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Restructuring of production *and territorial change:* a second industrialization *hub in Northern Mexico*

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This article takes the view that the restructuring of industry in Mexico is taking place in two different territorial environments which, to some extent, have independent development paths: on the one hand, there is the territorial environment shaped in accordance with the logic of northern border industrialization, while on the other hand there is the territorial environment of the industries set up during the import substitution industrialization phase, concentrated in the metropolitan areas of Central Mexico. In the authors' opinion, these are parallel but different industrialization paths, with different processes and forms of social organization of production in their territories: consequently, in order to understand the true significance of the restructuring of production it is necessary to study the logic of the industrial sectors and that of the territory simultaneously, since the course of events with regard to industrial restructuring is strongly affected by regional and local dynamics. Hence, it is necessary to establish a profile of the way the various forms of restructuring are processed and take place at this level. After an introduction in which these items are set forth (section I), the article goes on to analyse the recent evolution of industry, in order to gauge the correctness of the argument that the dynamic growth nucleus is shifting to the North (section II); the notion of the functional-territorial hub is discussed in order to be able to interpret the dynamics described in the previous section (section III), and the northern border hub is defined in terms of two aspects of its social organization which differentiate it strongly from the central hub: the role of regional economic groups, and the characteristics of the regional labour markets.

I

Introduction

The shift of Mexico's industrial growth from the metropolitan areas of Central Mexico to the cities of the north has been described in some studies as one of the most notable aspects of the reorganization of the Mexican economy. This "northernization" of the country's industrial development has been described in terms of various indicators which highlight the relocation and reorganization of key sectors (motor industry, electronics, etc.), changes in the dynamics and structure of the labour force (De Oliveira and García, 1993), substantive changes in labour relations associated with relocation (De la Garza, 1993), or structural changes in assembly-type border industrialization and an increase in the relative weight of this type of activity (González-Aréchiga, 1988; Carrillo, 1989).

In spite of the accuracy of these indicators and the diligence of those who have used them, interpretations of the significance of this process range from mistrust to exaggerated enthusiasm. On the one hand, there are those who view the process very favourably and see in the type of industrialization which has occurred in northern and border areas a kind of harbinger of future national success in a context of greater economic openness, thanks to greater competitiveness and the introduction of advanced practices and technology. On the other hand, there are quite a few analysts who argue that the new type of northern industrialization only offers precarious wages and working conditions, increases ecological risks, represents a scandalous subjugation of the country's development to the needs of the transnational corporations, and is thus a foretaste of a curse which will spread to the rest of Mexico when the economic reforms and the North American Free Trade Agreement (NAFTA) finally take off.

These are the terms –expressed surreptitiously, subtly or quite openly– in which the regional aspects of the industrial restructuring of Mexico have been described. Quite apart from the degree of truth of these interpretations, it is obvious that this restructuring is taking place within a framework of options which have not yet revealed their full implications. It is open to doubt, for example (because there is concrete evidence in this respect), that the border industrialization is tending to put wages and working conditions on a more precarious basis (Carrillo, coord., 1993), but if we look a little more closely at the features of the northern industrialization process it becomes clear that the idea that this process can be extended to the other industrial areas of the country is excessively bold. As the industrial restructuring of Mexico has already provided a wealth of experience and empirical data, it allows us to weigh up fallacies like this and put forward some soundly-based views regarding the current course of the process.

This is precisely what this article seeks to do, in presenting an interpretation based on an analysis of the features of industrialization in northern Mexico. On the basis of the studies made in recent years, our argument is that the industrial restructuring of Mexico is taking place in two different territorial spaces which, to some extent, have independent development paths. The first of these spaces, consisting of the metropolitan areas of central Mexico, is that which contains the industries set up in the import substitution phase; the second is the area shaped in accordance with northern border industrialization (which is not necessarily confined exclusively to the border areas).

Our thesis questions the interpretations of the territorial impact of the restructuring process which see this reorganization as a unitary process tending towards either polarization or convergence. We believe that in reality we are dealing with parallel but different industrialization paths, with different processes and forms of social organization of production in their respective areas. We also seek to show up the error of interpreting the restructuring process from the standpoint of a single industrial sector or branch,

□ A preliminary version of this study was presented at the International Seminar on Territorial Impacts of Restructuring Processes, organized by the Institute of Urban Studies of the Catholic University of Chile (Santiago, Chile, 12-14 July 1995).

neglecting the socio-spatial aspects of the process. On the contrary, the development paths historically associated with each area largely explain the nature and evolution of the two industrialization axes that mark the Mexican industrial restructuring process.

Our approach is therefore based on the methodological assumption that in order to understand the real meaning of the production restructuring process it is necessary to study the logic of the industrial sectors and of the territorial areas simultaneously. First, we will look at some statistical data on recent industrial development in order to evaluate the extent

of applicability of the theory on the "northernization" of the dynamic growth core. We will then analyse the notion of the functional-territorial hub, in order to propose criteria for interpreting the significance of the process in question. Finally, we will describe the northern border hub in terms of two aspects of its social organization which radically distinguish it from the central hub: the role of its economic groups, and the characteristics of its labour markets. In dealing with both of these aspects, we will use the concepts of mesoeconomic regulation and micro-economic regulation.

II

Territorial patterns in the configuration of the new dynamic centres of Mexican industrialization

The first task to be faced in dealing with the "northernization" of the new Mexican industrialization process is to assess the magnitude of this phenomenon, since few efforts have yet been made to gain a broad empirical knowledge of the scope of recent northern border industrialization. In this section, we will present the results of a modest but revealing effort in this respect, using data on industrial employment taken from the 1980 and 1993 economic censuses (INEGI, 1983 and 1995). The dates of these censuses are important because they correspond approximately to two high points in the national economic cycle: 1980 and 1993. The first of these corresponds to the high part of the cycle immediately preceding the intensification of the restructuring process begun with the 1982 crisis, while the second is just before the high point of the cycle which ended with the December 1994 financial crisis. Although this information does not cover all the details of a process which has been quite dynamic, it nevertheless provides some useful indicators.

