which would reduce prices and the demand faced by each firm; thus, manufacturing wages are reduced and further agglomeration is hindered (Fujita, Krugman and Venables, 1999). However, these two stabilising forces counteract those that foster concentration, namely, backward and forward linkages. In the case of the former, increased manufacturing employment would expand total expenditures in that sector's goods, which would boost demand and the sector-related wages; thus, concentration is encouraged. In that of the latter, the already-mentioned reduction in prices also affects the prices and demand for intermediate goods, boosting manufacturing wages and fostering further agglomeration (Fujita, Krugman and Venables, 1999).

The outcome will be determined by the interaction of these forces. However, the results do not contradict in any way the inferences of the core-periphery model described earlier in this chapter. There is, however, an important difference here. Transportation costs are substituted with a broader range of trade costs that include not only the former but also linguistic, cultural or any other difference (Krugman and Venables, 1990).

Figure 2.5: Wage Differentials and Trade Costs



At high levels of trade costs, manufacturing is evenly divided and the two economies are symmetrical. When trade costs are low, the two-stable one-unstable equilibria scenario applies and concentration is the result. Intermediate levels, as in the first core-periphery model, display a pattern composed by five equilibria, in which concentration in either country is possible, as is the symmetric outcome (Fujita, Krugman and Venables, 1999). However, the symmetrical equilibrium is flanked by unstable equilibria; thus, if equalisation is achieved, a slight change in employment shares will entail a process that would lead to concentration. Therefore, while high trade costs lead to equalisation, concentration becomes plausible with intermediate costs; however, low trade costs make it inevitable. Hence, lowering trade costs enhances the potential of backward and forward linkages to foster concentration.

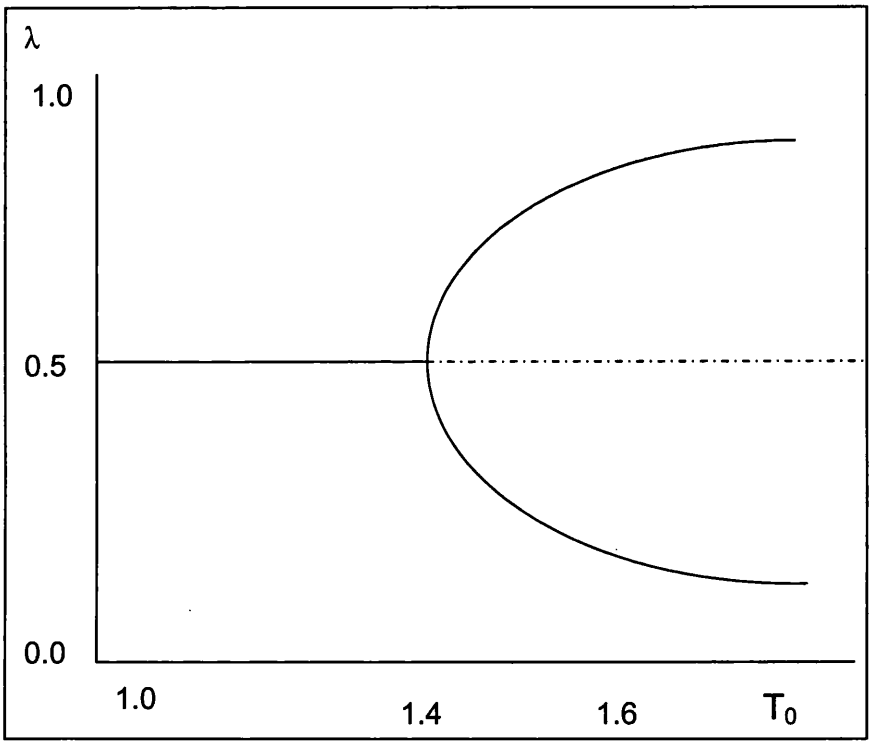
Moreover, wage differentials between the countries follow a pattern of sectoral concentration. As can be observed in Figure 2.5, wages are equalised at high-trade costs, thereafter intermediate costs force a discontinuous increase in the wages of the region that attracts more manufacturing, establishing a wage-differential pattern. Such income disparities between countries would widen with further decreases in trade costs, until a break point is reached and the gap would start to close and total trade costs elimination would bring about equalisation. How wide this gap is and when it starts to close will depend on the proportion of intermediates in total production and the share of manufacturing products in total consumption. In the case of the former, wage differentials (the distance between w_1 and w_2 in Figure 2.5) will be the same, but it increases the range of trade costs (the interval in which both, concentration and equalisation are possible) that can produce agglomeration, as the linkages in manufacturing are more relevant. In the case of the latter, the range of trade costs in which agglomeration is fostered is the same as the original case, but the wage differential is smaller producing a narrower gap.

Extensions of the model include making agriculture a decreasing function of the sector's employment, as well as the inclusion of other regions. The former has the effect of narrowing the range of values with in which agglomeration occurs, while the latter entails a process in which industrialisation spreads out in a series of waves (Puga and Venables, 1996; Fujita, Krugman and Venables, 1999). It is important to highlight the fact that under such model extensions, economic integration, which not only reduces transportation costs but also other trade costs, first produce and then dissolve disparities amongst countries.

Three Regions and Two Countries

In the previous section the original core-periphery model was adapted to international trade. Factor immobility was introduced, and manufacturing became –through intermediate goods- an input and trade costs reflected the many ways by which exchanges can be hindered. The model, however, was based only on two countries and disregarded the internal structure of each country. It is important, therefore, to make a final adjustment to the model to consider more regions than the two-countries two-regions extension described above. The prime example of this extension has been the model developed by Krugman and Livas Elizondo (1996). The final model[22] considers a world economy offering three locations. Location 1 and 2 refer to two different regions (as in the model that does not include international trade) within a country. Location 0 which represents the outside economy, engages locations 1 and 2 in international trade. If we assume that labour is the only factor of production and that there is no agricultural sector, then concentration in either of the two domestic locations (1 and 2) becomes possible (since neither capital nor agricultural labour prevents it). As it stands, only centripetal forces seem to be present in the model and as long as there is a small variation in the employment share –as in past models- concentration becomes possible. However, the model in Fujita, Krugman and Venables (1999), introduces (for simplicity) congestions diseconomies to the size of the agglomeration that diminishes real wages.

Figure 2.6: Concentration under Different Levels of Trade Costs



As it becomes evident from Figure 2.6 the results are fairly similar to the ones achieved by previous models.[23] That is, low trade costs are related to an equal division of employment since the larger market (location 0) to which a large proportion of the production of 1 and 2 go to, make backward and forward linkages rather weak

[22] It is the final model for the purposes of this thesis, since it is the model that considers international trade and internal economic geography.

(production is not oriented towards these domestic markets but to international ones) compared to congestion costs. In contrast, high trade costs are associated to concentration since firms rely more on the domestic market and congestion costs are bearable in order to exploit larger linkage effects. However, instead of total concentration in one single location, the two domestic centres of production are of unequal sizes. Therefore, as we increase the number of locations and this become associated to larger or smaller trade costs depending on the proximity to the larger market of location 0, the possible results that emerge can lead either to dispersion or concentration.

The effect of trade liberalisation is therefore, the emergence of a "hierarchy of domestic locations, in which locations have different population sizes and different industrial structures. External trade liberalization causes deconcentration of population and simultaneously, the clustering of particular industries" (Fujita, Krugman and Venables, 1999: 336). In fact, external trade liberalisation results in similar effects to those of a reduction of internal trade costs[24], with the difference that, under free trade, because consumers depend less on local firms, backward linkages are weaker and industrial clustering or specialisation can occur. The rest of the thesis will therefore consider that both concentration and dispersion can be the outcome of a process of trade liberalisation and that concentration of employment does not necessarily entails concentration of all industries since specialisation or clustering can occur.

[23] Again, λ refers to employment shares and T to trade costs (in this case, the subscript 0 denotes the international location). Similarly, dashed lines represent unstable equilibria.
[24] We can remember that as Ohlin himself expressed, countries are just special types of regions.

Neo-classical and New Economic Geography: Common Ground, Different Stories

The H-O model as explained earlier, based, amongst other things, on initial-endowments differentials between countries, expects factor prices to be equalised (either absolutely or relatively). Such partial or total equalisation of factor prices affects income distribution in the economies involved (Stolper-Samuelson theorem). Just as factor endowments vary across countries, they usually vary across regions in a country. Regional endowment differentials will bring about territorial specialisation and factor-price inequalities. In a similar vein, just as the factor-price equalisation theorem leads to equalisation of factor prices (and income distribution effects according to the Stolper-Samuelson theorem), endowment differentials across regions are likely to result in territorial specialisation and convergence across regions. In fact, Ohlin himself argued that trade is explained by the array and localisation of production in space. Therefore, at least implicitly, trade theory refers to location of production (Johnson, 1981). However, neo-classical models have not yet been extended to include spatial issues.[25]

Similarly, the new trade theory has also disregarded the question of space. Yet new trade theorists have introduced more realistic features such as increasing returns and imperfect competition, which have then, been applied to other theories (such as the new economic geography). In contrast, the new economic geography addresses the interaction between trade and geography, suggesting the possible results of spatial convergence or divergence, depending on the outcome of two countervailing forces: centripetal and centrifugal. In that sense, external economies, proximity to the market and a pooled labour market are the centripetal forces that foster divergence and disparities. However, the theory also contemplates centrifugal forces, which can be regarded as factor immobility, land rent, and congestion costs or any other type of negative externalities that incite both firms and workers to locate elsewhere.

Nevertheless, a common ground can be identified. Despite the evidently differing stories and outcomes of both approaches, they both recognise that initial conditions are a central factor in determining trade (neo-classical) and location (new economic geography). Furthermore, the proposals of both theories acknowledge the benefits of trade. However, they may come to different conclusions when it comes to the distribution of such gains. On the one hand, neo-classical theory, as argued above, implicitly refers to convergence of regions.[26] On the other hand, the new economic geography contemplates both convergence and divergence as possible outcomes. Before turning to the discussion of this dichotomy, it is necessary to discuss the third element of the relationship (trade, space and growth).

The above discussion would not be complete in a thesis that aims to discover the impact of trade on growth without exploring the latter in detail. Up until now this research has discussed the relationship between trade and space. Concentration and dispersion are related to growth. However, growth has generated its own, ongoing, debate. The next section is, then, dedicated to presenting an outline of that debate.

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[25] Although Ohlin himself considered that the link between trade and localisation of production was fundamental.
[26] Throughout the thesis it is acknowledged that the neo-classical theory does not focus on spatial issues and, therefore, this indirect possibility is only addressed here.

5. Regional Growth

Although trade liberalisation is expected to have an effect on regional growth differences, it is likely that the latter will also be influenced by other variables. In order to understand the forces that drive growth, it is necessary to briefly discuss the main doctrines that try to explain it. The debate is chiefly concentrated between neo-classical and endogenous growth approaches. On the one hand, the former regard growth as determined by capital accumulation (Solow, 1956; Swan, 1956). The basic proposition is that holding constant population expansion and in the absence of technological progress, diminishing returns to scale will bring about convergence (Aghion and Howitt, 1998). However, technological change was assumed to be a process that occurs in an exogenous or unexplained manner (Barro, 1997). Some extensions of the model consider not only physical but also human capital as an explanation of growth. Similarly, technology was made endogenous through the inclusion of R&D theories (Romer, 1990; Grossman and Helpman, 1994; Barro and Sala-i-Martin, 1995).

Let us consider these elements in greater detail. Neo-classical growth theory was originally based on the proposition that long-run growth is the result of continuous technological progress in the form of new goods, markets or processes (Aghion and Howitt, 1998). Otherwise, the lack of technological change in the long run would cease growth by the effects of diminishing returns (Solow, 1956; Swan, 1956). Thus, the model can be expressed as a function of capital accumulation only, assuming perfect competition and decreasing returns to capital leading to equilibrium (Ramsey, 1928; Solow, 1956). Technological progress is recognised as an important growth determinant, but is regarded as exogenous mainly due to the implicit difficulties in modelling increasing returns. What is more, the original model considers that people save a fraction of their income, whereas a proportion of it is lost through depreciation (Solow, 1956; Swan, 1956). Economic growth is, under these circumstances, temporary. In fact, "any attempt to boost growth by encouraging people to save more will ultimately fail" (Aghion and Howitt, 1998: 13). Even if population expansion is included, growth stagnation is the result. Population growth will reduce capital per person not by destroying it as depreciation does, but by diluting it since the number of people that must use it has increased (Aghion and Howitt, 1998). Therefore, long-run per capita growth rates can only be explained by technological progress.

The way in which the original neo-classical model includes technological change is by considering that an exogenously determined constant rate reflects the progress made in technology (Solow, 1956; Swan, 1956). Thus, the model implies conditional convergence;[27] that is, if a country starts from a lower level of per capita output relative to the other economy, the former is expected to attain a higher growth rate (Aghion and Howitt, 1998). Hence, the countries' output levels will tend to converge. Indeed, economies with less capital per worker are likely to attain higher rates of return and growth (Barro, 1997). Such a convergence is based on the assumption of diminishing returns to capital.

Including human capital as another form of capital, which in turn determines growth, represents one of the improvements made to the original model. Thereafter, the first attempts to endogenise technology faced the technical difficulty of modelling increasing returns to scale (Aghion and Howitt, 1998). One of the solutions is provided by considering that technological progress is the result of learning by doing (Arrow, 1962). Similarly, another stream considers that growth rates are related to investment rates;

characteristics in the latter such as its position and shape reflect the underlying rate of new ideas (Kaldor, 1957). However, both attempts could not avoid regarding part of the technological progress as exogenous. Thereafter, the models tried to use diminishing returns in the struggle to endogenise technology, since dealing with increasing returns posed modelling problems (Aghion and Howitt, 1998).

In the absence of technological improvements, neo-classical approaches were incapable of explaining long-run growth (Barro, 1997). For endogenous growth theorists, long-run growth was contemplated by considering that returns to capital did not diminish, since human capital entailed knowledge spillovers and external benefits (Romer, 1986; Lucas, 1988; Rebelo, 1991). In addition, R&D theories were introduced and imperfect competition was factored in the model (Romer, 1990; Grossman and Helpman, 1994; Barro and Sala-i-Martin, 1995). The pursuit of long-run growth determinants represents the major contribution of the endogenous growth approach (Pack, 1994).

Again, there is a common ground between the two theories. The neo-classical approach regards growth as being determined by capital intensities and human capital, and recognises the role played by technology in determining long-run growth but fails to include it in the model. The endogenous growth theory agrees on all three elements, but instead of regarding technology as exogenous it has tried to include it in the analysis. Theoretically, technology-treatment differences are crucial for determining long-run growth; empirically however, it is difficult to test. Particularly, in cases where data is limited, including technological progress into the model is remarkably difficult. In Mexico, finding regional data on R&D activities is virtually impossible. Consequently, despite the desirability of including technology in the explanation, the model to be presented in Chapter Five will be limited to including capital accumulation and human capital as other determinants of growth. Thus, the elements included in the model are common to both theories, and no difference between them will be made.

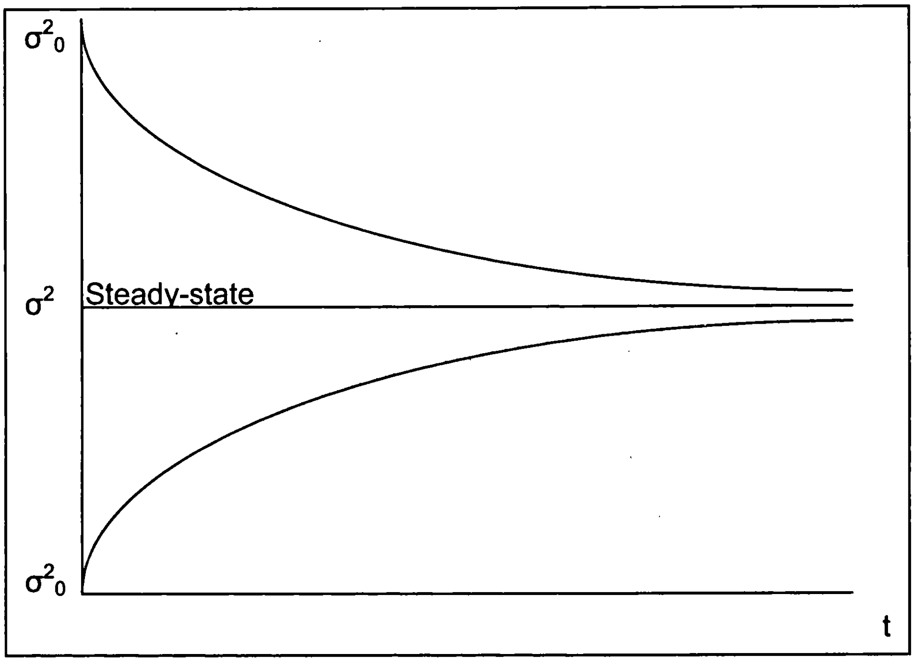
As discussed above, the possibility of equalisation and concentration leads us to consider two key concepts used throughout the rest of the thesis: convergence and divergence. Therefore, it is necessary to discuss convergence and divergence further in light of these theories.

The Relevance and Meaning of Convergence

The new economic geography acknowledges that a possible outcome of trade is regional divergence. More precisely, the theory predicts that the interaction between increasing returns to scale and factor mobility, as well as the tension between centripetal and centrifugal forces will entail further concentration with decreasing transportation costs. In turn, concentration will lead to eventual disparities across regions and to a pattern of regional divergence. Therefore, the discussion of what convergence actually means and its implications is central to the aims of this chapter. The discussion of theories presented in previous sections had the aim of identifying the potential spatial implications of trade. In addition, it is crucial to examine different empirical treatments of these concepts to be able to make an adequate assessment of territorial convergence/divergence in Mexico in later stages of the thesis.

[27] Convergence is fully explained below.

Figure 2.7: Behaviour of Dispersion



One of the most important predictions emanating from neo-classical growth theory is that of conditional convergence; that is, if a country starts below its steady state,[28] it will be inclined to grow faster (Barro and Sala-i-Martin, 1995). In other words, poor economies are likely to grow faster than rich ones. However, a difference in notions of convergence can be identified. On the one hand, convergence could mean that a poor economy grows faster than a rich one, so the former seems to catch up with the latter in terms of per capita income (Barro, 1991; Barro and Sala-i-Martin, 1995). Such an approach is called the β convergence or regression towards the mean. On the other hand, the σ convergence represents a decline in the dispersion of per capita income values of a certain group of countries (Barro and Sala-i-Martin, 1995). Convergence of the first type tends to produce convergence of the second type. However, greater growth rates for poorer countries do not imply a reduction of the dispersion of the

[28] The steady state is a situation that implies constant growth rates on the variables (Barro and Sala-i-Martin, 1995).

group of countries. In fact, "over time, σ^2_t falls (or rises) if the initial value σ^2_0 is greater than (or less than) the steady state value, σ^2" (Barro and Sala-i-Martin, 1995: 385). As can be observed in Figure 2.7, the dispersion (σ^2) may fall, rise or remain constant depending on the starting steady-state level despite β convergence is occurring at all times.

Convergence can be regarded as absolute, when income converges independently of the degree of similarity across economies and their steady states; alternatively, convergence is conditional when income per capita converges amongst structurally (technology, preferences, etc.) identical economies regardless of the initial steady state (Esquivel, 1999a). However, simple changes in steady-state levels such as population increases or modification of savings rates can alter such states, which in turn can hamper neo-classical predictions. One such alteration is the introduction of technology in the model as the endogenous growth theory suggests. In fact, considering technological progress in the model allows for divergence. Therefore, growth theory also determines the scope for convergence; that is, neo-classical growth theory predicts convergence (and as is described below they actually measured it), whereas endogenous growth theory allows for the possibility of divergence.

Convergence analysis has been extensively used by different scholars and applied to different regions in the world. Evidence obtained thus far can be classified into two groups. First, neo-classical approaches predicting convergence, and, in fact, yielding very similar rates of convergence. Second, endogenous-growth based methods allowing for divergence. To discuss this distinction further it is necessary to first introduce two notions on convergence.

Scholars have employed different measures of convergence, namely the β convergence or regression towards the mean and the σ convergence involving a decline in the dispersion of income (Barro, 1991; Barro and Sala-i-Martin, 1995). Although convergence of the first type (β) can take place, the second sort (σ) might not; that is, if we assume a certain rate of β convergence so that poorer economies are growing faster than richer ones, dispersion (σ convergence) may still decline, increase or persist depending on how far away from the steady-state value it has started (Barro, 1991).

A second type of convergence is conditional on differences in the steady states of the regions, which in turn depend on structural aspects of the economy such as variations in technology, preferences, saving rates, population increases, governmental policies and initial levels of human capital (Barro and Sala-i-Martin, 1995). Thus, conditional convergence takes into account differences in these aspects, whereas absolute convergence relates initial levels of income to growth rates (Esquivel, 1999a). In Chapter Four, the thesis will concentrate on absolute convergence of the β and σ types and therefore no variations in the structure of the regional economies will be introduced.

7. Conclusions

This chapter focused on the possible spatial implications of trade. Whereas the benefits of trade stem from exchange and specialisation, its geographical distribution is unclear. On the one hand, neo-classical approaches have not addressed territorial changes resulting from trade. One of the most important predictions of the H-O model refers to the equalisation of factor prices; however, there is no explicit suggestion of income equalisation across countries.

On the other hand, the propositions of the new economic geography rest on its core-periphery model, which allows for the interaction of increasing returns to scale, transportation costs and factor mobility. The central idea is that the concentration or dispersion of economic activity will be the result of the tension between centripetal and centrifugal forces fostered by the continuous reduction of transportation costs. In a similar vein, trade liberalisation allows for concentration and dispersion, implying convergence and divergence, depending on the tension between centripetal and centrifugal forces.

There was also a discussion of the way that growth is fostered by capital (both physical and human) accumulation. Although technological change is a key element in determining growth, data limitations hamper its use. It is important to bear in mind the convergence-divergence dichotomy as a concept that will be used throughout the thesis.

In that sense, it is the purpose of the next chapter to explore Mexican regional disparities in light of a plausible effect of the trade approaches undertaken by the country. The spatial implications of trade are absent from neo-classical models; however, the new economic geography emerges as a suggestive explanation of possible spatial transformations resulting from trade. Although most of the theoretical ground is based on the new economic geography, the neo-classical approaches are eventually employed to explain patterns of trade in Mexico. Therefore, the next chapter will discuss territorial imbalances in Mexico in view of trade policies and other historical events that have influenced regional disparities in the country. Later on, in Chapters Four and Five these theoretical considerations are tested empirically in an attempt to explain both regional growth trends and the mechanics of territorial inequalities.

As will be explored in the next chapter, Mexico followed an import-substitution industrialisation model from the late 1930s until 1985 when Mexico signed the General Agreement on Tariffs and Trade (GATT). Liberalisation was complemented by a strategy based on economic integration with its major commercial partners, which led to the signing of the North American Free Trade Agreement (NAFTA). Is it possible that such trade approaches have influenced regional disparities? If so to what extent and what have been the factors behind changes in territorial inequalities? Is the new economic geography a suitable explanation for plausible changes in Mexico? The next chapter deals with the first question, while the second and third interrogatives are addressed in Chapters Four and Five.

Chapter Three
The Evolution of Regional Disparities in Mexico

1. Introduction

After a long period of protectionism and State intervention, Mexico has opened up to free trade and market competition. New economic policies have been followed since 1986, when Mexico acceded the General Agreement on Tariffs and Trade (GATT). Recently, Mexico has endorsed bilateral and multilateral agreements with diverse countries. Of these the North American Free Trade Agreement (NAFTA) stands out, not only due to the fact that Mexico, Canada the USA now integrate the largest market in the world, but also for the differences in development between these nations. Indeed, "the countries involved are clearly of very unequal size: Mexico's GDP is about 3 per cent of the combined GDP of the USA and Canada" (Venables and Van Wijnbergen, 1993: 2).

As will be argued in this chapter, some benefits can be identified as stemming from trade liberalisation. However, the spatial implications of trade reforms are not clear. In that sense, the purpose of this chapter is to explore the evolution of regional disparities in Mexico, taking into account the different development models and trade policies that have been implemented. Thus, regional disparities are presented using a historical approach. Accordingly, the different development models and trade policies implemented by Mexico, as well as their implications at a regional level, are presented in the following sections. The chapter ends with some conclusions.

In its recent economic history, Mexico has adopted two economic strategies. The first was a long-run model of import-substitution industrialisation (ISI) that can, in turn, be divided into two different periods: the early and the advanced stages. The former (1939-58) was characterised by a structural external imbalance, growth and inflation-devaluation. The latter (1959-85) related to a semi-structural external imbalance and stable growth. The second and current strategy is characterised by a renewed export-led approach and openness.

2. The Closed-Economy Approach

The Import-Substitution Industrialisation Model (ISI)

ISI-style policies were common practice in most contemporary-OECD countries from the nineteenth century onwards (Dussel Peters, 1997). Two main motives lay behind the implementation of ISI-style policies. First, the relative influence of politically, economically and military dominant nations such as England, France, Germany and the USA was at stake, so many of those nations resorted to protectionist practices. Second, the infant-industry-protection argument was en vogue at the time (Dussel Peters, 1997). Mexico probably embraced ISI under the influence of the above-mentioned countries. At the same time, other Latin American nations, which may have also been influenced in the same way implemented their own ISI-style policies. However, that influence was likely to have been an external and supplementary force.

It has also been argued that the Revolution (1910/1917) inspired nationalism and xenophobia, which would help to explain protectionism in Mexico. Nevertheless, as opposed to liberalism and agrarianism, economic nationalism does not have its origin in the Revolution. Instead, it was a response to specific circumstances such as government bankruptcy, economic decline and financial collapse (Knight, 1991). Indeed, the Obregón and Calles administrations (1920-24 and 1924-28, respectively) recognised foreign investment as a key element for economic growth (Knight, 1991). Alternatively, the main force leading Mexico to ISI was the impact of the Great Depression. The inward-oriented industrialisation was rather a reaction to plummeting exports due to a decline in demand from the USA.

According to the ISI Model, a country must reach levels of capitalisation that could finance industrialisation, while avoiding certain types of consumption that could be incompatible with capitalisation (Prebisch, 1950). Additionally, technical progress in agriculture would foster the process. However, limitations imposed by the size of the markets and their fragmentation could diminish productivity; that is, in certain industries the scale of production is of paramount importance, and economic interdependence with other economies should be sought (Prebisch, 1950). Although the strategy was explicitly established in 1947, in practice most of the ISI premises were already in operation in Mexico (Fitzgerald, 1984 and 1994). Import substitution in Mexico was, to some extent, unconsciously applied. However, this series of improvised measures were a reaction to the effects of the Great Depression (Díaz Alejandro, 1988; Ground, 1988). They had the main objective of restricting imports (Cárdenas, 1996). The reason for an initially gradual rise in import tariffs was that the balance of payments was unstable due to a currency overvaluation and the pace of national income growth (Cárdenas, 1994). The primary sector was responsible for providing manufacturing with the raw materials needed for the process of industrialisation. Particular products or industrial branches were protected either through tariffs or quotas. However, during the

1950s the scheme was broadened to comprise many industries and products, especially the easy-to-substitute consumption goods. The explicit and conscious import-substitution effort was aided by the implementation of industrial subsidies and the boost to basic-infrastructure public investment, namely energy, railways and roads (Cárdenas, 1994).

The Early Stage (1939-58)

In the early stage of ISI (between 1939 and 1958), the economy's average annual growth measured in real GDP was 5.8 per cent (Villarreal, 1988). Annual average inflation ran at 10.6 per cent. Primary sector exports were boosted by allied demand during the Second World War (Ramírez, 1989). Not only did exports grow as a result of the global conflict, but imports from the USA also declined, a factor that contributed to the development of the infant domestic industry (Smith, 1990). In addition, unsafe markets in developed countries sought relatively safer places to invest; thus, foreign savings were increasingly available in Mexico (Ortiz Mena, 1998). At the end of the war, US demand for Mexican products declined and foreign capital stopped flowing into Mexico, as the USA and Europe became safer places to invest. The USA also liberated domestic prices, which were controlled as part of its policy during the conflict. Such price liberalisation in the USA not only increased the cost of Mexican products, reducing exports even further, but also influenced the strong appreciation experienced by the peso between 1940 and 1948 (Ortiz Mena, 1998). Accumulated inflation reached 70.2 per cent while the exchange rate was fixed at 4.85 pesos per dollar. In addition, the 1946 US recession had a delayed effect in Mexico in 1947 (Ortiz Mena, 1998). As a response to the growing external deficit resulting from the reduction of Mexican exports, the government twice used devaluation (in 1948 and in 1949) as an adjustment mechanism.

Consequently, the need to finance an external imbalance plunged Mexico into a structural dependency on foreign capital, both through foreign investment and external loans (Villarreal, 1988).

The primary objective of the ISI model was to reduce the imports to total supply ratio. What prevented Mexico from reducing imports was the lack of competitiveness in those products that were suitable to substitute imported goods, such as intermediate and capital goods needed for the substitution process itself (Villarreal, 1988). Consequently, imports actually increased in this period. However, such imports enabled Mexico to start developing a substitution capacity in some sectors. Additionally, exports were concentrated in a few primary products and were unable to grow fast enough to finance the required imports for the process. Thus, the nature of the deficit was structural and, as will be argued below, intimately related to competitiveness. This meant that devaluation or any other commercial strategy aimed at altering relative prices was bound to be unsuccessful. Thus, the adjustment mechanisms were unsuccessful in correcting the commercial gap and simultaneously promoting growth.

During this period, growth was not only spurred by agriculture, but also by manufacturing, which grew at an average annual rate of 6.4 per cent. This growth allowed the share of imports to total supply to decrease by 69 per cent (Villarreal, 1988). Towards the end of the early stage (1950s), a structural change in manufacturing was taking place. Traditional manufacturing such as food and textiles accounted for a smaller proportion of total manufacturing production. Shares in the former fell from 38.5 per cent in 1950 to 29.3 per cent in 1958, whereas those in the latter dropped from 15.6 to 10.3 per cent in the same time span (Martínez del Campo, 1985). In contrast, industries that required the use of more advanced processes or technologies increased their share of total output. The most important change took place in machinery, where participation grew from 2.7 per cent in 1950 to 11.9 per cent eight years later (Martínez del Campo, 1985). Similar trends can be found in the chemical, metallic and steel industries. Between 1934 and 1940 the chemical industry doubled its demand for national inputs, while tripling its imports of intermediate goods (Hughlett, 1946).

Agricultural exports earned a surplus of foreign exchange and led to the expansion of the domestic market for manufactures (Auty, 1994). The rate of average annual growth in agriculture between 1947 and 1956 was 7.8 per cent. Agriculture was, then, the driving force of the economy, representing 75 per cent of total exports (Parra, 1954). Investment was heavily directed towards that sector; however, most of those investments were confined to the North and north-east regions, where large firms were located (Ramírez, 1989). Agricultural expansion petered out during the 1960s, achieving an average annual growth of 4.8 per cent. Although, the import-substitution process was taking place, the lack of development of domestic intermediate and capital goods was hampering the completion of the process.

The shape of the economy was determined both by direct and indirect action of the State, the former through public investment and the latter through economic policy. The State encouraged the development of a structure characterised by protectionism and industrial nurturing. During the first stage of ISI, the necessary conditions for further import substitution were created through legislative changes and promoting institutional support. Legislative changes included the 1938 oil expropriation and the 1939 'Law for Tax Exemptions to New Industries' (later integrating the 'necessary industries'); the latter was a five-year total duty-free scheme (Vázquez Tercero, 1966). The institutional change included the establishment of the *Fondo de Garantía y Fomento a* *la Industria Mediana y Pequeña* (FOGAIN), as well as the creation of one of the first centres for industrial productivity in Latin America. By the 1950s, the use of more advanced technology was evident in some new industries. These new activities included the production of industrial gases, fertilisers, detergents, pharmaceutical substances and synthetic plastics. Mexico began to produce refrigerators, copper and aluminium products, televisions, light agricultural machinery and railcoaches (Martínez del Campo, 1985). Although the development of these activities was fostered by Mexican institutions, their effective support was negligible. By the end of the early stage of ISI, the support given to research and development (R&D) was limited. Public expenditure in R&D represented just 0.07 per cent of GDP; moreover, such support was not optimally utilised due to lack of co-ordination amongst institutions (Martínez del Campo, 1968).

At the regional level the effect of these policies was the concentration of manufacturing in Mexico City (Aguilar, 1999). Some 60 per cent of tax exemptions and the same proportion of FOGAIN's allocation were channelled to firms located in Mexico City and Edo. de México (Aguilar, 1999). Moreover, local-level policies were also in opposition to a more even regional development. Additional exemptions on local taxes levied by the governments of both Mexico City and Edo. de México provided further incentives for concentration (Romero Kolbeck and Urquidi, 1952).[29]

During the 1930s and part of the 1940s the State devoted its energies to the construction of the political and social institutions. From 1946 to 1958 the main concern was to maintain control over the origin and destiny of public investment. During the 1934-59 period, institutional efforts to industrialise the country were decisive. The *Banco Obrero de Fomento Industrial* created during the Cárdenas administration (1934-40) was one of the first attempts to institutionalise the support to Mexico's industry. Similarly, the establishment of such banks as the *Banco de Crédito Ejidal* and *Banco de Crédito Agrícola* fostered agricultural development. Moreover, both banks also gave support also for infrastructure development, mainly to build roads. Infrastructure was also the main task of the *Comisión Nacional de Caminos e Irrigación*, which supported road construction and irrigation works for rural areas. In Morelos, institutional support during the Cárdenas administration was key to developing the Zacatepec sugar mill that allowed Mexico to reduce its sugar deficit (Ortiz Mena, 1998). One of the most important industrial projects during President Manuel Avila Camacho's term in office (1940-46), was the creation of *Altos Hornos de México* as the leading steel company,[30] which was established in Coahuila giving the region an important boost (Ortiz Mena, 1998). Similarly, mining plants dedicated to the extraction and processing of cement both in Chihuahua and Sonora were fostered through private-public efforts (Ortiz Mena, 1998). By 1945, Chihuahua and Sonora produced almost 20 per cent of total cement production (Hughlett, 1946). Apart from steel, metal and cement production, the government directly participated in a number of other activities such as fertilisers, the chemical and petrochemical industries (Hernández Laos, 1985). In addition, public investment was directed towards the provision of electricity and oil, the main State monopolies.

Government intervention started to play an important role in the take-off and fostering of industrialisation of states. Regional development was pursued through a series of

[29] However, the forces leading to concentration were so strong that most agglomerated industries would have located there anyway (Romero Kolbeck and Urquidi, 1952)

[30] Established by the government as a private company to respond to increased world demand resulting from the Second World War, which the private sector was reluctant to assume. It was financed with resources from Nacional Financiera (the most important development bank in Mexico).

uncoordinated efforts made by commissions dedicated to particular regions. In 1936, the *Dirección de Obras del Bajo Río Bravo* was set up to resolve the flooding problems in the areas bordering the USA (SPP, 1985a). Two years later in Sonora, the *Comisión the Fomento Agrícola y Ganadero*, reversing the effect of Porfirian policies, provided the *yaqui* indigenous community with cultivating land, water-pumping equipment and instruments, thereby promoting agricultural development in the state (SPP, 1985a). The commissions of Papaloapan working in the states of Oaxaca and Veracruz, of Tepalcatepec in Michoacán and Jalisco, of Río Fuerte in Sinaloa and of the Grijalva river in Tabasco and Chiapas, carried out numerous projects in their areas of influence, building dams, hydroelectric plants and roads. Additionally, these commissions established social programmes, installed experimental farms and fomented industry. Other commissions were set up, delivering economic analysis with poor practical impact. Amongst these unpragmatic commissions were: the 1936 *Comisión Intersecretarial de la Alta y Baja Sierra Tarahumara*, in Chihuahua; the *Comisión Intersecretarial de Estudios y Planeación en el Valle del Mezquital*, in the state of Hidalgo; and the 1937 *Comisión Intersecretarial de la Mixteca*, in Oaxaca. However, all the above-mentioned institutions were ran by the federal government with little intervention from the state governments. The single effort of state-federation co-operation was the creation of the *Consejo Mixto de Economía Regional*, a consultation organism that failed to deliver results (SPP, 1985a). The centralisation trend is also evident in the creation in 1954 of the *Comité de Inversiones*, a federal institution that attempted to hierarchically implement public investment.

Let us now turn to the spatial effects of the early stage of the ISI model. The reason for not presenting a territorial analysis of the whole economy for the period is the absence of data. As it is explained in Annex 1, due to the lack of GDP data that would have allowed a more thorough analysis, manufacturing data is used, which stems from 1950

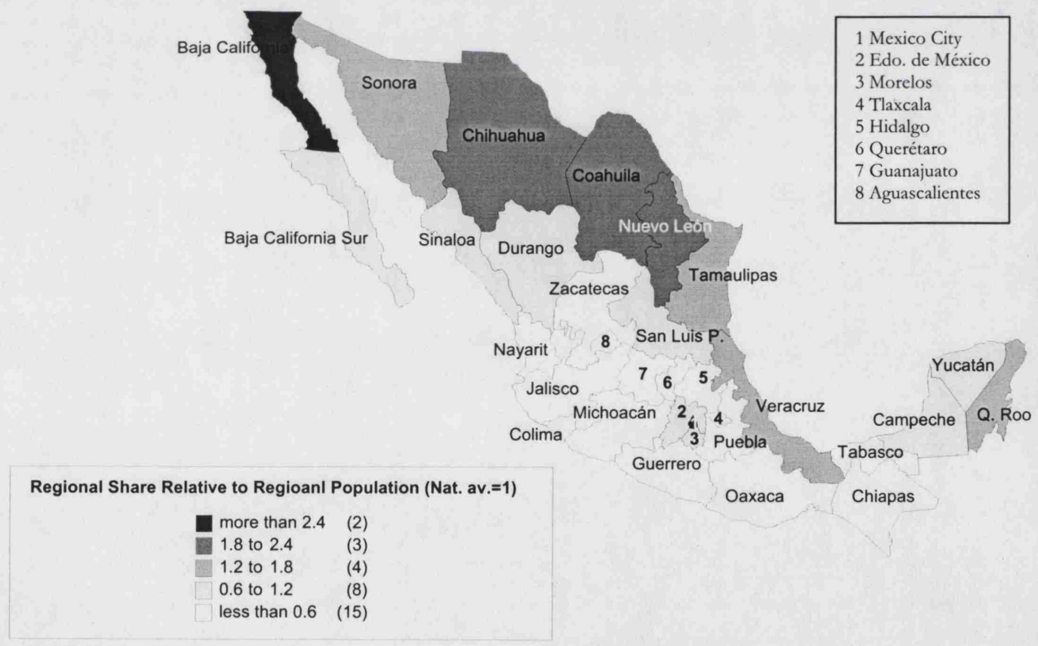
Industrial Census that appears in López Malo (1960). This section, thus, explores the level of per capita industrialisation of states. As can be observed in Figure 3.1, Mexico City became a pole influencing, albeit modestly, industrialisation in the neighbouring states of Edo. de México and Morelos. However, its influence over the nearby states of Puebla and Tlaxcala was less notable (these actually de-industrialised if we compare the results for 1930 presented in Annex 1). In contrast, there were advances in the industrialisation of Veracruz, probably influenced by its position as the main harbour in the country. Apart from further industrialisation in Mexico City, probably the most relevant feature of industrialisation in 1950 is its extension from the pole of Monterrey to the rest of the border area. Although Yucatán seems to fall back somewhat relative to its previous level of industrialisation (Annex 1), it also appears that the process took off in the neighbouring states of Quintana Roo and Campeche. The lag in the industrialisation of the former was related to the collapse of the international market of *henequén*,[31] the main textile industry in the state (Smith, 1990). Thus, it would seem that the effort to substitute imports, which was associated with an increase in tariffs and barriers to trade, brought about the reinforcement of the existing poles of Mexico City and the north-east, as well as further industrialisation in the border-states. The situation increasingly resembled a North-South divide. Finally, it is important to note the lack of industrialisation not only of the South, but also of states near Guadalajara (one of the three largest urban areas).

The activities carried out and developed by 1950 in industrialised states were the same as those in 1930 (Annex 1). However, it is important to mention the production emerging in the industrialised states during the period. In that sense, Chihuahua reached the second level of industrialisation in Figure 3.1, joining most of the border-states by

[31] *Henequén* is the word used to refer to the sisal fibre. International *henequén* prices fell as synthetic fibres were

hosting metallurgic plants, cotton processing, sawmills and wheat mills, as well as coffee mills and roasters (López Malo, 1960). The first four activities were associated with natural resources exploited within the state, while the last was related to the possibility of exporting processed coffee, a product which was cultivated in the south-east, to the USA. Sonora was also conducive environment for thriving industries in metallurgy, cotton processing and wheat mills, but was also developing food refrigeration and freezing, as well as canned meat (López Malo, 1960). All of Sonora's main activities were associated with the exploitation of the resources available in the region.

Figure 3.1: Industrial Production in Mexico (1950)



Source: López Malo (1960) and INEGI (1990)

Industrialisation around Mexico City and in the peninsula was still modest. In the case of Edo. de México, industrialisation was mainly focused on the production of tyres,

developed.

electrical instruments and machinery, paper, steel and textiles (López Malo, 1960). Morelos developed sugar mills, textiles, rail tracks, rice processing and *nixtamal*[32] mills (López Malo, 1960). Yucatán influenced Campeche and Quintana Roo in producing sisal, but in turn, they developed sawmills and extraction and preparation of raw *chicle*[33].

Table 3.1: Industrial Concentration During ISI (1930-50)

	Concentration Index	
State	**1930**	**1950**
Aguascalientes	0.44%	0.24%
Baja California	2.50%	3.19%
Baja California Sur	0.33%	0.23%
Campeche	0.14%	0.30%
Coahuila	5.56%	5.32%
Colima	0.17%	0.14%
Chiapas	1.09%	0.31%
Chihuahua	1.93%	6.20%
Mexico City (Distrito Federal)	28.01%	28.55%
Durango	2.75%	2.24%
Guanajuato	4.10%	2.02%
Guerrero	0.25%	0.69%
Hidalgo	1.96%	1.20%
Jalisco	3.48%	3.86%
Edo. de México	3.34%	4.75%
Michoacán	1.99%	1.43%
Morelos	0.29%	0.71%
Nayarit	0.54%	0.24%
Nuevo León	7.85%	6.53%
Oaxaca	0.98%	0.76%
Puebla	6.83%	3.50%
Querétaro	0.77%	0.44%
Quintana Roo	0.01%	0.13%
San Luis Potosí	2.01%	2.78%
Sinaloa	2.48%	1.79%
Sonora	1.84%	2.41%
Tabasco	0.21%	0.18%
Tamaulipas	2.58%	4.04%
Tlaxcala	0.88%	0.46%
Veracruz	11.29%	12.67%
Yucatán	2.90%	1.73%
Zacatecas	0.48%	0.98%

Source: Personal calculations based on López Malo (1960)

With respect to the concentration pattern of the 1930s (Annex 1), the 1950s saw a slight setback in the agglomeration of Mexico City. Although Mexico City showed a slightly

[32] A corn-based substance used to produce the dough for *tortillas*.

higher concentration in Table 3.1, the whole area of influence attained only 38 per cent of industrial production, whereas in 1930 it agglomerated more than 40 per cent. Even including Morelos, Querétaro and Tlaxcala, states that, it could be argued, have been historically influenced by Mexico City's activity, concentration still does not reach 40 per cent. However, this change was a modest one and Mexico City was still the largest agglomeration. Despite the slight reduction of concentration in Nuevo León and Coahuila, the border-states concentrated almost 28 per cent of national output. The most impressive performance was that of Chihuahua, since its share leapt from 1.93 per cent in 1930 to 6.20 per cent in 1950. A significant increase in concentration was also experienced in Tamaulipas, Edo. de México and Veracruz, and less importantly in Baja California and Sonora. In contrast, the most important processes of de-concentration occurred in the centre. Puebla reduced its share by 3.33 per cent, whereas Guanajuato did by 2.08 per cent. The decline of Nuevo León was also significant since its industrialisation share decreased from 7.85 to 6.53 per cent. As mentioned above, the sisal industry led to a decline in concentration in Yucatán. These circumstances conditioned territorial inequalities, which were featured by concentration in border-states and in already industrialised regions such as Mexico City and Veracruz.

The main reasons behind such concentration were the agglomeration of population in a few urban areas, particularly the centre; centralisation of political and administrative decisions favouring the centre; and external economies effects that tend to establish firms of the same type in the same area (Vázquez Tercero, 1966). That is, a pooled labour force, as well as backward and forward linkages determined the pattern of concentration. During this period, as mentioned above, Mexico started a process of urbanisation, which was spurred by population growth and migration to urban centres.

[33] The base material for chewing gum.

The former was the result of a declining mortality rate and a steady birth rate (Alba, 1982).

At the core of the incomplete and inefficient process of import substitution was the level of competitiveness of Mexican firms. The pattern of concentration described above could also be spurred by changes in competitiveness induced by enhanced efficiency. If we take into account the calculations made by Hernández Laos (1985), who considers a measure of efficiency for Mexican regions,[34] Mexico City and Edo. de México increased their competitiveness, since their productivity rose from 0.965 in 1935 to 1.043 in 1960. Similarly, Veracruz and Tabasco experienced an increase from 0.923 to 1.194 in the same period. Most of the northern non-border states also experienced a significant increase in their levels of productivity. In contrast, the levels of efficiency in Nuevo León and Tamaulipas dropped dramatically from 1.909 to 0.873 during the same period. Chihuahua and Coahuila registered a slight decrease in the same indicator, since in 1935 the level was 1.525 and in 1960 the indicator decreasing to 1.354 by 1960 (Hernández Laos, 1985). However, it is not clear whether the changes in productivity were influenced by further agglomeration or vice-versa. Moreover, the above measurements consider regions as sets of states, which might influence estimations and conclusions and they could not necessarily be applied to particular states. Nevertheless, amongst the factors that determine efficiency were technology and economies of scale, socio-economic factors, urban services, infrastructure, which vary in importance according to the type of industry (light or heavy) under consideration (Hernández Laos, 1985). Location factors are more important for heavy industries than for light ones, and more relevant for small than for large firms (Hernández Laos, 1985). It is important to

[34] A total-factor productivity measure in which all factors having an effect on productivity are considered; in that sense, efficiency is an input-output ratio where national average = 1. The 32 Mexican states were agglomerated into ten regions.

note that although the productivity score for highly industrialised states fell, they still achieved the highest levels of efficiency. Since the reverse occurred in the less-industrialised states, an association between industrialisation and productivity can be established.

The Advanced Stage (1959-85)

The advanced stage of the ISI model refers to the further and deeper process of import substitution, which fostered and nurtured the creation of national firms to substitute imports. The ISI model plunged into crisis in the late 1960s (García Páez, 1989). The reason for it stems from the advanced stage restriction on importing goods that were vital to most industries, creating bottlenecks in productive processes. In addition, the external deficit increase was tackled differently this time. Instead of using devaluation as an adjustment mechanism as in the early phase of ISI, the government's strategy was based on the use of foreign investment and loans. While foreign investment represented 16.57 per cent of GDP in 1959, by 1970 it had risen to 22.39 per cent (Ortiz Mena, 1998). In turn, external debt amounted to US$649.1 millions in 1959 and had increased fourfold by 1970, reaching US$3.28 billions (Ortiz Mena, 1998). Foreign capital financed the current account deficit, which in turn stemmed from high imports. Between 1970 and 1976 the model eroded due to the external capital dependence.

Between 1959 and 1970, the Mexican economy grew at an average annual rate of 7.1 per cent and inflation was 2.9 per cent (annual average). Manufacturing during this period, was growing at an annual average rate of nine per cent, allowing for greater import substitution, mainly on intermediate and capital goods. In intermediate goods, the participation of imports in total supply decreased by 44 per cent, while for capital goods that share fell by 27 per cent (Villarreal, 1988). Industrialisation was increasingly oriented towards the production of capital and intermediate goods (Vázquez Tercero, 1966). While in 1950, capital and intermediate goods represented 25 per cent of total production, they had expanded to more than 32 per cent by 1970. The share of manufacturing production of the chemical industry nearly doubled, reaching almost 15 per cent in 1975 (Solís, 1990). The share of manufacturing going to machinery rose from 8.5 per cent in 1950 to almost 20 per cent in 1975. Other activities developed during the advanced stage of ISI were the mineral and steel industries.

In contrast, the participation of consumption goods was reduced from almost 75 per cent in 1950 to less than 68 per cent 20 years later (Solís, 1990). Food and textiles, as well as the wood and paper industry saw their relative production decrease. In 1950 food and textiles represented 36.3 and 26.1 per cent of total manufacturing, respectively; by 1975, these shares had dropped to 26.4 and 16.5 per cent, respectively. Likewise, the wood and paper industries fell from almost 11 per cent to less than seven per cent.

Agricultural growth was petering out. The impressive annual growth rate of 7.8 per cent during the early stage of ISI (1939-58) was reduced to 4.8 per cent by 1966; thereafter, growth was almost zero (Auty, 1994). Manufacturing was thus, the driving force of the economy. However, the price of industrialisation and domestic self-sufficiency was inefficiency. Despite high levels of growth and price stabilisation, the external deficit continued to grow.

By 1975, consumption-goods production was at its most efficient reaching a relative efficiency index of 1.022 (for all related industries).[35] The most efficient activity in manufacturing and consumption goods was tobacco processing with an index of 1.298, followed by wood and beverages with indexes of 1.053 and 1.047 (Hernández Laos, 1985). In contrast, intermediate and capital-good production comprised some of the most inefficient industries with indexes of 0.891 and 0.936, respectively (Hernández Laos, 1985). Amongst intermediate goods, plastic and chemical products represented the most inefficient industries with indexes of 0.838 and 0.868 (Hernández Laos, 1985). Similarly, in the capital goods sector, machinery was relatively inefficient achieving an index of 0.903 (Hernández Laos, 1985). However, the dispersion of efficiency levels is greater when public firms are considered, since they were more efficient at producing capital than consumption goods, reaching 1.408 and 0.703 respectively. The most efficient public-run industry was metal products with an index of 1.519 (Hernández Laos, 1985). Thus, while ISI brought about further industrialisation in capital and intermediate goods, those activities were precisely the ones in which the private sector was more inefficient; in turn, the public sector was efficient at producing capital goods. Moreover, ISI favoured direct public sector intervention and involvement in production, rather than a nurturing policy for private capital. As will be argued in the next chapter, during GATT, protectionism was still effective on those economic areas in which state-owned firms were present.

Protectionism not only favoured public-run firms, but also led to inefficiency. Between 1960 and 1980, the correlation between the most protected industries and those that achieved higher productivity was not statistically significant; that is, protectionism was not associated with productivity (Fernández Pérez, 1994). The chemical industry was

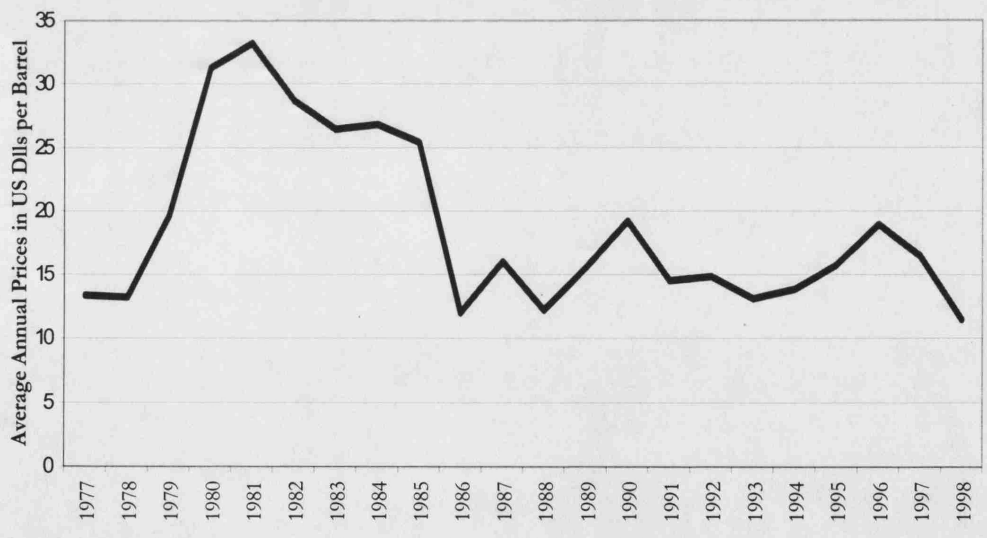
[35] The index refers to Hernández Laos's (1985) calculations.

one of the most inefficient private activities, yet it received one of the highest levels of protection (Fischer, Gerken and Hiemenz, 1982). As a result, ISI promoted private capital under great levels of inefficiency and direct public intervention and involvement.

The end of the ISI model was characterised by increasing income inequalities amongst individuals, unemployment, lagging productivity, declining agriculture, accelerating inflation, commercial deficit growth and reliance on foreign capital to finance external and public deficits (Ramírez, 1989). Political and social unrest at the end of the 1960s pressured the government to pursue both the promotion of industrialisation and income redistribution, at the expense of economic stability. President Luis Echevería's administration (1970-76) was characterised by populist programmes and the aim to accelerate the ISI model on capital goods. Augmented use of public spending and greater money supply resulted in four and six-fold increases in public deficit and inflation, respectively (Cárdenas, 1996). As a consequence, the currency was severely overvalued and investment plummeted, since real returns were negative. Furthermore, financing the level of spending entailed by social programmes, brought about a fourfold increase of the external debt (Ramírez, 1989). Not surprisingly, Echeverría resorted to devalue the peso, by 60 per cent in September 1976, and by 40 per cent a month later (Skidmore and Smith, 1997). Within two months, the international value of the peso was cut in half (Smith, 1990). Thus, the severe economic conditions imposed on Mexico by the exhaustion of the ISI model were aggravated by governmental policies such as public spending, reliance on external debt and devaluation, which were aimed at tackling the symptoms and not the root of the problems.

The incoming President José López Portillo (1976-82) agreed to implement a three-year stabilisation programme elaborated by the International Monetary Fund (IMF). The plan contemplated a reduction in spending and constraints to wage increases, which brought about deflation and a sharp decrease in public deficit. However, in 1976 vast discoveries of oil and gas reserves in Tabasco and Chiapas and its rapid exploitation from 1978 changed the government perspective towards spending and the stabilisation programme. Compared to industrialisation, the petrolisation of the economy was seen as a less expensive alternative and one that did not divert resources from consumption (Brailovsky, 1981). Moreover, the government did not perceive indebtedness as a plausible long-term conflict (Zedillo, 1981). Oil exports were seen as a source of revenue to finance public deficit and in the medium term promote growth (Morales, Escalante and Vargas, 1988).

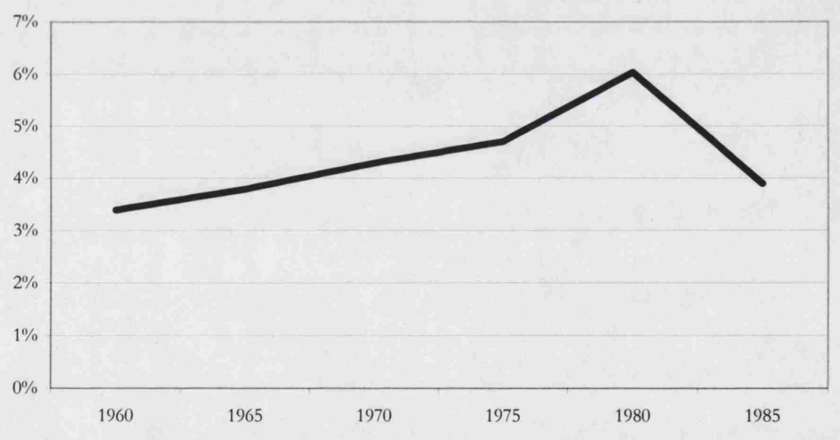
Figure 3.2: Oil Prices



Source: Personal calculations based on INEGI (2000a) and Snoeck (1988)

The effect of the discovery on Mexican oil production and governmental attitudes were reinforced by the influence of international events on global oil prices. The 1979 Iranian Revolution that overthrew the Shah, and the Iran-Iraq conflict soon after reduced global oil supply (Gilbert, 1999). Influenced by those events, the value of crude oil started to rise. The war between Iran and Iraq destroyed 2.5 million barrels of oil per day and, as can be observed in Figure 3.2, the prices doubled, reaching US$35 a barrel (Williams, 2000). PEMEX, the State-owned firm agglomerating all oil companies expropriated in 1938, became the main revenue contributor, the most important investor and the prime source of employment. López Portillo's effective petrolisation of the economy can be observed in Figure 3.3. The oil industry's participation in GDP doubled. Moreover, as shown in Figure 3.4, in 1982, oil exports represented almost 80 per cent of total exports.

Figure 3.3: Oil's Participation on Total GDP



Source: Snoeck (1988)

The new and abundant oil deposits renewed confidence in Mexico's development, and emphasised the need for infrastructure to exploit those resources. Although the IMF and the World Bank suggested that Mexico should utilise trade liberalisation to finance oil exploitation, the government decided to do it all by itself and expanded its external debt (Kaldor, 1981). As a result of the expansion of the oil industry, the required structural change was postponed to embark on a large-scale programme of public spending (Smith, 1990). The public deficit rose dramatically, as spending was again unfettered. The government financed it through money supply and external debt. The former was doubled while the latter reached a staggering 61.9 per cent as a proportion of GDP (Ramírez, 1989). In addition, from 1978 oil prices started to increase, which had a greater effect on the economy than the price increases experienced in the early 1980s (Hamilton, 2000). On the one hand, changes in the price of oil altered public expenditure by encouraging greater spending financed by expansionist monetary policies and indebtedness. On the other hand, spending patterns were disrupted through greater availability of money in the economy resulting from the monetary policy (Hamilton, 2000). The augmented need to finance the commercial deficit brought about the increase in interest rates. Currency overvaluation led to massive amounts of capital being transferred overseas, which worsened the balance of payments. In addition, the US recession and plummeting oil prices finally plunged Mexico into economic crisis. The interrupted external lending and the 90-day debt-payment moratorium declared by the Mexican Government aggravated that recession (Lustig and Ros, 1987). Neither advanced-purchase payments made by the US Government nor reactivated loans from international banks could counterbalance the continuous capital transfers abroad. López Portillo resorted to strict exchange controls and to the nationalisation of the banking system.

The new administration, led by President Miguel de la Madrid, adopted a restrictive policy in order to contract internal demand, reduce imports and obtain a surplus in the balance of payments that would allow it to meet external debt obligations (Martínez Hernández, 1989). External indebtedness left the government blighted by high service payments. In addition, oil revenue —one of the most important sources of income for the government— diminished considerably. As can be observed in Figure 3.2, international prices rose significantly in the late 1970s and early 1980s, but plummeted in 1985 and 1986. The reasons for that decrease can be found in a global recession that reduced demand, more efficient production processes, better insulated housing and increased mileage of automobiles (Williams, 2000). However, changes in the oil industry did not affect all regions equally.[36] The excessive size of the external debt unleashed a crisis that was to last for several years.

Figure 3.4: Oil's Participation in Total Exports

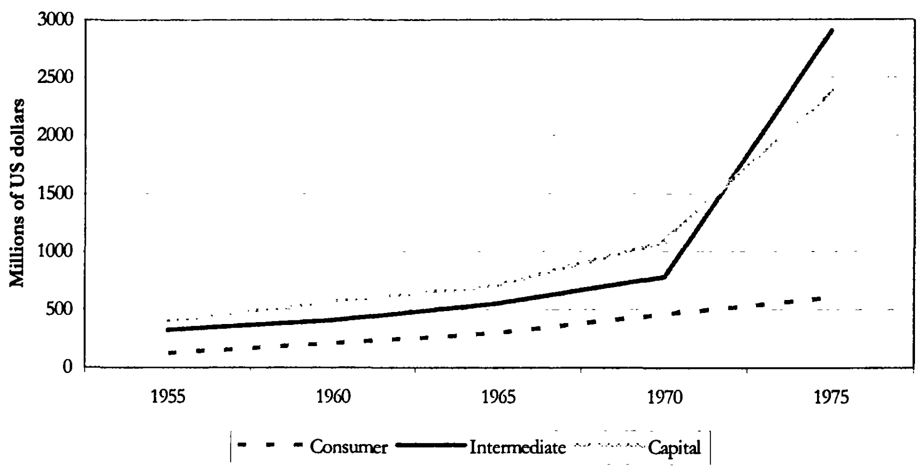
Source: Personal calculations based on INEGI (2000a)

In sum, the reasons for Mexico's unsuccessful industrialisation are manifold and were related to the loss of competitiveness of the productive sector, absence of technical progress in agriculture, the increasing financial dependence on external funds brought on by the lack of capitalisation, as well as to the dimension of the domestic market. Protectionism meant governmental support of inefficient industries and an oligopolistic structure that entailed high prices and low quality relative to foreign produce, which in

[36] On the contrary, it is by nature an industry that is localised where oil can be exploited. However, it is in refining that the industry can move to other regions. But due to the required amounts of investment involved in such an activity, refining is also localised very near to extraction centres. In the few cases in which refineries are

turn resulted in a gradual loss of competitiveness (Cárdenas, 1994; Love, 1994). Instead of nurturing viable and efficient industries, protectionism was used irrationally; as mentioned above, it granted the greatest protection to the most inefficient industries (Love, 1994). Not only that, but the import-substitution strategy, as can be observed in Figure 3.5, succeeded in hampering consumption and certain intermediate goods, but was ineffective in tackling most intermediate commodities and capital goods. In addition, technology was particularly designed for the needs of the developed world; thus, technological change was an exogenously determined factor (Love, 1994). The few funds available through uncoordinated institutions were also directed to firms and research centres in Mexico City and its area of influence. Furthermore, R&D relied heavily on public intervention; few firms undertook projects, and when they did, it was with foreign institutions (Urquidi, 1968).

Figure 3.5: Imported Goods During ISI's Advanced Stage



Source: Solís (1990)

As mentioned above, the agricultural sector collapsed. Most agricultural activities continued to use traditional labour-intensive methods and technical progress was absent

installed away from exploitation areas, it is due to export facilities. For instance, the refinery of Salina Cruz, from the production process. However, agricultural activities carried out in border-states were technologically more advanced than those in the rest of the country (Secretaría de Industria y Comercio, 1975). An additional reason for the decline in agriculture was that public investment to the sector was progressively withdrawn and allocated to manufacturing and urbanisation (Fitzgerald, 1985; Cárdenas, 1996). The population grew at an average annual rate of 3.4 per cent during the 1960s, nearly double that of the early-1930s. Such demographic expansion was spurred by steady decreases in mortality rates (Alba, 1982).[37] While in 1940, the urban population represented one fifth of total, by 1970 it had risen to almost 45 per cent (Alba, 1982). Moreover, large cities (500,000 people or more) concentrated 52 per cent of the urban population in 1970; by far the largest concentration was Mexico City with almost 40 per cent of the urban total (Garza, 1999). However, Aguilar (1999) has argued that the process of concentration began to be reversed during the 1970s. Agricultural subsidies artificially biased cultivation towards inefficient crops. Despite the fact that some resources were channelled to rural areas,[38] land property insecurity and government-fixed crop prices brought about a de-capitalisation of the sector (Smith, 1990). Rural population growth and the small-plot schemes imposed by *ejidos* led to reductions in productivity (Cárdenas, 1994).

The lack of capitalisation of the whole economy was related to the dependence on foreign capital, since domestic savings were not enough to finance investment flows. Both deficits, commercial and public, grew steadily; the former stemming from the weakening of exports and the latter from increased public expenditure (Cárdenas, 1994).

Oaxaca, exports the oil produced by southern states of Campeche, Chiapas and Veracruz.

[37] Whereas the 1960s birth rates remained around the same levels to those in the 1930s, average annual rates of mortality were reduced from 2.56% (1930-34) to 1.04% in the early 1960s (Alba, 1982).

[38] Such as the support given by the *Programa de Inversiones Públicas para el Desarrollo Rural* to 86 micro-regions within different states that represented 35% of national territory (SPP, 1985a).

The public deficit was financed through the generation of inflation and not by increasing taxation, which it was feared could hamper private investment (Ramírez, 1989). The scale of production needed to make profitable some industries such as those of capital goods, exceeded the size of the domestic market, which could have benefited from economic interdependence (Prebisch, 1950). Moreover, the government promoted the deepening of the import substitution process, but failed to attain an export-led growth in the first stage of the model (Auty, 1994).

