

How are cities working in the Spanish territorial development?

(1985-2000)¹²

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INTRODUCTION

The study of the territorial/ regional development in Spain has nowadays a relatively long tradition, specially since the birth in the early eighties of the Autonomous Communities(“Comunidades Autónomas”) or regions, considered as NUTS II in EUROSTAT nomenclatura. There are plenty of articles and books written about the regional Spanish development, and in general they can be considered as a rich economic literature. But when one looks at the regional development topic from the point of view of the cities, there are few documents about it and the studies are very scarce(Trullén, Lladós y Boix, 2002; Viladecans, 2002). The first question that arises is why that happens in a country that has experienced a fast urbanisation process in the last four decades?. In the international level , this topic has had much more attention(in the UE, Cheshire, 2002; in the USA, Henderson, Glaeser et al....).

The aim of this paper is threefold: first, to determine the factors that explain the urban growth of spanish cities; secondly, to see what the role is of the cities in the Spanish territorial development; and thirdly, to observe what the cities situation is in terms of “winners” and “losers” after a long period of integration of Spain in the EU or at least what the Spanish cities map is after a period of impact of the Single European Market and the Euro(Economic and Monetary Union). In fact, we try to test the same hypothesis than in Cheshire(2002):” The integration of Europe favours the core regions at the expense of the peripheral ones... removing protection as a result of economic integration works to the relative disadvantage of backward, peripheral regions and

¹ Do not quote without permission.

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favours advanced core regions”(p.213). The analysis period starts just before the Spanish adhesion to the EU(1985) and finishes in the year 2000 for which we have available data.

ANALYSIS FRAMEWORK

We will try to explain the evolution of cities during this period of time taking into account as a proxy of the GDP per capita the “market quota or share” per capita (M_i)of the Spanish cities(all that are bigger than 50.000 inhabitants and province capitals). Actually the best proxy would be the so called “economic activity level” by La Caixa(2003), but it is not possible to rebuild this variable for the eighties. In fact M_i is rather an indicator of the purchase capacity of the population, not of the production level. We don't have available data in Spain for the GDP at the city level, only for the province level(NUTS III for EUROSTAT). Even though the “market share” can be considered as a good proxy of the GDP, since both have a correlation index of 0.91 % when measured at province level.

The function that would explain urban evolution in Spain would be one as the following:

$$M_i = F(S_i, H_i, T_i, K_i, L_i, P_i, G_i, C_i)$$

Where S_i is the starting situation of the cities in the year 1985 measured in terms of M_i , H_i are the human resources, T is the technology, K_i is the capital endowment, L_i is the location of the cities, P_i is the productive structure , G_i is the economic growth, C_i is the political capacity of the cities.

The basic model used to test the hypotheses has the following form:

$$1/15 \ln(M_{i,2000} / M_{i, 1985}) = \alpha_0 + \alpha X_i + \mu_i$$

where the dependent variable is the market share yearly variation, X_i the explanatory variables, and the μ is the vector of random error terms. The dependent and the explanatory variables are defined in Table 1.

The analysis will be done on two geographic scales: first, at city scale; second, at urban agglomeration scale. The first one has already been defined above as the cities which are capitals of provinces and those cities with more than 50.000 inhabitants(122 cities or observations). And the second one is the urban set formed by the cities belonging to the same province (50 provinces or observations). Due to the known problems of the spatial autocorrelation, the models have been subjected to the adequate tests of being “well specified”.

Market Share

The market share is a number that represents the consumption or purchasing capacity of the cities. The value is measured as a function of six variables:

$$M_i = \frac{I_p + (I_t + I_c + I_l + I_b + I_r)/5}{2}$$

where M_i is the market share, I_p is the population, I_t is the number of telephones, I_c is the number of cars, I_l is the number of lorries, I_b is the number of bank branches, and the I_r is the number of retail activities. Then the market share is not only measured by the population importance of the city, but by its purchase capacity represented by the remaining variables. The data source is La Caixa, 2003. The variable is calculated in per capita to avoid the scale effect, due to the important city size differences.

