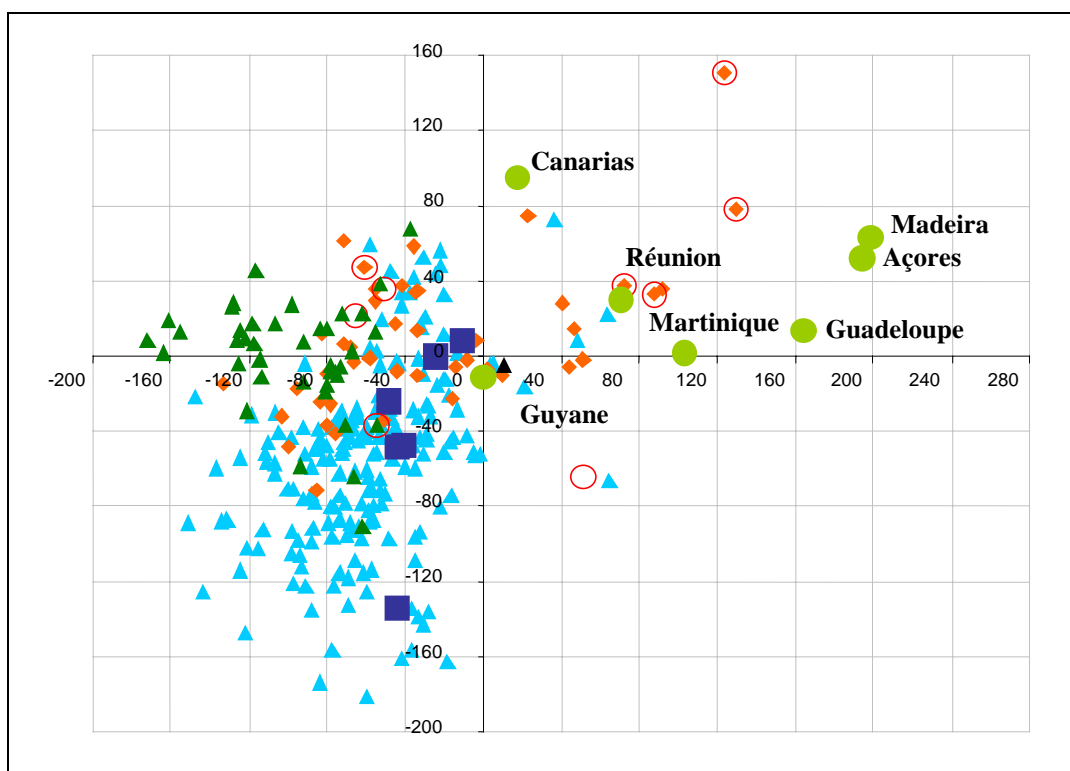




The INTERREG III B Community Initiative Programme for the Promotion
of Co-operation between European Union Regions during the Period 2000-2006

The Ultraperipheral Regions of the European Union: Indicators for the Characterisation of Ultraperipherality





Investigation: **The Ultrapерipheral Regions of the European Union: Indicators for the Characterisation of Ultrapерipheralіty**

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O objectivo do estudo consiste em caracterizar as regiões ultraperiféricas da União Europeia (Açores, madeiras, Canárias, Martinica, Guadalupe, Reunião e Guiana Francesa) em relação às restantes regiões europeias, mediante a utilização de indicadores estatísticos. Pretende-se ainda a obtenção de um indicador agregado de ultraperiféricidade.

Este estudo pode ser dividido em quatro partes distintas.

- *Numa primeira parte, os autores tentam obter e sistematizar um quadro conceptual sobre o conceito de ultraperiferia a partir de um conjunto de estudos já existente.*
- *Numa segunda parte, o estudo centra-se na construção de um conjunto de regionais a partir do Eurostat, Espon, Institutos Regionais de Estatística e elaboração dos próprios autores.*
- *Uma terceira parte recorre à análise multivariada dos dados, com destaque para a análise regressão e análise de clusters.*
- *Numa última parte, os autores voltam ao quadro conceptual tentando obter, dentro das possibilidades, um indicador agregado de ultraperiferia.*

A escassez de dados regionais, a qual condiciona a análise deste fenómeno, encontra-se presente no trabalho. Apesar de tudo, os dados obtidos e referenciados no trabalho revelam um esforço significativo.



1 OBJECTIVE

This investigation titled *"The Ultraperipheral Regions of the EU: Indicators of Ultraperipherality"* was commissioned to MCRIT S.L. by the Government of the Canary Islands in the framework of the UCEST INTERREG IIIB Project (Azores, Madeira and the Canary Islands) with the objective of characterising ultraperipheral regions using the available indicators as a base, with new indicators which can be calculated specifically.

The hypothesis of the investigation is that ultraperipheral regions constitute a territorial identity with unique and permanent specific characteristics which differentiate them from the rest of European regions. These characteristics derive from their geographical situation and from their unique natural conditions. Although some of these characteristics which define ultraperipheral regions (in Section nº2 of Article 299 of the ECT, and in Article II-424º of the Constitutional Treaty) can be found in an isolated manner in other European regions, the difference between the ultraperipheral regions, or that which makes them a group apart from the body of other European regions is that the presence of these characteristics is simultaneous and exhaustive. This creates an accumulative and interactive framework of effects from which a highly individual process of economic growth and development arises. The accumulation of all the determining factors for development identifies ultraperipheral character, and constitutes that which could be identified as the true cost of ultraperipherality. In some of these regions the negative effects of this situation is exacerbated by the fact that they are archipelagos (geographical fragmentation and dispersion).

In fact the distance from the European continent, the small territorial and demographic size, or geographical and economic isolation (the inexistence of neighbouring markets as a significant dimension) provoke an absence of critical mass, an absence of economies of scale and size, the lack of an adequate provision of resources and an absence of size in their markets in ultraperipheral regions, which in turn provoke a reduced space for economic opportunities, a weakened efficiency and elevated extra costs, an economic structure with little diversification, a weakened profitability in terms of public and private investment, and a marginal rate of importation which is highly elevated. Ultraperipheral regions face extreme problems in endogenising a sustained process of growth and economic development. The economies of the ultraperipheral regions, independently of the level of per capita production which they have attained, (largely through the implementation of



the policy of cohesion deriving from the first financial perspectives), are still vulnerable economies which are susceptible to regressive phenomena.

This research attempts to measure and quantify this characterisation of ultraperipheral regions as much as possible, taking into account the already known limitations of the available indicators for European regions as a whole. It also seeks the conceptualisation of new indicators and the construction of compound indicators. Compound indicators must permit a reasonable quantitative approximation of the accumulative and synergetic effects of the interaction of the characteristics which define ultraperipheral regions. The conceptualisation of new indicators must pass through the critical assumption of the limitations of the existing indicators in order to achieve the objectives established by this research.

This document was presented in its first complete version in Madeira in July 2005, and was later revised and presented on the 20th of September in Madrid; it was scientifically checked during the month of October and finally presented on the 28th of November.



2 METHODOLOGY

Given that an attempt is being made to characterise ultraperipheral regions in relation to other European regions using quantitative data, the greatest difficulty encountered in this investigation has consisted precisely in creating a database at a European regional level which both integrates and completes existing bases. EUROSTAT and ESPON (EC/DGREGIO) regional indicators have been used as a base with others, completing the most relevant indicators when these were not available for ultraperipheral regions, taking information from regional statistical institutes. Instead of defining a series of ideal indicators (which would be impossible to implement due to the lack of homogenous information for all regions), indicators which are really available or which are of practicable calculation have been used, and an attempt has been made to achieve the best possible characterisation of the ultraperipheral regions.

In addition to the ESPON indicator base the following sources of statistical information have been used:

- The National Institute of Statistics of Spain (INE)
- The Canary islands Statistical Institute (ISTAC)
- The National Institute of Statistics of Portugal (INEP)
- The Regional Service of Statistics of the Azores
- The Regional Administration of Statistics of Madeira
- The National Institute of Statistics and Economic Studies of France (INSEE)
- EURISLES (European Islands System of Links and Exchanges)
- E U.P.R.'S (The Ultraperipheral Regions of the European Union Resource Centre)

A critical summary of the research has been created on the economic impacts of the territorial determining factors of ultraperipherality, with the objective of systemising, as far as is possible, the fundamental concepts which are later measured with the most representative indicators. New indicators were defined and calculated in order to make up for the limitations of existing indicators.

We then represented the indicators which we considered to be the most relevant for the measurement of the fundamental concepts, presenting them in bivariate graphs (generally relating a territorial indicator to an economic indicator) simultaneously for all European regions and classified typologically. These graphs facilitate the observation of both the



relative differences of the regions included in each typology, and the relative differences between the groups, and therefore facilitate the identification and selection of the most pertinent indicators. This type of graph is indispensable as it provides a panoramic view of all the regions and the majority of inter-related indicators.

Later a statistical multivariant analysis was undertaken which consisted in analysing, on the one hand, which territorial indicators were more related with the economic indicators, and on the other hand, which typologies of regions were configured from an optimal statistic viewpoint. The question which we attempted to respond to was whether ultraperipheral regions constitute an important statistical fact existing regional indicators, or in other words, which territorial indicators and which economic structures make ultraperipheral regions a singular group within European regions. In this aspect the study revised and updated the work of a previous study carried out by the European Commission.