In order to define what we have called the dynamic core of industrialization, that is to say, the classes of industrial production responsible for the absolute increase in industrial employment between 1980 and 1993, we identified in the four-digit Mexican classification the branches which most increased

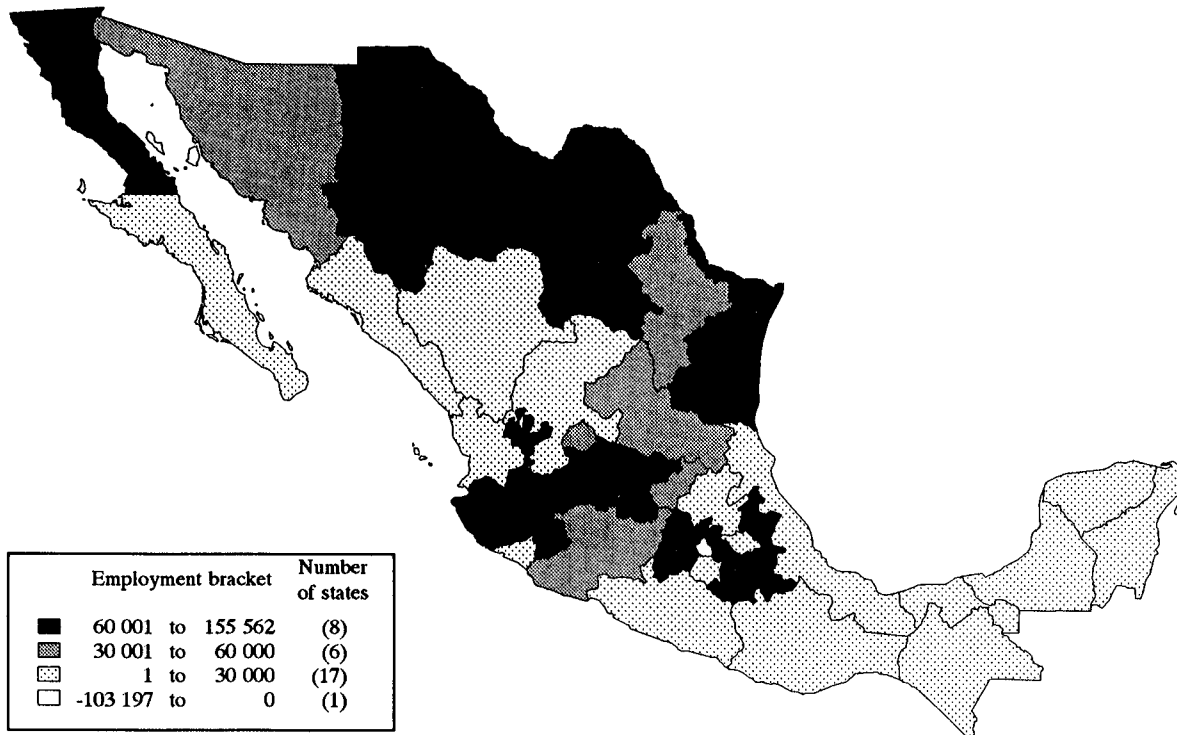
industrial employment between those dates. Altogether, the branches which increased employment in absolute terms accounted for 1,130,140 jobs. The dynamic core consists of the ten branches which increased employment most and are responsible for 57% of the absolute difference between industrial employment in 1980 and in 1993. The electrical machinery and equipment branch (3831) was the most dynamic, generating 10.4% of that difference. The absolute loss of jobs in the branches whose shares declined amounted to 85,206 jobs, with over half of that figure corresponding to basic iron and steel industries (43,347 jobs). It is interesting to note that in the entire four-digit industrial classification only these ten branches suffered a decline; the others improved their shares.¹

After having thus defined the dynamic core of the industrial restructuring process, we turned our attention to determining the territorial pattern of this

¹ It is important to note that this type of analysis leaves out the effect of the relative weights of the various branches but highlights their share in growth. Nevertheless, we only detected one branch which lost ground although it had substantial relative weight in both periods: namely, soft-fibre yarns and fabrics (branch 3212), which accounted for 5.3% of total industrial employment (with 112,812 jobs) in 1980 but, due to its poor performance, only accounted for 3.6% (with 115,788 jobs) in 1993.

MAP 1

Mexico: New industrial employment, by states, 1980-1993



dynamism. Map 1 shows the distribution of the absolute growth in industrial employment between 1980 and 1993, by states. The first thing that strikes us in this map is that there are two main geographic areas of growth: the northern states associated with the growth of assembly industries and new export activities, and the states in central Mexico historically associated with industrial growth based on the old import substitution model and now subjected to an intensive restructuring process in the light of the new export-oriented model involving greater trade openness. It may be noted that between 1980 and 1993 the northern and border states (excluding Nuevo León, which although a northern state has been historically and functionally associated with the import-substitution growth pattern) generated 39.3% of new industrial employment.

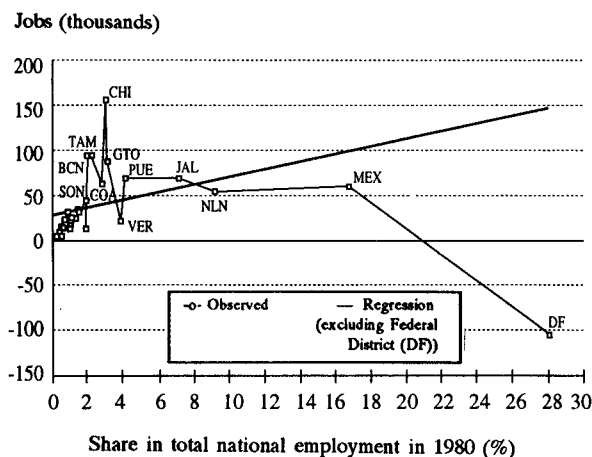
It may be gathered from these data that although relative growth has been significantly greater in the northern states, nevertheless in the traditional industrial growth hub (with the notable exception of the Federal District, which was the only loser) the states of Nuevo León, Jalisco, Estado de México, Puebla

and Guanajuato kept up their growth and leading positions in the period in question, despite the severity of the restructuring process that affected them.

However, we need a more precise indicator to define the trends in the territorial distribution of industrial growth. Is there a trend towards the "north-ernization" of Mexican industrial development, or is it a question rather of a process with different characteristics? In order to appraise this question we used as a reference point the degree of industrial concentration displayed by the states and the Federal District in 1980, in order to analyse this initial distribution with respect to the differences in absolute employment displayed by the same states between that year and 1993.

It is quite a simple matter to produce an indicator for this analysis: i.e., relating the absolute variation in industrial employment in the states between 1980 and 1993 with the share each of them had in industrial employment in 1980 (figure 1). If we place the states on the horizontal axis according to their percentage share of industrial employment in 1980 and place the absolute differences in employment be-

FIGURE 1
Mexico: Changes in industrial employment, by states,^a between 1980 and 1993



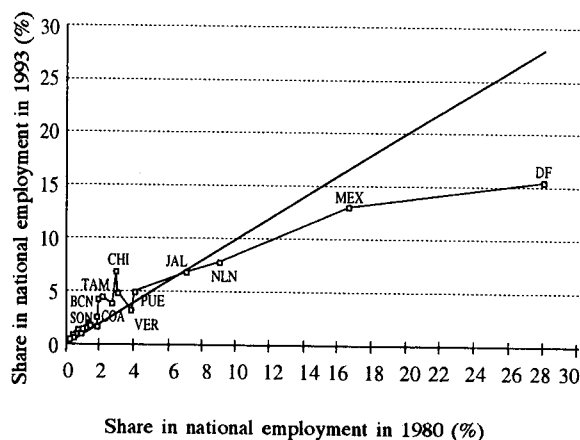
^a Sonora, Baja California, Tamaulipas, Chihuahua, Guanajuato, Coahuila, Veracruz, Puebla, Jalisco, Nuevo León, Estado de México (MEX) and Federal District (DF).

tween 1980 and 1993 on the vertical axis, we see that the line of regression between the two variables (excluding the Federal District) has a positive slope. This means that the old pattern of territorial concentration in the central states tends to be maintained, the only exception being the Federal District (i.e., metropolitan Mexico City), which radically departs from the scheme because it is the only state that suffered a loss of employment in absolute terms.

