

Pidal, Elena Giraldez

**Conference Paper**

## Toward a division of metropolitan labour: An empirical analysis of the metropolitan area of Barcelona

38th Congress of the European Regional Science Association: "Europe Quo Vadis? - Regional Questions at the Turn of the Century", 28 August - 1 September 1998, Vienna, Austria

**Provided in Cooperation with:**

European Regional Science Association (ERSA)

*Suggested Citation:* Pidal, Elena Giraldez (1998) : Toward a division of metropolitan labour: An empirical analysis of the metropolitan area of Barcelona, 38th Congress of the European Regional Science Association: "Europe Quo Vadis? - Regional Questions at the Turn of the Century", 28 August - 1 September 1998, Vienna, Austria, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/113504>

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**TOWARD A DIVISION OF METROPOLITAN LABOUR: AN EMPIRICAL ANALYSIS OF THE METROPOLITAN AREA OF BARCELONA**

**ABSTRACTS**

The economic globalisation, firm's internationalisation and the territorial decentralisation of the productive process to increase competitiveness via prices is producing not only a new process of international labour division between developed countries that overcome the previous divisions between North and South if not also a division of employment inside big metropolitan areas in developed countries. A divisor process of employment that we can call (metropolitan division of labour). These metropolitan regions, old nucleus of regional development it transforms in a complex model which interrelations are necessary analyse to develop, from the public territorial institutions, the adequate strategies. The aim of this paper is analyse the model of metropolitan division of labour in the Metropolitan Area of Barcelona.

Elena Giráldez Pidal  
Dept. de Política y Estructura Económica  
Universidad de Barcelona  
giraldez@eco.ub.es

## Introduction

From the beginning of the Industrial Revolution to nowadays, the urban systems -with rare exceptions- have tended, simultaneously, to increase their size and to spread out the space. The growth rhythms and the functional structure that are assumed by them vary depending on the period

- a. During a great part of the nineteenth century, the urban production systems usually consisted of manufactures and workshop complexes, in industries as textile, shod, watches, etc.
- b. At the time of sequence fordize production, the industrial urban agglomerations acquired dimensions without precedents with the expansion of the global scale production, among the growth leader sectors, in particular (automobiles, household appliances, machinery, etc.) with numerous providers, direct or indirect.
- c. Nowadays, the resurrection of production and labour market flexible ways has engendering the return to the agglomeration and to the urban growth. The main activities implied on these areas of development are handicrafts industry based on skill, the high technology industry, financial services and the services to the enterprises.

As Scott points (1) , one or two decades ago, the most part of the urban theories considered the city, at first place, as authority of the residential activity, of housing choosing and of collective consumption (Scott, 1987). In these last years, this point of view is hardly used, not because these uses are not important yet, but because the crisis and the deep changes of the seventies and eighties on the whole of west countries have pointed again the attention on the impact of the industrial production in the urban system evolution.

The unbalances that have shaken the different systems of fordize production from the end of the seventies, in North America as in West Europe, too, the emergence and expansion of flexible production sectors and the massive internationalisation of the economic activity have had deep repercussions on the prosperity of the metropolitan regions of the contemporary world. Although, for some authors this is only one of the two faces of the same coin about the process that is taking place. So important as the impact of the economic activity and its transformations about the structure and the performance played by the cities, are being the different ways in which the urban characteristics, historical, social, cultural and political of those areas, etc. contribute not only to the dynamism of the activities located in these, but the internal emergence of new activities and the situation of foreign activities.

This second part of the analysis presents a special interest for the territorial development, because it can give a big push to the role that the local economic policies can play in the sustained internal development.

## **The metropolitan's problematic.**

### ***The metropolitan fact: some considerations.***

In front of the multiplication of don't agree definitions in the shape, although they agree with the background, of the metropolitan fact, seems important to consider some basic positions before to state the geographical boundary limited as Barcelona Metropolitan Area in the development of this work.

Following Clusa (2), three main factors can be considered on the metropolitan construction (Clusa,1995) :

- a. The real' agglomeration variables (population, housing, territory, etc.).
- b. The infrastructure' system of the zone (highways, ports, etc.).
- c. The metropolitan flux (activities, work-residence fluxes, and leisure).

Respects on the first factor, the different definitions have tried to establish the minimum, from which a zone can be considered metropolitan. On this concept development have been considered variables as global population, distance from the centre to the limit of the area, central town size, and settlement more or less uniform along the territory, growth rhythm of the population, etc. These standards have given, obviously, different results depending on the variables used.

The second factor has pointed the zone infrastructure. A metropolitan area is not only a group of population units, of activities or of residences, at the contrary requires the intercommunication among the different units of this. The previous fact to this intercommunication is the existence of suitable infrastructures so among different parts of the area as of this with the outside and the existence of local quick communications resources able to achieve that the different situation of everyone of the nails is not motivated by orographic reasons, but because of the functional distribution of the agglomeration.

On that sense, well the distance, well the time covered from the centre to the edge of the metropolitan area should be an assumed function of costs in relation to the work-residence, residence-leisure, residence-purchases fluxes, etc.

However, this system, so when works with a high composition of internal selfconsumption of its production (3), must be able too, to communicate itself with the outside across the airports nets, ports and highways, although the most part of these communication resources are being today, highly complemented, even substituted, by the modern nets of telecommunication.

The metropolitan flux would be the dynamic factor that would make work the metropolis elements with their infrastructures. Is not enough, then, that exists agglomeration or communications. The metropolitan area is a functional whole, where the residential zones of whichever of its points generate

fluxes that, across their infrastructures go towards the work, the trade or the leisure and where the economic activity, functionally separated between the centre and the outskirts are in touch.

This active relation requires that the activities be no local, essentially, it means, that they needn't to have an exclusive link with a zone, and they must answer, in their situation, to profitably factors in relation to the urban space.

The central spaces are occupied, then, in a development Rostow-Vernon process by economic activities of the tertiary sector with high added value (financial, administrative, trade), that eject the urban productions of the secondary sector towards the outskirts (industrial zones) and the residents, to new beehive-suburbs or high standing residential zones, depending on their income levels.