Starting situation

S_i is the starting situation of the market share in 1985 in order to test the change process among the different urban market areas. We guess that the biggest cities- as it can be easily seen looking at their indicator through time- are going down in favor of the neighboring cities in terms of market share. It is in general considered as an indicator of the agglomeration economies or of the scale market economies, even though congestion problems can show up as a consequence of a demographic decentralization phenomenon in the greatest Spanish metropolitan areas (Madrid, Barcelona, Valencia, Bilbao, Seville,...).

Human resources

It is a quite complex argument made up by labor market and entrepreneurship components. **Employment** shows the labor market working and the human capital of the employment hired in cities. Glaeser and Maré(2001) found out that there is a straight relationship among salaries, human capital and productivity of city workers and the salaries of greatest cities are bigger than the smaller ones. At the same time it must be kept in mind the great explaining power that the human capital has in the differences of the GDP per capita among states in the USA. **Entrepreneurship** or the availability of a entrepreneurship capacity that makes possible the introduction of the technological and productive innovations, is a strategic factor for the transformation, adaptation and improvement of the city competitiveness level. Otherwise not only the old sectors and activities lose the possibility of being substituted, but the city will miss the opportunities of raising new activities with more development potential (Vázquez, 1993). At the same time it is convenient to say that a natural measure of the amount of competition is just to measure the number of firms in the city per worker, just the inverse of the average firm size so anything that we attribute to competition may actually be a function of smaller firms(Glaeser et al. 1992).

Technology

The technology is measured by the number of patents by cities or municipalities and by the I+D expenses by provinces. The number of patents was taken from Spanish Patents Office files (Saez, 2003). The I+D expenses data is not published (it is only published at Comunidad Autónoma or region level) and the National Statistic Institute(INE) estimated it by request of our colleagues from the University of Barcelona(Esteban Sanromá and Raúl Ramos). Audretsch(1998) points out that knowledge-based economic activity is generated and transmitted more efficiently via local proximity- actually via face-to-face interaction and through frequent and repeated contact-, and has a high propensity to cluster within a geographic region. Audretsch quotes very appropriately to Glaeser et al.(1992) “intellectual breakthroughs must cross hallways and streets more easily than oceans and continents” and to Krugman(1991) when he emphasized that “States aren’t really the right geographical units, the relevant geographic unit of observation is at the city level” concerning the innovative output measured by the number of patents.

Capital

The capital is composed of the private capital (residential and productive) and the public capital (transport infrastructure, urban equipments). The Spanish economy is strongly capitalized, with growth rates since 1964 to 2000 of 4,25 on average. This accumulation process has had two main dimensions: the residential sector (48% of the private investment was concentrated in housing, hotels and apartments) and the transport infrastructure in the public sector (38% of the total public investment). We know that the improvement of the capital investment was unequal by Autonomous Communities and provinces. The highest growth rates have been located in the territories placed in the Mediterranean coastline, the archipelagos, Madrid and its surrounding area (Toledo and Guadalajara provinces), Alava province and La Rioja. In Aragon, Castilla-La Mancha, Castilla-León, Ceuta y Melilla, the private capital protagonism was more important than in the other Autonomous Communities. On the contrary, the Balearic archipelago registered a higher speed in the private capital accumulation. In general, following Ivars, Pérez and Uriel (2003), the capital accumulation was more intense than the population growth. The northeast of Spain, the closest Spanish area to the main markets of the EU, are those that attract more easily the private capital, whereas the peripheral territories situated in the Center- South and West of the Iberian Peninsula find more attraction difficulties. According to Ivars, Pérez and Uriel, the smallest public capital endowment belongs to the most populated provinces (Madrid, Barcelona, Valencia, Sevilla, Alicante and Málaga).