Furthermore, while recent Mexican industrialization has been concentrated in the northern and border states,² it has also been strongly represented in other states in central Mexico, especially Guanajuato, Puebla and Jalisco. Thus, it may be said that although the territorial dispersal of industrial growth largely benefitted the northern and border states, in the centre of the country the loss of dynamism of the Federal District was accompanied by a dispersal of growth among the central states, including those which already had a considerable share in 1980, such as Nuevo León and the state of México. All in all, there has been a significant change in the pattern of geographical concentration of industry, but without greatly altering the positions of the most important states (figure 2).

² The states of Baja California, Sonora, Chihuahua, Coahuila and Tamaulipas.

FIGURE 2
Mexico: Shares of individual states^a in industrial employment in 1980 and 1993

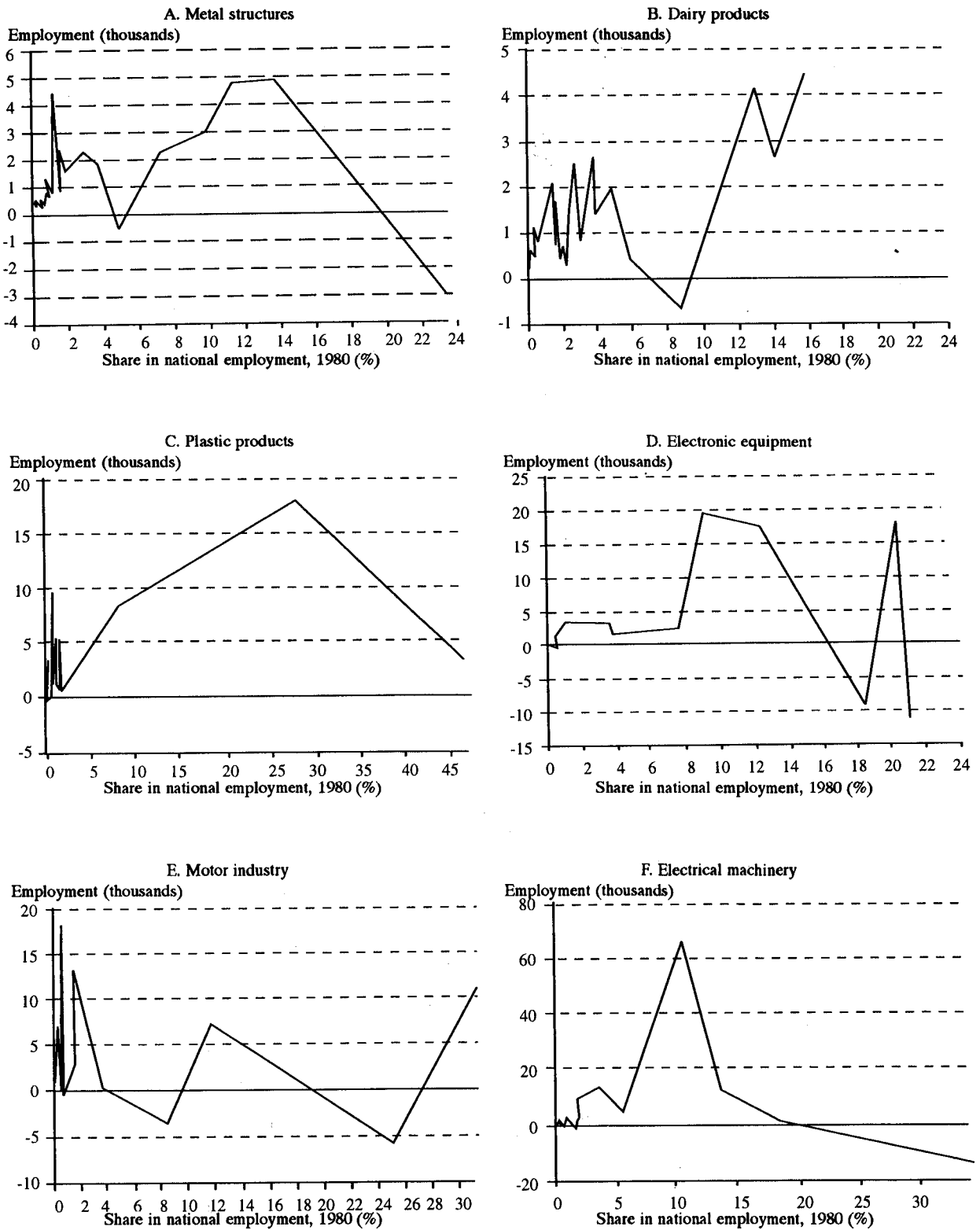


^a Sonora, Baja California, Tamaulipas, Chihuahua, Guanajuato, Coahuila, Veracruz, Puebla, Jalisco, Nuevo León, Estado de México (MEX) and Federal District (DF).

Finally, we wished to determine whether what we noted regarding the overall differences in employment between 1980 and 1993 also applies to the dynamic core (figure 3). The results are interesting and confirm the previous trend. Despite their wide range of different performances, almost all sectors (to different degrees) display a bimodal distribution of growth: that is to say, significant growth in areas where there was no industrial concentration in the import substitution period, but also growth in areas of high concentration associated with the old territorial pattern (though distorted at one extreme by the negative performance of the Federal District). Thus, for example, in the cases of metal structures (branch 3811), dairy products (branch 3112), plastic products (branch 3560) and the motor industry (branch 3841) the distribution is markedly bimodal (although the performance of the Federal District tends to distort the effect). The case of the motor industry (map 2) is important because it is usually taken as a reference when studying the relocation of motor vehicle assembly and component plants in Mexico (Arteaga, ed., 1993; Carrillo, ed., 1990; Mortimore, 1995); it also shows that although prominence has been given to the growth associated with the northern industries, the areas in the central part of the country maintained a similar level of dynamism. This is not so, however, in the case of the electronic, radio and television equipment industry (branch 3832), where the north-