It is worth mentioning that it was under the advanced stage of ISI that the maquiladora scheme was created. The maquiladora industry is what some authors have called export oriented zones, which were introduced in Mexico in 1965 under the Border Industrialisation Programme. The relatively isolated development experienced in border-states attracted immigrants who demanded services, generating social problems (SPP, 1985a). Even in 1961, the relative dynamism of border-states and their lack of integration with the rest of the country motivated the government to set up the *Programa Nacional Fronterizo*. In addition, the programme was also an attempt to win over the border area's growing market for domestic firms (SPP, 1985a). Further to what the government perceived as the region's de-integration, the situation was aggravated by the decision taken by the US Government in 1964 to suspend the Bracero Programme (García y Griego and Verea Campos, 1988).[39] The Mexican Government was afraid of a massive return of workers demanding employment and services. Therefore, the Border Industrialisation Programme's scheme allowed foreign-owned firms to operate along its border with the USA on a duty-free basis (Sklair, 1990). A large number of firms took advantage of US tariff rules on the re-import of assembled unfinished goods that

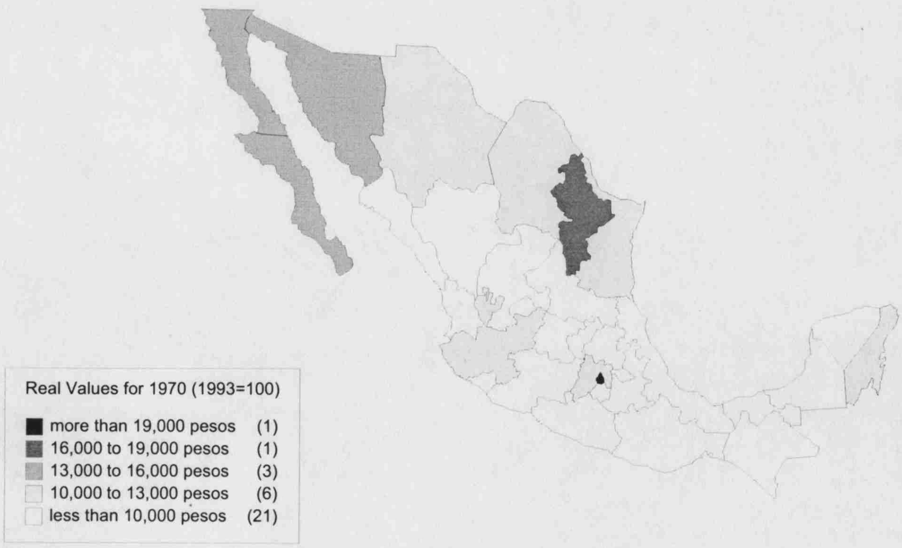
[39] US participation in the Second World War reduced the labour supply, increasing demand for Mexican migrant workers. Thus, in 1942 the US Bracero Programme allowed temporary non-immigration stay of Mexican workers. The Programme carried on until 1964 (García y Griego and Verea Campos, 1988).

incorporated US components. Although Mexico allowed almost unrestricted inflows of US investment in the North, it continued to protect the rest of the country in line with ISI principles. However, the industry would eventually become an important source of foreign currency and employment and would attain considerable shares of manufacturing production under trade liberalisation. Despite the 1972 regulation, which allowed maquiladoras to locate anywhere in Mexico, the industry remained heavily concentrated along the border.

On the one hand, the import-substitution scheme, public-investment allocation and industrialisation policies favoured firms in Mexico City and its area of influence (Aguilar, 1999). On the other hand, the government tried to pursue policies aimed at reducing regional disparities. However, such policies were centrally designed with little or no participation from the regions. At the core of the strategy was the Secretary of the Presidency created in 1958, amongst other things to plan and foster regional development. In addition, during the 1960s, the *Comisión del Río Balsas* (in substitution of the Tepalcatepec Commission) was established to improve living standards and seize productive resources in some parts of the states of Guerrero, Jalisco, Michoacán, Oaxaca, Puebla, Tlaxcala and throughout Edo. de México (SPP, 1985a). As part of the industrial decentralisation policy, the *Programa de Parques y Ciudades Industriales* (Industrial Estates and Cities Programme) was created to avoid further concentration in saturated regions at the same time that it promoted regional development through the creation and operation of industrial estates outside Mexico City. The most important examples are Ciudad Sahagún in Hidalgo, Irapuato in Guanajuato, San Juan del Río in Queretaro, Xicotencatl in Tlaxcala and Torreón in Coahuila (SPP, 1985a). The strategy was aimed at de-concentrating Mexico City. The outcome, however, was agglomeration in central regions spurred by proximity to the main market. In addition, private investment did not follow the public drive intended by the programme (Aguilar Barajas, 1989).

The border also represented a source of concern due to its relative de-integration from the rest of the country, leading to the establishment of the aforementioned *Programa Nacional Fronterizo*. Although there was a slow response during the first years, fiscal incentives of up to 50 per cent on transportation costs for products from the centre and later the establishment of the maquiladora scheme, attained the localisation of 500 industrial plants along the border generating some 80,000 jobs. Similarly, in order to integrate isolated regions in states such as Chiapas, Oaxaca, Tabasco and Veracruz, the *Comisión Coordinadora para el Desarrollo Integral del Istmo de Tehuantepec* was created in 1972 with limited results.

Figure 3.6: Regional GDP Per Capita During ISI



Source: INEGI (1985b)

Regional disparities related to the advanced stage of the ISI model can be observed in Figure 3.6. On the one hand high-income states can be found in large metropolitan areas. As in the early stage, they are located in the centre (Mexico City) and the North (Monterrey in Nuevo León). Guadalajara, in the state of Jalisco, was the second largest metropolitan area, but as opposed to the cases of Mexico City and Monterrey, it does not excel in terms of GDP per capita. However, Jalisco's performance improves in Figure 3.6 relative to Figure 3.1, since it considers GDP data instead of just manufacturing as in the previous section's figures. The reason for Jalisco's low level of industrialisation as evident in data for 1930 and 1950, could be attributed to the absence of an industrial elite that could challenge that of Mexico City, the former being influenced by the social and economic sphere of the latter (Smith, 1990). In addition, the region could have been economically static as a result of the *cristeros* political opposition to the Revolution and its institutionalisation.[40] Although there is a marked difference between Nuevo León and the rest of the border-states, the latter represent richer regions in relation to the rest of the country. The growth of maquiladoras in border-states and the industrial elite of Monterrey were at the root of the North's development. As a result, economic, political and cultural differences between northern states and Mexico City increased (Smith, 1990). States in the south-east and northern non-border states were the lower income regions. Comparing the industrial production analysis presented for the early stage of ISI to the present analysis, a clearer picture emerges. The northern states away from the border, which were modestly industrialised before the start of protectionism and during the early stage of ISI, represent poorer regions. High-income regions during the advanced stage were those related to metropolitan areas and the border. Similarly, the modest industrialisation in Veracruz and states in the peninsula evident in Figure 3.1 is not reflected in terms of GDP per capita during the advance stage of ISI. As can be observed in Figure 3.6, Veracruz and

[40] Catholic militants, among which were members of the clergy, *hacendados* and peasants, who defended the pre-revolutionary order on religious grounds. The reason for their opposition was the land reform and redistribution

states in the peninsula were among those with the lowest level of income, which contributing to a sharper division between high and low-income regions. It is important to mention that the modest income level attained by Quintana Roo was related to tourism-sector developments.

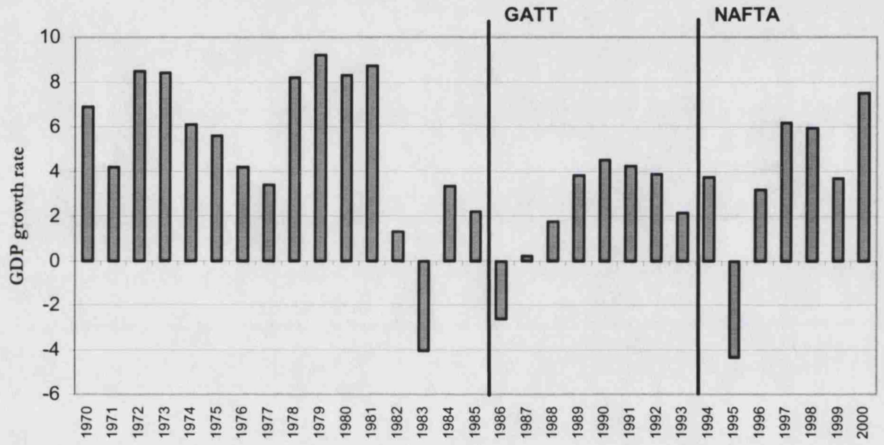
3. The Export Promotion Model (1985-onwards)

ISI was a period in which protectionism fostered industrial inefficiency (Villarreal, 1988). In addition, throughout ISI, imports actually increased, as they were needed to develop a substitution capacity, initially in the production of consumption goods and later intermediate and capital goods. Equally, as can be observed in Figure 3.5, the 1970s were characterised by import growth, while exports grew only modestly. Exactly the opposite occurred during the trade liberalisation process that started in the mid 1980s. Export growth is significantly larger than imports. The former grew 43 per cent in 1986, 10 per cent in 1987, and 17 per cent in 1988 (Maloney and Azevedo, 1995). In contrast, imports decreased by 13.5 per cent, and grew only 6.9 per cent in 1987 (Bravo Aguilera, 1989). Exports grew partly due to oil sales and partly due to manufacturing. However, a considerable proportion of such export expansion can be attributed to a 40 per cent depreciation of the peso against the dollar in 1985 (Maloney and Azevedo, 1995). Still, the response of exports to that devaluation was greater than the one related to the 1982 debt crisis, which might suggest that an export promotion strategy was taking place. The government's commitment to export promotion implied a reduction in the perceived risk of domestic operations, which attracted investment (Maloney and Azevedo, 1995). As will be explored, it was also a time of industrial restructuring. As

carried out by the revolutionary government. Peasants were drawn into the conflict motivated by the religious content of their claims. The movement was especially strong in the state of Jalisco (Skidmore and Smith, 1997).

can be observed in Figure 3.7, there was a slowdown in the economic growth in the same period. The reasons behind such a decrease were the expansion of indebtedness and that oil exports were, as can be appreciated in Figures 3.2 and 3.4, affected by falls in the international market prices (Villarreal, 1988). In this context, both multilateral trade liberalisation and regional economic integration took place.

Figure 3.7: Real GDP Growth in Mexico



Source: Ibáñez Aguirre et al. (1997), INEGI (2000a) and BANXICO (2000)

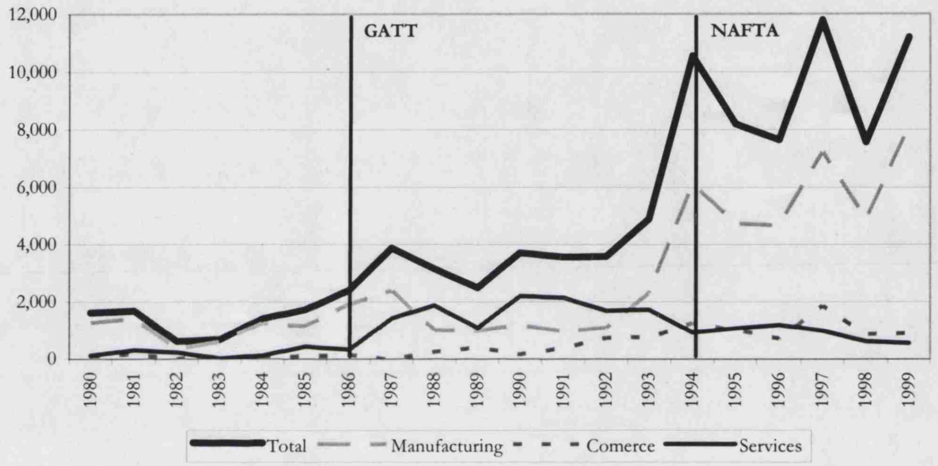
As mentioned above, the external debt, the oil shock and the relaxation of public-spending policies during the 1970-82 period generated the 1982 crisis. Mexico again agreed to undertake a stabilisation programme elaborated by the IMF, which was carried out during President Miguel de la Madrid's term in office (1982-88). Stabilisation was guided by devaluation, price controls that sought to cease inflation and by a reduction in subsidies and public spending (Lustig and Ros, 1987). A new strategy of structural change emerged, which included privatisation, an accelerated growth of non-oil exports, reliance on domestic savings and fiscal incentives to private investment (Lustig and Ros, 1987). The policies implemented recognised the structural nature of the crisis, which was not just a monetary problem (Ramírez, 1989). By 1984, the public deficit and inflation were cut almost by half (Ramírez, 1989). However, the 1985 earthquake in Mexico City and the drastic drop in oil prices turned the situation around. Although the public deficit decreased from 17 to nine per cent of GDP, inflation accelerated towards three-digit figures and unemployment rose to 17 per cent (Auty, 1994). GDP fell, despite a brief revival of the domestic market driven by manufactures. The earthquake reduced GDP by 3.4 per cent, whereas falling oil prices resulted in a 6.7 per cent aggregate demand reduction (Ramírez, 1989; Smith, 1990). The public deficit increased by an extra eight per cent due to the earthquake (Brailovsky, Clarke and Warman, 1989). As a result of the 1982 crisis, the effect of the earthquake and the oil-price decreases, the 1982-86 accumulated real per capita income was reduced by 17 per cent (Martínez Hernández, 1989).

In this context of economic crisis, Mexico shifted its policy and decided to undertake a process of liberalisation that included entrance to GATT in 1986. The long-needed structural reform was built on two major policies: reduction of the economic intervention of the State through privatisation and trade liberalisation through accession to GATT (Smith, 1990). The latter implied not only removing the import-licensing scheme, but also an export-promotion stance (Blanco, 1989). As a consequence, capital started to return and import licences were no longer applied to all transactions but only to nine per cent of imported commodities.

Accession to GATT

Even before Mexico's entry to GATT, protectionism was rationalised. These policies aimed to replace quotas with tariffs, lowering levels in the latter. This process started in 1983, but was accelerated by the oil shocks, inflation levels and inefficiency of the productive sector (Bravo Aguilera, 1989). Subsidies were abandoned as a promotion effort for exporters. Instead, domestic conditions were brought to similar standards to those faced by competitors abroad. Fiscal, financial, administrative and customs-related circumstances were improved (Bravo Aguilera, 1989).

Figure 3.8: FDI Flows in Different Sectors



Source: Based on INEGI (2000a)

The above-mentioned boost in exports is related to a sustained increase in foreign direct investment (FDI). US firms seeking cheaper labour costs, seized the opportunity presented by the opening up of the Mexican economy, as well as schemes such as the maquiladora, to undertake production processes across the border featuring, in many cases, intra-firm trade; thus, the intermediate-goods exchange between both nations was developed to a considerable extent during this period (Weintraub, 1988). If we refer to Figure 3.8 it seems that entry to GATT brought about greater access to foreign capital. FDI flows grew significantly during the eight-year span under GATT regulations. It is important to highlight that accession to GATT led to an expansion of maquiladora activities. In the first year after signing GATT, the number of maquiladora establishments grew 17.1 per cent, while employment in the sector rose 17.86 per cent

(INEGI, 1998a). During the whole period (1986-93) the number of establishments operating under the maquiladora scheme almost tripled and employment grew by 156 per cent (INEGI, 1998a).

However, a notable fall in FDI flows from 1987 to 1989 can be observed. The Wall Street's crash of October 1987 had profound effects on the Mexican economy. Speculation and distrust precipitated falls on the Mexican stock-exchange, and investors tried to minimise their losses by buying dollars. Demand for dollars mounted and the central bank had to pull out of the market in order to protect its international reserves (Cárdenas, 1996). The resulting devaluation of the peso and the lack of foreign capital led to a second part of the oil-bequeathed crisis, which as can be observed above in Figure 3.7, turned growth rates negative. GDP contracted by approximately two per cent. By the end of 1987, annualised inflation ran at 461 per cent and external debt represented 95 per cent of GDP. The reasons behind the failed stabilisation are not only related to Wall Street's crash. The service and size of the external debt, which the government had incurred during the 1978-82 period to seize oil resources also played an important part (Cárdenas, 1996). Moreover, the external debt was under-appreciated by the government, who regarded it as a mere liquidity problem. A renewed effort was launched in December 1987 through the *Pacto de Solidaridad Económica* (Economic Solidarity Pact). This was aimed at reducing inflation and recovering growth using the nominal exchange rate as an inflation anchor and price controls agreed with the productive sector. By the end of 1988, the new President, Carlos Salinas de Gortari, focused on continuing the stabilisation programme, recovering growth and enlarging the export-promotion strategy. It is important to mention that the regional and bilateral agreements promoted by Mexico during the 1990s could theoretically have been in opposition to the multilateral trade liberalisation undertaken in 1985; yet in practice, as is explored in the next chapter, these could have spurred freer trade.[41] Nevertheless, whereas GATT and multilateralism brought about a boost to FDI flows, the regionalism proposed in the early 1990s offered very specific opportunities and possibilities (Bhagwati, 1991).

The economic strategy of President Salinas was aimed at reducing inflation, fostering growth and alleviating poverty. In order to achieve these objectives, the strategy was based on three fundamental aspects: privatisation, economic integration with Canada and the USA and public spending that targeted poverty reduction. Salinas turned public deficit into surplus through the privatisation scheme. The programme comprised the sale, transfer or liquidation of State-owned, small and medium-sized firms in a first stage. The second stage included the sale of companies and banks with considerable assets (Ros, 1994). The programme focused on privatisation of those economic units that were not considered by the State to be of strategic importance (Rogozinski, 1997). The aim was to increase efficiency in the allocation of resources, redefine the role of the State, as well as improve public deficit (Rogozinski, 1997). The US$22 billion of total revenue stemming from the privatisation of chiefly large firms such as the State telephone company (TELMEX) and commercial banks was used almost entirely to reduce internal and external debt, as well as to eliminate the public deficit. Free trade and economic integration were guaranteed by the signing of NAFTA. Poverty was targeted through the application of public funds from the *Programa Nacional de Solidaridad* (PRONASOL), which contemplated a high degree of civil society involvement. By 1992, the programme was comparable to nine per cent of GDP, and represented 45 per cent of social expenditure and 18 per cent of total public investment (Garza, 1999).

[41] The multilateralism-regionalism debate and its implications for Mexico are explored in depth in the next

In addition, the Salinas administration achieved a sensible reduction in the external debt through the Brady Plan (Urzúa, 1997). Moreover, the relations between the Catholic Church and the government were re-established,[42] while a constitutional reform on land tenure was promoted, resulting in a redefinition of the *ejido* (Gledhill, 1996; Jones, 1996). Public deficit reduction, privatisation and legal reform that granted domestic treatment to foreign investors brought in overseas capital (Ros, 1994). By 1992, the country had attracted US$5.4 billion in net foreign investment (Ocampo and Steiner, 1994). As can be observed in Figure 3.8, FDI increased exponentially. Between 1991 and 1993, the accumulated capital account reached US$84 billion (Cárdenas, 1996). However, in any economy, a huge inflow of capital tends to increase income and aggregate demand, which in turn has two effects. First, capital flows raise domestic prices of tradable goods more than the increases in prices experienced abroad. If the nominal exchange rate does not change, the currency ends up overvalued. Second, the supply of non-tradable goods cannot keep up with mounting demand, resulting in faster price increases than those of tradable goods. In turn, these market distortions affect firms' profits and decrease demand. Overvaluation leads consumers to prefer imported goods to domestic ones since their prices are artificially lower (Cárdenas, 1996). Greater levels of imports generate a higher commercial deficit that needs to be financed through more capital flows. The economy ends up vulnerable to external shocks. Moreover, it is also exposed to domestic increases in the demand for foreign currencies, which may not be eased by limited international reserves. This phenomenon was very much the case of the progressive weakening of the Mexican economy that resulted in crisis in December 1994.

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chapter.

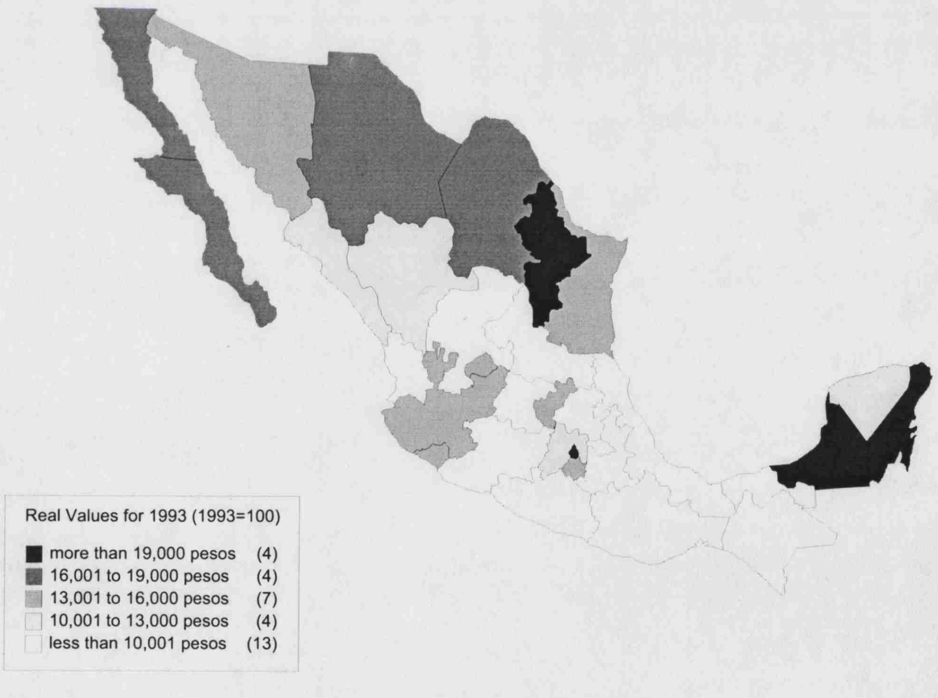
[42] The State and the Church had been in confrontation over several issues ever since the Laws of Reform restricted the latter's political activity and right to own property and capital. Such tension was also evident in the *cristeros* movement. After the 1991 reform to the Constitution, the Church was able to get involved in education, own real estate and capital and the clergy regained the right to vote. However, some limitations to Church involvement still remain, such as the ban on political content in speeches, publications and meetings (Canak and Swanson, 1998). The major explanation behind its political involvement since the mid-1980s is the declining legitimacy of the ruling party (PRI). President Salinas's reforms were guided by the PRI's need to draw on the Church's legitimacy to boost its own beleaguered reputation (Camp, 1997). However, the Church was not co-opted by the scheme, as has its own agenda and a need to stay independent if it is to maintain its reputation (Camp, 1997).

In addition, the government failed to address changes to the oil sector, which could have impinged slow growth in the Mexican economy (Philip, 1999). Despite all the above-mentioned reforms, risk aversion conditioned a paramount sector of the economy (Philip, 1999). Furthermore, the threat of crisis was triggered by social and political factors (Edwards, 1997). The Chiapas rebellion and assassinations of key political actors were amongst the troubles faced by the Mexican economy in 1994.

The regional impact of the policies implemented by the Mexican Government between 1985 and 1993 is shown in Figure 3.9. The spatial implications of this new approach related to trade liberalisation and multilateralism are associated with a deepening of the already existing regional income disparities. Indeed, as can be observed in Figure 3.9, the picture becomes even clearer after trade reform takes place. In 1993, just before NAFTA entered into effect, high-income regions were located following a similar pattern to that resulting from the ISI model. However, income polarisation was more evident.

Not only had per capita income in the three largest metropolitan areas risen, but these had also increased their influence over neighbouring states. It is particularly interesting to note that Jalisco had improved its level of income and may have influenced the neighbouring states of Aguascalientes and Colima, which also performed better during GATT. Similarly, the economic expansion of Mexico City and Nuevo León seemed to have had an effect over Morelos and Queretaro in the case of the former, and over Coahuila in that of the latter. Border-states achieved high levels of income, which were more generalised throughout the region than under ISI. In addition, Campeche and Quintana Roo, both states in the peninsula and far away from the border or from the three metropolitan agglomerations, attained high-income levels. That performance was related to the oil industry in the case of the former and to tourism in the latter. It is worth mentioning the modest improvement in income levels experienced during the period by some northern non-border states such as Sinaloa, Durango and San Luis Potosí, as well as by Tabasco in the south-east. Although there were no major changes in the arrangement of regional income in Mexico as a result of trade liberalisation, the pattern becomes clearer. Multilateral free trade is associated with deeper regional inequalities. In this context, Mexico fostered liberalisation and free trade during President Salinas's term in office (1988-94).

Figure 3.9: Regional GDP Per Capita After GATT



Source: Personal calculations based on INEGI (2000a) and CONAPO (1988)

Economic Integration and NAFTA

In 1994 Mexico embarked on an economic integration process with Canada and the USA. That scheme is known as NAFTA and it aims at delivering greater exchange between the countries involved. The agreement, however, comprises much more than just trade; investment, environment and labour issues are also contemplated. Similarly, in recent years Mexico has signed bilateral agreements to promote exchange with Bolivia, Chile, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Uruguay. Equally, Mexico is a member of the *Grupo de los Tres,* an additional trilateral agreement with Colombia and Venezuela. The economic opening strategy extends beyond the continent to include bilateral agreements with the European Union, the European Free Trade Area (EFTA) and Israel. In addition, negotiations are ongoing to include agreements with other Latin American countries, Singapore and Japan. However, taking into account the nature of the economic integration process implied by the agreement, as well as by the importance of the commercial partners, NAFTA represents by far the most significant trade framework ascribed to by Mexico. In fact, NAFTA is the first example of economic integration between developing and developed countries (Bulmer-Thomas, Craske and Serrano, 1994). It is also important for Mexico since trade with NAFTA countries represents over 83% of total trade (Secretaría de Economía, 2001).

As President Salinas stated in the agreement's Official Text, NAFTA represents a set of rules that will establish the norm for exchanges of capital, goods and services that have long been taking place between the signing countries (SECOFI, 1993). Pre-NAFTA exchanges were regulated by a set of agreements of a sectoral character (Weintraub, 1988). The intention behind Mexico's entry into NAFTA was to provide security and confidence to investors and exporters (SECOFI, 1993). Moreover, the inter-dependency between Mexico and the USA developed during ISI was stronger from the former's point of view. On the one hand, the USA was losing competitiveness in consumer goods, which were supplied by Mexico, but that otherwise would have been provided by other countries. On the other hand, Mexico needed the USA's larger market to expand its production and income (Weintraub, 1988). As mentioned above, trade in intermediate products in the Mexican economy was developed during GATT, as part of intra-firm production processes; thus, trade involved US direct investment. Mexico's need for free trade with the USA was so strong that the former had to make additional reforms in order to secure the agreement (Cameron, 1997). Such reforms were related to the domestic legislation on intellectual property rights, equal treatment to foreign and domestic investors, the acceptance of a bilateral investment treaty and admittance of foreigners in financial services. Even oil was placed on the agenda; however, reforms in the oil industry were limited to foreign access to investment opportunities in petrochemical production and trade in natural gas and electricity. As mentioned above, the Mexican government has been risk averse regarding the oil-industry reform (Philip, 1999). Additionally, with a new US democrat government, Mexico had to add the acceptance of complementary agreements on labour and the environment. Many of the concessions made by Mexico would have been made in any case as part of a domestic reform process (Cameron, 1997). Indeed, such measures were intended to improve the climate for business. In return, Mexico benefited from attracting foreign investment, repatriation of capital, restoration of the confidence in the economy and gaining the approval of the international community. But, above all, Mexico gained access to the US market.

Although the agreement was ratified by the member countries' legislative bodies, domestic political and economic problems have worked against the benefits related to

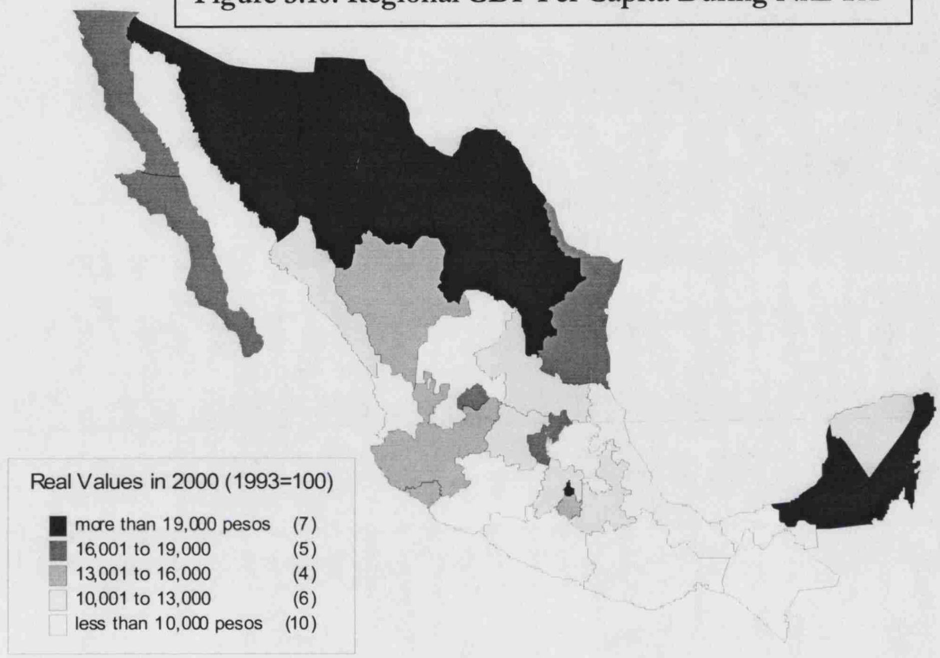
NAFTA membership. On the one hand, the armed rebellion of Chiapas erupted, ironically, on the same day that NAFTA came into effect. Three months later, the PRI's presidential candidate (Luis Colosio) was assassinated, and five months later the Secretary General of PRI was also gunned down. On the other hand, overvaluation of the peso was not balanced by daily adjustments to parity. By the end of the first year of NAFTA, Mexico was, as the government called it, in a state of economic emergency.

Due to the above-mentioned events, international reserves declined throughout 1994 and by December investors' confidence in Mexico had evaporated, undermined by the events of the year, as well as by the realisation that the peso was overvalued. The low levels of international reserves weakened the Mexican position. As a result, capital started to migrate from Mexico. In turn, the new President Ernesto Zedillo recurred to a 15-per-cent devaluation, but as capital continued to flee, the Mexican Government decided to float the peso (Edwards, 1997). Capital continued to leave the country. As can be observed in Figure 3.7, the result was a greater GDP contraction than the one experienced in the early 1980s. Moreover, the banking system was almost bankrupt. In January 1995, US President Clinton lobbied commercial and development banks and even with the Senate to conform a rescue plan that included a credit line of US$20 billion with the US Treasury and a US$17.8 billion stand-by-agreement with the IMF (Urzúa, 1997). Mexico was demanded to raise VAT levels, increase the price of utilities, restrict credit, float the peso, privatise railroads, ports and petrochemical industries, as well as to open up the banking system to foreign competition and investment (Urzúa, 1997).[43] All of the conditions were met, but the effects of the crisis were sound in terms of GDP contraction as can be observed in Figure 3.7. Moreover, if we take BANXICO (1998) into account the

[43] Some of the conditions had already been met, such as currency floating; others were being already considered for implementation by the government.

GDP contraction was greater,[44] falling by 6.2 per cent, almost double that of the early-1980s crisis.

Figure 3.10: Regional GDP Per Capita During NAFTA



Source: INEGI (2000a)

The banking system rescue represented a significant burden to the economy.[45] Some banks suffered intervention and some others have been acquired by foreign banks in an effort to re-capitalise financial institutions. Through the Savings Protection Fund (FOBAPROA/*Fondo de Protección al Ahorro*), the government created the Temporary Capitalisation Programme (PROCAPTE/*Programa de Capitalización Temporal*), aimed at preventing the bankruptcy of the financial system. In addition, consumer credit re-structuring was tackled through the Agreement for Immediate Support to Debtors (ADE/*Acuerdo de Apoyo Inmediato a Deudores*) and employing investment units

[44] BANXICO (1998) and INEGI (2000) figures on GDP growth differ due to the fact that the latter refers to seasonally adjusted GDP changes.

(UDI/*Unidades de Inversión*). It is estimated that the financial-system rescue had a cost of 15 per cent of 1998 GDP (Hernández Trillo and Villagómez, 2000). The cost of the financial rescue was concentrated in the Institute for the Protection of Banking Savings (IPAB/*Instituto para la Protección al Ahorro Bancario)* which not only absorbed the debt, but also serves as partial/total cover of banking deposits; however, in 2000 IPAB's debt[46] amounted to 13.14% of GDP (IPAB, 2001).

Inflation and interest rates rose considerably. During 1995, 90-day CETES (short-term interest rates on treasury bonds) reached over 70 per cent (annual rates) and annual average active rates (on loans) reached nearly 100 per cent (OECD, 1995). In the same year, inflation was over 50 per cent (BANXICO, 1998). The Zedillo administration focused on overcoming one of the worst economic crises in Mexico's history. Growth and FDI flows recovered and surpassed pre-crisis levels.[47] Inflation was 9.49 per cent in 2000 (INEGI, 2000a) and the economy grew by over 7 per cent (See Figure 3.7). In fact, between 1996 and 2000 growth rates averaged 5.4 per cent (Lustig, 2001). However, according to Lustig (2001), that performance is less impressive if it is considered in the context of the economic rebound from the crisis. It is important to bear in mind that slow growth prior to the crisis could have been partly the result of the absence of needed reforms particularly in fiscal issues and in the oil industry (Philip, 1999).

Let us now focus on the regional transformations entailed by the export-promotion approach. It is difficult to foresee the full impact of NAFTA on the already existing regional economic differences within Mexico, since it is an ongoing liberalisation process that has been taking place for only a few years. However, disparities between

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[45] There was, however, no other alternative, since the destruction of the financial system could have placed Mexico in an even worse position.

[46] IPAB's debt is expected to decrease as proportion of GDP to around 7% by 2010 (IPAB, 2001)

the relatively richer states and the rest of the country have accentuated. By 2003, regional disparities in Mexico as shown in Figure 3.10, were still cut by the same pattern. The three metropolitan areas, the border-states and the oil and tourism-influenced states in the peninsula continued to be the higher income states. In contrast, the lowest income levels can be found in the South. It also looks as if the plausible benefits or spillover effects of a region being close to one of the three agglomerations has continued after the introduction of NAFTA. Although all three metropolitan areas appeared to be influencing income levels in neighbouring states during GATT, NAFTA modestly reduces that effect on close-by states. Morelos, a neighbouring state to Mexico City, has dropped one level in the income hierarchy presented in Figure 3.10. In contrast, the state of Querétaro, which is close to Mexico City, has improved its GDP per capita level. Querétaro's improvement could lend support to the de-concentration-process argument put forth for Mexico City (Aguilar, 1999). The implication is that regional, instead of local external economies, as explored in the next chapter, are taking place. However, whereas ISI was characterised by demographic and economic concentration in and around Mexico City, export-promotion strategies are marked by territorial re-distribution (Olivera Lozano, 1997). Most states in the Yucatán Peninsula remain at the same level, influenced by oil production and tourism.

The Maquiladora Phenomenon

Although most economic sectors were hurt by the crisis, the maquiladora industry was favoured by even lower relative wages after the devaluation. As mentioned above, the maquiladora sector grew steadily during the GATT years, but it was with the negotiations leading to the signing of NAFTA that the industry soared. However, the industry has been

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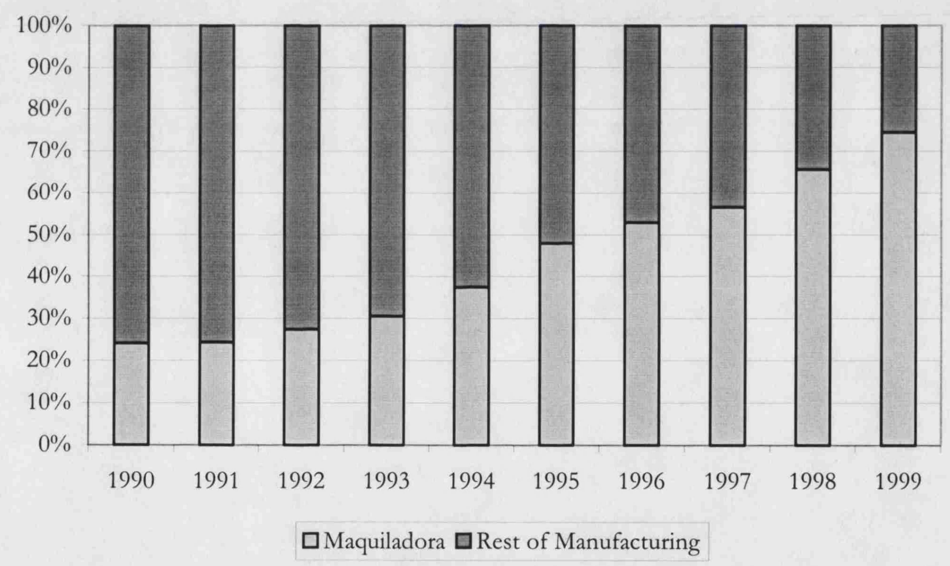
[47] Despite a recent contraction of FDI flows entailed by the world recession.

criticised for its poor linkages with other industries, lack of technology transfer and questionable working conditions. Despite those criticisms the maquiladora is nowadays a vital industry in Mexico. Accordingly, Figure 3.11 shows the participation of maquiladora activity in the total value of manufacturing production. In just ten years Mexican manufacturing was completely transformed. In 1990, the share of maquiladora production in manufacturing was nearly 25 per cent, with the rest of manufacturing accounting for just over 75 per cent. By 1999, the shares were exactly the opposite. Maquiladora was responsible for nearly 75 per cent of manufacturing, whereas other industries produced the remaining 25 per cent.

Figure 3.11: Production in Manufacturing and Maquiladora

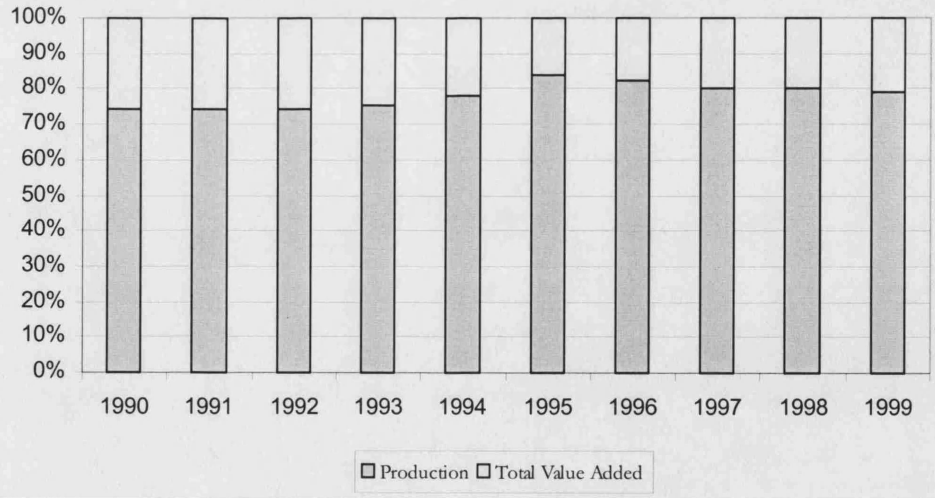


Source: INEGI (2000a)

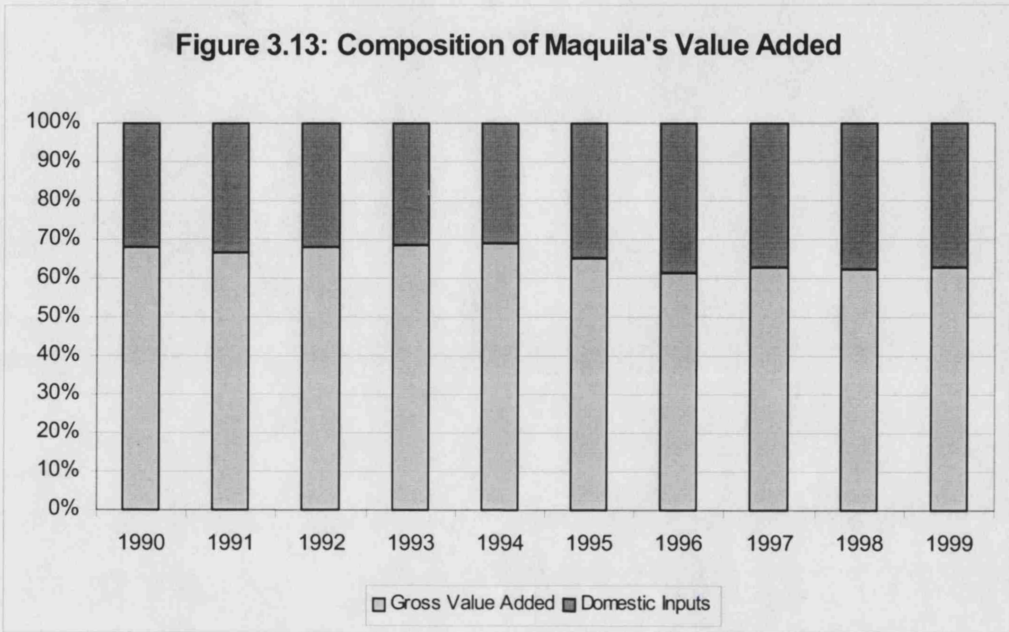
However, value-added figures show that while production has increased, value added has decreased over time, representing 21% of the value of production in 1999 (INEGI, 2000b). In contrast, non-maquiladora manufacturing's value added typically represents one-half of the total value (INEGI, 1995). Although the importance of maquiladora has been significant in terms of production and employment in the country, value added figures show that such significance is still limited to some inputs and wages paid to workers. It is important to note that as can be observed in Figure 3.12, value added was greatly affected by cheaper imports stemming from the devaluation of December 1994 and despite they have always represented a low share of production, they seem to start recovering only recently.

In spite of cheaper inputs coming from abroad, domestic producers whose quality and quantity allowed them to become suppliers of the industry enhanced the level of integration of the industry to the Mexican production structures. Although the lion's share of the value added in the industry stems form wages, packaging costs, other expenditures and profits, namely the gross value added, domestic inputs have become an increasing source of the limited total value added of the industry (Figure 3.13).

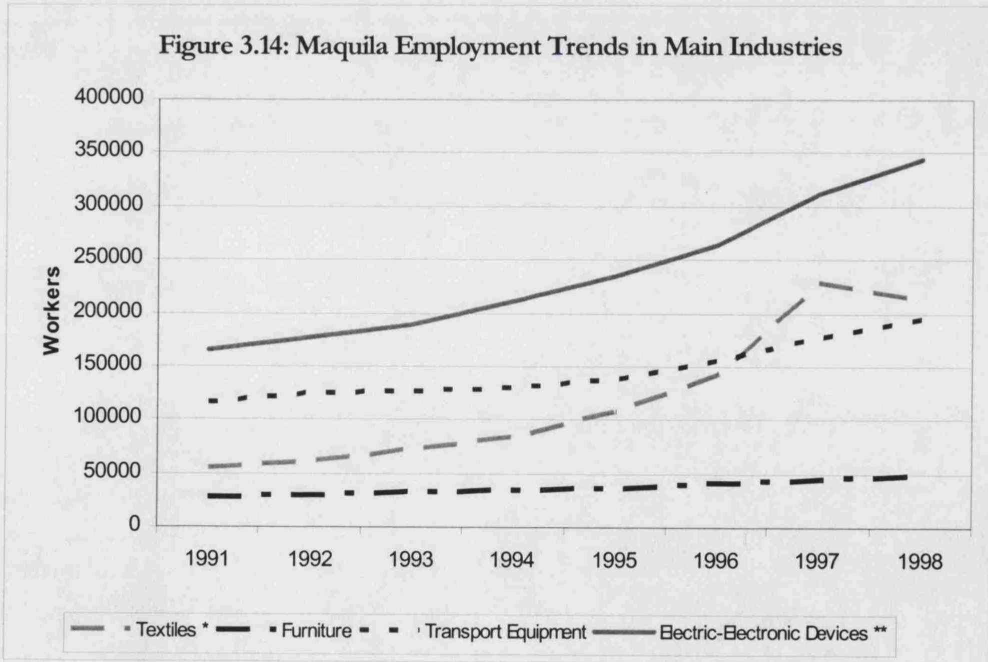
Figure 3.12: Value Added in the Maquiladora Industry as Proportion of Production



Source: INEGI (2000b)



Source: INEGI (2000b)



Source: INEGI (1997d and 1999d)

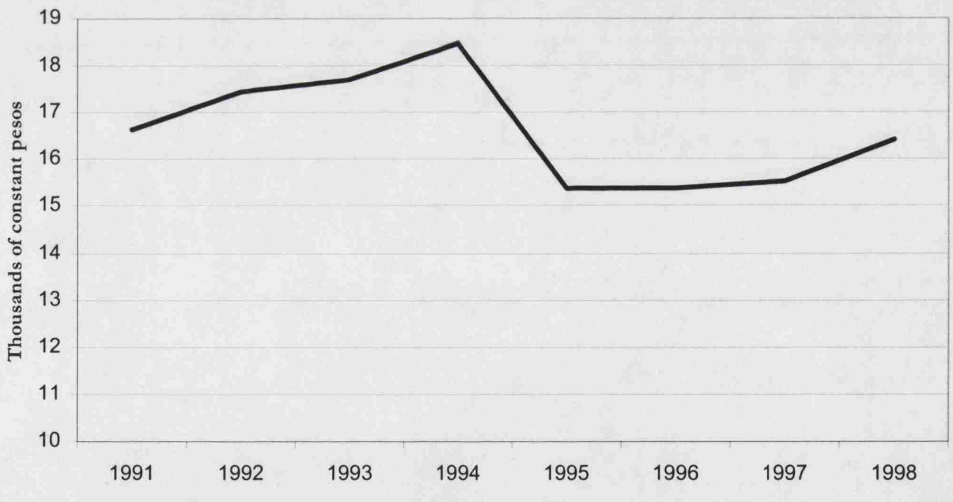
In terms of employment the maquiladora industry has been specialising in industrial activities such as electric-electronics, transport equipment and textiles, which in 1998 represented 34, 21 and 19 per cent respectively of total maquiladora employment (INEGI, 1999d). As we can see in Figure 3.14, the aforementioned activities have been steadily growing in terms of employment. However, if we take into account growth rates between 1991 and 1998, those activities with greater growth have been textiles, chemicals[48] and electric-electronics with average annual rate of 17, 11.8 and 9.9 per cent respectively (INEGI, 1999d). It is interesting to find that electric-electronics and textiles, not only are the main employers, but are also growing faster, and it is even more interesting that one can be considered relatively labour intensive (textiles), while the other capital intensive (electric-electronics). Between 1991 and 1998, the former grew stronger than the latter except for 1998 when we can observe a contraction of over 6%. Moreover, textiles' growth was boosted after the devaluation of December 1994, whereas electric-electronics' was steady. Indeed, most probably such employment growth in textiles was entailed by a reduction in real average wages as the main factor employed in their production is labour; as it is shown in Figure 3.15, real average wages in the maquiladora industry declined considerably after the 1994 devaluation and have started to recover in 1998, which coincides entirely with the pattern of employment growth in textiles. In contrast, employment in the relatively more capital-intensive industry, namely electric-electronics, has been growing, apparently unaffected by such changes in real wages.

It is also important to mention that wages in the textile maquiladora established in non-border states typically represent between 61 and 72 per cent of wages in the same activity in border-states (INEGI, 2000b). Such wage differential has increased employment in that activity in non-border states. Textile employment under the maquila programme in non-border states represented in 1991 28% of total employment in that

[48] However, chemical activities, represented in 1998, less than 2% of maquiladora total employment.

activity, but grew annually on average 22.4%, representing in 1998, nearly half of the activities national employment. In border-states, annual average growth rates were almost half (11.9%) of that of non-border states, which enabled a decline on the border's participation of employment in textiles (INEGI, 2000b). In contrast, employment machinery and equipment, which include amongst other things –but chiefly- electric-electronics[49], has almost entirely been located in border-states[50] (INEGI, 2000b). This a first indication that processes based on capital are preferring a closer location to the USA, whereas those that are labour intensive are choosing to locate farther South[51]

Figure 3.15: Real Average Wages in the Maquiladora Industry



Source: INEGI (1997d and 1999d)

Figure 3.16 represents the value of the total maquiladora production by its origin. From 1990 and until 1995, border-states were responsible for 95 per cent of the industry's total

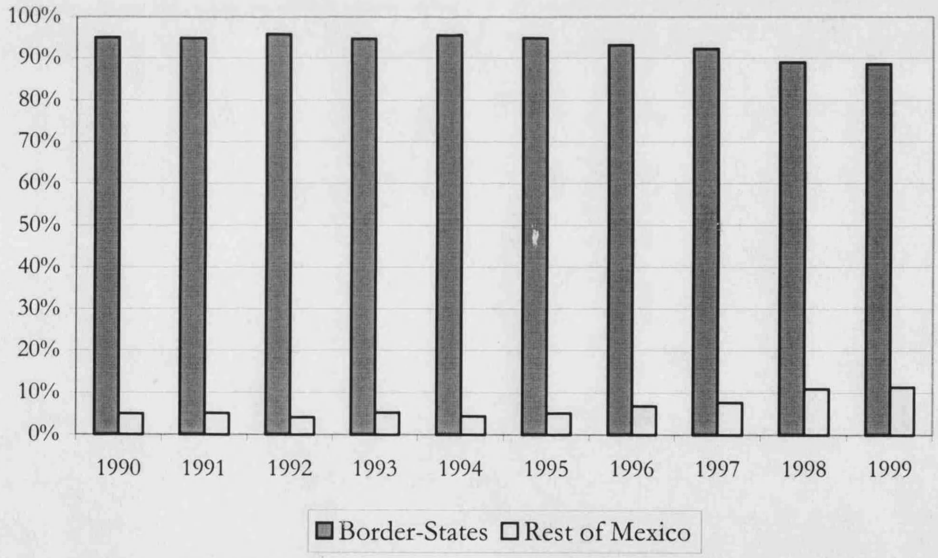
[49] Data for electric-electronics was not available.

[50] With the notable exceptions of Jalisco and Querétaro, whose employment was not significant compared to border-states, but whose average wages were actually higher than the latter's (INEGI, 2000b).

[51] This is an important argument that will be revisited in Chapters Six and Seven.

production, whereas the remaining 5 per cent was produced in the rest of the country. However, during NAFTA, and particularly from 1996 onwards, non-border states have steadily increased their share of the maquiladora industry. By 1999, maquiladoras located in non-border states represented over 11 per cent of the industry's production. In terms of employment, the fastest growth rates have been observed since 1983 in municipalities away from the border (MacLachlan and Aguilar, 1998). However, such fast-growing non-border municipalities were located initially in border-states. It is only after NAFTA (particularly after 1996) that non-border states really start to benefit. However, the industry is still heavily concentrated in border-states.

Figure 3.16: The Location of Production in the Maquiladora Industry



Source: INEGI (2000a)

The findings for maquiladora are not necessarily extensive to other industries. According to Hanson (1996) there is a concentration of plants in Mexican cities that are on the border or very close to it. Moreover, concentration of industrial activity in Mexican border regions is even generating manufacturing growth in US border cities (Hanson, 1996). The continuous and deeper trade liberalisation is likely to contribute to the further development of bi-national production centres that are already springing up along the border (Grunwald, 1985; Hanson, 1996). The maquiladora industry represents a boost to border-states, since it has remained along the border or in nearby cities, despite the recent allowance to locate in other regions. The reason is that a large proportion has been seizing low wages, producing intermediate inputs or finished produce in an intra-firm trade context (Weintraub, 1991). Under such circumstances, proximity between pairs or groups of subsidiaries of the same firm has proven to be a key aspect. In addition, maquiladora brings new technology to the regions in which it locates (Weintraub, 1991), possibly giving rise to spillover effects to other industries. In sum, border-states have several advantages over the rest of the country, particularly location, and that might explain the reluctance of maquiladora firms to move. Consequently, due to the importance of maquiladora not only within manufacturing, but also to the whole economy, and since this activity is heavily concentrated in border-states, it is important to bear in mind that such agglomeration implies a bias in regional growth. The industry is increasingly important; since 1994 maquiladora has been able to direct part of its production towards the domestic market. The legislation allows for up to 50 per cent of maquiladora production to be sold in the national market from 2000.[52] Therefore, in future chapters this bias will be considered.

The Biasing Oil Industry

During NAFTA, the oil industry has played a less important role relative to the end of ISI. However, the activity continues to be important and one that influences regional growth trends, as it is heavily localised in a few places. On the one hand, oil as a proportion of total

[52] Details of such regulation can be found in the 'Decreto que Modifica al Diverso para el Fomento y Operación

exports has significantly declined since the early 1980s (Figure 3.4). In 1991, oil represented 19.2 per cent of exports; by 1998, that figure was 6.07 per cent of total exports (INEGI, 2000a). Indeed, oil is now complementary to other industrial activities[53] and not the drive of the economy as in the early-1980s (Alzati, 1989). On the other hand, oil revenue represented 27.71 per cent of total budgetary revenue for 1990, whereas by 1997 its participation had increased to 29.72 per cent. Its renewed budgetary importance was mainly based on domestic taxes imposed on oil, rather than on sales of oil abroad. In 1990, oil exports represented 13.16 per cent of budgetary revenue, whereas by 1997 the figure had dropped to 9.73 per cent (BANXICO, 1998). Most importantly, the industry becomes especially relevant to this thesis for its high level of regional concentration. Its presence biases regional estimations on which the analyses of subsequent chapters are based. In 1998, 94.66 per cent of all oil production was concentrated on Campeche and Tabasco (Table 3.2). As explored in Chapters Four and Five, oil production in these states alters the analyses of convergence and growth performed in those chapters.

Table 3.2: Localisation of the Oil Industry in 1998

Oil-producing states	Share of daily extraction
Campeche	74.17%
Tabasco	20.49%
Veracruz	2.57%
Chiapas	1.82%
Tamaulipas	0.75%
Puebla	0.16%
San Luis Potosí	0.03%
National	100.00%

Source: Personal calculations based on PEMEX (1999)

de la Industria Maquiladora de Exportación', issued on 24 December 1993 (ISEF, 1998).

[53] In contrast, the automobile industry has exhibited an outstanding dynamism, contributing to more than a quarter of Mexican exports in 1997 (BANXICO, 1998).

4. Conclusions

Mexico shifted from a closed-economy approach entailed by an import-substitution model, to free trade by entering GATT and implementing an export-promotion model. More recently, Mexico has embarked on a process of economic integration by signing NAFTA. This chapter has connected historical accounts with geographical transformations, particularly relating trade approaches to the evolution of regional disparities.

After the socially and politically motivated Revolution, the political stability offered by the creation of the PNR, as well as the effects of the Great Depression led Mexico to the adoption of an inward development model. By 1930, the above-mentioned strategies gave rise to industrialisation in Yucatán, Mexico City and its area of influence, as well as in the North, both border and non-border states. The situation continued virtually unchanged until 1950. However, Quintana Roo's industrialisation seemed to have taken off, while the border slightly enhanced its position relative to northern non-border states.

Industrialisation patterns led, however, to increased regional disparities by 1970. The ISI model, which was adopted chiefly as a reaction to foreign factors, provided the necessary conditions for disparities to increase. High-income were concentrated in the three largest metropolitan areas and in border-states. Large oil-deposit discoveries brought about relaxed spending and distracted the government from stabilisation programmes; policies aimed at tackling the effects of the crisis and not the root of the problem, plunged Mexico into economic crisis.

Trade liberalisation was introduced when Mexico acceded GATT in 1986. However, ISI had provided protection for inefficient industries and public-owned firms. Mexico shifted from a permit-based to a tariff-based system; thereafter, tariffs were progressively lowered. At the same time, the government had committed to the IMF to follow a stabilisation programme. Exports based on non-oil production began to increase. FDI flows increased, particularly just before to the signing of NAFTA (and throughout that period). However, the Mexico City earthquake and the financial crash of Wall Street brought about a second crisis.

Although regional inequalities were similar to those observed at the end of ISI, the divide between border-states and metropolitan areas, on the one hand, and the rest of the country (particularly the South), on the other, was greater. Although some states in the Yucatán Peninsula have been profiting from the new scheme, the improvement was related to particular industries such as tourism in Quintana Roo and oil in Campeche.

NAFTA and the signing of other trade agreements has led to benefit in terms of growth, exports and attraction of FDI. Despite the mid-1990s crisis, the country seems to have rejoined the path of economic growth. Additionally, the maquiladora scheme, favoured by proximity to the USA, has boosted the economy. Despite NAFTA has led the industry to spread to non-border states, the industry has been heavily concentrated in border-states. Although the oil industry no longer enjoys the importance it used to have, particularly at the end of ISI, the activity is paramount for specific states. Its production is concentrated mainly in two states, namely Campeche and Tabasco.

During NAFTA, territorial inequalities have followed the previous pattern. However, they have increased. Border-states and the three largest metropolitan areas seem to have been benefiting from trade. However, while Mexico City and Monterrey seemed to have gained from trade, Guadalajara (the third largest urban centre) has lagged behind. Nevertheless, have trade liberalisation and economic integration reinforced regional imbalances in Mexico? In order to answer this question, the next chapter will focus on the regional distribution of trade benefits and on regional growth trends, as well as on determining —through convergence analyses— whether disparities have widened or waned after trade was introduced.

It is important to bear in mind three factors that may bias growth: public expenditure, the maquiladora scheme and the oil industry. Whereas the first of these might be considered an explanatory factor rather than a source of bias, the last two elements can entail data disturbances. Firstly, maquiladora was found in this chapter to be localised heavily in border-states. Secondly, oil was found chiefly concentrated in south-east states of Campeche and Tabasco. Thus, in the next chapters particular attention should be paid to these factors.

Chapter Four
Regional Growth and Convergence Trends

1. Introduction

As discussed in Chapter Two, benefits from trade can be divided into *gains from exchange* and *gains from specialisation* (Kenen, 1994; Markusen et al., 1995). The former implies greater exchange between countries, which in turn raises the utility function of consumers in the participant countries; that is, consumers are better off by having at their disposal a greater range of products at a lower price relative to autarky. The latter implies a shift in the pattern of production in the economies involved, thereby producing more of the comparatively advantageous goods and less of the disadvantageous ones.

In order to establish whether there have, in fact, been benefits from trade for Mexico, as well as the possible distribution of such gains, it is important to explore the liberalisation process induced by GATT, as well as the progress in economic integration established by NAFTA. These two processes and their sectoral impacts are addressed in the next section. Bearing in mind the above distinction between types of gains, the present chapter aims to evaluate Mexico's benefits from trade not only in terms of the gains from exchange and specialisation, but also in terms of growth and capital reception entailed by the free-trade-oriented model, which otherwise would not be achieved. In addition to determining the plausible gains from trade for Mexico, this chapter also explores the spatial localisation of such benefits through a regional analysis of growth and reception of FDI. Finally, that regional growth appraisal will enable the identification of convergence/divergence trends in Mexico.

2. The Pace of Liberalisation in Mexico

The first attempt to liberalise the Mexican economy was initiated during President López Portillo's term in office (1976-82). According to Cameron (1997), Mexico tried to seize the opportunity to become a free rider; that is, while demanding access to the US market, it sought recognition of its special status as a developing country. The USA tried to bring Mexico into the free-trade arena and even proposed a North American common market. In 1979, the Mexican Government promised to begin talks that would eventually lead to the country's accession to GATT. Despite the extremely beneficial terms negotiated by Mexico, in 1980 the government decided to withdraw from the liberalisation talks, which produced bilateral tension. The reason behind the retraction was Mexico's relatively good position and expectations due to the newly discovered oil reserves in the south-east. However, the early-1980s oil shock, a new president with different attitude towards trade, and the need to access the US market finally led Mexico to join GATT. Developing countries usually got advantages when joining GATT; however, Mexico's pressing economic situation resulted in a negotiation without advantages. According to Cameron (1997), such privileges would have been most likely granted in the late 1970s, under a stronger Mexican position. Moreover, the deal implied the commitment of non-interrupted oil sales to GATT members (Cameron, 1997). Such an arrangement meant a drastic change in Mexico's strategy. However, Mexico's adhesion to GATT by no means involved an absolute, immediate or non-discriminatory trade liberalisation.

Table 4.1: Mexico's Tariff Structure 1984-92

	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total items	8063	8091	8206	8445	8472	11932	11838	11815	11828
Subject to import licence	64.7 %	10.4 %	7.8 %	3.9 %	3.4 %	2.7 %	2.1 %	1.7 %	1.6 %
Tariff average	23.3	25.4	22.6	10	9.7	10.4	13.1	13.1	13.1
Tariff dispersion	22.5	18.8	14.1	6.8	6.9	7.1	4.4	4.5	4.5
Weighted tariff	8.5	13.3	13.1	5.6	6.2	6.2	9.7	10.5	11.1

Source: GATT (1993b)

As mentioned in the previous chapter, tariff reductions were implemented in Mexico before signing GATT. Tariffs were raised again to counterbalance the elimination of permits in 1985 (GATT, 1993a). Tariff reduction was undertaken again in 1986 when Mexico acceded GATT and accelerated towards an average rate of ten per cent. Moreover, tariff dispersion decreased from 24.8 per cent in 1982 to 4.5 per cent in 1992 (GATT, 1993a). Such dispersion meant that particularly consumer goods, which received the highest levels of protectionism, experienced the greatest tariff reductions, bringing them in line with those of intermediate and capital goods by 1988 (GATT, 1993a). In fact, the Mexican Government's trade objectives were stated in GATT (1993b) as being: lowering tariff rates, reducing tariff dispersion and replacing quantitative restrictions by tariffs. As can be observed in Table 4.1, the number of items subject to import licence was dramatically reduced; while in 1984, the items subject to permits represented nearly two thirds of total items, the figure plummeted to less than two per cent by 1992. As mentioned above, prior to joining GATT average tariffs increased momentarily, but declined steadily until 1989 when they recovered slightly; however, if we take into account the import-weighted average such an increase was the result of greater trade rather than renewed protectionism. Indeed, despite the slight increase of 1989, tariff dispersion decreased consistently throughout the period, signalling Mexico's compliance with trade objectives and the requirements of GATT.

Despite the reduction in the number of items requiring an import licence, the decrease in the average tariff and the contraction in the dispersion of tariffs, the pattern of liberalisation was different across sectors and branches. In agriculture and manufacturing, protectionism continued in some commodities and activities. Amongst the legacies of the ISI model were the application of license requirements to a few agricultural products and the existence of guaranteed prices on selected crops; these forms of protectionism were particularly favourable to corn and soybeans (GATT, 1993a).

Table 4.2: Effective Rates of Protection in Agriculture

	1988	1989	1990	1991
Agriculture				
Corn	45.7	78.3	101	155.2
Rice	-56.4	-34	-35.9	-12.5
Wheat	-38.3	-18.6	3.9	-2.4
Kidney-bean	-36.3	-56.9	-8.2	-24.7
Sorghum	-8.3	27.2	70.8	28.7
Barley	-56.7	-14.2	15.5	10.9
Soybean	-29.4	19.3	78.6	114.6
Sesame	-17.2	-14.1	-15	-10.9
Cotton	-0.4	1.1	14.3	14.3
Sugarcane	2.9	3.4	1.9	-3.9
Coffee	-36.1	-37.2	17.8	-10.6
Tobacco	-80.7	-51.8	-59.7	-50.3
Cocoa	-6.7	0.8	25.6	10.3
Other	-12.9	-27	-23.9	-1.7
Livestock				
Bovines	24.1	57.2	39.7	71.5
Pigs	37.2	93.6	200.1	262.7
Sheep	34.9	105.1	163.4	346.3
Poultry	106.8	0.8	33.1	6.7
Other	-1.4	-0.7	0.3	-4.7
Forestry				
Forestry	-17.9	8.5	38.3	38
Fishery				
Fishery	-28.9	-10.6	-7.4	-16.2

Source: GATT (1993a)

Tariff averages and their dispersion are useful measures of protectionism since they reflect direct levels of protection for specific industries. However, such measures are unable to capture protectionism in the structure of production. That is, they do not depict the protection offered to inputs used by particular industries. As a result, production costs are underestimated (Kessel and Kim, 1994). For instance, in the case of Mexico, automobiles, computers and pharmaceuticals received special treatment up until the 1990s (Weiss, 1999). The effect of such special treatment would not be reflected in nominal tariffs (Weiss, 1999). In order to account for protectionism on inputs of production, a measure called effective protection rates was created. Effective protection rates as calculated by GATT (1993a), based on Ten Kate and Venturini (1989) are shown in Tables 4.2 and 4.3; the methodology reflects differences between value added at domestic and international prices.[54]

As can be observed in Table 4.2, protectionism was still effective in some crops. As argued above, corn and soybeans were by far the most protected crops; moreover, the level of effective protectionism increased throughout the period. A more moderate protectionism can be found in the case of barley, sorghum, cotton and cocoa, while a trend towards effective liberalisation can be found in the rest, particularly in sesame and tobacco. Protection levels in pigs and sheeps were more important than in the rest of livestock. Finally, while forestry shifted from levels of negative protection in 1988 to considerable levels of protectionism, fishery sustained its negative levels of protectionism. Although liberalisation was the norm, there were two trends that can be pointed out at the end of the GATT period. First, an increase in the average tariff was related to the inclusion of additional trading items and not to a reversal in tariff levels. Second, the legacy of protectionism was still effective mainly in grains and livestock.

[54] The specific methodology is available in GATT (1993a).