The following analysis, which is more conceptual than statistical, consists in identifying those indicators which were better suited to the measurement of the fundamental characteristics of the opportunities of regional development and the calculation of an aggregated index, simply standardising the partial results and applying them to each type of region as a whole. The objective of the analysis and of the compound indicator proposed is not therefore to classify a determined region as ultraperipheral or non-ultraperipheral, but to verify up to which point the group of the ultraperipheral regions are effectively singular within the rest of the European regions, from the perspective of territory and economic structure.

Finally a critical analysis is made of the structural indicators and an alternative proposal is made, based on the regional indicators included in the base, which is more relevant to ultraperipheral regions.

In a complementary manner, the qualitative information compiled is included as a reference and is organised region by region.



3 THE ORGANISATION OF THE REPORT

The report is presented in accordance with the following working methodology:

- *Firstly* the precedents of the definition process involving the concept of *ultraperipherality* have been revised within the treaties and agreements of the European Union, as well as in the various studies which evaluate the differential concept of ultraperipherality in terms of cost, opportunity and economic development. These precedents are presented in the introduction and serve only as a conceptual framework for the development of this report, the objective of which is not the analysis of the strategies of ultraperipheral development, but the characterisation of the regions using statistical indicators. Due to its special relevance, a summary of the study on ultraperipheral regions which was undertaken as an assignment of the European Commission is included.
- *Secondly* a data base was constructed with the indicators available, integrating new indicators specifically calculated for this research (the results are presented in graphs and are integrated in the description of the regions in Chapter 6 of this report). The databases were also completed so as to be able to apply the indicators homogeneously to the entire European territory. Graphs and tables were constructed with the indicators in order to permit a primary exploration which is integrated with both qualitative and quantitative information in order to carry out a territorial and economic description of the ultraperipheral regions in an integrated manner.
- *Thirdly* a multivariant statistical analysis was carried out in order to investigate the degree of explanation of the diverse indicators and the significance which the regional groups could have which resulted from the adoption of one or another kind of indicator as classification criteria.
- *Fourthly* those indicators which were considered to be especially useful for characterising European ultraperipheral regions were selected, and these were used to define the aggregated and compound indicators which had to take account of the accumulative effects of the territorial and economic determining factors.
- *Fifthly* the relevant material was organised and published on the project website for later publication if such material proved relevant.



4 AN INTRODUCTION TO *ULTRAPERIPHERALITY*

This chapter revises the precedents of the definition process for the concept of ultraperipherality within the treaties and agreements of the European Union, as well as the studies and analysis made on the determining factors which ultraperipherality has in terms of opportunity for economic development. The interest of the chapter lays not so much in the analysis of ultraperipherality in itself but rather it serves as a conceptual framework for the definition of a system of indicators for its characterisation.

4.1 TERRITORIAL DETERMINING FACTORS FOR ULTRAPERIPHERAL EUROPEAN REGIONS

In the entire European area there are a total of seven ultraperipheral regions: the Canary Islands, the Azores and Madeira, in the Atlantic Ocean, and which, from the 16th century, ports of call for Spanish and Portuguese transoceanic maritime voyages; Martinique, Guadalupe and Guiana, in the Caribbean, which were later colonised by France as was Reunion Island in the Indian Ocean. The majority of these territories had a *strategic localisation value* for the European metropolis which lost territories in Africa and America in the 19th and 20th centuries. The Ultraperipheral European territories constitute a *territorial singularity* in themselves for evident geographical and historical reasons.

Owing to their singularity they have shared similar *developmental determining factors*, and today they face similar economic challenges. The territorial determining factors must not be considered to be strictly determining: the determining factors which made their industrial development difficult during the decade of the seventies are the same which as those which make these territories excellent tourist destinations, especially for the European market, or strategic emplacements for the location of specialised technological installations.

However the result between the negative effects and the advantages of these territorial determining factors is manifestly unfavourable, as is demonstrated by several studies on indirect costs linked to ultraperipherality in the agricultural and fishing sectors. The EU provides various subsidies on the basis of these reports in order to attenuate these negative effects.

The territorial determining factors of the ultraperipheral European regions may be summed up as follows:



- They are *very distant* from the European continent in geographical terms.
- They are *isolated*, either because they are oceanic islands, or because they are bordered by poorly populated, basically forested areas with relatively low levels of development, in addition to the lack of direct communication with their geographical surroundings and the difficulty of trading relationships due to the fact that they belong to different economic areas.
- They are areas with a *small surface area*, with scarce natural resources.
- The archipelagos are highly fragmented, a factor which provokes a *double insularity* in the smaller islands.

The following table is a summary of these determining factors and their influence in various stages of economic and social development:

Territorial Determining factors	The Economic Process
OCEANIC LOCATION	The determining factors which promoted their primary colonisation and which impeded their industrial development today induce new development models either as excellent tourist destinations for the European market, or as suitable sites for the installation of logistical or technological equipment, etc. The extreme economic specialisation , and the dependency on the exterior , has been maintained in all stages of development until today. Inefficiency in markets and public investment is difficult to resolve owing to insularity and territorial size. This makes these areas vulnerable economies , which have registered accentuated cyclic oscillations throughout their history in terms of economic activity, large-scale migrations and an insufficient accumulation of capital.
DISTANCE FROM THE EUROPEAN CONTINENT	
ISOLATION IN SURROUNDINGS	
INSULAR FRAGMENTATION	
SMALLNESS – SCARCITY OF RESOURCES	

Table 1 The Influence of the Territorial Determining factors in distinct States of Development. Source: Authors' own using previous research information.



4.2 THE EFFECTS OF ULTRAPERIPHERALITY ON SOCIAL AND ECONOMIC DEVELOPMENT MODELS

The characteristics of ultraperipherality (geographical location, distance from the European continent, isolation, insular fragmentation, smallness or a scarcity of resources), have conditioned the evolution and the socioeconomic development of these regions throughout their history. Until recently each region's income levels had always been below the national averages of their respective countries. All these regions have followed patterns, which are distinct from regions on the European continent yet similar to each other. These patterns have been marked by different stages of exterior dependence and specialisation, which could be qualified as *monocultivation*. From stopover ports for transoceanic maritime routes, these regions became centres of intensive agriculture, for sugar cane or bananas, they did not become industrialised and later specialised in, and developed themselves, as tourist destinations, some in mass tourism, while maintaining traditional activities.

Ultraperipheral regions have generally followed an economic development marked by both its base determining factors, by the success or the failure of the strategies of local or external companies which have operated on their territory, and the impact of the public policies in the framework of the institutional development of each owner country.

The singular nature of their territorial determining factors has provoked successive stages of extreme specialisation throughout modern history. These stages have been marked by periods of rapid growth, more or less accentuated, with pronounced external dependency, regulations, and public or specific subsidies which have provoked a more or less justified perception of vulnerability owing to the distinct degrees of autonomy and capacity for relating to their geographical surroundings.

Given the gradual specialisation which some ultraperipheral territories have had in the tourism sector, it could be argued that their conditions of ultraperipherality could today be a comparative advantage in relation to other European or international tourist destinations, and even an element of added protection for small and medium-sized local companies. However, even in the case of tourism, ultraperipherality imposes additional costs when dealing with an induced demand and imported products. In addition, physical distance brings with it extra costs related to transport which are associated with highly specific industrial sectors, as well as for the import and export of products with little specific value.



There is no *development path* which all these regions must necessarily follow, although the development followed by those regions in the centre and north of Europe could be described as paradigmatic. From an agriculture capable of generating excesses which can be sold and lead to the creation of larger markets which are industrialised on the basis of the use and transformation of natural resources, to new technologies which reduce production and distribution costs, and which result in the integration of the planet in a single economic system, governed by immaterial flows of information and knowledge, and of globalised financial markets which function in real time. In this context a concentration of activities is produced which are decisive in a few areas, such as a greater dispersion of production and consumption, while economic sectors linked to leisure and entertainment, health and the environment emerge. In an economic arena of greater complexity, which is more de-territorialized, in which geographically closer activities can be distanced in terms of relationship, and in which the more distant activities are in continuous contact, public policies could have impacts which may even be contradictory if they continue to be inflexible over time.

In the globalised economic system of today, the economic development of a determined region must be based on the so-called *model of open endogenous development*, in which local companies should be capable of evaluating the comparative advantages of the region at an international scale, with a greater specialisation in sectors of greater added value, however maintaining diversified and sustainable structures of economic activity.

4.3 THE COST OF ULTRAPERIPHERALITY

The so-called cost of *ultraperipherality* would integrate all these additional costs which all those economic agents which operate in ultraperipheral territories have in relation to the rest of Europe, and which they must assimilate via prices, or generally through the reduction in the offer of the goods and services which they have available. Public aid, capital transfers, subsidies and market regulations together should compensate for this disparity in order to re-establish a framework of social and economic equity within the area of Europe.

The first matter would therefore be to identify and quantify these costs, isolating them from those derived from the inefficiency of the markets, and deducing *the benefits of ultraperipherality*, given that these exist. The difficulty of carrying out this analysis



objectively and consistently is a fair demonstration that the calculation of the tax balances between regions, a first step in the territorialisation of economic flows, may be carried out following different methods, and with results which are significantly distinct with respect to the method chosen.