The metropolitan space, in its growth-diffusion process of the economic activities, is consolidating a hierarchic functional structure to include different urban zones that composed it (with their different dynamics centre-periphery) with another one of higher range that includes the global needs of the agglomeration.

The centre of the nodal city assumes, simultaneously, the role of the urban tertiaryation with the more complex of metropolitan tertiaryation, exerting a big impact among the zone infrastructures, and the translation of these impacts in social conflicts and the reorganisation of the social classes on the territory.

### ***Local problems, metropolitan problems.***

Independently of the decisions that the local agents can take about the metropolitan reality, there is no doubt that it exists and that, however, is a system that generate problems of different kind from the problems of each one of its parts.

The quantitative change of zone produce not only an increase of the quantitative needs to cope with them, it can unchain scale economies and diseconomies, also, that require or generate qualitative changes.

In other words, the relocation of a logistic centre of commodities transport in a zone, the relocation of an area of urban residues, the building up of a big commercial centre can provoke general changes on the tendencies of the traffic fluxes, residential changes, changes on the little settlements, changes which make necessary plan the whole effects that drag down decisions of this kind.

This problem, spread over various municipality terms, requires minimum rules to analyse the effects, and for giving solutions and distribute their benefits and charges. If this analysis does not take place, it will mean, or charge above the weakest or the less capable to negotiate the biggest problems, or do not solve them.

The metropolitan problem characteristics and their ways of posing and solution have been treated in numerous studies (4). Obviously, exist problems that, by the own definition of metropolitan area, assumed from the first moment that rank.

- a. The communication infrastructures would be an essential element in this approach because of the metropolitan fluxes that will appear greater or less fluently depending on the state of them.
- b. Big equipment and public endows are basic elements, also, of this problematic. Do not the local problems yet, that must have the main importance, in endowment and situation of the big services, and all enter the metropolis functional game.
- c. University centres, sanity, assistance, public transport nets, etc, are typically metropolitan problems.

In this period of economical change, the conception about the metropolitan phenomenon must incorporate the complex problematic of restructuring, restructure, reindustrialization and economic internationalisation, together with the effects of all of these phenomena over the metropolis territorial structure. Do not be, then, a traditional approach of the metropolitan area and that makes compulsory to pause about the need and strategy of the active institutional agents taking part on the problems resolution of it, but the effects about the social and economic segregation, the labour market fragmentation, disorganised economy, the business interrelations in the decentralisation process, so as the factors that power or limit the metropolitan development must be key elements in whichever analytic process.

The metropolitan phenomenon view is every time more complicate given the possibilities of operating over it. It is not the statistic determination which transform the metropolitan problems in operational variables with functional resolution, in place of that are the wills and politic interpretations of those realities which make possible their resolution, through the plan, the consensus or the coordination or through the resolutions and reactions of everyone of the administrations and the organisations depending on their particular criterion.

Creating institutions can be a justified act when exists a clear vision about their function, effectiveness, and their framework in the whole. When the institutions appear (or disappear) without a serious analysis about their cost and effectiveness or they are justified more by short or long reach politic criteria, they do not contribute at all to the resolution of the real problems and then is when the covering up, irresponsibility, global management and squandering problems appear.

If the decisions in Spain about the rule of the metropolitan areas of the Basque and Madrid cases were solved in a relatively quick way independently of their results, in the Catalanian case the argue about the metropolitan problem was inserted in the global context of the Catalonia territorial organisation, giving as a result four laws about the local government and Catalonia territorial organisation. The 5/1987 Law of the provisional regime of the provincial county council („diputaciones“) domains. The 6/1987 Law

about the Catalonia district organisation ; the 7/1987 Law which established and adjusted the public special actions in the Barcelona (conurbation) and the regions included in its direct influence zone ; and, finally, the 8/1987 Law municipal and of local regime.

As the Law introduction points, „to broach the adequate way this question a reflection over the metropolitan phenomenon is needed which must go further than the restricted vision to a determined organisational formula. As these experiences prove does not exist an unique administrative organisation model to recognise a reality with particular characteristics and the territorial organisation of every country, it must be found the formula that offers more coherence and reasonability joint together with the in force politic co-ordinates.

## **Metropolitans process of Barcelona municipality**

### ***The industrialisation beginning process***

The importance of the industrial and commercial productive activity, developed during the nineteenth century begins the consolidation of the economic structure of Barcelona. The great expansion of the city, on that years, was supported on the settlement of manufacturers industries that endowed it with factory and labour suburbs, classic of all industrial city.

From the beginning of nineteenth century, the development industrial process produced a big increase on the activity and population in Barcelona. The greatest growth tax was produced between the forties and the middle of seventies, as a result of the big migratory movements, producing a great occupation of the residential space and reaching to saturate the available space into the limits of the municipality. This polarisation in the metropolitan core give as a result a diffusion process as a oil stain towards the surrounding municipalities, generating a urban metropolitans process with its centre in the city of Barcelona.

This metropolitan's process was based on the relocation of the industrial activity, so as a certain residential relocation. The increase of the ground price was a regulator mechanism on the increasing space demand pressure, helping together the refunctionalisation of it to metropolitan scale.

From the economic view, takes place the classic process of tertiarysation of the urban centre and the industrialisation of the peripheral ancient agrarian spaces, a sectorial specialisation of the space ; at the same time, the population increase, generates scale economies and makes possible the appearance of new urban centre on the metropolitan surround and the location of different services activities.

The population pressure at the industrial zones that were built during the nineteenth century and the first third of twentieth century, especially during the period after of forties, make that them end closed into a residential surround. Progressively, this industrial space constricted inside of the urban area was

making itself obsolete for adapting to the new organised series technologies that needed a big dimension. This fact, together with the increase of the ground price (capable of being occupied by another kind of functions with more added value), the drowned of their expansion possibilities and the possibility to obtain bonus values by the functional change in the use of its plots, meaning a group of influences overall from the seventies, when new industrial investments were directed to the outside of the urban places area more agree with its functional needs and the ground prices.