Table 4.3: Effective Rates of Protection in Manufacturing

	1980	Average 1988-91	GDP growth 1985-93
Food, Beverages and Tobacco			
Meat and dairy	94	15.25	25.41%
Canned fruit & vegetables	7	-27.375	50.58%
Grain milling	-39	-49.975	-1.14%
Coffee processing	56	7.125	-5.78%
Sugar processing	-15	-39.3	20.33%
Oils and fats	107	-35.75	11.60%
Animal feeds	-9	207.475	-12.29%
Alcoholic beverages	212	-60.7	21.43%
Beer and malt	-3	-47.65	47.15%
Soft drinks	-55	-29.55	26.95%
Tobacco manufactures	-25	-52.7	-9.80%
Other foodstuffs	28	-16.05	32.91%
Textiles			
Soft-fibre spinning and weaving	7	223.5	-25.28%
Hard-fibre spinning and weaving	42	-24.3	-176.82%
Clothing	119	0.675	3.15%
Footwear and leather	30	-55.075	-35.25%
Other textiles	14	-10.5	10.15%
Wood and Paper			
Sawmills	51	19.75	-28.48%
Other wood industries	64	-35.15	4.62%
Paper	96	19.575	6.10%
Printing and publishing	-9	-58.475	14.88%
Chemical			
Petroleum refineries	32	70.3	14.39%
Basic petrochemicals	-45	-25.75	66.56%
Basic industrial chemicals	121	41.425	23.52%
Fertilisers and pesticides	-48	629.225	-28.16%
Synthietic resins, plastic materials	824	15.375	20.04%
Pharmaceutical	30	-68.55	13.85%
Detergents	17	-33.625	30.77%
Rubber	98	12.825	-3.00%
Plastic	2091	6.725	25.17%
Other chemicals	82	78.35	15.39%
Minerals			
Glass	11	-32.8	31.65%
Cement	76	144.025	31.41%
Other minerals	31	-22.825	14.31%
Metallic			
Iron and steel	38	25.825	19.85%
Non-ferrous metallics	34	-7.05	20.38%
Food, Beverages and Tobacco			
Metal furniture	129	106.05	14.43%
Structural metal products	34	67.75	15.00%
Other metal products	57	-16.575	14.17%
Non-electric mach. & equip.	65	21.6	33.00%
Electrical mach. & equip.	65	75.4	21.33%
Electrical appliances	134	197.1	17.02%
Electronic equip. & appliances	365	47.45	39.30%
Other electrical equip & appliances	111	-32.75	32.14%
Motor vehicles	---	11	98.95%
Engines, parts and car frames	23	7.85	19.70%
Other transport equipment	60	40.8	-41.78%
Other Manufacturing Industries			
Other manufacturing industries	89	-51.575	16.14%

Source: GATT (1993a) and INEGI

Similarly, Table 4.3 shows effective rates of protection in the manufacturing sector that as discussed earlier, were calculated by GATT (1993a) employing differences in value added at domestic and international prices as applied in Ten Kate and Venturini (1989). As can be observed, despite progressive trade liberalisation, industrial policies stemming from the ISI model and particularly from the early 1980s remained. Nevertheless, sectoral programmes were followed in the automotive, pharmaceutical and computer industries in order to tackle the large trade deficit (GATT, 1993a). In addition, according to the World Bank, other industry-specific actions were aimed at supporting State-owned enterprises in foodstuffs, textiles, shoes, furniture, consumer appliances, cellulose and paper, cement, iron and steel, as well as in the basic chemical industries (GATT, 1993a). Thus, as discussed in the previous chapter, not only was there still some protectionism in place, but this was also chiefly aimed at supporting State intervention.

However, the efforts to liberalise the economy cannot be overlooked. Of the 48 activities listed in Table 4.3, only 12 registered a rise in protectionism. In the food, beverages and tobacco sub-sector, the effective rate of protectionism only increased considerably on animal feed. In textiles, the only branch not being effectively liberalised by 1991 was soft-fibre spinning and weaving. In the mineral industries, cement was the only protected activity. In the metal products sub-sector iron and steel was the only effectively favoured activity.

Protectionism was also noted in chemicals, as well as in machinery. The former was related to petroleum refineries, basic industrial chemicals, fertilisers and pesticides, as well as other chemicals. The latter was associated with metal furniture, structural metal products and electrical appliances. Although electrical machinery experienced nominal liberalisation, the branch still enjoyed high levels of effective protectionism. Most of the effective protection was observed in industries in which the State intervened. Nevertheless, the liberalisation carried out during the late 1980s and early 1990s was significant.

Table 4.4: OLS Results for GDP Growth During GATT

	Model 1
ERP	-0.15994 (-1.0989)
R-square	0.026

It is important to note that the level of protectionism and the activities to which it was applied to, were not based on competitiveness, but simply on maintaining a shield around those activities in which the State had economic interests. Indeed, using branch-level GDP growth rates for manufacturing activities, as well as ERPs shown in Table 4.3, OLS regressions were ran. Protectionism was in place during GATT; however, its impact on economic growth is unclear. The results of Table 4.4 show that effective rates of protection had no statistical significance in shaping the period's growth. Hence, protectionism not only helped State interventionism to continue during the liberalisation period, but also had little impact on GDP growth. The damage was therefore, not only in delaying genuine liberalisation, but on limiting growth through intervention.

Mexico's accession to GATT meant undertaking multilateralism[55]; however, the benefits of trade could have been seriously curtailed. On the one hand, the progressive nature of the liberalisation process implied that the gains would be attained gradually. On the

[55] Multilateralism refers to a non-discriminatory liberalisation that favours all nations (Memodovic, Kuyvenhoven and Molle, 1999).

other hand, trade benefits were hampered by the lack of liberalisation in some areas due to State intervention; in the case of manufacturing, through production; in the case of agriculture, mainly via guaranteed prices. Thus, it is not only important to bear in mind the effects of trade diversion[56], but also that the liberalisation process in Mexico was far from completed during the GATT years, representing an additional limitation to profiting from trade.

The Speed of Economic Integration amongst Canada, Mexico and the USA

The term economic integration has no clear-cut meaning amongst economists. In fact, the origin of the term can be traced back to Viner (1950), but has been used differently by authors developing the economic integration theory (Jovanović, 1998). However, for the purpose of this chapter, economic integration will be taken to mean trade liberalisation amongst a group of countries discriminating against non-members. Different levels of integration can also be identified. First, free trade areas in which member countries remove trade barriers amongst themselves but determine independently their own policies with respect to the rest of the world as in NAFTA. Second, customs unions, which are free trade areas with a common external framework such as a common external tariff (the objective of MERCOSUR by 2006). Third, common markets such as the EU extend the customs union to include factor mobility across member countries. Fourth, complete economic union, which are common markets that have unified their monetary (as in the EMU) and even their fiscal policies.

[56] An important debate has centred on whether integration entails trade creation or trade diversion. The former represents expanded trade amongst the economies involved in liberalisation, while the latter represents exchange on the basis of non-maximising welfare criteria; moreover, by inducing trade with a restricted number of countries, specialisation might be biased towards producing goods without a comparative advantage.

Fifth, complete political unions, where the participant countries become a nation, as in the re-unification of Germany (El-Agraa, 1997).

Despite criticisms regarding trade diversion and the possibility of undermining the regulation of the multilateral trading system, Preferential Trade Agreements (PTA) entail some advantages (El-Agraa, 1997). First, increased levels of production are made possible by the increased size of the market. Second, production is not only greater, but more efficient as specialisation is allowed. Third, the PTA's terms of trade are improved by its enhanced international bargaining position. Fourth, competition will bring about economic efficiency. Fifth, technological advances will facilitate changes in the quantities and qualities of the factors of production. Further gains can be attained by going beyond the customs union, but as Mexico has not reached that level of integration, I shall not discuss them here.

PTAs are in vogue; around 90 agreements have been notified to GATT through the World Trade Organisation (WTO). Large PTAs such as the EU and NAFTA have been expanding their membership or are planning to do so. The vast majority of WTO members belong to a PTA; moreover, some of them have signed more than one. This expansion of PTAs has led to the overlapping of many of them. As mentioned in the previous chapter, Mexico has endorsed bilateral and trilateral agreements with diverse nations. At the same time, Mexico has embarked on a process of integration with Canada and the USA, but continues to comply with WTO requirements of multilateral trade. The problem of overlapping agreements is exclusive to free trade areas (FTA) such as NAFTA, since a customs union or any other integration agreement would imply a common external commercial policy. FTAs allow countries to determine their own commercial policies with other countries. The problem is that of determining the nationality of a product when FTAs overlap; to help determine that nationality, the rules of origin (ROO) have been created to ensure that a certain content of an item should be produced with domestic or intra-FTA products. Therefore, when a country pursues multiple FTAs, ROOs become a source of conflict amongst member countries, as the term 'domestic' becomes loose and levels of locally produced content become indeterminate. An example of this type of conflicts is illustrated in Krueger (1997); California winegrowers had to negotiate with Chile and Mexico the terms of their own Chile- Mexico FTA, as ROOs became conflictive and liberalisation schedules differed from those negotiated between Canada, Mexico and the USA under NAFTA. Moreover, differences in ROOs across member countries could entail differences in production costs faced by competing industries within the FTA; hence, competition is undermined by overlapping PTAs. In addition, different cost structures could not only distort competition but also bias investment decisions altering the location of production (Krueger, 1997).

In sum, overlapping FTAs could seriously damage trade by conflictive ROOs, undermining competition and introducing bias to location decisions. If the aforementioned problems of trade diversion arising under PTAs are also considered, it can be established that PTAs are not a scheme that will maximise the gains from trade. However, it is also important to bear in mind that it is an approach that delivers greater gains than autarky. The question of whether PTAs are stepping-stones towards multilateral global trade remains unanswered. As mentioned in the previous chapter, Mexico has entered into several trade arrangements with diverse countries, not only in the Americas, but also with the EU and Israel and it is also a member of the Asia Pacific Economic Co-operation (APEC) and of the WTO.

Mexican products had access to the Canadian and US markets under the most favoured nation principle and the preferential tariff system for developing nations granted by developed countries since the agreement of the Tokyo Round of GATT. However, Mexico decided to seize exports and investment opportunities by joining NAFTA. The political reasons for Mexico's entry into the PTA are beyond the scope of this chapter but they can be found in Tornell and Esquivel (1997).

NAFTA schedules the integration of the Mexican economy based on a maximum tariff of 20 per cent and an average tariff of 13.2 per cent in effect in 1991 (Kessel and Kim, 1994). The agreement considered immediate, five, ten and fifteen-year stages of liberalisation. As can be noted in Table 4.5, tariff elimination is advantageous for Mexico until the 2004 liberalisation round, when only seven per cent of all Mexican exports to Canada and the USA will be subject to tariffs. In contrast, 38 per cent of Canadian and US products exported to Mexico will still be subject to tariffs. However, by 2009 the three members will only charge tariffs to one per cent of member-countries exports. While the greatest liberalisation of foreign products entering the Mexican market was effected immediately in 1994, the second largest wave of liberalisation is yet to come in 2004. Therefore, it is important to remember that the liberalisation of the Mexican economy is by no means a one-off event that occurred in 1994, but rather something that is increasing in a series of waves and that the full impact of NAFTA is yet to be seen.

Table 4.5: Liberalisation Schedule (Proportion of Total Exports)

	For Mexican Products		**For Foreign Products**	
	in the US	**in Canada**	**from the US**	**from Canada**
Immediate (1994)	84 %	79 %	43 %	41 %
5 years (1999)	8 %	8 %	18 %	19 %
10 years (2004)	7 %	7 %	38 %	38 %
15 years (2009)	1 %	1 %	1 %	1 %

Source: Kessel and Kim (1994)

Table 4.6: Liberalisation under NAFTA

	Mexico	
	Average Tariff	Dispersion
1991	13.2 %	4.5 %
1994	8.9 %	6.2 %
1995	8.2 %	5.6 %
1996	7.6 %	5.1 %
1997	6.7 %	4.9 %
1998	6.0 %	4.8 %
1999	5.6 %	4.6 %
2000	5.3 %	4.5 %
2001	5.0 %	4.5 %
2002	4.7 %	4.5 %
2003	4.4 %	4.6 %
2006	4.4 %	4.6 %
2008	4.4 %	4.6 %

Source: Kessel and Kim (1994)

According to Table 4.6, both the average tariff and the dispersion of tariffs in Mexico have been decreasing steadily since 1994. Even after the scheduled liberalisation for Mexico, displayed in Table 4.5, protectionism will still be present in the country, since tariffs will continue to be applied to non-NAFTA countries. Table 4.6 displays average tariffs as well as their dispersion. Assuming that tariff levels for the rest of the world remain constant, average tariffs and dispersion for member countries drop appreciably as a result of NAFTA. After 2000, however, the average tariff and dispersion display very minor reductions, since discriminatory policies against non-members are being applied. Mexico will be losing potential gains from trade due to trade diversion. Products from non-member countries will be affected by the tariffs. If those products had a comparative advantage relative to member-countries' alternatives, the second-best option, produced in a member country, could be favoured; thus, producing trade diversion.

Table 4.7: Effective Rates of Protection in Manufacturing Under NAFTA

	1994	1999	1994-99	GDP growth 1993-98
Food, Beverages and Tobacco				
Meat and dairy	9	5.1	7.05	0.14%
Canned fruit & vegetables	18.4	19.1	18.75	4.24%
Wheat milling	20.4	2.1	11.25	-0.35%
Oils and fats	14.9	13	13.95	-14.40%
Animal feeds	8.9	-1.8	3.55	-3.76%
Beer and malt	15.1	9	12.05	-5.68%
Soft drinks	-3.2	-2.5	-2.85	1.21%
Other foodstuffs	14.6	9.2	11.9	6.05%
Textiles				
Soft-fibre spinning and weaving	10.9	9.5	10.2	-9.73%
Hard-fibre spinning and weaving	8.2	8.8	8.5	19.69%
Clothing	18.8	12.7	15.75	-2.01%
Footwear and leather	16.1	14.2	15.15	-5.52%
Other textiles	11.4	4.2	7.8	8.74%
Wood and Paper				
Sawmills	15.5	8.3	11.9	-5.41%
Other wood industries	14.7	7.5	11.1	-0.29%
Paper	5.6	-0.1	2.75	-8.06%
Printing and publishing	2	1.2	1.6	0.36%
Chemical				
Petroleum refineries	-5.4	-2.2	-3.8	-1.14%
Basic petrochemicals	-1.5	0.1	-0.7	-19.84%
Basic industrial chemicals	3.8	2.6	3.2	-0.35%
Fertilisers and pesticides	5.9	6.3	6.1	-9.28%
Synthietic resins, plastic materials	7.4	5.6	6.5	-7.34%
Pharmaceutical	9.1	8.2	8.65	5.81%
Detergents	15.6	9.4	12.5	-6.88%
Rubber	12.2	5.7	8.95	-10.61%
Plastic	15.3	9.1	12.2	-1.97%
Other chemicals	6.1	5.6	5.85	-4.99%
Minerals				
Glass	13.1	7.8	10.45	2.33%
Cement	5.9	1.2	3.55	-1.08%
Other minerals	14.8	10.5	12.65	-3.29%
Metallic				
Iron and steel	4.2	6	5.1	-5.15%
Non-ferrous metallics	4.5	2.8	3.65	1.62%
Machinery and Equipment				
Metal furniture	17.9	9.4	13.65	-6.55%
Structural metal products	13.1	10	11.55	2.28%
Other metal products	13	8.1	10.55	2.16%
Non-electric mach. & equip.	8.3	6.2	7.25	-7.02%
Electrical mach. & equip.	9.5	8.1	8.8	11.37%
Electrical appliances	18.2	11	14.6	8.36%
Electronic equip. & appliances	10.5	7	8.75	18.28%
Other electrical equip & appliances	12.6	8.7	10.65	4.99%
Motor vehicles	14	7.6	10.8	-3.94%
Engines, parts and car frames	9.5	5	7.25	12.69%
Other transport equipment	1.7	2.5	2.1	-1.99%
Other Manufacturing Industries				
Other manufacturing industries	7	6.2	6.6	1.84%

Source: Own calculations based on Kessel and Kim (1994), INEGI (2000) and SHCP (2002)

The outstanding high levels of protection experienced during GATT and presented in Table 4.3 are reversed under NAFTA. Moreover, the high and moderate levels of effective negative protection during GATT decreased with integration. In Table 4.7, the same methodology for the construction of effective rates is employed. High levels of positive and negative effective protection observed during GATT converge towards very moderate levels of protection under NAFTA. The reason for that lies in the fact that not only tariff elimination is taking place with NAFTA, but also that the non-tariff barriers to trade such as guaranteed prices, subsidies and tax devolution to exporters are being eliminated by Mexico. Although NAFTA has led to decreasing protectionism relative to GATT, which would implicitly entail greater gains from trade, the possibility of trade diversion is still present. However, it could be argued that despite plausible diversion of trade, NAFTA is proving to be a stepping stone towards freer trade.

Using a simple model also applied for the GATT period, an OLS regression was employed to explore the relationship between implicit protectionism measured by ERPs and regional economic growth based on branch-level information. Table 4.8 shows that effective rates of protection between 1993 and 1999 had no statistically significant effect on growth; that is, growth during NAFTA is not determined by the inefficient allocation of resources implied by protectionism. GATT was found to be a period in which effective protectionism was persistent but failed to influence growth; although protectionism has declined considerably during NAFTA its effect on growth is still very poor. The fact that different levels of protectionism are not related to growth is intriguing but explained by a number of factors. First, the model is rather simple and most likely overlooks the effect of other factors determining growth. Second, implicit levels of protectionism are notably larger in certain sectors, while modest in others, which, amongst other things, determines the lack of statistical significance. Effective protectionism is but one of the forms hampering trade and its benefits, and the measure used (ERPs) neglects non-tariff barriers to trade.

Table 4.8: OLS Results for GDP Growth During NAFTA

	Model 1
ERP	0.243 (0.674)
R-square	0.011

The above effective rates of protection should in theory, have an impact favouring protected sectors and thwarting unprotected ones. In practice, it is difficult to determine with precision whether sectoral impacts are produced by trade liberalisation or by trade diversion stemming from indirect (inputs) protectionism or by other factors. We can still know, however, whether sectors have been positively or negatively –or largely unaffected for that matter- affected by liberalisation and implicit protectionism. The level of disaggregation of Mexican GDP data prevents this type of analysis to go beyond the sub-sector level[57]. As one can expect from a period in which there is generalised regional economic contractions, there are several sectoral impacts across regions in Mexico during GATT.[58] All sectors are notably affected in almost every region (Table 4.9). The minerals, machinery and others sub-sectors were amongst the least affected. Regionally speaking, just as it was found in the previous chapter that per capita growth was scattered around the country, negative sectoral impacts are present in border-states such as Chihuahua and Nuevo León, northern states such as Durango and Sinaloa, central states such as Edo. de México, Jalisco and Puebla and most south-east states. Despite protectionism was still in place in some sub-sectors during the liberalisation period, the transition to freer trade coupled with a slow recovery first from

[57] GDP data is available for the ISI period (1980-85), but it is unavailable from 1986 onwards. Tables 4.9 and 4.10 are based on sub-sector growth for 1985-93 and 1993-99 for all Mexican states.

an economic and later from a financial crisis impinged negative sectoral impacts across regions in Mexico.

Table 4.9: Negative Impacts by Sub-sector During GATT

	Foods.	Text.	Wood	Paper	Chem.	Min.	Met.	Mach.	Other
Aguascalientes		X		X			X		
B. California	X	X		X	X				
B. California Sur	X	X	X		X		X		
Campeche	X	X	X	X	X		X	X	
Coahuila		X		X			X		
Colima	X	X	X	X			X		
Chiapas	X	X	X		X			X	X
Chihuahua	X		X	X	X		X		
Distrito Federal	X	X	X	X	X	X	X	X	X
Durango	X		X	X	X		X		X
Guanajuato		X	X				X	X	X
Guerrero	X	X			X				
Hidalgo	X	X					X	X	
Jalisco		X	X	X	X	X	X		
México	X	X	X	X	X	X	X	X	X
Michoacán	X	X		X					X
Morelos		X		X	X		X		
Nayarit	X	X		X	X	X		X	X
Nuevo León	X	X	X	X	X	X	X	X	
Oaxaca	X	X	X	X			X	X	X
Puebla		X			X	X	X	X	X
Querétaro		X		X	X	X		X	
Quintana Roo			X	X			X		
San Luis Potosí		X	X	X	X		X		
Sinaloa		X	X		X		X	X	X
Sonora		X			X	X			
Tabasco		X			X				
Tamaulipas					X				
Tlaxcala		X	X	X		X	X	X	
Veracruz		X	X	X			X	X	X
Yucatán	X	X		X	X				
Zacatecas	X	X			X	X			

Source: Own calculations based on INEGI (2000a)

In contrast, NAFTA is a period of growth in which few negative sectoral impacts can be seen at a regional level. With the exceptions of wood and minerals all sectors had fairly positive impact in Mexican regions (Table 4.8). However, the regional picture is quite different from the one described above for GATT. Negative impacts are chiefly

[58] Sectoral impacts represented by marks on Tables 4.10 and 4.11 refer to negative growth rates for the corresponding state and sub-sector.

found in central and southern Mexico. In fact, with the exception of Quintana Roo, almost every state to the South of, and including, Mexico City was negatively affected. The entire south-east, the peninsula, and states in central Mexico such as Puebla, Hidalgo and Jalisco, as well as northern non-border states such as San Luis Potosí and Sinaloa comprise the group of states with significant negative sectoral impacts. The above findings are in line with the pattern of regional growth in Mexico that was found in the previous chapter. Despite the negative sectoral and regional impacts, as it is argued in the next section, there have been benefits associated to trade. It is important to mention that whereas negative rates are related to trade periods, there is no available tool to distinguish trade form other determinants of growth.

Table 4.10: Negative Impacts by Sub-sector During NAFTA

	Foods.	Text.	Wood	Paper	Chem.	Min.	Met.	Mach.	Other
Aguascalientes							X		
B. California									
B. California Sur									
Campeche	X		X			X			
Coahuila			X						
Colima									
Chiapas		X	X			X			
Chihuahua							X		
Distrito Federal			X			X	X		
Durango						X			
Guanajuato			X						
Guerrero				X		X			
Hidalgo	X						X		X
Jalisco				X		X			
México									
Michoacán									X
Morelos			X					X	
Nayarit	X					X			
Nuevo León									
Oaxaca			X					X	
Puebla				X		X			
Querétaro		X							
Quintana Roo	X								
San Luis Potosí		X	X			X			X
Sinaloa			X			X			
Sonora									
Tabasco		X		X		X			
Tamaulipas			X						
Tlaxcala									
Veracruz					X			X	
Yucatán			X				X		
Zacatecas									

Source: Own calculations based on INEGI (2000a)

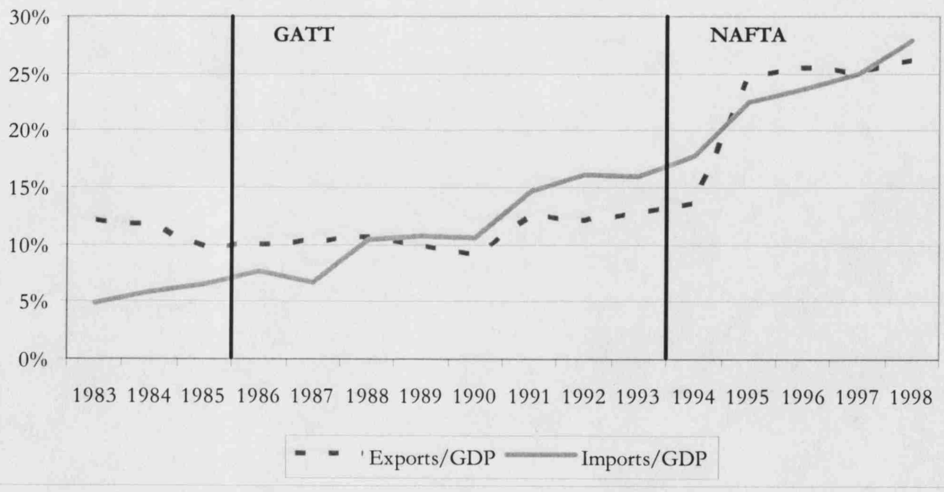
3. The Benefits of Free Trade

As mentioned above, gains from exchange imply an increase in the availability of goods relative to autarky; that is, to prove that gains from exchange are taking place, it is necessary to prove that an economy has reached a higher utility function. As attaining such proof involves an effort beyond the scope of this chapter, an alternative route, as explained below, has been taken. Similarly, to explore the plausible gains from specialisation entailed by free trade, it is necessary to prove that an economy has been concentrating on the production of certain goods and reducing the manufacturing of others. In that sense, this section explores the re-structuring of production; firstly, amongst sectors and secondly within manufacturing.

Gains from Exchange

Foreign exchange in Mexico has intensified since trade liberalisation, but particularly after economic integration. Exports and imports' contribution to national GDP increased with Mexico's accession to GATT and particularly during the 1990s and NAFTA (Figure 4.1). The Mexican industrialisation strategy of the early 1980s relied heavily on oil production. As can be seen in Figure 3.3, at that time oil represented six per cent of GDP. Exports were heavily concentrated in oil. In 1983, nearly 72 per cent of total exports were oil (INEGI, 2000). However, total exports represented only 12.12% of GDP. As protectionism was still in place, imports represented less than 25% of total trade and only 4.9% of GDP (INEGI, 2000). As can be noted in Figure 4.1, trade liberalisation has led not so much to an expansion of trade, but rather to a re-composition of it, lowering, as mentioned above, the contribution of oil to exports and increasing considerably the level of imports. By 1993, the former represented 12.66% of GDP, while the value of imports as a proportion of GDP was over 16 per cent. It is important to note that after the greater liberalisation undertaken in 1989, imports were greater than exports. Although there was still effective protectionism taking place during GATT, trade liberalisation evinced industrial inefficiency, which contributed to the sharper rise in imports. Although GATT considerably enhanced the value of non-oil exports and imports, it has been under NAFTA that their proportions have soared. Exports as a proportion of GDP rose from 13.58% in 1994 to 26.14%, while imports grew from 17.7% to 27.9%. It is worth noting that while exports outstripped imports between 1995 and 1997, that effect was likely to have been caused by improved terms of trade after the 1994 devaluation. Finally, it is important to recall the sharp fall in international oil prices mentioned in Chapter Three and depicted in Figure 3.2, contributing to lowering oil's contribution to total exports.

Figure 4.1: Exports and Imports as Proportions of GDP

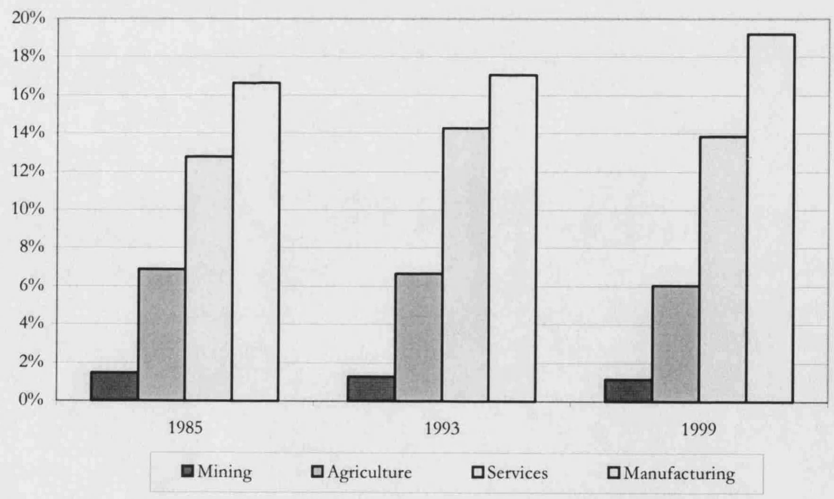


Source: Personal calculation based on INEGI (2000a)

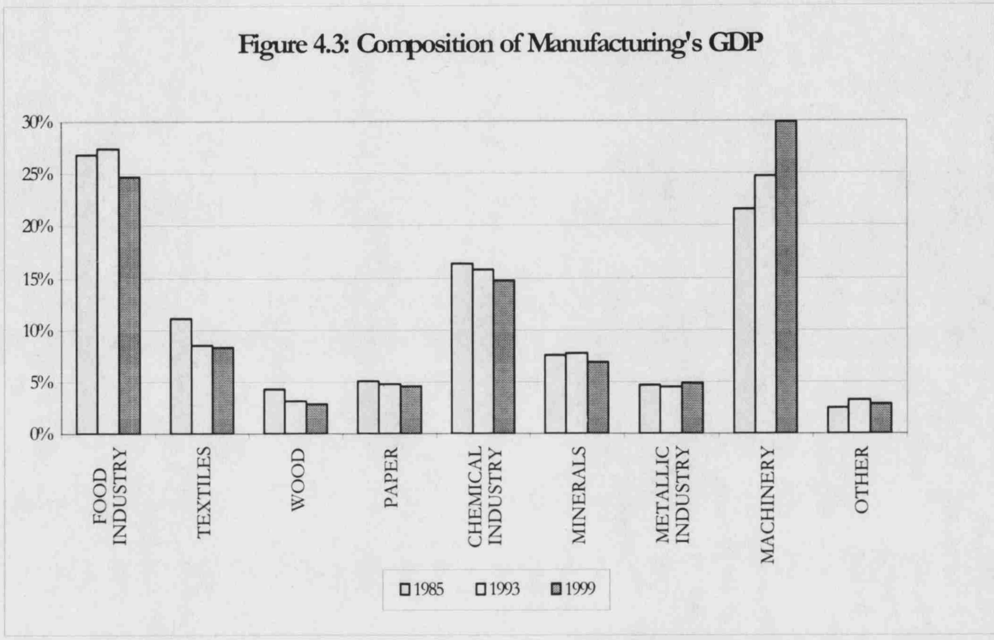
Gains from Specialisation

The aim of this section is to explore the extent to which the Mexican economy has concentrated on the production of certain groups of goods and moved away from presumably less advantageous activities. As can be observed in Figure 4.2, manufacturing has steadily increased its participation in GDP. Services improved their share of national rent during GATT, but decreased modestly with NAFTA. Both agriculture and mining have been steadily reducing their participation in aggregate demand. Therefore, it would seem that the economy is progressively moving towards specialisation in manufacturing. At the same time, production is moving away from primary-sector activities, such as agriculture and mining. The effect on services is unclear if we consider the initial rise and subsequent fall of its share.

Figure 4.2: GDP Composition



Source: Personal calculation based on INEGI (2000a)



Source: Personal calculation based on INEGI (2000a)

Within manufacturing, we can infer from Figure 4.3 that Mexico is specialising in machinery production and to a lesser degree in the metallic industry, while it has been moving away from the rest of the manufacturing activities. The decreasing participation is most notable in textiles, food and chemical activities. Foodstuffs, mineral activities and other industries seem to have been positively influenced by GATT, but negatively affected by NAFTA. Nonetheless, it is clear that Mexico is specialising in manufacturing, where maquiladora activities are increasingly important; moreover, concentration is particularly notable in machinery. The latter is explained chiefly by the dynamism in the production of electric and electronic appliances, and to a lesser extent by the drive of the automobile industry (BANAMEX, 2000). One particularly interesting point is that while the chemical industry[59] has contributed less to GDP after trade was introduced, it was one of the activities that ISI protected the most. In other words, ISI fostered the creation of inefficient industries, which have been in decline since the introduction of trade; thus, trade has brought about the promotion of the most efficient industries that can compete on the basis of comparative advantage. In fact, trade liberalisation brought about specialisation in capital-intensive activities such as the automobile and electronic industries, while employment levels in traditionally labour-intensive activities such as textiles have fallen (Dussel Peters, Piore and Ruiz Durán, 1997). Paradoxically, the production of capital goods has been spurred by trade and not by the advanced stage of ISI.[60] The economy has been chiefly specialising in producing machinery, where intra-firm trade created by multinationals and maquiladoras, is of paramount importance. In sum, specialisation appears to be one of the benefits produced by trade.

National Growth

Although the international trade theory considers trade benefits to be the gains derived from exchange and specialisation, both gains can lead to economic growth. If we consider Figure 3.7, Mexico's recent GDP growth trends have been interrupted on three occasions by economic contraction. The first negative growth rate was observed in 1983 when the petrolisation of the economy failed. The second contraction was brought about by the international financial crash in 1987. The largest of the three reductions of GDP was experienced in 1995. In that sense, Mexico's path towards economic growth has been erratic. However, if we consider the four periods depicted in Figure 4.4, it is possible to extract some conclusions. The period of greatest economic growth was that of the 1970s (based on ISI and State intervention) reaching an average annual growth rate of over six per cent. Despite such indication of economic success, as

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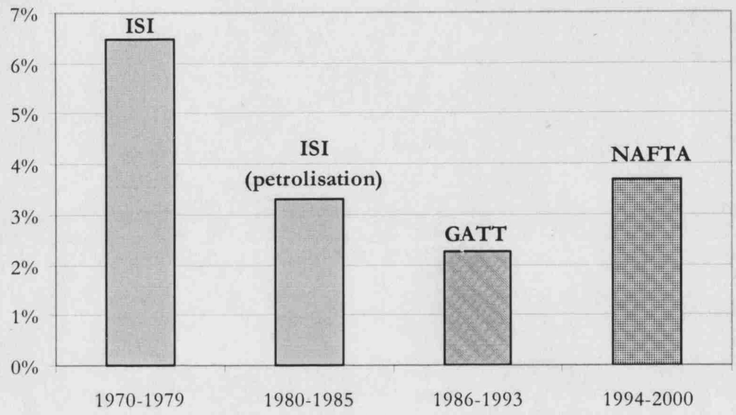
[59] An industry almost entirely concentrated in Mexico City during ISI (López Malo, 1960).
[60] It should be recalled that the advanced stage of ISI was featured by deeper import substitution precisely in intermediate and capital goods (see Chapter Three).

has already been explored in Chapter Three, inefficiency and lack of productivity would eventually undermine Mexico's position by the end of the 1970s, when new oil deposits were discovered. Despite the 1983 contraction, the average annual growth at the end of ISI (1980-85) stood at 3.3 per cent. Mexico's adjustment to trade liberalisation (GATT) and the above-mentioned second crisis led to average annual rates of 2.24 per cent. The NAFTA period (1994-2000) has been associated with a third (and the deepest) crisis[61] and average annual rates of 3.7 per cent. That is, economic integration has produced substantial growth rates –particularly after the crisis (1997 and onwards)– that resemble the high growth rates achieved during ISI. It is possible that further integration and less barriers to trade will bring not only considerable growth rates but also the re-allocation of activities to more productive and efficient industries.

In 1998, the growth rate in Mexico was 5.95 per cent to which the greatest contribution was the 11.5 per cent growth in the machinery sub-sector (BANAMEX, 2000; INEGI, 2000). Similarly, during 1999, national GDP grew by 3.7 per cent fuelled mainly by the machinery industry's growth of 5.7 per cent (BANAMEX, 2000; INEGI, 2000). During the year 2000, GDP grew by 7.5 per cent (BANXICO, 2000). It is important to mention that the agricultural and mining sectors contributed less to GDP growth than they did under EEM and ISI. Likewise, the participation of oil in GDP growth steadily decreases, whereas maquiladora activities emerge as the driving industry, representing nearly 75 per cent of manufacturing. As discussed in the previous chapter, the latter is intimately related to FDI flows, which are the fourth type of benefits brought about by trade to be explored in this section.

[61] Such economic contraction was mainly due to the reduction in consumption and gross fixed capital formation. The former fell 11.11 per cent during the second quarter of 1995, while the latter dropped 34 per cent in the same

Figure 4.4: Average Annual Growth per Periods



Source: Personal calculation based on INEGI (2000a)

Foreign Direct Investment

Regarding annual flows of FDI, it was established in the previous chapter (see Figure 3.8) that both total and manufacturing FDI flows have been growing since 1980. However, there are slowdowns in such annual inflows related to periods of devaluation. It is also important to stress that before Mexico's trade liberalisation (entrance to GATT and NAFTA in 1986 and 1994 respectively), FDI flows were chiefly allocated to the manufacturing sector. Thereafter, there appears to have been some diversification of investment. According to data presented in Chapter Three (see Figure 3.8), services were boosted after GATT; however, NAFTA seems to have introduced a slight slowdown to the dynamism of that sector. Yet, a considerable proportion of the investment made before the crisis of 1995, was focused on consumption and projects that contributed little to the needs of Mexico's industrial infrastructure, such as shopping malls and other features of a high consumption society (Klein and Coutiño,

period (BANXICO, 1998). The most affected sector was construction, which contracted by 23.5 per cent, whereas the least effect was observed in electricity, gas and water (BANXICO, 1998).

1996). It is also worth mentioning the significant explosion of FDI flows when negotiations on NAFTA started at the end of 1991. However, it should be noted that data in Figure 3.8 is based on INEGI (2000) and that FDI figures were calculated with a different methodology before 1993.

Mexico has experienced not only gains from exchange and specialisation, but there are also indications that trade, and particularly economic integration, are associated with economic growth. In addition, trade flows are also accompanied by capital flows in the form of FDI, a feature that the international trade theory does not include since it focuses on trade flows. The inclusion of that feature was based on the consideration that they represent part of the benefits stemming from trade liberalisation and economic integration with Canada and the USA.

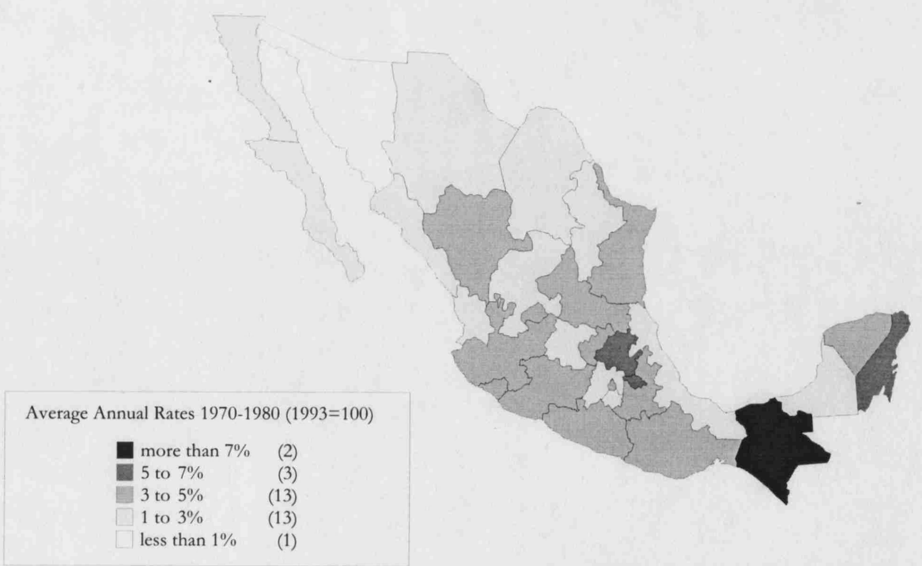
4. Regional Distribution of the Benefits

Regional Growth under a Closed Economy: The ISI Period

The benefits of the opening to trade and economic integration in Mexico have been unevenly distributed. In particular, the trends of growth and FDI flows are territorially conditioned. On the one hand, regional growth has contributed, as is explored in the next section, to increasing territorial inequalities in Mexico. On the other hand, FDI has been chiefly concentrated in manufacturing and, to a lesser extent, in services. The impact of FDI is brought to the fore if we consider maquiladora's relevance in manufacturing and that around 88 per cent of it is based on border-states, which in turn are achieving the greatest economic growth rates. Both indirect benefits of trade (growth and FDI) are, as explored below, conditioned by geography.

During the final years of ISI, almost all states with higher average annual growth rates were located in the south-east, especially Chiapas and Tabasco, which grew due to the oil industry (Figure 4.5). Thus, regional economic growth disparities in the 1970s can be considered to follow a pattern of high growth in the south-east and the peninsula, with some states in the centre and the pacific, as well as some northern non-border states also performing well. That is, low-income states achieved the greatest growth rates. In contrast, high-income states displayed modest growths. Border-states (including the Monterrey agglomeration) along with Jalisco (which includes Guadalajara) performed poorly in terms of growth. The exception is Mexico City that enhanced its position. Such a negative association between income and growth signals the possibility of convergence during ISI.

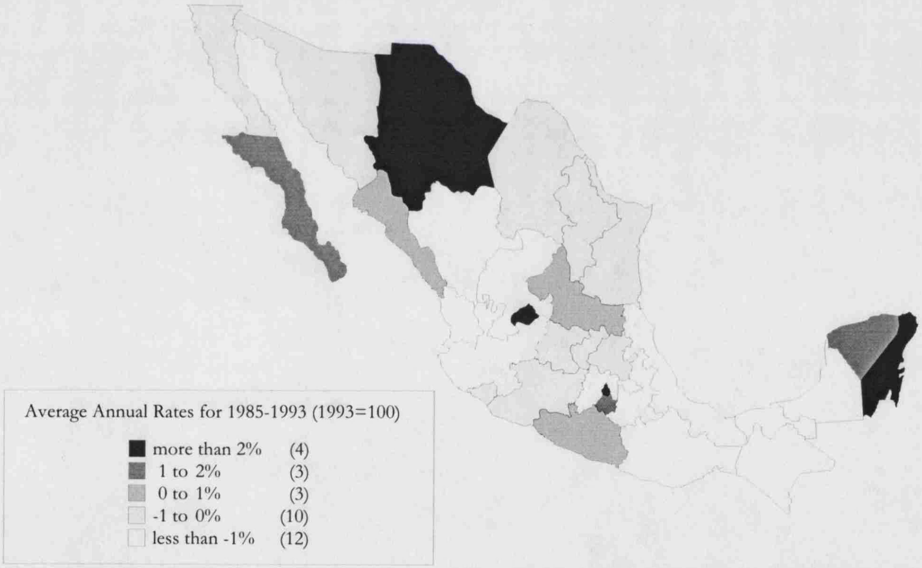
Figure 4.5: Per Capita GDP Growth During ISI



Source: Personal calculations based on INEGI (1985a) and BANXICO (1999)

As mentioned in the previous chapter, between 1985 and 1988, the oil-related crisis precipitated economic decline. Such poor economic performance was also associated with the international financial crash and the mounting external debt. Negative growth rates were generalised. Only eight states grew, while seven stagnated; the rest of the regions contracted. The benefits of trade reform, at least in terms of growth, were not equally distributed, but rather were very much localised.

Figure 4.6: Per Capita GDP Growth After GATT



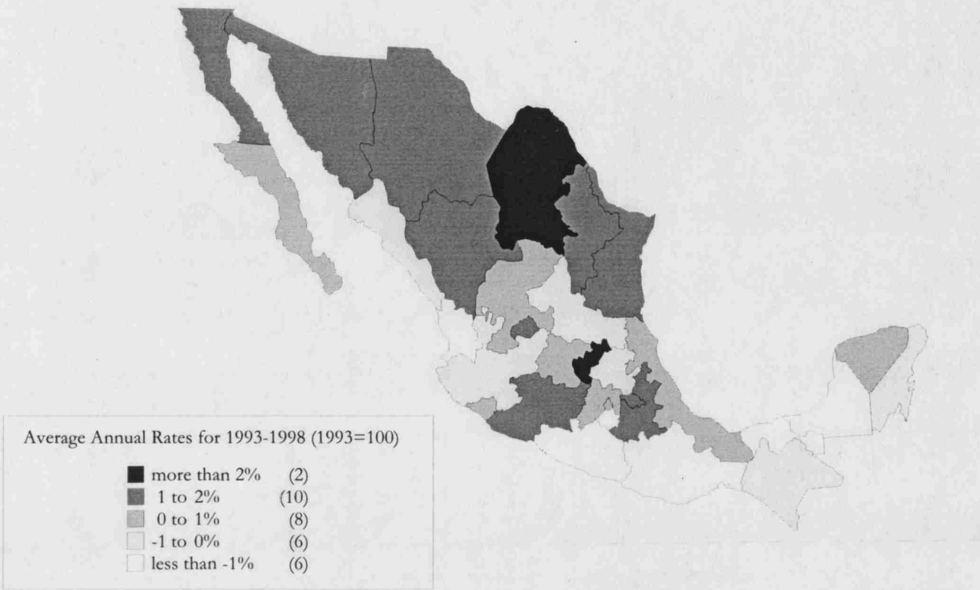
Source: Personal calculations based on BANXICO (1999) and INEGI (2000a)

As can be observed in Figure 4.6, growth was scattered throughout the country. The largest growth rates were attained by states such as Chihuahua in the border, Mexico City and Aguascalientes in the centre and Quintana Roo in the Yucatán Peninsula. More modest growth rates (but still positive within a period of contraction) were achieved by northern non-border states such as Baja California Sur, Sinaloa and San Luis Potosí, Mexico City's neighbouring state of Morelos, Guerrero in the south-east and Yucatán. Although such a scattered distribution of growth makes it difficult to identify a pattern, a change in territorial growth can be observed. Most of northern non-border states, almost the entire south-east, most of the regions associated with Guadalajara's metropolitan concentration, as well as the oil-related states comprised the group of regions with the largest economic contraction in that period. That is, the panorama is transformed from one of convergence during ISI to one of a North-South divide. It is important to stress that Mexico City, despite or perhaps due to the re-building effort entailed by the 1985 earthquake, still achieved a relatively high-growth rate. In Quintana Roo, high growth was related to the boom in the area's tourism industry. In contrast, Campeche and Tabasco displayed negative growth rates related to the fall in international oil prices.

Regional Growth and Economic Integration: The NAFTA Impact

Growth rates during NAFTA were influenced by the financial crisis started by the December 1994 devaluation. As can be observed in Figure 4.7, states achieving high-growth rates can be found mainly in border-states, seizing the advantage of being close to the larger market of the USA. The positive performance of the Mexican economy during the NAFTA period (Figure 4.4) is mainly fuelled by manufacturing, which grew at an average annual rate of 5.38 per cent between 1994 and 2000 (INEGI, 2000). The heavily concentrated maquiladora industry, representing an important activity within manufacturing, was the main factor behind the growth of border-states. However, states such as Nuevo León with particular local large firms based in Monterrey, could have also been influenced by other factors.

Figure 4.7: Per Capita GDP Growth Under NAFTA



Source: Personal calculations based on BANXICO (1999) and INEGI (2000a)

Although Mexico City was still achieving growth, its rate was lower to one per cent for the five-year span. In contrast neighbouring or close-by states attained higher growth rates. This, perhaps, might indicate that a process of industrial restructuring and relocation intimately related to economic integration has started. It has been argued that the largest cities in Latin American countries –and certainly Mexico City– concentrated industrial production under ISI (Olivera Lozano, 1997; Aguilar, 1999). According to Aguilar (1999) urban-industrial agglomeration in the prime city also inhibited growth of nearby cities. Location advantages, economic growth and attraction of migrants worked against metropolitan neighbours under protectionism. Trade liberalisation, however, brought about flexible production practices leading to spatial de-concentration (Aguilar, 1999). In fact, "we are witnessing the extension of existing manufacturing systems from the strictly urban or metropolitan scale to a more regional level" (Aguilar, 1999: 394).

Such a possibility is in line with Storper (1997), who has argued that agglomeration economies are now more regional than local. Linkages could be stretched between agglomerations, creating a new territorial 'grey zone' that operates at the system-of-city level (Storper, 1997). In that sense, firms needing to remain close to the largest domestic market could be moving to the neighbouring Edo. de México or to nearby states such as Tlaxcala, Puebla and Querétaro.

Alternatively, firms facing foreign competition, plausible over-crowding effects in Mexico City and the opportunity to export to the larger market of the USA, could decide to move out of the City to the northern export-oriented border-states. In that case, the market-relevance argument presented earlier affects Mexico City to such an extent that industry starts to de-concentrate in what had previously been the largest agglomeration. This idea is in line with Krugman and Livas Elizondo (1996) and Hanson (1998), who argue that since trade liberalisation, the larger market of the USA has been inducing firms based in Mexico City to re-locate to border-states. Moreover, both processes, the extension of location economies to regional economies and the re-location to border-states, could have been taking place at the same time. However, these inferences on Mexico City's restructuring need further analysis and should be considered carefully.

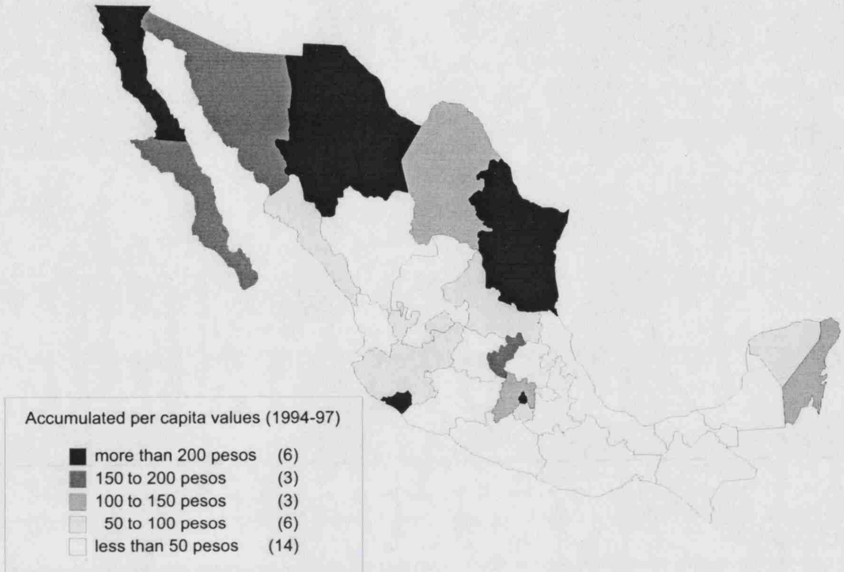
The states of Aguasçalientes and Michoacán are also performing well. The former reflects the dynamism of its manufacturing sector, particularly in textiles, wood, chemicals, the mineral industry and machinery. The latter, could be the result of the boost given by agricultural products, perhaps associated with exports of vegetables such as avocado, as well as by manufacturing activities, namely, the mineral, metal[62] and chemical industries (INEGI, 2000). In contrast, growth is no longer attained by states with an important oil industry such as Campeche and Tabasco. As mentioned above, the decline of oil's relevance is in line with a more diversified industrial strategy. It does, however, favour states driven by tourism such as Quintana Roo. In sum, NAFTA seems to have increased the relevance of the international market, proximity to the USA and the plausible restructuring of Mexico City. The results for Aguascalientes may indicate maquiladora development in non-border states, while those for Michoacán could be the first sign of agriculture's potential.

5. The Allocation of Foreign Direct Investment

An examination of the pattern of FDI can be revealing, not only in terms of its implications for economic growth, but also for its relevance for balancing the external sector. In other words, FDI is an important component of the capital account that can finance a current account deficit caused by high imports. In addition, as is argued in the previous section, FDI can be regarded as one of the indirect benefits stemming from trade liberalisation. In that sense, FDI in Mexico as a historical balance has been mounting since 1980. However, FDI flows have gone though important changes. Flows until 1986, appear to have been strongly directed towards manufacturing, while the inclusion of Mexico in GATT, has brought about a diversification of the recipient sectors (Figure 3.8). Although FDI is now more diversified, manufacturing has remained the main recipient.

[62] In this particular industry, it is important to highlight the possible boost given to Michoacán by the privatisation of the *Las Truchas* steelwork complex in the early 1990s.

Figure 4.8: Distribution of FDI During NAFTA

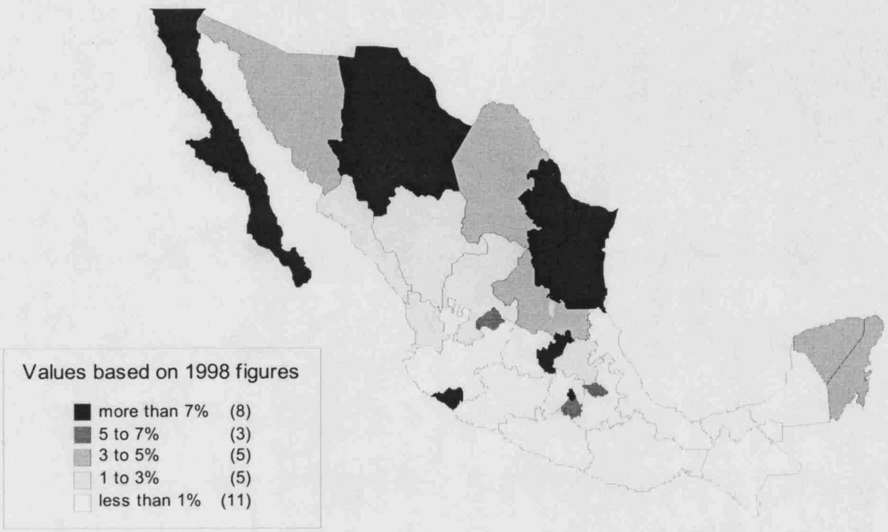


Source: CNIE (1998) and Presidencia de la República (1999)

As one of the arguably indirect benefits of trade liberalisation, it is important to establish the allocation of FDI at a regional level. Unfortunately, regional FDI information is not available for all the periods examined in this thesis. However, Figure 4.8 shows the regional distribution of FDI only for the NAFTA period. Although Figure 4.8 shows that FDI follows an almost identical pattern to that of per capita GDP (see Chapter Three), Figure 4.9 that factors in GDP indicates some differences. In both figures, regional disparities were consistently distributed in high and low-income states, the former being the three largest metropolitan centres and the border-states, whereas the latter, with some exceptions –namely oil-producing and tourism-based states– were the rest of the country. Likewise, FDI is heavily concentrated in border-states, as well as regions that contain large metropolitan areas (except for Jalisco that does not perform as well as Mexico City or Nuevo León). However, the analysis of regional distribution of FDI as a proportion of the state's GDP reveals some notable variants. Figure 4.9 shows a larger disparity in FDI reception between Mexico City and Nuevo León on the one hand, and Jalisco on the other. It is also important to note that northern non-border states such as Durango and Zacatecas or small states in the centre such as Tlaxcala perform better under this measure. It is worth mentioning that states with a significant oil industry do not excel in this area; the underlying reason being that investment in oil is of an endogenous nature, since it is reserved for exploitation by the State.

Both, growth and FDI have been favouring richer states. In fact there is a statistically significant correlation between those two factors reaching a Pearson's coefficient of 0.402 which was significant at the five per cent level. Moreover, running an OLS bivariate regression in which the dependent variable was regional per capita GDP growth (1994-98) and the independent variable the natural logarithm of FDI flows during NAFTA, such relationship was statistically significant as can be observed in Table 4.11. This suggests that FDI flows have contributed to increasing territorial inequalities in Mexico. In Annex 2 this relationship will be explored in light of the relationship between regional growth and other factors. Although this may have an influence on convergence trends and in improving regional disparities in Mexico, the analysis thus far has not provided with conclusions on the trends of territorial inequalities. Hence, the next section will determine whether convergence or divergence amongst the Mexican regions, has been taking place in the three periods analysed in this thesis.

Figure 4.9: FDI as a Proportion of GDP



Source: CNIE (1998) and INEGI (2000a)

Table 4.11: OLS Results for FDI During NAFTA

	Model 1
FDI	0.4023 (2.3664)**
R-square	0.1618
Adj. R-square	0.1329

6. Convergence Trends

Some Empirical Results

Although the measures of convergence discussed in Chapter Two, can be employed to determine whether convergence or divergence has taken place, the fact that most of the studies have yielded similar rates of convergence has generated debate. Almost all studies have found convergence before 1970, the speed of that convergence being in the vicinity of two per cent. However, after 1970, divergence is only possible if less developed countries (presumably with different steady states as in endogenous growth approaches) are included in the sample (Gil Canaleta, 1999).

A study of 48 states and four main census regions of the USA taking into account regional β convergence of per capita income levels was conducted for the 1880-1990 period and for some other eight sub-periods, namely decade-based spans (Barro and Sala-i-Martin, 1999). The result was convergence for all but one of the sub-periods, specifically the 1920-30 span. Not only was the speed of convergence across states around two per cent, but a similar rate of convergence across regions (based on groups of states) was also attained. However, according to Johnson and Takeyama (2001) convergence in the US case is based on 'clubs'. The authors divided the states into four different groups according to their initial conditions, amongst which capital accumulation, and found that states converged to their own club steady-state. Such findings are important since it is often the perception that regions within countries –as opposed to across countries- would share an economic structure; however, Johnson and Takeyama (2001) show that even in countries where regional disparities are not that significant, there are some underlying factors in the regional economies that determine the pattern of convergence/divergence.

In Canada, Maxwell (1994) has found a narrowing of regional disparities since 1970. Coloumbe and Day (1999) used three different measures of dispersion (per capita income, output per capita and output per worker) and included all Canadian provinces and used as reference, a group of 12 US states that share a border with Canada. The study found a decline in regional income disparities at a rate of 3.7%, which is considerably higher than the two per cent rule. Although the level of social and economic integration between the two countries, and in particular, amongst Canadian provinces and northern US states is quite significant, the study overlooks the possibility of differences in the underlying economic structures across regions. It is also important to note that due to data availability, the data set used is based in nominal rather than in real terms. Despite the above caveats, it is an important study that evinces the relevance of proximity to regions in other countries in trying to explain a country's evolution of regional disparities.

For the Japanese case, a study including 47 Japanese prefectures and seven districts containing prefectures was carried out for the 1930-90 period (Barro and Sala-i-Martin, 1995). Although dispersion of income per capita increased from 0.47 at the beginning of the period to 0.63, which is, according to the authors, explained by military spending particularly in the industrial areas of Tokyo, Osaka and Aichi, the result for the whole period was β convergence across prefectures and has reached dispersion levels of around 0.12 to 0.15 since 1978. Again the rate at which prefectures converged was in the order of two per cent; as in the Barro and Sala-i-Martin's US case, convergence across districts exhibited a similar rate.

According to Barro and Sala-i-Martin (1999), 90 European regions in 8 countries displayed intra-country convergence for the period 1950-90, at around the same rate as that of US states and Japanese prefectures. The sample included regions in Belgium (3), Denmark (3), France (21), Germany (11), Italy (20), the Netherlands (4), Spain (17) and the UK (11). The analysis also included equations with country dummies to control for differences in steady-state values, which in turn increased the model's explanatory power substantially. A convergence analysis by decade found rates that ranged between

0.10 (1980-90) and 0.23 (1960-70), whereas the rate for the whole period was 0.19. The authors also found convergence within countries; they particularly focused on the big 5 European countries[63] finding estimates ranging from 0.0182 in Italy to 0.0277 in the UK, arguably the country with the fastest convergence rate for that period[64]. However, using regional β-convergence analysis and neighbourhoods[65], Carrington (2002) found that despite EU regions are converging at the usual two per cent rate, "neighbourhoods of regions diverged at an almost equal rate, leaving a net effect of convergence considerably smaller than the 2% rule" (Carrington, 2002: 3); that is, regions within neighbourhoods are converging faster than groups of regions (across neighbourhoods), which supports evidence of significant spatial externalities.

Spain's economic performance between 1965 and 1995 relative to that of the OECD has been rather uneven (De la Fuente, 2001). Spanish regions started to catch up with OECD economies until 1975 when they lagged behind again, recovering rapid growth and convergence from 1985. Although the results of the convergence analysis carried out by De la Fuente (2001) found a relatively high rate of convergence (2.49%) between 1965 and 1975, it declined to just over one per cent (1975-85) and contracted again to 0.38% between 1985 and 1995 when regional growth in Spain was clearly above the OECD's[66]. Despite the author found convergence in the whole period, such convergence is not necessarily determined by periods of high growth rates –one of the most common arguments found in the literature.

[63] France, Germany, Italy, Spain and the UK.
[64] Sala-i-Martin (1996) develops a similar analysis for the aforementioned cases (USA, Japan and Europe) finding very similar rates of convergence (two per cent) for all three cases.
[65] "The neighbourhood of any region is defined as a set of regions contiguous to it" (Carrington, 2002: 3).
[66] Similarly, Raymond and García (1994) found a similar process of convergence in the Spanish regions, slowing down during the 1970s.

In the case of Russia, it is interesting to see that from the de-integration of the Union of Soviet Socialist Republics (USSR) in 1991, and presumably since the country has experienced a process of economic liberalisation, regional divergence as evinced by σ-convergence analysis, has increased around 40 per cent (Carluer and Sharipova, 2001). In terms of β convergence, the analysis performed by the authors show a divergence rate of 0.78 per cent. However, since the latter analysis includes data for years preceding 1991's liberalisation, as well as years after such an important change, the result could be biased by a more stable regional process between 1985 and 1991 yielding a small rate of convergence when in fact regions could be diverging. Conditional convergence analysis shows that the process of divergence in Russia is mainly due to investment and human capital patterns.

Convergence is also present in the Chinese economy. Using panel data Choi and Li (2000) estimated convergence rates for individual Chinese provinces. Low-income provinces in the centre and West of the country are experiencing lower growth rates, but overall regional convergence seems to be achieved (Choi and Li, 2000). According to the authors, the reason for experiencing disparities and convergence at the same time is based on Barro and Sala-i-Martin's (1995) explanation in which convergence does not necessarily leads to narrowing of dispersion (dispersion depends as mentioned in Chapter Two, on how far a region is from its steady-state). However, an additional explanation is put forward by Yao and Zhang (2001), who used both cross-section and panel data to explore regional growth in China over the 1978-95 period. The authors found that both analyses showed that Chinese regions are converging into three clubs; convergence is thus, found within each club, but between these clubs the result was divergence.

Juan-Ramón and Rivera-Batiz (1996) studied convergence in Mexico over the 1970-93 period using both σ and β convergence indicators and two types of samples (the full sample including the 32 states and one that omits the oil-producing states of Campeche and Tabasco). The authors found evidence of the two types of convergence in the high-growth sub-period (1970-85); however, the low-growth sub-period (1985-93) shows divergence. As it is common in many cross-section studies on convergence, periods of national income slowdowns lead to divergence, whereas periods of high national growth are associated with convergence of regional income (one important exception being the aforementioned Spanish case). The latter means that southern states in Mexico are catching up with their northern counterparts in periods of high national growth rates; in fact, southern states, arguably the poorer regions grew as much as twice as the rest of the regions during the interval of high growth experienced until 1985. However, the economic slowdown after 1985 brought about a decline of such poorer states and resulted in divergence. It is interesting to note that between 1970 and 1985, regions converged at a rate of 2.4%, close to the 2 per cent rule, whereas the rate of divergence for the 1985-93 sub-period reached -1.6%.

However, another study on Mexico, found that between 1940 and 1995, Mexican regions have converged albeit a slowdown and even reversal of the trend is perceived towards the end (Esquivel, 1999). The author finds that over the 55-year period, the convergence rate is rather low (1.2%) compared to other studies, many of which are mentioned above, and has been clearly insufficient to significantly reduce regional disparities in Mexico. Esquivel (1999) also found that the convergence process was actually fast until 1960 (at 3.2%); between 1960 and 1995, the dispersion of per capita income across states has remained relatively stable and the convergence rate reached only 0.9%. Further division of the periods shows that the slowdown in convergence happened between 1980 and 1995. Although Esquivel's analysis shows that convergence in Mexico disappeared during the 1980s, it does not relate convergence trends to economic reforms in Mexico. In spite trade is but one of the many reforms in Mexico over the last decades, trade liberalisation is increasingly being perceived as an important determinant of convergence, and research is progressively moving in that direction (Ben-David, 2001).

Studies employing more diverse samples –including both developed and less-developed countries- find trends of divergence. In addition, samples contemplating more recent data, namely after 1970, are more likely to find divergence (Gil Canaleta, 1999). Moreover, some of those studies have explored conditional convergence, employing β-convergence analysis and samples containing dissimilar countries. Islam (1995) found divergence across countries conditional on different levels of human capital.

The above empirical evidence may suggest that the Solow-Swan model of growth, discussed earlier, based on capital accumulation and diminishing returns to capital, will, at least partially, explain growth trends across and within countries. However, how can one explain that rates of convergence fluctuate around two per cent in most cases? It is possible that they are the result of periods of national economic growth. The above studies are typically based on Barro's convergence model, yielding very similar results when the model is applied to national data (Rodríguez-Pose, 1997). Indeed, similar rates of convergence may be the outcome of an invariant economic structure across countries and regions or due to differing structures across time and space (Quah, 1995). For instance, it could be argued that growth patterns in Europe are neither featured by convergence nor divergence, but are associated with the spatial and national contexts of a particular region (Rodríguez-Pose, 1997). Even if it was possible to consider fixed effects across countries and business cycles experienced through time (in order to overcome Quah's criticisms), there is an additional problem. Failing to consider technological change can limit the measurement. In fact, even under constant returns to capital[67], certain disturbances in technology can generate convergence (Leung and Quah, 1996). Indeed, "long-run growth is not driven simply by replicating existing machines; technological progress must play a role" (Aghion and Howitt, 1998: 33). Therefore, if measurement-induced errors are overcome (Quah's criticisms), the models rely on their assumption of diminishing returns to capital disregarding technological progress in explaining convergence.

A Note on the Methodologies to Calculate Convergence

Convergence of the σ type reflects the dispersion of per capita incomes in a sample of countries or regions; thus, having extreme cases either of low or high income bias the result obtained through this indicator. One such measure of dispersion can be represented by:

$$D_t = (1/N) * \Sigma [\log (y_{it}) - \mu_t]^2 \qquad \text{(Equation 4.1)}$$

where D stands for dispersion, N is the number of observations in the sample, y represents income in region/country *i* in time *t* and μ its mean. That is, inequality will be measured by the sum of differences between the income of each region and the sample's mean and weighted by the size of the sample[68].

[67] Most of the empirical evidence points out to the relevance of diminishing returns to capital, which makes possible conditional convergence (Aghion and Howitt, 1998).
[68] Equation 4.1 is based on Barro and Sala-i-Martin (1999)

Since β convergence implies faster growth of lower income regions, for convergence of this type to appear, it is necessary to find an inverse relationship between growth and income. Such negative relationship is best tested through a regression analysis. Most of the research that can be found in the literature is based on a variant of the empirical framework that was developed in Chapter Two. Likewise, the model that will be used in this chapter is based on a log-linear version of Ramsey's model introduced by Barro and Sala-i-Martin (1999):

$$(1/T)\ [\log (y_{it}/y_{i0})] = a - [\ (1 - e^{-T})\ /\ T] * \log (y_{i0}) + u_{i0,T} \qquad \text{(Equation 4.2)}$$

where T is the number of years within the period, y is the per capita GDP of state *i* and u the average of the error terms. Transforming Equation 4.2 into a totally linear equation:

$$(1/T)\ [\log (y_{it}/y_{i0})] = a - b\ (\log (y_{i0})) + u_{i0,T} \qquad \text{(Equation 4.3)}$$

The aforementioned inverse relation between growth, represented in Equation 4.3, by the term in the left-hand side, and logged per capita income represented by log (y_{i0}). Hence, whether convergence or divergence results will depend on the sign of the second term in the right-hand side of Equation 4.3 and the magnitude of such convergence/divergence will be determined by the estimated b (β).