The objective of this report does not consist in the undertaking of such a calculation, or in defining the most suitable methodology for this task, but in the characterisation of ultraperipheral territories with relation to the other European regions, indicating that which identifies them and which should form, in all cases, the basis of a European policy specifically for them.

4.4 RECOGNITION OF ULTRAPERIPHERALITY IN THE EUROPEAN UNION

The recognition by the European Union of the specific nature of ultraperipherality, and the need to deal with the problems of European ultraperipherality in a different way, as recognised in Article 299.2 of the Treaty of Amsterdam, requires specific and appropriate treatment in European Regional Policy as of the year 2006, in order to promote the integration of ultraperipheral regions in the European area.

This treatment must be based in the precise analysis of the limitations of ultraperipherality itself, without placing the integrity and coherence of the community's legal ordinance in danger; this includes the domestic market and common policies, and thus guarantees the operational capacity of the above-mentioned article. According to the European Council of Seville (June 2002), *"Ultraperipherality demands concerted political action, which is global and coherent, which can respond to the developmental needs of these regions in a world which is increasingly more innovative and globalised"*.

In the entire European area there are a total of seven ultraperipheral regions: the Canary Islands, the Azores and Madeira, in the Atlantic Ocean, and which, from the 16th century, ports of call for Spanish and Portuguese transoceanic maritime voyages; Martinique, Guadalupe and Guiana, in the Caribbean, which were later colonised by France, as was Reunion Island in the Indian Ocean. The majority of these territories had a *strategic localisation value* for the European metropolis which lost territories in Africa and America in the 19th and 20th centuries.



As they were unable to industrialise, owing to their territorial conditions, they maintained subsistence economies which were combined with the specialisation of export products – grapes, sugar, cochineal, bananas -, and fishing fleets until the mid-seventies when mass tourism generated a highly accelerated yet unbalanced economic development in some of these regions, and which in some islands has provoked various types of environmental and social conflicts.

In the case of the Azores, their economic growth during the last few decades has been based on the use of the comparative advantages which derive from the production of milk products. The Azores are producers of almost 27% of the milk produced in Portugal, an activity which sustains a large part of the industrial sector of the region (in terms of employment the secondary sector of the U.P.R. is that which has greater relative importance). As a consequence, the quantity of exports from the Azores is based mainly on the export of these products. Only in the last few years has tourism begun to increase in a sustained and significant manner. The tourism sector in the French DOMs is in full development although in some of the regions this fundamental activity has still not been entirely developed.

Faced with the specific nature of the ultraperipheral regions, and taking into consideration the different experiences acquired with the initiation of regional development programmes in the framework of the FEDER, the U.P.R.'s defend the greater common interest for continuing the cooperation initiated within the framework of the REGIS programme for the 1994-1999 programming period regarding common themes and problems. The reason for this common interest is that their differences with the rest of the European continent make them equal.

The three community initiative programmes, INTERREG III B, ("Azores-Madeira-Canary Islands", "South West Europe" (Portugal, Spain, France, Great Britain) and "Atlantic Space" (comprising these countries and Ireland)) constitute a privileged framework which would allow the improvement, at an operative level, of the cooperative relationships between these regions, as mentioned in Point 15 of the orientations of the Commission on INTERREG III.

This opportunity for cooperation, as well as being in accordance with that expressed by the European Commission, and coherent with the new framework established for the U.P.R.'s in the above mentioned Article 299.2 of the Treaty of Amsterdam, is precisely the subject of the proposals made on numerous occasions by the Conference of Presidents of the U.P.R.'s



With this objective, the U.P.R.'s have decided to preserve a specific measure in the heart of each priority axis (cooperation among U.P.R.'s) with a determined budget to be determined in the framework of each programme, which allows the financing of their cooperative actions.

Each one of these measures will allow the financing of all types of eligible actions in the heart of the current axis. Priority will be given to cooperation which focuses on those themes of specific interest for ultraperipheral regions.

In the framework of the programming complements of their respective INTERREG III B programmes, the U.P.R.'s commit themselves as a whole to establish specific criteria for the selection of projects between these regions and other coordination measures (for example a minimum number of members, modes of finance, coordination among management committees, etc).

4.5 FROM STRUCTURAL FUNDS TO EUROPEAN TERRITORIAL POLICY?

During the last few decades the ultraperipheral regions have received different types of capital transfers (e.g. Structural and Cohesion Funds from the European Union), subsidies (e.g. discounts in transport services) and tax exemptions (e.g. free ports), in order to compensate for the development conditions *which ultraperipherality involves*. Between 1986 and 1996 the GDP of the ultraperipheral regions increased more than that of other regions in the EU. The most recent data included in the third Cohesion Report drawn up by the European Commission show a certain regression in this tendency, as Guiana has negative growth rates. Unemployment expressed as a percentage of the active population also decreased.

The process of European integration is reluctant to contemplate exceptions to the common regime. The islands form part of the regional development programmes provided that they fulfil the requirements necessary for their inclusion in these, and not because they are islands. For example, the majority of islands are included in Objective 1 regions in the FEDER programmes, as they have a per capita income 75% below that of the European Union average. Those insular regions which have a GDP which is above this have been, or will be excluded from Objective 1 (the future Objective of the Convergence). A situation like that of the U.P.R.'s, with their distinct taxation and economic structures, was not anticipated in Europe.



In 1985, during the integration process of Spain and Portugal, Spain negotiated special integration conditions for the Canary Islands which were established in Protocol 2, Annex to Membership Treaty. As such the Canary Islands were integrated into the European Union, but VAT was not applied to them as in the rest of Spain, neither were EU commercial and agricultural policies integrated into the islands, which remained on the margin of the customs union and the common agricultural policy. Portugal negotiated the approval of a joint declaration concerning the situation of the Azores and Madeira, through which a series of specific measures were agreed upon in order to promote the development of these two Atlantic –Portuguese archipelagos.

After the entrance of Spain and Portugal to the European Economic Community (today the EU), the European Commission, with Jacques Delors as its president, created a group of inter-services in 1986 for the DOM, PTOM, the Azores, Madeira, the Canary Islands, Ceuta and Melilla. Presided over by Giuseppe Ciavarini Azzi, this group has been a decisive element for the adoption of more effective instruments in the economic and social development of ultraperipheral regions. The result of his tireless efforts, the POSEI (POSEIDOM, POSEIMA, POSEICAN), REGIS and REGIS II programmes were applied – probably the largest and most efficient investment programmes ever undertaken in the ultraperipheral regions. These specific application policies have been and are effective in the development of the U.P.R.'s.

With respect to the future revision of European Union regional policies, the revision of all aid mechanisms for current development could be inevitable. It is significant that when the reform of European developmental aid policies tends to orient itself more with respect to territorial criteria (frontier zones mountainous areas, insular areas, coastal areas, inner rural areas, areas converting to tourism, industrial areas in recession etc.), the ultraperipheral areas accrue a large number of these conditions.

4.6 PRECEDENTS: THE EC/DGREGIO INVESTIGATION

The closest research precedent is that carried out by Planistat Europe and Bradley Dunbar Ass, which was commissioned by the DG REGIO of the European Commission in order to analyse the economic and social situation of these regions. The conceptual framework proposed in this research, and the indicators which were adopted constitute the most direct precedent for this research.



All ultraperipheral regions suffer, in addition to extreme isolation, from at least one of the following handicaps: six of the regions are islands, six are mountainous, and one region considered due to its sparse population; four of them are archipelagos, causing another structural handicap of double or triple insularity.

Table 1 : the outermost regions and permanent structural handicaps

Region	Outermost region	Island	Mountainous	Sparsely populated	Archipelago
Azores	X	X	X		X
Canary Islands	X	X	X		X
Guadeloupe	X	X	X		X
French Guiana	X			X	
Madeira	X	X	X		X
Martinique	X	X	X		
Réunion	X	X	X		

The study divides the handicaps into three categories: extreme remoteness and isolation, conditions of size and environmental conditions. A series of causes and effects arises from the study of these handicaps which refers to the following areas: demography, environment, political autonomy, access to public services and transport.

The analysis methods developed in the EC/DGREGIO research sought three main objectives:

- to determine how these territories and regions orientate themselves with relation to each other;
- to determine how these territories are orientated in relation to a continental reference framework comprising European territories and insular European regions, the poorest regions in the European Union, and the countries to which they belong.
- to analyse the development policies implemented in those territories by the European Union, the member states and the regions.

The ultraperipheral regions comprise seven entities with individual social and geographical characteristics, however all of them are considered to be peripheral and isolated. These regions are located far from Europe in an almost abandoned social and economic environment. The distance which separates the capital city from each one of these regions from the capital of the country to which they belong is between 1,040km (Madeira) and 9,370 km (Reunion). The fact that these regions are islands, or enclaves such as Guiana, accentuates their peripherality and adds to their isolation. In addition a difference exists between the level of prosperity in terms of GDP/inhabitant from the regions of the Caribbean, and that of the population of the area to the order of five to one.



Table 2: the isolation of the outermost regions

Region	Distance from the capital of the Member State	Distance from the continent*
Azores	1 500	1 450
Canary Islands	2 000	250
Guadeloupe	6 800	560
French Guiana	7 500	N/A
Madeira	1 000	660
Martinique	6 850	410
Réunion	9 400	1 700

* Average for archipelagos

Guiana as the only continental region is an enclave with barely no contact with neighbouring countries, a territory largely covered by Amazonian rainforest.