### **The economic transformation process on the metropolitan Barcelona area (1975-1995)**

Along the 1975-1995 period, the productive space of Barcelona and its influence area have passed through different economic transformation process:

- a. The subsequent stabilisation Plan transformation (that includes all the 1970 decade)
- b. The big recession of seventies and the beginning of eighties.
- c. The rationalisation of industry (first half of eighties; Solchaga period).
- d. The innovation and technologic transformation period at the middle of the eighties, in parallel with the entry of Spain in the European Union.
- e. The technologic accelerated transformation at the beginning of the nineties, simultaneously with the start of the space (decentralisation) strategy of the traditional sectors (textile basically) towards North African countries.
- f. The 1991-1993 recession.
- g. The economic recovery since 1994.

This productive transformation process, national and regional is developed in parallel with the internationally and globally process at world scale, where the cities system acquires a big importance as a articulator element of the global space. Every city with any aspiration to have a rule on the world scale it will be compelled to organised its regional space in a coherent way and operationally, in function of their aspirations in the geopolitics and economic context.

Appears then, the territory -physic and material factor- as an articulated ambit at the service of multiple objectives of city internal strategy and the use of it by the economic- productive forces that see, in that territory, and in its economic, social and technologic articulation, an adequate space to the attainment of their objectives.

The metropolitanism as a social spatial phenomenon keeps on in force not because of the city throw outside of its administrative limits, but by the material and the executive way. The agents, interested in take profit of the possibilities that the city offers them, know that the modern city do not absorb the

industrial productive system into the urban perimeter, but organise its surround settlement, helping to define the metropolitan space in proportion to proceed to locate, in this space its industrial tissue.

All of this change process is powered by new production models of increasing versatility and technologic complexity, that need agglomeration economies because of the needs of the present globally process (labour market with high specific qualification; existence of consulting services, technology, commercials, marketing or financial) can be solved.

## **The industrial investment in the metropolitan area**

### ***Objectives, sources and methods***

The last two decades are being witness of significant changes in the internal structure of the big cities and a vigorous restructuring of the global geography of the urbanisation as an answer to the new tendencies. Our objective is analysed these transformations in the Barcelona Metropolitan Area by the location strategies of a fundamental variable in the economic development and in social, politic and space transformations that provokes the industrial investment.

Giving the geographical variations that has experimented institutionally the influence area of the Barcelona municipality, it has been adopted on that work as a limited space the 27 municipalities governed in the region Plan of 1953, limit that is used in the most of works consulted around of the subject.

### **The industrial investment behaviour in the metropolitan area of Barcelona during 1975-1990 period.**

Invest is equivalent to renew and enlarge the productive equipment. Doubtless, a part of the investments will destroy employ in some areas of the economic system. They are necessary investments to increase the productivity of those activities and to cope with the increasing competitiveness from the other countries, which have transformed, from the new technologies, it's the productive processes. However, beside this investment, that can affect negatively the employ levels, there are another investments neatly creators of job. We are referring to the investor process that leads to a greater use of the productive equipment, but, overall, to the investments that make possible making work of new activities materialising the creators initiatives in an increase of the number of enterprises and settlements of different kind.

Evolution of the global industrial investment

Different basic features form the dynamic of industrial investments in 1975-1990 period:

- a. The great decrease of the investments in 1975-1981 period.

- b. Its light recover in 1982 and 1983, consequence in great part of the encouragement that represented the take of power of socialist party with absolute majority, and the conservative measures that performed, diluting the management's afraid of a possible turn to the left of the public policies.
- c. From 1984 the expectations about the entry in the European Union unchained a big investor push that had, in spite of the ups and downs that were registered from ones to each other's, a clearly expansive tendency.
- d. The crisis at the beginning of the nineties, that not ended to 1994.

Indeed, the industrial investment analysis in 1975-1990 period allows seeing the big impact of the crisis in this variable. As well the total values and at current prices do not reflect clearly the decrease on the investment from the politic transition, their valuation, at constant prices (using as a deflators the corresponding to the gross capital form of the Spain Bank, base 1986), discover the effects of the crisis and the politic problems over the investor astonish in 1975-1990 period. In 1982 takes place a big investment expansion to goes down again, in 1983, to the levels of 1981. From 1985 begins a new period of industrial investment growth, with accumulative annual average tax, respect to the period before of the 2.63%.

This industrial investment growth keeps on until 1990, so, in 1985-1990 period, the accumulative annual growth tax is of 5.31%. The recession that begins in 1991 produces, again, a big impact over this variable and over the generation of employment derived of it. The negative effects are no reduced until 1994, when it seems that the economy is at the start of a new expansive cycle at international level. However, the different countries economy, does not seem have reached, nowadays, a stable tendency. At the European Union countries, the politic strictness that seeks to achieve the Maasticht agreements and the institutional structures sclerosis that are resisted the welfare conditions change achieved after long years of trade union confrontation, are producing real contradictions on the different systems.

### ***The industrial investment analysis in new industries and enlargements***

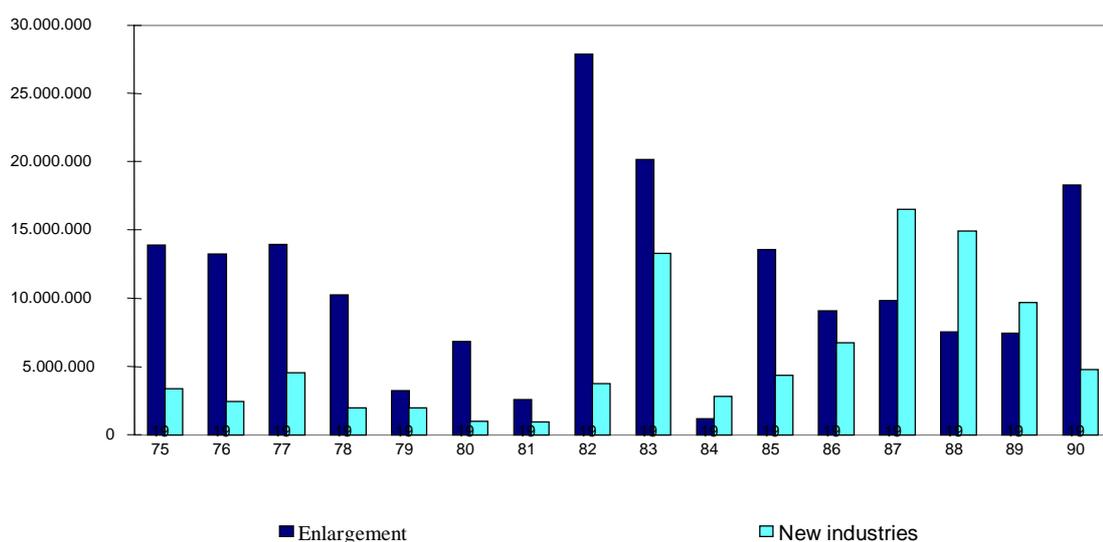
During those years, the investor process has not been directed, majority, to the creation of new activities or new settlements, but the improvement and enlargement of the existence activities (Table 1; figure 1). This fact has important consequences over the space dynamic, because the investments in enlargements do not modify the territorial map of the economic activity. Respect to the total investments, those assigned to enlargements have reached higher percentages, until 1982, than 75 per cent of the total investments