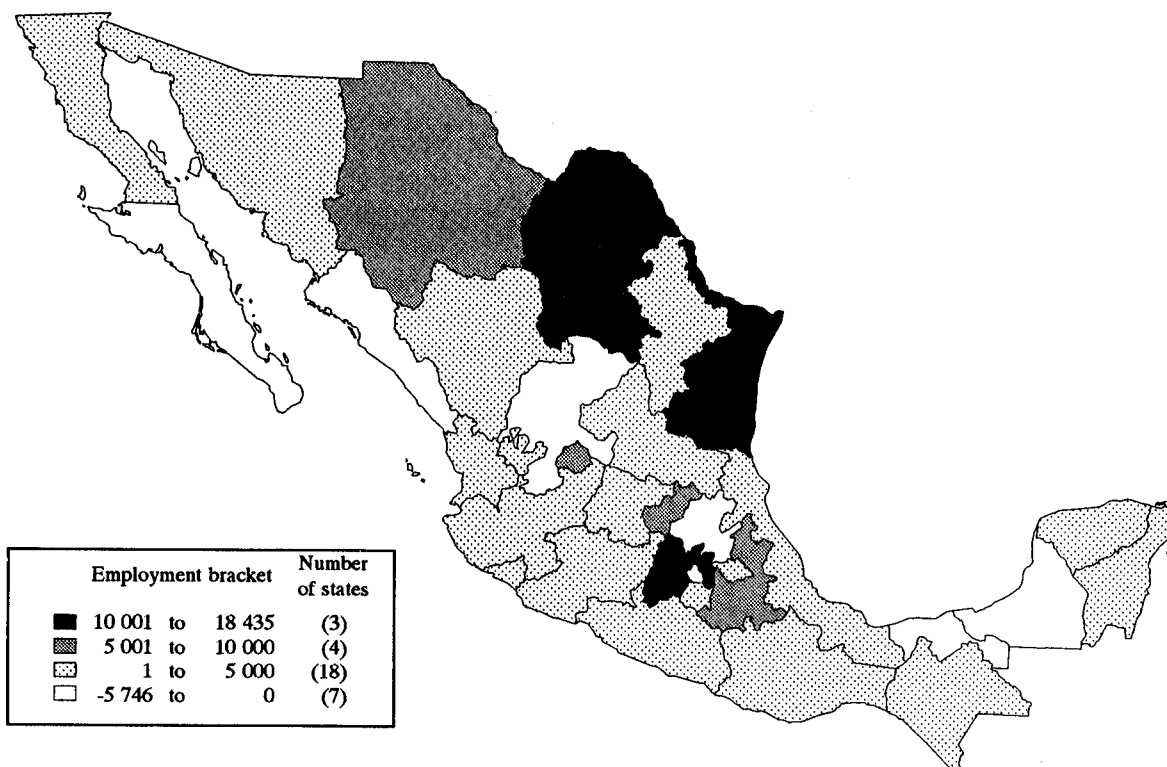
FIGURE 3

Mexico: Changes in employment in selected industrial branches, 1980-1993



MAP 2

Mexico: New employment in the motor industry, by states, 1980-1993



ern states, which already accounted for substantial percentages of the sector, kept up their dynamism, while the Federal District and the state of México, which had reached similar levels of concentration, suffered a serious decline in their positions.

These results permit a clearer picture to be gained of the supposed "northernization" of recent industrial growth in Mexico. In our view, what is really involved is the emergence of a new growth hub, and while it cannot be denied that this hub is very dynamic, we should not overlook the fact that the industrial conversion process has also meant growth for the traditional areas of Mexican industrial development. The exception to this is the Federal District, which has undoubtedly suffered a serious loss of employment (-103,197 jobs), but even so it still accounts for a substantial percentage of industrial employment (15.5% in 1993 compared with 25.5% in 1980).

At all events, it may be assumed that the industrial conversion process in the geographical area historically associated with Mexican industrial development has allowed it to keep its leading role in

industrialization, strengthened by the trend towards the dispersal of industrial growth within the area (in Puebla and Guanajuato, for example). If growth rates are used as the main element of analysis, it might be thought that the northern border hub will lead the way in terms of dynamic growth, since it has the highest rates. It should be emphasized, however, that the changes will depend ultimately on the level of development attained by the restructured sectors of central Mexico in the coming years, since the functional-territorial rationales of the two hubs are operating at very different moments in the respective expansion processes, and although numbers are important in this case, what is most essential is to understand the social rationales behind the respective growth processes.³

³ It should not be forgotten that the rationale of the northern border hub is based on the fact that the area is just beginning to develop, whereas that of the central hub is combined with a rationale of industrial conversion (e.g., in Aguascalientes).

III

The two functional-territorial hubs in the context of the industrial restructuring of Mexico

Quantitative analysis only reflects part of the story, for although the northern border expansion represents the emergence and consolidation of a second space for recent industrial growth, what we really want to emphasize is that it is not a question of the mere shifting of industrial growth from one point in the territory to another: i.e., it is not exclusively a spatial distribution phenomenon. What is involved are two different configurations of industrial development organization, coexisting under the wing of the same macroeconomic governance model. Moreover, the characteristics of the branches making up the dynamic core of recent industrialization take on radically different organizational features depending on which hub they belong to: in other words, the process is not purely sectoral.

We use the concept of functional-territorial hubs to highlight the need to include within a single analytical framework the dynamics of industrial sectors, branches or products and those of territorial configurations.⁴ We may define this concept as the set of trajectories of changes in organizational and production patterns registered in the development of a dynamic industrialization core, within the framework of the aspects of territorial interdependence expressed in a set of conventions and institutions of economic governance. In other words, industrial development takes shape on the basis of a close relation with the organizational configuration of the spaces in which it takes place and is historically located.

The concept of economic governance⁵ is used here to indicate a certain process common to the dif-

ferent trajectories of change displayed by the dynamic core of industrialization. In other words, the heterogeneity of the different outcomes, expressed for example in a varied range of regional production systems, has as its counterpart a shared common range of forms of economic coordination (and of ways of seeking their definition and change); this common range includes, for example, the relations and strategies of the dominant economic groups, the nature of intra- and inter-company relations, the system of industrial relations, and other aspects. This common environment, we must stress, is a basic feature of the hub and is expressed, with the relevant special features, in each regional production system and each production sector, branch or chain forming part of that system.

A decisive aspect of economic governance as it affects the dynamic industrialization core may be noted at the macro level: we refer to the economic policy and national development model and the forms of international coordination involved in it. The special feature of the Mexican case is that whereas in the period of stabilizing development there was only a single functional-territorial industrialization hub, the new model caused the expansion and qualitative evolution of a hub which, in the previous period, had remained an area on the periphery of the dynamic core: the industrialization hub consisting of the export assembly industry located in border areas of northern Mexico. This process was later complemented by the expansion of the export manufacturing operations of the transnational corporations which, as from the late 1970s, found northern Mexico to be an ideal location for such activities. In the central part of the country, for its part, there was an intensive process of restructuring of the industries which had accounted in the past for the development of Mexican industry. The fundamental differences between these two hubs therefore should not be sought at the level of macroeconomic governance,

⁴ The idea of the functional-territorial hub should be understood as a conceptual tool, and hence any substantive element arising from this idea (such as the idea of a northern border hub in Mexico) should be understood as an "ideal type".

⁵ Understood as the institutions, conventions, practices and processes of coordination produced and reproduced by the economic agents in order to ensure the successful outcome of their intervention (see Campbell and Lindbergh, 1991, and Storper and Harrison, 1990).

although, because of the particular characteristics of the two hubs, the effects of economic policy measures (such as exchange-rate measures) are very different, each of the hubs has its own organizational and production rationale *vis-à-vis* a given economic policy model.⁶

The fundamental differences between the two hubs lie at the meso and micro levels of their economic governance. Meso-economic regulation refers to the organizational level at which economic groups or business organizations act in order to maintain, modify or generate an economic regulation framework in keeping with their strategic expansion and development guidelines. Microeconomic regulation refers to the organizational level at which measures are taken to settle operational aspects of the production processes (such as intra- and inter-company relations) and of the local labour markets, as well as aspects connected with technology and production performance.