Convergence Analysis

Before conducting the convergence analyses, it is important to consider the bias represented by the oil and maquiladora industries in Mexico. As mentioned in the previous chapter, the oil industry is still an important sector. While oil revenue has increased, the industry's exports have declined. Furthermore, some 94.66 per cent of the country's total oil extraction (Table 3.2) is concentrated in the south-eastern states of Campeche and Tabasco. The implications of such concentration are evident. An industry that has had such a considerable participation in GDP and exports, contributing both to growth and crises, and that is localised heavily in two states must have regional implications that should be taken into account when assessing growth and convergence. In fact, the bias is so strong that when considering σ convergence across states, the result will be completely different depending on whether the analysis includes or excludes the cases of Campeche and Tabasco. Similarly, the maquiladora industry has had a profound effect in border-states and has even started to play a role in the South; hence, that bias will be controlled for in the analyses below.

The concentration of oil production in two states produces a strong distortion in our perception of the evolution of regional disparities and especially in the analysis of σ and β-convergence trends. If the distortions associated with oil are not taken into account, the ISI period (1970-85) was characterised by σ divergence (Table 4.12); the standard deviation of per capita GDP across Mexican states rising from 0.3976 to 0.4733. In contrast, convergence was attained under GATT (1985-93), reducing the standard deviation to 0.4285 by 1993. The NAFTA period (1994-2000), represented a return to divergence, with the value increasing to 0.4397. Changes in σ convergence are however, strongly biased by the behaviour of the oil-producing states of Campeche and Tabasco. The discovery of oil in the late 1970s, the increase in its price and the fact that oil revenues are accounted for in the states where oil is produced, made Campeche by far the richest state in Mexico by the end of the ISI period. While the per capita GDP of 8,800 pesos for Campeche (measured in 1993 pesos) in 1970 placed it in the bottom half of Mexican states, by 1985 its per capita GDP had soared to 85,330 pesos, which was by far the highest level of income in the country. At that time, its GDP per capita was 3.5 times that of Mexico City. Tabasco underwent a similar albeit less spectacular, transformation.

Table 4.12: σ convergence across states

Standard Deviation	1970	1985	1993	2000
Full Sample	0.3976	0.4733	0.4285	0.4397
Excluding Campeche and Tabasco	0.4105	0.3149	0.4178	0.4374
Excluding Border-States	0.3607	0.5053	0.4283	0.4273
Excluding Campeche and Tabasco & Border-States	0.3751	0.2931	0.4153	0.4201

Source: Own calculations based on INEGI (2000) and Presidencia de la República (1999)

A more realistic measure of the evolution of regional disparities can be made if Campeche and Tabasco are excluded from the analysis, as in Juan-Ramón and Rivera-Batiz (1996). In this sample, ISI becomes a period of regional convergence, whereas the GATT and NAFTA periods are dominated by divergence. Table 4.12 displays a reduction in the standard deviation from 0.4105 to 0.3149 by the end of ISI. In contrast, the value increased to 0.4178 during GATT, and rose to 0.4374 –both higher levels than in 1970– during NAFTA.

These results highlight that in Mexico there has been a strong association between the implementation of different trade models and macroeconomic policies and the evolution of regional disparities. The opening up of the economy and regional integration may be having an overall positive effect on the Mexican economy, but they are also generating increasing territorial polarisation. If border-states, which concentrate maquiladora production, are excluded from the sample, the trend follows that observed for the full sample, except for a reduction of the standard deviation by 2000. Although the standard deviation in 1985 is higher producing stronger divergence than the one observed for the full sample, figures are fairly similar to the full-sample analysis. Moreover, if both maquiladora states (border-states) and oil-producing regions (Campeche and Tabasco) are excluded from the sample, the trend is similar to that described above for the sample excluding Campeche and Tabasco. The picture that emerges is one of convergence during ISI and divergence with GATT and NAFTA, once biasing factors are controlled for. It is important to highlight that NAFTA is linked to greater regional disparities in all but the sample excluding border-states. The slight reduction in the standard deviation during NAFTA signals the importance of maquiladora activities; however, if oil production is also excluded from the sample, NAFTA becomes a period of divergence.

When β-convergence coefficients are calculated, the results point in a similar direction. Table 4.13 presents the OLS results of running simple absolute convergence models for the three periods considered in the analysis. As in the previous case, four different samples (a full sample, one excluding oil-producing states, one excluding maquiladora states, and one excluding both industries) are reported. When the full sample is considered, the negative value of the β coefficient, signals convergence during the ISI period; however, the t-statistic value in parenthesis denotes that is not statistically significant. As in the σ-convergence analysis, the GATT period represented a continuation of the convergence of the late stages of ISI. In contrast, the positive sign of the β coefficient during NAFTA indicates a reversal of the trend towards divergence albeit the result is not statistically significant.

Table 4.13: β-Convergence Analysis

	Period	B	Adj. R square	Observations
Full Sample	ISI 70-85	-0.292 (-1.674)	0.055	32
	ISI 80-85	-0.279 (-1.589)	0.047	32
	GATT	-0.029 (-0.159)	-0.032	32
	NAFTA	0.097 (0.536)	-0.024	32
Excluding oil-producing states	ISI 70-85	-0.720 (-5.484)	0.501	30
	ISI 80-85	-0.512 (-3.153)	0.236	30
	GATT	0.328 (1.836)	0.076	30
	NAFTA	0.173 (0.928)	-0.005	30
Excluding border-states	ISI 70-85	-0.185 (-0.925)	-0.006	26
	ISI 80-85	-0.265 (-1.349)	0.032	26
	GATT	-0.098 (-0.481)	-0.032	26
	NAFTA	-0.104 (-0.514)	-0.03	26
Excluding oil-producing states and border-states	ISI 70-85	-0.665 (-4.179)	0.417	24
	ISI 80-85	-0.531 (-2.941)	0.250	24
	GATT	0.362 (1.820)	0.091	24
	NAFTA	-0.028 (-0.130)	-0.045	24

Source: Own calculations based on INEGI (2000) and Presidencia de la República (1999)

If the two major oil-producing states are excluded from the analysis, the trend is again similar to the one described in the σ-convergence analysis. ISI is a convergence period as in the regressions that considered the full sample. The rate of convergence between 1980 and 1985 is of 5.1% per annum and of 7.2% between 1970 and 1985. Moreover both results are statistically significant. In contrast, both GATT and NAFTA are periods of divergence, revealing positive, but statistically not significant β coefficients. That is, for ISI's convergence result is paramount to exclude oil-producing states, which leads to strong and statistically significant coefficients. In spite of the end of the 'petrolisation' of the Mexican economy and the start of a process of trade liberalisation, the influence of the oil industry is still important to determine results during GATT; in fact, divergence appears during GATT, only if oil-producing states are excluded from the sample.

If border-states (based on maquiladora activities) are excluded from the sample, all periods show convergence albeit none of them attain statistical significance. The processes of trade liberalisation and economic integration are now related to convergence. In addition, if both biasing industries, namely oil and maquiladora, are excluded from the analysis, ISI is still associated to convergence and its results are statistically significant. While NAFTA is still associated to convergence, GATT is again related to divergence. The results evince that the oil industry determines strong convergence during ISI. In contrast, border-states based on maquiladora activities, are decisive to find divergence during NAFTA. Howver, these results are curtailed by the lack of statistical significance chiefly during GATT and NAFTA.

The results exhibited by the adjusted R^2, hint about a change in the Mexican economic structure. For ISI, the exclusion of oil-producing states allow for a good explanation – for a bi-variate model- of the convergence phenomenon. In contrast, GATT and NAFTA display very low levels of adjusted R^2, suggesting that divergence after trade is not explained by initial income levels alone. That is, the Mexican economy seems to have become more complex than during the closed-economy approach.

Both convergence analyses have yielded similar results. First, oil-producing states and border-states based on maquiladora activities, bias the sample so strongly that a distorted picture of regional trends results if they are included in the analysis. Second, the closed-economy approach was related to a process of convergence. Third, by eliminating the biases, it appears that trade liberalisation triggers a process of divergence. Although divergence seems to be present during GATT and NAFTA, it is only found when border-states are included in the sample; however, the lack of significance limits the conclusions.

7. Conclusions

While it is clear that greater gains from trade are possible from undertaking multilateralism, it is less clear whether regionalism represents a stepping-stone towards multilateralism and larger benefits from trade. In addition, the expansion of PTAs has brought about overlapping problems exclusive to FTAs that could lead to product-nationality-determination controversies amongst other complications. In the case of Mexico, the adoption of multilateralism through accession to GATT has meant greater benefits from trade than during ISI. Although, protectionism has been tackled by NAFTA, it was still effective under GATT despite the trade liberalisation process. Paradoxically, a regionalist agreement implying lower gains from trade has led to freer trade. Thus, it is important to note that trade diversion is possible under NAFTA, but at the same time, that the pace of liberalisation and the protectionism still present during GATT must have hampered the possible benefits of trade.

Although Mexico has been experiencing benefits from an outward model and free trade, those benefits do not seem to have been distributed evenly throughout the country, at least not the indirect benefits of growth and access to capital in the form of FDI. Indeed, growth has not been uniform across the regions. The 1970s are associated with high growth rates achieved by low-income states. Thus, a convergence pattern emerges, which also supports evidence presented by Juan-Ramón and Rivera-Batiz (1996). However, the early 1980s saw a slowdown of the economy due to devaluation and falling oil prices amongst other events discussed in Chapter Three. During GATT, growth was scattered throughout the country. However, NAFTA brought about higher growth rates in border-states and, to a lesser extent, in metropolitan areas. Such findings are however, not supported by the convergence analyses presented in this chapter, since GATT and NAFTA coefficients are not statistically significant.

The effects of NAFTA are difficult to fully assess, since it is an ongoing process of economic integration in which tariffs must be lowered according to a timetable that extends until 2009. Nevertheless, growth for the period considered (1994-2000) was again concentrated in border-states. Surprisingly, Mexico City has declined in importance achieving a growth rate of 2.3 per cent. This could be related to a process of industrial relocation of Mexico City, a possibility that needs further research. Whereas border-states have grown considerably during this period, oil-producing states are no longer achieving high-growth rates; however, tourism-based economies continue to profit. In addition, this chapter finds that NAFTA has stimulated considerable FDI flows to be chiefly allocated in the already high-income states in Mexico, namely border-states and two of the large urban agglomerations.

Increases in trade and economic integration have brought about benefits to Mexico. However, such benefits could be localised. Indeed, the convergence pattern observed during ISI could have been reversed by trade liberalisation with GATT and by the economic integration of NAFTA. Nevertheless, the results depend of whether the two biasing industries, namely oil and maquiladora are included in the analysis. The reasons for the change of trend towards divergence are unclear. Thus, the next chapter will be dedicated to exploring the possible impact of trade on regional growth patterns.

Chapter Five
The Impact of Trade Liberalisation on Regional Growth

1. Introduction

The interaction between trade, growth and space in Mexico has scarcely been investigated. Studies such as the research by Dussel Peters (1997) on Mexico's sectoral growth, that chiefly focus on manufacturing growth are prevalent. Most studies usually comprise two of the three possible elements in the above-mentioned interrelation. First, the relation between growth and space has been increasingly researched. On the one hand, studies on industrial location combining Mexico's sectoral growth and space such as Bannister and Stolp (1995) and Hanson (2000) have contributed to the understanding of concentration, but have not addressed regional growth. On the other hand, regional growth analyses featuring absolute convergence, fundamentally the works of Juan-Ramón and River-Batiz (1996) and Esquivel (1999a), have successfully explored the relationship between growth and space, but have not included trade in their analyses.

Second, the relationship between trade and space has been established for the Mexican case by Krugman and Livas Elizondo (1996) and by Hanson (1998). In addition, Katz (2000) has also explored the impact of NAFTA on Mexico's manufacturing growth. However, these studies have not included growth (GDP per capita) in their analyses. Third, the link between trade and growth has been subject to even less research. Most of those studies "are surprisingly fragile" (Harrison and Hanson, 1999: 1). New growth theory has also contributed to exploring different ways in which trade might influence growth as in Edwards (1998), where not only trade reform but also technological gaps are considered. However, some other studies have suggested that the effect of trade on growth is endogenous (Frankel and Romer, 1999). The relationship is, therefore, not easily tested. In the Mexican case, research such as Harrison and Hanson (1999) has focused on the effect of trade on growth but not on its regional implications.

The attempt to link trade, growth and space is not only vital to understanding the Mexican case, but also to contribute to the ongoing theoretical debate. Thus, this chapter explores the factors behind the differentials in regional growth rates. The analysis has been divided according to the three Mexican trade policies identified in earlier chapters (ISI, GATT and NAFTA).

The main question to be answered by this chapter is whether those changes in approaches to trade have had an impact on regional economic growth; that is, whether progressive trade liberalisation has led to changes in regional inequalities amongst Mexican states and the factors behind such transformations. As argued in Chapter Three, trade liberalisation and particularly economic integration seem to have been linked to the improvement in the economic conditions of the already relatively richer states. Moreover, according to the findings in Chapter Four, convergence trends observed during the final stage of ISI have been reversed by GATT and NAFTA. Yet what are the forces behind such changes?

The first section of the chapter discusses the main regional growth determinants that will be integrated into the empirical analysis. The variables based on the theoretical framework outlined in Chapter Two, are incorporated into a multiple regression model.

Thereafter, the results for each period are displayed, which will enable the establishment of some inferences. Finally, a set of conclusions is presented at the end.

2. The Hypothesis

This chapter explores whether trade liberalisation in Mexico has had an impact on regional growth. Hence, the associated hypothesis is whether changes in trade regimes have altered the factors behind regional growth in Mexico.

3. The Model

The model used in this chapter to test the impact of trade policies on regional economic growth can be stated as:

$$Y = f\,(y_0, x, m_0, dismx, disus, k_0, ed_0, hsg_0, camtab, maq, pubinv_0) \qquad \text{(Equation 5.1)}$$

where Y is regional real per capita GDP growth and y_0 represents the initial regional income (per capita GDP). Regional export growth rates are represented by x, while state net migration rates at the beginning of each period are included under m_0. The natural logarithmic function of distance in kilometres by road from the capital of each state to Mexico City is expressed as *dismx*. In turn, the natural logarithmic function of distance in kilometres by road from the capital of each state to the nearest border city is represented by *disus*. These two estimates will determine whether the domestic or foreign market is the most relevant for each period. In addition, k_0 and ed_0 refer to the natural logarithms of state commercial banking deposits at the beginning of the period and to the initial average level of education in each state, respectively. The higher qualification of the labour force is represented by hsg_0, which refers to the natural logarithm of the initial number of high school graduates.

In addition to the variables presented in this model, other estimators are used to control for biases in the structure of the economy, such as the effect of oil, maquiladora and public investment. Therefore, the variables representing such effects are *camtab*, *maq* and $pubinv_0$ respectively. The biasing effect of the oil industry is captured in *camtab*, a dummy variable for the states of Campeche and Tabasco. Maquiladora employment growth rates were used as a proxy for the maquiladora-industry effect (*maq*), whereas $pubinv_0$ refers to initial levels of public investment in the state. The following section presents the reasons for the inclusion of the variables introduced in the model, as well as the data that will be used to carry out the multivariate regression analysis. In brief, it establishes the connection between the model and the theory.

It is important to mention that two other variables were considered in constructing the model: first, a measure of the structure of the regional economy by including the share of agriculture on state-level employment; second, foreign direct investment as a measure of other types of benefits stemming from trade. In light of the number of variables that were needed in the model and the limitation imposed by the degrees of freedom, they were not included it in the final model. However, such OLS results are exhibited in Annex 2. Coefficients for agriculture are only significant after trade; however they are negatively associated to growth. During the advanced stage of ISI, agriculture stopped being the engine of growth for the Mexican economy (see Chapter Three). After trade, agriculture had greater shares of regional employment in poorer states of the country, which explains the negative influence of employment in primary activities on growth. The results for NAFTA exhibit the same pattern. In contrast, FDI during NAFTA (data was only available for such period) was significant and positively related to growth. However, the influence of foreign investment is already considered in maquiladora employment, a variable included in the model. As can be observed in Figure 3.8, FDI in Mexico is greatly inluenced by manufacturing, which are attracted to the country chiefly in the form of maquiladora in order to take advantage of duty-free operations. The number of variables already considered in the model, the fact that maquiladora is one of the variables of the model and the lack of available data for other periods were the reasons to exclude this otherwise significant variable.

4. Defining the Model: Variables and Data

As mentioned in Chapter Three Mexican economic policy has been characterised by the transition from an import-substitution industrialisation (ISI) model to an export-promotion approach. The latter has been a strategy that commenced with the signing of the General Agreement on Tariffs and Trade (GATT). Thereafter, trade agreements have been sought with diverse countries, of which the North American Free Trade Agreement (NAFTA) is the most important. The ISI era extends from 1939 until 1985. The GATT years were between 1986 and 1993, while the NAFTA period started in 1994 and continues until the present.

The above-stated hypothesis is examined through linear regression analyses, which test the causes for regional growth disparities across Mexican states. Accordingly, using ordinary least squares (OLS) regression models, this chapter explores whether Mexico's trade policies have had an impact on regional economic growth. In order to test the hypothesis, three regressions were performed, each related to one of the periods analysed throughout the thesis.

Panel data analysis could have been applied as an alternative method to using three OLS regressions and comparing the results for each period. In fact, the former has major advantages over cross-sectional analysis. First, panel data analysis controls for individual heterogeneity (Mátyás and Sevestre, 1992; Baltagi, 1995). Second, panel data offers an increased number of data points, which in turn increases the degrees of freedom and reduces collinearity amongst explanatory variables; hence, improving the efficiency of the estimates (Hsiao, 1995). Third, panel data are better suited to the study of adjustment dynamics (Baltagi, 1995). However, in light of the overwhelming advantages of panel data over cross-section and time-series analysis, why then has cross-section analysis been the method used in this chapter? The reasons are related to the availability of data. Regional data in Mexico on a yearly basis is not available. Moreover, Mexican data reports are not even regular. For instance, regional GDP was reported for 1980, 1985, 1988, 1993 and 2000, making it hard to even use five-year periods as time units. Therefore, the alternative taken in this chapter has been to form intervals associated with a particular change –in this case trade policy– and observe changes through three independent cross-section regressions. However, using those time terms in a panel data fashion still represents a better alternative to independent cross-section analysis, as long as the time spans are homogeneous. Although the problem of heterogeneous spans still remains in cross-section, it is not as severe as in the panel data, since the latter includes a vector of time (Mátyás and Sevestre, 1992). Furthermore, it is assumed that data is available on an N number of individuals over T periods of time (Mátyás and Sevestre, 1992). However, in the case of Mexico, it is clear that spatial information is not available for the necessary number of observations.

The Dependent Variable

The variable to be explained is state per capita growth rates for each period (1980-85, 1985-93 and 1993-2000). The reason for using growth is that territorial inequalities can be a product of regional growth performances. A region's per capita income outstrips or lags behind others depending on the velocity at which that income grows; that is, regional disparities are in the long term, a product of regional growth. In that sense, the *Instituto Nacional de Estadística, Geografía e Informática* (INEGI/National Institute of Statistics, Geography and Information Systems) publishes the data used here as state GDP. These are calculated from the results of the economic censuses carried out on 1980, 1985 and 1993. Regional growth rates for ISI and GATT were constructed using INEGI data on 1980, 1985 and 1993 GDP. For NAFTA, the figures were taken from the aforementioned 1993 GDP, whereas the 2000 data was taken from an annual estimation made by INEGI (2000). Population figures used to calculate per capita growth rates were obtained using population figures based on Presidencia de la República (1999) and INEGI (2000). Once figures were in real terms (1993=100) and per capita values, growth rates were calculated using the log of the product resulting from dividing the final and initial per capita values; that is:

$$Y_i = \log (y_{it} / y_{it-1}) \qquad \text{(Equation 5.2)}$$

where Y represents the growth rate for state i and y represents regional per capita income in state i and time t.

The use of logs in this and other variables in the model are introduced in order to obtain linear parameters, regardless of whether variables are linear or not. Linearity of the parameters (βs) is central to the OLS regression. This thesis model is of the double-log type, in which both the dependent and some of the explanatory variables are linearized by the use of logs. Because most of the variables that have an impact on economic growth exhibit decreasing returns to scale, the relationship of these variables with growth will be non-linear and therefore OLS cannot be used. Hence, most models have adopted the use of logarithms in order to linearize such a relationship. As a result, the variables used in this model, which exhibit a non-linear relationship with growth will be transformed using logs, namely initial income, education, capital accumulation and distances to the market. In addition, some of these variables will be included –as explained thoroughly below- as initial values for each period to avoid causality problems stemming from plausible endogeneity.

The Independent Variables

Following the recognition by neo-classical and new economic geography theories that there is a starting situation that influences concentration or convergence, the first variable to be included in the model is a proxy for what the new economic geography refers to as *history matters*. Therefore, the logged[69] per capita GDP for the initial year[70] of the period (y_0) based on INEGI (1985a) and INEGI (2000) –and employing Presidencia de la República (1999) figures for some of the periods- is used as a proxy for historical accident that fostered initial concentrations.

[69] The reasons for using logs in this and other variables in the model are given above.
[70] The reasons for using values at the beginning of the period are given below.

Regarding the possible impact of the three different Mexican trade policies, one of the variables that could mirror those changes is exports. Consequently, state-export growth rates for each period were included, which are based on data provided by INEGI (1985b) and SECOFI (2000). While exports can reflect trade policy shifts, they do not necessarily reveal a relationship with income. Indeed, regressions testing the impact of the former on the latter have found moderate positive relationships (Frankel and Romer, 1999). However, such an association may not expose the full effect, since trade might be influenced by endogenous factors (Frankel and Romer, 1999). In addition, the same authors have suggested that a different approach should be used, namely that of instrumental variables. Nevertheless, since the aim of the chapter is to explore the impact of trade policy on per capita growth, exports (x) will be considered to be a proxy for trade.

Concerning factor mobility, neo-classical predictions are divided between the original model –which regards factors as geographically immobile and predicts absolute equalisation– and those that contemplate factor mobility and anticipate relative equalisation (Jones and Neary, 1984). Nevertheless, while the model to be developed in this chapter will not tell us whether absolute or relative equalisation is achieved, it can clarify the extent to which factor mobility is significant in explaining growth. Moreover, the model can indicate whether factor mobility is related to any particular trade policy. Additionally, the new economic geography expects firms and workers to concentrate in core regions (Ottaviano and Puga, 1998). According to this theory, mobility will definitely be a relevant factor in explaining growth. However, the only available data on factor mobility is inter-regional migration. Therefore, net migration rates at the beginning of each period (m_0) are used in order to test the predictions stated above.

It is important to consider that some of the variables that are included in the model bring about endogeneity problems. Migration as other variables in the equation such as capital accumulation, education, maquiladora activity and public investment are also associated to growth and are determined by the period's growth rate. That is, growth is determined by the explanatory variables, and in the same way, such independent variables are influenced by growth rates. In order to prevent such two-way causality, such endogenous variables are lagged to the initial value of the period; hence, education –for instance- during GATT will be the average regional schooling years (in its logged version for the aforementioned reasons) in 1985 (which is the initial value for such interval). Although exports are included in the model as growth rates for the period entailing the possibility of endogeneity, having the initial value of exports would not fully capture the impressive growth rates experienced particularly during NAFTA.

Distance to the most important markets also plays an important role in the literature pertaining to the new economic geography, which assumes the larger market to be the international one, once trade is introduced. Distance is relevant because of the transport costs incurred when producing away from large population concentrations. Accordingly, some theoretical and empirical studies assert that the largest market during the ISI period was Mexico City (Krugman and Livas Elizondo, 1996; Hanson, 1998). Those same studies recognise the USA as the relevant market once trade liberalisation is implemented. Thus, distance to Mexico City (*dismx*) and distance to the border with the USA (*disus*) have been used to represent proximity to the largest market. Both variables are tested for all three periods in order to assess whether there is a shift in the relevant market. Distance to the USA should be shown to be increasingly important as trade liberalises and economic integration advances.

Both neo-classical, and endogenous growth theories have suggested that capital accumulation and human capital play a fundamental role in explaining growth. Therefore, the model includes variables, which it is hoped will contribute to a more complete understanding of the processes involved in growth. However, due to data limitations the model will include proxies that mirror both elements. Capital accumulation (k_0) will be represented by the initial levels of regional deposits, registered in commercial banks, while initial levels of average schooling years in the regions will be used to characterise human capital (ed_0). In addition, the importance of a qualified labour force will be represented by the region's natural logarithm of the initial number of high school graduates (hsg_0). This variable will allow the model to assess to what extent higher levels of qualification in the labour force are required for growth.

Other factors should also be taken into account in the model. As discussed in Chapter Three, oil has been a key industry in Mexico's industrialisation. Although the emphasis formerly placed on that industry has diminished, it remains an important activity. However, hydrocarbon extraction is chiefly concentrated in two states, namely Campeche and Tabasco. Therefore, it is fundamental to control for any effect introduced by the industry, particularly when one of the periods contemplated by the analysis (ISI) is characterised by the stress placed on oil. Thus, the model includes a dummy variable that represents the two most important oil-producing states. Other institutional factors are also controlled for in these regressions. As discussed in previous chapters, the maquiladora scheme might introduce a certain bias in the present analysis, since it has been heavily concentrated in border-states. Thus, the maquiladora effect was factored in using the log of maquiladora employment at the beginning of the period taken from INEGI (1998a). Similarly, other institutional factors such as the amount of resources spent on infrastructure in each of the states might have an impact on whether or not the region grows. Consequently, initial levels of public investment in each of the regions were used as a measure that takes into account this plausible effect. Indeed, there is the possibility that public resources allocated inequitably could have an impact on growth.

5. Data Sources and Limitations

Although the ISI scheme started in the late 1930s, data at the regional level is not available for that period. Hence, to represent the entire period, figures for the last years (1980-85) within the period were used, since that was the only data available to represent it. Thus, all data related to that period refers to the 1980-85 interval. As a consequence, the period might be miss-represented by the last part of the stage of ISI, which is a limitation that should be acknowledged.

Although the results presented in the next section, refer to the end of the ISI period (1980-85), an analysis for a longer interval (1970-85) was performed, using only the variables for which data was available, namely initial income (y_0), the dummy variable to control for the effect of oil (camtab), as well as the two distances to the market. Since few variables were eligible for inclusion, the results are presented separately in Annex 3. Convergence between 1970 and 1985 is conditioned by the inclusion of the proxy for the oil industry, which is in line with the results found below for the 1980-85 interval.

Regarding export growth, this variable is calculated through the use of initial and final years in the period. However, data on this variable at the regional level, if it exists, is very limited. Indeed, there is a partial absence of regional export data between 1985 and 1992. Thus, export growth for the ISI period is represented by figures on regional exports for 1981 and 1984, which means the omission of the 1985 observations and the implicit limitations that this may impose. The problem continues when attempting to represent the GATT period, as data for the initial year will be set as 1984, given that the 1985 data is unavailable. Export growth rates during NAFTA are established using regional export data for 1993 and 1998 as calculated in SECOFI (2000).

Net regional migration rates were, as stated above, included in the model as a proxy for factor mobility. In contrast, owing to a lack of data on inter-regional capital flows, capital mobility was excluded from the analysis. Therefore, it should be noted that while the inclusion of labour mobility in the study is desirable, the exclusion of capital mobility might limit the findings of this chapter. In addition, it must be considered that Mexican migration rates at a regional level are not produced on a yearly basis. In fact, there is no regularity in their publication. Moreover, net regional migration rates are only available for 1990 in INEGI (1995) and for 1995 in INEGI (1997b). Therefore, information related to those years is taken to be representative of the GATT and NAFTA intervals, respectively. In contrast, net regional migration rates were not available for the ISI period. However, using regional inward migration statistics from INEGI (1986a), as well as a personal calculation of regional out-migration figures based on Partida Bush (1994), a migration balance for 1980 was produced. That measure was, in turn, expressed as a relative rate to the total population of the state.

As discussed in Chapter Two, neo-classical and endogenous growth theories agree on the inclusion of capital accumulation and human capital as explanatory variables. However, data on the former is not available at the regional level in any INEGI publications or any other official publication from relevant Mexican institutions. The most suitable proxy with available data was initial levels of regional commercial banking deposits. Therefore, the ISI period is represented by commercial banking calculated from INEGI (1987). Capital accumulation during GATT is based on commercial banking deposits taken from INEGI (1987). Similar rates were calculated for the NAFTA period based on INEGI (1995).

The second variable included by neo-classical and endogenous growth theories is human capital, which can be represented by the initial level of education in each state. Accordingly, regional average schooling years were used as a proxy for human capital. Initial levels for this variable were calculated for the three periods based on information contained in Presidencia de la República (1999).

The third and key variable for the debate between neo-classical and endogenous growth theories is, as highlighted in Chapter Two, technological change. However, the variable was not included in the model, since the required information regarding technological change at the regional level was not available for any of the periods used in this research. Thus, the model will be curtailed by the exclusion of technological progress. However, the variable representing higher levels of qualification in the labour force (hsg_0) was included in the model using the initial number of high school graduates in each state. Such data was obtained from SEP (2001) and although it refers to the initial levels for the period, the only figures available for the GATT period were from 1990 rather than 1986. Therefore, the possible limitations imposed by this substitution of data should be taken into account.

The oil industry has been of paramount importance throughout Mexico's history. Although the relative dependence of Mexico on this industry has declined in recent years, the oil industry remains highly relevant. It is particularly important in this analysis since it is an industry that is localised in the states where the oil is extracted. As argued in Chapter Three, extraction and production are now carried out by only seven of the 32 Mexican states. Furthermore, nearly 95 per cent of total oil extraction during 1998 took place in just two states: Campeche and Tabasco (PEMEX, 1999). In view of the importance of this industry to Mexico as a whole, and since it is localised chiefly in two states, a dummy variable for those regions was used. This procedure will make it possible to identify the relevance of the oil industry and control for it.

All data used in this chapter's analysis and that in Chapter Four, has been made available to the reader in the Statistical Appendix.

6. Analyses and Results

The ISI Period

Which factors determined regional growth and the formation of regional disparities at the end of the ISI period, when the Mexican economy was already largely reliant on oil? Table 5.1 reports the results of regressing regional per capita growth rates for the period between 1980 and 1985 on the independent variables. Five models are performed. The first four models include different subsets of independent variables: model 1 contains just the initial level of GDP per capita[71]; model 2, the basic structural variables associated to economic growth in some developing economies (export of raw materials and migration); model 3, the distances to the main market, a key aspect of the new economic geography; and model 4, the structural variables associated with growth in more developed economies, as well as other variables such as maquiladora and public investment. Model 5 represents the most satisfactory simplification of the general model at a 90 percent level of significance. VIF, Cook-Weisberg, and Moran's I tests have been carried out in order to check for multicollinearity, heteroskedasticity, and spatial autocorrelation respectively. Any violation of the assumptions is reported at the bottom of Table 5.1.

Seven factors emerge as the main determinants of growth during the final years of ISI. Around two thirds of the variance in growth across Mexican states during this period was explained by the initial levels of GDP per capita, exports from the states, the levels of human capital, and proximity to Mexico City (Table 5.1). As expected in a period characterized by regional convergence, high initial levels of GDP per capita (y_0) were inversely correlated with growth rates, meaning that the highest growth was concentrated in the poor states of the South of the country.

Contrary to what could have been expected under an ISI regime – but not under an economy that had become increasingly dependent on oil and other exports of raw materials – exports had a positive and significant correlation with growth rates (Table 5.1). The combination of exports of raw materials (mainly oil, but also minerals), agricultural produce, and, to a lesser extent, undifferentiated low-cost industrial goods contributed to the growth of those Mexican states with the highest endowment of natural resources and/or with the lowest labour costs. This factor fostered growth in the South and centre of Mexico, where large reserves of natural resources and the lowest

[71] Coefficients for initial income reported in Table 4.13 for the convergence analysis and the results in Table 5.1, differ slightly from one another since the dependent variable in the former is based on annual average values, whereas the latter is based on growth rates for the whole period.

labour costs could be found. The South of the country was also home to a large percentage of the outward migrants towards other parts of the country and the US.

Table 5.1: OLS Results for the End of the ISI Period

ISI Indep. Var.	[1] Coef.	[2] Coef.	[3] Coef.	[4] Coef.	[5] Coef.
y_0	-0.277	-0.671	-0.754	-1.194	-1.164
	-(1.577)	(-4.150)***	-(4.451)***	(-5.941)***	(-6.242)***
camtab		0.531	0.578	0.682	0.728
		(3.901)***	(3.983)***	(4.251)***	(5.394)***
x		0.403	0.431	0.325	0.324
		(3.064)***	(3.169)***	(2.507)**	(2.701)**
m_0		0.457	0.550	0.436	0.451
		(2.973)***	(3.400)***	(3.022)***	(3.416)***
dismx			-0.219	-0.254	-0.226
			(-1.766)*	(-1.691)	(-1.981)*
disus			-0.046	0.051	
			(-0.355)	(0.427)	
k_0				0.423	0.445
				(1.828)*	(2.192)**
ed_0				0.477	0.466
				(2.917)***	(3.526)***
hsg_0				-0.553	-0.468
				(-2.372)**	(-2.316)**
maq_0				0.089	
				(0.651)	
$pubinv_0$				0.105	
				(0.532)	
F	2.486	12.896	9.477	9.684	14.432
Prob>F	0.125	0.000	0.000	0.000	0.000
df	*1,30*	*4,27*	*6,25*	*11,20*	*8,23*
R^2	0.077	0.656	0.695	0.842	0.834
Adj. R^2	0.046	0.606	0.621	0.755	0.776
Multicollinearity	No	No	No	Yes	No
Heteroskedasticity	No	No	No	No	No
Sp. Autocorrelation	Borderline	No	No	No	No

Standardized coefficients reported. t-statistics in parenthesis under coefficients
***,**, and * denote significance at the 99%, 95%, and 90% respectively

As expected from the variables that are traditional determinants of growth, education and capital accumulation are both significant and a positive influence on growth. The variable used as a proxy of the qualified workforce (*hsg_0*) is also significant, but negatively associated with growth (Table 5.1). It is important to note that while education (average schooling years) has a positive influence on growth, more advanced levels of education are negatively correlated. This result reinforces the view presented earlier for the Mexican economy in the final years of the ISI period as sharing some of the features of less developed economies. During the late 1970s and early 1980s Mexico's national and regional economies had become extremely dependent on the export of oil and other natural resources and agricultural goods. This reliance on natural resources and the relative absence of advanced manufacturing and services among the most dynamic export-oriented sectors of the economy rendered the presence of high skilled labour somewhat redundant, as the highest skills were generally found in sectors orientated to the less lucrative national market.

Finally and, in accordance with new economic geography postulates, the coefficient for the distance to Mexico City (*dismx*) is significant in some of the models and negatively associated with growth (Table 5.1). This underlines the importance of the Mexican Capital as the reference market and the advantages of being geographically close to it.

Altogether, the regional growth panorama in Mexico in the final stages of ISI seems to reproduce many of the neo-classical postulates, highlighted by the fact that there is notable regional convergence. Some of the postulates defended by the new economic geography approach are also fulfilled, especially the importance of Mexico City, rather than the US, as the main market during a period of economic protectionism. Centrifugal forces, however, prevailed over centripetal forces.

The GATT Interval

Table 5.2 reports the results of regressing regional GDP per capita growth during the GATT years (1985-94) on the independent variables for that period. The procedure followed is the same as for the previous period. The results expose the existence of a radical shift in the factors connected to regional growth in Mexico after the demise of the ISI system. The convergence process found in ISI is also present during GATT. However, in Chapter Four divergence appeared only after the exclusion of oil-producing states from the sample. Since this chapter does not exclude outlier cases from the sample, but rather captures the effect of oil in *camtab*, results for initial income (y_0) go from negative and strongly significant to positive and not significant. However, it can be argued that as found in Chapter Four, divergence during GATT hinge on whether the sample excludes oil-producing states. Indeed, the effect of oil was still present in the GATT years as it is revealed by the coefficients of *camtab* in all four models in which it was included. It is important to mention that this result is curtailed by multicollinearity in Model 4.

Factors such as exports or proximity to Mexico City as the main national market that were among the main determinants of regional growth in the earlier period, are no longer relevant. Despite aperture is taking place, distance to the market of the USA is still not relevant in determining regional growth. Although capital accumulation spurs growth, education is no longer a determinant. Moreover, higher levels of education are still not playing an important role as it is evinced by its negative and significant correlation with the dependant. Maquiladora activities, although more important than during ISI, are still not shaping regional growth.

Table 5.2: OLS Results for the GATT Period

GATT Indep. Var.	[1] Coef.	[2] Coef.	[3] Coef.	[4] Coef.	[5] Coef.
y_0	-0.482	0.023	0.015	-0.529	-0.321
	(-3.016)***	(0.140)	(0.078)	(-2.573)**	(1.742)*
camtab		-0.839	-0.841	-0.495	-0.631
		(-5.630)***	(-4.949)***	(-2.506)**	(-4.089)***
x		0.052	0.035	0.054	
		(0.482)	(0.290)	(0.350)	
m_0		0.180	0.215	0.255	0.205
		(1.486)	(1.597)	(2.139)**	(1.846)*
dismx			-0.052	-0.156	
			(-0.409)	(-0.981)	
disus			0.060	0.139	
			(0.492)	(1.195)	
k_0				0.736	0.723
				(2.595)**	(2.962)***
ed_0				0.222	
				(1.217)	
hsg_0				-0.875	-0.679
				(-2.949)***	(-2.913)***
maq_0				0.055	
				(0.398)	
$pubinv_0$				0.114	
				(0.444)	
F	9.096	16.658	10.608	9.772	18.903
Prob>F	0.005	0.000	0.000	0.000	0.000
df	1,30	4,27	6,25	11,20	5,26
R^2	0.233	0.712	0.718	0.843	0.784
Adj. R^2	0.207	0.669	0.650	0.757	0.743
Multicollinearity	No	No	No	Yes	No
Heteroskedasticity	No	No	No	No	No
Sp. Autocorrelation	No	No	No	No	No

Standardized coefficients reported. t-statistics in parenthesis under coefficients
***,**, and * denote significance at the 99%, 95%, and 90% respectively

Overall the results of the analysis of the GATT years point more towards a country still under the shock of the collapse of its import-substitution strategy, rather than to a country starting to feel the effects of economic liberalisation. The foundations of the later years of the ISI model, such as oil dependency and the reliance on the export of natural resources and low-value added goods were being shaken, but no clear alternative was emerging. The fact that exports were no longer significant represents better than any other variable this period of transition. The Mexican economy could no longer rely on its traditional exports for growth, but the incipient and still rather tentative process of trade liberalisation had not yet generated an alternative economic system, in which exports of other industrial goods could have filled in the vacuum left by the steep decline in revenues caused by the collapse of the price of oil and other natural resources. The 'petrolization' of the economy during the early 1980s resulted in a postponement of the structural change reform in the late stages of ISI (Smith, 1990) and led to a doubling of public expenditure and to the expansion of external debt, which reached 61.9% of GDP by the mid 1980s (Ramírez, 1989). As a result, after the sharp decline of oil prices of the early 1980s the government was more concerned with cutting expenditure, reducing public deficit and servicing the debt under a stabilization program carried out under the auspices of the IMF (Auty, 1994), than with preparing the Mexican economy for trade liberalisation.

The Impact of NAFTA

Greater changes in the factors affecting regional growth can be observed after membership of NAFTA. After the transition of the GATT years, the results for the NAFTA period point in the direction of the emergence of what can be the seed of a new economic model of regional growth in Mexico.

As evidenced by model 5 –and considering the caveat that model is marginally affected by a problem of spatial autocorrelation– three variables alone explain more than forty percent of the variance in regional growth in Mexico between 1994 and 2000. Exports has the most robust and significant coefficient. However, the most striking result is the lack of significance of initial income's coefficients. As in the GATT years, the standardized coefficient is positive, pointing to the existence of regional divergence, which, in combination with other variables, tends to be stronger (Table 5.3). Divergence during NAFTA, as found in Chapter Four, is subject to the inclusion of border-states in the sample and limited by the lack of significance.

The three significant variables, initial migration (m_0), exports (x) and maquiladora activities (maq_0), indicate that profound changes were taking place in Mexican regional growth in the last few years of the 20th century. The coefficient of the initial migration variable has a negative sign (Table 5.3). Migration within Mexico from the poorer areas to the more developed states and to the US had been a common feature of the Mexican economic and social history of the last few decades. In many ways it represented a safety valve for poorer states since first it contributed to keep population growth in states with scarce economic potential at bay and, second, because the remittances from migrants represented an important source of income for the inhabitants of many states (Taylor and Yúnez-Naude, 1999). The fact that the coefficient of migration is negative implies that losing human resources to other states can no longer be considered an asset for economic growth.

The profound change in production structures in Mexico by the influence of maquiladora activities on manufacturing, coupled with access to the market of the USA and Canada through NAFTA is evinced by the strong significance and positive influence of exports on growth. However, NAFTA not only opened the door for greater market access, but also for greater FDI flows directed mainly to manufacturing in the form of maquiladora operations. For the first time maquiladora employment is significant and influential in determining regional growth. Although the inclusion of FDI as a variable does not yield best results for the model (Annex 2), incorporating distance to the US market (*disus*) in place of maquiladora employment brings about greater insight into the new regional growth model during NAFTA. Model 6 shows that, as expected by the new economic geography (Hanson, 1996 and 1998), distance to the market of the USA, is in fact, influential on regional growth. The change in the relevant market from Mexico City to the US has been taking place greatly aided by exports based on maquiladora activities.

In brief, changes in the results of the analysis conducted during the NAFTA period herald an important transformation in the Mexican economy. The increasing regional divergence (curtailed by significance levels), the negative effect of outmigration, and the positive and robust influence of exports and maquiladora, as well as the emergence of distance to the international market as determinant of growth are all signs of a very different Mexican economy. However, the possibility of the emergence of a new, more knowledge-based economy linked to economic liberalisation and regional integration was not supported by the present analysis. It is however, a premise that will be explored in the next chapter.

Table 5.3: OLS Results for the NAFTA Period

NAFTA INDAP. Var.	[1] Coef.	[2] Coef.	[3] Coef.	[4] Coef.	[5] Coef.	[6] Coef.
y_0	0.097	0.310	0.356	-0.287	0.143	0.239
	(0.536)	(1.763)*	(1.993)*	(-0.641)	(0.951)	(1.423)
camtab		-0.260	-0.203	0.019		
		(1.591)	(-1.325)	(0.098)		
x		0.415	0.525	0.475	0.535	0.444
		(2.535)**	(2.889)***	(2.482)**	(4.152)***	(2.983)***
m_0		-0.261	-0.457	-0.307	-0.389	-0.369
		(-1.501)	(-2.511)**	(-1.239)	(-2.645)**	(-2.174)**
dismx			0.266	0.028		
			(1.384)	(0.093)		
disus			-0.270	-0.029		-0.380
			(-1.655)	(-0.151)		(-2.434)**
K_0				0.509		
				(0.976)		
ed_0				0.269		
				(0.963)		
hsg_0				-0.420		
				(-0.742)		
maq_0				0.485	0.562	
				(1.858)*	(4.010)***	
$pubinv_0$				-0.091		
				(-0.325)		
F	0.287	3.835	4.162	3.155	8.691	5.05
Prob>F	0.596	0.014	0.005	0.012	0.000	0.004
df	1,30	4,27	6,25	11,20	4,27	4,27
R^2	0.009	0.362	0.500	0.634	0.563	0.428
Adj. R^2	-0.124	0.268	0.380	0.433	0.498	0.343
Multicollinearity	No	No	No	Yes	No	
Heteroskedasticity	No	No	No	No	No	
Sp. Autocorrelation	Borderline	Borderline	Yes	No	Borderline	

Standardized coefficients reported. t-statistics in italics under coefficients
***,**, and * denote significance at the 99%, 95%, and 90% respectively

7. Conclusions

This chapter has analysed whether changes in trade policies and economic integration in NAFTA have had an influence on regional growth and the evolution of regional disparities in Mexico. As mentioned earlier, problems linked to the availability and reliability of regional data in Mexico have implied that any conclusion should be considered with caution. Bearing this in mind, the results of the analysis have shown that the successive passage from a crumbling ISI system to incipient trade liberalisation through membership of GATT and then to economic integration in NAFTA has provoked major changes in regional disparities and in the importance of the factors that generate growth.

First, trade liberalisation and economic integration have brought about a shift in regional inequalities. Despite the fact that regional disparities and a North-South divide has existed in Mexico since industrialization took off in the 1930s (Annex 1), recent changes in economic regimes have been associated with a change in regional trends. Whereas the end of the ISI period was characterised by regional convergence, economic liberalisation and integration have been connected to economic divergence and a widening of the gap between a relatively rich North of the country and an increasingly poor South. Economic liberalisation and integration have also spurred greater concentration of economic activity in the main economic poles of the country. The states bordering the USA have mainly benefited from this, but Mexico City has also fared well. Despite reducing its share of manufacturing jobs (Hanson, 1998b), the capital is attracting high value-added services and becoming an important financial centre. In contrast, the agricultural and natural-resource-dependent states of the South of the country have suffered severe relative declines. This is especially the case in some oil-producing states, such as Tabasco, whose GDP per capita has been seriously dented by the decrease in oil prices and the ebbing oil dependence of the Mexican economy. The rural and agricultural states of Chiapas, Oaxaca or Guerrero also shared poor rates of growth.

During the late stages of the ISI period Mexican regional growth was mainly associated with the production of oil, raw materials, and agricultural produce. The poorer states of the South supplied during this period the bulk of the exports. In this context, investing in improving human skills or in trying to generate endogenous growth opportunities in relatively poor states made little sense as a regional development strategy. Workers with the highest skills tended to find jobs in the less productive nationally orientated manufacturing and service sectors. The mobility of labour and exports of natural resources sufficed to reduce inequalities across states. Yet, this situation entailed serious risks, which became evident once the ISI system collapsed. Mexico had become too dependent on oil and the exploitation of other natural resources and the decline in their prices contributed to the collapse of the ISI model and to the debt crisis that ravaged Mexico throughout most of the 1980s.

The demise of ISI led to economic liberalisation and greater openness to trade. The signature of GATT was a capital step in this strategy. However, in terms of regional growth and the evolution of regional disparities, the GATT years were still dominated by the effects of the breakdown of the previous system. Increases in trade were associated with a reversal in the regional growth trends. Regional convergence, which had been the norm since the 1970s and seemed to continue during GATT –conditional on oil-producing states being excluded from the sample-, gave way to regional divergence. Only during the NAFTA period have the full effects of trade liberalisation and economic integration become more apparent. These forces seemed to have unleashed a process of greater economic concentration, which has mainly benefited the relatively advanced regions of the North. Regional disparities have been reinforced, benefiting fundamentally those regions with the highest levels of maquiladora employment, namely those closer to the USA, and with the lowest levels of outmigration. Centrifugal forces are currently less important than centripetal forces. However, there are still no signs of the emergence of an increasingly knowledge-based economy, which is likely to further widen regional disparities across Mexico.

In brief, trade liberalisation and economic integration have not provoked a reduction in territorial disparities, but have led to greater polarization (Dussel Peters, 1997). As predicted in some Heckscher-Ohlin-von Thünen models (Venables and Limão, 1999), Mexican states close to the North American market have benefited from integration, increasing their production and incomes. States farther away from the US have lost out in relative terms and have become more detached from the recent insertion of the Mexican economy in world markets. Although centrifugal forces may start playing a greater role in the future, once congestion and environmental degradation start to affect the efficiency of the main economic poles, greater policy intervention than hitherto may be needed in order to curb the spiralling of regional disparities. Industrial, educational and regional development policies need to be developed fast in order to set up the bases for development in a series of Mexican states which until recently relied almost solely on migration and their natural resources to survive. In any case, further research is needed in order to determine which are the factors behind regional growth in Mexico in the last few years, since the traditional factors which influenced growth until very recently are giving way to new and less well-known factors which are likely to shape growth and regional disparities in Mexico in years to come.

Chapter Six
Economic Transformations on the Border: Trade Liberalisation Effects in Chihuahua

1. Introduction

As explored in Chapter Two, the new economic geography establishes that spatial concentration or dispersion of economic activity are possible. The previous chapter was dedicated to exploring trade-induced changes on Mexican regional growth patterns. The regression analyses in Chapter Five led to the conclusion that regional disparities have been exacerbated by trade liberalisation and economic integration despite there is no clear econometric indication of a shift in the relevant market from the domestic to the international. The result for high-school education might indicate the emergence of a new, more knowledge-based economy. The loss of relevance noted for previously significant variables such as migration should be explored further in order to confirm or adjust their role in determining growth. The effect that the maquiladora sector is having, not only on its traditional sites of the border-states but further South, was also uncertain, as are the implications of public investment.

The purpose of this chapter is to clarify the effect of the above-mentioned variables on Mexican regional growth. More precisely, to determine to what extent trade liberalisation and economic integration have been responsible for the economic transformations and growth observed at local level. The reason for the examination of regional cases in the present thesis lies in the inherent geographical aspect of the research. Case studies reveal the hidden elements that are particular to each region, contributing to a more complete understanding of the phenomena under investigation. A statistical analysis like the one performed in Chapter Five tends to divorce a phenomenon from its context, focusing attention on just a few variables. However, phenomenon and context are not always distinguishable in real life (Yin, 1994). For instance, although the exports variable was significant under both ISI and NAFTA, it is clear that its composition was quite different in each period. During ISI, exports were mainly dominated by oil, while under NAFTA exports are predominantly manufactured goods. These and other contextual factors that are difficult to separate from the phenomenon have motivated the use of case studies in the present chapter to determine whether the variables identified in the neo-classical and the new economic geography theories, are indeed responsible for regional growth and increasing disparities in Mexico.

The cases chosen were those of the states of Chihuahua and Oaxaca. The former is a border-state that was traditionally a mining and cattle-raising economy, now hosting a large manufacturing sector in which maquiladora plays a leading role. Although the inclusion of the latter will be discussed in detail in the next chapter, Oaxaca is a southern state, predominantly oriented towards primary-sector activities and producing for the market of Mexico City. The reason for choosing these cases lies in their pattern of growth. As can be observed in Table 6.1, growth rates for border-states were negative for the 1980-85 spell, becoming moderately positive during GATT, and strongly positive with NAFTA. Amongst them, Chihuahua displays a moderate negative tendency during ISI, but is the only one that seems to experience growth and benefit from trade liberalisation (GATT). NAFTA has brought about positive growth rates, slightly greater than the average for border-states and considerably higher than the national average. What is more, Chihuahua is the only border-state that has attained high-growth levels during both GATT and NAFTA. Not only that, but as will be explored in this chapter, Chihuahua experienced a structural change, relying increasingly on manufacturing as the motor of its economy and moving away from its traditional activities. The state is also the prime case with which to explore the transformation experienced in Mexican manufacturing over the last decade. Manufacturing has gone from being considerably influenced by maquiladora in 1990 (25 per cent of the sector's production) to being dominated by it ten years later (75 per cent of manufacturing production).[72] In turn, Chihuahua hosts the largest concentration of maquiladora employment in the country (INEGI, 2000). Thus, Chihuahua is an ideal case to explore the benefits of trade liberalisation.

Table 6.1 Border-States Growth

State	Total Per Capita Growth Rates*			
	1970-85	1980-85	1985-93	1993-2000
National	8.32%	1.89%	-2.53%	2.56%
Border-states average	18.61%	-6.29%	1.88%	19.36%
Baja California Norte	11.16%	-10.77%	-5.12%	17.00%
Coahuila	23.71%	-6.07%	-0.15%	21.94%
Chihuahua	**24.12%**	**-2.83%**	**23.92%**	**21.76%**
Nuevo León	22.50%	-6.43%	-1.39%	19.89%
Sonora	8.59%	-1.14%	-2.88%	16.06%
Tamaulipas	21.59%	-10.46%	-3.11%	19.49%

Source: Personal calculations based on Presidencia de la Republica (1999) and INEGI (2000)
*/ Growth rates for the whole period.

In contrast, the case chosen to explore the transformations in the South was Oaxaca. The reason for its selection lies in the pattern of growth followed by the region. While most states in the South and centre experienced moderate growth between 1980 and 1985, Oaxaca achieved, oil-producing states aside, the highest growth rate, which is in

[72] As discussed in Chapter Three, the impact that the maquiladora industry has had on manufacturing's value of production, has not been the same in terms of value added.

line with the early convergence tendency observed in Chapters Four and Five.[73] Furthermore, while the national average growth rate was barely positive during ISI, Oaxaca displayed a per capita growth rate of over 13 per cent for that interval (Table 6.2). The introduction of trade liberalisation was accompanied by a serious economic crisis in the region, which impinged Oaxaca's decline. Moreover, whereas most states in the Table recovered with NAFTA, Oaxaca continued exhibiting negative growth rates between 1993 and 1998. It was only after 1999 and the arrival of the first maquiladoras that Oaxaca was able to exhibit positive rates as reported in Table 6.2. The region is an ideal case to explore the impact of trade liberalisation and economic integration in a southern state away from the benefits brought about by being close to the USA. Moreover, as will be argued in the next chapter, Oaxaca exhibits all the transformations described above.

Table 6.2: Growth in Selected Southern States

	Total Per Capita Growth Rates*			
State	1970-85	1980-85	1985-93	1993-2000
National average	8.32%	1.89%	-2.53%	2.56%
Southern states average	68.07%	13.50%	-34.38%	5.08%
Campeche	226.97%	201.80%	-130.82%	-0.04%
Chiapas	54.88%	-36.15%	-42.65%	7.67%
Guerrero	32.89%	-3.91%	1.71%	1.31%
Morelos	25.81%	0.61%	12.51%	2.31%
Oaxaca	**59.63%**	**13.73%**	**-12.98%**	**5.76%**
Tabasco	105.20%	-50.22%	-88.97%	1.34%
Veracruz	16.58%	-6.20%	-22.74%	8.40%
Yucatán	22.58%	-11.68%	8.93%	13.89%

Source: Personal calculations based on Presidencia de la República (1999) and INEGI (2000a).
*/ Growth rates for the whole period.

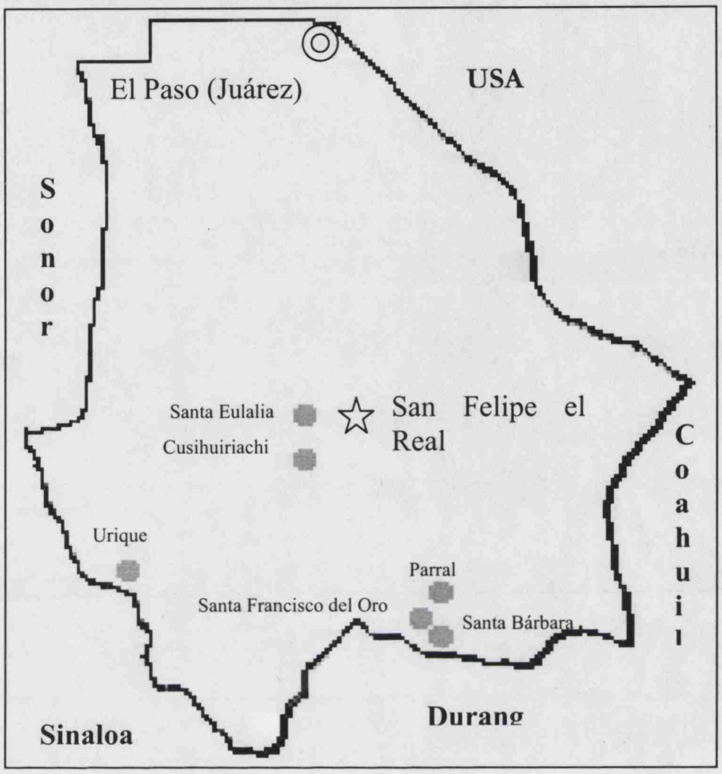
The chapter is dedicated to exploring the case of Chihuahua and to analysing the local transformations brought about by trade, the relevance of the maquiladora sector and the role that the public and private sector have played. It is organised according to the three periods used throughout the thesis. As one of the reasons for undertaking a case study is the difficulty in untangling phenomenon and context, a brief economic history of the state is presented in an initial section. Thereafter, the sections correspond to each of the three periods. Finally, a set of conclusions is presented at the end of the chapter.

2. A Brief Economic History of Chihuahua

Initial settlements in Chihuahua (Figure 6.1) were established to extract rich gold and silver deposits (Martínez, 1978; Jordán, 1981; Gómez Antillón, 1998; CIES, 2000a). Such wealth also fostered the construction of a route linking Chihuahua to Mexico City called the *Camino Real*, which was extended to unite seven state capitals from Santa Fé in New Mexico to Mexico City (Moorhead, 1958). Between, 1705 and 1790, Chihuahua produced one eighth of the whole colonies' silver production (Martin, 1996). Independence did not reduce foreign participation in mining activities (French, 1956; Wasserman, 1992). However, the dynamism experienced in the mining sector had effects not only on private property, but also on its degree of concentration (Gómez Antillón, 1998). The affluence of the sector fostered the emergence of the agricultural and cattle-raising sectors (Martin, 1996). The state's tradition of cattle exports started as a result of entrepreneurial efforts to take advantage of the link with the USA established by the railway.

[73] Growth rates for southern states during the ISI period are considerably higher, as reported in Table 6.2, if we take into account rates for the 1970-85 interval.

Figure 6.1: Initial Settlements in Chihuahua



Based on Jordán (1981), Gómez Antillón (1998), and Lister and Lister (2000)

The greatest railway expansion in the history of Mexico was effected between 1880 and 1884 (Coatsworth, 1981). In the case of Chihuahua that meant a regional link to the USA and Mexico City. Rail tracks allowed further development in areas such as Ciudad Juárez that were traditionally isolated from the mining-driven economy in the South of the state. A second line was created to support the development of a transoceanic route to the Pacific (Pletcher, 1958; González and León, 1994). However, whereas the line to the USA and Mexico City was most successful, the transoceanic was riskier and did not deliver the expected commercial benefits (González and León, 1994). Although, the railway favoured already prosperous regions in the state, others were boosted by the Chihuahua-El Pacífico railway namely those that were attractive for their potential in metallurgy or forestry. Yet huge extensions of both, deserts and mountains were left in virtual isolation.

Although there is no economic measure for production levels in the mining sector prior to the introduction of the ISI model, records of the physical volume of production of some metals are available for 1937 in González Reina (1944). According to this source Chihuahua was the largest producer of gold, silver, lead and zinc in Mexico, as well as the second most important in copper extraction. The state's participation in national mining production was sizeable: one third of gold, one quarter of silver, two thirds of lead, three quarters of zinc, and one fifth of copper. Therefore, the importance of the sector in the state, but also its relevance in overall production, is evident. Foreign investment and the concentration of land enabled the exploitation of mining enclaves in the state.

Regarding manufacturing, in 1930 Chihuahua concentrated less than two per cent of total manufacturing production. Not surprisingly, the most important activity by far was metallurgy, which could draw on the enormous exploitation of minerals and metals in the state. The second most important activity was cotton processing (López Malo, 1960).[74] Sawmills were the third most important activity in the state, taking advantage of the fact that more than one third of the state's area was forest.[75] The fourth and fifth industries were wheat milling and coffee processing (milling and roasting), respectively. Nevertheless, the mining sector was so strong in the state that the most important activity was processing minerals and metals; moreover, the combined value of

[74] Cotton, as a farming product native to Mexico, was originally cultivated in some areas of the Gulf and the Pacific. After 1880, foreign competition and the incapacity to develop irrigation systems impinged the industry's decline in those regions. By the turn of the century, the region of La Laguna in Coahuila and Durango, produced around 90 per cent of Mexico's cotton. Later on, northern valleys in border-states became the main producers (Keremitsis, 1973).

[75] Chihuahua's forests represent an area slightly larger than that of England.

production of the other four activities described above was still far less than that of the mining-related activities (López Malo, 1960).

During the early stage of ISI, regional policy in Mexico was confined to allocation of tax exemptions and the operation of the River Basin Development Commissions. Few efforts were made to foster development in Chihuahua. Isolated actions were undertaken, such as the private-public co-ordination in promoting cement extraction and processing in the state (Ortiz Mena, 1998). The *Comisión Intersecretarial de la Alta y Baja Sierra Tarahumara* delivered economic analysis without practical impact. Although the Río Fuerte Basin Commission included part of the south-west of Chihuahua, it focused chiefly on developing the part of the basin that fell within Sinaloa (Barkin and King, 1970). However, during the 1940s, the tremendous dynamism of the US economy attracted migrants from the rest of the country to border-states. The 1942 Bracero Programme implemented by the Mexican and US Governments spurred migration to border regions. The population of Ciudad Juárez almost tripled during that decade (Margulis and Tuirán, 1986), becoming the most important urban centre in the state tilting the economic and political power towards the northern part of the state (Wasserman, 1993). Industrial production in the Ciudad Juárez area represented more than double the amount carried out in the Chihuahua City-Delicias-Camargo region (Zamora Millán, 1958). Nationally, a process of further concentration in Mexico City and surrounding areas was taking place. At state level, however, the predominance of central/southern regions oriented towards extraction was then, being challenged by the border.

3. Economic Growth and Structure in Chihuahua during ISI

Regional and Industrial Policies during ISI

During ISI, industrial policy was aimed at modernising and optimising production;[76] at the same time, decentralisation became an important policy objective (Solís, 1975).[77] The creation of the Industrial Cities and Estates Programme, as described in Chapter Three, was one of the first attempts to de-concentrate Mexico City. However, private involvement was frequently not interested in locating in the estates provided by the government (Aguilar-Barajas, 1989). Non-regional programmes paradoxically had a profound effect. The end of the Bracero Programme in the USA highlighted the need to prevent repatriates from increasing demand for urban services in such areas as Mexico City. The government was also aware of northern Mexico's particular de-integration from the centre[78] and the importance of seizing the growing market of border-states. Therefore, in 1961 the *Programa Nacional Fronterizo* promoted the creation of hundreds of industrial establishments and thousands of jobs in border-states. Similarly, the creation of the 1966 Border Industrialisation Programme, which introduced duty-free maquiladoras into border regions, represented an industrialisation path that became more important as trade liberalisation was introduced in Mexico. By 1980, 121 firms of the total 620 maquiladoras were located in Chihuahua. One third of the industry's employment was provided by firms based in the state (INEGI, 1997c). During these years, Chihuahua experienced a process of urbanisation. While in 1950, 44

[76] One of the most important problems perceived by the government was that of under-utilised capacity (Solís, 1975). Indeed, inefficiency was at the heart of the productivity problem (Trejo Reyes, 1973).

[77] Although decentralisation was an objective, most policies had the reverse effect (see Chapter Three). In addition, local governments of Mexico City and Edo. de México also used incentives to foster agglomeration (Romero Kolbeck and Urquidi, 1952).

[78] As mentioned in Chapter Three, one of the policies of the period was aimed at integrating northern Mexico into the national economy (Corona Rentería and Sánchez Gleason, 1989). However, industrialisation programmes in the region had the opposite effect (Hansen, 1985).

per cent of the population lived in urban areas, the figure had risen to more than 70 per cent by 1980 (Presidencia de la República, 1999). As a result, Chihuahua's industry was still concentrated in border areas such as Ciudad Juárez (Young, 1986).

During the Echeverría administration (1970-76), it was recognised that the ISI model, in nurturing consumption-goods industries had favoured industrial concentration in the largest urban centres, particularly Mexico City (Palacios, 1989). Therefore, Echeverría aimed to de-concentrate the three largest urban centres in the country. However, the policy lacked further regional considerations by designating all regions, except for the three largest metropolitan areas, target zones (Palacios, 1989). President López Portillo's (1976-82) preferential incentives for industrial location favoured Chihuahua, as two of its municipalities, namely Ciudad Juárez and Chihuahua City, were designated areas in the second tier of industrial-development priorities (Secretaría de Patrimonio y Fomento Industrial, 1979; Palacios, 1989). However, such polices ended up promoting industrial activities in Mexico City and its area of influence, as tax exemptions and resources chiefly supported firms in that area (Aguilar, 1999). What is more, the few incentives for Chihuahua, were channelled to the already more prosperous areas in the state, fostering intra-state disparities. Overall, during the advanced stage of ISI, public investment was also concentrated. Almost one quarter of total public investment was allocated to Mexico City. Chihuahua's share of national public investment was around four per cent, still below the national average (Aguilar-Barajas, 1989).

The Causes of Growth Trends

In line with the process of convergence found at the end of ISI, relatively richer states on the border experienced a contraction (see Chapter Four). The previous chapter found evidence that convergence was fuelled by exports, oil, migration, capital accumulation and education, as well as proximity to the relevant market: Mexico City. How does that explanation fit the case of Chihuahua? Although during the 1970s Chihuahua grew at an average annual rate of 1.6 per cent, the pace slowed down and even became negative during the crisis of the early 1980s.[79] As shown in Table 6.1, per capita GDP growth rates for the 1980-85 period fell to -2.83 per cent (Presidencia de la República, 1999).

Between 1980 and 1985, Chihuahua experienced a slight decrease in per capita income (INEGI, 2000). Whereas in 1980 per capita income in the region had reached 14,086 pesos, by the end of the ISI period, it had fallen to 13,693 pesos (INEGI, 2000). This level of per capita income was slightly below the national average, but the contraction experienced between 1980 and 1985 was lower than the average for border-states (Table 6.1). That income contraction was accompanied by a decrease in real exports between 1981 and 1984 (INEGI, 1985b). Real growth of commercial banking deposits declined by 26.19 per cent during the same period (INEGI, 1987). What is more, a dearth of private capital was accompanied by scanty public allocation of funds; real public investment decreased by more than 67 per cent (INEGI, 1985b; Presidencia de la República, 1999).