**Table 1.** Evolution of enlargement and new industries investment in the Metropolitan Area. (1986 thousand constant Pesetas)

Years	Enlargements	New Ind.	Total
1975	13.895.737	3.357.262	17.252.999
1976	13.254.090	2.436.737	15.690.827
1977	13.949.357	4.571.669	18.521.026
1978	10.223.750	1.976.347	12.200.097
1979	3.221.226	1.980.119	5.201.345
1980	6.826.972	985.412	7.812.384
1981	2.596.724	966.474	3.563.198
1982	27.872.523	3.780.733	31.653.256
1983	20.176.770	13.288.666	33.465.436
1984	1.179.789	2.813.807	3.993.596
1985	13.578.404	4.353.195	17.931.599
1986	9.079.752	6.731.453	15.811.205
1987	9.842.854	15.616.188	26.359.042
1988	7.521.672	14.939.444	22.461.116
1989	7.419.826	9.688.952	17.108.778
1990	18.288.491	4.756.051	23.044.542

Source: self-elaborated from the industrial registry of the Ministry of Industry.

**Figure 1** Enlargement and new industries investment (constant thousand Pesetas)



Source: self-elaborated from the industrial registry of the Ministry of Industry.

The analysis of table 1, where are include the investments in new industries, enlargements and totals, show a series of facts:

a. Between 1975 and 1981 the investments able to generate new productive activities decrease considerably respect 1975, so the level that total investment reach to is because of the support and transformation of enterprises that existed before. If we compare these investments with the imports in equipment goods, this last data would explain clearly the important increase of the unemployment. New technologies incorporated in equipment goods are savers of labour force, and two join effects are produced as a consequence in the labour market : closing of enterprises, unable to cope with the new competitive market conditions, and the decrease of labour factor in the production function. This fact can be represented in the important levels of unemployment figures, and that level could be even higher if the

productive sectors, less subjected yet to the world competition, like the services, will intensify the ratio capital-labour in favour to de first factor.

b. The expansion since 1981 to 1984 is produced, in great part, by the entry of foreign capital, that takes positions in Barcelona and its influence zone as a platform to the European Single Market. These investments are directed to enterprises that existed before, as a consequence in great measure of the disability that the local enterprises to cope alone with an open market and highly competitive. Is because of this reason that the investments in enlargements exceed clearly the investments in new industries.

The continued expansion -although with some fluctuations- is produced in 1982. Between this year and 1989 the path of both magnitudes is absolutely opposed. In 1989 the economic recession that is declared in 1991 is reflected with anticipation on the industrial investment of 1989. The investment in new activities decrease giddily from that year while the stagnant investments register a big increase.

The analysis of the two investment elements allows establishing a first hypothesis. When a situation of crisis or uncertainty appear, investment in new activities are almost void, only take place the necessary investment to improve or sustain the enterprise existent equipment. When international and national expansion keeps on for various years, are the new investment that act and generate employment. The difference between new industries and enlargements can define then the economic cycle and the unfavourable or more favourable tendency of the labour market.

Except during the years of big economic expansion (1982 and 1983), investment in enlargements at constant price keep on, from 1978 to 1990, an average of the 51.4 per cent of their value in 1975. On the investment in new industries the decrease only takes place between 1976 and 181, with an average for this period of the 61 per cent, in other words, higher than the experimented by the enlargements. From 1982, although with some fluctuations, takes place a big expansion of the new industries investment.

The comparative analysis of both kinds of investment permits to deduce that between 1975 and 1982 investment in enlargements are the 80 per cent, approximately, from the total investment. There is not, then, in this period, neither new activities creation nor employment creation, because the investment in new industrial activities hardly represent 20 per cent of the total investment. This situation is broken during the economic expansion years. As firmer is the expansion higher is the investors decision to do new investment projects<sup>(5)</sup>. The Catalonian enterprises lacks of a feature present in other countries: the assumption of risk.

## Space behaviour of the industrial investment

**Table 2** Concentration indexes of the investments in the municipalities of the Metropolitan area.

Years	New ind.	Enlarge.	Years	New ind.	Enlarge.
1975	0.585	0.578	1983	0.701	0.693
1976	0.619	0.647	1984	0.538	0.583
1977	0.601	0.686	1985	0.575	0.689
1978	0.642	0.661	1986	0.540	0.690
1979	0.798	0.571	1987	0.711	0.765
1980	0.619	0.725	1988	0.643	0.688
1981	0.648	0.674	1989	0.515	0.754
1982	0.555	0.800	1990	0.466	0.685

Concentration index average = 0.681. Source: self-elaborated

### *The investment in new industries*

The got results by territorial concentration indexes show that the investment is highly concentrated (values higher than 0.3000, which is the limit of low concentration) and, moreover -with some alterations by cause of very concentrate investments -these degree of concentration keeps on during all the period.

Investments in new activities have represented, as we declared before, on the 1975-1990 period only 20 per cent of total investments. The territorial analysis of these investments, by the concentration indexes in relation with the equal distribution (6), shows concentration levels higher than 50 per cent every year and with annual average of 0.610, for the analysed period.