Although a detailed analysis of both these hubs would be outside the scope of this article,⁷ which is devoted to the analysis of the northern border hub, we can briefly indicate some radical differences between them.

With regard to meso-economic governance, in the central hub it is the strategic guidelines of the major Mexican oligopolistic groups that determine the efforts made to secure changes in the regulatory framework of the dynamic core of that area. The configuration of those groups during the period of stabilizing development and import substitution gave them a national character, even though they were located in different regional settings (metropolitan Mexico City, Guadalajara, Puebla and Monterrey). The actions taken by those groups continue to be of national scope and, to a certain extent, the emergence in Mexico of the new secondary export model is linked with the outcome of the conflict among those

groups regarding the definition of the course and features of national-level economic regulation.⁸

In the case of the northern border hub, in contrast, the economic groups associated with the creation and consolidation of its regulatory framework hardly lost their regional nature at all, although they contended individually (as in the case of the Chihuahua Group) or collectively (as in the case of the border industrial associations) for a space of their own within the national industrial development strategy.

In the field of microeconomic governance, the distinctions are even more radical. In the central hub, the development of the import substitution model gave rise to a system of production and industrial relations which could be described as almost Fordist: mass production for domestic consumption, stable domestic production linkages, and a system of industrial relations in which the labour force had its prerogatives (collective bargaining). The restructuring of this hub meant a radical change in the details of these aspects, but it basically continued to evolve along the same lines: production for the domestic market, but now under a model involving trade openness and strong export orientation; strengthening of domestic production linkages of a competitive nature, but with the substitution of imported inputs for domestic inputs which did not meet the demands of competitiveness; weakening of the trade unions and the rights of the labour force, but maintenance of collective bargaining nevertheless.

The northern border hub, in contrast, operated from the start on the basis of the rationale of a new industry, without effective trade union organizations (except in a few cases such as that of Tamaulipas), almost without domestic production linkages, and with operating conditions quite different from those of the local labour markets (employment of a majority of women, for example).

The most radical difference between the two hubs, however, is the continuity or discontinuity between meso-economic and microeconomic governance. In the central hub, the entrepreneurs who control the oligopolistic domestic groups also control the strategies governing the production processes of the firms in question, but in the case of the northern

⁶ An important task in this analytical approach, which we unfortunately cannot undertake here, is the evaluation of the different impacts of the various economic policy measures on the two hubs, in order to determine whether conflicting needs arise because of their respective development paths, or whether those policy measures have managed to strike a suitable balance capable of maintaining both growth paths.

⁷ Such an analysis, together with a more detailed analysis of the concept of the functional-territorial hub, may be found in Alonso (1996).

⁸ By "economic regulation" we mean the formal procedures and rules adopted in order to adapt and condition the conduct of the individual agents to a predetermined objective.

border hub this control is exercised by the transnational corporations, as part of their broad strategic guidelines, while the action of the entrepreneurs of that area is limited to generating and maintaining the regulatory framework and providing services and the industrial infrastructure. Indeed, in the microeconomic governance of their production guidelines, the transnational corporations operating in one hub adopt different strategic approaches from those operating in the other.

Although this study is devoted to the analysis of the emergence and consolidation of the northern border hub, it is important to note that the concept of the functional-territorial hub seeks to explain the decisive segmentation which has occurred in Mexican industrialization and to highlight the emergence of two rationales of meso-economic and microeconomic governance which operate on a parallel basis, with few mutual production linkages, but under a single economic policy and development model.

IV

The northern border hub: the economic regulation of the new type of industrial development

1. The emergence of this second hub

The new northern border industrialization of Mexico started with a set of industrial activities developed under the system of temporary importation of inputs for subsequent re-export after processing set up in the mid-1960s, usually grouped together under the title of border export assembly industries. In the Mexican context, this industrialization was belated and atypical compared with the established import substitution model. Mexico's industrialization, begun in the 1930s, was marked by a high degree of territorial concentration of activities in the cities of Guadalajara, Monterrey, Puebla and, above all, metropolitan Mexico City, representing the historical configuration of the central hub. The policy responsible for this fitted in perfectly with the import substitution model, was highly protectionist, and was designed to satisfy the priorities of the domestic market.

Northern border industry was set up in an area where labour was over-abundant but jobs were scarce. Because of changes in the agricultural sector and migratory flows from the south, this area had registered population growth which exceeded its capacity to absorb labour. Between 1940 and 1960 the population doubled and the area consequently faced serious problems in terms of employment, housing and urban services. Furthermore, the cancellation by the United States in 1964 of the binational agreement

on the entry of temporary labourers led to the massive repatriation of Mexican workers, many of whom decided to settle in the Mexican border area.

It is against this background that we should interpret the establishment in 1965 of the Border Industrialization Programme, which permitted and encouraged the installation of export assembly plants, on an exceptional basis and subordinated to import substitution industrialization. Through this measure, the Mexican government –taking into account some incipient experiences with export processing zones in other countries– embarked upon a policy which was to be of an exceptional nature, with a clearly defined scope in terms of time and geographical extension. The idea was that in the medium term the industrialization drive would generate production linkages which would encourage industrialization with a domestic base, whereby the border area could be “reintegrated” into the national economy. With regard to its geographical scope, the model was adapted exclusively to the exceptional conditions of the northern border area in respect of its labour market and its proximity to the United States.

Because of the supposed pre-eminence of the import substitution model, the export assembly industry was seen as an eminently peripheral phenomenon, both because of its relatively small size in the overall Mexican context and because of the express intentions of the government policy which supported

it. The 1982 crisis, however, caused a break with that approach. That year witnessed the definitive "take-off" of border industrial development, thanks to the effects of increased world competition on the United States economy and, above all, the macro-economic policy measures adopted by Mexico to consolidate the export industrialization model. Border industrialization ceased to be a mere peripheral process. Since 1970, employment in the northern border hub has grown by 10% per year, compared with only 2% in nationwide manufacturing. Today, with nearly 3,500 establishments and 750,000 jobs, it can be said that the export assembly industry, together with the export manufacturing plants in northern Mexico, has formed a second functional-territorial industrial development hub in the country, the core of which is located in just a few border localities.

At the same time, since the late 1970s the transnational corporations operating in Mexico, especially in sectors under increasing pressure from foreign competition (such as the motor industry), decided to establish export plants in the northern part of the country in order to establish a shared production strategy with their United States operations. The increased trade openness and the new export-oriented economic policy measures intensified that process, while also generating suitable conditions for the establishment of manufacturing operations (such as the production of television sets) by other transnational corporations which found in the northern border location and the forms of production organization prevailing there a favourable environment for their expansion strategies. By the late 1980s, the combination of the above-mentioned actions by the government and the transnational corporations had been firmly consolidated into what we have termed the northern border national industrialization hub.