In contrast, according to calculations based on INEGI (1986a) and Partida Bush (1994), migration contributed to Chihuahua's total population increase by a rate of 2.54 per cent. Similarly, advances in human capital formation were in line with the overall economic performance of the state. The average level of education increased from 4.9 years in 1980 to 5.85 in 1985, representing a growth rate for the period of 17.7 per cent

[79] It has been argued that due to the extreme interdependence of twin sisters across the border, Mexican states on

(Presidencia de la República, 1999). In particular, the continuous flow of investment under the maquiladora scheme could have helped to cushion the region's economic decline. Maquiladora employment in Chihuahua grew faster than anywhere else in the country, expanding 67.8 per cent in just five years (INEGI, 1997c). Nonetheless, as the causes of growth in Chihuahua are not fully explained by the above variables, it is necessary to explore the sectoral composition of growth in greater detail.

Economic Structure and Sectoral Growth Patterns by the End of ISI

By the end of ISI, the industrialisation of Chihuahua was already under-way. While in 1970, manufacturing represented 12.23 per cent of total GDP, by 1985 its share had risen to 18.29 per cent. As can be observed in Table 6.3, manufacturing's share of the state's GDP increased steadily throughout the 1970-85 span. Agricultural activities rose by 1975, they then fell by 1980 and partially recovered by the end of ISI. Although mining regained its participation in the state GDP in the 1970s, it had declined to negligible levels by the end of ISI. Moreover, such changes are also noteworthy when compared to the national average. Figure 6.2 exhibits the change in the composition of Chihuahua's sectoral GDP relative to the national average; that is, the Figure displays regional deviation from national trends. The decline of mining and the rise of manufacturing not only altered the local composition, but brought the region closer to the average economic structure in the country. Yet, agriculture had a greater economic bearing on Chihuahua than the average for all states. In contrast, the state's contribution to total manufacturing was still lower than the average for the regions. However, the gap between Chihuahua's contribution to the sector and the state-average participation in manufacturing was closing.

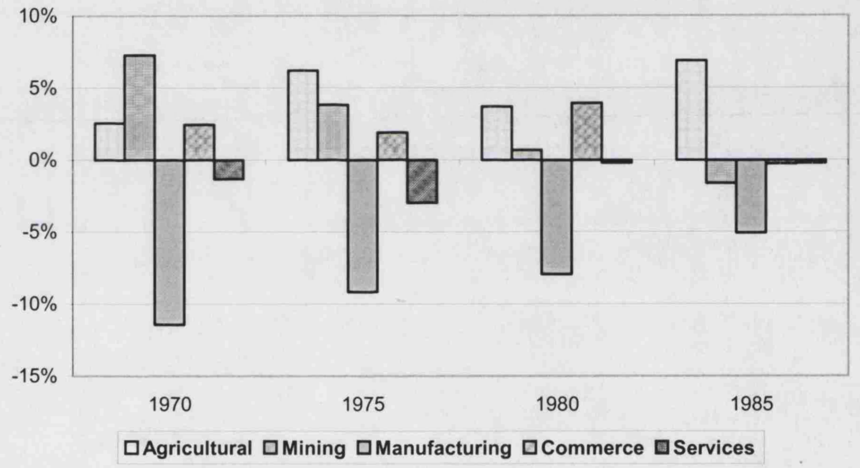
the border were particularly affected by the crisis (Hansen, 1985).

Table 6.3: GDP Composition in Chihuahua (End of ISI)

	1970	1975	1980	1985
Agricultural	14.74%	17.43%	12.06%	15.99%
Mining	9.80%	6.71%	7.51%	3.03%
Manufacturing	12.23%	14.15%	15.07%	18.29%
Commerce	28.38%	27.09%	27.34%	27.80%
Services	24.30%	22.92%	25.38%	23.73%
Other Sectors	10.55%	11.70%	12.64%	11.16%
Total Chihuahua	100%	100%	100%	100%

Source: Personal calculations based on INEGI (2000a)

Figure 6.2: Differences in GDP Composition (% points deviation from national average)



Source: INEGI (2000a)

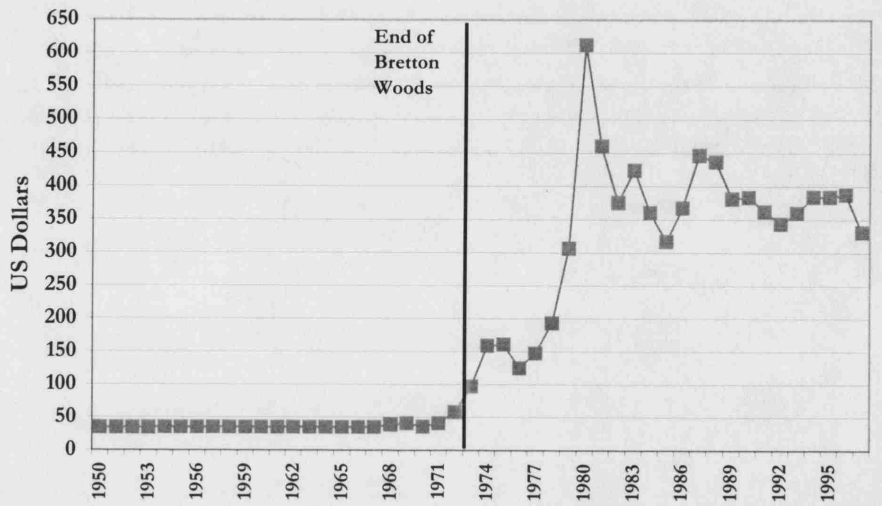
It must be recalled that the end of the ISI period coincides with a crisis that resulted in negative growth rates for the country as a whole. As described in Chapter Three, agricultural activities stopped fostering growth by the end of the 1960s. Indeed, whereas agriculture grew annually at 2.7 per cent, manufacturing's performance reached an average annual growth rate of nine per cent. At the end of ISI, the slight progress achieved by the Mexican economy was spurred by manufacturing. Despite fluctuations in its contribution to the state's GDP, in Chihuahua the decline of agriculture was not taking place. In fact, agricultural activities were growing at more than seven per cent per annum. This considerable growth in agriculture was mainly supported by farming activities, growing at 9.6 per cent annually; nevertheless, forestry and cattle raising in the state were also growing by almost five per cent (INEGI, 2000). According to SARH (1988a), by the end of ISI, the main crops behind the dynamism of farming were apples, nuts and cotton. Similarly, grains such as oat, corn, wheat, beans and sorghum, as well as vegetables such as onions, potatoes and chillies stood out in terms of their production. In addition, forestry in the state was stimulated by the demand for cellulose and wood production; in fact, according to SARH (1988b), in 1985, Chihuahua was the leading national producer of cellulose and the second for wood. Finally, cattle raising in the state was dominated by production and exports of bovine livestock.

Although manufacturing in the state was growing at an annual pace of over five per cent (INEGI, 2000), it did not follow national growth trends. In fact, what happened in Chihuahua at the end of ISI was that the domination of the mining sector in the local economy was, after centuries, coming to an end. The state was industrialising but at the same time increasingly relying on agricultural produce; indeed, industrial activities as mentioned above, were closely related to agricultural production, as in the case of the meat and milk industry and the cotton pitting and packing.

The contraction of the mining sector was enormous. According to data in INEGI (2000), the sector was declining on average 16.6 per cent per annum, mainly due to the decline in the value of production of the traditionally exploited metals such as gold, silver, lead, zinc and copper. Similarly, the value of steel production was shrinking annually by over eight per cent and other non-metallic minerals by more than six per cent. The only mining activity that was growing during the 1980-85 was that of quarry extraction. However, the contraction of mining activities was not related to local production flaws or slowdowns, but rather conditioned by alterations in the international monetary system. In 1971, the US suspended currency-for-gold convertibility, which was agreed for international payments at Bretton Woods. Thus, the entire international monetary system was undermined. By 1973, the Bretton Woods monetary system had ceased to exist (Rivera-Batiz and Rivera-Batiz, 1994). Currency-backing metals –chiefly gold, but also silver– stopped flowing, which increased international prices.

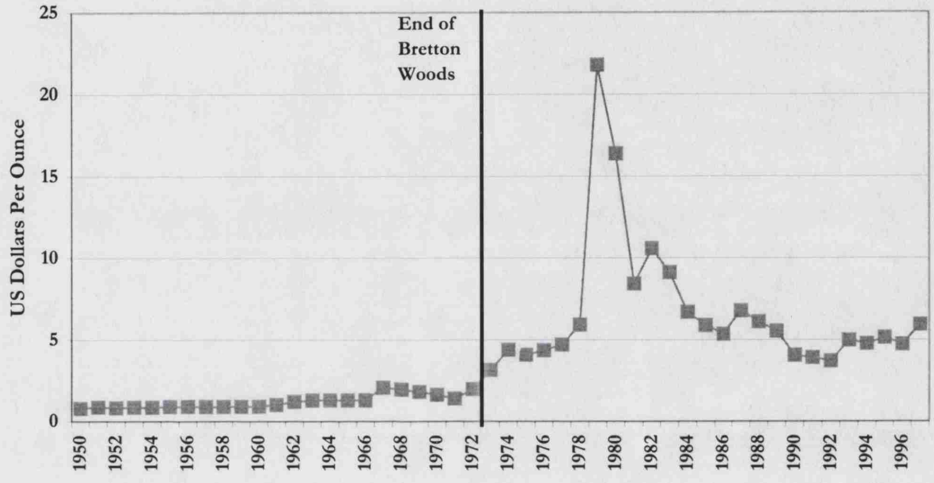
As can be observed in Figures 6.3 and 6.4, the end of the 1970s saw staggering increases in gold and silver prices, which peaked in 1980 and 1979, respectively. Production and exports of gold and silver extracted from Chihuahuan mines were placed in the market at the highest levels in 1980 and by 1985 prices had fallen considerably. The fact that the sectoral GDP growth rates analysed in this section, were based on the 1980-85 period conditions the relative decline of mining activities in the state; it is clear that such a deterioration responded to international conditions and not necessarily to local economic transformations.

Figure 6.3: Average International Prices of Gold



Source: Based on Gold Institute (2000)

Figure 6.4: Average International Prices of Silver



Source: Based on KITCO (2000)

Therefore, the overall decline in the Chihuahuan economy was brought on by the contracted value of exports in the mining sector. Moreover, the negative growth rate in Chihuahua for that period is the second lowest amongst border-states; that is, the mining-sector's decline was somewhat compensated for by manufacturing, but mainly by agricultural activities. On the one hand, production of some agricultural commodities such as grains and apples cushioned Chihuahua's economic decline. On the other hand, the dynamism of manufacturing was driven by foodstuffs, mineral industries and machinery. In contrast, chemical industries contracted by 5.5 per cent annually.

Industrial Activities Fostering Growth

As can be observed in Table 6.4, foodstuffs grew due to the dynamism in corn milling, meat and milk, wheat milling and soft drinks.[80] Nevertheless, the industry's participation in national-industrial figures did not expand in all four branches. According to INEGI

(1981) and INEGI (1986b), meat and milk production in Chihuahua represented 7.7 per cent of national value in 1980, falling to nearly 5 per cent by 1985. Similarly, wheat milling represented over 3.5 per cent of the branch's national production, declining to just over two per cent in the same period. In contrast, corn milling and soft drinks increased their national participation from 2.2 and 1.4 per cent, to 4.4 and 1.8 per cent, respectively. If employment figures are considered, the trend in participation rates is unchanged; the meat and milk industry and wheat milling reduced their participation in the activity's national employment, whereas corn milling and soft-drinks preparation increased their shares. However, in terms of investment, the activities considered in Table 6.4 all increased their participation in the national value, except for corn milling that contracted slightly.

Table 6.4: Growth in Foodstuffs

	1980-1985
FOODSTUFFS	9.13%
Meat and milk	12.71%
Fruit & veg. prep.	-11.16%
Wheat milling	10.90%
Corn milling	24.08%
Coffee milling	11.91%
Oils and fats	4.82%
Animal food	-2.50%
Other foodstuffs	6.80%
Alcoholic drinks	-25.38%
Beer	-11.41%
Soft drinks	1.90%

Source: Personal calculations based on INEGI (2000a)

[80] Although coffee milling grew significantly over the period, its value of production represented a fraction of national output and was considerably inferior to the four industries mentioned here.

As reported in Table 6.5, relative productivity[81] of labour and capital decreased in both, the meat and milk and wheat milling industries. Such contractions in either industry can be explained by a slightly greater reduction of production shares than the decrease experienced in investment and employment. Production shares contracted 2.7 per cent in the meat and milk industry and 1.5 per cent in wheat milling, while employment participations were reduced by less than one per cent in either industry. Moreover, the increases experienced in investment shares in both industries and the above-mentioned reduction in production shares entailed a greater fall in relative capital productivities. The fact that both industries exhibited high-growth rates while reducing their participation in national production and employment, signals the possibility that growth in those industries was partly influenced by national factors. Wage levels in the meat and milk industry increased relative to other states and the number of firms involved in production decreased, while the opposite occurred in wheat milling. Hence, growth in the former may be attributed to an increase in wages and in investment relative to the same industry in other states. Growth in the latter was spurred by an expansion in the number of firms that was matched by an increase in relative investment levels that soared from 2.6 per cent of the industry's total to nearly 11 per cent by 1985.

Table 6.5: Productivity, Wages and Firms in the Foodstuffs Sub-sector

	Labour Productivity		Capital Productivity		Wages		Number of Firms	
Foodstuffs	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**
Meat and milk	1.2829	0.9554	1.0034	0.43532	1.1126	1.1164	65	20
Wheat milling	0.7037	0.4736	1.3581	0.18895	0.9120	0.8531	18	23
Corn milling	1.2846	1.7515	0.9523	1.98914	1.3047	1.50637	554	602
Soft drinks	0.6748	0.7636	0.8319	0.54335	0.7963	0.92413	20	21

Source: Personal calculations based on INEGI (1981 and 1986b)

[81] Relative productivity measures were constructed using the state's share of the national production relative to employment and investment shares of the national values, respectively, for labour and capital productivities.

The other two high-growth industries in Table 6.4, corn milling and soft drinks,[82] were growing faster than national levels. Indeed, the national average growth in corn milling (over 14 per cent) was outstripped by the state performance, reaching an impressive rate of over 24 per cent per annum. The interventionist nature of the ISI model was evident in the government's self-sufficiency objective in corn production, increasing guaranteed prices of corn, which diverted production from cash crops towards corn (Gledhill, 1993). The effect of this policy was stronger in Chihuahua, since commercial firms rather than single peasants, were able to exploit these artificial incentives to produce corn. In fact, Grupo Maseca that now enjoys a national market share of around 70 per cent had set up a plant in the state by the end of the period (GRUMA, 2000). Since the state's participation in milled corn production increased more than its share of employment in the activity and since its share of total investment decreased, both measures of productivity improved. The incentives to process corn were so strong that they influenced the proliferation of enterprises from 554 in 1980 to 602 in 1985. Relative wages also increased; by 1985, these were 50 per cent higher than the national average for the branch (INEGI, 1981 and 1986b).

Soft-drinks production in the state increased by almost two per cent, whereas in the whole country it grew by 1.6 per cent; moreover, the state's shares of total employment and investment increased. As a result, labour productivity rose due to a greater production expansion relative to improvements in employment. Naturally, increased shares of investment of the industry's total entailed diminished values of capital productivity. The number of firms and relative wages expanded; by 1985, the number of enterprises in the branch rose to 21, whereas relative wages increased by around 13 per cent albeit they were still below the national industrial average.

[82] Although other foodstuff industries, such as coffee processing or oils and fats, grew faster than soft-drinks

In sum, the main factor behind economic expansion of the high-growth branches within foodstuffs was productivity.[83] In particular, labour productivity follows the same pattern in all four industries analysed above, whereas the measure for capital fails to determine soft-drinks performance. However, why have foodstuff firms chosen to locate in Chihuahua and not elsewhere? Different reasons seem to apply to different branches. In the case of the meat and milk industry, since production of Chihuahuan bovine cattle was almost entirely exported to the USA, proximity to the market was paramount; in addition, the climate and environment of the Chihuahuan plains favour cattle raising. Similarly, climate and environment are propitious for wheat production during the relatively colder winters in Chihuahua, which in turn provides the vital input for milling plants. The above-mentioned incentives to the production of corn given by the government help to explain the boost to corn milling. Finally, the above-national growth displayed by the soft-drinks industry is not exclusive to the state, but applies to the whole of the country; indeed, in per capita terms, Mexico is the world's second largest consumer of Coca-Cola (JPMorgan, 1996).

Table 6.6: Growth in Machinery

	1980-1985
MACHINERY	13.56%
Metallic furniture	10.00%
Metallic structures	13.84%
Other metallic products	-30.52%
Non-electric machinery	13.04%
Electric machinery	-3.26%
Domestic appliances	11.28%
Electronic devices	-10.27%
Electric devices	26.34%
Automotive industry	65.04%
Transport equipment	13.00%

Source: Personal calculations based on INEGI (2000a)

production, the latter was analysed as the value of production was much greater than other high-growth activities.
83 It is not difficult to see that changes in the number of firms, as well as the factor-proportion mix, will influence productivity.

The fastest growing sub-sector during the 1980-85 interval was machinery, which achieved an average annual growth rate of 13.56 per cent. As can be observed in Table 6.6, the chief activity supporting the sub-sector's performance was the automotive industry, achieving an impressive annual growth rate of over 65 per cent. In fact, almost 55 per cent of the sub-sector's real GDP was generated by the automotive industry. In addition, non-electric machinery, and electric devices were also key branches spurring the sub-sector's growth and accounting for over 13 per cent of real GDP for the sub-sector. Whereas the automotive and electric devices industries were the activities attaining the highest growth rates, some branches such as metallic structures grew at a higher rate than that of non-electric machinery, but the minor proportion of GDP it represented made it a less attractive activity to analyse.

National production in the machinery sub-sector was growing at half the rate attained in the region under analysis. In contrast, production growth in Chihuahua's machinery was over 13 per cent (INEGI, 1981 and 1986b). In fact, the three above-mentioned branches increased their participation in the industry's national value. In 1980, non-electric machinery production in the state represented 0.28 per cent; by 1985, its share had expanded to over 2.5 per cent of the industry's total value. Similarly, electric devices contributed around 0.15 per cent of the national value, registering staggering growth in the five-year period to reach almost ten per cent of the total. As the automotive industry was, during ISI, oriented towards production of vehicles and auto-parts for the larger market of Mexico City, most firms were located near that market. Indeed, Volkswagen produced in Puebla, Ford in Edo. de México and Nissan in Morelos. Hence, Chihuahua's production contributed little to the national value; nevertheless, while in

1980 the state branch produced just 0.05 per cent of the total, by 1985 it had increased to almost 1.4 per cent. By the end of ISI, Ford Motor Company had installed a plant in Chihuahua, which was dedicated to motor' assembly and had a production capacity of 400,000 motors per year (Zapata, Hoshino and Hanono, 1990). Similarly, Alphabet de Mexico producing harnesses for the automotive industry, installed its first plant in Chihuahua (DESEC, 2000). Likewise, other services to the automotive industry were provided by Auma Servicios (part of Grupo Bocar), which was located in the region in 1984 (DESEC, 2000).

In terms of employment, the trend was stronger. In 1980, non-electric machinery had a 1.27 per cent share of the national figure; five years later, that proportion had multiplied, reaching almost seven per cent of the total. Likewise, electric devices production in the state expanded its share of employment from 10.5 to nearly 32 per cent of the national figure in the same time span. Finally, the automotive industry in Chihuahua concentrated 0.03 per cent of the industry's jobs, surpassing one per cent by the end of the interval. Although, investment also grew relative to total figures, its share was inferior to that for employment. While the non-electric machinery went from 0.03 to 4.7 per cent, electric devices rose from 8.1 per cent of the total to more than 17 per cent; although, the automotive industry made some progress in its share of the national investment, this remained below one per cent of the national average.

Behind such growth patterns, as can be observed in Table 6.7, there were significant increases in labour productivity relative to other states. The automotive industry of Chihuahua made remarkable progress during those five years, multiplying its relative productivity several times and achieving one of the highest levels in the country by 1985. Similarly, non-electric machinery and electric devices saw considerable progress in their labour productivity levels; however, they were still far from catching up with productivity in central regions such as Mexico City, Edo. de México, Hidalgo, Morelos and Puebla, or more industrialised states such as Nuevo León and Jalisco. Labour productivity increases were also accompanied by improvements in relative wages. Capital productivity supported growth in electric devices and in the automotive industry; however, the former was still considerably below national average levels, whereas the latter was almost double the industrial average. In contrast, the non-electric machinery branch experienced a reduction in this measure of productivity. However, the number of firms in that branch actually rose. While in 1980 there were 67 firms in non-electric machinery, by the end of the period this figure had increased to 94. Likewise, investment multiplied several times and so did employment in the activity. The source of such reduced capital productivity stems from the fact that relative levels of production grew at a slower pace than relative amounts of investment. Indeed, by the end of the period, the industry had installed physical capabilities that were yet to show their full productive potential.

Table 6.7: Productivity, Wages and Firms in the Machinery Sub-sector

	Labour Productivity		Capital Productivity		Wages		Number of Firms	
Machinery	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**
Non-electric machinery	0.2252	0.3745	0.8042	0.5451	0.7123	0.7516	67	94
Electric devices	0.0147	0.3046	0.0190	0.5560	0.7233	0.7421	51	86
Automotive industry	0.1669	1.3754	0.8042	1.9415	0.4897	0.8449	11	38

Source: Personal calculations based on INEGI (1981 and 1986b)

Finally, it is important to examine the minerals processing sub-sector. Although those activities did not perform as well as foodstuffs and machinery, the sub-sector reached an annual growth rate of over eight per cent; that is, growth in the mineral industries was above average for the manufacturing sector in Chihuahua. It is clear from analysing data provided by INEGI (1981 and 1986b) that the activities responsible for that performance were glass and cement. The former achieved an annual growth rate of over 36 per cent, whereas the latter reached nearly 16 per cent. However, glass production in the state relative to the national, represented nearly half of that attained in 1980. In contrast, output in the Chihuahua cement industry represented around 4.4 per cent of the national figure, almost double the share achieved in 1980. Investment shares followed almost exactly the same pattern. In terms of employment, both branches exhibited a slight increase in their participation; nevertheless, whereas glass could not surmount one per cent of national production, cement reached four per cent.

Table 6.8: Productivity, Wages and Firms in the Minerals Sub-sector

	Labour Productivity		Capital Productivity		Wages		Number of Firms	
Minerals	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**
Glass	0.3037	0.1295	0.7237	3.3475	0.3853	0.3061	12	14
Cement	0.7729	1.0824	1.0068	1.0039	1.0398	1.0741	114	111

Source: Personal calculations based on INEGI (1981 and 1986b)

Surprisingly, despite the impressive growth rates experienced in the glass industry, its participation in national production and investment fell. Although relative labour productivity and wages decreased substantially, capital productivity levels in the industry multiplied, exceeding the national average (Table 6.8). The activity was boosted by Grupo Vitro's arrival in Chihuahua,[84] which represented a minor increase in the number of firms operating in the state, but a considerable expansion of investment in the branch. In contrast, the cement industry advanced considerably in terms of its relative labour productivity, growing above the national average and placing Chihuahua's cement industry amongst the most productive in the country. There were also slight improvements registered in relative wages. However, the branch experienced a minor contraction in the number of firms, which was accompanied by an extraordinary increase in investment related to the arrival of Cementos Mexicanos (CEMEX).[85] Although capital productivity in the cement industry contracted slightly, labour productivity supported its expansion, while capital productivity was behind the considerable growth in glass production.

Growth Determinants

As argued in Chapter Two, both neo-classical and endogenous growth theory consider human-capital accumulation to be a growth determinant. In fact, the coefficients for the ISI period shed by the previous chapter's regressions were positive. In particular human capital had a re-distributive effect influencing growth in poorer states.[86] Chihuahua experienced considerable improvements in education levels during the last five years of ISI. The average level of schooling measured in years of formal education rose from 3.3 in 1960 to 4.9 in 1980, both levels slightly over the national average (Presidencia de la República, 1999). In addition, illiteracy in the state went down from over 20 per cent to less than nine per cent, while average illiteracy in the country was 34.5 per cent and dropped to 17 per cent between 1960 and 1980. Nevertheless, during the 1982-83 interval, if skill-development education and training are considered, Chihuahua managed to achieve not only the most students, but also the largest number of schools outside the three more developed states in the country (INEGI, 1985b).[87] In fact, if those urban concentrations are taken out of the equation, Chihuahua had the second highest

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[84] Mexico's largest glass-production holding based in Monterrey, in the state Nuevo León.
[85] Mexico's largest cement producer, and since 1996, the world's third largest.
[86] Taylor and Yúnez-Naude (1999) have mentioned this possibility based on the work of Pritchet (1996) "Where Has All the Education Gone?", *World Bank Policy Research*, Working Paper No. 1581.
[87] Mexico City, Nuevo León (Monterrey) and Jalisco (Guadalajara).

number of teachers in the nation, only behind Puebla. What is more indicative of the role played by education is the fact that by far the greatest contribution in terms of schools, teachers and students was made by the private sector, which probably saw education for the workplace as an important determinant of productivity. Moreover, the number of high school graduates[88] in the state was one of the highest compared to other regions, and also as a proportion of number of students enrolled (SEP, 2001). The fact that Chihuahua experienced negative growth rates during ISI despite the progress in education is not surprising given the process of convergence taking place at that time. The more technical education (*hsg0*), although significant was negatively associated to growth since places like Chihuahua with better educational attainment were not experience growth.

The relative small contraction felt in the state compared to other regions –particularly compared to other border-states- was explained not only by the performance of agriculture and the level of education, but also by manufacturing. Particularly, the maquiladora sector helped to alleviate the economic downturn of the period. The increase in maquiladora employment was, however, very localised. Almost all those establishments were based in Ciudad Juárez. However, Chihuahua City started to benefit from the industry, hosting 18 plants by 1980, which were mainly dedicated to producing electronic materials, electric devices, textiles and furniture (CEPAL, 1996). If one considers data issued by INEGI (1986b) and INEGI (1997c), more than 63 per cent of the state's manufacturing employment was maquiladora. Although the regressions in Chapter Five do not find maquiladora employment growth particularly important, it seems to provide part of the explanation for the case of Chihuahua. According to Aguilar-Barajas (1989), the allocation of public resources to Chihuahua

[88] What can be called terminal efficiency.

was reduced from less than four per cent before 1970, to 1.43 per cent between 1983 and 1985; however, public investment was heavily directed towards the manufacturing sector, accounting for almost half of 1981's total federal resources (INEGI, 1985a). Agricultural activities also benefited with one-fifth of such investments. Although public investment fell dramatically during this period, the available funds were channelled into the provision of infrastructure for industrial location such as maquiladora, which in turn stimulated growth in manufacturing, particularly in machinery and minerals production. The dominance of the mining sector was already being challenged by agricultural activities, which were, in turn, generating growth in the foodstuffs industry.

It is important to note that although the maquiladora industry in Chihuahua was still far from attaining the significance that it did during the GATT and NAFTA periods, the industry had started to make its mark. Furthermore, maquiladora location also helps to understand the relatively smooth economic decline. The industry is heavily concentrated along the border drawn this by being the largest border city (the best developed and cleanest) with the largest labour pool, offering attractive living conditions for management personnel in El Paso, Texas, good freight transportation and the best source of local Mexican technicians (Baerresen, 1971).

The First Maquiladoras

At this point it is important to present a conceptual distinction developed by Carrillo and Hualde (1998) on the types of maquiladoras locating in the state. According to these authors, there have been three 'generations' of maquiladoras. The first generation appearing from the outset of the programme in 1966 until the mid 1980s was drawn by traditional factors such as low wages, proximity to the USA and infrastructure. The second generation emerged with trade liberalisation, attracted not only by traditional factors, but also non-traditional ones such as the training and skills of the labour force. Finally, the third generation appears to have arrived after the signing of NAFTA, based on the involvement of Mexican plants in the design and R&D of products. Although the ISI period may be linked to a first generation of maquiladoras seizing the benefits of the programme, in the case of Chihuahua it seems that some of the elements that would be taken into account by the second generation of maquiladoras were already being nurtured during ISI. Indeed, the fact that Baerresen (1971) found that factory managers, company owners and executives of the industry located in Ciudad Juárez (by far the most popular location in the state during ISI) considered the size of the skilled labour pool in the area, signalled that the state economy was preparing for a more complex type of maquiladora, less limited to assembly and gradually undertaking manufacturing.

Summary (ISI): The traditional economic basis (chiefly mining) was in decline during the last stage of the ISI model (1970-85). However, it would seem that Chihuahua was already anticipating changes by attracting FDI in the form of maquiladora plants and increases in human capital. That anticipation allowed the region to grow faster once the markets started to liberalise.

4. The Transformations Entailed by Trade Liberalisation

Regional and Industrial Policies during GATT

During GATT, as mentioned in Chapter Three, two economic difficulties emerged. First, the contraction related to the decline of oil prices, which was aggravated by the

Mexico City earthquake. Second, the financial crisis provoked by the Wall Street crash. The already diminished levels of oil revenue were under further strain by the expenditure needed for the reconstruction of Mexico City and by the effect of the financial crash on, amongst other things, interest rates paid by the government. In addition, the change of the country's economic model implied less intervention by the State. All these factors brought about the cancellation of the few attempts to implement regional policies such as those of the River Basins Commissions and the Industrial Estates and Cities Programme.[89] In contrast, the maquiladora sector thrived with the new trade approach.

In the case of Chihuahua, the few actions taken by the central government to foster industry chiefly favoured the already most developed municipalities. Under the new industrial strategy, only Ciudad Juárez and Chihuahua City were included in the category of maximum national priorities (NAFIN, 1993). Industrialisation was also favoured by urbanisation; by 1990, over 77 per cent of Chihuahua's population were living in urban centres (Presidencia de la República, 1999).

The result of the Industrial Estates and Cities Programme in Chihuahua was the establishment of 14 industrial estates, one of the highest figures in the country. However, almost two thirds of these were based in the already industrially developed Ciudad Juárez and Chihuahua City, hosting six and three estates, respectively. Camargo, Cuauhtémoc, Delicias, Parral and Casas Grandes each developed their own industrial estate. Nevertheless, these new estates hosted few firms. By 1992, only two firms were based in Camargo, six in Cuauhtémoc and six in Delicias. Casas Grandes and Parral

[89] It should be borne in mind that, as mentioned in Chapter Three, the River Basins Commissions represented efforts to foster particular areas with flooding problems, but that at the same time had potential to be developed.

counted with three and one firms, respectively. In contrast, just one of Chihuahua City's industrial estates concentrated 73 firms (NAFIN, 1993). Not surprisingly, according to NAFIN (1993), industrial estates in either Chihuahua City or Ciudad Juárez, were predominantly private run and financed by international and national banks, whereas those in the rest of the state were mainly State-promoted and run without private financial support. The sole case of a private-public partnership in developing an industrial estate in Chihuahua was located in Delicias. Similarly, estates in Chihuahua City and Ciudad Juárez were specialised, while the other towns hosted general manufacturing activities.

Changes in the Economic Structure and Sectoral Growth

Trade liberalisation brought about structural changes in the regional economy. GATT led to the transformation of Chihuahua into an industrial state. Table 6.9, shows the decline in the mining sector, where participation in the state GDP fell to less than one per cent. The participation of agricultural activities was halved, falling to less than eight per cent,[90] while manufacturing registered a slight increase in its GDP share.

The state's negative growth trend experienced during the last years of the ISI model was reversed with GATT. While average national growth over that period, declined by almost six per cent, Chihuahua was the one border-state growing in the period, attaining almost 24 per cent growth over the whole interval (Table 6.1). Moreover, only Mexico City and Quintana Roo achieved higher growth rates than that of Chihuahua. Per capita GDP in 1993 reached 17,393 pesos, compared to the initial income for the period of

Similarly, the Industrial Cities and Estates Programme aimed to provide the physical conditions and space to enhance industrial location.

nearly 13,700 pesos. Growth in Chihuahua during GATT led to an increase of around 33 per cent in its contribution to national GDP. That is, whereas at the end of ISI, the state contributed with about 2.94 per cent, by 1993 the rate had gone up to nearly four per cent (INEGI, 2000).

Table 6.9: GDP Composition in Chihuahua during GATT

	1985	1993
Agricultural	15.99%	7.95%
Mining	3.03%	0.95%
Manufacturing	18.29%	19.70%
Commerce	27.80%	29.34%
Services	23.73%	31.98%
Other Sectors	11.16%	10.08%
Total Chihuahua	100%	100%

Source: Based on INEGI (2000a)

In contrast to the last stage of ISI, growth in Chihuahua was no longer supported by the agricultural sector. Agricultural activities in the state, contracted by over 30 per cent during the period that is almost four per cent per annum. Mining activities continued to decline at a similar pace as they had during ISI, reaching annual negative growth rates of over 7.6 per cent. In contrast, manufacturing grew by over 47 per cent, which represented an annual average rate of nearly 6 per cent. The fastest growing manufacturing sub-sectors were the metallic industries, machinery and textiles; in contrast; modest contractions were experienced in wood, paper, chemicals and foodstuffs. Unfortunately, branch-level GDP data was not available from 1993 onwards, which curtails insight on sectoral sources of regional growth. Instead of employing GDP growth rates as for the ISI period, this section will use data drawn from the 1985 and 1993 Industrial Censuses, particularly those related to gross value of

[90] The proportion of state GDP coming from agricultural activities was not only affected by the increasing relevance of manufacturing, but also by a seven-year drought in the region.

production, value added, employment and number of firms. In addition, relative levels of productivity, industrial shares and relative wages will be presented in this section.

Industrial Activities Supporting Growth

Table 6.10: Economic Changes in the Metallic Industries (GATT)

	Gross Production*		Value Added*		Employment		Investment*		Number of Firms	
Metallic	**1985****	**1993**	**1985****	**1993**	**1985**	**1993**	**1985****	**1993**	**1985**	**1993**
Basic metals	10.27	0	4.63	0	132	0	1.03	0	10	0
Basic non-ferrous metals	832	168599	110	73798	1086	248	4.55	123	6	NA

Source: Personal calculations based on INEGI (1986b and 1994a)
*/ Figures in thousands of pesos.
**/ Gross production, value added and investment figures for 1985 have been converted to new pesos and expressed in constant pesos (1993=100).

The activities behind growth were considerably different from those during ISI. Whereas under protectionism, foodstuffs and minerals had softened economic decline, the dynamism of GATT was fostered by the textiles and metallic industries albeit the machinery sub-sector continued to grow in Chihuahua. Metallic industries grew by over 37 per cent per annum. That performance was supported by considerable increases in gross production and value added in the basic-metals branch (e.g., smelting/lamination of non-ferrous metals, tubes and similar products). In addition, employment figures decreased in the branch compared to the 1985 values (Table 6.10). Despite such drop in employment, labour productivity fell slightly relative to the rest of the country; however, their levels were still way above the national average (Table 6.11). Chihuahua's basic metals industry was the third most labour-productive state in the country in terms of labour by 1993. In 1985, Chihuahua was the second most capital-productive region in the basic metals industry; investment flowed to the region and by the end of the period, it had become several times more productive than any other region in the country. High productivity levels were accompanied by an increase in relative wages of more than 100 per cent.

Table 6.11: Productivity and Wages in Metallics (GATT)

	Labour Productivity*		Capital Productivity*		Wages*	
Metallics	1985	1993	1985	1993	1985	1993
Basic metals	0.32	---	1.18	---	0.3800	---
Basic non-ferrous metals	1.88	1.80	4.15	21.32	0.8300	1.75

Source: Personal calculations based on INEGI (1986b and 1994a).
*/ Values are relative to the national value.

In contrast, while in 1985, the iron and steel industries participated with four per cent of the value of production, the closure of the state's largest steel-smelting company, Aceros de Chihuahua, impinged the severe contraction of the iron and steel industries in the region. Thus, production, employment and investment levels contracted. In fact, although on the whole, Chihuahua benefited from the export-promotion model, some industries showed the signs of a struggle to keep up with competition. Iron and steel production was given substantial governmental support during ISI, so that not only was import substitution in the industry achieved, but significant amounts of steel were also being exported (Cole, 1967). Ironically, competing in the domestic market was increasingly difficult. Around 85 per cent of the domestic market for ferrous products was concentrated in Mexico City, Monterrey and Guadalajara (Kendrick, Meeraus and Alatorre, 1984). Higher costs incurred in transporting production to those centres, greater foreign competition and a lack of local inputs were the root of the problem but not the whole story.

Aceros de Chihuahua was created, owned and run by the State under a closed economy with a poor supply of inputs as all raw materials were imported and the main market was provided by local demand and exports.[91] However, several problems arose. First, the firm accidentally manufactured, distributed and exported steel products contaminated with radioactive material, which generated an international health problem (La Botz, 1988). Second, as low value-added products such as bars and ingots, or even steel for casting, were manufactured at Aceros de Chihuahua (Watkins, Fuller and Fischer, 1964), considerable amounts of investment were required to increase value added in order to face mounting competition from other countries (La Botz, 1988).[92] Third, Miguel de la Madrid's government (1982-88) was determined to reduce the size of the State and its intervention in the economy through privatisation and the closure down of inefficient firms (La Botz, 1988). Fourth, in the midst of international health problems and increased competition, the firm's labour union decided to strike demanding a 40 per cent wage increase (La Botz, 1988). Hence, in 1986 the firm was liquidated. Although, the firm experienced some problems directly related to trade liberalisation, most of all it was shaken by the pressures imposed by the change of model. That is, the fact that the development model changed precisely when the firm had to deal with environmental, competition and labour-related issues determined the closure down of the firm and with it the contraction of the branch. Therefore, growth in the metallic sub-sector was completely due to growth in the production of basic non-ferrous metals. According to INEGI (1994a), employment in the branch was due to smelting and refining of non-ferrous metals; however, the value added of the activity represented just over one per cent of the manufacturing figure for Chihuahua.

[91] Written information provided on November 17th 2000, by Lic. Cenia Chaparro of the private association Desarrollo Económico del Estado de Chihuahua A.C. in response to the question 'What were the reasons for Aceros de Chihuahua's closure?'

Table 6.12: Economic Changes in Machinery (GATT)

	Gross Value*		Value Added*		Employment		Investment*		Number of Firms	
Machinery	1985**	1993	1985**	1993	1985	1993	1985**	1993	1985	1993
Total Manuf. in Chihuahua	12533	11936844	3330	6172928	122822	222559	578	587582	3574	7204
Total in Machinery	2987	4858418	1482	3292299	70026	141605	315	373250	898	1620
Moulding industry	95	36578	43	16181	991	648	4	978	32	53
Metallic structures	63	252521	18	107296	1238	3242	3	10103	424	915
Metallic furnitures	13	53779	3	36008	263	1317	1	10384	12	41
Other metal. prod.	14	146796	7	99091	301	2810	1	6786.3	98	144
Non-electric machinery (spec. use)	40	25654	18	14592	635	399	3	676.2	62	19
Non-electric machinery	171	159508	102	97288	4638	3683	18	6840	94	140
Office mach.& inf. sys. tech.	153	111897	107	58650	3475	1689	24	2099	12	—
Electric devices	1303	2363316	937	1697836	39037	74598	152	53283	86	150
Electronic devices	449	1033757	328	741334	15648	34911	70	28616	21	66
Domestic appliances	—	178720	—	134108	—	6762	—	10316	—	21
Automotive industry	614	336920	-134	171628	1454	6436	22	239293	38	25
Other transport material	41	37478	27	25345	1262	1048	5	708.5	10	—
Precision instr. & eq.	30	121492	25	92944	1084	4062	11	3167.5	9	36

Source: Personal calculations based on INEGI (1986b and 1994a)
*/ Figures in thousands of pesos.
**/ Gross production, value added and investment figures for 1985 have been converted to new pesos and expressed in constant pesos (1993=100).

The second fastest growing sub-sector during GATT was machinery, which grew more than 15 per cent per annum. The sub-sector's share of value added in manufacturing

[92] Idem.

increased from 44.5 to 53.3 per cent. Similarly, employment in the sub-sector represented nearly 64 per cent of the total manufacturing employment, an increase of more than six per cent on 1985 figures. Both in terms of value added and employment, the automotive industry exhibited considerable progress. Whereas during the 1980-85 spell, the industry had delivered negative value-added figures, by 1993 the branch represented over five per cent of machinery's value-added figures and 4.5 per cent of employment in the sub-sector.

Nevertheless, that employment-share expansion led to a decrease in relative labour productivity levels; the above-national productivity levels exhibited during ISI had decreased dramatically by 1993. However, as those rates were calculated relative to other regions, greater productivity increases in other states determined Chihuahua's poor performance. Indeed, during those years, Sonora saw the arrival of Ford, while Renault, Dina and Masa plants were established in Hidalgo; likewise, Nissan produced in Morelos, while Puebla hosted Volkswagen (Zapata, Hoshino and Hanono, 1990). Relative wages also deteriorated during GATT.

Thus, productivity decreases in the industry relative to other states did not necessarily reflect diminished productivity in the activity. In 1986 the Delphi Group set up the firm Delphi Sistemas de Energía devoted to the production of engines (DESEC, 2000). The installation of Ford in Chihuahua City was followed by two plants belonging to the General Motors Company (GMC) in 1986, and soon after Alambrados y Circuitos Eléctricos, an offshoot of Delphi Group, which provided inputs for the GMC plants.[93] Likewise, two of the three plants commissioned by Buenaventura Autopartes in 1989 and 1990 produced automotive wires and harnesses (DESEC, 2000). Whereas in 1985 less than one per cent of the activity's national investment was based in Chihuahua, by the end of the period this figure was more than 13 per cent of the total value. The automotive industry went from representing just over seven per cent of Chihuahua's machinery sub-sector, to a staggering 64.1% by 1993 (Table 6.13). Increases in investment shares were accompanied by a reduction in relative capital productivity (Tables 6.12 and 6.13). Although both relative measures of productivity, as well as relative wages, actually declined during the period, the great expansion of investment and employment shares determined the increase in the regional value added yielded by the industry (Tables 6.12 and 6.13). The reason for the arrival in Chihuahua of such firms –which were dedicated to supplying inputs to the multinationals (Ford and GMC)– lies in the poor quality of potential local suppliers. Hence the need to establish their own network of providers complying with intra-firm standards. Similarly, the maquiladora industry had few linkages with local suppliers. In Mexico, typically less than two per cent of total inputs of maquiladoras were supplied by the domestic industry in the early 1990s. In Chihuahua that figure was less than one per cent for the same period (INEGI, 1997d).

Although at the beginning of the period domestic appliances were not yet produced in Chihuahua, trade liberalisation led to the appearance of the first plants that contributed to the branch's share of four per cent of machinery's value added in the state and an employment share of almost five per cent. By 1993, production of domestic appliances in Chihuahua represented around 3.5 per cent of the national value of production in the activity and 3.7 of the state's machinery (Table 6.13). Likewise, investment in the activity represented over 3.4 per cent of national investment in the branch and nearly three per cent of Chihuahua's machinery (Table 6.13). What is more, almost 20 per cent of the

[93] Written information provided by Mr. Marco Ledón, researcher at UNAM.

branch's national employment was working for the 21 firms located in the state. Nevertheless, relative levels of labour productivity were amongst the lowest in the country; similarly, relative wages were below national average. Growth in the branch was spurred by improvements in capital productivity levels (Table 6.13).

Table 6.13: Productivity and Wages in Machinery (GATT)

	Labour Productivity*		Capital Productivity*		Wages*	
Machinery	1985	1993	1985	1993	1985	1993
Moulding industry	0.8749	0.7806	0.8473	1.7687	0.7755	0.8172
Metallic structures	0.7386	1.1462	1.0050	0.8510	0.7065	0.9496
Metallic furnitures	0.6134	0.5439	0.1732	0.1806	0.4990	1.1032
Other met. prod.	0.3798	0.3423	0.5497	0.9443	0.3814	0.6344
Non-elec. machinery (spec use)	0.4508	0.6211	0.6774	0.9485	0.5609	0.8334
Non-electric machinery	0.3745	0.4105	0.5451	0.6782	0.7516	0.8069
Office mach.& inf. sys. tech.	0.1861	0.2924	0.3178	0.8339	0.7451	0.9281
Electric devices	0.3046	0.4040	0.5560	1.2641	0.7421	0.7854
Electronic devices	0.3060	0.3908	0.3587	0.8731	0.8315	0.8728
Domestic appliances	---	0.1775	---	1.0293	---	0.6655
Automotive industry	1.3754	0.1265	1.9415	0.0392	0.8449	0.7245
Other trans. mat.	0.2783	0.3592	0.2885	2.9753	0.6715	0.7907
Precision instr. & eq.	0.2713	0.4894	0.1267	0.7995	0.8352	0.9537

Source: Personal calculations based on INEGI (1986b and 1994a).
*/ Values are relative to the national average.

Although value-added and employment shares in the moulding industry, structured metal products and metallic furniture branches were still relatively low in 1993, their participation in the machinery sub-sector had multiplied several times. Growth in the smelting of basic metals (excluding iron and steel) was continued further along the productive chain in moulding and production of structures and furniture. Moulds were produced by the Canadian-owned plant Span de México, which commenced operations in Chihuahua in 1991 (DESEC, 2000). While the value of production in structured metals and in metallic furniture grew as a proportion of their national values, the moulding industry experienced a minor shortfall. Equally, employment and investment shares of the national industry followed the pattern of production (Table 6.13). High levels of relative capital productivity supported growth in moulding and modest ones in metallic furniture. In contrast, labour productivity increases fostered growth in structured metallic products. Relative wages increased in the three branches, but the greatest expansion was registered in metallic furniture. Finally, the number of firms operating in such branches proliferated in all three activities.

Value-added and employment shares in the precision instruments branch still represented under three per cent of the machinery sub-sector in the state. However, in relation to 1985 results, the progress was considerable. Production of precision instruments represented more than 6.4 per cent of the national production; compared to 1985 levels, the share had almost tripled. The activity's employment shares increased from nearly nine per cent to more than 13 per cent. In contrast, the investment share fell from 19 per cent to just over eight per cent by the end of the period.[94] Although relative labour productivity in the activity exhibited below-average levels, the figures showed considerable progress after 1985. Labour productivity improvements were accompanied by wage expansion. Although relative wages paid in the state were still below the national average, they increased considerably during GATT. Likewise, capital productivity multiplied during the period, albeit without attaining national-average levels

(Table 6.13). Those productivity levels were explained not only by employment and investment growth, but also by the expansion in the number of firms operating in Chihuahua.

Increases in value added and employment shares in the electronic devices branch although positive, were rather modest. However, the industry still accounted for more than one fifth of the state's machinery sub-sector. In addition to the multinationals established during ISI such as RCA, that performance was bolstered by the arrival of such firms as Digital, Data General, and Altec,[95] producing electronic components mainly under the maquiladora scheme. The state share of national production in the industry increased by four per cent, representing more than ten per cent at the end of the period, while employment shares reached almost 27 per cent.[96] Relative labour productivity in the industry increased, although it remained well below the mean. In contrast, investment shares contracted by more than five per cent, to less than 12 per cent of the national figure. Tapered investment in the branch led to improved capital productivity, although this remained slightly below average. Relative wage levels were also below the mean, progressing modestly during GATT (Table 6.13). Value-added, production, employment and productivity levels rose during the period, not only due to the arrival of the aforementioned large firms, but also the operations of other smaller companies, which tripled the number of firms.

It is important to bear in mind that electronics actually contracted during the 1980-85 interval. Two possible explanations for the contraction of the early 1980s and its

[94] These shares are relative to the national value of the precision instruments branch and were not reported in tables, which show the branch share of the machinery sub-sector as in the rest of the chapter.
[95] Written information provided by Mr. Marco Ledón, researcher at UNAM.
[96] These values refer to the state's electronic industry shares of national figures for that industry and do not reflect the industry's share on the state's sub-sector.

subsequent recovery can be found. First, the mid-1980s crisis affected the sector in Chihuahua. However, it is unlikely that the maquiladora industry operating in the state perceived devaluation as a business deterrent; probably quite the opposite, since it improved their terms of trade. Second, De la O Martínez (1994) has argued that flexible specialisation processes appear to have emerged at this time, at least in Ciudad Juárez's electronics and precisely at RCA. In fact, the 'Fordist' approach to production was questioned at RCA's plant in Juárez, where flexible production, skilled labour and technological innovation had been implemented during GATT (De la O Martínez, 1994). It is possible then, that the industry, one of the most important in the state, was restructuring its production processes at the end of ISI and that during GATT, a flexible-specialisation type of manufacturing appeared in the state.[97]

Table 6.14: Economic Changes in the Textiles Sub-sector (GATT)

	Gross Value*		Value Added*		Employment		Investment*		Number of Firms	
Machinery	1985**	1993	1985**	1993	1985	1993	1985**	1993	1985	1993
Total manuf. in Chihuahua	12533	11936844	3329.6	6172928	122822	222559	577.7	587582	3574	7204
Total in textiles	483	778454	271.2	563634	13594	25973	14.1	15652	250	522
Hard fibres	---	836	---	418	---	15	---	210	---	---
Soft fibres	191	11204	124.8	4030	5069	281	9.3	139	21	---
Non-garment confection	49	578168	43.8	135814	2216	19321	0.1	12612	11	50
Weaving industry	36	1765	27.6	751	541	65	0.1	4	7	15
Clothing confection	105	127327	55.1	46782	4378	4852	3.1	2077	163	342
Leather industry	32	14932	2.6	10510	354	444	0.1	219	13	33
Shoe industry	70	44222	17.4	21619	1036	995	1.4	391	35	67

Source: Personal calculations based on INEGI (1986b and 1994a)
*/ Figures in thousands of pesos.
**/ Gross production, value added and investment figures for 1985 have been converted to new pesos and expressed in constant pesos (1993=100).

[97] As it will be argued below, such changes correspond to a second generation of maquiladoras.

Table 6.15: Branches' Shares of the Textiles Sub-sector (Based on Table 6.14)

	Gross Value		Value Added		Employment		Investment		Number of Firms	
Machinery	1985	1993	1985	1993	1985	1993	1985	1993	1985	1993
Textiles*	3.9%	6.5%	8.1%	9.1%	11.1%	11.7%	2.4%	2.7%	7.0%	7.2%
Hard fibres	---	0.1%	—	0.1%	---	0.1%	---	1.3%	—	---
Soft fibres	39.5%	1.4%	46.0%	0.7%	37.3%	1.1%	65.9%	0.9%	8.4%	—
Non-garment confection	10.1%	74.3%	16.2%	24.1%	16.3%	74.4%	0.5%	80.6%	4.4%	9.6%
Weaving industry	7.5%	0.2%	10.2%	0.1%	4.0%	0.3%	0.8%	0.0%	2.8%	2.9%
Clothing confection	21.8%	16.4%	20.3%	8.3%	32.2%	18.7%	22.4%	13.3%	65.2%	65.5%
Leather industry	6.6%	1.9%	0.9%	1.9%	2.6%	1.7%	0.6%	1.4%	5.2%	6.3%
Shoe industry	14.4%	5.7%	6.4%	3.8%	7.6%	3.8%	9.8%	2.5%	14.0%	12.8%

Source: Personal calculations based on INEGI (1986b and 1994a).
*/ Textiles' shares are relative to the total value of manufacturing, whereas the branches' are relative to the machinery sub-sector.

More moderate increases in value-added and employment shares as proportions of total state manufacturing were experienced in textiles. Value added increased to represent more than nine per cent of Chihuahua's manufacturing by the end of GATT. Similarly, employment ratios grew, reaching nearly 12 per cent of the sub-sector's value. Almost entirely responsible for such an expansion was the non-garment confection branch of textiles. Its share of value added for the sub-sector, increased from 16 to over 24 per cent. In terms of employment the expansion was greater, soaring from 16.3 to around 74.4 per cent (Table 6.15). The number of firms operating in the state flared reaching 50 by the end of the period (Table 6.15). One of the textile firms that continued operations in the state was Cirmex, installing a third plant. The Creaciones Opis and Creaciones Tinajero companies commenced operations in Chihuahua on a more modest scale than that of Cirmex. Nevertheless, if production is measured in relation to other regions, the non-garment confection industry decreased its share from 3.18 per cent in 1985 to 0.77

per cent in 1993. The reverse occurred with the state's employment share, which doubled, reaching 30.8 per cent, the largest share in the country.

Table 6.16: Productivity and Wages in Textiles (GATT)

	Labour Productivity*		Capital Productivity*		Wages*	
Textiles	**1985**	**1993**	**1985**	**1993**	**1985**	**1993**
Hard fibres	---	35.7908	---	2.8182	---	1.0735
Soft fibres	0.3186	19.9892	1.0831	185.3671	0.8026	0.6858
Non-garment confection	0.2052	0.0249	12.4409	0.0774	0.6751	1.1235
Weaving industry	0.7470	18.0124	11.4700	806.5373	0.8782	0.5033
Clothing confection	0.4556	1.1038	0.8895	2.3994	1.0538	1.0774
Leather industry	0.7691	1.3265	14.0761	5.0891	1.0913	1.2692
Shoe industry	1.0376	0.0001	5.2972	0.0005	1.2366	0.9547

Source: Personal calculations based on INEGI (1986b and 1994a).
*/ Values are relative to the national value.

Investment in the activity multiplied (Table 6.15). However, it reached only around ten per cent of the industry's national mean. As a result, relative capital productivity was greatly diminished; whereas in 1985 the state was the most capital productive, by the end of the period, it had decreased substantially. Investment in textiles signalled the possibility that textiles, which is typically a labour-intensive industry, was spatially dividing its productive processes. That is, concentrating the relatively capital-intensive processes in Chihuahua, while the more labour-intensive stages were located farther South. In fact, demand for labour in the industry was increasing and was several times better paid in Chihuahua than the national average. Relative levels of labour productivity diminished drastically, with relative wages doubling and exceeding the industry's mean. It is possible that better paid jobs in the state were related to more skilled workers and that mounting investment meant more advanced technologies and automatisation; as it will be argued below, such conditions signalled the arrival of a second generation of maquiladoras. Finally, it must be borne in mind that the last two years of the period correspond to a new regional government that considered textiles to be one of the three clusters to be developed in Chihuahua.

Growth Determinants

Chihuahua's exports grew in real terms, more than 920 per cent between 1984 and 1993.[98] The state has also been one of the most important locations for maquiladora production, which must have a bearing on the exceptional growth of state exports and, in turn, its growth performance. Migration, as in the results of Chapter Five, supported growth in the period of analysis. By 1990, migration rates in Chihuahua had more than doubled relative to those of 1980; thus, the population increased by 6.7 per cent due to migratory attraction.

The regressions of the previous chapter found that growth was not determined by education. However, the case of Chihuahua shows the contrary. Levels of education in Chihuahua improved between 1985 and 1993, far more so than during ISI. On average, a Chihuahuan would then, complete seventh grade, which represented an improvement of over 19 per cent relative to ISI. Illiteracy was reduced from almost 15 per cent in 1970 to six per cent in 1990 (Presidencia de la República, 1999). The positive and considerable increase in education levels coincided with the high growth levels experienced in the period. Perhaps these advancements allowed Chihuahua to experience positive growth rates in a period of economic restructuring.

The Greater Importance of Maquiladoras

During the 1985-93 interval, the number of maquiladora plants in the state doubled, rising from 168 to 337 (INEGI, 1997c). Immediately after the opening up of the economy, the number of maquiladoras in Chihuahua increased substantially (1986-89). However, by 1993 that figure had contracted (INEGI, 1997c). As a result, the state's share of the total number of maquiladoras dropped from 22 to 16 per cent (INEGI, 1997c). That trend was common to other border-states, signalling the beginning of a relocation of maquiladora to non-border states. In fact, that type of industry has been flowing into such states as Jalisco, Edo. de México and Mexico City. Similarly, Durango and Yucatán have received an increasing number of plants (See Statistical Appendix). Whether such firms have relocated to those states or these represent new plants, is not possible to determine with the available data. The reduction in the share of maquiladora employment in Chihuahua was moderate. Whereas in 1985 almost 37 per cent of the sector's employment was based in the state, by 1993 that figure had fallen to 32 per cent. It is in the last year of GATT and the first of NAFTA that maquiladora employment almost stagnated, growing just 0.5 per cent per year; in fact, monthly employment figures diminished from June 1993 to May 1994. As few states matched the declining employment pattern, Chihuahua's decreases could be particular to the conditions in the state at the time. Nevertheless, throughout the period, Chihuahua was the region with the largest number of maquiladora workers; what is more, state employment in the sector grew almost 124 per cent during the GATT period.

Intra-regional location of maquiladora in Chihuahua seems to have also been altered by trade liberalisation. Whereas in 1980, Ciudad Juárez hosted 19.5 per cent of the

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[98] Limitations on the availability of state-exports data were put forth in Chapter Five.

country's maquiladora firms and concentrated 33 per cent of the sector's national employment, by 1993 relative figures on plant location had fallen to less than 12 per cent and related employment to 24.4 per cent (CEPAL, 1996). By way of contrast, in the same interval, Chihuahua City's employment in that sector rose from 3.2 to six per cent; however, it fell back slightly on number of firms. By 1993, other municipalities in the state accounted for 1.1 per cent of the country's establishments and nearly two per cent of employment (CEPAL, 1996). Thus, not only were maquiladora firms and employment localising in non-border states following trade liberalisation, but they were also choosing other municipalities in Chihuahua. In sum, the maquiladora sector played a greater role, despite the momentary relative decline in firm-hosting figures and the almost stagnating employment growth at the end of GATT.

The above analysis of manufacturing activities reveals a distinction amongst high-growth industries. On the one hand, branches such as non-ferrous metals, moulding, structured metallic products, metallic furniture and precision instruments albeit their positive performance, made a limited contribution to sectoral production and employment. On the other hand, the automotive and electronic industries achieved high-growth rates, while their influence on manufacturing's performance was greater. It is important to mention the modest advances, but considerable sectoral contribution of textiles during the period. At the heart of the region's progress was the maquiladora scheme. It is not only paramount in explaining the dynamism in the automotive and electronics industries, but also in the smaller but fast-growing activities mentioned above.

Yet the question remains: Why were those companies choosing to locate in Chihuahua? Traditional factors such as low wages, proximity to the USA and infrastructure played a part. However, non-traditional factors were also attracting investment to the region. According to Carrillo and Hualde (1998), the availability of trained workers and professionals was a location determinant for this second-generation maquiladora. During GATT, maquiladora was drawn to the region not only by its cheap labour, geographical position or its relatively better infrastructure, but also by the size of the labour market and the qualifications of the workers. Increasingly since the mid 1980s and especially since accession to GATT, firms have not only employed unskilled labour but also semi-skilled and skilled workers in production processes that imply the use of greater technology and automated and semi-automated lines of production. In addition, this second generation of maquiladora, although limited to certain branches such as electronics and possibly textiles, was also introducing flexible processes of production to meet changing demand and competition.

The role played by local businessmen, as well as by central and regional governments, must also be acknowledged. Although the former gradually lost control of entrepreneurial activities in the state during GATT, they became FDI facilitators providing the necessary conditions and services for maquiladora to arrive and flourish (Vázquez Ruíz, 1997). Through the provision of spaces both independently of, and in partnership with, the private sector, the latter have contributed to the flow of investment to the state in the form of maquiladora. Moreover, the action of the state and central governments through the Industrial Cities and Estates Programme has not only co-operated towards funding and organising privately run estates in the two most important urban centres in the state (Chihuahua City and Ciudad Juárez), but also attempted intra-state de-concentration by supporting new estates in other regions of the state.

Summary (GATT): During GATT, the importance of mining activities was further reduced. Similarly a long drought imposed a severe contraction on agricultural activities. In contrast, industrialisation continued mainly driven by metallic industries, machinery and textiles. However, the change of economic model is evident in the efforts to reduce the participation of the State in the economy, which in Chihuahua meant, amongst other things, the termination of the steel industry. At the same time, the opening up of the economy brought a thriving automotive industry. Although capital and labour productivity levels were behind such transformations, the ultimate economic-shaping factor was the attraction of maquiladoras. By the end of the period, maquiladora numbers had doubled. Yet employment growth in the industry started to slow down; furthermore, Chihuahua's share of the national number of maquiladoras dwindled. In spite of the above, a second generation of maquiladoras seems to be present in the state, albeit limited to a few branches such as electronics. Labour-intensive industries such as textiles also behave in a similar fashion, allocating increasing capital and paying better wages to a more skilled labour force. In contrast, labour-intensive parts of the process (e.g., the typical first-generation maquiladora), were starting to locate in the South. Although the automotive industry continued to strengthen its position in the state, it hardly established links with local suppliers, which could be one of the drawbacks of the industry.

5. The Impact of Economic Integration in Chihuahua

The Absence of Regional Policy and the Rise of Local Governments

As discussed in Chapter Three, the few and limited regional policies undertaken by the central government were reduced during GATT and abandoned completely with

NAFTA. However, regional aspects of some public policies were implemented. First, poverty-reduction schemes were occasionally aimed at reducing regional disparities. Second, the process of decentralisation of education initiated in 1992 was mainly implemented during the 1994-2000 administration with the objective of easing regional education inequalities. Third, the new concept in the public budget, *Rubro 33* (Concept 33),[99] was established as a complement to other decentralisation policies. However, there is evidence that the allocation of funds through *Rubro 33* is contributing to increased territorial differences in the country (Esquivel, 1999b).

In addition to these regional-oriented policies, in the last fourteen years, Mexico has also pursued fiscal decentralisation. Although at first it had the effect of de-concentrating tax spending to the Mexican states (1988-1994), some progress in terms of public spending has been achieved. Approximately one-half of Mexico's public spending is currently applied by state governments albeit such spending has been conditioned to some extent and through a myriad of sectoral programmes (Courchene et al, 2001). According to Courchene et al (2001), Mexico has also adopted features of other two fiscal decentralisation models. First, some improvement has been made in exploiting the direct federal-municipal relationship; however, this option is also curtailed by the common incapacity of most municipal governments to exercise their fiscal responsibilities properly. Second, administrative fiscal decentralisation has also progressed, although it has not explored the possibility of assigning legislative activities to federal authorities and implementation and administration ones to sub-national governments (Courchene et al, 2001). Even the spending side of decentralisation has

[99] An annual transfer of resources from the Federation to the regions, which is comprised of funds previously allocated by the central government to diverse aspects (social, education, etc.).

not explored further opportunities entailed by Ramo 28 (*Concept 28)* to use revenue-sharing conditional transfers to give way to more sub-national taxation.[100]

Although these attempts have been very limited and ineffective, the lack of a regional policy from the central government has been counterbalanced by the emergence of regional and local governments. After Mexico entered into the economic integration process with the rest of North America, the states and municipalities have gained the particular capacity to implement development strategies. Moreover, those policies generated locally are enjoying greater success than previous centrally designed efforts. Although strategies and outcomes are clearer in the case of Chihuahua, they are also increasingly occurring in poorer states such as Oaxaca (Giugale, Hernández Trillo and Oliveira, 2001). Greater self-determination of policies should be welcome and even more so in view of regional policies. However, in the future it is possible that poorer regions could lose out as a result of territorial competition. Courchene, Díaz-Cayeros and Webb (2001) mention this possibility as a result of greater exposure of border-sates to the North-American market. However, the same authors also give some weight to increased political openness since 1988 and chiefly since opposition parties have won state and municipal governments since 1989. Although the authors also consider that the fact that the PRI lost the majority at the Chamber of Deputies in 1997 also strengthened decentralization, they give a significant importance to the economic integration process that Mexico is undergoing.

The fact that the major presidential candidates of 2000 were all former governors - including President Fox- is also a sign of a tendency towards decentralization and

[100] Although municipal and state governments have their transfers conditioned to efficient levels of tax collection, these are still limited to a handful of local taxes, while excluding major federal taxes.

towards a greater political leverage in the Mexican states (Courchene, Díaz-Cayeros and Webb, 2001). More recently, the Governors' National Conference (CONAGO/*Conferencia Nacional de Gobernadores*), which is integrated by PRI –now in opposition- and PRD governors has showed considerable political power in diverse national-interest issues. As a result of all these factors, the regions seem to be slowly getting away with some of their core interests (i.e. the 2003 budget law increased the amount and proportion destined for transfers). Nonetheless, "two initial conditions set the boundaries for the future evolution of fiscal arrangements in Mexico. The first has long been a feature of Mexican federalism, namely the degree of inequality across states. Understanding this inequality is critical to designing a more decentralized federation. The second is the impact of the North American Free Trade Agreement (NAFTA). As with selected provinces in Canada, some Mexican states are becoming fully integrated economically within the new environment created by NAFTA, and they are demanding more fiscal and economic autonomy than some other provinces can handle (see Courchene 1998 on Canada). Unless an appropriate system for transferring resources and responsibilities is devised, the uneven pattern of regional integration may exacerbate political and regional tensions" (Courchene, Díaz-Cayeros and Webb, 2001: 131). Thus, there are at least two possible outcomes that can emerge from Mexico's ongoing fiscal-decentralisation process. First, greater decentralisation will continue overlooking regional inequalities leading to exacerbated economic polarisation in the country as typically those states with greater taxation capabilities will be also those ahead in the ladder of economic development (Rodríguez-Pose and Gill, 2003). Second, decentralisation not only brings about greater revenue independence and overall fiscal autonomy, but also is implemented using a transfer system oriented towards reducing regional imbalances. The real extent of the political power of the regions, and more importantly, their impact in economic policy, will only be known in years to come.[101]

Under NAFTA, and in the absence of regional policies or programmes, major and centrally designed policies have had regional implications (OECD, 1997). The National Solidarity Programme (PRONASOL) was one of the main instruments used since the Salinas administration (1988-94), and although it has been a national programme, it has had regional implications. By 1997, almost 56 per cent of government expenditure was directed towards social aspects, representing nine per cent of GDP (OECD, 1997). However, only eight per cent of social expenditure was aimed at regional and urban development. The bulk of the resources have been allocated to education and health care. Nearly two thirds of expenditure in education is de-concentrated, that is, applied by state governments; thus, at least in education some degree of decentralisation has recently been granted. However, the effects of those policies have been few and far between, since different levels of government have been involved in the process, without an overall strategy in mind (OECD, 1997). Policies aimed at promoting R&D activities have not been regionally designed either. The National Council for Science and Technology (CONACYT) has been supporting projects from small firms with an innovative content in technology parks and industry hotels since 1992. Those efforts focus on fostering innovation outside Mexico City and its area of influence. However, the National Chamber of Manufacturing (CANACINTRA) has criticised the location of such projects in already developed regions that concentrate research centres (OECD, 1997).[102] PRONASOL's resources have been directed towards provision of healthcare,

[101] Nevertheless, it is important to mention that despite central government's attempts to induce industrialisation in southern states by moving some industrial processes from the border through the *Programa Marcha Hacia el Sur* (March-South Programme), border-states actions, and in particular Chihuahua's, have not only re-oriented the programme, but have also led to the installation of maquiladoras in marginalised areas of the state.
[102] However, business associations including CANACINTRA, have played a minor role themselves in supporting innovation at all firm levels, but especially at the micro, small and medium sizes (Lozano-Aguirre, 2001)

education, basic services, housing, nutrition and employment in the most backward regions in the state, namely those of the Sierra Tarahumara in Chihuahua (OECD, 1997).