It seems to produce a light abandon of this rule of behaviour from 1984 (when the economy starts its expansion period), because of the light reduction of the concentration indexes, that it means, that one part -relatively important- of the investment is being directed to areas of intermediate levels of industrial development (7). But this alteration of the space behaviour that can be collected in the whole of total industrial investment do not take place in its two elements: investments in new industries and enlargements, because in 1984 only decrease the concentration indexes of new industrial settlements investments. We could say that is glimpsed, at space level, a different behaviour between new industries investments and enlargement investments. While the seconds tend to concentrate themselves more on ancient industrialisation areas, those that promote new activities, or at least new industrial settlements, tend to locate in less industrial development level.

### *Enlargement investments*

The distribution analysis by municipalities of industrial investments in enlargements, by the concentration indexes, shows that the enlargement investments are more concentrated territorially than the new activities investments. The concentration coefficients, calculated respect to the distribution percentages in the metropolitan area, are higher than the corresponding to the new activities. The space

model that is being outlined is much more concentrated than the past. Barcelona goes on, with another traditional important pole, the pusher core of the metropolitan area. It is the heart of the territory, the main trunk, but new nodes appear and tend to acquire their importance.

The analysis of concentration indexes permits to deduce as follows:

- a. Enlargement investments keep, in the decade of 1980 (between 1985 and 1990) the same territorial concentration level, so the traditional previously model is a highly (polarised) model in few municipalities.
- b. The differences between concentration indexes of the enlargement investments and the corresponding to the new industries established these late are developing a dispersion process of the economic activity inside the Metropolitan Area, confirming, as we said before, a modification of the industrial space model of every municipality and of the whole Area.

### **Municipalities of destiny of industrial investment**

What municipalities have been directed preferably the industrial investment to? If we consider on first place the new industries investment, we can see that this has been distributed very unequally among of the 27 metropolitan municipalities. This investments are found concentrated in four municipalities that have occupied during the period the first places by their investments percentages, absorbing an estimated average of 70 per cent.

During the economic crisis on the first half of the eighties (1980-1985), the industrial investment was concentrated in few municipalities (mainly in Barcelona, with the 70 per cent of the investment in 1980 and 40 per cent in 1985). Otherwise, the Barcelona municipality investments are not consequence of big and continuous investments in currency terms, and are consequence of multiple projects of short size (except some exceptions in the automobile sector) with an approximate average value of four million pesetas by project.

From the economic expansion, Barcelona loses around a 20 per cent of investments that was receiving, lost that is resolve for a wide number of municipalities. The eighty per cent of the new investments is concentrated in nine municipalities, in front of the five of 1980. The numbers of the local receivers' institutions of new investments are the double, so the Barcelona periphery is going to extending as an oil stain.

The municipalities that have concentrated a high percentage of the industrial investment are: Barcelona, El Prat de Llobregat, Badalona and L'Hospitalet de Llobregat.

**Table 3. Municipalities with higher new industries and enlargement investments**

Municipalities	Perceptual Average News Industries	Perceptual Average Increases	Municipalities	Perceptual Average News Industries	Perceptual Average Increases
Barcelona	41.62	46.15	Cerdanyola Vallès	5.71	7.53
Prat de Llobregat, El	22.65	23.46	S. Joan Despí	5.47	4.26
Badalona	10.97	5.68	S. Feliu de Llobregat	5.17	7.13
Hospitalet de Llobregat	9.15	6.00	Esplugues de Llobregat	4.58	8.37
S. Boi de Llobregat	8.33	3.70	Sant Adrià Besos	4.36	4.43
Ripollet	7.57	---	Viladecans	4.02	6.24
S. Cugat Valles	6.30	13.94	S. Vicens Horts	3.34	11.22
S. Just Desvern	6.09	4.31	Molins de Rei	3.09	--
Cornellà Llobregat.	6.09	4.85	Resto Municipios	<3	<3
Montcada i Reixac.	5.96	4.26			

Source: Self-elaborated

### Sector behaviour of industrial investment

The section objective is to know which has been the sector behaviour of the industrial investment during 1975-1990 period, in other words, what activities have concentrated the industrial investment.

If we consider, on first place, the new industries investment, can be seen, that this has been distributed very unequally in the whole of the industrial activities (two digits level of CNAE 1993). Taking only those whose investment percentages have exceeded 5 per cent in every analysed year, we have that these have absorbed, approximately, a 75 per cent of the total industrial investment in the period.

From the twelve industrial activities that have occupied these places, not all have had neither the same presence nor the same importance on the investor process.

The important presence of investments in building sector has allowed to decrease, in big measure, the economic crisis impact over the employment, explaining also its keeping on the moments of economical expansion, like with the 1992 Olympic Games preparations. The infrastructure and improvement works of the urban surround carried out by the public sector (according to the Keynesian demand model), not only have been useful to endow Barcelona with important potentialities for its future industrial development (telecommunications, highways, ports, airports...) and services (expansion and suitable maritime front) at international level, and to improve the employment levels, too, to recover many craftsmanship activities (plasterers, glaziers...) of high quality that were being lost and, overall, improve the live quality of all population, specially of the bedroom cities, exponents of 'speculator development' of the seventies.

The transport materials sector, with the important presence that Barcelona province has, reaches only at the metropolitan area an investor average of 5.14% due to the spectacular volumes of 1982 year (only in this year is carried out the 53% of the total national industrial investment) were carried out in Martorell municipality, out of the metropolitan area.

Has been oriented the investment to the different activities in a similar way in the new industries investment or in enlargements? This means, have been the same activities that have created new industrial settlements and have improved the settlement existent before or they have been corresponded with different activities?

The obtained results permit to point two different facts. On first place, the enlargement investments have been oriented to traditional sectors that existed before in Catalonian economy, even in those with important added value, like the machinery construction and electric equipment. The chemical sector, that absorbs an important investments level, is hardly creator of employment.

In both kinds of investments is peculiar the lack of high technology investments (office material and computers, precision implements and optics), that make up, together with the construction sector of machinery and electric equipment, the dynamic sectors of the economy.