This was not just a simple process of industrial expansion, but a process involving the appearance of manufacturing and assembly operations in the branches which formed the dynamic core of national industrialization. The two most eloquent examples of this process are the electronic components and consumer electronic products industry and the motor vehicle and vehicle components industry. In both cases the dynamism and magnitude of Mexican industrial expansion and the attainment of global competitiveness levels are associated mainly with the evolution of those sectors in the northern border hub, and only

to a much more limited extent with their evolution in the central hub. Even within the same firm (Ford, for example), the organizational and production rationales of the two hubs sometimes exist side by side (Carrillo, 1995) and are reflected in different paths within the dynamic core.

2. Meso-economic governance: entrepreneurs and the shaping of the institutional framework

The appearance of the assembly industry on the northern border was not simply the result of government policy, that is to say, of the series of Presidential decrees which permitted the maintenance of a special industrialization policy in border areas, subsequently extended to the rest of Mexico. Important contributory factors were the local conditions and, above all, the economic agents who determined its dynamism and the profile that the growth would assume. The emergence of an entrepreneurial sector associated with that growth is of fundamental importance for understanding the impact and potential of northern assembly industrialization. This is because the entrepreneurial groups of the area contributed to the process of its integration by transferring surpluses from one sector to another within it through their investment portfolios and organizational makeup. Even though those groups were not the determining agents of the production process and in many cases were outside it or merely acted as the symbolic owners of the assembly firms, the evolution of the process was not unconnected with their strategic interests in those areas.

It is important to understand the actions of the economic groups of the northern border area in the promotion of assembly activities and export plants (generally subsidiaries of transnational corporations), as well as the way those activities fit in with the organizational rationale and structure of opportunities in the various sectors of the area's economy. It is worth highlighting the fact that the entrepreneurial sector has played a decisive role in the functional-territorial configuration of the northern border hub through its intermediation in shaping the institutional framework (i.e., negotiating the border development policy) and acting as an important agent in organizing the overall economy of the area.

The entrepreneurial sector of the area did in fact originate from the special border fiscal arrangements made in the 1930s, because these made possible the

growth of the commercial and services sector, which even now is responsible for a substantial part of the area's economic dynamism. It was in the border towns (especially Tijuana and Ciudad Juárez) that grew most thanks to these policies that the biggest growth in assembly activities was registered.

The special fiscal arrangements for cross-border imports and exports (also known as "free zones") played a very important part in the development of the northern border hub. Commercial imports for consumption in the border area itself were of vital importance for the entrepreneurs of the area. In fact, those arrangements acted as the main form of accumulation, mainly because domestic producers (i.e., the big oligopolistic Mexican groups) could not compete with imports in border markets in terms of price and quality. This meant that there was a constant contradiction between the import substitution model and these special arrangements: in other words, between the border entrepreneurs and the big national oligopolistic groups. This contradiction was expressed at the time in a now historic controversy with a very high ideological content: whether to encourage the "national integration" of the border areas or to promote their "regional development". It is well known that the first of these objectives guided the economic decisions of the federal government with respect to the border areas, giving rise to a climate of permanent tension with the entrepreneurs of those areas.

For this reason, the relations between border entrepreneurs and the federal government have a long tradition of tensions and conflicts. The free zone arrangements became the major problem in relations between the entrepreneurs and the government in the mid-1950s, when regional repercussions began to arise as a result of the combination of a protectionist policy which restricted imports and an overvalued exchange rate which encouraged the consumption of imported goods. This situation was characteristic of national import substitution industrialization policy during the process of stabilizing development.

It was precisely this conflict which gave rise in the past to a certain degree of unified collective action among the border entrepreneurs. During the import substitution period, the federal government's development policy with respect to border areas and the dispute over the arrangements for free zones reflected a fundamental conflict of interests between the border economic groups and the most important groups at the national level, which were located

above all in the major metropolitan areas of the country and included domestic and foreign monopoly groups.

Thus, the dispute over the system of free zones was above all a conflict among economic groups, in which the State intervened as a mediator of their differences and as the regulator of capitalist competition. The specific question of border economic policy reflected the correlation of forces among the different business groups, the scope for the harmonization of interests left open by the capital accumulation cycle, and the capacity of the State to work out, in the regulation of those competing interests, an agreement which was satisfactory to all the economic groups.

The nature of this conflict changed substantially after the 1982 crisis, for three structural reasons. First, the new policy of under-valuation of the peso compared with the dollar made domestic products more competitive with cross-border imports, thus enabling the establishment of domestic trading channels and ensuring the stability of the supply flows from the central area to the border zones. Second, although the policy of greater trade openness caused immediate problems for the free zones, it nevertheless created a suitable context for the regional groups to invest with a long-term approach in the various sectors of the economy, especially services and manufacturing. Third, in so far as the generation of foreign exchange became a priority of the Mexican model, this furthered the policy of supporting export assembly industries, thus ensuring considerable expansion of northern border business activities associated with the assembly industry (professional services, industrial management, construction, infrastructural rents, etc.).

A second important group in the northern border business sector was made up of the entrepreneurs whose markets were fundamentally the surrounding areas but who continued to have strategic plans for penetrating the big domestic markets.⁹ At all events, these groups played an important part in promoting the new export-oriented industrialization, especially with the aim of strengthening their position in line with their growth strategies.

⁹ An exceptional case is that of the Chihuahua Group, which at one time attained levels comparable with the other domestic groups but now maintains a strategic approach oriented towards exports and the penetration of local area markets.

It is hard to forecast how successful these groups will be in the immediate future, although the new industrialization process is likely to be advantageous for at least some of them. It has been suggested that conflicts of interests may arise among the northern border business groups: i.e., between the assembly industry groups and those associated with commerce and services (Salas Porras, 1987, pp. 51-58), which could adversely affect the strategic management capacity of the entrepreneurs of the area as a whole. Currently, however, there does not seem to have been any conflict with consequences extending beyond the sphere of the strategic decision-making of some groups in the area (such as the Chihuahua Group). The most likely outcome is that the growing dynamism of assembly and export industrialization, due to the diversification of the long-term investments of the local economic groups, will enable both the assembly industries and the commerce and services sectors to find an advantageous place in the new national economic growth model.

What does seem increasingly unlikely is that local production linkages may be established with the export assembly industries and the export manufacturing plants. This repeated expectation of the Border Industrialization Programme and the series of decrees issued in the past for the promotion of assembly industries continues to be the biggest challenge for strengthening the area's industrial development possibilities. Once again, the key to understanding the lack of industrial entrepreneurs associated with the assembly industry is to be found in the features and requirements of the assembly industry production processes and the type of local entrepreneurial attitudes developed in the past in the border areas.

3. Microeconomic regulation: changes in organization and their impact on the labour force¹⁰

In the northern border hub, microeconomic regulation takes place at the company level. Since industrial dynamism is a function of inter- and intra-firm transactions and the marketing chains are in the hands of the transnational corporations which run this process, industrialization in this area is depend-

ent on the interaction of the global rationale of the firms, on the one hand, and the specific nature of the local labour markets, on the other.