Briefly, on one hand, it seems interesting to test how the capital growth rate works in our model, and, on the other hand, to check whether the public capital endowment works as a good explaining variable of the market share growth (we currently don't know this date for the thorough period 1964-2000, so we only use the number of roads and highways per km² in the year 2000). It is reasonably presumed that public capital is overused and congested in the main and dynamic cities and is underused in the most backward and underdeveloped areas. (See national and international books and Kiel paper). Public infrastructure has been paid much attention in Spain (Gil, 2001) and elsewhere, since the Biehl et al. (1986) document for Europe and the Aschauer (1989) and Munnell (1990) studies for the USA about the regional effect of the infrastructure investment.

Information society

In spite of the poor development of the information society in Spain- in comparison with the rest of the EU- it does not mean that the disparities among the different cities and territories do not exist and even are not clearly patent. Here we use some indicators concerning the information society embedding that shows the use of IT by dwellers owning a computer or having access to Internet. Let us say that the use of IT by companies and public administration will be welcomed, but this data is not available yet at this local level(Fundación Auna, 2002).Nevertheless, this data gives us a clear idea of the “digital geography” of Spain and, needless to say, it still keeps being an evident urban phenomena(Lopez and Chaminade, 2001). The same seems to be happening in the USA where the big cities set up hubs of regional and international information flows(Hicks and Nivin, 2000).

Land and housing can be considered as residential capital, so it can be said that as in Glaeser and Khan(2001) that their price rising is an important factor of population and productive activity delocalization from the biggest cities.

Location and economic potential

The location of cities is approached by an economic potential or accessibility index and by a dummy variable. The accessibility index is inspired in Clark et al.(1969) and Keeble et al(1988), but estimated in a different way. Instead of choosing arbitrary an exponent to the distance, we empirically estimate the distance effects on the road transport of commodities for the particular Spanish case. We divide the transport flow by either the production of the origin province or the production of the destination province, we represent in a graph the weighted transport flow as a function of the distance and then we adjust the function taking into account several distances inside a same province (its radio, its surface and its third of the radio: the best one has been the first)³. The best exponent has been 2,5 for the year 1987 and 2,2 for the year 2000(Figure 1). Firstly, that shows that the distance is becoming less reluctant to the economic transactions in Spain; secondly, that at the same distance more and more trade is made or more trade per distance unit; and thirdly, that the trade is becoming more

³ Concerning marine distances, we have taken the formula used by Keeble et al.(1988): the distance is equal to the distance by road to the closest port+ 150+ marine distance divided by 1,5. The formula does work quite well, except for Ceuta and Melilla.

concentrated in shorter distances, because of the steeper slopes of the 2000 function, up to distances of approximately 150 kms. In other words, the road transport improvements and the diminution of the transaction costs among regions and countries in the EU during the period are prone to deepening the spatial disparities at the province level in Spain (Figure 1).

The dummy variable takes into account that the gravity center of the Spanish economy has been moving since the sixties to the North-East (Alcaide and Alcaide). This dummy considers that all the provinces to the East of a diagonal line drawn from Navarre to Cadiz, crossing through Madrid, are virtuous provinces and enjoyed better growth rates than the remaining ones, including in this virtuous group the Canary Islands as well. There are no theoretical reasons for including this variable, but empirical evidence shows that the economic activity is increasingly concentrating in the eastern side of the country.

Productive Structure

The productive structure and its change have exhibited a very good performance at the province level in order to explain the province growth and the productivity convergence (Garrido 2002). In this sense, we will use:

- The non-agrarian GVA change percentage (1985-2000) as an expression of the agrarian weight loss during the last decades in Spain,
- The public services GVA change percentage due to, in many interior Spanish provinces, the public sector has played a protagonist role by means of its intervention in terms of agrarian and energetic activities, building sector and non-tradable services (education and health, social services, public administration). The opposite has happen in the most developed provinces that are closely linked to the industrial and more advanced services.
- The productivity change measured as a quotient of the GVA and the employment.
- The employment change as a way of watching whether or not is the GDP the magnitude that is backing the productivity growth. The considered period has two different spans: 1985-1995 with loss or minimum employment growth and 1996-2000 with an important employment growth.