Then, in conclusion, the investment in Catalonia has been induced by two big challenges:

- a. The entry of Spain to the European Union and the excellent entrance door that Barcelona means to the foreign investors.
- b. The Olympic Games, with resources directed in mass to the building industry and to the activities related with it.

Otherwise, these financial fluxes have not served to create a modern and competitive sector with high added value. This is a challenge yet, that has posed the Catalonian economy and that difference it from the other big metropolitan core of national level as it is Madrid.

### **Location of the productive activities in the Barcelona's Metropolitan area. Investments in new industries**

The classical regional economy models consider the location decisions based, mainly, in transport costs and labour force criteria. Equally, different works show the limitations of this kind of establishment pointing the notable differences existent among the big production units and the little manufacturer settlements, the importance of lease interdependence or the incidence in many decisions of factors location and foreign criteria to the costs very best.

This last kind of models, tied to the industrial production mainly, the tendency to the vertical disintegration in some fixed sectors of the industry and the qualitative changes registered at the territorial groups of transformer enterprises makes difficult a general treatment of the industrial location subject.

Is necessary to consider the microeconomic aspects, also, like the kind of the activity and the enterprise characteristics, to value their needs and the lease tendencies that can be detected.

According to the different empirical studies carried out related with the lease needs of different enterprises agree with the variables pointed previously (size and kind of activity, mainly), through a first approach, we can see orientation elements for local strategies at the time to incentive the productive investments site national and international.

Through the analysis of the industrial investments we have could know:

- a. On first place, where these investments are concentrated and which of them seem to be the expansion axis in the metropolitan area.
- b. On second place, how this investment is concentrated on the territory and which has been the tendency of this concentration.
- c. On third place, which the sector structure of different municipalities is and if that structure has been modified during the time and, finally, what activities have received the mass of the industrial investment.

At this point, we are interested in the relation that is established between activities and territory, but no from the territory point of view, but from the point of view of the activities; so the question that could be raised is how the different activities are located on the territory, and this is going to do it by two complementary ways. On the first place, checking the concentration degree of that activity in the territory, that means, if an activity is located in few municipalities or if, by the contrary, appears very disperse, and the activity can be found in the most part of the territory. On the second place, the interesting question to know is : what municipalities is the activity concentrated on ?

The methodology used has consisted on, like on the previous points, in obtain the concentration indexes from the differences between the real municipal distribution percentages of the activities and their equal distribution -an equal distribution at the space- to check the dynamic behaviour during the time of those indexes.

**Table 4.** Annual average in the period 1975-1990 of the concentration index of the productive activities in the space

1.Food, drinks, tobacco	0.739	10. Manuf.c. Products met.	0.525
2. Textile Industry	0.770	11.Const. mach.and Mec eq..	0.560
3. Leather, shoes, confec.	0.708	12.Const. mach..and Elec. Eq.	0.805
4. Wood, cork, furniture	0.725	13. Mat. Office and computer.	0.826
5. Paper and graphic arts	0.748	14. Transport Material	0.822
6. Rubber and rubber products	0.725	15. Tools. Preci. And opt.	0.853
7. Chemistry	0.757	16. Others ind. Manuf.	0.879
8. Materials of construction.	0.732	17. Construction	0.727
9. Ind. Metal. basic	0.815	18.Services	0.722

Source: Self-elaborated

The analysis of the obtained results allows making some considerations:

a. The fact that the high concentration indexes are above in almost all the activities to 0.700 implies that it had to redistribute more than 70 per cent of the investments to achieve an equally distribution. This involves that the specialisation is very significant and every activity is concentrated in an only one municipality. It is, then a municipal industrial monofarming. Only the metallic products industry and the machinery construction and equipment goods are better distributed in the whole of the Area. The logic of this behaviour is determined by the product nature, those are inputs of the most of the productive activities.

b. The evolution of the concentration indexes between 1975-1984 and 1985-1990 periods reveals that it is producing -although in a limited way- a higher dispersion on the economic activity at the territory. Although the level is only the 10 per cent, it is the reflect of a tendency: the investment initiates to locate in no traditional municipalities.

c. Finally, is important to emphasise the null presence inside the Area of industry investments in increase demand activities or above added value. These investments are only produced from 1985 and are strongly concentrated in the territory.

According to the results of this point, the industrial activities are highly concentrated in the space, so the specialisation degree of every municipality shows levels near the 80 per cent, and then the productive monofarming strengthens the regional fluxes inside the Metropolitan Area given the existent complementary.

### **Sector specialisation of the metropolitan area municipalities from Barcelona**

The income level of a municipality is not only determined by the industrial investment percentage that takes in relation to the entire territory, also by the economic sector that these investments are destined. There are traditional activities, and phases from the less traditional, that are intensive in non qualified labour force, while the most of the staff that employ other activities is highly qualified. The territorial (municipal) detachment of both kind of activities causes, at local level, a similar productive structure to the international work division that we could design metropolitan labour division.

In parallel with this metropolitan labour division, nowadays, takes place a urban labour division. The demand pressure caused by productive and residential expansion joined to the need of big surfaces for the enterprises interested in high production levels, with the objective to achieve more competitive prices from taking profit of scale economies, induced to the industrial activities to locate at the urban

system periphery, remaining the central core transformed -during many years- in a depressed residential, and of services centre.

The urban traditional centre from the big cities had lost an substantial part of its preceding attractive when put inside the enterprises located at the periphery the services that demanded before.

The addition of the new information technologies, apparently destined to increase this process (given the telecommunications advantages) unchained, by the contrary, contrasting situations that were not forecast. Present technical production organisations, among which is stood out the use of *just in time* system, require follow from all those chain production phases that turn out to be more profitable to make external, giving so place to a group of complex relations from the technical and territorial view: a. the providers of all kind of enterprise services with high added value tend to locate at the urban cores that enjoy of unsurpassable locate advantages to supply to the disperse productive net of the Area and b. new microeconomic strategies reduce considerably space needs of productive enterprises, which are transferring this problem and the costs associated to it to the intermediate inputs providers.