Table 3: some significant figures

	Population	Area	Density	Number of islands	Nominal GDP € million	GDP - PPS*	Unemployment rate	% pop. < 25 yrs old
Azores	246 000	2 330	105	9	1 840	12 006	2.5	40
Canary Islands	1 610 000	7 242	222	7	22 600	17 773	14	33
Guadeloupe	422 000	1 705	247	8	5 350	12 877	26	38
French Guiana	155 000	83 934	1,85	N/A	1 850	11 948	22	50
Madeira	245 000	779	314	2	2 570	16 444	2.5	37
Martinique	380 000	1 128	337	1	5 600	14 952	27	35
Réunion	728 000	2 520	289	1	7 710	11 082	33	44

* Average for the Union: 22 576

The ultraperipheral regions have a total population of 3.8 million inhabitants (1% of the population of the EU), spread across an area of some 25,000 km² (100,000 km² if the forest area of Guiana is included, a region in which 90% of its territory is covered by equatorial forest). This population is distributed irregularly between the seven regions, all of which are densely populated with the exception of the Azores (105 inhabitants/km²) and Guiana (1.9 inhabitants/km²) where 80% of the population are mainly concentrated on the coast.

Ultraperipheral regions however have an extremely young population, and this produces a series of problems in terms of land use and employment. With the exception of the Canary Islands the GDP of the ultraperipheral regions is significantly lower than that of the EU; as is the case of the French regions which are among the poorest regions in the EU. However the situation of the Canary Islands and the size of its population improve the average of the ultraperipheral regions appreciably. All of these regions are eligible Objective 1 regions.

The economy of these regions is based mainly on tourism and agriculture.

Table 4: trade in goods

	Export	Import	Balance	Balance as % of GDP
Azores				
Canary Islands				
Guadeloupe (1998)	101	1 627	-1 526	28%
French Guiana (1998)	85	517	-433	23%
Madeira				
Martinique (1998)	255	1 515	-1 260	21%
Réunion (1998)	185	334	-2 149	27%

All the ultraperipheral regions have a high level of political autonomy with respect to their mother countries; this grants them a number of prerogatives, mainly tax prerogatives or the possibility of modifying laws adopted in the mother country.

The economic and social influence of the mother countries, together with certain geophysical characteristics constitutes the origin of the differences between these regions. The functioning of these regions diverges with respect to employment, economic activities and demographic behaviour. The French ultraperipheral regions suffer a high degree of demographic pressure, high rates of unemployment, excessive dependency in the tertiary sector (which is poorly diversified) and a relatively wide non-market sector. The Portuguese have a unique geographical situation (isolated in the Atlantic, archipelagos, and mountainous), demographic pressure compensated by a high level of emigration, very low levels of unemployment and a still-thriving primary sector. The ultraperipheral region of the Canary Islands, the closest to the European continent is comparable to a large number of continental regions.

Table 5: summary of variables used for the statistical analysis

Groups of factors	Variables
Island nature	Temperature, rainfall, latitude, number of islands, altitude, agricultural area, highest point/area, length of coastline/area and importance of natural risks.
Natural environment	
Isolation/remoteness	Distance to be travelled to meet 15 times the population of the territory, distances island/continent and territory/capital of the mother country, number of means of transport, difference between GDP and that of the surrounding population, tonnes of freight per capita and number of passengers transported per capita.
Size	Population, area and GDP.
Demography	Structure of the population, rate of growth and migratory balance.
Low-level of production	Breakdown of population by qualifications, breakdown of employment by sector, breakdown of value added by sector, eligible areas, state aid, breakdown of value added by sector and permanent jobs.
Access to services	Public-sector jobs, presence of infrastructures, number of doctors and hospital beds.
Seasonal variations	Rate of secondary residence and number of tourists per capita.
Decentralisation	Degree of autonomy.

The most significant factor is distance, peripherality/remoteness. This factor explains more than 50% of the behaviour of the territories in question, followed by geo-morphological conditions (39%) and size (8%). These results also demonstrate in a general way, a clear difference between the ultraperipheral regions and the European islands. There are densely



populated territories which are mountainous, and scarcely populated areas which are less mountainous.

The following diagram classifies ultraperipheral regions into two groups: Group 1 includes ultraperipheral regions of a large size and high altitude, and those European islands of a large size or with an abnormally high altitude, while the smaller ultraperipheral regions of lower altitudes figure in Group 2.

Table 6: breakdown of the outermost regions by group

Group 1	Group 2
<u>Outermost region territories:</u> Réunion, Pico, Flores, Sao Jorge, Corvo, Sao Miguel, Faial, Terceira, Graciosa, Tenerife, Santa Maria, French Guiana, La Palma, Madeira, Hierro, Gran Canaria, Guadeloupe, Gomera and Martinique.	<u>Outermost region territories:</u> Porto Santo, Saint Martin, Saint Barthélemy, La Désirade, Lanzarote, Terre-de-Haut, Terre-de-Bas.
<u>European territories:</u> Sicily, Sardinia, Stromboli, Crete, Rhodes, Corsica...	European territories classified according to their size and altitude.

Regional analysis facilitates the positioning of the U.P.R.'s for comparison while considering the differences between regions. The results of the analysis conclude in the following manner:

- There is a clear difference between the situation of the U.P.R.'s and that of the insular regions, mainly in reference to their peripherality and isolation.
- A marked inequality exists between these regions, both at an economic and demographic level. The French U.P.R.'s are in economic recession but have a marked demographic dynamism; The Azores and Madeira have high emigration and still retain an important primary sector; the Canary Islands are comparable to the European continent.
- In the last 10 years, with the support of the EU, the U.P.R.'s have experienced a high degree of economic dynamism. However, this development is still insufficient, even in the framework of the extension of the EU to 27 countries it does not reach the EU average.
- The population of these regions is extremely young.
- The U.P.R.'s lack access to public services both in terms of quality and quantity.
- The flow of foreign capital is practically zero.



5 A DEFINITION OF INDICATORS TO CHARACTERISE ULTRAPERIPHERALITY

Criteria are defined below for the selection of the most relevant indicators, using all those indicators available. The singular nature of the European ultraperipheral territories is manifest in the fact that many geographical indicators which are applicable to other European regions must be adapted in order to be significant for U.P.R.'s (e.g. kilometres of border, land access, provision of railroad infrastructures, population at a certain distance in terms of time or cost, etc.).

5.1 CRITERIA FOR THE DEFINITION OF INDICATORS

An *indicator* is a quantitative measure which provides politically significant and scientifically consistent information in relation to a particular question. While *descriptors* are objective data and neutral (e.g. the average daily temperature on a winter's day, or the average intensity of traffic on a weekday), the definition of an *indicator*, as well as its mathematical formulation usually requires a more arbitrary and questionable choice. Producing indicators (e.g. the internal return figures from a determined public investment) may imply the use of highly complex models and theories.

As such, the criteria followed for the definition of the indicators adopted in the study of the characterisation of ultraperipheral regions is based on the following considerations:

- The choice of indicators from among those already existent and available has been made with respect to their capacity to provide significant information on the problems and potential problems, weaknesses and strengths of the ultraperipheral regions in relation to the five above-mentioned *territorial determining conditions* (situation, distance isolation, fragmentation and resources) and to their *socioeconomic profile* (population, culture and innovation, activities, relations, social welfare) which can also be expressed in terms of *socioeconomic determining conditions* to future development (in terms of the degree of dependency of the population , youth unemployment etc.).
- The indicators chosen permit comparisons with the EU in its entirety, and with other areas of the EU, as well as the analysis of differences between ultraperipheral regions. It is therefore necessary that the indicator chosen is available, not only for ultraperipheral



reasons, but also for the rest of Spain. As such the ESPON and SPESP databases such as EUROSTAT and others have been considered as reference sources for the research are additional to the databases of the regional statistical institutes.

- The most commonly accepted indicators already used by official statistical institutes and in other European research work have been chosen from among the existing indicators. These indicators are complemented where possible with information expressly created for the research.
- The indicators refer to the most significant spatial level. In the case of Regional European indicators it is especially useful to employ averages and deviations for regional typologies (such as the U.P.R.'S themselves, insular regions, Objective, etc.), with the objective of illustrating the most important tendencies and the most relevant relative magnitudes. As such the chosen indicators have been calculated for the following group of regions wherever possible:
 - Ultraperipheral regions of the European Union (the Canary Islands (SP), the Azores (PT), Madeira (PT), Guadeloupe (FR), Martinique (FR), Guiana (FR) and Reunion (FR)).
 - Peripheral Nordic regions of Sweden and Finland (It-Suomi (FI), Pohjois-Suomi (FI), Mellestra Norrland (SW) and Oevre Norrland (SW)).
 - Other insular regions (Balearics (SP), Aland (FI), Ionia Nisia (GR), Voreio Aigaio (GR), Notio Aigaio (GR), Kriti (GR), Bornholms amt (DK), Corsica (FR), Sardinia (IT), Smaaland Med Oearna (SW)).
 - Other regions which do not fulfil Objective 1 of the UE15
 - Other regions which fulfil Objective 1 of the UE15
 - Other regions which do not fulfil Objective 1 of the UE10
 - Other regions which fulfil Objective 1 of the UE10
- The indicators must permit, as much as is possible, the construction of time series in distinct years, especially in the case of socio-economic indicators. Despite the availability of indicators in time series is very much at a regional level in Europe, in the



cases in which indicators are available, graphs have been drawn up which facilitate their analysis.