- The tourism index as a way of taking into account the outstanding and key role played by tourism in the Spanish economic development. Not only the so-called “sun and beach tourism”(where the Mediterranean coastline and the Islands are specialized), but also the cultural and business tourism in which cities- like Madrid, Barcelona, and some others- are key players.

Economic growth

One of the main characteristics of the current economy is the high degree of interdependence among the different geographic levels of the economic activities. By means of trade, the economic cycle of a city is deeply linked at least to the economic cycle of the province where she is located, and linked as well to its Autonomous Community and the national economies evolution to some extent (Raymond, 1993).

Political capacity

As it is argued by Cheshire (2002), political capacity endows the cities of growing incentives for territorial competition, higher economic promotion effort and growth enhancing strategies (human capital, innovation, services, infrastructures...), in a coherent way with the theories relating to club formation and the provision of local public goods.

In summary, we bear in mind a city model where

RESULTS

The analysis of the market share growth points out quite clearly three important features to be emphasized (Table 2 and 3). One, it is very easy to detect a spread movement from the main markets of the metropolitan cities to the surroundings areas; two, there has been a very noticeable role of the tourism sector as expansion factor of the market areas, and third this expansion enhanced the consumption capacity in the most accessible (highest economic potential) cities. This process was particularly intense in the cities located in provinces where the no-agrarian sectors (particularly public and private services) grew more, enjoyed a more intense capitalization process, and demonstrated an outstanding entrepreneurship capacity in terms of companies births. It is also evident that the market share dynamism is becoming increasingly concentrated in the East of Spain, including on that of course the archipelagos and the central region led by

Madrid. It goes without saying that the large Iberian space North/West is declining for lack of thriving cities capable of regenerating their influence territories.

The current real estate boom (rapid upraise of prices) is being reflected very harshly in places with highest market share at the beginning of the period- so the principal Spanish cities-, strong capitalization processes, utmost firms creation, economic potential or accessibility, located in the Mediterranean area (and in general in the East part of the country) very motivated by a strong demand of houses on the coastline, second residences and a high pressure of the land rents/costs on the final housing prices mainly in the chief cities. In fact, the last ones is one of the main factors which are expelling people- particularly the youngest- from the biggest cities and from the main old market share, and enhancing new market areas demanding more and more distance from the traditional city centers. Even so it deserves to point out yet two important aspects: one, the housing demand will be expanding for years yet since the average size of dwellings is going down (but is still much higher than the European average size), the immigrants entrance in the country is being intense, and the forecast of the second residences demand (included the one coming from foreign owners) is on the rise. Only the first factor would have needed two millions houses in the 1991-2001 period- for the same population volume- to offset the reduction of dwellings size. This strong demand is back up or supported by an income earned by two salaries couples, stemmed from increasing female activity rates particularly intense in the most dynamic urban areas. And two, the population growth of these new areas is faster than the market share expansion in per capita terms. So the urbanization process of the Spanish core areas and their surroundings cities will be kept for years yet.

From the point of view of the technology and capital factors, it can be said that the market share growth is considerably explained by the province productivity and the population study level; even though it should be underlined that the correlation's of these last variables are stronger with the market share at the beginning of the period than with its growth rate. It might mean that the market share spread is not followed at some important extent by the productivity, technological progress (patents by cities and R+D expenses by provinces), physical capital and human capital levels. In other words there is a sort of decentralization process, but the cores keep retaining the main keys of the economic growth, in terms of the employment qualification, technology, capital, and productivity. Same thing can be said of the accessibility, the TIC embedding, the

infrastructures, and its spread effects that are very correlated among them, affecting positively to the market share growth, but concentrated around the main urban areas.

Some nuances can be made yet. Comparing models 9 and 12, when we don't take into account the economic potential, the explaining power falls sharply and the technological capacity loose signification. Comparing as well models 10 and 11, when we introduce the economic potential, not only the explaining power rises but also the market share at the beginning of the period and the patent coefficients recover their signification.