A process of deslocalization is then produced, that situate the central phases (and with a high added value of a productive process) in a municipality, while the decentralisation and providers phases of inputs are going to disperse in the space. Some of them, depending on their needs of storage, by less ground cost municipalities and others out of the metropolitan surround. A technical, territorial, metropolitan, even international division of the productive process is, then, produced.

This behaviour model explains why the important investments that registered some municipalities do not generate either employment or income. They are investments guided to keep on the strong storage infrastructures that permit the whole working of the productive, sector and enterprise system.

Today, we are attending to the development and international growth to an absolutely opposed system production than the other one that was pushed on the expansion economic decades, based on the big integrated enterprise vertical and horizontally in all of its production chain phases, located in a single space. The new system is based on the big multinational enterprise decentralised vertical and horizontally, that only preserves, on one half, the initial management phases and, by the other side, the assembly phases. In some cases even these last have been left to carry out, remaining all the activities in subcontracted hands (enterprises like Phillips only impose the trademark to products laboured almost in their wholeness by subcontracted enterprises, while another enterprises with less lucky trademarks, but with quality products, achieve massive productions of products without trademark or white products that go directly to the consumers of the big productive trademarks. So the importation and exportation commercial nets are considerably increased).

The industrial change has produced an important modification at the time of deciding to carry out an investment: lose importance the previous microeconomic points of view and are going to earn importance the objectives of minimise the risks and the uncertainties of the around. This minimisation implies changes on the industrial strategy; we can see that vertical production disintegration is given, in other words, the enterprises sustain the most important phases and the less relevance production phases are subcontracted, which makes decrease the risk due to the market fluctuations. These subcontracted enterprises are not necessary located beside the matrix house; depending on the production and transport costs, and on the institutional advantages will be situated further or closer than the matrix house.

The medium and little enterprises are not only that have to reach to collaboration agreements; big enterprises cannot afford the high costs to modify all the pieces of a product to supply competitively the world market and need the producers concert of their same level and with similar problems. The *trademark*, in other words, *the name as no tangible quality of a big enterprise* (the only thing that distinguish products that produced by a single producer are presented at the market as a different supplies), has came to be one of the no tangible more important at the big enterprises. We have so big household equipment manufacturers that do not manufacture household equipment and big manufacturers of automobiles that only assembly the pieces that have not been produced by them. Only a *trademark* contains the product that the consumers demand to a big manufacturer.

Another microeconomic strategy that is achieving increasing relevance and that could in some way the life quality in some municipalities of the Area is the called marketing mouth by mouth. The deslocalization to the urban periphery of the big enterprises gave place to the noncommunication (in spite of living the telecommunications era) of the managers of those enterprises, with the consequent lost of valuable information that personal relationships provide. On the past decade, by the slowness of the events, of the technological changes and the productivity variations, this information outcome less valuable, but at these days do not have any substitute.

The cultural and political associations are taking more importance day by day, as happens in the same way with the sport clubs at the time to establish relationships among the enterprises managers. The reason why the money destined to support shares and associations for the high manager charges at the big enterprises is very simple: the contracts signed in a relaxed atmosphere, far from the offices, takes more relevance at the time of taking decisions (opinions of some multinational enterprises managers). Among these strategies is found the return to the urban centre of manager cores that can exert their activity without being stick physically on the enterprise, emerging the management phases at the urban traditional core. Similar objectives are pursuit, but with different apparent territorial impact, the creation of clubs, golf fields, etc., etc., for the big enterprise staff. In that relaxed atmosphere the interchange of ideas, problems, forecasts, scares, collaboration common strategies, of pressure, of Opinion State, etc., is produced.

All these elements, are conforming slowly a `urban labour division ´ in a double direction: a. the development of the urban core with high added value activities and b. the empowerment of municipalities with a high income level near the sea and with lack of productive activity.

To check if these tendencies are produced at the Barcelona Metropolitan Area has been analysed the productive behaviour of the municipalities include in it, using for that the sector specialisation coefficients of the new industries investments. These coefficients measure the differences between the sector structure of the reference territory and the sector structure of every municipality analysed. The addition of all differences (positives or negatives) will give the specialisation degree of every municipality. A high municipal specialisation index reveals that a high proportion of region manufacturer activity is concentrated in a few numbers of sectors.

The outcome obtained show that the specialisation indexes (that measures the productive structure of everyone of the twenty seven municipalities in relation with the total productive structure of the Area) are very highly, that reveals that in the most of the municipalities the investments in new industries have been directed during 1975-1990 period to very different activities from the Barcelona municipality, municipality that determines, given its low coefficient, the Metropolitan Area productive structure.

Barcelona, L'Hospitalet and Badalona are municipalities with an specialisation index relatively low; in the rest of municipalities the specialisation coefficients presents very highly values, it means that in everyone of them different productive sectors achieve a considerable weight in relation to the percentage share that have in the metropolitan whole.

Between 1975-1983 and 1984-1990 periods, the changes have been important. On the second half of eighties decade the specialisation is increased in 17 municipalities -63 per cent from the whole- while is decreased in eight -30 per cent-, remaining fixed the 7 per cent.

If for the new industries investments the specialisation indexes obtained are high, in the analysis of enlargement investments these indexes are still higher than in the new industries. So in one investments kind as in the other an authentic labour division is produced inside the Metropolitan Area. An important proportion of manufacturer activity of every municipality is concentrated in a few numbers of sectors.

The problem, as we said at the beginning of this point, of the productive specialisation of the different municipalities is not based only on the different activities location, but however on the fact that are activities that require, because of they different productive structure, different locations in relation to the labour force used; this is the reason why exist specialised municipalities on the intensive use of non qualified labour force and low degree of remuneration, while, in others, the basic activities are

specialised on the use of labour force highly qualified. The different wage rewards of both kinds of labour force explain, setting aside other factors, the income, life levels education, etc., unbalances, inside the area. (see Table 4).