As mentioned in Chapter Three, and as established in previous sections, the few regional policies that were pursued were designed and implemented by Mexico's central government. State and municipal governments took limited actions. Trade liberalisation and increased political competition in Mexico were reflected first in northern Mexico and, in fact, in Chihuahua. Some economic groups[103] promoted the candidacy of Francisco Barrio[104] for the municipal government of Ciudad Juárez (1983-86). After Barrio's election, the government sought an alliance with those economic groups, which led to dwindling support for Barrio's candidacy, this time for governor. Thus, Francisco Barrio (and his party, PAN) was only supported by small and medium entrepreneurs. Although PAN lost the 1986 election, Barrio and PAN had a second and this time successful, opportunity in 1992.

After wining the state elections in 1992, the first opposition governor, Francisco Barrio (1992-98), promoted state growth through a public-private co-operation scheme. The economic transformation was designed at the private institution *Desarrollo Económico del Estado de Chihuahua A.C.* and contemplated fostering growth through the promotion of clusters of activities. The strategy recognised activities demonstrating potential in manufacturing as being the automotive industry, electronics and textiles (Ruiz Durán, 2000). Similarly, natural-resource exploitation was geared towards agriculture and cattle

[103] Some of the strongest entrepreneurial groups in the state, Grupo Chihuahua favoured by ISI policies, and Grupo Bermúdez benefiting from the maquiladora scheme (Arroyo Galván, 1997), led the political and economic changes in the state. As economic interests of those groups were harmed by the nationalisation of the banking system in 1982, public-private consensus was broken up and they sought political action (Arroyo Galván, 1997).
[104] Who became Governor of the State of Chihuahua for the 1992-98 period.

raising, forestry and furniture production and some other materials. In services, transport, business services and tourism were supported (Ruiz Durán, 2000). FDI in Chihuahua was promoted by 'Chihuahua Now', designed jointly by the organisations in charge of fostering economic development both in Ciudad Juárez and in the state. Likewise supplier-development councils were created in Chihuahua City and Ciudad Juárez. Under the state-development strategy known as *Chihuahua Siglo XXI*, R&D centres have been created in the state, dedicated to particular topics or to tackling industry-specific needs (Ruiz Durán, 2000). Although considerable progress has been made in employment, investment and growth in the region, few non-maquiladoras have progressed in the state; moreover, a large proportion of those that have thrived have been supplying inputs or services to maquiladoras (Vázquez Ruíz, 1997). Although regional growth has been affected by trade liberalisation, state and local governments have gained more autonomy and have been playing a more active role in promoting growth and employment.

Transformations in the Economic Structure and Patterns of Growth

Economic integration and the implementation of the above-mentioned regional efforts have delivered a per capita GDP growth rate of nearly 22 per cent between 1993 and 1998 (an average annual rate of 3.1%). As can be observed in Table 6.17, GDP composition is to some degree sustained during the seven-year span. Agriculture slightly increased its share –albeit temporarily, as it went down again in 2000), while mining reduced it further. The industrialisation process has continued and manufacturing activities accounted for more than 22 per cent of state GDP. The effect of the crisis, by altering the terms of trade, is also evident in the momentary improvement in the GDP participation of agriculture and, to a lesser extent, manufacturing.

The initial per capita income in Chihuahua was 17,393 pesos for the NAFTA period. As argued in Chapter Five, the period is one of divergence; that is, high initial income is positively related to growth. Chihuahua is part of the group of states that are benefiting the most from the economic integration strategy. If sectoral GDP annual growth rates are considered, the declining trend in agricultural activities during GATT is to some extent reversed with NAFTA. The sector grows annually by almost 1.2 per cent, reaching an overall rate of over 8 per cent for the period. However, the recovery of the sector after a long drought was still not enough to reach pre-GATT real GDP values. The farming sub-sector was growing but a much slower pace than agricultural activities as a whole. According to INEGI (1999a), the sub-sector grew by less than two per cent between 1993 and 1997. In contrast, according to INEGI (1999a), production of cattle actually decreased in Chihuahua between 1993 and 1997. Growth in farming was supported by the production of sorghum, chillies and peaches. Besides chillies, the rest of Chihuahua's dominant crops (corn, beans, and apples) were not expanding during the period. In contrast, the production of chillies grew annually by a rate of 18.6 per cent. Sorghum had the fastest expanding production achieving an annual rate of nearly 31 per cent, whereas peach production increased annually by around 8.6 per cent. Contractions in the other main crops were so strong that they almost offset these significant increases of production.

Table 6.17: GDP Composition in Chihuahua During NAFTA

	1994	1995	1996	1997	1998	1999	2000
Agricultural	7.13%	7.75%	8.00%	9.33%	7.63%	7.18%	5.91%
Mining	0.79%	0.78%	0.75%	0.68%	0.67%	0.56%	0.56%
Manufacturing	20.07%	21.43%	22.81%	22.30%	22.34%	21.88%	22.53%
Commerce	30.94%	25.79%	26.30%	26.44%	27.51%	28.48%	30.64%
Services	30.28%	32.78%	30.48%	28.72%	28.29%	27.08%	24.88%
Other Sectors*	10.79%	11.47%	11.66%	12.53%	13.56%	14.82%	15.48%
Total Chihuahua	100%	100%	100%	100%	100%	100%	100%

Source: INEGI (2000)
*/ Includes construction, electricity and transport.

In contrast, the decline in mining continued at an annual rate of 2 per cent, eroding the sector's real GDP value by over 14 per cent. Nevertheless, the most growth-supporting sector was manufacturing, expanding annually by 7.3% and increasing the real GDP value of the sector by more than one-half relative to the end of GATT (nearly 52%). In fact, this the period in which manufacturing grew fastest (in annual terms). Apart from the metallic industry, which contracted 37 per cent during the seven-year spell, all sub-sectors grew. Below industrial average (for the state) annual growth rates can be observed in foodstuffs (2.2 per cent), wood (2.8 per cent), paper (3.3 per cent) and minerals (6.9 per cent). Growth is much more pronounced in textiles, achieving an annual growth rate of 8.6 per cent, in machinery, expanding annually by an average of 9.56 per cent and in the chemical industry, growing on average at 9.58 per cent annually.

High-Growth Branches in Manufacturing

Although the chemical industry was the fastest growing manufacturing sub-sector, its share of manufacturing employment in Chihuahua was still modest. At the beginning of the period, it represented 2.9 per cent of the state's manufacturing employment; by 1998, that share had increased to just over 3.6 per cent. The most significant expansion in terms of gross production was experienced in plastic products, increasing its value of production by 79% (Table 6.18), mainly due to plastic injection companies producing plastic products for a myriad of industries. A significant influx of investment related to new plants in the branch was supporting growth of the activity as it is reported by capital productivity figures in Table 6.19. The second fastest-growing industry, in terms of gross production was 'other chemical substances' branch (paint, perfumes, soaps/detergents, etc), which expanded 40% (Table 6.19) boosted by asphalt production carried out at Asfaltos de la Frontera, and by the manufacturing of candles undertaken at Ensambles Mexicanos (CIES, 2000b). Similarly, basic petrochemical products expanded 33% over the five-year span.

Table 6.18: Economic Changes in the Chemical Sub-sector (NAFTA)

	Gross Value*		Value Added*		Employment		Investment*		Number of Firms	
Chemicals	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Total manuf. in Chih.	11937	23274	6173	11752	222559	381163	588	1216	7204	8800
Total in chemicals	480	677	194	204	6462	11033	41	52	97	135
Petroch.	55	76	-12	-24	286	741	1.3	0.492	1	2
Basic substances	170	152	85	40	533	574	3	10	15	14
Artificial fibres	—	1.4	—	0.9	—	29	—	0.007	—	—
Pharmac.	10	2.4	3	0.8	77	40	-0.011	0.131	—	4
Other substances	27	41	13	8	184	352	0.469	1.7	18	35
Oil refining	—	NA	—	-22	—	234	—	8	—	3
Coke industry	19	17	6	3	145	52	—	1.3	—	NA
Rubber industry	51	62	31	36	1088	1279	17	0.3	14	17
Plastic products	148	327	68	160	4149	7732	20	31	41	60

Source: Personal calculations based on INEGI (1994a and 2003)
*/ Figures in millions of constant pesos (1993=100).

Although employment shares of the national production in the plastic industry remained small, they expanded; similarly, the industry's employment participation in the chemical sub-sector of the state also grew. In 1993 more than 64 per cent of the state's chemical employment was in the plastic industry, five years later that share had reached nearly 68 per cent. Employment in the industry had almost doubled; over 3,600 jobs were created in the five-year interval. Such expansion of employment determined a reduction of labour productivity figures. The number of firms in the industry also increased from 41 in 1993 to 60 in 1998. Nearly 200 of the over 7,732 workers in the industry were employed by the Advance Dial Company, which started operations in plastic injection in 1996 (DESEC, 2000). Similarly, in 1994 and 1995 Key Plastics Inc. installed two plants employing 600 people, and two years later the Portuguese firm, Iberomoldes arrived in Chihuahua. The firm from Florida, Security Plastics Inc., recruited 320 people, while the Mexican company Tecnología Plástico Mecánica started operations in 1997. The reason for the industry's expansion resides in the fact that most of these plants have been locating in the state to provide the automotive industry with high-quality and reliable inputs. The lack of integration into the state economy shown by the automotive industry was during ISI and GATT exclusive to inputs provided by firms in its own branch and some electric inputs. However, during NAFTA de-integration was being further promoted in other branches by the establishment of firms that could provide plastic inputs to the automotive industry, influencing growth in the chemical sub-sector. Despite the dynamism revealed by the industry its development has meant the inhibition of local suppliers.

Table 6.19: Productivity and Wages in Chemicals (NAFTA)

	Labour Productivity*		Capital Productivity*		Wages*	
Chemicals	**1993**	**1998**	**1993**	**1998**	**1993**	**1998**
Petrochemical	0.1877	0.1286	1.2703	1.7172	1.0127	2.1327
Basic substances	0.8266	0.5214	3.4091	1.0648	0.8287	0.9687
Artificial fibres	---	0.1161	---	2.2011	NA	NA
Pharmac.	0.4326	0.1419	-28.4275	0.7207	0.5449	8.1566
Other substances	0.5441	0.3498	1.4032	0.7027	0.3990	2.9622
Oil refining	---	NA	---	NA	---	5.4606
Coke industry	0.3869	0.8019	NA	0.3863	0.4760	NA
Rubber industry	0.3240	0.3234	0.0797	19.5466	0.6715	0.3902
Plastic products	0.3555	0.3479	0.5067	0.6687	0.6232	0.3041

Source: Personal calculations based on INEGI (1994a and 2003).
*/ Values are relative to the national value.

Table 6.20: Economic Changes in Machinery (NAFTA)

	Gross Value*		Value Added*		Employment		Investment*		Number of Firms	
Machinery	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Total manuf. in Chihuahua	11937	23274	6173	11752	222559	381163	588	1216	7204	8800
Total in machinery	4858	10443	3292	6702	141605	241272	373	461.7	1620	2059
Moulding industry	37	60	16	34	648	1678	1	1	53	70
Metallic structures	253	362	107	130	3242	6638	10	3.405	915	1140
Metallic furnitures	54	96	36	58	1317	2307	10	8.127	41	83
Other metal. prod.	147	373	99	170	2810	5625	7	12.14	144	173
Non-electric machinery (spec. use)	26	172	15	56	399	1252	1	24.27	19	41
Non-electric machinery	160	180	97	113	3683	6705	7	0.536	140	205
Office mach.& inf. sys. tech.	112	271	59	216	1689	7192	2	3	---	6
Electric devices	2363	4145	1698	2925	74598	126390	53	112.6	150	172
Electronic devices	1034	2262	741	1729	34911	51619	29	257.1	66	81
Domestic-use devices	179	331	134	196	6762	8471	10	5.521	21	18
Automotive industry	337	1749	172	746	6436	11868	239	12.87	25	37
Other transport material	37	19	25	10	1048	614	1	6.441	—	3
Precision instr. & eq.	121	423	93	319	4062	10913	0	13.9	36	30

Source: Personal calculations based on INEGI (1994a and 2003)
*/ Figures in millions of constant pesos (1993=100).

In the machinery sub-sector, growth was experienced in every branch, which led to the sub-sector's expansion as a proportion of manufacturing's employment. Whereas in 1993 machinery represented 63.6 per cent of manufacturing employment in Chihuahua, by 1998 that share had risen to 67.2 per cent. Modest –with respect to the impressive growth in other branches- increases in gross production were observed in electric devices, other metal products and metallic furniture, some of which had also advanced modestly during GATT. Greater growth rates can be found in domestic devices, non-electric machinery for specific uses, other transport material and moulding. The most dynamic branches during the five-year span were metallic structures, the automotive industry, electronics, non-electric machinery, precision instruments and office machines. It is important to mention that although all branches' gross production grew, the sub-sector was heavily influenced by the dynamism of the automotive, electronics and electric-devices industries, which accounted for approximately 80% of machinery's gross production, value added, investment and employment and only 14% of all firms in the sub-sector (Table 6.20).

In electric devices, firms such as Avio Exito (1,500 workers), as well as trans-nationals such as Coilcraft Company (900 workers), Xomox/Emerson Electric (830 workers in two plants), Via Systems (1,147 workers) and Lear Corporation (7,969 workers in seven plants) accounted for a substantial employment growth rate (DESEC, 2000). The automotive industry, on the other hand was stimulated by the arrival of 14 new firms during the NAFTA interval. Although the fourth and fifth plants of the Japanese firm Sumitomo Wire System Company were not established until 1999 and 2000 (recruiting nearly 700 workers), its plants installed between 1994 and 1998 employed over 1,200 workers (DESEC, 2000). Another Japanese company, the Yazaki Corporation installed its second and third plants in 1995 and 1997 with personnel of almost 2,500 people producing wire harnesses (DESEC, 2000). Champion Products Inc. employed 1,550 people, while Wire Craft Inc. employed 2,000 workers (DESEC, 2000). Seaton Company arrived in Chihuahua in 1998 hiring 857 people for the production of leather upholstery, while Seldahl Inc. employed nearly 200 workers to produce automotive flexible circuits (DESEC, 2000). Finally, the TRW Company began producing steering wheels for automobiles in 1998, employing 1,250 workers (DESEC, 2000). It is also important that with the notable exception of electronics, growth was supported by improvements in capital productivity and that relative wages declined in almost all branches (Table 6.21).

Growth in the 'office machines and information-system technologies' branch, represent a different type of assembly production that was until recently undeveloped in Chihuahua. While in 1993 the activity represented just over one per cent of employment in machinery, its share grew to nearly three per cent in just five years. The branch is dominated by six firms employing over 7,000 people. Datamark Inc. has installed two plants dedicated to information-system technologies, while Autozone Inc. installed Datazone in 2000. Similarly, CMS Mexicana and Avery de Mexico based in Ciudad Juárez have been producing laser-printer cartridges and labels, respectively (CIES, 2000b). The type of activities carried out by these companies are considerably different from those of traditional assembly and labour-intensive maquiladoras. For instance, Datamark Inc. specialises in remote remittance processing, data capture, document scanning and microfilming services; it currently scans over 250,000 items per day, keying in over 1,000,000 airplane tickets, credit card applications, medical claim forms and other customised applications (Datamark, 2000). The labour requirements for these kinds of activities imply more highly skilled workers than traditional assembly work. In that sense, it is possible that the 'third-generation maquiladora' argument presented by Carrillo and Hualde (1998) with regard to the automotive industry's demand for highly skilled labour and involvement in research and development with parent companies across the border could also be applied to technology-based activities such as information-system technologies.

Table 6.21: Productivity and Wages in Machinery (NAFTA)

	Labour Productivity		Capital Productivity		Wages	
Machinery	1993	1998	1993	1998	1993	1998
Moulding industry	0.7806	0.4645	1.7687	3.5372	0.8172	0.7031
Metallic structures	1.1462	0.9437	0.8510	4.5827	0.9496	0.5601
Metallic furnitures	0.5439	0.6516	0.1806	0.3227	1.1032	0.7501
Other metal. prod.	0.3423	0.3856	0.9443	1.4983	0.6344	0.7208
Non-electric machinery (spec. use)	0.6211	0.8650	0.9485	0.2423	0.8334	0.7952
Non-electric machinery	0.4105	0.2422	0.6782	12.8711	0.8069	0.4846
Office mach.& inf. sys. tech.	0.2924	0.0938	0.8339	3.3084	0.9281	0.2364
Electric devices	0.40402	0.4146	1.26412	1.50153	0.7854	0.2346
Electronic devices	0.39084	0.6884	0.87313	0.47502	0.8728	0.4181
Domestic-use devices	0.1775	0.2568	1.02929	2.78874	0.6655	0.255
Automotive industry	0.12652	0.2769	0.03924	4.90229	0.7245	0.3712
Other transport material	0.35918	0.3209	2.97529	0.13138	0.7907	0.3679
Precision instr. & eq.	0.48943	0.4252	0.79947	1.86027	0.9537	0.1434

Source: Personal calculations based on INEGI (1994a and 2003).
*/ Values are relative to the national value.

Fostered by the state government's cluster considerations (Ruiz Durán, 2000), the textile sub-sector grew at an annual average rate of 7.4 per cent, in turn driven mainly by soft-fibre textiles, as well as both, confection of garments and non-garments. In contrast, a decline in gross production and other indicators reported in Table 6.23, can be observed in hard fibres, and the weaving and shoe industries. Growth was then a combination of large amounts of investment accrued by new textile plants arriving in Chihuahua and a reduction and even disappearance of industries with a low presence in the sub-sector. Such a ten-fold increase in investment did not have an effect on capital productivity levels relative to those exhibited by the sub-sector elsewhere in the country. In fact, both measures of productivity were severely reduced during the NAFTA period. It was however, those industries, namely weaving and shoes, in which wages were above the national average that the decline in gross production and value added was experienced.

Table 6.22: Economic Changes in the Textiles Sub-sector (NAFTA)

	Gross Value		Value Added		Employment		Investment		Number of Firms	
Machinery	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Total manuf. in Chihuahua	11937	23274	6173	11752	222559	381163	588	1216	7204	8800
Total in textiles	778	1598	563.6	1054	25973	46295	15.7	157	522	573
Hard fibres	1	---	0.4	---	15	---	0.2	---	---	---
Soft fibres	11	281	4.0	115	281	1604	0.1	56	---	18
Non-clothing confection	578	858.8	135.8	618	19321	24308	12.6	70	50	40
Weaving industry	2	1	0.8	1	65	53	0.0	0.1	15	9
Garment confection	127	357	46.8	266	4852	17236	2.1	30	342	372
Leather industry	15	79.4	10.5	46	444	2458	0.2	1.5	33	48
Shoe industry	44	20.4	21.6	9	995	636	0.4	0.3	67	86

Source: Personal calculations based on INEGI (1994a and 2003)
*/ Figures in millions of constant pesos (1993=100).

Although firms such as Bomar de Mexico produced and exported thread or Amamex produced synthetic thread on a maquiladora basis, textile plants were increasingly focusing on producing inputs chiefly for the automotive industry i.e. TRW, which produced airbags for several car companies, and moving away from more traditional textile production. Despite the government's intervention to spur growth in the sub-sector, the labour-intensive nature of textile production was proving to be more competitive localised farther South in states like Yucatán or even Oaxaca (see Chapter Seven). In recent years firms that constituted a pillar of the textile sub-sector in Chihuahua such as Denimtex (producing denim) or Champion (producing sportswear) have terminated their operations in the state (DESEC, 2000).[105] These events are in line with an argument presented earlier regarding the specialisation in capital-intensive activities that Chihuahua has undergone.

Table 6.23: Productivity and Wages in Textiles (NAFTA)

	Labour Productivity*		Capital Productivity*		Wages*	
Textiles	**1993**	**1998**	**1993**	**1998**	**1993**	**1998**
Hard fibres	35.7908	---	2.8182	---	1.0735	---
Soft fibres	19.9892	0.4022	185.3671	0.0813	0.6858	0.3037
Non-clothing confection	0.0249	0.0000	0.0774	0.0000	1.1235	0.0279
Weaving industry	18.0124	7.9622	806.5373	15.9033	0.5033	4.2843
Garment confection	1.1038	0.0024	2.3994	0.0018	1.0774	0.3878
Leather industry	1.3265	0.0014	5.0891	0.0039	1.2692	0.2216
Shoe industry	0.0001	0.0010	0.0005	0.0025	0.9547	1.8994

Source: Personal calculations based on INEGI (1994a and 2003).
*/ Values are relative to the national value.

[105] Although firms such as Greenwood Mills, Preston Globe, Chapiro, Contract Apparel, Advison Telafar, Coinsa, Aldama Manufacturas, BBM, Diprokim, Confecciones y Maquilas del Norte, Ensambles Santa Bárbara, Blue Cast Denim, Action West, Sierra Western International, RHG and Carnero operated in Chihuahua during NAFTA, some of them such as Sierra International have expressed their lack of competitiveness and have explored the possibility of migrating farther South (DESEC, 2000).

Growth Determinants

Overall, Chihuahua's relatively high-growth rate during the period was related to maquiladora production and export. Not only has basic education been relevant, but technical skills have also become increasingly important. The series of interactions between firms across the border played an important role in determining maquiladora location. Although the sector's activity is quickly spreading to non-border states, Chihuahua benefited particularly from the concentration of its employment; ultimately, proximity to the larger market of the USA played an important role. However, as argued below, other non-traditional factors are coming to the fore.

According to data contained in SECOFI (2000), state exports during this period, grew 37.83 per cent in real terms, which represents an average annual growth of more than 7.5 per cent. That performance was supported by the maquiladora sector, which exported around 87 per cent of the state's total in 1999 (BANCOMEXT, 2000). With more than one quarter of the industry's employment concentrated in Chihuahua, the state has been by far the largest agglomeration of maquiladora workers in the country.[106] However, while national maquiladora employment grew by 91.5 per cent, that is almost 19 per cent per year (INEGI, 2000), in Chihuahua, the above-mentioned maquiladora stagnation entailed a considerably lower growth (12 per cent annually). If the 1996-98 spell is considered, that rate rises to 16 per cent; nevertheless, the rate for the post-crisis period was still lower than the national. Indeed, value-added growth during 1999 was lower in Chihuahua than in the national average.[107] The 21.5 per cent value-added growth in the state was challenged by most border-states except Sonora, and was easily

[106] Chihuahua's maquiladoras in 1998 agglomerated more than one quarter of a million jobs.
[107] The INEGI (1999b) report considers only value added data, whereas INEGI (2000) exhibits employment and gross-production values, which makes them impossible to compare.

exceeded by some non-border states such as Aguascalientes, Edo. de México and Yucatán (INEGI, 1999b). Yet, it is important to consider that such states attained higher growth rates precisely because they started from much lower levels of maquiladora employment. Nevertheless, these non-border states have been recently attracting more labour-intensive industries such as textile maquiladoras (SECOFI, 1997). Although textiles have also been growing in Chihuahua, the state has been specialising in more capital-intensive branches, such as the automotive industry (SECOFI, 1998).

According to data presented in INEGI (1997b), population increases in Chihuahua were supported by an inward migration rate of almost eight per cent, which is higher than that of the GATT period. If the pooled-labour market is supported by migration, and in that way the former propels growth, migration rates experienced in Chihuahua must be influencing growth rates to certain extent.

In addition, human capital accumulation, measured as the increase in formal schooling years, increased in Chihuahua by nearly 11 per cent. That is, on average, the population of Chihuahua now reaches the eighth grade.[108] Although there are no statistical references in Mexico to measure the degree to which industry requires skilled labour, it is possible to make some comparisons. In 1990, according to INEGI (1992), the number of technicians graduating from education centres as a proportion of the over-16 population was 2.49 per cent, a ratio higher than the national value. The sum of graduates from technical careers and those of preparatory schools as a proportion of the over-16 population was also higher than the national average (INEGI, 1992). Using more recent statistics, according to CIES (2000b), between 1999 and 2000, 21,395 students were enrolled in the skill-development education and training programmes carried out in the state, which is equivalent to more than 15 per cent of the state's secondary-school enrolment and more than 30 per cent of preparatory education figures for the same interval. In fact, these students can be assumed to be oriented towards the productive system, representing around half of the professional-education population (CIES, 2000c). Similarly, in 1999, students in training programmes increased by around five per cent with respect to 1998 (Poder Ejecutivo Estatal, 1999). There are however, no available data that would allow further inferences to be drawn in relation to other states. Education seems to have a positive influence over growth.

It is important to note that the productive sector-education system interrelation has been perceived by the current state government (1998-2004) as fundamental and the basis upon which to determine technical-education needs and develop adequate programmes (Gobierno del Estado de Chihuahua, 1999). In fact, Chihuahua has become a national leader in the attraction of design and engineering centres (i.e. Delphi, Visteon, Thomson, Philips, Scientific Atlanta, among others) due to the fact that it is the only state in the country with 10 technological universities supplying over one thousand engineers per year in various fields (SDI, 2002).[109] Moreover, such attraction has been possible thanks to the flexibility of the university's curricula that is adaptable to industry's needs and to the interaction of the public, private and academic sectors that makes available such support to new plants coming to the region (SDI, 2002). Similarly, R&D might start to play a more active role in the future. In fact, during the 1990s, nine R&D centres have been established in the state, mainly in the automotive, electronic, food, mining and furniture industries.

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[108] Although, education levels increased to a greater degree during GATT than in NAFTA, annual increments have been identical (2.2 per cent per year).
[109] Eight of these institutions are public, and one of them is considered the best in the nation.

A New Type of Maquiladora and a New Style of Government

Although traditionally labour-intensive industries such as textiles are still present in the state, Chihuahua is specialising in more capital-intensive activities such as the automotive industry, electronics and plastic injection. Moreover, capital has accrued in textile industries and wages have increased in the activity relative to other regions, which may indicate that the state could be specialising in the more capital-intensive parts of the textile-manufacturing process. At the same time, the more traditionally labour-intensive parts of the processes could be moving to the South. In fact, as has been argued above, maquiladora activity has grown in southern states, but the type of maquiladora setting up in those regions is related to labour-intensive processes, limited automatisation, low levels of technology and unskilled labour. Although that description fits around 80 per cent of maquiladoras still present in border-states (Carrillo and Hualde, 1998), and which can also be called first-generation maquiladoras, the skilled-labour based, flexible-production oriented and technologically advanced second-generation maquiladoras are gradually locating in Chihuahua. Moreover, the third generation of maquiladoras based on design and R&D has started to emerge in the region. Second-generation maquiladora features are present in the 'office machines and information-system technologies' branch, which uses highly skilled labour, advanced technologies and quick response to change in demand.[110] Features related to the third generation maquiladoras are present in the automotive and electronics industries, particularly in Delphi –but also, more recently in Visteon and Thomson amongst others-. In fact, Delphi has not only been developing prototypes and new models which are followed and produced by other Delphi plants, but has recently been serving as a training centre (Carrillo and Hualde, 1998). Under these circumstances, the quality of production, creativity and the size of the skilled labour pool are the new elements combining with traditional factors to draw investment into the state.

The role played by the government since 1992 has also fostered specialisation in auto-parts and electronics. Moreover, the fact that the government aimed not only to develop clusters in these two industries which dominate manufacturing in the state, but also in textiles, helps to explain the conviviality between capital and labour-intensive industries. Indeed, the 1992-98 state administration had the objective of promoting the generation of clusters in precisely these three industries (Ruiz Durán, 2000). Thus, the labour pool feeds both industries through the agglomeration of a diversity of skilled and unskilled labour. The 1998-2004 administration through the provision of education, training programmes and the promotion of innovation and technological progress at regional R&D centres, has also contributed to conforming a knowledge-based economy. Finally, in light of the still unsatisfactory degree of integration of the maquiladora industry, both public and private efforts have been deployed. One such effort includes the establishment of one of the few regional suppliers-development centres in the country, which prepare, promote and nurture potential high-quality and reliable suppliers for the industry.

Summary (NAFTA): Economic integration is further transforming the local economy; however, it is not the only factor. Public-private co-operation, as well as state and municipal level collaboration are influencing the size and type of industry that Chihuahua attracts. Indeed, the shift in trade policies combined with political changes have opened the door for regional and local governments to play an active role in the local economy. Despite a slight recovery in agriculture, primary activities, which are not

[110] Third-generation maquiladora characteristics may be also involved in their processes. However, the scope of

the state government's objective, contracted during this period. In contrast, the chemical industries, machinery and textiles continue to support the dynamism of manufacturing. Again, maquiladora reception is at the heart of the explanation. Furthermore, a new generation of maquiladoras seem to be localising along the border, one increasingly linked to design, research and development. In addition, the spreading out of maquiladora to the South seems to be conditioned by skills and the production processes. More capital-intensive processes requiring a more highly skilled labour force seem to be localising in border-states such as Chihuahua, whereas the labour-intensive parts with few skills requirements have been installing in the South.

6. Conclusions

Undoubtedly, Chihuahua has profited from the new trade approach. Not only was further industrialisation carried out, but also a new more knowledge-based economy seems to have emerged. Primary production has progressively given way to secondary activities. The decline of mining was externally induced (through world prices) and particularly dramatic during ISI. Although agricultural activities were the main economic drive with ISI, trade liberalisation and a long drought conditioned the decline of the sector, which has slightly recovered with NAFTA. In contrast, manufacturing has prospered in the region. Although the sector was already important during ISI, large firms such as Cemex and Vitro at that time influenced production in the mineral sub-sector. At the same time, agricultural production and State intervention in domestic prices impelled foodstuffs. Nevertheless, the maquiladora programme fostered machinery production mainly related to the automotive industry, non-electric machinery and electric devices.

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this thesis does not allow me to investigate in detail processes at particular plants.

Trade liberalisation had profound effects on the state economy not only at the sectoral level, but also within manufacturing. Foodstuffs and minerals were no longer supporting growth; instead metallic production[111] and textiles were triggering growth. During GATT, machinery was still influenced by the automotive industry, but also by other activities such as electronic devices and precision instruments. It is during this period, that flexible-specialisation production emerged in some branches as one of the characteristics of the second-generation maquiladoras. That new type of manufacturing started to employ a more skilled labour force, introduced more advanced technology and automatisation. However, the lack of linkages between maquiladoras and local suppliers was aggravated.

Despite the slight recovery of agricultural activities in the NAFTA interval, they have recaptured growth thanks to a handful of products, while the rest of the sector has actually contracted. Similarly, by 1998, the mining sector was almost irrelevant. In contrast, machinery dominated the economy influenced by maquiladora production. Although chemical industries and textiles continue to flourish, the dominating sub-sector is still machinery, in part due to minor but steady improvements in the moulding industry, structured metals and metallic furniture. Electric devices continue to lead the sub-sector, representing around one half of machinery's employment and having experienced re-investments in already established firms and the arrival of new ones.

Perhaps the most interesting development in the machinery sub-sector is the fact that skilled-labour employment has been increasingly required by the office machines and

[111] Despite the closure of Aceros de Chihuahua, which represented the period's struggle to reduce the size and intervention of the State in the economy.

information systems technology branch. This activity has not only expanded in the state in terms of employment, but could also signal the emergence of a third generation of maquiladora, one that is increasingly involved in design and R&D. Evidence of the emergence of that type of industry is clearer in the automotive industry and more recently in electronics. Innovation and design of auto-parts and electronic devices are taking place in Juárez with Delphi, Thomson, Philips and Scientific Atlanta amongst others and in Chihuahua City with Visteon. Although these industries themselves have a significant share of manufacturing employment, they are influencing firm formation and production not only in its own branch, but also in electrics and even in plastic injection (a branch of a different sub-sector). Nevertheless, the provision of inputs to the automotive and electronics industries by these other industries has been in detriment to the formation of local suppliers.

In terms of governmental action, policies have passed from limited in ISI to non-existent with GATT, but have re-emerged by the new role played by state and municipal governments during NAFTA. Indeed, co-operation between different levels of local governments has produced actions that have led to the strengthening of the economy. Political change has been supported by public-private co-operation that has entailed the described changes in the economy. Thus, not only have the maquiladora programme, exports, education and further migration spurred growth in the region, but political transformations have also deepened the effects of economic integration. The last two administrations (1992-98 and 1998-2004) have not only aimed to attract FDI, but also to support R&D activities in the region, complementing the mounting supply of relatively high-skilled labour. These changes have favoured growth in the region and, as mentioned in the previous two chapters have been generally adverse in southern states.

Therefore, the next chapter explores the local transformations occurring in Oaxaca as a result of changes in the approaches to trade.

Chapter Seven
Exacerbating the North-South Divide: Oaxaca after Trade and Integration

1. Introduction

Although trade has been found to be related to increased levels of territorial inequalities, such imbalances are nothing new. As argued in Chapter Three, during ISI industrial production was already concentrated in the country's three largest metropolitan areas (Mexico City, Monterrey and Guadalajara). By the end of that period, border-states had joined the richer metropolitan-based states. The relevance of border regions has been evinced by trade liberalisation, and particularly so after NAFTA. In contrast, northern non-border regions and southern states have been lagging behind. That is, as shown in Chapter Four, the convergence observed in the Mexican economy at the end of ISI was reversed by the process of divergence brought about by the opening up of the economy. GATT, but particularly NAFTA have favoured the action of centripetal forces. Economic concentration has been the product of the existence of imperfect markets and the fact that increasing returns and transportation costs act in order to foster production close to the markets, other firms and potential workers. Indeed, as put forward by Krugman and Livas Elizondo (1996), trade has induced a shift in the relevant market favouring border regions. In light of the possible economic restructuring experienced in Mexico City, which experienced a growth rate of less than one per cent for the whole NAFTA period, what role is there left to be played by southern states? What have been the effects of increased trade and progressive integration further South? In order to address these questions, the present chapter explores the transformations entailed by trade in regional economic structure and growth patterns taking place in the South.

As explored in Chapter Five, regional convergence during ISI was the product of higher growth rates particularly in southern states. The oil industry and its exports (as well as exports of other natural resources) drove growth. After trade liberalisation and particularly since NAFTA, regional divergence has been fuelled by manufacturing exports in which maquiladora activities are increasingly important, as well as proximity to the US market and a qualified labour force. Southern states, thus, have been losing out in this newly opened economy. Yet all is not lost. Maquiladora activities and more precisely, its more labour-intensive processes have been locating in southern states. In addition, regional and local governments are ever more able to design and implement their own development policies. However, territorial competition and the location of processes based on technical pooled-labour markets could worsen the North-South divide.

The case chosen to explore the above issues was Oaxaca. The reason for its selection was exposed in the previous chapter. As can be observed in Table 6.2, Oaxaca experienced the highest growth rates (excluding oil-producing states) during ISI. However, trade liberalisation brought about considerable economic contraction in the region, which impinged its decline. During NAFTA, some signs of future recovery can be identified. Both maquiladora activities and the emergence of regional governments are becoming increasingly important. The region thus, is an ideal case to explore transformations entailed by trade in the South.

The chapter is organised in the same way as Chapter Six and according to the periods used throughout the thesis. The following section gives a brief account of the state's economic structure. The subsequent sections explore the economic structure of the state and address the changes experienced in the local economy as a result of free trade and the role played by central and local governments. In addition, the factors that might explain growth patterns are considered. Particular emphasis is placed on sectoral and branch-level growth trends in order to establish the type of activities fostered by trade and those less favoured by the newly opened economy. It is important, nevertheless, to first explore some contextual factors through briefly outlining Oaxaca's economic history.

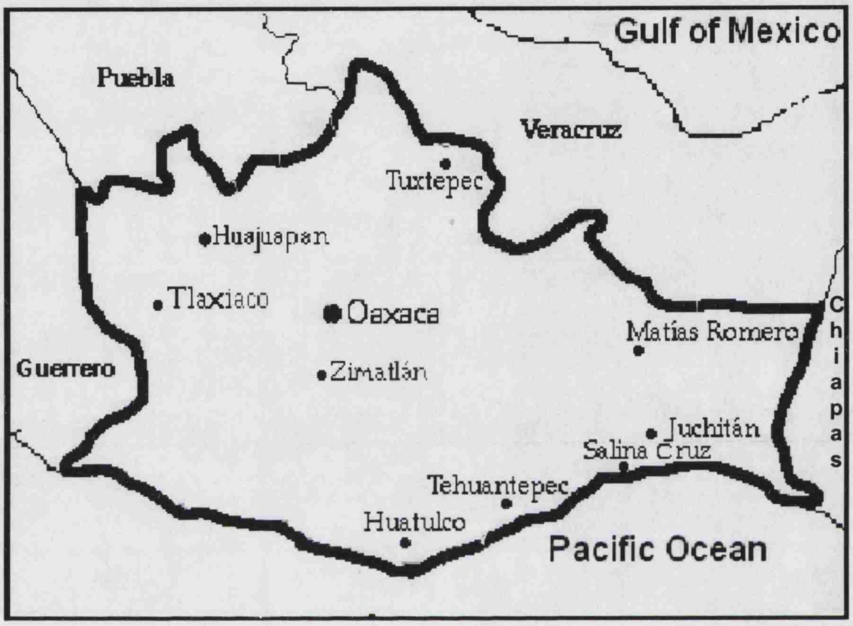
2. A Brief Economic History of Oaxaca

Underpinned by proximity, the influence of the centre has been felt in Oaxaca since the Aztec Empire, during the Spanish colony and throughout independent Mexico. At the same time, the region is isolated by mountains.[112] Moreover, poor links have been developed amongst the state's main regions.[113] During Spanish domination, the region stretched from the Gulf of Mexico to the Pacific Ocean (García de Miranda and Falcón de Gyves, 1974). The central valley (Oaxaca City) has been the hub of the region for over two millennia (Taylor, 1972; Murphy and Stepick, 1991). Spaniards were

[112] The Western Mountain Range that runs through Chihuahua continues through western Mexico until it meets the Southern Mountain Range precisely in the Oaxacan area of the High Mixteca.
[113] Usually regarded as the central valleys, the Mixteca, the Isthmus and the coast. However, the state can be divided in a different way. One such division is based on cultural traits by which seven regions are recognised.

attracted[114] by the agricultural potential of the central valley and the introduction of the *encomiendas.*[115]

Figure 7.1: Most Important Settlements in Oaxaca



Based on Ortiz Wadgymar (1971) and Berry (1981)

After the capital, Oaxaca City was the second most important urban agglomeration in the country, partly due to its proximity to Huatulco, the most important port in the Pacific (Murphy and Stepick, 1991). Until the mid-nineteenth century, red dye produced in the region was,[116] after silver, the country's second most important export (Hamnett, 1971).[117] Thus, the central valley was heavily oriented towards the cultivation of the cactus needed to obtain the dye. However, the activity had to compete for space with sugar mills (such as San Javier and Candiani). Wheat, hides and cotton cloths were

[114] Hernán Cortés himself was interested in dominating Oaxaca to control the route to Guatemala and South America via Huatulco Port. Although the Spanish Crown granted him rights over, amongst other areas, most of Oaxaca (Barrett, 1970), in practice local settlers managed to seize power (Murphy and Stepick, 1991).
[115] A system that served a dual purpose. On the one hand, the *encomendero* (who was usually someone that excelled during the Conquest) was granted property and rights (of services and tribute from local Indians). On the other hand, they had the obligation to ensure the Indians' evangelisation (Lira and Muro, 1996).
[116] The dye was obtained from a chochineal insect that lives in a local cactus.

transported to central Mexico, Guatemala and South America (Murphy and Stepick, 1991), while manufacturing and mining prospered briefly. The relevance of Huatulco waned as it was challenged by Acapulco, a port in the neighbouring state of Guerrero and closer to Mexico City. In addition, Oaxaca was outstripped by Puebla, as this became the main connection between Veracruz[118] and Mexico City. The 1824 Constitution deprived Oaxaca of its Gulf coast, which was annexed to Veracruz.

The short distance to Mexico City was augmented by geography. Mountains hampered access to Puebla via Tehuacán[119] and Veracruz through the Isthmus. Communication with the state's eastern side was first addressed by attempting to build an inter-oceanic channel (Ortiz Wadgymar, 1971);[120] instead, a trans-Isthmus railway line was introduced (Coatsworth, 1981) linking Coatzacoalcos in Veracruz to Salina Cruz in Oaxaca. However, the opening of the Panama Channel (1915) and revolutionary attacks (1910s) precipitated the region's economic decline. Subsequently, oil exploitation and sulphuric extractions promoted trade and transportation through the Oaxaca Isthmus.[121] The western side was first connected to Tehuacán by a tramway and was later directly linked to Puebla and Mexico City by a railway line (Coatsworth, 1981). Hence the two areas appear to have grown in separate ways and been linked to different regions. The railway attracted mining[122] (Chassen, 1985) and agricultural enclaves (Murphy and Stepick, 1991), but these were affected by the Revolution. Agricultural enclaves were common

[117] Dye production was almost eliminated by competition from Guatemala, the effects of the Wars of Independence and the invention of chemical dyes (Hamnett, 1971).
[118] Veracruz was the only official port of the New Spain in the Gulf of Mexico, which allowed the Spanish Crown to control trade in the colony.
[119] The Mexico City-Puebla-Tehuacán route was by 1877, primarily crossed by wheeled vehicles, whereas the Tehuacán-Oaxaca City stretch was predominantly undertaken by mules (Coatsworth, 1981).
[120] The reason being that the Tehuantepec Isthmus was the narrowest part of the country, crossing Oaxaca from North to South on its eastern flank.
[121] Ortiz Wadgymar (1971) has argued that the Veracruzan side of the Isthmus profited the most, while the Oaxacan side was deprived of the benefits. Although the gains were likely to have been higher in Veracruz, since Oaxaca only participated in the transportation of the commodities, urban growth and industrial production in Tehuantepec, Salina Cruz, Juchitán, Laguna and Matías Romero signal that benefits were localised throughout the Isthmus.

for tropical crops such as tobacco and coffee (in the Mixteca); sugar-cane, oilcloth and citric fruits (in the Isthmus); and coffee, oilcloth and cotton (along the coast). Oaxaca exported corn, beans and beef to other Mexican regions (Murphy and Stepick, 1991). The few manufacturing activities in the state were localised in the central valleys, producing beer, shoes and cigarettes.

3. Oaxaca Under Protectionism

Regional Policies

During the early stage of ISI, most import restrictions were imposed on consumption goods. As a result, agricultural production, in which Oaxaca specialised, was encouraged. Regional policies were limited to supporting natural resources exploitation in river basins. The Papaloapan River Basin[123] Commission[124] was established in 1947, comprising parts of Oaxaca,[125] Puebla and Veracruz. The Oaxacan side of the basin specialised in sugar-cane, pineapples, tobacco and bananas (Barkin and King, 1970). The Commission carried out flood-control works, constructed two major roads, launched a credit programme fostering agricultural activities, built the Alemán Dam and set up the Alemán irrigation zones; nevertheless, most of this development was carried out on the Veracruzan side (Poleman, 1964; Barkin and King, 1970). In fact, by 1957, Oaxaca counted with just one per cent of the irrigated areas in the country (Zamora Millán, 1958). The few irrigation districts in Oaxaca, such as the *Distrito de Riego Número 19* were

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[122] Although mining exploitation cannot be compared to that realised in northern Mexico, its local effects in the South were by no means contemptible.
[123] An area of around 18,000 square miles.
[124] The River Commissions were regional development schemes aimed at developing particular river basins (see Chapter Three).
[125] In Oaxaca, this comprised mainly the Mixteca, stretching from Coixtlahuaca (east of Huajuapán) to the Jaltepec River in the Southern Mountain Range and from the Tuxtepec area to the central valleys.

localised in the Isthmus area (Piñón Jiménez, 1994). Following the election of President Ruiz Cortínez (1952-58), the policy towards the basin changed. Part of the main canal building for the dam was abandoned and money was lost in the agricultural credit operations. Administrative irregularities led to further reductions in the project's budget during the administration of President López Mateos (1958-64). Nevertheless, between 1947 and 1957, the harvested area doubled and sugar production increased nearly twofold, representing one third of the national value; again, the progress achieved was chiefly concentrated in Veracruz (Barkin and King, 1970).

In 1960, the Balsas River Commission absorbed the old Tepalcatepec Commission (Barkin and King, 1970); the former being aimed at developing an area that covered parts of different states including Oaxaca (SPP, 1985a). Initially, the Commission's most active area was that already covered by the Tepalcatepec (Barkin and King, 1970), having little or no impact in Oaxaca. The project subsequently focused on social investment in the Oaxacan highlands. In 1972, the Tehuantepec Isthmus Commission attempted to develop the area; again, the project achieved few results, while the river basin approach to regional development was gradually eliminated. Instead, Echeverría's regional policies (1970-76) were founded on establishing new development poles (Hiernaux, 1989).[126] Public investment and large projects were then, directed towards particular poles (Hiernaux, 1989). Fundamentally, regional policy was being substituted by further State interventionism (establishing and operating firms). If one considers that in 1975 public investment was 18 times that of 1940 (Bravo Ahuja, 1982), its regional impact must have been significant.

Regarding manufacturing, one of the few policies was the Industrial Cities and Estates Programme,[127] having almost no impact in Oaxaca. Manufacturing was barely attracted to the region as support for small and medium-sized firms through FOGAIN, was heavily concentrated in Mexico City (Aguilar, 1999). Moreover, the region failed to lure manufacturing into the region despite López Portillo's decentralisation decrees considered the region a high-priority area for industrial location (Palacios, 1989).

In the 1970s, the government aimed at achieving self-sufficiency in food production, paying particular attention to the Tehuantepec Isthmus; the region was considered the potential 'barn' of the country (Piñón Jiménez, 1994). However, this had little impact on the state's economy. The Irrigation District Number 19, for instance, suffered from technical inefficiencies and deterioration of the irrigation channels, bureaucratic attitudes in the government and a lack of water supply to the dam by the feeding rivers; in fact, the district never operated beyond 50 per cent of its capacity (Piñón Jiménez, 1994). The government planned the development of Salina Cruz as a Pacific Ocean link to the oil wealth in the Gulf and south-east (Segura and Sorroza Polo, 1994). However, as the oil strategy failed in the early 1980s, the region's economic dynamism declined once again (Segura and Sorroza Polo, 1994). More recently, a 10,000-hectare project to develop the much-isolated Oaxacan coast was undertaken in the 1980s (SPP, 1985b), transforming it into a tourist area. However, since President Miguel de la Madrid's administration, no specific regional policy has been applied.

[126] Based on Perroux's theory of poles of development.
[127] The problems that arose by attempting to influence private investment through public allocation of funds, as in the Industrial Cities and Estates Programme, are explored in Aguilar-Barajas (1989).

During the 1970s, Oaxaca's contribution to national GDP oscillated between 1.41 and 1.51 per cent (INEGI, 1985b). By the end of the ISI model, its importance had risen to 1.77 per cent of the national figure (INEGI, 2000), placing it nineteenth amongst Mexican states. The state grew at an annual average rate of 4.6 per cent during the 1970s. As displayed in Table 6.2, between 1980 and 1985, GDP per capita grew by 13.73 per cent, that is, at an average annual rate of 2.75 per cent, the highest amongst the states in the Table (excluding oil-producing states). In fact, if growth rates for 1970-85 are taken into account, annual rates go up to nearly 4% over the fifteen-year period. What is more, while Oaxaca achieved a two-digit growth rate between 1980 and 1985, the national average reached negative growth rates of over six per cent (Presidencia de la República, 1999). Growth levels in Oaxaca contrast with the economic contraction found in the case of Chihuahua. The trend signals the process of convergence found in Chapters Four (through σ and β-convergence analyses) and Five (with regression analyses) for the last part of ISI. In this chapter, the trend is confirmed: Oaxaca, with the country's second lowest GDP per capita (only 6,814 pesos), achieved the second largest growth rate (excluding oil-producing states).

What factors were behind that trend that can be identified from the previous chapter's regressions? Oaxaca's real exports grew during the 1981-84 interval by 362 per cent, mainly supported by the oil production of other states being exported through the port of Salina Cruz. Influenced by the decline of the oil industry in the early 1980s, oil refining in Oaxaca contracted. Yet the state exports were based on crude oil provided by producing states (typically Campeche and Tabasco) and shipped at Salina Cruz. However, such activities had few links with the local economy. Even though the state economy grew and exports were expanding, during the period Oaxaca experienced the second sharpest decrease in population through outward migration in the country; indeed, the state out-migration rate reached 13.18 per cent (as a proportion of total population).

The state's rate of growth in commercial banking deposits for the span was 3.22 per cent, whereas the country, on average, experienced a contraction of nearly 17 per cent (INEGI, 1987). Schooling years in the state grew at an above-average rate, increasing its education level by 26.5 per cent. In 1980, on average, the population of Oaxaca received 2.8 years of formal instruction, while five years later that index of schooling had risen to 3.65. However, education levels in Oaxaca remained the second lowest in the country. Real public investment plummeted by more than 93 per cent; the figure is not surprising if cuts to public funds allocated to the state through the aforementioned regional policies are borne in mind. According to data presented by Aguilar-Barajas (1989), during the 1983-85 spell Oaxaca's share of the national public investment was considerable only in tourism. Despite some of these variables supported growth in the state, other reasons for such a pattern, have to be sought in sectoral tendencies.

As can be observed in Table 7.1, agriculture's share of the state GDP was the highest amongst sectors in the state (besides commerce and services), accounting for more than one quarter of Oaxaca's GDP. In contrast, mining represented by far the least relevant sector. Although manufacturing's share improved in 1975 and 1980, it had declined once again by the end of the period. The economy prospered at the end of ISI, initially fuelled by agricultural and manufacturing activities and, to a lesser extent, by mining; later the improvement was provided only by agriculture. Commercial activities may have been spurred by agriculture and manufacturing at the beginning and exclusively by the former towards the end of the model.

Table 7.1: GDP Composition in Oaxaca at the End of ISI

	1970	1975	1980	1985
Agricultural	25.93%	29.28%	23.50%	25.11%
Mining	0.85%	1.05%	1.19%	0.61%
Manufacturing	12.29%	12.58%	15.56%	11.16%
Commerce	17.31%	17.97%	16.43%	29.65%
Services	35.00%	31.78%	31.45%	24.37%
Other Sectors	8.62%	7.34%	11.87%	9.10%
Total Oaxaca	100%	100%	100%	100%

Source: INEGI (2000a)

In accordance with the closed-economy development approach, the structure of the economy was shaped by State intervention in a number of ways. First, protectionism in consumption goods fostered the production of agricultural produce, which was the main sector in the local economy. Second, as argued below, guaranteed prices influenced the type and amount of crops cultivated in the region. Third, the State was involved in the distribution of some commodities such as tobacco. Fourth, the State also intervened in manufacturing, paper production and refining oil in Oaxaca. The State was the main drive of the economy and its direct and indirect intervention managed to offset the decline of public investment in Oaxaca in the absence of regional policies.

As argued in Chapter Three, the agricultural sector ceased to be the motor for the Mexican economy by the end of the 1960s. That change is evident in the case study presented in the previous chapter. However, the case of Oaxaca is in clear opposition to the national trend and the results presented in Annex 2. By the end of ISI, the agricultural sector of Oaxaca still supported regional growth. In fact, in terms of participation to the state's GDP, agricultural activities were the only expanding sector, achieving an annual average growth rate of 6.6 per cent. The most dynamic sub-sector supporting that agricultural performance was farming activities, growing at 7.7 per cent annually. In terms of their participation in the national figure, in 1980, the agricultural sector of Oaxaca represented nearly four per cent of the national total, whereas farming alone was 4.27 per cent of the total farming value. By 1985, participation had increased in both areas, while the whole sector provided around five per cent of the national agricultural production, farming accounted for 5.56 per cent (INEGI, 2000).

According to SARH (1988a), farming performance was chiefly supported by corn, which represented around 53 per cent of the state's sub-sector value. Artificial prices in corn guaranteed by the government, provided incentives for producers to switch to corn from other more efficient crops. Thus, corn was harvested everywhere in Oaxaca, but it was particularly important in the central valleys, the coast and the Isthmus (Gobierno del Estado de Oaxaca, 1982). Other grains such as beans grown in the central valleys, peanuts from the coast and wheat from the Mixteca, also contributed with around 13.4 per cent of farming production in the state (Gobierno del Estado de Oaxaca, 1982; SARH, 1988a). Fruit and vegetables accounted for around one quarter of farming production. The central valleys and Tuxtepec produced green chillies and pineapples, while melons, watermelons and tomatoes were cultivated in the Isthmus (Gobierno del Estado de Oaxaca, 1982; SARH, 1988a).

However, the government was failing in its attempt to transform Oaxaca into the 'barn' of the country. Except for peanuts, which represented 10.53 per cent of the country's peanut production, Oaxaca produced relatively small proportions of the above-mentioned grains. Corn represented 3.44 per cent of the national production, whereas beans and wheat registered 2.49 and 0.67 per cent, respectively. While the state contributed little to national production of grains, fruit and vegetables participated considerably in national production. Melons produced in Oaxaca accounted for nearly one quarter of the national harvesting. Pineapples constituted 17.01 per cent of the national figure, whereas watermelon production represented 13.02 per cent of the total. Nevertheless, tomatoes accounted for just 1.4 per cent of national production (SARH, 1988a).

Growth was also supported by cattle raising, growing at an annual average rate of 4.7 per cent (INEGI, 2000). Although participation ratios of the activity's national value were smaller than those of farming, they rose from 2.96 per cent to 3.44 per cent between 1980 and 1985. According to the Gobierno del Estado de Oaxaca (1982), the main livestock activities were bovine and goats, the former being particularly raised in the Isthmus and Tuxtepec, while the latter was concentrated in the Mixteca and the central valleys. More than one third of Oaxaca's livestock was bovine (36.24 per cent), whereas more than one quarter was composed by goats (28.89 per cent) and nearly one fifth (18.5 per cent) was porcine (Gobierno del Estado de Oaxaca, 1982). In addition, growth was also spurred by forestry, growing annually at an average rate of 3.7 per cent. According to SARH (1988b), forestry activities in Oaxaca accounted for 5.24 per cent of the national value.

The mining sector's contraction was total; almost all mineral activities in Oaxaca declined. In fact, with the exceptions of the carbon and 'other minerals' branches, all activities declined. Mining contracted at an annual average rate of 8.2 per cent. Whereas the real value of non-ferrous minerals extraction diminished annually by an average of 26.7 per cent, quarry exploitation decreased on average 5.7 per cent per annum. In contrast, the extraction of 'other minerals' expanded each year by 17.2 per cent, while carbon exploitation had begun on a minor scale by 1985. These increases and particularly that of the 'other minerals' branch were not sufficient to stop the considerable decline of the mining sector in Oaxaca.

Similarly, manufacturing activities in Oaxaca contracted on average by 1.3 per cent per annum. The textile and chemical industries were chiefly responsible for that decline. In fact, if manufacturing growth is calculated excluding the textiles and chemical sub-sectors, the sector increased its value by nearly 2.5 per cent per annum. A greater contraction was experienced in the wood sub-sector, which contracted annually at a rate of 14.2 per cent. However, the small size of the sub-sector meant that the effects on manufacturing were minor. Growth was spurred by expansions in machinery, foodstuffs and paper, increasing annually their value by 30.2, 7.3 and 4.8 per cent, respectively.

Growth Patterns in Manufacturing

The manufacturing sector in Oaxaca was rather small in size. By 1985, the sector represented just over 11 per cent of Oaxaca's GDP. Although the value of the sector contracted, the decline was less drastic than that of mining. Cushioning the economic decline in manufacturing was the outstanding growth in the machinery sub-sector, adding almost one third to its value each year. Surprisingly, that trend was supported chiefly by the automotive industry, which not only represented 72 per cent of the sub-sector's value in 1985, but also grew annually by an average of 74.3 per cent (INEGI, 2000). In terms of employment, production and value added, chassis assembly was the main product of the industry (INEGI, 1981 and 1986b). Related to chassis assembly, metallic structures production also expanded by nearly 27 per cent annually. Despite the positive performance of these branches, most of their production was carried out by a considerable number of firms employing few workers. Indeed, there were no large firms in the Oaxaca automotive industry. In addition, the value of the sub-sector as a proportion of national production was negligible. The reason for the lack of large multinational firms in the automotive industry was the hidden barriers preventing entry into the industry. Not only was entry hindered by economies of scale, but the cost of developing product differentiation also deterred new producers (Bannett, 1986). Furthermore, the already established firms had an advantage in gaining access to materials, capital and technology (Bennett, 1986). Public policy represented an additional obstacle. Local-content requirements, import permits and tariffs were other disincentives.

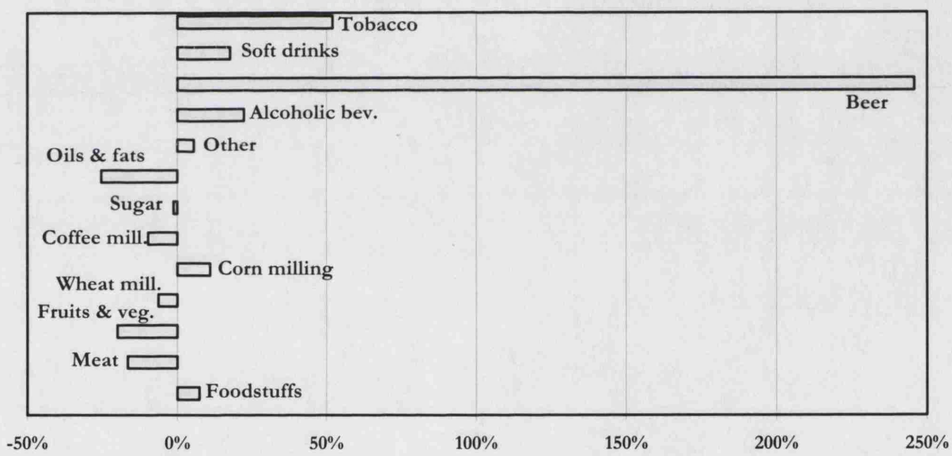
Table 7.2: Productivity, Wages and Firms In the Machinery Sub-sector (ISI)

	Labour Productivity		Capital Productivity		Wages		Number of Firms	
Machinery	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**
Smelting industry	0.3503	0.1200	0.1866	NA	0.5168	NA	5	4
Metallic structures	0.4569	0.3371	0.3246	0.3685	0.4171	0.2414	223	371
Metallic furnitures	---	0.1842	---	NA	---	0.1430	---	5
Other met. prod.	0.1217	0.1087	1.0930	0.4282	0.0764	0.0989	37	52
Non-elec. machinery (spec. use)	0.2028	0.1571	0.5189	NA	0.1036	NA	4	4
Non-elec. mach.	0.0000	0.2146	0.0000	0.8530	0.4621	0.2152	5	14
Office mach.& inf. sys. tech.	0.0163	---	0.0290	---	0.2081	---	5	---
Electric devices	0.0399	0.1269	NA	NA	0.2804	0.1749	6	6
Electronic devices	---	---	---	---	---	---	---	---
Domestic-use devices	---	0.0876	---	0.0496	---	NA	---	3
Automotive industry	0.0322	NA	0.0626	NA	0.4081	NA	6	NA
Other trans. mat.	NA	0.2903	1.7896	0.2063	NA	0.52537	6	5
Precision instr. & eq.	---	1.9973	---	8.3421	---	0.59256	---	5

Source: Personal calculations based on INEGI (1981 and 1986b)

The largest expansion in production of foodstuffs between 1980 and 1985 was registered in the beer industry. As can be observed in Figure 7.2, the activity grew at nearly 246 per cent a year, to become the second largest branch in foodstuffs after corn milling. The reason for such an outstanding performance lies in the installation of a brewing plant on the part of Cervecería Modelo, which has traditionally commanded a significant proportion of the Mexican market.[128] Construction of the plant started in 1980 and operations were initiated in 1984 in Tuxtepec (Grupo Modelo, 2000b).

Figure 7.2: Growth in Oaxaca's Foodstuffs (1980-85)



Source: INEGI (2000a)

The second fastest-expanding branch was that of tobacco processing, which grew on average at an annual rate of almost 52 per cent. The reason for such growth lies in State interventionism. The State-owned firm, Tabacos Mexicanos (TABAMEX) was founded in 1972 in order to intervene in the tobacco production market, which was controlled by large producers of cigarettes buying tobacco from small farmers. TABAMEX provided the latter with credit and technology packages to offset the formers' absolute dominance in tobacco production (Mackinlay, 1999). In return, the State firm received

[128] It now holds over 57% of the domestic and export market of Mexican beers (Grupo Modelo, 2000a).

the farmers' cured tobacco to be deveined at its plants, to be ultimately transferred to tobacco and export companies (Mackinlay, 1999). TABAMEX operated in Oaxaca's main tobacco-producing areas, Tuxtepec and Zimatlán, where brown tobacco was cultivated. Although TABAMEX's intervention led to increased production in Oaxaca, this type of tobacco was increasingly difficult to commercialise domestically and internationally (Mackinlay, 1999).

Alcoholic beverages also increased the value achieved by the foodstuffs sub-sector in 1985, growing by an average of 22.16 per cent per year. The preparation of mezcal,[129] however, was carried out on a small scale. As most international soft-drink brands were traditionally transported into the region rather than produced there, growth in the branch was stimulated by the production of local firms such as Envasadora El Rey, Refrescos de Oaxaca and Comercial y Distribuidora Gugar. As a result, in the five-year period, the activity annually increased its value by 17.58 per cent on average.

As described in the previous chapter, State intervention in the production of grains had a profound effect on corn-milling production in the state of Chihuahua. However, the intervention was far from limited to corn; besides controlling, as mentioned above, the production of tobacco, it influenced that of other grains such as wheat and beans. The mechanisms through which grain production was manipulated were guaranteed prices and import controls by CONASUPO (Compañía Nacional de Subsistencias Populares/National Subsidised Staple Products Company), and during the 1980s also by the SAM (Sistema Alimentario Mexicano/Mexican Food System). Such intervention not only shifted cultivation from more efficient crops to corn, but also stimulated corn

[129] An alcoholic beverage fermented from a local plant called agave or maguey. It has now captured the attention of foreign and domestic investors and represents one of the main exports of the state (BANCOMEXT, 2001). However, during the 1980-85 span, little support was given to the industry.

milling as in the case of Oaxaca, where around 85 per cent of arable land was employed in corn cultivation (Sanderson, 1986). Indeed, 90 per cent of milled corn was provided by domestic and international purchases made by CONASUPO and, to a lesser extent, by other intermediaries (Barkin and Suárez, 1985). As a result, the activity grew by an annual average of 10.92 per cent. It is important to mention that while the mechanism was intended as an income support for poor peasants, who in their vast majority produced corn, by the end of the period guaranteed prices were inferior to those observed on the international market and had deteriorated in real terms relative to 1970 (Sanderson, 1986).

In contrast, fabrication of oils and fats, preparation of fruit and vegetables, the meat industry, coffee milling, wheat milling and sugar refining contracted, inducing a more modest overall sub-sector growth rate than the suggested by the above-described expansions. It is particularly interesting to note that while some fruit and vegetables increased their value of production relative to 1980, especially those produced in Tuxtepec, the Isthmus and the above-mentioned District Number 19, their industrial preparation did not follow the trend. Similarly, while livestock expanded during the period, the meat industry decreased considerably. In contrast to enhanced rates of corn milling, wheat processing receiving the same sort of support was unable to match that performance. Although wheat farming increased during the period, cultivation was carried out on a rain-fed basis in areas such as the Mixteca and did not fully exploit the irrigated areas such as District Number 19 (Gobierno del Estado de Oaxaca, 1982). Wheat cultivation was heavily concentrated in three states in the northwest (Baja California, Sonora and Sinaloa) and Guanajuato, together producing around three quarters of the national value (Sanderson, 1986). Thus, guaranteed prices influenced wheat cultivation but on a more modest scale than in other states. This had a bearing on the amount of wheat that was processed in the area, as most of the production was controlled and distributed by CONASUPO.