The comparison of models 9(Table 2) and 10(Table 3) shows that the market share at the beginning of the period and the rest of variables showing innovation capacity and competition work in the urban areas in a much better way than in individually cities, what is a good proof of the agglomeration economies.

The cities(see models 8 and 9 of Table 2) keep sustaining their own dynamic, since even without economic potential poles, their strategic inputs(services, capital, and intangibles) remain working very well.

Employment rate, female employment, services, productivity, housing price increase, wages work, and national growth work in the same direction (Table 4). Table 4 shows as well that the patents are geographically concentrated by clusters of innovation, due to that the R2 of urban agglomeration is much bigger than when it is considered by cities. On the contrary, tourism is rather a spot phenomenon. Unit policy is more powerful

From the other point of view, the market share dynamism depends strongly on the GDP growth national/province rates and in a bigger extent the first one. That means that the Spanish economic growth, enjoyed under our belonging to the EU, has mainly captured by the innermost core cities and their closest areas.

Lastly, we tried to incorporate as in Cheshire (2002) a policy unit in order to see in this case its influence on the market share evolution. We found out that its influence is not negligible- especially when its squared root measures it, since its value interval is between zero and one - and determined positively the market share growth. It does mean that Spanish local/regional authorities have been playing an important role in a broad spectrum of enabling policies, providing public goods, attracting new firms (specially multinationals as a target of Madrid and Cataluña regional governments),

encouraging innovation and training activities (Technological and Scientific Parks, Business Centers, New generations of Managers coming from University and Engineering Faculties), improving urban life and increasing the attraction of cities.

Trying to relatively compare our results with those obtained by Cheshire (2002)- even though the comparison is not thoroughly possible since our dependent variable is neither the growth in GDP per capita, nor the spatial units and the period of time-, we estimated the relation between the market share growth and the “policy unit”(measured by the population on the most populated city as a proportion of the province population) (Figure 2). We can say that there is a growing impact on the market share with the “policy unity” power- with a maximum at 1,5, but neither the growing impact nor the decreasing effect are so sharp as in Cheshire (2000). In other words, the agglomeration/ disagglomeration effects are smoother in the Spanish case comparing with EU FUR (Functional Urban Regions), due to very probably the strong decentralization political process undergone by the Spanish State during the last twenty years. This decentralization process has implied the creation of new public administrations in seventeen new regions (Comunidades Autónomas), located in regional capitals that created new public employment’s and new population attraction poles.

FINAL REMARKS

Bigger cities are not dying. These cities keep concentrating and absorbing in a latest backwash process the newest frontiers in matters as technologies, information society, communications and financial systems, headquarters and strategies of companies, public and private decision hubs and accessibility to the international networks. It means that the bigger cities keep taking over the whole urban system through their highest economic potential and their strongest political power.

It could be said as well that even whether the territorial disparities have increased over the last two decades, they might be worst if the public administration was not so decentralized. The regional governments in Spain have been implementing many sectorial and transversal policies that are allowing in different degrees of success a development from the bottom, based on strategy planning, public/private cooperation and in more local commitment of officers, policy makers, law makers and politicians.

The UE regional policy has contributed to a more rationale way of making and organizing policies by means of Regional Development Plans as a requirement to be beneficiary of the Structural Funds.

Even though the empirical evidence of this paper is quite clear to the effect that the market mechanism and a more open competition are stronger than the regional policies and dominate the economies working, driving them to an accrued concentration of the productions factors and the economic activity.