## Educational level among the metropolitan area municipalities

**Table 5.** Educational level on the metropolitan area. Different municipalities

Municipalities	Index 1981	Index 1986	Index 1991	Growth tax (1981-1986)	Growth tax (1986-1991)	Growth tax (1981-1991)
Badalona	0.10	0.15	0.19	50.00	26.67	90.00
Barcelona	0.33	0.44	0.50	33.3	13.64	51.52
Castelldefels	0.19	0.27	0.35	42.11	29.63	84.21
Cerdanyola del Vallès	0.14	0.22	0.28	57.14	27.27	100.00
Cornellà de Llobregat	0.07	0.15	0.22	114.29	46.67	214.29
Esplugues de Llobregat	0.15	0.16	0.29	6.67	81.25	93.33
Gavà	0.10	0.22	0.23	120.00	4.55	130.00
L'Hospitalet de Llobregat	0.09	0.18	0.22	91.49	22.22	134.04
Molins de Rei	0.14	0.24	0.27	71.43	12.50	92.86
Montcada i Reixac	0.12	0.18	0.21	48.33	17.98	75.00
Mongat	0.19	0.13	0.32	-30.53	142.52	68.42
Pallejà	0.11	0.14	0.26	27.27	85.71	136.36
El Papiol	0.10	0.22	0.20	129.17	-9.09	108.33
Prat de Llobregat	0.06	0.17	0.18	165.63	5.88	181.25
Ripollet	0.08	0.17	0.18	112.50	5.88	125.00
S. Adrià de Besòs	0.06	0.13	0.17	109.68	30.77	174.19
S. Boi de Llobregat	0.07	0.14	0.19	105.88	35.71	179.41
S. Climent de Llobregat	0.08	0.14	0.20	77.22	42.86	153.16
S. Cugat del Vallès	0.36	0.52	0.63	44.44	21.15	75.00
S. Feliu de Llobregat	0.08	0.15	0.22	92.31	46.67	182.05
S. Joan Despí	0.09	0.15	0.24	72.41	60.00	175.86
S. Just Desvern	0.34	0.47	0.56	38.24	19.15	64.71
S. Vicenç dels Horts	0.06	0.13	0.16	103.13	23.08	150.00
Sta. Coloma de Cervelló	0.15	0.20	0.36	33.33	80.00	140.00
Sta. Coloma de Gramanet	0.06	0.10	0.16	81.82	60.00	190.91
Tiana	0.26	0.42	0.50	61.54	19.05	92.31
Viladecans	0.05	0.13	0.17	150.00	30.77	226.92
<i>Average</i>	0.14	0.22	0.28	57.14	27.27	100.00

Source: Self-elaborated

From the economical point of view, the education is one of the most important elements of the investment and one of the central determinants of the force labour productivity. The control of the educational supply is in consequence; one of the most direct tools that are disposing the governments to influence over the development process.

An important branch of the economic growth theory has been centred on the productivity increase and the labour quality as a result of the human capital investment. On this branch the T. Schultz, Denison and Uzawa studies are pointed up (8). At recent years, the subject has emerged again in the growth bibliography with works like Lucas and Azariadis and Drazen (9) have carried that out.

Given the importance that nowadays acquires the qualified labour force, have been estimated, a qualification indexes of every municipality from data about the instruction level collected on the population census of 1981 and 1991 and the municipal inhabitants roll of 1986.

To obtain indexes that reflect in a synthetic way the qualification level of every municipality labour force only the population over 14 years old have been used whose education levels would have surpassed the primary studies. These indexes are got from the weighing up of the inhabitants' municipality number with a determined studies level. The over qualifications have been weighed up by 3; the intermediate degrees, by 2; and inhabitants with secondary education level has had a score of 1. The result obtained has been separated among the global population of every municipality:

$$I_i = (A_i \times 3 + B_i \times 2 + C_i) / P_i$$

$I_i$ : educational level of i-essimal municipality.

$A_i$  : Population with a high degree of i-essimal municipality.  
 $B_i$  : Population with intermediate degree of i-essimal municipality.  
 $C_i$  : Population with B.U.P, C.O.U or F.P. of i-essimal municipality.  
 $PT_i$  : Global population of the i-essimal municipality.

The outcome obtained and collected on board 16 reveal various important facts:

- a. The differences that exist among the educational levels in the metropolitan area.
- b. The general growth experimented by the educational level at the metropolitan area municipalities during 1981-1991 period.
- c. The unequal growth among the educational levels at the metropolitan area municipalities.

### **Relation between the industrial investment indexes and educational levels**

The relation between the educational levels and the industrial investment are shown on draw 8. To elaborate this board has been distributed the values achieved between the investment levels in new industries and qualification indexes in four intervals.

If we consider not only the total coincidences (A,A), (B,B), (M,M), (MB,MB), but the nearest (MB,B), (B,MB), we obtain that the number of municipalities where the investment and educational levels are similar reaches the 70 per cent from the total of municipalities. The geographical location of news activity investments is highly conditioned by the educational levels of the different territories.

The municipalities where the previous relation is not produced are Tiana, Sant Cugat del Vallès, Sant Just Desvern, Badalona and el Prat del Llobregat.

### **Relation between the industrial investment indexes and income indexes**

To check if there are reasons that can explain the disagreement that exists in some municipalities between the investment and educational levels, has been established the existent correlation between investment and income, using the same methodology that at the preceding point.

The obtained results show that the existent correlation between the investment and income levels is smaller, affecting only to 60 per cent of the municipalities.

We can establish, as a synthesis, next considerations:

- a. Investments are highly correlation with educational levels.
- b. Investments and income levels are correlation also, but less than with the educational levels.

If we consider how the municipalities behave not only related with variables as income, investment and education, but related with unemployment levels too we can settle that, at the Metropolitan Area, the economic development of the last twenty years is shaped according on a complex territorial model:

- a. Industrial zones intensive in capital activities with high-income level, education and employment.
- b. Industrial zones intensive in labour force activities with low-income level, low educational level and high employment level.
- c. Residential zones with high income level, high educational level, high employment level and low investment.
- d. Decline zones with low income, investment, education and employment levels.

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(5) It's a very common attitude between our managers and financial institutions which influences negatively about the existence of capital-risk resources, necessary nowadays to cope with new processes that must speed up the economy.

(6) It is meant, if the investment were equally distributed over the whole of the municipalities

(7) However, as we work with relative indexes, is convenient to be cautious, because of it can be reflecting distribution alterations on the basic variable.

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