5.2 EXISTING INDICATORS

Although the literature on territorial, socioeconomic and environmental indicators is extensive, the availability of complete and updated databases for all European regions, including the ultraperipheral regions is scarce.

5.2.1 EUROSTAT Statistical Indicators

The recently published regional statistical annual (EUROSTAT Regions: Statistical Yearbook 2004) contains a series of regional indicators which are basically centred on socioeconomic aspects, and which therefore constitute a fundamental reference in this aspect.

Population change rate as a percentage (65+)
Regional differences in old-age dependency ratios (65+ / (15-64))
Pigs per hectare of utilised agricultural area
Sheep per hectare of utilised agricultural area
Cattle per hectare of utilised agricultural area
Grassland and dairy cows
Dairy cows: Production of cows' milk and share of dairy cows
GDP per inhabitant, in PPS
Change of GDP per inhabitant (in PPS) in percentage points of the average EU-25
Primary income of households per capita, in PPCS
Disposable income of private households as % of primary income
Yearly average growth rate of the available per capita income
Regional disposable income per capita in PPCS, all sectors
Employment rate of age group 15-64 %
Change in employment %
Agriculture – share of total employment %
Services – share of total employment %
Unemployment rate %
Change in unemployment rate % points
Female unemployment rate %
Youth unemployment rate %
Share of long-term unemployed persons in total %
Share of manufacturing in total employment
Share of construction in total employment
Share of trade in total employment
Share of services in total employment
Wages and salaries per person employed in trade and services
Wages and salaries per person employed in manufacturing and construction
Density of employment in manufacturing and construction
Density of employment in trade and services



Investment rate in manufacturing
Cerebrovascular diseases: Age standardised mortality in males of all ages
Cerebrovascular diseases: Age standardised mortality in females of all ages
Malignant neoplasm of colon: Age standardised mortality in males of all ages
Influenza and pneumonia: Age standardised mortality in females of all ages
Malignant neoplasm of prostate: Age standardised mortality in males of all ages
Malignant neoplasm of breasts: Age standardised mortality in females of all ages
Traffic accidents: Age standardised mortality in males aged 0-64
Accidental falls: Age standardised mortality in females of all ages
Number of bed places in hotels and similar establishments
Number of bed places per 1000 inhabitants
Nights spent in hotels and similar establishments
Nights spent in hotels and campsites by non-residents

Other databases from EUROSTAT were already integrated, and in some cases completed within the numerous ESPON projects of the EC/DGREGIO which have been used for reference in this research.

5.2.2 Structural Indicators

The *structural indicators* were presented in the statistical annex of the Commission's report to the European Council in the spring of 2005. The list facilitates an evaluation of the actions carried out in accordance with the time established by the Lisbon agenda. In the widest context of the strategy of Lisbon, the stable maintenance of this list of indicators is anticipated during three years, starting from 2004. At present however a statistical base which contains these indicators at a regional level and which includes the following indicators exists:

- Per capita GDPpps
- Labour productivity per employee
- Employment rate
- Employment rate of older workers
- Success rate for youth education
- R and D domestic expenditure (GERD)
- Level of comparative prices
- Investment opportunities
- At-risk-of-poverty rate after social transfers
- Long-term unemployment rate
- Dispersion of regional employment rates
- Greenhouse gas emissions



- Energy intensity of the economy
- Volume of freight transport in relation to the GDP

The following table was drawn up by the *Centre of Urban and Regional Studies* (Helsinki) for the DG REGIO ESPON 3.3. Project, and shows the limited availability of these indicators for distinct NUTS levels. Only five indicators out of fourteen are available at a regional level.

Indicator	Definition	Source	Spatial reference	Time	NUTS level
GDPpps per capita	GDP per capita in Purchasing Power Standards	EUROSTAT	EU 25+4	1991-2001	0,2,3
Labour productivity per person employed	GDP in PPS per person employed	EUROSTAT	EU 25+4 (or +3?)	1991-2001	0,2,3
Employment rate	Employed persons aged 15-64 as a share of total population of the same age group	EUROSTAT	EU 25+4 (or +3?)	1990-2001	0,2,3
Employment rate of older workers	Employed persons aged 55-64 as a share of the total population of the same age group	EUROSTAT	EU 25+4 (or +3?)	1990-2001	0,2
Spending on human resources (public expenditure on education)	Total public expenditure on education as a % of GDP	EUROSTAT	EU 24+4 (or +3?), no data on Slovenia	1993-2001	0
R&D expenditure	Gross domestic expenditure on research and development (GERD) as % of GDP	EUROSTAT	EU 24+4 (or +3?), no data on Malta	1991-2000	0, 2
IT expenditure	Expenditure on IT as % of GDP	OECD/WITSA/IDC/EITO	EU 23+4 (or +3?), no data on Cyprus and Malta	1991-2000	0
Financial market integration (convergence in bank lending rates)	Coefficient of variation across countries on annual interest rates charged on short-term corporate debt	DG MARKT / EUROSTAT, based on data from ECB and national central banks	EU 12	1993-2002	0



Indicator	Definition	Source	Spatial reference	Time	NUTS level
At-risk-of-poverty rate	Share of people with an equivalised disposable income below the risk-of-poverty threshold after social transfers. The threshold is set at 60% of the national median equivalised disposable income (after social transfers)	EUROSTAT	EU 25+4 (or +2?)	1995-2000	0
Long-term unemployment rate	Total long-term unemployed (over 12 months) as % of the total active population aged 15-64	EUROSTAT	EU 25+4 (or +3?)	1990-2001	0, 2
Dispersion of regional employment rates	Coefficient of variation of employment rates across sub-regions within regions	EUROSTAT	EU 18 (no data on DK, IR, LU, CZ, HU, PL and SK). No data on BG, RO, NO (and Switzerland?)	1996-2001	0, 2
Total greenhouse gas emissions	Percentage change in emissions of 6 main greenhouse gases (CO ₂ , CH ₄ , N ₂ O, HFCs, PCFs and SF ₆) since base year and targets according to Kyoto Protocol	EAA	EU 25+4 (or +3?)	1990-2000	0
Energy intensity of the economy	Gross inland consumption of energy divided by GDP	EUROSTAT	EU 25+4 (or +3?)	1991-2001	0
Volume of freight transport relative to GDP	Index of freight transport volume relative to GDP Measured in tonne-km/GDP and indexed on 1995	EUROSTAT	EU 23+4 (or +3?), no data on Cyprus and Malta	1991-2001	0

Table 2 Availability of Structural Indicators for distinct NUTS Levels. Source: Centre of Urban and Regional Studies (Helsinki)



5.2.3 UNEP Indicators

UNEP is one of the most extensive sources of information on islands, with data and indicators of approximately 2,000 of the most significant islands in the world, including the Canary Islands, the Azores, Madeira and the French island of Reunion. The majority of the indicators are related to the environment and social themes, more than to the economy or transport. In addition the database contains simple indicators and compound indicators combining various simple indicators. These aggregated indexes are related to activities which involve human impact in the environment and the risk ecosystems face in terms of natural risks and other dangers.

Although the majority of the indicators of this data base are related to the environment, the importance of this database goes beyond environmental themes: it assumes that the potential for tourism is directly related to landscape, the flora and fauna, and the climate, and that the devastation of the natural environment is also related to the tourism sector, and in consequence with the local economy of the islands.

3 tables are provided below (one for each U.P.R. country) with the values of the some of the aggregated indicators for this database.

5.2.4 ESPON Indicators

ESPON (The European Spatial Planning Observatory Network) has developed what is probably the widest currently available base of regional indicators, integrating information from EUROSTAT and also from other sources, although many of the indicators are not complete for ultraperipheral regions.

Using the most recent database available (March 2005), a primary selection of these indicators has been made, and their availability has been studied for all regions on the European continent as well as for the 7 ultraperipheral regions which are the subject of this research.