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Table 1. Definition of the variables used in the Models of Cities and Urban Agglomerations

Variable	Definition and Source
Dependent variable	
Market Share growth	Annualized rate of growth of M_i per capita (1985-2000), LA CAIXA and own estimates.
Independent variables	
Economic Potential Change	Index of growth of the economic potential (1987-2000) according to KEEBLE, D. ET AL.(1988)
Starting Market share	Value of the M_i in 1985. Calculated With data coming from BANESTO (1985)
No-Agrarian employment Change	Percentage of no-agrarian employment change by provinces (1985-2000), FUNCAS (2003)
Capital	Dummy variable measuring the private and public capital growth by provinces (1964-1998). MAS, M. ET AL.(2003)
Competition indicator	Number of firm's creation per worker by provinces (1989-2000), BEL(2001)
Eastern	Dummy variable measuring the most expansive Spanish provinces (1985-2000) in terms of annualized rate of GDP p.c.(in constant pesetas), FUNCAS(2003)
R&D Expenditures	R&D expenses p.c. by provinces in 1994, INE (2000)
University Degrees	Percentage of population with university degrees by cities (2000), LA CAIXA (2002)
Internet embedding	Percentage of dwellings with Internet access by cities (2000), LA CAIXA (2002)
Tourism indicator	Economic activity tax (IAE, Spanish acronym) paid for the tourism facilities, taking into account the number of rooms, their category and the yearly occupation percentage, LA CAIXA (2002)
Unemployment Rate	Unemployment/Population by cities. Unemployment is registered by the INEM, LA CAIXA (2002)
Patents	Number of patents p.c., OEPM (2003)
Competition index	Number of firms created (1989-2000) per worker, BEL (2001)

Table 2 : TESTING FOR EVOLUTION OF MARKET SHARE OF SPANISH CITIES (1985-2000)

Variables	Models								
	1	2	3	4	5	6	7	8	9
EPC	0,4070 4,8740	1,5361 11,3683	1,5335 12,0063	1,3760 9,3533	1,0569 4,3625	1,1616 4,8878		0,6835 2,1804	
MS85		-1,2784 -9,4609	-1,4908 -10,7356	-1,5222 -11,0463	-1,5727 -11,2192	-1,5472 -10,9703	-1,5796 -11,5978	-1,6201 -11,4905	-1,6270 -11,4230
N-agrar			0,3170 3,8973	0,3571 4,3276	0,2824 3,0179	0,2885 2,9948	0,2396 2,8719	0,2519 2,7545	0,3380 3,1360
Capital				0,2044 2,0730	0,4077 1,650 *			0,2305 2,3658	0,2490 2,2602
Competition					0,2297 2,3183	0,3154 1,276 *			
Easter						0,1688 1,582 *	0,1718 1,684*		
R+D							1,5331 9,8027		
Univ								0,8419 2,4891	0,9260 3,2810
Internet									0,5503 2,2490
R2	0,1650	0,5236	0,5779	0,5929	0,6020	0,5930	0,6090	0,6140	0,6290

EPC: Economic potential change

MS85: Market share in 1985

N-agrar: Non-agrarian employment change

Capital: Dummy of Capital

Easter: Easter dummy

R+D: R+D expenses per capita

Internet: Percentaje of dwellings with internet (2000)

Competition: Competition indicator

Competition-R+D; R+D-Univ; Internet-EPC are highly colineals

Univ: Percentaje of population with university degrees (2000)

* Significant at 10%

** Non-Significat at 10%

Table 3 : TESTING FOR EVOLUTION OF MARKET SHARE OF SPANISH URBAN AGGLOMERATION (1985-2000)

Variables	Models											
	1	2	3	4	5	6	7	8	9	10	11	12
EPC	0,736 7,776	1,967 7,513	1,836 6,699	1,788 7,336	1,246 5,032	1,408 7,346	1,428 8,268	1,787 6,357	1,866 6,683		1,723 5,854	
MS85		-1,240 -4,602	-1,300 -4,817	-2,000 -6,622	-2,872 -8,569	-3,595 -12,546	-3,805 -14,360	-1,500 -5,234	-1,453 -5,018	-0,312 -1.106 **	-1,550 5,252	0,270 1.428*
N-agrar			0,187 1.428 *	0,252 2,135	0,606 4,557	0,822 7,564	0,826 8,438	0,165 1.226 *		0,333 1.841*	0,164 0.234**	
Univ				0,747 3,812	0,804 4,762	0,525 3,793	0,567 4,523					
Internet					1,115 4,114	1,876 7,591	2,122 9,043					
Tourist						0,374 5,665	0,415 6,843					
Unemployment							-0,175 -3,315					
Patents								0,340 2,617	0,350 2,648	0,343 1.896 *	0,325 2,465	0,423 0.2233**
Competition										0,438 1.839 *	0,142 0.782**	
R2	0,5430	0,6760	0,6830	0,755	0,819	0,894	0,914	0,7170	0,7170	0,4720	0,752	0,430