Generally speaking, the firms established in the northern border hub have undergone a series of changes connected above all with technology, forms of production and organization, labour management, and production chains, as we shall see below.

a) *The transition from assembly activities: from assembly work to competitive manufacturing*

In the debate on the emergence and evolution of the export assembly industry in Mexico, there are two approaches which seek to describe this process: one based on the neo-Taylorist paradigm and another based on flexible production.

The neo-Taylorist approach emphasizes the regressive nature of the development of the export assembly industry, highlighting such aspects as alarming working conditions and environments, environmental degradation, and the lack of national production linkages because of the simple assembly operations carried out by these firms. This approach is based on concepts formulated in the 1960s and 1970s which linked the process of internationalization of production and the consequent development of export firms with low-technology activities making intensive use of routine manual labour, with few or no linkages with the domestic economies, with relatively low wages and with a high level of utilization of women with skills limited to the domestic sphere: in short, it sees the assembly industries as being based on a vertical integration model harking back to the primitive forms of Taylorism. According to the regulation school of thought, the extension of Fordism to peripheral countries is an attempt at industrialization using Fordist technology and consumption models, but without the corresponding social conditions, work processes and mass consumption standards. In this sense, the transplantation of this approach –initially called post-Taylorism– is considered a caricature even in the best of cases (Lipietz, 1995). This model is characterized by the intensive use of cheap labour, the division of activities into separate groups, the flexibility of labour regulations in the absence of trade unions, and the use of very little technology, and it usually depends on the existence of an authoritarian and repressive State.

¹⁰ For a more detailed analysis of this subject, see Alonso, Carrillo and Contreras, 1994.

The second approach, based on flexible production, has emphasized the introduction of new production techniques and processes and new labour skills. It focusses primarily on the most modern sectors of export assembly industry. In various empirical investigations, it has stressed the study of the new methods of organization of production (such as just in time production and total quality control), the introduction of flexible technologies (numerically controlled machines) and the application of methods of organization and control of labour skills and management (quality circles, versatility, wage systems, participation techniques, etc.).¹¹ Generally speaking, this approach has tried to give a picture of a "transition" in industry, showing various aspects of its changing nature and complexity. Various studies¹² have reported at length on the industrial changes in the assembly sector, thus justifying the application to these firms of the title we have used here: "second-generation assembly firms".

At the present time, it is clear that, at the micro-economic governance level, there has been a substantial albeit partial spread of second-generation assembly firms. Carrillo and Ramírez (1993), using a multivariate analysis, find that 18% of 358 assembly plants (in three sectors of the economy) are of high technology and flexibility, compared with only 5% of all plants nationwide. Likewise, according to the managers consulted, 40% of the production workers operate under flexible organizational techniques. Moreover, in a non-probabilistic survey covering 71 assembly plants in four localities, Wilson (1992, p. 63) also found that 18% of the plants were using flexible production. Finally, Pelayo Martínez (1992, p. 9) found, in a survey of 18 motor vehicle component assembly plants in Ciudad Juárez, that 38% of them were using the just in time production system, 44% used quality circles, and 100% used statistical process control. If we also take account of the automobile and engine export firms, we see that the spread of the just in time system and total quality

control, along with automation processes, is even greater (see, *inter alia*, Micheli, 1994; Shaiken, 1990, and Carrillo (ed.), 1990).

If we look at the strategies applied by companies like Ford and General Motors (Carrillo, 1995; Micheli, 1994) and their suppliers (Ramírez, 1995) in the two industrialization hubs, we see that the spread and adaptation of flexible production is much greater in the northern border export firms than in those of the central hub. This fact represents a substantive difference from the restructuring strategies of the plants oriented towards the domestic market. Thus, everything indicates that there has been greater adaptation to the principles and practices associated with just in time production and total quality control in the northern border hub than in the case of the firms in the central hub.

b) *Labour relations*

Various studies note that foreign investors' perception of the labour environment is an important factor in their decisions to locate industries in the northern border area of Mexico. A labour environment favourable to the interests of the firms is seen as one where there are no militant trade unions, there is a low rate of labour conflicts, and collective contracts are flexible in terms of labour regulation. Except for a few labour movements and inter-union conflicts, labour relations in the export assembly industries, as well as in the motor industry export firms, have been non-conflictive and represent a contrast, in this respect, with those of the companies which arose and developed under the import substitution industrialization policy.

Generally speaking, four main features of labour relations in the export assembly industries may be identified:¹³ i) low conflictivity, despite the repeated criticisms of working conditions; ii) a highly unionized industrial environment, especially in the north-east border area (rates of unionization of the plants exceeding 90%); iii) the participation of "active" (traditional) and "phantom" (regressive/functional) unions, both incorporated in the main national trade union confederations, and iv) highly flexible collective labour protection contracts.

¹¹ For more details on the features of the flexible production system, see Humphrey, ed., 1993, pp. 6-8; Kaplinsky, 1993, pp. 3-8, and Coriat, 1993, pp. 22-23.

¹² Such as those of Echeverri-Carrol (1994), Wilson (1992), Koido (1991 and 1992), Sklair (1993), Carrillo (coord.) (1993), Shaiken (1990), Brown and Domínguez (1989) and Mertens and Palomares (1988).

¹³ On the basis of the studies by Covarrubias (1992), Williams and Passé-Smith (1992) and Carrillo and Ramírez (1990).

It is hard to determine how far this has influenced the working conditions and environment in the export assembly industries. What is certain, however, is that while in those industries there is progress in the labour sphere and some degree of stability in the trade unions (Carrillo, coord., 1993; Carrillo and Ramírez, 1990), in the firms oriented towards the domestic market and located in the traditional industrial centres there has been a reversal in labour conditions and a deterioration in the bargaining power of the trade unions (De la Garza, 1993).

The way the trade unions function is of course an important element in the institutional mechanisms which, at least potentially, should play a part in the improvement of labour conditions. However, it would appear that it is the real shortage of labour in the northern border hub, rather than the trade unions, which is behind the relative improvement in those conditions in the latter area.

c) Working conditions: wages and benefits

Both in the northern border assembly industries (especially the second-generation ones) and in the export manufacturing industries (motor vehicles, engines, cement or mining products), labour conditions have evolved positively (at least up to the 1994 crisis), whereas in the central hub they have deteriorated (let us make a comparison, for example, between the Ford plant in Hermosillo and that in Cuautitlán, or between the border assembly plants and those of the central area). This trend may be illustrated by the levels reached in the early 1980s. Whereas in the northern border hub most of the firms are quite recent and started from a low level of labour conditions but subsequently began to improve, the plants in the central hub made substantial economic and labour gains in the 1960s and 1970s, thanks to the participation of the trade unions, but began to deteriorate in this respect from the 1980s onward. These firms have undergone profound restructuring processes which have been reflected in a decline in employment, an increase in labour flexibility, lower wages and the loss of capacity for trade union negotiations.

Looking at the export assembly industries from the standpoint of flexible production, what we want to know is whether the evolution of labour conditions in them is a steady process of change, or whether the changes are relatively small and reversible. The available information indicates the following: i) from

1982 up to 1994 both nominal and real wages in these industries increased; ii) economic benefits also increased, forming a growing part of the overall wages (23% in 1982, 30% in 1990, and a forecast of 43% for 1997), and iii) although many of the assembly plants continue to make intensive use of unskilled labour, in a substantial proportion of them work has been enriched by the skills learned and involvement in the job.