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Arial 8

	A	B	C	G	R	S	T	U	V
	Descripción del	Nombre de la variable	Proyecto ESPON	Relevancia social y económica	CANARIAS	AZORES	MADEIRA	MARTINICA	GUADALUPE
1									
2	tmgdpr25t	mesoscale (25), weighted by GDP	2.1.1						
3	tmgdpr1000	makroscale (1000), weighted by GDP	2.1.1						
4	ttmoppr25	mesoscale (25), weighted by Population	2.1.1						
5	ttmoppr1000	makroscale (1000), weighted by Population	2.1.1						
6	ttmgdp25tt	life mesoscale (25), weighted by GDP	2.1.1						
7	gdp1000ttm	life makroscale (1000), weighted by GDP	2.1.1						
8	pop25ttm	life mesoscale (25), weighted by Population	2.1.1						
9	p1000ttm	life makroscale (1000), weighted by Population	2.1.1						
10	ttmgdp25tt	mesoscale (25), weighted by GDP	2.1.1						
11	gdp1000ttm	makroscale (1000), weighted by GDP	2.1.1						
12	pop25ttm	mesoscale (25), weighted by Population	2.1.1						
13	pop1000ttm	makroscale (1000), weighted by Population	2.1.1						
14	pop_date_nat	on national classifications	1.1.2		1	1	1	1	1
15	rel_rurality	Relative rurality based on national classifications	1.1.2		1	1	1	1	1
16	typo_ur_pop_nat	classifications	1.1.2		1	1	1	1	1
17	S_BES_MILLIONS	sector - Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1	1			
18	S_BES_MILLIONS	sector - Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1				
19	S_BES_MILLIONS	sector - Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1	1			
20	S_BES_MILLIONS	sector - Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1				
21	S_BES_MILLIONS	sector - Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1	1			
22	S_BES_MILLIONS	sector - Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1				
23	S_BES_MILLIONS	sector - Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación					
24	S_BES_MILLIONS	sector - Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación					
25	S_BES_PERCENT	sector - Percentage of GDP	2.1.2	Innovación, cultura, formación	1	1			
26	S_BES_PERCENT	sector - Percentage of GDP	2.1.2	Innovación, cultura, formación	1				
27	S_BES_PERCENT	sector - Percentage of GDP	2.1.2	Innovación, cultura, formación	1	1			
28	S_BES_PERCENT	sector - Percentage of GDP	2.1.2	Innovación, cultura, formación	1				
29	S_BES_PERCENT	sector - Percentage of GDP	2.1.2	Innovación, cultura, formación	1	1			
30	S_BES_PERCENT	sector - Percentage of GDP	2.1.2	Innovación, cultura, formación	1				
31	S_BES_PERCENT	sector - Percentage of GDP	2.1.2	Innovación, cultura, formación					
32	S_BES_PERCENT	sector - Percentage of GDP	2.1.2	Innovación, cultura, formación					
33	S_GOV_MILLION	Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1	1			
34	S_GOV_MILLION	Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1				
35	S_GOV_MILLION	Millions of Euro (from 1.1.1999)/ECU (up to	2.1.2	Innovación, cultura, formación	1	1			

Indicadores \ ESPON /

Dibujo Autoformas

Listo NUM

Figure 1 Available Indicators from the ESPON network related to Ultraperipheral Regions. Source: Authors' own.

5.2.5 Statistical Indicators from Statistical Institutes

An inventory has been made of the existing indicators using databases from the following statistical institutes:

- The National Institute of Statistics of Spain (INE)
- The Canary islands Statistical Institute (ISTAC)
- The National Institute of Statistics of Portugal (INE)
- The Regional Service of Statistics of the Azores
- The Regional Administration of Statistics of Madeira
- The National Institute of Statistics and Economic Studies of France (INSEE)
- EURISLES (European Islands System of Links and Exchanges)
- E.U.P.R.'S (The Ultraperipheral Regions of the European Union Resource Centre)

Those indicators defined by various institutions which have been considered relevant for the characterisation of ultraperipheral regions have been updated and completed with the



information from these sources, mainly European Commission structural indicators and indicators from bases created by UNEP, ESPON, PEEIL and others.

Although this database is incomplete, it contains a minimal amount of statistical reference information for the fundamental variables, and can be used to validate information from other sources.

5.2.6 Indicators used in Studies on Ultraperipherality

The indicators used in previous studies of ultraperipherality have been classified using territorial determining factors (localisation, accessibility, resources, integration, surroundings) or the economic and social factors in these regions (activities, demography, relations, innovation and development, welfare and social cohesion), indicating the spatial level, which has been used to calculate the definition, the objective and the source where possible. However the original databases which were used for making these calculations are not available.

The fact that they have been mentioned and discussed in different studies does not imply that they have been calculated for all the regions in a homogeneous manner.



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Arial 8

	A	B	C	D	E	F
	Designación	Condicionantes territoriales	Relevancia social y económica	Definición	Objetivo	Comentario
1	Precio público de billete ida y vuelta entre el aeropuerto más frecuentado y la capital nacional (1996)	Accesibilidad	Relaciones	Precio público de billete ida y vuelta entre el aeropuerto más frecuentado y la capital nacional (1996)		
50	Nombre del aeropuerto más frecuentado		Relaciones	Nombre del aeropuerto más frecuentado		
51	Salario medio por hora		Actividades	Es el salario medio por hora ofrecido para todos los sectores confundi- do, medido en el lugar de trabajo.		
52	Salario medio mensual		Actividades	Es el salario medio mensual ofrecido para todos los sectores confundi- do, medido en el lugar de trabajo.		
53	TA: Oferta total en número de asientos en las conexiones con el continente (1995)	Recursos		Número de asientos ofrecidos entre la región y el continente (sin charters)		
54	TA: Número de pasajeros transportados en líneas regulares con el continente (1995)	Recursos		Número de pasajeros que entra y salen en los aeropuertos (sin charters)		
55	TA: Número de asientos de las líneas intraregionales	Recursos		Número de asientos ofrecidos en líneas entre islas		
56	TA: Número de pasajeros transportados en las líneas intraregionales	Recursos		Número de pasajeros que entra y salen en los aeropuertos		
57	Número de empresas (establecimientos) (1995&1996)		Actividades	Se entiende cómo establecimiento una pequeña unidad económica que debajo un régimen de		

Indicadores ESPON

Dibujo Autoformas

Listo

Figure 2 Available Indicator in existing Studies related to Ultraperipheral Regions. Source: Authors' own.

5.2.7 The Selection of Indicators

The existing indicators which are considered to be of interest have been incorporated into a database and divided into the following sub-themes.

Socioeconomic development:

1. Population
2. Culture, Innovation and Training
3. Welfare and Social Cohesion
4. Economic Activities
5. Relations and Flows

Territorial Determining Factors:

1. Location
2. Distance
3. Isolation





4. Fragmentation

5. Resources

The indicator base was the ESPON base, which was used as a reference, completing the information for the ultraperipheral regions when this was not available, together with the EUROSTAT 2004 regional base.

The indicators have been organised into two separate Excel files. The first with the EUROSTAT base, reorganised in accordance with the requirements of this research, but including all the original indicators, and the second with the ESPON base extended to the ultraperipheral regions with the selection of indicators which are shown below (those indicators marked with an asterisk (*) were available in a time series data, and those marked with two asterisks (**) were available for the ultraperipheral regions):

5.2.7.1 *Population*

- Total population (*)
- Population density (hab/km²)
- Percentage of population less than 25 years old (*)
- Percentage of population over 75 years old (*)
- Percentage of population development between 1995 and 2000
- Changes in the natural potential of growth: population between 20-29 years of age in 2020 (born between 1991-2000) / Population between 20-29 years of age in 2000 (born between 1971-1980)
- Fertility ratio
- Dependency ratio (Total population / Population with ages of between 20 and 64 – this is a function of the size of the young groups (0-19) and older groups (65+))
- Migratory balance / 1,000 inhabitants

5.2.7.2 *Culture, Innovation and Training*

- Population with higher education studies / Active population (in %)
- Population with higher education studies / Total educated population (in %)
- Expenditure in research and development in all institutional sectors.
- R&D personnel BES (in fte) / 1,000 active persons
- Total R&D personnel (in fte) / 1,000 active persons



5.2.7.3 *Welfare and Social Cohesion*

- Health service equipment: number of beds in hospitals / 100,000 inhabitants
- Health service personnel: doctors / 100,000 inhabitants
- Health service personnel: nurses / 100,000 inhabitants
- Health service personnel: pharmacists / 100,000 inhabitants
- Health service personnel: dentists / 100,000 inhabitants
- Population with diabetes / Total population (**)

5.2.7.4 *Economic Activities*

- Active population (*)
- Active population / Total population (in %)
- Unemployment figures (in %)
- Development of unemployment between 1998-2001 (in %)
- Unemployed persons under 25 years of age / 1,000 inhabitants of between 15 and under 25
- Gross Domestic Product –GDP- (euros/inhabitant/year) (*)
- Gross Domestic Product –GDP- / Average European GDP (euros/inhabitant/year) (*)
- Growth of GDP between 1995-2000 (in euros and in %)
- Density of employees (per km²)
- Employees in the agricultural sector / Total employees (in %)
- Employees in hotels and restaurants / Total employees (in %)
- Employees in services / Total employees (in %) (*)
- Employees in manufacturing / Total employees (in %) (*)
- Percentage of employees in agriculture, forestry and fisheries (1992-1999)* (*)
- Percentage of farm owners under 35 (1990 – most recent year)* (*)
- Percentage of added value due to agriculture, forestry and fishery products (1995-1997) (*)
- Standard Gross Margin per farming unit worked (what one person produces in a year) (1990-1999)* (*)
- Standard Gross Margin per farm owner (1990-1999)* (*)
- Agricultural output-input ratio
- Proportion of internet users /100 inhabitants
- Proportion of companies with their own web page