EPC: Economic potential change

MS85: Market share in 1985

N-agrar: Non-agrarian employment change

Univ: Percentage of population with university degrees (2000)

Internet: Percentage of dwellings with internet (2000)

* Significant at 10%

** Non-Significant at 10%

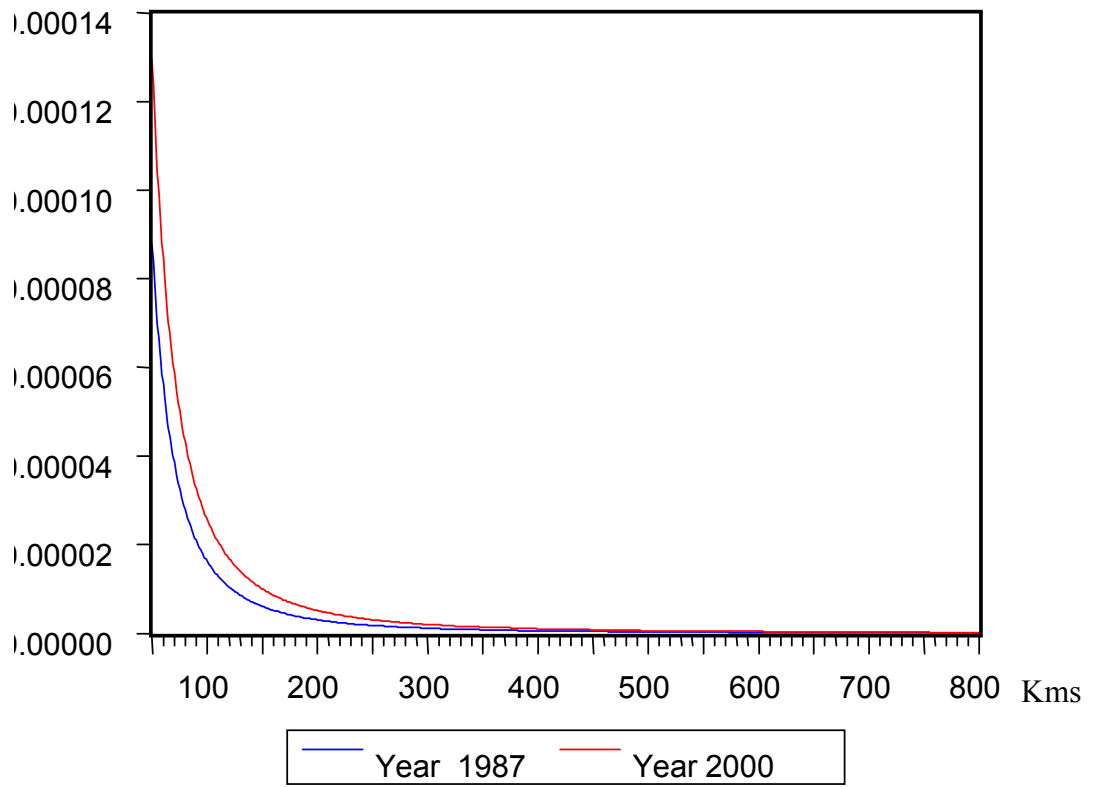
Tourist: Tourist index variation

Unemployment

Patents: Number of patents p.c. (2000)

Competition: Competition indicator

Figure 1. Accessibility Index



MAP OF SPANISH URBAN AGGLOMERATIONS