Labour conditions in the export assembly industries display a more positive trend than in other sectors of manufacturing. On the one hand, by local standards the incomes of workers employed in those industries are higher than those paid in other manufacturing plants, and they are undoubtedly higher than the general and professional minimum levels prevailing in the country; on the other hand, the evolution of wages shows that although in 1980 average wages in the nationwide manufacturing sector were 56% higher than in the export assembly industries, by 1990 this advantage had gone down to 30%, and projections for 1997 indicate that wages in assembly industries will be 12% higher in that year.

By international standards, the export assembly industries have also shown that they respect internationally established workers' rights, and they have even been evaluated more favourably than export processing zones in other countries (United States Department of Labour).

We thus see that although the firms in the central hub pay higher wages than the export assembly industries, the differences have been going down appreciably over time, and the export firms are even being taken as models for labour conditions in the rest of the country.

d) Employment, skills and stability

In general terms, employment and job stability, as well as labour skills, have evolved differently in the firms of the northern border hub than in the companies of the central area.

Firstly, employment grows more quickly in the export firms than in those producing for the domestic market: in 1994-1995 employment in the export assembly industries grew by 13.3%, whereas it increased by only 1.5% in the rest of Mexican manufacturing. In the northern border hub the average number of workers per establishment has risen appreciably (for example, from 377 to 2,029 between 1985 and 1995 in the firms producing television sets), in contrast with the evolution observed in

manufacturing firms in the central hub. However, the socio-demographic profile of the workers in the northern border hub is marked mainly by the employment of young women with little schooling and experience in the sector, whereas there is a bigger proportion of skilled male workers in the central hub.

Secondly, labour skills have gradually risen in the export assembly industries and the export firms. In the assembly firms, the average schooling of the workers has risen from six to seven years, while the proportion of workers with previous work experience rose from 30% in 1979 to 70% in 1989.¹⁴ In the area of working conditions, the tasks that workers have to carry out have become more complex because of the spread of some new manufacturing processes and the use of new technologies and methods such as total quality control (especially statistical control of processes and quality control groups). At the organizational level, according to the management surveys, the number of highly trained employees has grown over time from 20% in 1979 to 40% in 1989. It should be noted in this respect that although the work in the export assembly industries is relatively unskilled in general terms, the fact that 80% of the occupational structure consists of workers directly connected with production is associated with at least three factors: the age of the firms (the newer a firm is, the fewer skilled workers it will have in its organizational structure); the high turnover of staff (whose replacement constantly renews the unskilled segments of the labour force), and the compact organizational structures of the firms (consisting of four categories, for example).

Thirdly, employment in the export assembly industries is really of a temporary nature, as workers constantly leave their jobs. The average monthly turnover in 358 plants analysed in 1989 was 12% (compared with 2% in firms located in Monterrey, for example). The northern border export assembly industries have the highest rates of turnover in the whole of Mexican manufacturing; this labour instability is associated mainly with socio-demographic factors (Carrillo and Santibáñez, 1993). A broad-ranging study in Tijuana found that single persons and the younger workers rotate more frequently, due no doubt to the stage they are at in their life cycles and the abundant job prospects in the northern border area.

To sum up, and simplifying the way the firms are categorized, in the northern border hub, and particularly in highly dynamic and internationally competitive export firms which are not devoted to assembly activities, labour relations are not conflictive, because the influence of the unions is low, wages are gradually improving (at least up to 1994), and benefits form an increasing part of the overall wages. The number of workers per firm is growing rapidly, skill levels are gradually rising, tasks are becoming more complex as more advanced technological processes and new forms of organization of work are introduced, and there is a flexible external labour market because of the abundant job opportunities. In general terms, all these features differentiate the northern border industries from non-export-oriented firms located in the traditional industrial areas (Monterrey, Guadalajara, Puebla, etc.).

V

Some conclusions

More than a decade has passed since the 1982 crisis, and many of the structural changes brought on by the change in course of the national industrial development model have assumed special features within their territorial expression. Our aim in this study is to put forward an alternative approach to those based

exclusively on sectoral analysis (such as industrial sociology) or territorial analysis (such as regional science), proposing instead a working hypothesis which includes both aspects. Obviously, much remains to be done in this sphere, both at the conceptual and research levels. Nevertheless, even bearing in mind that this is just a hypothesis, there is evidence to back up the theory that the restructuring of production in Mexico has been characterized by functional-territorial industrial growth hubs. We hope

¹⁴ Firms like Ford Hermosillo, for example, only take on workers who have completed at least the technical school cycle of studies.

that further progress in this research will make it possible to gain a broader picture of the regional development options open to the various northern and border localities.

The idea of a functional-territorial hub allows us to take into account both the heterogeneous nature of the production linkages and the regulatory framework which gives some characteristics of territorial homogeneity to the process. With regard to this homogeneity, we may ask how far the entrepreneurs of the northern border area can maintain a collective strategy, or whether there is a risk of a split between the rationales of the different entrepreneurial sectors operating in the area.

As regards the heterogeneity of the process, we must seek to progress in the identification of the wide range of linkages and relations between, on the one hand, the export assembly industries and other export firms, and on the other their parent companies and foreign contractors and, ultimately, the whole structural diversity of the external industrial sector with which they are linked. What is involved, then, is a scenario with different development paths, different needs and internal production organization and control rationales, and different inter- and intra-firm relations. In order to analyse these dynamics, we will need development path studies such as those proposed by Storper and Harrison (1990) for the case of industrial districts. There are very few studies aimed in this direction (Mercado, 1988), although they would be very useful for understanding export assembly industries better. It would also be desirable to give up any idea of continuing to study the export assembly industry as a homogeneous unit of analysis. It is not just a question of acknowledging the structural

heterogeneity of the main variables defining this industry (Carrillo, coord., 1993; González-Aréchiga and Ramírez, 1989), but of assuming that it is not an industry at all in the recognized sense. In fact, the export assembly industry is merely a set of manufacturing plants operating under a specific tariff system in order to obtain a number of advantages for their exports. Little progress has been made in analysing labour diversity from the standpoint of the structural heterogeneity of the assembly plants. In other words, this diversity has not been seen as the result of differences in their relations and linkages, and little consideration has been given to the economic governance which defines it and which holds the answer to our questions about the development potential of this model.

In order to accept the existence of a "regional question" it is necessary to determine how changes are taking place in regional linkages in Mexico: that is to say, how the forms of social organization of the Mexican economy in the various regions and localities are being redefined. The basic premise of the present article is that in order to determine the nature of these structural trends in the country it is necessary to move from the analysis of processes at the global level to the analysis of the development trends of specific regions and localities. The course of events with regard to the restructuring of industry partly depends on regional and local dynamics, and until such time as we have a profile of how the various forms of restructuring are processed and take place at those levels, there is not much we can say about their real course.

(Original: Spanish)

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