- Long-term unemployment figures
- Sectorial concentration index

5.2.7.5 *Ratios and Flows*

- Number of overnight stays (minimum one night stay in destination)
- Number of tourists who arrive at the region
- Index of tourist pressure
- Air transport (1,000 passengers embarked)
- Air transport (1,000 passengers disembarked)
- Air transport (1,000 passengers embarked and disembarked)
- Sea transport (1,000 tonnes of goods loaded)
- Sea transport (1,000 tonnes of goods unloaded)
- Sea transport Sea transport (1,000 tonnes of goods loaded + unloaded)
- Coverage rate
- Average movement of passengers in airports "regional airports and accessible points of the territory " (in accordance with TEN classification)
- Average movement of passengers in airports "Points of community connection " (in accordance with TEN classification)
- Average movement of passengers in airports "Points of international community connection " (in accordance with TEN classification)
- Average movement of passengers in airports "Report of points of community connection " (in accordance with TEN classification)
- Average movement of passengers in airports "Report of an international system " (in accordance with TEN classification)

The territorial indicators available chosen from those databases which best reflect the characteristics of the ultraperipheral regions are as follows:

5.2.7.6 *Location*

- Potential regional threat of earthquakes
- Potential risk of radioactive contamination
- Approximate probability of winter storms
- Average number of floods
- Average altitude with respect to the sea



- Maximum height with respect to the sea
- Minimum height with respect to the sea
- Minimum/Maximum height with respect to the sea
- Maximum height with respect to the sea /Regional surface

5.2.7.7 *Distance*

- Distance to the European continent (Maastricht) (in km)
- Distance to the capital of the mother country (in km)
- Accessibility potential by aeroplane, space EU29 = 100
- Accessibility potential by road, space EU29 = 100
- Multimodal accessibility potential, space EU29 = 100
- Global Accessibility Index (GAI) in a straight line
- Distance of poles of knowledge and innovation in a straight line

5.2.7.8 *Isolation*

- Population at less than 500 km. in a straight line (in 1,000 inhabitants)
- Population at less than 1000 km. in a straight line (in 1,000 inhabitants)
- Population at less than 1,500 km. in a straight line (in 1,000 inhabitants)
- Human development index of neighbouring countries
- Accessible market at less than 500 km. in a straight line (in 1000,000 euros)
- Accessible market at 1000 km. in a straight line (in 1000,000 euros)
- Accessible market at 1500 km. in a straight line (in 1000,000 euros)
- Population under 60 euros (in 1,000 inhabitants)
- Population under 120 euros (in 1,000 inhabitants)
- Accessible market at 60 euros (in 1,000)
- Accessible market at 120 euros (in 1,000)

5.2.7.9 *Fragmentation*

- Length of coastline / Regional surface area in km/km²)
- Regional surface area / Surface of mother country
- Cost (distance, time) to the capital of the region



5.2.7.10 Resources

- Density of road network
- Density of road network (in km/km²) Speed > 85 km/h
- Capacity of commercial airports (passengers/year)
- Useful agricultural surface area (UAS) / Total agricultural surface area (in %)
- CORINE natural surface area / Total surface area (in %)
- CORINE Artificial surface area / Total surface area (in %)
- Percentage of the total area which is useful agricultural surface area (UAS) (1986-2001) (*)
- Number of airports "regional airports and points of accessibility to the territory " (according to TEN classification)
- Number of airports "points of community connection" (according to TEN classification)
- Number of airports "points of international community connection " (in accordance with TEN classification)
- Number of airports "report of points of community connection " (in accordance with TEN classification)
- Number of airports " report of an international system " (in accordance with TEN classification)

5.2.8 Additional Indicators

In order to complement the indicators selected from the above-mentioned bases, the following series (or families of indicators) of indicators has been defined and calculated):

- *Global accessibility*: this indicator represents the average accessibility of a point of origin in order to reach the rest of the points in a determined territory.
- *Population and accessible market in distinct time intervals* (1 hour, 3 hours, 5 hours) or cost (euros) from these regions, and from other significant regions of the European Union with the modal chain of optimum transport (road and air, road and coastal motorways etc.).
- *Cost between administrative capitals* within the region in vehicle (road and ferries).
- *Cost of access to the capital of the mother country with respect to the minimum wage*.

- *Availability of infrastructures and social services*, in terms of territorial provision.
- *Provision of transport services*: availability in frequency and price of the services of distinct modes of transport in remote regions (maritime and air services) between these, the European continent and other countries and regions. This information is not however available for other European countries.

For the calculation of the indicators related to accessibility a system of geographical information was developed with transport networks and socioeconomic information distributed by cities and associated to a grid such as that shown in the figure below. The calculations and final graphs are presented in separate Excel files.

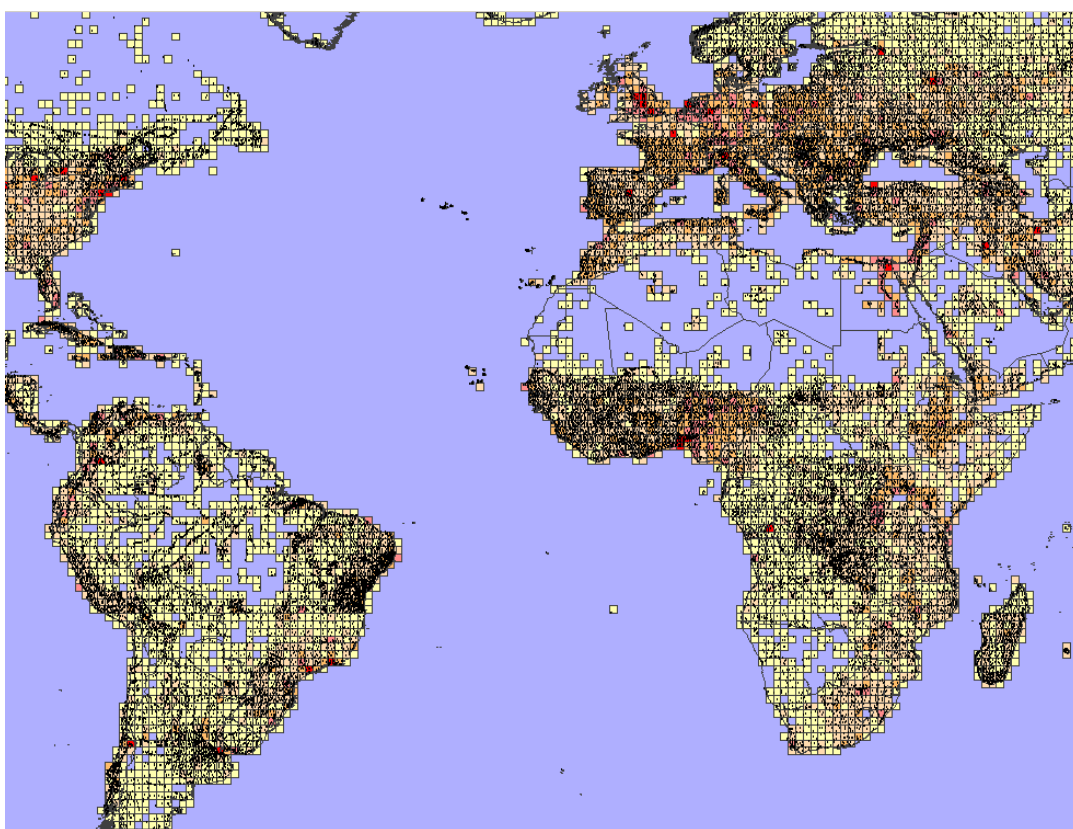


Figure 3: Analysis of Population and Population accessible from Ultraperipheral Regions. Source: Authors' own

This comprises a database with some 135 regional indicators.

In the following chapter a primary approximation is presented of the characterisation of ultraperipheral regions, graphic representations are included which were taken from the most relevant results obtained with these additional indicators.



6 A DESCRIPTION OF EUROPEAN ULTRAPERIPHERAL TERRITORIES

In this chapter a primary characterisation of ultraperipheral regions is presented using a synthesis of precedents which were completed with indicators compiled in the information base of this study. The characteristics are presented in a synthesis which integrates both qualitative and quantitative information.

6.1 A SYNTHESISED DESCRIPTION OF THE ULTRAPERIPHERAL REGIONS

The ultraperipheral regions present a complex topography characterised by average altitudes which are superior to those of other islands and European regions. In addition, and largely due to their recent volcanic orogenesis, they have high maximum altitude figures, some of which are over 3,500 metres, far exceeding the majority of the European NUTS III regions. What must be highlighted is, therefore the greater difficulty in the management of these mountainous areas, the lower availability of anthropic surface area, and greater natural surface area.