Table 7.3: Productivity, Wages and Firms in the Paper Sub-sector (ISI)

	Labour Productivity		Capital Productivity		Wages		Number of Firms	
Paper	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**
Cellulose and paper	1.5795	NA	0.1285	NA	1.5720	NA	3	NA
Printing	0.2946	0.4774	0.4550	2.3982	0.4685	1.3315	44	66

Source: Personal calculations based on INEGI (1981 and 1986b)

The paper sub-sector grew annually by 4.8 per cent during the period. Again, the explanation for that performance lies in the direct intervention of the State in paper production. Fabrication of paper and cardboard supported such growth, expanding at 4.5 per cent, while printing activities increased their value by around 10.4 per cent per annum. Although expansion in the latter was greater, the former represented almost 95 per cent the sub-sector's total value. While the latter can be related to the publishing of local newspapers and magazines, the former was supported by paper production at Fábricas del Papel Tuxtepec, part of the state-owned corporation PIPSA, which had a near-monopoly participation in the domestic market (Lloyd, 1999). As can be observed in Table 7.3, the production of cellulose and paper registered above national-average levels in labour productivity and wages and low levels of relative capital productivity during 1980; however, no data was available for 1985, perhaps due to the limitation of the economic census office to reveal data on branches based on a single firm as it was the case by 1985. In Table 7.3, it is also evident that printing activities' growth was supported by advancements in their productivity levels, particularly in capital.

Table 7.4: Productivity, Wages and Firms in the Textiles Sub-sector

	Labour Productivity		Capital Productivity		Wages		Number of Firms	
Textiles	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**	**1980**	**1985**
Hard fibres	---	---	---	---	---	---	---	---
Soft fibres	0.1109	0.1506	2.6188	1.1715	0.0994	0.3258	225	46
Non-clothing confection	0.2808	0.1694	20.236	0.2920	0.5332	0.1449	12	41
Weaving industry	0.0942	0.6004	0.5127	1.9882	NA	0.4219	7	18
Garment confection	0.0818	0.2377	0.1317	0.8318	0.1198	0.1564	216	196
Leather industry	0.2177	0.2161	4.8513	0.8493	0.1539	0.2882	28	38
Shoe industry	0.2358	0.2667	6.9994	NA	0.0457	0.0872	59	36

Source: Personal calculations based on INEGI (1981 and 1986b)

In contrast, and determining the overall performance of the manufacturing sector in Oaxaca, were the contractions experienced in the textiles, wood and chemical sub-sectors. The decline of textiles was sizeable reaching a negative rate of growth of over 16 per cent per annum. Although hard-fibres grew annually by 8.6, its expansion could not compensate contractions in soft fibres and garment confection, as well as in leather and shoes. Soft fibres endured a significant reduction in capital productivity levels and the disappearance of around four fifths of the firms in the branch leading to a 24.77 per cent annual GDP contraction. Garment confection suffered a reduction in employment, and surprisingly, of labour productivity levels, as well as the loss of 20 firms, which led to the branch's GDP annual average reduction of 27.08 per cent (INEGI, 1981 and 1986b). The largest negative rates were observed in leather and shoes, the value of which diminished at a rate of around 39 per cent per year. Most of the sub-sector's production was handcrafted by local artisans having little impact in the production structure of the state; indeed, the sub-sector represented around 3.67 per cent of manufacturing GDP in 1985.

The wood industry also contracted by an annual average rate of 14.2 per cent. The two branches comprising the regional sub-sector registered negative levels of growth. Whereas sawmill production decreased annually by an average of 13.02 per cent, other wood-related production declined, on average, 19.6 per cent each year. Surprisingly, sawmills proliferated. At the beginning of the period, 22 sawmills operated in the state, whereas by 1985 the total had reached 57 (INEGI, 1981 and 1986b). Despite the increased number of sawmills, their value of production, in real terms, contracted by 20 per cent.[130] Similarly, employment rose from 1,279 workers in 1980 to 1,936 in 1985. In the 'other wooden products' branch, growth was motivated by employment and not by entry of new firms.

The considerable decline of chemical activities in the state was entirely imposed by the decline of the oil-processing industry. The demise of the oil-driven economy by the end of the period was evident in the annual contraction of production of around 13.87 per cent in the oil-processing branch. The oil crisis of the early 1980s entailed diminished values of production. PEMEX's refinery activities in the Salina Cruz plant in Oaxaca Isthmus coast were no exception. The rest of the sub-sector actually performed better than in 1980. On the one hand, the rubber industry and the other chemical products branch grew at 8.9 and 18.66 per cent, respectively. On the other hand, branches such as basic petrochemicals, basic substances, artificial fibres, pharmaceuticals and the plastic industry, that were not present in the region in 1980, emerged in modest

[130] It is important to bear in mind that growth rates at branch, sub-sector and sector level were composed using GDP data available in INEGI (2000), whereas the contraction of sawmill activities is based on census data

numbers. However, the extent of the contraction and the size of the refining branch tipped the scale, giving rise to a negative growth rate for the chemical sub-sector.

Summary (ISI): Oaxaca's growth between 1980 and 1985 was fuelled by the dynamism experienced in the agricultural sector. On the one hand, the objective of reaching national food self-sufficiency boosted cultivation of grains, amongst them peanuts; guaranteed prices offered by CONASUPO supported the farming of corn, wheat and beans. On the other hand, the regional policies of ISI's early stage produced irrigation areas that were ideal not only for grains but also for fruit growing. Incipient industrialisation in the state is also evident in the fact that although considerable progress was attained in cattle raising and forestry, their industrial counterparts, namely the meat industry and the wood sub-sector declined. Similarly, mining continued to contract. Although the value of manufacturing was reduced, the contraction was cushioned by growth in foodstuffs, paper and machinery. It is particularly important to note that State intervention during ISI was present not only in the dynamic agricultural sector, but also in the progress and downturn of manufacturing activities. On the one hand, tobacco, corn milling and paper production were bolstered by State-owned enterprises and interventionist mechanisms such as guaranteed prices. On the other hand, the decline in chemical activities was conditioned by PEMEX and the economic strategy based on oil followed during the period. Thus, the State was at the heart of economic progress and decline in the Oaxacan economy during ISI.

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calculated at 1993 prices and using the value of production variable. Thus, both calculi are not necessarily comparable. It must also be considered that these calculations were only used as no other data was found.

4. The Effects of Accessing GATT

Regional Policies between 1985 and 1993

Besides the few remaining regional policies being cancelled, the economic crisis reduced resources destined for regional development. As a result, the river basin approach and the Industrial Estates and Cities Programme were eliminated. While northern Mexico profited from the establishment of maquiladoras, southern states such as Oaxaca struggled to overcome the ill-effects of trade liberalisation and the elimination of the few regional policies aimed at developing some of its areas.

The Industrial Estates Programme promoted the creation of spaces for industrial development in Mexico and aimed to de-concentrate Mexico City by promoting relocation to neighbouring states (Aguilar, 1999). The effects of Mexico's regional industrialisation efforts were limited in Oaxaca. By 1993, there were just two industrial estates in the whole state. Near Oaxaca City, The *Parque Industrial Santo Domingo Barrio Alto* hosted a single firm employing 17 workers (NAFIN, 1993). Eleven kilometres away from Tuxtepec, The *Parque Industrial Tuxtepec* contained just one firm employing 20 workers (NAFIN, 1993). Moreover, both industrial estates were mostly non-urbanised; whereas the latter had developed less than ten per cent of the estate's area, the former was completely undeveloped. In sum, the results of the industrialisation efforts were a lack of industrial areas, poor urbanisation of the few estates and scarcity of firms located in such developments.

The fact that Oaxaca remained a rural economy with insufficient urban developments, conditioned the attraction of the region for manufacturing. On the one hand, the lack of urbanisation was a fundamental feature of the failed industrialisation effort described above. On the other hand, that lack of urbanisation prevented the formation of a pooled labour market. Although the generalised process of urbanisation observed in the country was also experienced in Oaxaca, the trend was much more gradual. By 1990, less than 40 per cent of the state's population was living in urban centres, whereas the national average was 75 per cent (Presidencia de la República, 1999). What is more, by 1988, Oaxaca's population density was 27.8 people per square kilometre, compared to a national average of 42.1 (CONAPO, 1988). In other words, Oaxaca remained essentially a rural society.

Changes in the Economic Structure and Growth

The state's per capita GDP plummeted from 6,814 pesos in 1985 to 5,984 in 1993, a contraction of almost 13 per cent over the eight-year period. As observed in Table 6.2, Oaxaca's economic decline was greater than the national average and greater than that of the group of states depicted in the Table. The economic crisis and the economic adjustment brought about by the change of model apparently had a greater impact in most southern states, in particular Oaxaca. As a consequence, the state's per capita GDP still represented the second lowest in the country by the end of the trade liberalisation span.

The period displayed convergence in Chapter Five's regressions; however, significance levels were lower than those for ISI. In contrast, the analyses of Chapter Four showed divergence if oil-producing states were excluded from the sample. This last trend is present in the cases analysed in this thesis. Whereas Chihuahua registered one of the greatest economic expansions during GATT, Oaxaca contracted.

Table 7.5: GDP Composition in Oaxaca during GATT

	1985	1993
Agricultural	25.11%	18.55%
Mining	0.61%	0.81%
Manufacturing	11.16%	11.78%
Commerce	29.65%	19.30%
Services	24.37%	36.55%
Other Sectors	9.10%	13.01%
Total Oaxaca	100%	100%

Source: INEGI (2000a)

As can be observed in Table 7.5, trade liberalisation had a negative effect on Oaxaca's agricultural sector, which had traditionally been the motor for regional growth, which is in line with the results presented in Annex 2, where the sector's employment is negatively correlated to growth. The sector's share of state GDP fell from 25.11 per cent in 1985 to 18.55 per cent in 1993. In contrast, mining and manufacturing activities increased their participation. Although the former increased that participation by almost one third, it accounted for only 0.81 per cent of Oaxaca's GDP. The expansion in manufacturing was, however, minor, representing less than 12 per cent of the state's figure. Commercial activities, probably related to agricultural produce, declined as the latter also contracted. Services captured the participation lost by other sectors. The Huatulco tourism development accounted for a significant proportion of the state's GDP. In addition, tourist attraction to Oaxaca City was also important.

Real exports grew 283 per cent during GATT, supported mainly by exports of oil transported to the state from Campeche, Chiapas, Tabasco and Veracruz seizing the Pacific Rim market via Salina Cruz. In addition, the boost to the mining sector also contributed to exports albeit marginally. However, both industries had few links to the local economy.

The rate at which Oaxaca lost population softened the negative growth trend in the state. Moreover, outward migration reflected regional wage differentials. Indeed, this finding adheres to the model of Mexico's urbanisation developed by Colosio (1979). In the model, migration is produced by urban-rural differentials in expected wages. In a similar vein, workers can detect regional wage differentials, and thus, migrate.[131] Hence, migration can effectively help us understand the performance of the Oaxacan economy during GATT. Oaxaca lost population by means of migration even faster than under ISI. Whereas in 1980, the outward migration rate[132] was 13.18 per cent (INEGI, 1986a; Partida-Bush, 1994), by 1990 it had increased to 17.6 per cent (INEGI, 1995). Not only might pressures in the labour markets have been eased, but the economic decline could also have been ameliorated through remittances.

Just as capital accrued during ISI, it dwindled with trade liberalisation; that is, the positive growth rate achieved in ISI was related to capital accumulation, whereas economic decline during GATT was associated with shrivelled capital. Between 1985 and 1993 capital in the state dwindled by more than ten per cent (INEGI, 1987 and 1994b). The poor performance of the regional economy was not even compensated by increases in human capital formation. In 1985, the average number of schooling years was 3.65, rising to 5.05 by the end of the period, which represented a human-capital growth rate of more than 32 per cent, well above the national average of schooling growth and the second largest education progress in the country just after Chiapas. In addition, just as schooling years on average increased in Oaxaca, so too did illiteracy abatement between 1980 and 1990; thus, literacy rose from 64.1 to 72.5 per cent (Presidencia de la República, 1999). As in the regressions presented in Chapter Five, public investment does not seem to be related to Oaxaca's pattern of growth. Public

[131] According to Colosio (1979), migration is a function of expected wages.

funds allocated to Oaxaca during GATT still diminished by just over two per cent, albeit to a lesser extent than in the 1980-85 spell (INEGI, 1994c; Presidencia de la República, 1999).

During the period under consideration, maquiladora employment data for Oaxaca was not available, since states with minor contributions to the total figure were omitted from the official publications. However, it was a period of a considerable maquiladora-employment growth for non-border states; what is more, the minor contributors to the national maquiladora employment, grouped under the 'other states' label, grew by more than 20 per cent during GATT (INEGI, 1998a). Despite the considerable employment growth of the sector in 'other states', they still accounted for less than five per cent of the total by the end of the period. Nevertheless, in the case of Oaxaca it is impossible to assess the impact of the industry without the benefit of the official data for the state. However, according to data presented in CEPAL (1996), in 1990 there were no maquiladoras established in Oaxaca. Furthermore, the first maquiladora did not appear in Oaxaca until 1999 (Gobierno del Estado de Oaxaca 2000).

Although the state occupied third place in the production of both coffee and sugar and the fifth in coconut production (INEGI, 1994d), agricultural activities declined on average by nearly five per cent annually. By 1993, the most important crop by far in terms of volume of production was sugar-cane, followed by alfalfa, corn, wheat, oranges and tomatoes (SAGAR, 2000). In addition, the state had the largest goat population in the country and was the fifth most abundant in sheep (INEGI, 1994d). Trade liberalisation brought about the decline not only of agricultural, but also of mining

[132] The proportion of total state population that is migrating to other states.

activities.[133] In contrast, manufacturing was growing. Although it may seem that the first signs of industrialisation had appeared, the analysis at sub-sector and branch levels presented below found different results.

Trade liberalisation brought about the dismantling of the mechanisms that drove the Oaxacan economy prior to 1985. State intervention in agricultural activities finally ceased. First, TABAMEX's control over financing, production and distribution of tobacco in the region came to an end. Second, guaranteed prices for grains that once shifted production of farming activities towards corn, wheat and beans were no longer in effect, which gave rise to a greater emphasis on sugar-cane, alfalfa, oranges and tomatoes. The withdrawal of the State from the most important farming activities in Oaxaca, led to overall sectoral decline, which in turn determined the state's economic contraction. Similarly, the disappearance of CONASUPO and TABAMEX had severe effects on milling and tobacco activities, which partly led to foodstuffs contraction. As will be argued below, the reduced action of the State in the economy as a result of trade liberalisation also conditioned the decline of paper production once dominated by the State-owned PIPSA. Although the State had withdrawn from the main activities in the economy, its influence was still present during GATT through oil refining. The decline of such activities gave way for an overall contraction, but at the same time enabled the restructuring of farming activities according to market –and not guaranteed- prices. In addition, it facilitated the appearance of new industries in the state such as the plastic production, and the further development of the rubber and cement industries.

[133] Unfortunately data on both sectors relative to the GATT period was limited, hampering further analysis.

Activities Abating Economic Decline

Not only was further industrialisation failing to take place in Oaxaca during GATT, but the few activities abating economic decline were partly related to oil. In fact, all sub-sectors contracted during the 1985-93 interval, except for those of chemicals and minerals. The former increased its share of manufacturing's value added from 53 per cent in 1985 to over 73 per cent by the end of the period attaining annual average growth rates of over nine per cent in per capita values. Taking into consideration the censuses values contained in INEGI (1986b) and INEGI (1994a), by far the greatest contribution to value added in the sub-sector was oil refining. The activity accounted almost entirely for the sub-sector's value added in 1985 and 1993. Although employment figures as a proportion of the sub-sector's employment fell considerably, they still represented nearly 60 per cent of the sub-sector's employment. Oil refining, as mentioned above, implied the transportation of oil produced in south-eastern states by the State-owned company, PEMEX. More than one quarter of national oil refining was carried out in Oaxaca by the end of the period, whereas the figure was around 10.5 per cent in 1985. Nevertheless, during the same span, employment shares relative to other regions fell slightly to 9.34 per cent. In fact, Table 7.6 reports staggering growth in almost any aspect and for each of the branches present in the state at that time; however, employment was the only variable contracting both for the sub-sector and the oil-refining branch. Unfortunately, investment shares and capital productivity could not be calculated, since investment data was not available for that branch. However, the positive performance of the branch was influenced by an over threefold increase in relative productivity of labour and a considerable expansion of relative wages.

Table 7.6: Economic Changes in the Chemical Sub-sector (GATT)

	Gross Value*		Value Added*		Employment		Investment*		Number of Firms	
Chemicals	**1985****	**1993**	**1985****	**1993**	**1985**	**1993**	**1985****	**1993**	**1985**	**1993**
Total manuf. in Oaxaca	2742	10697577	1203	4004262	22534	40057	308	123681	4033	11524
Total in chemicals	1303	7866342	645	2929400	4575	3114	230	9367	40	118
Petroch.	---	---	---	---	---	---	---	---	---	---
Basic substances	---	855	---	85	---	11	---	15	---	NA
Artificial fibres	---	---	---	---	---	---	---	---	---	---
Pharmac.	14	3831	8	602	117	51	0	13	3	NA
Other substances	14	13564	2	5284	126	280	NA	69	26	89
Oil refining	1264	7689491	631	2871091	4196	1851	229	NA	5	1
Coke industry	---	480	---	273	---	7	---	NA	---	NA
Rubber industry	11	15153	3	-2074	136	197	1	491	6	13
Plastic products	---	142969	---	54140	---	717	---	8778	---	15

Source: Personal calculations based on INEGI (1986b and 1994a)
*/ Figures in thousands of pesos.
**/ Gross production, value added and investment figures for 1985 have been converted to new pesos and expressed in constant pesos (1993=100).

In terms of employment shares of the sub-sector, considerable improvements can be observed in the rubber and plastic industries; however, those share expansions had a little or no impact on value added. In addition, by the end of the period, either branch represented one per cent or less of their respective national production and investment values, and around 0.5 per cent of employment levels. In the rubber industry, relative productivity of capital decreased, while the labour measure improved slightly and relative wages remained at around the same level (Table 7.7). Plastic production was not present in the region at the beginning of the period; however, by the end of the period, both productivity measures were above national average, while relative wages were slightly below the country's mean.

Table 7.7: Productivity and Wages in Chemicals (GATT)

	Labour Productivity*		Capital Productivity*		Wages*	
Chemicals	1985	1993	1985	1993	1985	1993
Petroch.	---	---	---	---	---	---
Basic substances	---	0.2019	---	3.2339	---	0.5548
Artificial fibres	---	---	---	---	---	---
Pharmac.	0.5133	0.2411	5	8.9279	0.8002	0.3131
Other substances	0.3899	0.1770	NA	4.6972	0.2766	0.1401
Oil refining	0.8569	2.6782	0.6610	NA	0.8635	1.1383
Coke industry	---	0.2000	---	NA	---	0.5554
Rubber industry	0.4030	0.5355	0.9559	0.8261	0.3310	0.3288
Plastic products	---	1.9803	---	1.0901	---	0.8641

Source: Personal calculations based on INEGI (1986b and 1994a).
*/ Values are relative to the national value.

Table 7.8: Economic Changes in the Mineral Sub-sector (GATT)

	Gross Value*		Value Added*		Employment		Investment*		Number of Firms	
Minerals	1985**	1993	1985**	1993	1985	1993	1985**	1993	1985	1993
Total Manuf. in Oax	2742	10697577	1203	4004262	22534	40057	308	123681	4033	11524
Total in Minerals	143.73	476616.7	22.36	257160	1713	3087	4108	11652	269	867
Ceramics	1.94	5245.50	0.98	1874.20	250	984	43.71	11	108	491
Constr. materials	6.16	6056.70	2.71	2528.90	327	422	109.3	66.2	106	160
Glass	---	213.20	---	91.80	---	13	---	3	---	6
Cement	135.62	465101.3	18.66	252665	1136	1668	3955	11572	55	210

Source: Personal calculations based on INEGI (1986b and 1994a)
*/ Figures in thousands of pesos.
**/ Gross production, value added and investment figures for 1985 have been converted to new pesos and expressed in constant pesos (1993=100).

Growth in the mineral sub-sector reached, on average, annual per capita rates of 7.34 per cent, increasing its share of manufacturing's value added. In 1985 it represented less than two per cent of the sector's total; eight years later, it had reached 6.42 per cent. As can be observed in Table 7.8, the activity that almost entirely dominated mineral industries was cement production. Whereas in 1985, around 83.5 per cent of mineral value added came from cement, by 1993, that share had risen to 98.25 per cent. Although in terms of employment its share contracted, the figure was still around 54 per cent of the sub-sector's employment. Several plants belonging to Cementos Portland La Cruz Azul, located in the Isthmus, were responsible for that volume of cement production. It is important to note that although Cementos Portland La Cruz Azul established its first plant in Oaxaca during the 1940s, several others were successively installed in the area (Cruz Azul, 2001). Shares of the national cement production increased from 1.1 per cent in 1985 to nearly three per cent in 1993 (INEGI, 1986b and 1994a). Similarly, employment shares in the activity rose from 1.6 to 2.05 per cent during the same time span, while investment shares grew from 0.5 to 1.32 per cent. Relative productivity of labour more than doubled, making Oaxaca the second most productive state in cement production; however, relative wages eroded significantly. Although capital productivity advances were not as important as those observed in labour, they also improved considerably (Table 7.9).

Table 7.9: Productivity and Wages in the Mineral Sub-sector (GATT)

	Labour Productivity		Capital Productivity		Wages	
Minerals	**1985**	**1993**	**1985**	**1993**	**1985**	**1993**
Pottery and ceramic	0.2276	0.2545	2.9506	68.6714	0.0311	0.0145
Construction materials	0.2258	0.2083	3.5256	8.7395	0.1829	0.1602
Glass	—	0.0972	—	4.4550	—	0.0124
Cement	0.6911	1.4555	2.1645	2.2581	1.1837	0.5911

Source: Personal calculations based on INEGI (1986b and 1994a).
*/ Values are relative to the national value.

Progress was also achieved, although only in terms of employment shares, in the pottery and ceramic branch; however, the large number of firms and relatively small number of workers signalled the artisan-style of production in place in the industry. Nevertheless, the activity's shares of national production and employment nearly doubled reaching 1.12 per cent and 4.9 per cent, respectively. In addition, relative wages improved significantly but remained well below national average levels. Investment shares were not only unimportant but they eroded greatly during GATT. As a result, slight improvements in labour productivity were greatly surpassed by capital productivity.

In sum, manufacturing was driven chiefly by the action of two firms, namely PEMEX and Cementos Portland La Cruz Azul. Although progress was attained in chemicals and minerals, the overall negative performance was the result of the contraction in manufacturing and plummeting primary activities. The decline was not only observed in agricultural activities, but also in foodstuffs, machinery and paper, sub-sectors that contributed towards the economic performance during ISI. In fact, if one excludes the production of the two above-mentioned firms, all activities contracted during GATT. Although the State withdrawal from the economy permitted a different pattern of crop production, its influence continued through oil processing. Industrialisation was still an incipient process in Oaxaca. Few activities developed during the period, the exceptions being rubber, plastic and cement; however, except for cement, the size of operations implied a negligible influence on the economy. However, during NAFTA, the spreading out of maquiladora activities in search of cheaper labour and lured by industrial promotion carried out by local governments would encourage the process of industrialisation in Oaxaca albeit related to a negative economic performance.

Summary (GATT): Trade liberalisation brought about important changes in the Oaxacan economy. On the one hand, agriculture, the traditional motor of the regional economy, declined sharply. Economic deterioration was related to the change of development model in a number of ways. On the other hand, no sector was filling the void. Although manufacturing grew during the period, the activities responsible for that improvement were associated with State intervention. There was, however, one firm in the cement industry that not only supported growth, but was also run by a co-operative concerned about improving social conditions in its area of influence. In addition, regional programmes were being cancelled and industrialisation policies were not successful. As a result, a lack of urbanisation conditioned industrial attraction and the labour market. Despite improvements in manufacturing, industrialisation was not taking off.

5. The Impact of Economic Integration

The Absence of Regional Policies and the Emergence of Local Governments

The absence of a centrally designed regional policy and the ineffectiveness of public policies in reducing territorial inequalities (see Chapter Six), have been compensated by the emergence of regional and local powers. States and municipal governments have found themselves with a real ability to produce their own development strategies, particularly since NAFTA. Although the results achieved by Oaxaca during the period are far from comparable to those of Chihuahua, the outcome has been significant. The diverse regionally designed programmes to attract investment and industry are starting to render their first benefits. Industrialisation seems to be underway, but at the same time, micro and small entrepreneurs, including artisans, are also being supported.

Moreover, the first maquiladoras are appearing. Although industry is starting to locate in Oaxaca, the type of industry signals future regional differences. As will be argued below, technical skills and capital-intensive activities are increasingly concentrating in border-states such as Chihuahua, whereas lagging states in the South such as Oaxaca are benefiting from labour-intensive processes and lower wages.

The PRONASOL (Programa Nacional de Solidaridad/National Solidarity Programme) has aimed to abate poverty with a minor regional and urban-development content. As mentioned in the previous chapter, R&D policies have not been designed with a regional objective in mind. In contrast, education has been one of the few aspects (if not the only one) in which decentralisation was encouraged (Esquivel, 1999b); however, due to the intervention of different levels of government and a lack of co-ordinated efforts, those policies have had little impact (see Chapter Six). In the case of Oaxaca, almost the entire state has been identified among the 25 least developed regions in the country. Therefore, PRONASOL has targeted the provision of basic services, infrastructure for health, education, employment housing and nutrition needs (OECD, 1997).

As mentioned earlier, the Industrial Cities and Estates Programme was eliminated during GATT; nevertheless, industrial estates have continued to thrive in Mexico. In Oaxaca, the state government has, during the NAFTA period, promoted the creation of three additional industrial spaces raising its number to five. The Salina Cruz *Parque Industrial FONDEPORT* and the *Zona Industrial Pesquera*, both located in the Isthmus, as well as the *Parque Industrial Oaxaca 2000* near Oaxaca City, comprise the renewed effort being carried out by two different state administrations (1992-98 and 1998-2004) during the economic integration period. According to the Gobierno del Estado de Oaxaca

(2000), the Oaxaca 2000 estate represents the most important industrial-nurturing effort and was created with the objective of attracting maquiladora activity to the region. In fact, the FIDELO (*Fideicomiso para el Desarrollo Logístico del Estado de Oaxaca*/Trusteeship for the Logistic Development of the State of Oaxaca) supported the creation and operation of the FONDEPORT and Oaxaca 2000 industrial estates (SIEM, 2001a). However, the results have been very different. Whereas the former has urbanised just 4.2 per cent of its area and has no mail, public lighting or services, the latter is totally urbanised and is endowed with most services. As a result, the FONDEPORT estate hosted three manufacturing firms in 1998, whereas Oaxaca 2000 concentrated 17 firms, representing 45 per cent of total industrial-estate-based enterprises in the state (INEGI, 1999c). In contrast to FONDEPORT's poor performance, the *Zona Industrial Pesquera* located also in the Isthmus has achieved results similar to those of Oaxaca 2000 (at least in terms of number of firms) hosting 16 firms; the latter being relatively more dedicated to manufacturing (INEGI, 1999c). Created during GATT and without support from the FIDELO but State-run, the *Parque Industrial Tuxtepec* during NAFTA was still poorly urbanised and with some basic services; furthermore, the estate still hosted one single firm (INEGI, 1999c). Likewise, the *Parque Industrial Santo Domingo*, which was also created during GATT counted with one firm (INEGI, 1999c). Paradoxically, industrial estates flourished in Oaxaca after the elimination of a national strategy aimed at providing industrial spaces. As will be argued below, local-government initiatives seem to have had a greater effect during the GATT and NAFTA periods than those trickling down from the central power, at least those related to industrial nurturing.

The Government of the State of Oaxaca has also been backing the creation of micro, small and medium firms both financially and administratively. Small firms have been fostered by the operation of the FIDEAPO (*Fideicomiso para el Desarrollo de las Actividades*

Productivas del Estado de Oaxaca/ Trusteeship for the Development of Productive Activities in the State of Oaxaca). Particular attention has been paid to artisans producing textiles, pottery and ceramics, among other products through the actions undertaken by ARIPO (*Artesanías e Industrias Populares del Estado de Oaxaca/*Handicrafts and Popular Industries of the State of Oaxaca), which allowed total handicrafts' sales to more than triple during the period, with exports playing an increasingly important role.[134] As will be argued below, an increased number of firms and employment in those branches has been achieved in Oaxaca over the five-year interval.

Despite no regional policy has been designed by the central government, President Fox's recent initiatives indicate the concern of his administration for easing uneven development in Mexico. First, the Puebla-Panama Plan, has been created to integrate Mexican south-east states with the rest of the country and, in fact, with Central American countries. Although such integration has been merely focusing on infrastructure provision, it has caught the Inter-American Development Bank's (IDB) eye and support and specific works have already began in different states among which Oaxaca. Second, the *Programa Marcha Hacia el Sur* (March South Programme) was created with the objective of transferring productive investments in northern Mexico to lagging states in the South. After a period of strong criticism by northern Governors – headed, in fact, by Patricio Martínez, Governor of the State of Chihuahua- the programme not only changed his name but also its objective of relocating plants within Mexico to attracting also foreign ones to marginalised municipalities across the country. Oaxaca has thus, also benefited from such centrally designed policies leading to

[134] Around one third of Oaxaca's handicrafts were exported during 1998, whereas in 1993 the figure had been 7.8 per cent (Gobierno del Estado de Oaxaca, 2000).

improved infrastructure and recent industrialisation albeit in simple processes.[135] Thus, in the case of Oaxaca, increasing power of regional and local governments is making the difference in determining growth through such initiatives as industrial promotion and industrial-infrastructure provision. However, the aforementioned recent initiatives have both, produced positive results for the state, and prepared the nation for a regional dispute between the North and the South –but chiefly between the central and regional governments- that is far from over.

Transformations in the State's Economic Structure

Further and formal economic integration with Canada and the USA has brought about considerable changes in Oaxaca's economic structure. As can be observed in Table 7.10, as soon as the economic integration process started in 1994 the agricultural sector was severely damaged. As mentioned above, the sector had traditionally contributed significantly to state GDP. While in 1993 agricultural activities accounted for 18.55 per cent of the region's economic structure, by 1994 this contribution had fallen to 14.72 per cent. Although the devaluation improved the terms of trade for Mexico and effectively improved the competitiveness of Mexican goods, the effect was bound to be temporary. The sector's share of GDP increased slightly, losing most of that new ground by 1997. Ultimately, the sector's share oscillated between 14.72 and 15.68 per cent during the seven-year period. After the usual exchange-rate-related temporary improvement in competitiveness, the importance of the sector in the state's structure of production continued to erode once the economic integration process started. Similarly, NAFTA's coming into effect cut the share of Oaxaca's GDP held by mining activities

[135] As mentioned in Chapter Six, Chihuahua has benefited also from such programme restructuring; however, the main winners from such a scheme have been southern states despite some investors have expressed the enormous difference in infrastructure an labour-force qualifications.

nearly in half, falling from 0.81 per cent in 1993 to 0.47 per cent a year later. The sector decreased slightly in 1995 and maintained a 0.42 per cent share during 1996 albeit it has enjoyed a recent recovery.

Table 7.10: GDP Composition in Oaxaca During NAFTA

	1993	1994	1995	1996	1997	1998	1999	2000
Agricultural	*18.55%*	14.72%	15.68%	15.53%	14.82%	15.35%	15.35%	14.93%
Mining	*0.81%*	0.47%	0.42%	0.42%	0.66%	0.76%	1.00%	1.79%
Manufacturing	*11.78%*	12.46%	13.20%	13.82%	13.09%	13.96%	13.64%	13.27%
Commerce	*19.30%*	17.14%	16.94%	15.98%	16.00%	17.18%	16.97%	17.44%
Services	*36.55%*	40.62%	41.99%	41.82%	42.44%	41.17%	39.99%	39.09%
Other Sectors	*13.01%*	14.59%	11.77%	12.43%	12.99%	11.58%	13.05%	13.48%
Total Oaxaca	*100%*	100%	100%	100%	100%	100%	100%	100%

Source: INEGI (2000a)

In contrast, manufacturing activities experienced quite the reverse. As soon as economic integration came into effect, manufacturing activities' production share increased from 11.78 to 12.46 per cent. Although Oaxaca's industrialisation is incipient, it seems to have initiated the process. Despite minor setbacks in 1997, 1999 and 2000, manufacturing increased its production share during NAFTA period. By 1998, the gap in the contribution to state GDP of agricultural and manufactured produce had narrowed remarkably.

Commercial activities were also affected by NAFTA, losing more than two per cent of their GDP contribution in the agreement's initial year. Nevertheless, they have oscillated throughout the period. Another remarkable improvement in sectoral contributions to Oaxaca's GDP has been in services. Whereas in 1993, these accounted for 36.55 per cent of the state's GDP, a year later this share had risen to 40.62 per cent. Between 1995 and 1998, the share held by services has oscillated between 39.09 and 42.44 per cent. The reason for that increase is partly related to the emergence of

Huatulco and Puerto Escondido as important tourist developments. Together these beaches accounted in 1998 for 34 per cent of the visitors to the state and more than 43 per cent of tourism revenues in the state (Gobierno del Estado de Oaxaca, 2000). Huatulco, Puerto Escondido and Oaxaca City accounted for almost the totality of tourist affluence in the state, receiving in 1998 around US$195 billion (Gobierno del Estado de Oaxaca, 2000), which represents 21.5 per cent of the sub-sector's value in the same year (INEGI, 2000).

The Reasons behind Growth Trends

Despite the recent process of industrialisation, income in Oaxaca is lower than in 1985. Nevertheless, as can be observed in Table 6.2, Oaxaca experienced a per capita GDP expansion of 5.76 per cent.

However, such an expansion in per capita GDP levels was not associated with an increase in the state's exports.[136] For the first time in the periods under analysis, exports showed a negative trend. Between 1993 and 2000, exports contracted by more than 33 per cent. Despite a momentary recovery in 1997, exports steadily diminished throughout the period; in fact, exports in 1998 represented just over one quarter of those carried out in 1994 (Gobierno del Estado de Oaxaca, 2000). Amongst the most important state exports were coffee, fish, soft and alcoholic drinks, hard-fibre textiles, plastics, fats, fruits, milk and dairy products, wood, pottery, garments and starch-based products. However, except for plastics, wood and starch-based products, all export products contracted between 1994 and 1998 (Gobierno del Estado de Oaxaca, 2000).

[136] Export growth however, is based on 1994-98 figures, whereas GDP growth takes into account the 1994-2000.

Amongst the most important export contractions were coffee, garments and soft and alcoholic drinks. However, as is discussed below, the location of the first maquiladoras in the state could signal a recent improvement in export figures.

Out-migration in Oaxaca has progressively grown throughout the periods under analysis. Expulsion of labour force during NAFTA, measured by the 1995 migration balance as a proportion of the state's population, was 19.06 per cent. During the GATT period, increased levels of migration can be seen not only as a determinant of negative growth trends in the region, but also as a reflection of wage differentials with respect to other states. With NAFTA, out-migration has progressively increased; thus, the state has already lost nearly one fifth of its population at the beginning of the period, indicating the expectations of its inhabitants on the region's future development. However, economic expansion during NAFTA has partly been fuelled by remittances of those who migrate to other regions –or countries- in search of employment.

For those staying in Oaxaca, education levels have increased. Average schooling years in Oaxaca grew by more than 17 per cent increasing the level to sixth grade. That is, during NAFTA, the Oaxacan population typically completed primary education. However, the state still had the lowest level of education after Chiapas. While human capital improvement in the state measured by average schooling years, was one of the highest during ISI and GATT, it was challenged by similar or higher rates of progress in some other states during NAFTA. Although significant progress has been attained in education levels during this period, the standard is still well below the national average. In fact, average education levels in the rest of the country (except for Chiapas) are secondary, or even preparatory school as in the cases of Nuevo León and Mexico City (Presidencia de la República, 1999). In contrast, according to the most recent available data on population referring to 1990, only 14 per cent of Oaxaca's over-16 population had secondary schooling, whereas the national average was 26 per cent (INEGI, 1992). Equally, only 1.25 per cent of the technicians educated in the country were based in Oaxaca (INEGI, 1992); moreover, less than six per cent of the population that continued their education after primary school received a technical instruction (INEGI, 1992). Although increasing educational levels in Oaxaca is associated with the per capita GDP growth trend of the NAFTA period, it is possible that firms have been making location decisions based on relative standards; that is, they are reacting to relative levels of human capital development, just as in a knowledge-based economy.

According to CEPAL (1996), until 1990, maquiladora had not appeared in Oaxaca. More recently, however, maquiladoras have started to locate in the region, which now hosts 13 firms under that scheme (Gobierno del Estado de Oaxaca, 2000). Textile firms such as the Californian Danube Knitwear, which decided to locate in Oaxaca in 1999 or the Chinese-Mexican El León de Oro, operating in the region since 2000 (SIEM, 2001b), have been dominating maquiladora activities in the state. However, the number of firms and employment in the industry are still minor and its effect is yet to be known. Nevertheless, some important features can be identified. The type of processes locating in southern states such as Oaxaca, are based on labour-intensive production. Indeed, industrial-promotion efforts carried out by the state government, such as the Expomaquila 2000 event or the Compite workshop, have been concentrating on attracting garment-production firms and improving productivity levels in existing textile firms (SIEM, 2001b). Furthermore, under the *Plan Marcha Hacia el Sur*,[137] 25 textile firms are expected to locate in Oaxaca and Guerrero during 2001 (Navarrete, 2001).

The regional government has been promoting industrial location, stressing that the main advantages of Oaxaca over border-states are its proximity to the largest market in Mexico, lower average labour costs, port infrastructure, lower personnel rotation and lower average training costs (Gobierno del Estado de Oaxaca, 2001). Proximity to Mexico City and its area of influence not only ensures higher domestic sales,[138] but linkages to other firms in the sub-sector are also encouraged, since the Mexico City area agglomerates around 70 per cent of the country's textile industry (Gobierno del Estado de Oaxaca, 2001). Wages are actually half of the average for border-states, yet they still represent higher labour returns than alternative local wages in Oaxaca (Gobierno del Estado de Oaxaca, 2001). Although lower personnel rotation may be desirable, it also indicates low industrial concentration, which limits the possible benefits from backward and forward linkages. Surprisingly, according to the Gobierno del Estado de Oaxaca (2001) training per worker is considerably lower than in border-states; it is possible however, that lower training costs in Oaxaca are conditioned by the low skills needed in the labour-intensive processes establishing in the South, whereas capital-intensive ones in the North require greater skills. In the future, contrasting technical abilities and the type of process could determine further regional inequalities.

For the first time in the periods under analysis, public investment allocated to Oaxaca has grown.[139] It is possible that PRONASOL programme actually had an impact on the infrastructure provided to the state. Indeed, public investment during the period grew 11.48 per cent (INEGI, 1994c; Presidencia de la República, 1999). Although there has been a positive trend in funds allocated to the state, economic growth does not seem to

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[137] An industrial-development plan for southern states –see Chapter Six- established by Vicente Fox's administration (2000-06).

[138] Since 2000 maquiladoras can sell up to 50% of their total production in the domestic market (ISEF, 1998).

be affected by it. It is possible that most of such public investment has been directed to social ends, rather than to providing the infrastructure needed to transport goods in and out of the state or to develop ports and industry. Indeed, in 1991, nearly 77 per cent of municipal funds allocated to Oaxaca targeted social needs, whereas productive projects supporting infrastructure, namely roads and electrification received five and 18 per cent, respectively (Fox and Aranda, 1996). However, Rodriguez-Oreggia and Costa-I-Font (2001) have found that public investment has been negatively associated to growth during the period. That is, allocation of public resources has been favouring high-income regions in detriment of states such as Oaxaca. If, in addition to scanty funds, they are channelled towards non-industrial ('productive') projects, the variable could impinge greater territorial disparities in the future. However, evidence of the effects of public investment on growth is unclear, since the regressions of Chapter Five found no impact.

Sectoral Growth

Both, in absolute and per capita terms the economy has shown a slight recovery relative to 1993 levels. As can be observed in Table 6.2, Oaxaca grew nearly 6% between 1994 and 2000. Similarly, agricultural activities grew 4.7 per cent, but contracted nearly four per cent in per capita terms. In contrast, mining grew nearly 152 per cent, while manufacturing growth reached 18 per cent or 9.5 per cent in per capita terms. The expansion of sugar-cane, corn and pineapple production, three of the most important farming products in the state compensated shortfalls in coffee, melon and watermelon, and to a lesser extent in beans (Gobierno del Estado de Oaxaca, 2000). The relevance

[139] The Plan Puebla-Panama is likely to have had an impact on public investment funds allocated to the state. However, the data available and the basis of this analysis includes only 1998, therefore it does not include such plausible effect as the programme only started in 2001.

of diminished levels of production in crops such as melon and watermelon, lies in the fact that it is precisely this sort of farming that renders the greatest value of production with the least cultivation surface used (INEGI, 1998b). In contrast, farming in more traditional crops such as corn, in 1997, utilised more than half of the cultivable land in Oaxaca yielding only 15.5 per cent of its farming value of production (INEGI, 1998b).

The modest economic expansion in agriculture was aided by significant increases in livestock. According to Gobierno del Estado de Oaxaca (2000), bovine, porcine, ovine, goat and apicultural meat production expanded slightly. Equally, forestry expansion was also influencing agricultural activities' growth (Gobierno del Estado de Oaxaca, 2000). Although precious wood production has not grown during NAFTA, by far the most important wood produced in the state, namely pine also represented the most significant increase.

The mining sector's expansion was partly fuelled by increases in silver production, but also by gold extraction (Gobierno del Estado de Oaxaca, 2000). However, according to INEGI (1998b), in 1997 only 1.4 per cent of the value of production in the mining sector was provided by metallic minerals, whereas non-metallic ones dominated. Cement extraction accounted for 91 per cent of the value of production in the mining sector in 1997, representing the main drive of the sector. Nevertheless, the size of the mining sector in the state economy curtailed its impact on growth trends during NAFTA.

Manufacturing's expansion has been characterised by an annual growth rate of over three per cent. Its progress was chiefly driven by paper, textiles and foodstuffs production and to a lesser extent by minerals and machinery. In contrast to GATT trends, the chemical sub-sector has contracted sharply during NAFTA reaching an average annual rate of –5.27 per cent, which in turn significantly reduces the sector's overall performance. Since most of the production in the sub-sector was provided by oil refining, economic integration and the diminished role played by oil in the Mexican economy were evident in Oaxaca. Although employment in the branch rose from 1,851 in 1993 to 3,600 jobs in 1998, the sub-sector contracted considerably.

Economic integration, as discovered in Chapter Four, has undermined protectionism even more than trade liberalisation. The overall expansion of the regional economy is limited by agricultural performance. After the re-allocation of resources within the farming sub-sector, moving away from once-protected grains and into more profitable fruit and vegetables, the former have been under further competitive pressure, not only from US produce, but also from crops raised in other Latin American countries with which Mexico has signed free trade agreements such as Costa Rica and Chile. The latter particularly producing in a different hemisphere, has a seasonal advantage. That is, while agricultural decline during GATT was related to liberalisation of internal markets, the modest growth experienced with NAFTA –and even decline if per capita terms are considered- suggests that the problems are rooted in lack of competitiveness. Nevertheless, the process of liberalisation of the internal markets was still unfinished, having further effects in increased levels of production in milling activities once control restrictions are lifted.

Increased activity in the region's already well-established industries such as cement have promoted growth in directly related extractive industries. As will be argued below, the process of integration has had a tangible effect on export-related activities such as paper and cardboard needed for packaging. Finally, the emergence of three generations of maquiladora, an argument put forward in the previous chapter, is evident in the appearance of the first maquiladoras in the state associated with labour-intensive processes such as textiles.

The First Signs of Industrialisation?

Paper production expanded annually at an average rate of 6.67 per cent. As mentioned in the previous chapter, the available information that forms the basis of this analysis is also limited to censuses data referring to 1993 and 1998 for the NAFTA period. According to INEGI (1994a, 2000 and 2003), the number of firms producing cellulose and paper increased from 12 in 1993 to 54 in 1998; similarly, employment in the branch grew by 38 per cent. Likewise, the number of printing enterprises rose from 152 in 1993 to 260 in 1998, while employment levels increased 32.4 per cent over the same span. Expansion in the former was partly triggered by increased levels of exports. Cellulose and paper production have been growing, according to data in Table 7.11, around seven per cent annually (INEGI, 1994a and 2003). In addition, Mexico's imports of pulp and paper –upon which the Mexican paper production system is highly dependent- have also been expanding (QMIB, 2001). One important plant involved in paper production, has been the aforementioned Fábricas del Papel Tuxtepec, the expansion of production in the branch can be explained partly by that firm's activity. The ultimate production drive in the paper and cellulose branch has been the increasing levels of exports achieved by Mexico during NAFTA, since most of them require paper and cardboard packaging (QMIB, 2001). Investments in such branch have led to increases in labour and capital productivity increases relative to other states (Table 7.12).

7.11: Economic Changes in the Paper Sub-sector (NAFTA)

	Gross Value*		Value Added*		Employment		Investment*		Number of Firms	
Paper	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Total manuf. in Oaxaca	10698	10475	4004	1961	40057	52176	124	883	11544	18549
Total in paper	203	271	17.8	58	1589	1888	41.4	9	164	290
Cellulose and paper	161	227	-3.7	38	646	806	39.0	5	12	49
Printing	42	44	21.5	20	943	1082	2.4	3	152	241

Source: Personal calculations based on INEGI (1994a and 2003)
*/ Figures in millions of constant pesos (1993=100).

The textiles sub-sector grew at an annual average rate of 7.2 per cent or 5.46 per cent in per capita terms. That performance was driven mainly by clothing and non-clothing confection, hard and soft-fibre textiles and, to a much lesser extent, by the weaving and the shoe and leather industries. Between 1993 and 1998, the number of firms operating in the hard-fibre textiles branch rose from 87 to 699, an expansion that led employment levels to increase from 144 at the end of GATT to 1,053 during NAFTA (Table 7.13). Similarly, the state saw the establishment of 174 new soft-fibre textile firms in the five-year period, reaching a total of 525; employment levels increased by more than 300 jobs reaching 848 by 1998. Non-clothing confection firms increased slightly, reaching 827, the second largest figure in the country for that activity; by the same token, employment expanded from 1,379 in 1993 to 1,464 jobs by the end of the period. Although the number of firms and employment increased significantly in the weaving industry, these levels were still the lowest among the textiles branches in Oaxaca. Similarly, shoe-production firms and its employment increased, but levels were still modest compared to other branches. Increases were more modest in leather production and its employment level –which was identical for 1993 and 1998- was the second lowest within textiles (Table 7.13).

Table 7.12: Productivity and Wages in the Paper Sub-sector (NAFTA)

	Labour Productivity*		Capital Productivity*		Wages*	
Paper	1993	1998	1993	1998	1993	1998
Cellulose and paper	1.1577	1.3062	0.3889	2.0140	1.8387	1.0511
Printing	0.4355	0.4029	1.0671	0.6610	0.4623	0.4409

Source: Personal calculations based on INEGI (1994a and 2003).
*/ Values are relative to the national value.

Table 7.13: Economic Changes in the Textiles Sub-sector (NAFTA)

	Gross Value		Value Added		Employment		Investment		Number of Firms	
Machinery	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Totai manuf. in Oaxaca	10698	10682	4004	1961	40057	894005	124	883	11524	18549
Total in textiles	41	78	18.5	27	4051	7962	0.5	9	2287	4200
Hard fibres	0	—	0.1	—	144	1053	0.0	—	87	699
Soft fibres	6	281	2.1	2	535	848	0.0	0	351	525
Non-clothing confection	7	858.8	3.3	7	1379	1464	0.2	0	722	827
Weaving industry	0	1	0.1	0	14	101	NA	0	9	45
Clothing confection	17	357	8.4	14	1486	3973	0.2	8	860	1787
Leather industry	4	79.4	2.0	1	200	200	0.0	0.0	98	120
Shoe industry	6	20.4	2.4	2	293	323	0.0	0.1	160	197

Source: Personal calculations based on INEGI (1994a and 2003)
*/ Figures in millions of constant pesos (1993=100).

By far the most outstanding branch was clothing confection. Firms operating in the branch grew from 860 in 1993 to 1,787 in 1998. Moreover, employment levels increased 167 per cent during the five-year span to reach 3,973; that is, nearly half of Oaxaca's textile employment was dedicated to clothing confection, while in 1993 the proportion had been around 36 per cent. Improvements in the sub-sector were partly spurred by the above-mentioned financial and institutional support offered by the state government to micro and small entrepreneurs, as well as by the reduction in bureaucratic procedures to set up a firm (Gobierno del Estado de Oaxaca, 2000). In addition, labour productivity increased significantly in every branch but weaving, which supported the observed growth trend in these activities. More recently, the main drive of the sector has been the appearance of the first maquiladoras in the region. Such firms are dedicated to labour-intensive processes particularly in textiles, providing further evidence for the argument presented in the previous chapter. That is, a third-generation maquiladora has emerged in border-states, while labour-intensive processes with few technical requirements have been moving South seizing cheaper labour markets.

Growth in the foodstuffs sub-sector averaged annual rates of six per cent or 4.4 per cent in per capita terms. That trend was mainly driven by employment expansions in corn milling, bread production and wheat milling and, to a lesser extent, by the meat industry, the preparation of milk-based products and the candy and chocolate industry. In contrast, the canned food, oil and fats, sugar preparation and soft-drinks industries registered considerable contractions.

The number of firms operating in the corn milling industry increased over the five years by nearly 69 per cent to reach 4,588 enterprises, while its employment rose around 53.5 per cent to 7,057 jobs. The reason for that success stems from the fact that at the beginning of NAFTA, amongst the initiatives sponsored by the Mexican government to de-regulate and liberalise the economy, the corn-processing industry was liberalised. Further to the elimination of guaranteed prices for corn, which were removed during GATT, the State control over the number of corn-milling factories and tortilla-retail firms was abolished and subsequently retail prices of tortillas were liberalised. As a result, the number of firms trying to seize an important market multiplied, not only in

Oaxaca but throughout the country, leading to the observed regional rise of employment in the industry. Bread production was fuelled by the establishment of 577 firms in addition to the 1,189 operating in 1993, which in turn entailed an increase of around 38 per cent in the branch's employment reaching 4,091 jobs. The cereal-milling branch witnessed the proliferation of firms in just five years; whereas in 1993, there had been 54 firms dedicated to process cereals, the figure rose to 363 by 1998, the second largest figure amongst Mexican states. Likewise, employment in the branch nearly tripled in the five-year span. However, the branch has had limited impact on the regional economy, since it still represents a small industry in the state.

7.14: Productivity and Wages in Textiles (NAFTA)

	Labour Productivity*		Capital Productivity*		Wages*	
Textiles	**1993**	**1998**	**1993**	**1998**	**1993**	**1998**
Hard fibres	0.6644	NA	1054.63	0.0000	0.0145	3.1068
Soft fibres	0.3137	3.0348	61.69	6882.29	0.0234	16.7562
Non-clothing confection	0.1494	6.2128	1.97	114.3426	0.0554	9.5906
Weaving industry	18.7864	0.2053	NA	6.5104	0.1059	11.2409
Clothing confection	0.8061	2.4697	4.63	1.5303	0.1558	8.0826
Leather industry	2.5474	5.1954	1504.42	66.2190	0.0767	6.8086
Shoe industry	0.0720	1.2783	61.86	2.8272	0.1028	8.5671

Source: Personal calculations based on INEGI (1994a and 2003).
*/ Values are relative to the national value.

The meat industry's lesser impact on the performance of foodstuffs is evident if we consider that firms and employment in the activity actually decreased during the NAFTA interval from 716 to 710 and from 1,627 to 1,498, respectively. Similarly, in 1993 there were 318 firms dedicated to milk and dairy products preparation, whereas in

1998, this figure had increased to 415. Employment in the industry rose to 981, representing an expansion of over 47 per cent with respect to 1993. Smaller improvements were also achieved in the candy and chocolate preparation branch (Table 7.15).

Table 7.15: Economic Changes in the Foodstuffs Sub-sector (NAFTA)

	Gross Value*		Value Added*		Employment		Investment*		Number of Firms*	
Foodstuffs	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Total manuf. in Oaxaca	10698	10682	4004	1961	40057	894005	124	883	11524	18549
Total in foodstuffs	1813	2293	658.5	823	19153	22424	54.6	137	5346	8355
Meat industry	87	—	25.9	—	1627	1498	0.1	—	716	710
Dairy products	19	109	6.3	9	666	981	2.8	1	318	415
Canning	23	25.1	7.5	11	1002	623	0.1	1	28	38
Cereal milling	60	175	6.2	41	217	609	NA	0.0	54	363
Bakery products	60	72	19.7	24	2962	4091	1.6	1	1189	1766
Corn milling	94	139	34.8	44	4596	7057	1.8	1	2719	4588
Oils and fats	2	0	0.8	0	35	4	NA	NA	NA	NA
Sugar industry	322	383	47.5	109	1719	1998	27.0	18	4	NA
Chocolate	5	5	2.3	1	168	155	0.1	0	67	72
Other foodstuffs	13	19	6.1	9	349	748	0.4	1	94	164
Animal foodstuffs	7	3	1.7	0	17	14	0.0	NA	NA	NA
Soft drinks industry	94	139.5	34.8	44	4596	7057	1.8	1.1	2719	4588
Tobacco industry	—	—	—	—	—	—	—	—	—	—

Source: Personal calculations based on INEGI (1994a and 2003)
*/ Figures in millions of constant pesos (1993=100).

Although growth in the minerals sub-sector was slightly lower than in paper, textiles and foodstuffs, it averaged annual rates of nearly 3.6 per cent or 1.87 per cent in per capita terms. All activities comprised in the sub-sector expanded in terms of employment and number of firms. However, growth in minerals was mainly driven by the performance experienced in the pottery and ceramic branch, and to a lesser extent by clay processing. Minor improvements were registered in glass and cement production. The number of firms in pottery and ceramics production increased from 491 to 671, entailing a nearly 70 per cent expansion of employment levels, which rose from 984 to 1,669. Support given to artisans for the production of ceramics has reinforced artisan production in diverse manufacturing sub-sectors. In the case of ceramics, production of different types of *loza* (a type of pottery), amongst them white, green and red, as well as *barro negro* (black clay pottery artefacts) have also increased (Gobierno del Estado de Oaxaca, 2000).

7.16: Productivity and Wages in Foodstuffs (NAFTA)

	Labour Productivity		Capital Productivity		Wages	
Foodstuffs	**1993**	**1998**	**1993**	**1998**	**1993**	**1998**
Meat industry	0.2623	0.1835	20.51	6.5466	0.0402	0.0583
Dairy products	0.1236	0.4775	0.17	4.2017	0.2909	0.4885
Canning	0.1975	0.3096	10.29	1.0563	0.4132	295.1164
Cereal milling	0.8508	0.7310	4.74	-159.13	0.5074	908.1039
Bakery products	0.2545	0.2396	1.51	1.6769	0.1477	376.2738
Corn milling	0.4163	0.3999	1.248759	1.1681	0.3630	337.3852
Oils and fats	0.0942	0.0704	NA	NA	0.2960	778.9379
Sugar industry	1.0212	0.8583	0.229829	0.6716	1.0688	6680.8054
Chocolate	0.1764	0.2886	0.859534	1.9846	0.1210	19367.5593
Other foodstuffs	0.1459	0.0954	1.290321	0.6249	0.2596	510.8974
Animal foodstuffs	0.8263	0.3527	4.790373	NA	0.4510	1271.8946
Soft drinks industry	0.8899	1.2415	2.570513	0.5413	0.7922	NA
Tobacco industry	---	---	---	---	---	---

Source: Personal calculations based on INEGI (1994a and 2003)
*/ Figures in millions of constant pesos (1993=100).

The machinery sub-sector made an even more moderate progress than the above-mentioned activities. Growth levels reached 2.7 per cent or 0.99 per cent in per capita terms. While only minor improvements were achieved in the moulding industry, metallic furniture production, other metallic products, electric devices, the electronic industry and transport equipment, considerable progress was attained in metallic structures. In contrast, lower levels of employment were found in domestic appliances and precision equipment; moreover, a strong contraction was experienced in the automotive industry, which reduced employment levels from 767 in 1993 to 193 in 1998. Thus, the principal motor of the sub-sector was the improvement experienced in the production of metallic structures. Whereas in 1993, employment in the activity represented 57 per cent of total manufacturing employment in the state, five years later, the proportion was equivalent to more than two thirds of such employment. Such a performance was encouraged by the appearance of 465 new enterprises in just five years, which brought about the expansion of the number of firms to around 51 per cent. Manufacturing of metallic structures in Oaxaca has been featured by a large number of micro and small firms producing window frames, doors, banisters and other products.

In sum, the industrialisation of Oaxaca during NAFTA is unclear, since most of the growth in sub-sectors and activities can be explained by already established firms. However, improvements in some of the above-mentioned branches were mainly the results of financial and administrative support given to small firms. It is important to highlight the emergence of a small number of maquiladoras in the state and the promotion of manufacturing through state-government efforts such as the installation of new industrial estates. Nevertheless, manufacturing production in the state, except for the paper sub-sector dominated by a medium-sized enterprise, still consists of labour-intensive industries such as textiles and some branches in foodstuffs and machinery. Finally, the effects of the new economic model can be observed in the performance registered in corn milling, which was in turn boosted by liberalisation.

Production Structures and Effective Protectionism

One of the important arguments made throughout this chapter and also in Chapter Six, is that protectionism was linked to old production structures oriented towards the domestic market –most notably Mexico City- whereas liberalisation, and particularly, economic integration has fuelled growth in those activities with significant liberalisation. On the one hand, Oaxaca can be associated to protected activities especially during ISI and GATT. On the other hand, Chihuahua has presumably been focusing on those activities that have exhibited low levels of protectionism.

In order to test this idea, a bi-variate correlation using the effective rates of protectionism (ERP) employed in Chapter Four and manufacturing growth rates for each the periods in the thesis. Table 7.17 shows the results for such correlations. Despite Chapter Six and the present chapter have identified specific industries that were highly protected and that experienced significant growth –and in which the Mexican State had particular interest- the results of the correlations did not show statistical support for the argument. Correlations for both states and all periods were not statistically significant.

However, manufacturing growth is a product of a series of factors that are not included in the above analysis. Although the idea of examining the hypothesis with a linear model is appealing, the analysis is subject of a further study. In any case, beyond the statistical results, the industries that were identified and linked to import substitution remain prime examples of the effect of protectionism on regional production structures.

Table 7.17: Correlations Using ERPs and Manufacturing's Growth

		ISI	GATT	NAFTA
Chihuahua	Pearson	0.065	-0.022	-0.073
	Sig.	0.681	0.889	0.643
	N	43	43	43
Oaxaca	Pearson	-0.152	-0.099	0.005
	Sig.	0.33	0.526	0.975
	N	43	43	43

Source: Results based on data from GATT (1993a) and INEGI (1981, 1986b, 1994a and 2003)

Summary (NAFTA): As in the case of Chihuahua, in Oaxaca we can observe the greater bearing of regional and local governments. Oaxaca's government has been actively involved in promoting industrial location and attracting investment. Agriculture's importance is progressively although slowly, being compensated by the rise of manufacturing. The modest industrialisation, however, is the product of both already established firms and new arrivals. The former are related to privatised companies (as in paper) and the liberalisation of domestic markets (as in corn-milling). The latter are associated with the localisation of maquiladoras in southern states. Although the numbers are still modest, the efforts by the state government to urbanise and to provide the necessary infrastructure have been rendering some benefits. However, amid such gains, there is still room for concern. The fact that capital-intensive processes of production, design and R&D activities, as well as technical workers, have been locating in border-states (as in Chihuahua) and that southern states such as Oaxaca have been receiving firms based on labour-intensive processes may signal greater territorial inequalities in the future.

6. The North-South Divide: The Contrasting Experiences of Chihuahua and Oaxaca

In many ways, Chihuahua and Oaxaca represent the opposite cases; in many others, they also share some features. They represent the first and fifth largest territorial extensions in the country respectively, accounting for 17.4 per cent of Mexico's surface. Both states were traditionally oriented towards primary-sector production. They have also been controlled by local elites [140]. Their geographical location could not be more different and at the same time so alike. On the one hand, they both have large extensions of mountainous terrain that complicates intra-state integration. On the other hand, Chihuahua has traditionally been isolated from the national market and the influence of Mexico City, whereas Oaxaca was initially intimately tied to the former; thus, proximity to the main market favoured Oaxaca in the beginning. In contrast, the development of a railway system favoured Chihuahua, providing it with better links to the USA and at the same time to the capital of the country. Although further interdependence between Chihuahua and US states was induced by the new form of transportation the region was never as close to Mexico City. For Oaxaca, the opposite was true. Oaxaca City's relevance waned as the second most important city in the country and the state fell even more behind when it was relegated on the introduction of train tracks. Nevertheless, closer links between US states and Chihuahua, and faster transportation between Oaxaca and Puebla as well as across the Isthmus, have meant that Oaxaca has enjoyed relatively greater integration to the area of influence of Mexico City than that of Chihuahua.

[140] The role of elites in Chihuahua was briefly discussed in Chapter Six. See Basañez (1987) for the case of Oaxaca.

During the ISI model, both economies were oriented towards primary-sector activities. In Oaxaca, farming activities predominated, while this position was assumed by cattle raising in Chihuahua. It is worth mentioning the forestry and mining wealth present in both regions, which would eventually wane by the end of the model. The two states were also similar in the type of industry they had developed by the advanced stage of ISI; to be more precise, they seized its primary-sector industries. The northern region specialised in metallurgy, sawmills, cellulose, meat, wheat-milling and beverage production. Similarly, the southern state relied on corn-mills, sugar mills, sawmills, canning of fruit and vegetables, as well as on cement. Industrialisation grew at a slow pace in both regions, but was particularly incipient in Oaxaca. In terms of regional policy, Oaxaca received far more aid than Chihuahua despite the fact that it was localised and not well planned. However, differences between the two states started to emerge in fundamental aspects. Urban population grew as a proportion of the total in Chihuahua, whereas Oaxaca remained essentially a rural society. Trade liberalisation brought about industrialisation in the former, while the latter's economy continued to be an agrarian one. However, the decline of agricultural activities and the moderate boost of manufacturing in Oaxaca during the NAFTA period merit attention.

Trade and economic integration in the 1980s and 1990s, seem to have led both states along very different development paths. As already mentioned above, ISI brought about a process of convergence, which entailed high-growth rates for Oaxaca and economic contraction for Chihuahua. As entry to GATT brought about trade liberalisation in the country, growth rates soared in the latter and plummeted in the former, initiating a process of divergence. NAFTA has exacerbated the already existing North-South divide.

The regional effects of the new economic model applied in Mexico since 1986 can be observed not only in the changes in the sectoral structure of the economy, but also in the impact on particular industries that were favoured during ISI through a State-driven economy. The effects of the government's withdrawal from direct intervention in specific industries were felt in both states. During GATT, Chihuahua suffered the collapse of its smelting industry and struggle in corn milling after the elimination of guaranteed prices. In Oaxaca the effects were felt in more activities. Not only corn-related activities suffered, but tobacco production was also damaged and the role of the paper industry was transformed. In addition, oil refining in Oaxaca was still a decisive industry even during GATT; however, with economic integration its relative importance has been challenged by other manufacturing activities. Although both states were affected by the withdrawal of the State from the economic activity, Oaxaca was hit harder. Indeed, the liberalisation of grain prices disrupted both regional economies, but the effect on other sectors was more widespread in Oaxaca. In the northern state, the impact was profound but limited to a single manufacturing branch, whereas in the southern state, intervention was embedded in almost every important activity, provoking a collapse of the economy. Trade liberalisation, then, had disproportionate effects across regions, undoubtedly affecting the border-state, but at the same time offering an opportunity to further investment and exports. In the South, GATT ravaged the economy, not directly by competition, but by reducing the size and areas of State intervention. Moreover, NAFTA offered increased opportunities for Chihuahua, whereas Oaxaca, lacking competitive foreign firms, was distressed by competition.

Perhaps the main differences in the path towards industrialisation followed by the two states have been in the type of activities and the scale of production pursued in either region. In Chihuahua predominantly foreign-owned medium to large-sized firms have been increasingly producing relatively more capital-intensive commodities, whereas in Oaxaca production has been related to micro and small firms with small-scale production. However, the first signs of industrialisation recently observed in the latter are related to the fact that some maquiladoras are now choosing locations in the South in the search for cheaper labour costs and smaller agglomerations, allowing for, amongst other things, less rotation of personnel. In fact, whereas in Oaxaca we can observe the arrival of first-generation maquiladoras, in Chihuahua there is evidence of the emergence of second and third-generation maquiladoras. On the one hand, not only capital-intensive processes, but also design and R&D activities have been locating in Chihuahua. On the other hand, labour-intensive processes requiring less technical skills in the labour force have been establishing in Oaxaca. Whereas the latter is still taking the first steps on the road towards industrialisation, Chihuahua is already experiencing an advanced form of industrialisation, that of capital-intensive activities and R&D involvement.

In both cases, the growth trend followed that of exports in the three periods (except for Oaxaca during GATT). Trade liberalisation brought about a restructuring in the composition of exports. That determinant became increasingly related to maquiladora in the case of Chihuahua, which supported the staggering growth rates during GATT. In Oaxaca, the positive trend in exports does not match the negative performance of the economy once trade is introduced, which is explained by the fact that those exports were mainly oil, which was refined and shipped in Oaxaca, few links with the local economy being established.

Education does not fit the pattern of growth in at least one of the states in all three periods. Indeed, it does not account for Chihuahua's contraction during the closed-economy approach, nor does it follow Oaxaca's declining figures with GATT. One possible reason for this discrepancy is that average schooling years do not fully equate with the level of skills in the labour force. If the available data for the NAFTA period on technical education is considered, it is clear that whereas the northern state achieved a lower rate of progress in schooling years than Oaxaca, it also featured one of the highest levels of technical education. It is possible that firms are taking into account the technical preparation and the skills of the labour force in deciding their location, thereby giving rise to a more knowledge-based economy.

Maquiladora employment in Chihuahua evinces that the activity has supported growth in the region after GATT. Even during ISI, it is possible that growth in the industry's employment reduced the economic contraction by the end of the period, making the economic crisis milder in Chihuahua than in most border-states. In contrast, as Oaxaca lacked maquiladora employment, the variable cannot possibly account for economic changes in the region. Nevertheless, recent arrivals of maquiladora plants to Oaxaca signal interesting potential regional transformations in the future that must be carefully monitored.

Public investment patterns were almost entirely unrelated to growth. During ISI, they followed the declining trend in Chihuahua's economic performance, but did not account for Oaxaca's impressive growth during the same time span. Moreover, they declined in both states during GATT; whereas in the case of the former, public funds declined sharply while economic performance soared, the minor reduction in the case of the latter was not reflected in Oaxaca's economic decline after trade liberalisation. Although the variable matched growth patterns in Chihuahua during NAFTA, its positive trend in Oaxaca contradicted growth rates in the state. However, it is important to note that the variable does not distinguish between types of investment. As in the case of Oaxaca, after economic integration at least, public funds may have been allocated primarily to providing social infrastructure, while overlooking productive and supportive projects. Similarly, public investment could have been focused on providing infrastructure for industrial location as in the case of Chihuahua during the ISI period. The effect of public investment on growth, however, is unclear. Evidence discussed in this chapter and the one provided by Chapter Five's regressions contrast on the role of public investment. However, the possibility that the allocation of public funds can increasingly reinforce the North-South divide should be carefully examined by further research.

One of the key aspects determining regional growth in the model presented in Chapter Five was distance to the relevant market. Distance is a feature that in the strict sense is fixed. However, as concluded in Chapter Five and argued by Krugman and Livas Elizondo (1996) and in Hanson (1998), when trade was introduced in Mexico there was a shift in the relevant market. The larger market of the USA became the relevant market after NAFTA. In the cases presented above, it is evident that the benefits of trade are localised and that the process of divergence has been guided by proximity to the main market. In that sense, Chihuahua by being on the border has been seizing the gains from trade, whereas Oaxaca being farther away from the USA has relied on the declining market of Mexico City. However, regional disparities in Mexico are likely to increase not only due to distance and transportation costs but also to other factors underlined above, such as the role played by the State in the economy. It is possible however, that the new role played by state governments, as observed in both cases at the end of GATT, could alter the North-South divide pattern that was reinforced by trade liberalisation and economic integration.

7. Conclusions

The present chapter has found confirmation of some of the conclusions presented in the previous chapter. The cases analysed in this chapter have helped to determine the reasons for the changes manifest in the significance of exports; initially biased by oil and later dominated by maquiladora activities. Likewise, the cases confirm that not only initial schooling, but also a more technical education provided a relevant explanation for growth. Thus, it is likely that a more knowledge-based economy has emerged. As explored in the case of Chihuahua, the maquiladora sector is becoming increasingly important, both in terms of explaining exports and in determining growth; however, its influence is still limited in non-border states. Interesting developments in the sector such as the location of more capital-intensive processes in the North and relatively more labour-intensive ones in the South complicate the picture. In the future, monitoring the variable is recommended. Both in the cases studies and in the regressions presented in Chapter Five, public investment does not seem to drive growth; however, its lack of explanatory capacity could be related to the type of infrastructure developed. In addition, it is possible that the allocation of public funds could increasingly be exacerbating disparities. Traditional factors used to explain territorial inequalities such as migration, oil and initial levels of education can no longer account for exacerbated regional disparities. Instead, other factors such as trade (exports), distance to the market and technical education seem to be shaping imbalances. In addition, the absence of regional policies after GATT has been progressively counterbalanced by the emergence of local governments as real political powers, capable of designing and implementing their own development policies. However, territorial competition could actually end up harming backward regions; that is, the emergence of the regions as real political powers seems to be a double-edged knife. In sum, the cases confirm most of the conclusions presented in Chapters Four and Five and offer an explanation for the variable's trends based on contextual information of the cases that otherwise would have been impossible to assess.

Public policies could be aimed at improving the conditions of the labour market, particularly in low-income regions. Technical education and the provision of a more productive and supportive infrastructure in low-income states such as Oaxaca could be a determinant in improving out-migration rates and industrial concentration. It is also possible to carry out the promotion of an export-oriented culture throughout Mexico, in order to diversify the composition of exports, which are currently biased by maquiladora activities.

Chapter Eight Conclusions

1. What Has Been Attempted?

The scarcity of research carried out on the relationship amongst trade, growth and geography nurtured the interest of uncovering the threads that link them. More precisely, the thesis addressed the possibility that different approaches to trade could shape territorial growth. For the reasons offered at the outset of the thesis, the research has focused on the effect of different trade regimes on Mexico's regional transformations. It has been explored whether freer trade has led to deepened regional disparities in Mexico. The Mexican case was explored with the aim of contributing to the understanding of the effects of trade on growth and geography. The thesis found confirmation of the hypothesis; that is, that the impact of trade liberalisation in Mexico has been the exacerbation of inequalities amongst regions. However, before endeavouring to present the main findings, it is important to recall that they are limited by a number of factors.

2. Caveats

As argued in Chapter Two, models based on comparative advantage have remained silent on the spatial transformations entailed by trade. Therefore, the use of elements stemming from trade theory models was limited. Alternatively, some of the factors used in the empirical chapters referred to the new economic geography. Although the latter has proved to be a useful theory to explain the spatial implications of trade, the thesis has made limited reference to neo-classical trade models.

A further caution should be expressed about the results referring to the new economic geography. Although some of the elements (such as proximity to the market) used by the theory were introduced to the empirical analysis, others were not employed. The difficulty in measuring congestion costs as part of the centrifugal forces, for instance, led to its exclusion from the model. Some other factors such as backward and forward linkages were not included, the reason being that the analysis of growth at state level was incompatible with inter and intra-industry levels of analysis, which are the basis of such linkages.

Above all, the main obstacle to constructing the model was the availability and reliability of data. The former thwarted the inclusion of very important variables in the theory, such as R&D. The latter is a drawback that is present throughout the thesis. Official Mexican data is becoming increasingly available. However, some of the periods used in the thesis required older data, which in turn brought about two problems. First, some years were not reported for some variables, as in the case of export data for 1985 to 1992, which resulted in the use of other dates. Second, there is indication that data for some variables is not very good, as in the case of capital accumulation. Results for that period show a strong association between capital accumulation and other variables, while the model-fit was notable. The presence of high multicollinearity entailed by bad data is thus, a setback that should be borne in mind. Nevertheless, some conclusions can still be drawn from the analyses.

3. What Do We Know?

Although trade theory has not so far addressed the spatial implications of trade, further elements for its understanding have been offered by the new economic geography. This new explanation has been tested for the Mexican case. Although regional disparities have always existed in Mexico, they were altered by the trade regimes implemented at the time. The ISI model, which was adopted chiefly as a reaction to foreign factors, provided the necessary conditions for disparities to accrue. The group of high-income states comprised the large metropolitan areas (Mexico City, Monterrey and Guadalajara) and border-states. The divide between border-states and metropolitan areas on the one hand, and the rest of the country on the other, was sharper during GATT. With the signing of NAFTA, exports and FDI have soared and maquiladoras have been favoured by proximity to the USA, boosting the Mexican economy. However, regional disparities have been accentuated: border-states and the largest metropolitan areas have been benefiting most form trade.

The profits from trade have been accruing in Mexico. However, their regional distribution, at least in terms of growth, has been unequal. Initially high-growth rates achieved by low-income states, described a pattern of convergence. The trend started to change with increased exchanges; during GATT, high-growth rates were scattered throughout the country. The pattern of divergence became clearer under NAFTA, when positive growth performance was associated with high-income regions. The convergence analyses carried out in Chapter Four found a convergence trend during ISI, which was reversed by trade. Indeed, trade liberalisation and economic integration have led to divergence and greater territorial inequalities. However, the results depend on the sample considered. On the one hand, controlling for the influence of the oil industry during GATT revealed the trend towards greater disparities. On the other hand, NAFTA was associated with divergence as long as the sample used included border-states, which signaled the influence of such states and maquiladora activities on territorial imbalances.

Not only the trend towards convergence changed following trade liberalisation, but also the factors impelling regional growth varied. The closed-economy approach and the 'petrolisation' of the economy led the economy to rely on oil production and its exports. In addition, growth during ISI was driven by migration and by initial levels of education and capital accumulation. Migration meant a pooled labour market for receiving states, whereas it implied remittances for the region losing population. Trade liberalisation and the decline of the oil industry brought about regional divergence. Although migration, through strengthening labour markets and allowing remittances, was still important, the relevance of education waned. In this period of transition, capital accumulation was even more important than schooling. However, some important changes were about to occur. Integration with Canada and the USA through NAFTA, reinforced regional divergence and intensified territorial imbalances. Exports were the main factor propelling growth. However, those exports were not based on oil as during ISI, but on manufacturing production spurred by the dynamism of maquiladora. Moreover, a knowledge-based type of economy seems to be emerging in parts of Mexico. Although such claim is not supported by the statistical analysis of Chapter Five, the influence of technical education is clearer in the case of Chihuahua explored in Chapter Six. In addition, the main market of the economy had shifted. Whereas during the closed economy, Mexico City constituted the prime market, its relevance waned after NAFTA, proximity to the US border and the international market has emerged as the dominant geographical force determining growth.

The growth analyses performed in this thesis yielded a number of interesting inferences. Neo-classical predictions on growth seem to apply more to the closed economy than to trade liberalisation. Instead, factors such as *history matters* and proximity to the market, considered by the new economic geography, are progressively more important. Moreover, a new more knowledge-based economy could be emerging in which technical skills are increasingly important. As Krugman and Livas Elizondo (1996) have argued, the relevant market has shifted after trade. The increasing importance of border-states as postulated by Hanson (1998) was also confirmed. However, the effects of trade on Mexico City are unclear. It is possible that the economic *vocation* of the City has changed, placing more emphasis on financial services than on manufacturing. However, manufacturing activities once based in the traditional agglomeration could have been following two different but not mutually exclusive trends. First, some firms could be still benefiting from wider, stretched, regional rather than local external economies, locating in neighbouring states. Second, the old manufacturing belt could be moving North seizing proximity to the larger market of the USA. However, these are only possibilities, as the scope of this thesis did not allow further insight.

Maquiladora activities have been spurred by the opening up of the economy and by the process of integration. Not only do they represent three quarters of the value of production in manufacturing (although it represents more modest shares of value added), but they are also heavily concentrated in border-states. Although southern states are starting to attract maquiladoras, the type of industries locating in the border and in the South are fundamentally different and could lead to greater disparities in the future. Second and third-generation maquiladoras located in the North are giving more impetus to capital-intensive processes, technical skills, design and R&D. In contrast, the typical first-generation maquiladoras now locating in the South are based on lower wages and labour-intensive processes. These differences signal greater disparities in the future.

The case studies of Chihuahua and Oaxaca confirmed most of the arguments presented throughout the thesis. In the case of the former, trade liberalisation has favoured the industrialisation of the region. NAFTA has brought about opportunities for second and third-generation maquiladoras. These types of maquiladoras favour the operation of a knowledge-based economy; in the future, technical skills will be even more important. Moreover, the case of Chihuahua also evinces the emergence of regional and local governments as new powers capable of designing and implementing their own development strategies. In contrast, trade liberalisation and NAFTA hampered growth in Oaxaca. Although there are signs of industrialisation, it is as yet modest. The increasing importance of regional governments is also evident in the case of Oaxaca. Urbanisation and industrial-promotion efforts carried out by the state government have led to the arrival of the first labour-intensive maquiladoras. Yet, regional industrial differences (in maquiladora processes) and the possible emergence of the knowledge-based economy, warn of exacerbated territorial inequalities in the future.

4. The Way Forward

The findings of this research should be contrasted to future work on other countries and regions in order to perfect our understanding of the driving forces of growth and their relationship to trade and space. In addition, more research is needed to clarify the effects of technical education and R&D on regional growth patterns. However, such analyses will be curtailed in the case of Mexico by the availability of data.

In contrast, there is available data that would allow the determination of the effects of other centripetal forces such as backward and forward linkages over production patterns. However, that type of analysis requires a different approach and more detailed data (e.g., panel data using four-digit industry data). Similarly, the understanding of agglomeration of production and indirectly of regional advancement or decline, would be greatly improved by research into the ways to include centrifugal forces into the analysis. In the particular case of Mexico, it is important to monitor the trends in the maquiladora industry, since its locational behaviour could lead to greater disparities.

It is also particularly important to explore the transformations experienced by Mexico City, since this could fundamentally aid our understanding of the tension between centripetal and centrifugal forces. Manufacturing decline in the capital has been accompanied by an improvement in services, chiefly financial ones; thus, the City's main *vocation* could have changed. Furthermore, it is paramount to investigate whether the decline of manufacturing in the old hub is related to the rise of sectoral production in neighbouring states and/or on the border. The former would confirm the possibility of location economies' expansion, whereas the latter the dismantling of the traditional manufacturing belt. Political factors and the role of different levels of government should also be considered in future research.

The understanding of the relationship between trade, growth and space can be greatly advanced by observing other cases and indeed, other commercial blocs. Are the transformations observed in the Mexican case found in Canada and the USA? Although the former was already greatly integrated with the US economy, the integration of Mexico into the trading bloc could have affected both economies, and particularly that of the USA. Industrial location in Mexican border-states may also have influenced the establishment of parent-company branches on the northern side of the border. In turn, migration patterns and income disparities in the USA could have been affected by increasing trade with Mexico, but also by FDI flows.

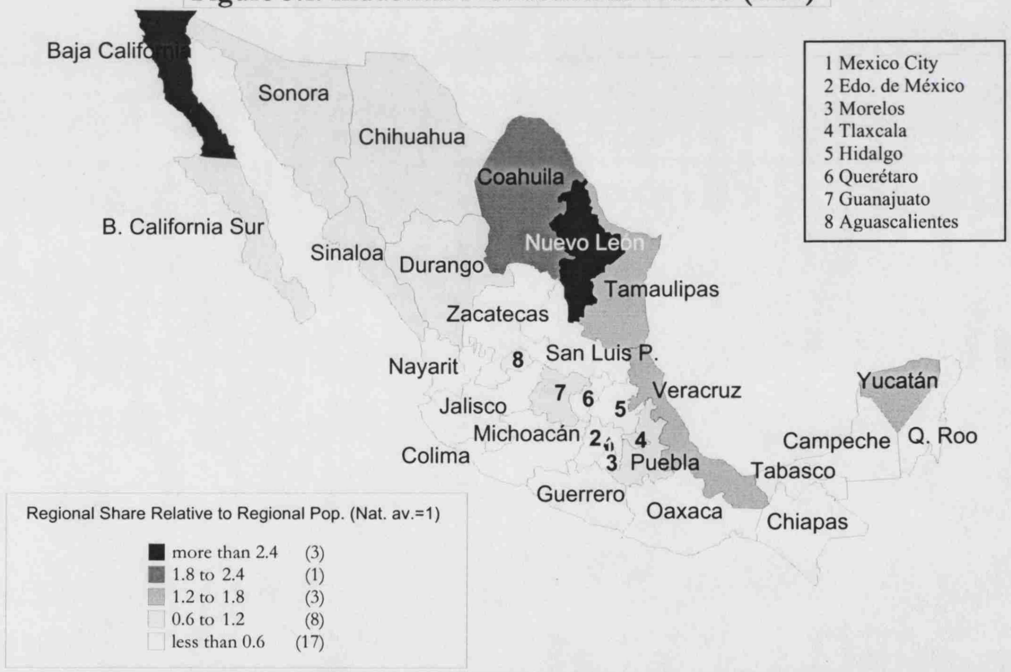
The implications of the arguments presented in this thesis should also be tested in other trading areas such as MERCOSUR or APEC. Although NAFTA is the only agreement through which both developing and developed countries have decided to integrate, agreements amongst more similar economies could also have influenced growth and inequalities. Is this true in the case of Argentina or Brazil in MERCOSUR? Is location of production altered by integration? Could that lead to increasing concentration or to convergence? Testing these questions in different trading areas would provide a more solid set of empirical results that can contribute to the ongoing theoretical debate.

Annex 1
The Territorial Economy Prior to ISI

The main economic activities during this period were, related to the primary sector. Agriculture and mining contributed with 37.4 per cent of national GDP, whereas manufacturing accounted for only 11.7 per cent (Parra, 1954). In order to explore territorial disparities prior to ISI, the analysis must include all activities contributing to GDP. However, regional GDP data for this period is not available. Instead, the analysis presented in this section will focus on manufacturing, since it is the only activity for which state data is available. Data was obtained from the 1930 Industrial Census presented in López Malo (1960). Further personal calculations to obtain the final data presented in Figure A.1 involved the estimation of the region's per capita industrialisation share; that is, the state share of national industrial production with respect to the region's population weight on the national.

Manufacturing was fostered through the welcoming of foreign investment and the further development of the railway system. As a result, the first signs of industrialisation can be identified. Between 1921 and 1935, manufacturing grew 7.6 per cent annually, while the economy as a whole grew only one per cent (Solís, 1990). As expected under an enclave-economy model, mining contributed more to GDP than manufacturing. By 1930 the trend was reversed, manufacturing represented more than 16 per cent, while mining accounted for just 9.26 per cent (Solís, 1990). However, from a regional perspective, such industrialisation was far from homogeneous. According to Figure A.1, prior to ISI, apart from Mexico City, the most industrialised states were border-states Nuevo León and Baja California. The second tier of industrialisation was composed of just one other state in the border: Coahuila. The third level (still with industrialisation levels above the national average), was integrated by Tamaulipas and Veracruz in the border and the centre respectively, as well as by Yucatán in the peninsula. The fourth category exhibited in Figure A.1, comprised those states with national-average industrialisation levels, such as border-states Sonora and Chihuahua, northern non-border states of Baja California Sur, Sinaloa and Durango, as well as by states in the centre such as Guanajuato, Puebla and Tlaxcala. The rest of the country experienced below average industrialisation.

Figure 3.1: Industrial Production in Mexico (1930)



Source: Personal calculations based on López Malo (1960) and INEGI (1990)

Industrial concentration in a few areas was the norm. Greater value-added manufacturing tended to locate near consumption and production centres, namely Mexico City. The highest level of per capita industrialisation was therefore, associated with such activities as pharmaceutics, printing, textiles and tobacco in the case of

Mexico City. Indeed, Mexico City's activities were mainly fostered by the fact that it constituted by far the largest market in the country (Hernández Laos, 1985). Nuevo León hosted activities such as metallurgy, beer, glass, tobacco and steelworks, while Baja California was the location of cotton pitting, industrial-use oil, fish processing, beer and wheat mills.

Some other industries, such as resource-based activities, sought proximity to inputs. Relatively less-industrialised regions were thus associated with these types of industries. Coahuila was, in 1930, only slightly behind the three most industrialised states, mainly thanks to cotton processing (pitting, packing, spinning and weaving), steelworks, metallurgy and wheat mills (Hughlett, 1946). Together Baja California (slightly more industrialised) and Coahuila accounted for up to 85 per cent of wheat production (Hughlett, 1946), indicating that even relatively industrialised regions hosted resource-based activities. This trend is even clearer in states in the third level of industrialisation. Tamaulipas was associated with cotton processing, sugar mills and vegetable oil, whereas Veracruz excelled in oil extraction, coffee processing and sugar mills. Similarly, the sisal-textile industry thrived in Yucatán. In contrast, industrialisation did not take off in southern states, the peninsula (except for Yucatán) and some northern non-border states such as Zacatecas and San Luis Potosí. Other reasons for the pattern of industrial localisation were transportation costs, public-services efficiency, the existence of other firms, climate, labour supply and wage levels (López Malo, 1960).

Industrialisation was characterised by the domination of Mexico City and to a lesser extent Nuevo León. The largest market in the country not only agglomerated industrial activity and public resources but also population. The country had started a process of urbanisation. In 1900, the urban population represented 10.5 per cent of the total; by

1930, it had risen to 17.5 per cent (Alba, 1982). Mexico City represented almost 15 per cent of the urban population; moreover, the figure rises to nearly 30 per cent if we consider nearby states (Alba, 1982). The expansion of public investment and services required for the industrialisation effort benefited Mexico City and surrounding areas, which in turn encouraged further location of industries in the region (Hernández Laos, 1985). For instance, 99 per cent of the pharmaceutical industry was located in Mexico City, distributing part of its production to the rest of the country (López Malo, 1960). The existence of other industries and the externalities that might have arisen by being close to one another, such as knowledge spillovers, were additional explanations for high concentration of activity.

It is important to highlight the fact that whereas most of the cotton pitting was done in border-states, the majority of textile industry was located close to Mexico City. This underlines the possibility that the industrialisation stage of product may have determined whether input or market proximity was more relevant. Similarly, foreign trade represented an additional market that stimulated the localisation of some industries in places with good access to the US border or harbours such as Veracruz. Thus, prior to the adoption of protectionist measures, industrialisation was fostered near urban conglomerates, as well as in regions with natural resources to be exploited and exported such as those concerning mining, textiles, oil or industrially processed agricultural commodities, including sugar.

In terms of concentration, Table A.1 shows that in 1930, 28.01 per cent of manufacturing production was located in Mexico City, followed by Veracruz that produced 11.29 per cent, Nuevo León with 7.85 per cent, and Puebla with 6.83 per cent. Over 40 per cent was produced in Mexico City and its area of influence, namely, Edo. de México, Puebla and Hidalgo. Border-states concentrated 22.31 per cent of national production. Of particular importance was the concentration that took place in the north-east. Nuevo León, Coahuila and Tamaulipas produced 16 per cent of total national output. Furthermore, almost 60 per cent of total production was concentrated in just five regions: Mexico City, Veracruz, Nuevo León, Puebla and Coahuila. The concentration of activity in those states provides evidence in support of the argument that industrialisation was influenced by the location of the natural resources to be exploited, proximity to the main markets and good access to ports. Agglomeration economies could have also provided rewards for firms locating close to each other, compensating for greater transportation costs.

Annex 2
OLS Results Using Agriculture and Foreign Direct Investment

Three regressions for each of the periods were ran using regional data for agriculture's share of total employment, as well as FDI's logged values. A fourth regression for ISI using the 1970-85 data was also performed. It is important to observe that the regressions include a measure of initial income controlling for the process of convergence or divergence.

Table A.2: OLS Results with Agriculture and FDI

	ISI 1970-85	ISI 1980-85	GATT	NAFTA
y0	-0.066 (-0.174)	-0.401 (-1.784)*	-0.825 (-7.147)***	-0.625 (-2.795)***
agr	0.256 (0.675)	-0.200 (-0.889)	-0.760 (-6.578)***	-0.526 (-1.765)*
fdi	---	---	---	0.487 (1.921)*
R sq.	0.100	0.101	0.692	0.425
Adj. R sq.	0.037	0.039	0.671	0.363

As can be observed in Table A.2, agriculture and FDI were significant in explaining regional growth only in GATT and NAFTA. The most robust result is attained by agriculture during GATT and its negative correlation to growth signals the fact that agricultural activities are related to regional economies that have performed poorly in terms of growth. Hence, agriculture's share of total regional employment does not spur growth.

In contrast, FDI flows are influencing growth during NAFTA which is in line with the findings of Chapter Five in which maquiladora and distance to the USA are found related to growth. FDI is attracted to the country chiefly to manufacturing activities (see Table 3.8), which typically take advantage of the maquiladora programme. Since maquiladora activities are already included in Chapter Five's model and due to the number of variables included in the model, as well as the lack of available data for ISI and GATT, FDI was not included in the final model.

Annex 3
OLS Results for the ISI Period (1970-85)

As can be observed in Table A.3, only initial income and the proxy for the oil industry are significant in determining growth over the 1970-85 interval of the ISI period. Convergence is, once more, the result of the regressions for this period albeit it is conditioned by the inclusion of the proxy for the oil industry in the model. In contrast to the results in Chapter Five, distance to Mexico City was found to be not significant in the regressions for the 1970-85 interval. However, the lack of available data for other variables used in this thesis prevents a more thorough analysis.

Table A.3: OLS Results for ISI (1970-85)

	1	2	3
y0	-0.292 (-1.674)	-0.265 (-2.942)***	-0.259 (-2.518)**
camtab		0.825 (9.161)***	0.830 (8.683)***
dismx			-0.057 (-0.579)
disus			0.012 (0.113)
R sq.	0.085	0.765	0.769
Adj. R2	0.055	0.749	0.735

Standardized coefficients reported. t-statistics in parenthesis under coefficients.
***,**, and * denote significance at the 99%, 95%, and 90% respectively

Statistical Appendix to Chapter Five

1. Per Capita GDP

	PER CAPITA GDP				
	1970	1980	1985	1993	2000
Aguascalientes	8.31884058	11.77361	11.40344	14.0218	17.95853
Baja California	15.37623188	19.14799	17.19207	16.33376	19.36081
Baja California Sur	14.61681159	18.90549	15.54583	17.16507	18.64365
Campeche	8.818550725	11.3425	85.33358	23.06557	23.0556
Coahuila	12.69333333	17.09695	16.08931	16.06465	20.00629
Colima	9.073623188	13.598	14.35142	13.57378	15.19294
Chiapas	5.24057971	13.02281	9.071921	5.922127	6.39408
Chihuahua	10.75826087	14.0862	13.69287	17.39332	21.62156
Distrito Federal	20.44521739	28.50868	25.44349	33.12017	38.90302
Durango	7.624347826	10.78226	12.12859	10.65795	12.42608
Guanajuato	7.554782609	9.684989	9.426613	9.131081	10.37374
Guerrero	5.475942029	7.912234	7.608656	7.739635	7.841524
Hidalgo	5.702028986	9.778983	9.256585	8.707547	9.399526
Jalisco	11.01681159	15.03321	14.26418	13.0886	14.97196
México	11.26724638	14.47318	13.23348	10.82383	12.10672
Michoacán	5.575652174	8.266658	7.448411	7.1608	8.761615
Morelos	8.87884058	11.42327	11.4935	13.02574	13.33076
Nayarit	8.018550725	10.59204	10.62172	8.660314	8.970796
Nuevo León	17.60115942	23.50718	22.04318	21.73818	26.52197
Oaxaca	3.753043478	5.939514	6.813501	5.983976	6.338581
Puebla	6.585507246	9.696854	9.061157	8.335413	9.967394
Querétaro	8.293333333	12.80895	14.48305	13.89611	18.08822
Quintana Roo	10.31884058	17.85582	14.68796	23.96762	22.34967
San Luis Potosí	6.195942029	8.696662	9.398598	9.610605	11.09204
Sinaloa	9.887536232	11.29577	11.35103	11.34938	11.85493
Sonora	14.67942029	16.1803	15.99643	15.54181	18.24914
Tabasco	7.671884058	36.29656	21.96744	9.023589	9.14501
Tamaulipas	11.12927536	15.33465	13.81134	13.38789	16.26916
Tlaxcala	4.828985507	8.221207	10.07758	7.005272	8.304042
Veracruz	8.60057971	10.80079	10.15144	8.086748	8.795366
Yucatán	7.586086957	10.68536	9.507901	10.39573	11.94465
Zacatecas	5.484057971	7.022684	8.010679	7.348881	8.358201

Source: INEGI (1985a: 9, 11; 2000a) and Presidencia de la República (1999: 297-302)

	GDP GROWTH			
	1970-85	1980-85	1985-93	1993-2000
Aguascalientes	0.315391822	-0.03195	0.206698	0.247452
Baja California	0.111625404	-0.10775	-0.05121	0.170017
Baja California Sur	0.061619906	-0.19566	0.099084	0.082629
Campeche	2.269710504	2.018011	-1.30823	-0.00043
Coahuila	0.237078206	-0.06074	-0.00153	0.219425
Colima	0.45847706	0.053926	-0.05571	0.112691
Chiapas	0.5487519	-0.36152	-0.42649	0.076677
Chihuahua	0.241201001	-0.02832	0.239211	0.217605
Distrito Federal	0.218710987	-0.11375	0.263682	0.16093
Durango	0.464218938	0.117664	-0.12926	0.153491
Guanajuato	0.221356067	-0.02704	-0.03185	0.127593
Guerrero	0.328922187	-0.03912	0.017068	0.013079
Hidalgo	0.484513101	-0.0549	-0.06115	0.076469
Jalisco	0.258328826	-0.05251	-0.08601	0.134437
México	0.160850296	-0.08955	-0.201	0.112011
Michoacán	0.289591436	-0.10423	-0.03938	0.201758
Morelos	0.25811073	0.006129	0.125146	0.023147
Nayarit	0.281142872	0.002798	-0.20415	0.035223
Nuevo León	0.225038273	-0.0643	-0.01393	0.198903
Oaxaca	0.596339013	0.137279	-0.12982	0.05757
Puebla	0.319125496	-0.0678	-0.08348	0.178806
Querétaro	0.557526932	0.122835	-0.04137	0.263652
Quintana Roo	0.353056909	-0.1953	0.489675	-0.06989
San Luis Potosí	0.41666598	0.077621	0.022307	0.143361
Sinaloa	0.13803386	0.004881	-0.00015	0.04358
Sonora	0.085919348	-0.01143	-0.02883	0.160584
Tabasco	1.051999136	-0.50216	-0.88972	0.013366
Tamaulipas	0.215911222	-0.10462	-0.03114	0.19492
Tlaxcala	0.735676536	0.203596	-0.36365	0.170079
Veracruz	0.165786347	-0.062	-0.22739	0.083998
Yucatán	0.225807265	-0.11675	0.089272	0.138888
Zacatecas	0.37893015	0.13163	-0.08623	0.128695

Source: Presidencia de la República (1999: 297-302) and INEGI (2000a)

	ANNUAL AVERAGE GROWTH*			
	1970-85	1980-85	1985-93	1993-00
Aguascalientes	0.021026	-0.00639	0.025837	0.03535
Baja California	0.007442	-0.02155	-0.0064	0.024288
Baja California Sur	0.004108	-0.03913	0.012386	0.011804
Campeche	0.151314	0.403602	-0.16353	-6.2E-05
Coahuila	0.015805	-0.01215	-0.00019	0.031346
Colima	0.030565	0.010785	-0.00696	0.016099
Chiapas	0.036583	-0.0723	-0.05331	0.010954
Chihuahua	0.01608	-0.00566	0.029901	0.031086
Distrito Federal	0.014581	-0.02275	0.03296	0.02299
Durango	0.030948	0.023533	-0.01616	0.021927
Guanajuato	0.014757	-0.00541	-0.00398	0.018228
Guerrero	0.021928	-0.00782	0.002133	0.001868
Hidalgo	0.032301	-0.01098	-0.00764	0.010924
Jalisco	0.017222	-0.0105	-0.01075	0.019205
México	0.010723	-0.01791	-0.02513	0.016002
Michoacán	0.019306	-0.02085	-0.00492	0.028823
Morelos	0.017207	0.001226	0.015643	0.003307
Nayarit	0.018743	0.00056	-0.02552	0.005032
Nuevo León	0.015003	-0.01286	-0.00174	0.028415
Oaxaca	0.039756	0.027456	-0.01623	0.008224
Puebla	0.021275	-0.01356	-0.01044	0.025544
Querétaro	0.037168	0.024567	-0.00517	0.037665
Quintana Roo	0.023537	-0.03906	0.061209	-0.00998
San Luis Potosí	0.027778	0.015524	0.002788	0.02048
Sinaloa	0.009202	0.000976	-1.8E-05	0.006226
Sonora	0.005728	-0.00229	-0.0036	0.022941
Tabasco	0.070133	-0.10043	-0.11121	0.001909
Tamaulipas	0.014394	-0.02092	-0.00389	0.027846
Tlaxcala	0.049045	0.040719	-0.04546	0.024297
Veracruz	0.011052	-0.0124	-0.02842	0.012
Yucatán	0.015054	-0.02335	0.011159	0.019841
Zacatecas	0.025262	0.026326	-0.01078	0.018385

Source: Presidencia de la República (1999: 297-302) and INEGI (2000a)
*/ Average annual growth rates were used on Chapter 4 for the convergente/divergente análisis.

2. Exports

	EXPORTS (1993=100)			
	1981	1984	1993	1998
Aguascalientes	0	0	265565209.8	1311467
Baja California	5036605	8586464	15853317959	38225153
Baja California Sur	51655.51	123406.6	322459260	240658.5
Campeche	31472.72	27983325	138644119	85506.93
Coahuila	931647.3	5081122	5226248843	12784134
Colima	568832.8	474524.8	57218904.18	60028.53
Chiapas	378788.8	473642.3	443487914.6	636636.6
Chihuahua	4518860	2700531	27083167596	39535216
Distrito Federal	5975791	1704974	36553634320	89973258
Durango	0	0	1344446185	2560223
Guanajuato	0	0	1434441022	4015184
Guerrero	189842.7	120117.8	85486915.94	213529
Hidalgo	0	0	260331555.7	934440.3
Jalisco	939533.8	1689830	4101629954	4271191
México	0	0	3504170785	9172045
Michoacán	18170.01	520205	1169437672	3178608
Morelos	0	0	245023004.2	1171949
Nayarit	0	0	87805896.11	109583.7
Nuevo León	14729.96	798188.7	7867627203	19637069
Oaxaca	248360	9285226	157669975.5	113319.4
Puebla	0	0	4036708854	15563195
Querétaro	0	0	831356041.1	4577504
Quintana Roo	14420104	59948.61	105752572.2	160786.8
San Luis Potosí	0	0	911229477.1	1985889
Sinaloa	403692.5	258833.9	1973502944	1999193
Sonora	4252422	6732360	7365802550	13436897
Tabasco	0	0	39744175.08	62382.21
Tamaulipas	14368503	21102903	14471475967	25198577
Tlaxcala	0	0	145003479.9	767589.2
Veracruz	51832034	59780550	1076764382	3057888
Yucatán	38060.03	124582.1	370288039.8	1095017
Zacatecas	0	0	172902270.7	313062.5

Source: INEGI (1985b: 312, 315) and SECOFI (2000)

	EXPORT GROWTH		
	1981-84	1984-93	1993-2000
Aguascalientes	0	15.85719354	1.597041194
Baja California	0.533454891	7.520947031	0.880114945
Baja California Sur	0.870887454	7.868247705	-0.292597685
Campeche	6.790243	1.600301569	-0.483312964
Coahuila	1.696333046	6.935916945	0.894511078
Colima	-0.181272652	4.792325768	0.047935589
Chiapas	0.223473558	6.84197349	0.361528501
Chihuahua	-0.514811196	9.213219112	0.378279395
Distrito Federal	-1.254166403	9.972985861	0.900731883
Durango	0	17.47907056	0.644112352
Guanajuato	0	17.54386363	1.029308032
Guerrero	-0.457722533	6.567645307	0.915409364
Hidalgo	0	15.83728915	1.277991658
Jalisco	0.586999571	7.794511621	0.040508332
México	0	18.4370423	0.962206327
Michoacán	3.354450811	7.717810599	0.999920344
Morelos	0	15.77668521	1.565071581
Nayarit	0	14.75046177	0.221560251
Nuevo León	3.992461223	9.19592208	0.914662513
Oaxaca	3.621300512	2.832079554	-0.33029349
Puebla	0	18.57851811	1.349479139
Querétaro	0	16.99839127	1.705850951
Quintana Roo	-5.482890937	7.475369741	0.41897693
San Luis Potosí	0	17.09012788	0.779027342
Sinaloa	-0.444466926	8.939134147	0.012933359
Sonora	0.459437109	6.997677571	0.601156414
Tabasco	0	13.95779641	0.450816882
Tamaulipas	0.384372084	6.530524193	0.554607972
Tlaxcala	0	15.25209086	1.666496982
Veracruz	0.142671966	2.891035531	1.043764019
Yucatán	1.185800298	7.997071502	1.084244354
Zacatecas	0	15.42805964	0.593676284

Source: INEGI (1985b: 312, 315) and SECOFI (2000)

3. Migration

	MIGRATION RATES		
	1980*	**1990****	**1995*****
Aguascalientes	-0.010324308	0.041	0.085
Baja California	0.229690944	0.409	0.3933
Baja California Sur	0.155735292	0.23	0.1904
Campeche	0.044752458	0.094	0.1208
Coahuila	-0.034630066	-0.044	-0.0545
Colima	0.0726867	0.126	0.0957
Chiapas	-0.029962145	-0.039	-0.0569
Chihuahua	0.025470242	0.067	0.0796
Distrito Federal	0.053146004	-0.143	-0.3027
Durango	-0.101786265	-0.188	-0.1988
Guanajuato	-0.10032405	-0.102	-0.083
Guerrero	-0.097909858	-0.152	-0.1529
Hidalgo	-0.130961746	-0.18	-0.1657
Jalisco	0.013370506	0.006	0.0221
México	0.147225428	0.34	0.3921
Michoacán	-0.113155626	-0.172	-0.1657
Morelos	0.03651811	0.182	0.2101
Nayarit	-0.02023257	-0.052	-0.0795
Nuevo León	0.1024233	0.162	0.163
Oaxaca	-0.131829461	-0.176	-0.1906
Puebla	-0.083059856	-0.094	-0.0911
Querétaro	-0.040482466	0.015	0.0697
Quintana Roo	0.375010679	0.539	0.4927
San Luis Potosí	-0.130344612	-0.178	-0.1881
Sinaloa	0.013258532	-0.028	-0.0766
Sonora	0.050194578	0.071	0.072
Tabasco	-0.011960817	-0.014	0.0085
Tamaulipas	0.033184226	0.091	0.0656
Tlaxcala	-0.124775816	-0.091	-0.005
Veracruz	-0.020921507	-0.047	-0.0663
Yucatán	-0.059694338	-0.098	-0.0816
Zacatecas	-0.200382466	-0.338	-0.3145

Source: */ Personal calculations based on INEGI (1986a: 1197-1249) and Partida Bush (1994: 26).
**/ INEGI (1995: 4)
***/ INEGI (1997b: 238-239)

4. Distance to the Market

	MEXICO CITY		USA	
	DISTANCE IN KMS.	LN	DISTANCE IN KMS.	LN
Aguascalientes	511	6.23637	812	6.6995
Baja California	2644	7.880048	0	0*
Baja California Sur	4309	8.368461	1525	7.32975
Campeche	1154	7.050989	2109	7.653969
Coahuila	828	6.719013	309	5.733341
Colima	693	6.54103	1212	7.100027
Chiapas	974	6.881411	1907	7.553287
Chihuahua	1468	7.291656	373	5.921578
Distrito Federal	0	0*	1149	7.046647
Durango	920	6.824374	787	6.668228
Guanajuato	365	5.899897	932	6.837333
Guerrero	275	5.616771	1424	7.261225
Hidalgo	88	4.477337	1124	7.024649
Jalisco	546	6.302619	1010	6.917706
México	64	4.158883	1127	7.027315
Michoacán	302	5.710427	1138	7.037028
Morelos	89	4.488636	1238	7.121252
Nayarit	762	6.635947	1226	7.111512
Nuevo León	925	6.829794	224	5.411646
Oaxaca	454	6.118097	1583	7.367077
Puebla	123	4.812184	1272	7.148346
Querétaro	215	5.370638	932	6.837333
Quintana Roo	1360	7.21524	2315	7.747165
San Luis Potosí	423	6.047372	741	6.608001
Sinaloa	1261	7.13966	980	6.887553
Sonora	1949	7.575072	284	5.648974
Tabasco	773	6.650279	1728	7.45472
Tamaulipas	702	6.553933	509	6.232448
Tlaxcala	113	4.727388	1262	7.140453
Veracruz	306	5.723585	1225	7.110696
Yucatán	1332	7.194437	2287	7.734996
Zacatecas	617	6.424869	682	6.52503

Source: Guia Roji (2000: 3)
*/ In order to calculate the natural logarithm of this observation, the distance considered was 1 instead of 0, since the natural log of 0 does not exist.

5. Capital Accumulation

	BANKING DEPOSITS (1993=100)			
	1980	1985	1993	1998
Aguascalientes	1519104.9	1511105.2	1278200.0	1978616.2
Baja California	8502395.2	5116140.6	4974200.0	6219303.9
Baja California Sur	588500.4	580137.0	515500.0	1322093.2
Campeche	792812.6	758459.1	397100.0	798288.0
Coahuila	6424796.5	4723700.8	3286200.0	4489561.5
Colima	778019.9	834814.2	602500.0	1047087.1
Chiapas	2541812.5	2027540.1	1640800.0	3030339.1
Chihuahua	6420349.4	4940878.0	3976100.0	5536648.6
Distrito Federal	113316678.0	83780151.9	216113100.0	225326087.5
Durango	1653994.5	1565235.6	1057300.0	1742827.2
Guanajuato	6014533.8	6629496.8	5164200.0	8125542.2
Guerrero	2089512.4	1803501.1	1734200.0	2849132.6
Hidalgo	1524464.9	1648605.6	1418500.0	2449072.7
Jalisco	16288913.8	14928053.7	17021600.0	24312324.0
México	2373147.9	9596746.4	3457500.0	12908877.4
Michoacán	4464392.4	5414808.4	3804400.0	1909902.1
Morelos	1823665.5	1960756.7	1586500.0	2703030.9
Nayarit	1093628.2	2158899.7	873200.0	1376638.4
Nuevo León	15628907.6	13207376.2	15979900.0	17068700.7
Oaxaca	1768965.4	1826905.9	1648300.0	2676898.6
Puebla	4840646.0	4466554.2	5245700.0	6181881.3
Querétaro	1643251.0	1365759.6	1474000.0	2488215.1
Quintana Roo	584334.1	522007.4	611900.0	1163317.9
San Luis Potosí	2716188.2	2412659.1	4706800.0	7108101.7
Sinaloa	4797953.2	4839566.5	4585400.0	4762698.4
Sonora	6728701.8	4710894.8	2938500.0	4007328.7
Tabasco	2134124.5	2079747.4	1139900.0	1909902.1
Tamaulipas	7906990.0	6098442.1	4210300.0	6069276.8
Tlaxcala	357552.1	377557.8	405600.0	760641.0
Veracruz	9023837.0	7915448.5	4463600.0	7670787.6
Yucatán	2761689.7	2274525.0	1859400.0	2529189.3
Zacatecas	1182220.4	1237809.1	1132500.0	1479709.6

Source: INEGI (1987: 27; 1994b: 101) and Presidencia de la República (1999: 104)

	BANKING DEPOSITS (LOG VALUES)			
	1980	1985	1993	1998
Aguascalientes	14.233632	14.228352	14.060963	14.497908
Baja California	15.955858	15.447911	15.419775	15.643169
Baja California Sur	13.285333	13.271020	13.152893	14.094727
Campeche	13.583342	13.539044	12.891943	13.590225
Coahuila	15.675676	15.368103	15.005242	15.317266
Colima	13.564507	13.634964	13.308843	13.861523
Chiapas	14.748388	14.522334	14.310694	14.924185
Chihuahua	15.674983	15.413054	15.195812	15.526900
Distrito Federal	18.545697	18.243707	19.191312	19.233059
Durango	14.318704	14.263547	13.871229	14.371019
Guanajuato	15.609689	15.707039	15.457261	15.910523
Guerrero	14.552441	14.405240	14.366057	14.862525
Hidalgo	14.237154	14.315440	14.165111	14.711220
Jalisco	16.605995	16.518753	16.649994	17.006494
México	14.679728	16.076935	15.056056	16.373426
Michoacán	15.311644	15.504648	15.151669	14.462563
Morelos	14.416359	14.488841	14.277041	14.809884
Nayarit	13.905011	14.585109	13.679920	14.135155
Nuevo León	16.564633	16.396286	16.586842	16.652757
Oaxaca	14.385905	14.418134	14.315255	14.800169
Puebla	15.392559	15.312128	15.472919	15.637133
Querétaro	14.312187	14.127221	14.203490	14.727076
Quintana Roo	13.278228	13.165437	13.324324	13.966787
San Luis Potosí	14.814740	14.696240	15.364519	15.776746
Sinaloa	15.383700	15.392336	15.338388	15.376325
Sonora	15.721893	15.365388	14.893410	15.203635
Tabasco	14.573567	14.547757	13.946451	14.462563
Tamaulipas	15.883258	15.623544	15.253044	15.618750
Tlaxcala	12.787036	12.841479	12.913123	13.541917
Veracruz	16.015380	15.884327	15.311466	15.852930
Yucatán	14.831353	14.637282	14.435764	14.743409
Zacatecas	13.982905	14.028854	13.939938	14.207356

Source: INEGI (1987: 27; 1994b: 101) and Presidencia de la República (1999: 104)

6. Human Capital

	AVERAGE SCHOOLING YEARS			
	1980	1985	1993*	1998*
Aguascalientes	4.7	5.7	7.5	8.6
Baja California	5.4	6.5	7.7	8.3
Baja California Sur	5.3	6.4	7.6	8.2
Campeche	4.1	5.0	6.4	7.3
Coahuila	5.2	6.3	7.7	8.7
Colima	4.9	5.8	7.2	8.1
Chiapas	2.5	3.4	4.7	5.6
Chihuahua	4.9	5.9	7.1	7.9
Distrito Federal	7.0	7.9	9.1	9.8
Durango	4.3	5.3	6.7	7.4
Guanajuato	3.3	4.3	5.7	6.5
Guerrero	2.9	4.0	5.4	6.2
Hidalgo	3.4	4.5	5.7	6.4
Jalisco	4.5	5.5	6.8	7.5
México	5.0	6.1	7.4	8.1
Michoacán	3.4	4.3	5.9	7.0
Morelos	4.6	5.7	7.2	8.2
Nayarit	4.4	5.3	6.7	7.6
Nuevo León	6.0	7.0	8.7	9.8
Oaxaca	2.8	3.7	5.1	6.0
Puebla	3.7	4.7	6.1	7.0
Querétaro	3.8	5.0	6.8	8.2
Quintana Roo	4.1	5.2	7.0	8.2
San Luis Potosí	3.7	4.8	6.1	6.8
Sinaloa	4.5	5.6	7.0	7.7
Sonora	5.2	6.3	7.7	8.5
Tabasco	3.9	4.9	6.3	7.2
Tamaulipas	5.0	6.0	7.4	8.3
Tlaxcala	4.2	5.4	6.9	7.8
Veracruz	3.6	4.6	6.2	7.3
Yucatán	3.8	4.8	6.1	6.8
Zacatecas	3.8	4.6	5.7	6.4

Soource: Presidencia de la República (1999: 297-302)
*/ Personal Calculations based on Presidencia de la República (1999: 297-302)

	AVERAGE SCHOOLING YEARS (LOG VALUES)			
	1980	1985	1993*	1998*
Aguascalientes	1.547563	1.740466	2.009555	2.151762
Baja California	1.686399	1.871802	2.041220	2.116256
Baja California Sur	1.667707	1.848455	2.026832	2.104134
Campeche	1.410987	1.599388	1.848455	1.987874
Coahuila	1.648659	1.832581	2.045109	2.163323
Colima	1.589235	1.749200	1.967112	2.091864
Chiapas	0.916291	1.208960	1.541159	1.722767
Chihuahua	1.589235	1.766442	1.958685	2.066863
Distrito Federal	1.945910	2.066863	2.208274	2.282382
Durango	1.458615	1.658228	1.894617	2.001480
Guanajuato	1.193922	1.446919	1.731656	1.871802
Guerrero	1.064711	1.373716	1.677097	1.824549
Hidalgo	1.223775	1.492904	1.738710	1.856298
Jalisco	1.504077	1.704748	1.913977	2.014903
México	1.609438	1.800058	1.997418	2.091864
Michoacán	1.223775	1.458615	1.774952	1.945910
Morelos	1.526056	1.740466	1.976855	2.104134
Nayarit	1.481605	1.658228	1.894617	2.028148
Nuevo León	1.791759	1.945910	2.161022	2.282382
Oaxaca	1.029619	1.294727	1.619388	1.791759
Puebla	1.308333	1.536867	1.800058	1.945910
Querétaro	1.335001	1.599388	1.921325	2.104134
Quintana Roo	1.410987	1.648659	1.951608	2.104134
San Luis Potosí	1.308333	1.558145	1.803359	1.916923
Sinaloa	1.504077	1.722767	1.940179	2.041220
Sonora	1.648659	1.832581	2.034706	2.140066
Tabasco	1.360977	1.589235	1.846879	1.974081
Tamaulipas	1.609438	1.791759	2.006871	2.116256
Tlaxcala	1.435085	1.677097	1.932970	2.054124
Veracruz	1.280934	1.515127	1.822935	1.987874
Yucatán	1.335001	1.568616	1.805005	1.916923
Zacatecas	1.335001	1.526056	1.743969	1.856298

Source: Presidencia de la República (1999: 297-302)
*/ Personal Calculations based on Presidencia de la República (1999: 297-302)

	HIGH-SCHOOL GRADUATES			
	1980	1985	1993	2000
Aguascalientes	6181	10254	10515	14134
Baja California	19559	23322	23319	31130
Baja California Sur	3190	5314	5587	5933
Campeche	4180	6732	6673	9755
Coahuila	22241	32648	31208	33103
Colima	4373	6670	6518	7301
Chiapas	14684	28847	30188	43918
Chihuahua	22236	29378	30578	34451
Distrito Federal	141104	152842	142559	133989
Durango	12844	18496	18447	19954
Guanajuato	22787	45999	46093	61603
Guerrero	22753	37046	34662	42297
Hidalgo	15554	30081	29240	39078
Jalisco	45255	69846	71229	83684
México	71790	152580	156838	184487
Michoacán	26199	42324	41628	50823
Morelos	15002	21725	21420	24233
Nayarit	10430	13930	14405	15706
Nuevo León	41867	55403	56503	58303
Oaxaca	17584	32723	34943	51946
Puebla	27900	56855	58150	71620
Querétaro	6935	15006	15306	19919
Quintana Roo	2158	5892	6646	10572
San Luis Potosí	15055	29649	29703	34547
Sinaloa	26012	36924	35839	37375
Sonora	23164	30928	29919	31722
Tabasco	9252	23271	24491	29536
Tamaulipas	25695	34450	32537	35188
Tlaxcala	8003	14282	14688	15726
Veracruz	43191	81023	81663	94311
Yucatán	10543	17214	17720	23568
Zacatecas	7604	14636	15231	19200

Source: SEP (2001)

	HIGH-SCHOOL GRADUATES (LOG VALUES)		
	1980	1985	1993
Aguascalientes	8.729235	9.235423	9.260558
Baja California	9.881191	10.057152	10.057024
Baja California Sur	8.067776	8.578100	8.628198
Campeche	8.338067	8.814628	8.805825
Coahuila	10.009693	10.393539	10.348430
Colima	8.383205	8.805375	8.782323
Chiapas	9.594514	10.269761	10.315200
Chihuahua	10.009468	10.288001	10.328036
Distrito Federal	11.857252	11.937160	11.867511
Durango	9.460632	9.825310	9.822657
Guanajuato	10.033945	10.736375	10.738416
Guerrero	10.032452	10.519916	10.453399
Hidalgo	9.652073	10.311649	10.283293
Jalisco	10.720068	11.154048	11.173655
México	11.181500	11.935444	11.962969
Michoacán	10.173477	10.653110	10.636528
Morelos	9.615939	9.986219	9.972080
Nayarit	9.252442	9.541800	9.575331
Nuevo León	10.642253	10.922389	10.942049
Oaxaca	9.774745	10.395833	10.461473
Puebla	10.236382	10.948259	10.970781
Querétaro	8.844336	9.616205	9.636000
Quintana Roo	7.676937	8.681351	8.801770
San Luis Potosí	9.619465	10.297184	10.299003
Sinaloa	10.166313	10.516617	10.486792
Sonora	10.050355	10.339417	10.306249
Tabasco	9.132595	10.054963	10.106061
Tamaulipas	10.154052	10.447264	10.390133
Tlaxcala	8.987572	9.566755	9.594786
Veracruz	10.673387	11.302488	11.310356
Yucatán	9.263217	9.753478	9.782449
Zacatecas	8.936430	9.591240	9.631088

Source: Pesonal Calculations based on SEP (2001)

7. Regional Economic Structure

	ECONOMICALLY ACTIVE POPULATION				
	1980	1985*	1990	1993*	2000
Aguascalientes	159943	188518	217092	252477	335042
Baja California	403279	490837	578395	679332	914853
Baja California Sur	69954	87467	104980	124640	170514
Campeche	134423	143663	152902	180729	245660
Coahuila	483898	544575	605251	673453	832592
Colima	108754	122400	136046	155821	201964
Chiapas	734047	804157	874267	977566	1218598
Chihuahua	664707	730879	797051	896857	1129737
Distrito Federal	3312581	3136926	2961270	3165797	3643027
Durango	357163	358579	359994	386610	448714
Guanajuato	978013	1020611	1063208	1187582	1477789
Guerrero	719154	678046	636938	715614	899191
Hidalgo	505091	506821	508551	577153	737223
Jalisco	1413854	1501022	1588190	1827409	2385586
México	2410236	2679198	2948159	3424581	4536232
Michoacán	872775	896465	920154	1016543	1241449
Morelos	303838	331826	359813	419495	558754
Nayarit	210188	224134	238079	263278	322077
Nuevo León	803764	920267	1036770	1174089	1494501
Oaxaca	858283	817064	775844	866140	1076829
Puebla	1081573	1096031	1110489	1282312	1683233
Querétaro	224435	261329	298222	354531	485917
Quintana Roo	79341	122383	165424	221401	352014
San Luis Potosí	532115	537012	541908	596372	723454
Sinaloa	568427	621429	674431	738757	888850
Sonora	484277	530741	577205	650034	819969
Tabasco	327502	366799	406096	467682	611381
Tamaulipas	624497	667272	710047	805010	1026590
Tlaxcala	174965	189437	203908	242586	332833
Veracruz	1796219	1794246	1792272	1968230	2378799
Yucatán	367825	390709	413593	476425	623033
Zacatecas	300963	303849	306734	322249	358449

Source: INEGI (2002)
*/ Personal calculations using census data

	ECONOMICALLY ACTIVE POPULATION IN AGRICULTURE				
	1980	1985*	1990	1993*	2000
Aguascalientes	28615	30191	31766	29554	24392
Baja California	38180	48382	58584	58276	57558
Baja California Sur	13538	16179	18820	19215	20138
Campeche	42836	47138	51439	54228	60737
Coahuila	76343	73740	71137	62875	43598
Colima	30291	31151	32011	32577	33898
Chiapas	421561	459941	498320	519875	570169
Chihuahua	137909	134760	131610	121869	99139
Distrito Federal	203225	111185	19145	19582	20600
Durango	110311	104758	99205	89427	66610
Guanajuato	187495	212104	236713	223656	193189
Guerrero	318424	270547	222670	227154	237618
Hidalgo	187043	184864	182684	183034	183852
Jalisco	267824	250920	234016	234889	236926
México	367888	308014	248140	243432	232448
Michoacán	344325	323775	303224	299473	290721
Morelos	76303	73595	70887	71963	74472
Nayarit	84819	86950	89081	88963	88686
Nuevo León	67308	64572	61835	57812	48426
Oaxaca	474793	436821	398848	410687	438312
Puebla	447439	423904	400369	419722	464879
Querétaro	65035	58403	51771	48683	41479
Quintana Roo	23136	27575	32013	33378	36562
San Luis Potosí	181346	173014	164682	161047	152565
Sinaloa	156542	199626	242710	244116	247395
Sonora	100765	114333	127900	128151	128736
Tabasco	127459	133776	140093	148260	167315
Tamaulipas	112362	111881	111400	105852	92907
Tlaxcala	65906	61028	56150	57252	59822
Veracruz	678029	681838	685647	703709	745854
Yucatán	115336	112697	110057	108891	106170
Zacatecas	148474	132831	117187	103969	73126

Source: INEGI (2002)
*/ Personal calculations using census data

	SHARE OF EMPLOYMENT IN AGRICULTURE		
	1980	1985	1993
Aguascalientes	0.178907	0.160147	0.117055
Baja California	0.094674	0.098570	0.085785
Baja California Sur	0.193527	0.184973	0.154167
Campeche	0.318666	0.328113	0.300053
Coahuila	0.157767	0.135408	0.093363
Colima	0.278528	0.254502	0.209067
Chiapas	0.574297	0.571954	0.531805
Chihuahua	0.207473	0.184380	0.135884
Distrito Federal	0.061349	0.035444	0.006185
Durango	0.308853	0.292148	0.231309
Guanajuato	0.191710	0.207821	0.188329
Guerrero	0.442776	0.399010	0.317426
Hidalgo	0.370315	0.364751	0.317133
Jalisco	0.189428	0.167166	0.128537
México	0.152636	0.114965	0.071084
Michoacán	0.394517	0.361168	0.294600
Morelos	0.251131	0.221788	0.171545
Nayarit	0.403539	0.387938	0.337903
Nuevo León	0.083741	0.070166	0.049240
Oaxaca	0.553189	0.534622	0.474158
Puebla	0.413693	0.386763	0.327317
Querétaro	0.289772	0.223485	0.137318
Quintana Roo	0.291602	0.225314	0.150757
San Luis Potosí	0.340802	0.322179	0.270044
Sinaloa	0.275395	0.321237	0.330441
Sonora	0.208073	0.215421	0.197145
Tabasco	0.389185	0.364712	0.317010
Tamaulipas	0.179924	0.167669	0.131492
Tlaxcala	0.376681	0.322155	0.236006
Veracruz	0.377476	0.380014	0.357534
Yucatán	0.313562	0.288441	0.228558
Zacatecas	0.493330	0.437160	0.322635

Source: Personal Calculations based on INEGI (2002)

8. Foreign Direct Investment

	FOREIGN DIRECT INVESTMENT	
	1994*	LN
Aguascalientes	28.5	3.349904
Baja California	227.1	5.425390
Baja California Sur	8.1	2.091864
Campeche	2.1	0.741937
Coahuila	102.3	4.627910
Colima	102.9	4.633758
Chiapas	0.4	-0.916291
Chihuahua	305.2	5.720967
Distrito Federal	7579.8	8.933242
Durango	21.5	3.068053
Guanajuato	12.8	2.549445
Guerrero	6.7	1.902108
Hidalgo	0.1	-2.302585
Jalisco	64.0	4.158883
México	323.5	5.779199
Michoacán	8.5	2.140066
Morelos	19.4	2.965273
Nayarit	5.6	1.722767
Nuevo León	917.7	6.821871
Oaxaca	0.1	-2.302585
Puebla	29.6	3.387774
Querétaro	119.5	4.783316
Quintana Roo	38.7	3.655840
San Luis Potosí	14.7	2.687847
Sinaloa	46.2	3.832980
Sonora	106.9	4.671894
Tabasco	0.5	-0.693147
Tamaulipas	361.7	5.890815
Tlaxcala	19.3	2.960105
Veracruz	10.2	2.322388
Yucatán	48.1	3.873282
Zacatecas	13.8	2.624669

Source: INEGI (2000a)
*/ Figures in millions of US dollars

9. Employment in the Maquiladora Industry

	EMPLOYMENT IN THE MAQUILADORA INDUSTRY			
	1980	1985	1993	1998
Aguascalientes	0	0	0	20454
Baja California	20418	38975	107674	218277
Baja California Sur	176	150	988	2672
Campeche	0	0	0	0
Coahuila	5523	10700	46915	94734
Colima	0	0	0	0
Chiapas	0	0	0	0
Chihuahua	39402	77592	173636	262816
Distrito Federal	0	0	0	1718
Durango	0	0	8586	24327
Guanajuato	0	0	0	10685
Guerrero	0	0	0	0
Hidalgo	0	0	0	0
Jalisco	4364	4881	8629	28651
México	114	142	3212	9585
Michoacán	0	0	0	0
Morelos	0	0	0	0
Nayarit	0	0	0	0
Nuevo León	0	0	22884	46227
Oaxaca	0	0	0	0
Puebla	0	0	0	20466
Querétaro	0	0	0	0
Quintana Roo	0	0	0	0
San Luis Potosí	0	0	0	0
Sinaloa	0	0	0	809
Sonora	17546	20197	42944	87529
Tabasco	0	0	0	0
Tamaulipas	23143	37050	94399	148159
Tlaxcala	0	0	0	0
Veracruz	0	0	0	0
Yucatán	0	0	5342	16711
Zacatecas	0	0	0	0

Source: INEGI (2000a)

	EMPLOYMENT IN THE MAQUILADORA INDUSTRY (LOG VALUES)		
	1980*	1985*	1993*
Aguascalientes	0.000000	0.000000	0.000000
Baja California	9.924172	10.570676	11.586863
Baja California Sur	5.170484	5.010635	6.895683
Campeche	0.000000	0.000000	0.000000
Coahuila	8.616676	9.277999	10.756093
Colima	0.000000	0.000000	0.000000
Chiapas	0.000000	0.000000	0.000000
Chihuahua	10.581572	11.259220	12.064716
Distrito Federal	0.000000	0.000000	0.000000
Durango	0.000000	0.000000	9.057888
Guanajuato	0.000000	0.000000	0.000000
Guerrero	0.000000	0.000000	0.000000
Hidalgo	0.000000	0.000000	0.000000
Jalisco	8.381144	8.493105	9.062884
México	4.736198	4.955827	8.074649
Michoacán	0.000000	0.000000	0.000000
Morelos	0.000000	0.000000	0.000000
Nayarit	0.000000	0.000000	0.000000
Nuevo León	0.000000	0.000000	10.038193
Oaxaca	0.000000	0.000000	0.000000
Puebla	0.000000	0.000000	0.000000
Querétaro	0.000000	0.000000	0.000000
Quintana Roo	0.000000	0.000000	0.000000
San Luis Potosí	0.000000	0.000000	0.000000
Sinaloa	0.000000	0.000000	0.000000
Sonora	9.772581	9.913289	10.667652
Tabasco	0.000000	0.000000	0.000000
Tamaulipas	10.049448	10.520024	11.455286
Tlaxcala	0.000000	0.000000	0.000000
Veracruz	0.000000	0.000000	0.000000
Yucatán	0.000000	0.000000	8.583355
Zacatecas	0.000000	0.000000	0.000000

Source: INEGI (2000a)
*/ In order to calculate the natural logarithm of these observations, employment in the states where there is not maquila presence was taken as 1 instead of 0, since the natural log of 0 does not exist.

10. Public Investment

	PUBLIC INVESTMENT (1993=100)			
	1981*	1985**	1993***	1998**
Aguascalientes	507479	342529	527383	337365
Baja California	2815674	1194896	633273	566761
Baja California Sur	1414022	449518	336317	378414
Campeche	6984857	3707112	1955168	3323701
Coahuila	5252742	1328780	1834047	989813
Colima	1556326	583931	287614	225097
Chiapas	4210610	1357641	1059965	2493075
Chihuahua	3239695	1049319	632325	647139
Distrito Federal	29449626	15758049	15923699	6040527
Durango	1299915	580436	415584	464662
Guanajuato	2022067	916630	838896	1055312
Guerrero	2692290	1284022	917926	882629
Hidalgo	2682720	1583623	1504145	1188964
Jalisco	3460224	1481110	958558	792157
México	4440654	2627564	2449112	1543526
Michoacán	3998060	4078319	730381	943193
Morelos	818254	446950	393736	412659
Nayarit	1131408	413543	833537	258818
Nuevo León	4215222	1672972	1051382	995981
Oaxaca	3198086	1255121	1229749	1379367
Puebla	2282284	1187903	551074	895639
Querétaro	1444909	444481	419091	581603
Quintana Roo	956258	420788	317857	419014
San Luis Potosí	1826516	1045870	397184	443389
Sinaloa	3549025	1558052	971169	786250
Sonora	3347929	1193036	812102	831449
Tabasco	12748445	2393118	2340547	3433577
Tamaulipas	6196960	2059719	1214864	1551078
Tlaxcala	530773	245348	287818	205881
Veracruz	18448959	6356153	2453876	3110605
Yucatán	1195945	652740	459174	729798
Zacatecas	872142	352280	147212	345477

Source: */ INEGI (1985b: 330)
**/ Presidencia de la República (1999: 330-336)
***/ INEGI (1994c: 132)
Figures in thousands of constant pesos

	PUBLIC INVESTMENT (LOG VALUES)		
	1981*	1985**	1993***
Aguascalientes	13.137211	12.744112	13.175682
Baja California	14.850712	13.993570	13.358657
Baja California Sur	14.161948	13.015932	12.725809
Campeche	15.759255	15.125764	14.485987
Coahuila	15.474261	14.099771	14.422036
Colima	14.257838	13.277538	12.569375
Chiapas	15.253118	14.121259	13.873746
Chihuahua	14.990990	13.863652	13.357159
Distrito Federal	17.198192	16.572862	16.583319
Durango	14.077809	13.271535	12.937440
Guanajuato	14.519631	13.728460	13.639842
Guerrero	14.805903	14.065508	13.729872
Hidalgo	14.802342	14.275226	14.223735
Jalisco	15.056844	14.208302	13.773185
México	15.306312	14.781568	14.711236
Michoacán	15.201320	15.221195	13.501322
Morelos	13.614928	13.010203	12.883436
Nayarit	13.938973	12.932518	13.633433
Nuevo León	15.254213	14.330112	13.865616
Oaxaca	14.978063	14.042743	14.022321
Puebla	14.640687	13.987700	13.219624
Querétaro	14.183557	13.004663	12.945843
Quintana Roo	13.770783	12.949884	12.669357
San Luis Potosí	14.417921	13.860360	12.892155
Sinaloa	15.082183	14.258947	13.786256
Sonora	15.023852	13.992012	13.607381
Tabasco	16.360920	14.688108	14.665895
Tamaulipas	15.639569	14.538080	14.010143
Tlaxcala	13.182089	12.410433	12.570084
Veracruz	16.730519	15.664934	14.713179
Yucatán	13.994447	13.388934	13.037185
Zacatecas	13.678707	12.772182	11.899629

Source: Personal calculations based on
*/ INEGI (1985b: 330)
**/ Presidencia de la República (1999: 330-336)
***/ INEGI (1994c: 132)

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