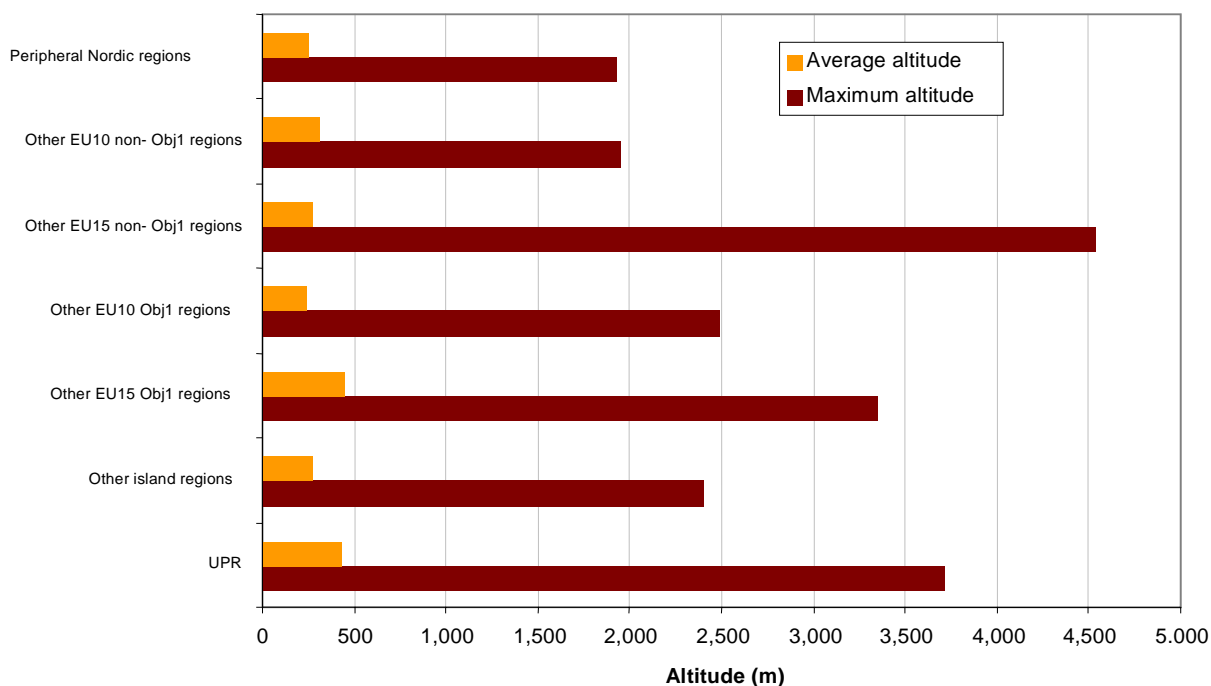


Figure 4 Maximum and Average Altitude of European Territory (NUTSIII level). Source: Authors' own using data from the research "Mountain Areas in Europe" (Áreas de Montaña en Europa)

If the provincial surface areas of the ultraperipheral regions are compared in relation to their maximum heights, the small Portuguese islands of the Azores and Madeira are those which reach the highest altitudes in comparison with their surface area, as with the French island of Reunion. On the contrary, the extensive French department of Guiana and the Canary Islands, - despite existence of the highest mountain in Spain in Santa Cruz de Tenerife, El Teide of 3,781m- have a more homogeneous topography.

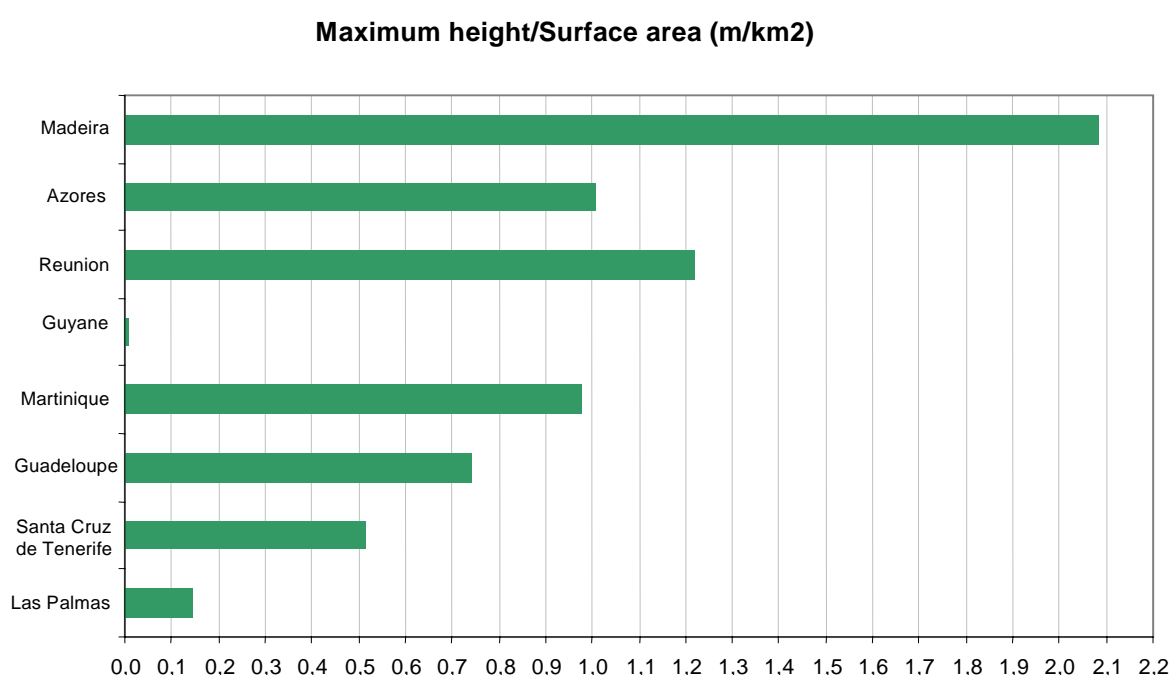


Figure 5 The Relationship between the maximum Height and the Surface Area of Ultraperipheral Regions (NUTSIII level).
Source: Authors' own using data from the research "Mountain Areas in Europe" (Areas de Montaña en Europa)

With respect to the entire European region, the ultraperipheral regions are the second group of regions with the greatest relationship between maximum height and regional surface area, and which are only surpassed by those UE15 Non-Objective 1 regions, and which are formed, among other areas, by many German and Austrian alpine provinces with an administrative surface area much smaller than in other European provinces.

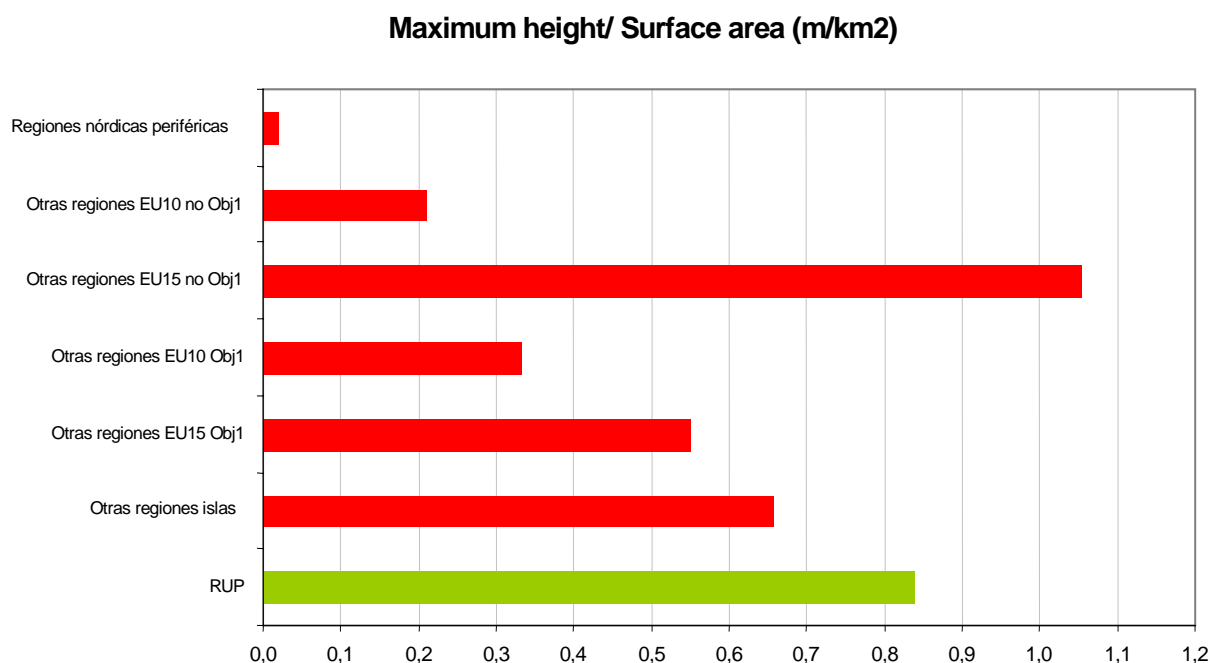


Figure 6 The Relationship between the Maximum Height and the Surface Area of Regions in European Territory (NUTSIII level).
Source: Authors' own using data from the research "Mountain Areas in Europe" (Áreas de Montaña en Europa).

Martinique, Madeira, the Azores and Guadeloupe have a high potential earthquake risk (to the order of 20 to 30, where the average value of the European regions as a whole, as defined by the potential earthquake indicator is 100) which is much higher than the majority of regions of the EU29 (to the order of 0 to 10). Reunion, Guiana and the Canary Islands have a potential earthquake risk which is relatively lower (to the order of 0 to 5).

6.1.1 Distance

While the inhabitants of European insular regions must travel an average distance of 500 km to reach that threshold population, Reunion and the Azores need more than 1,200 km, - or more precisely 1,500 km in the case of the Azores – the Canary Islands and Madeira have a population which is 15 times larger than its own at more than 1,000 km, and only Guiana, Guadeloupe and Martinique have figures of between 750 and 1,000 km.

Considering the purchasing power of the accessible population, the results show how, while the average accessible population from the U.P.R. regions is from 1.3 to 4.11 times less with regard to the distance of the average accessible population of other insular European regions, the accessible market is from 1.4 to 34 times less. This indicates that the



neighbouring territories of the ultraperipheral regions have a purchasing power which is notably inferior to other EU29 regions.

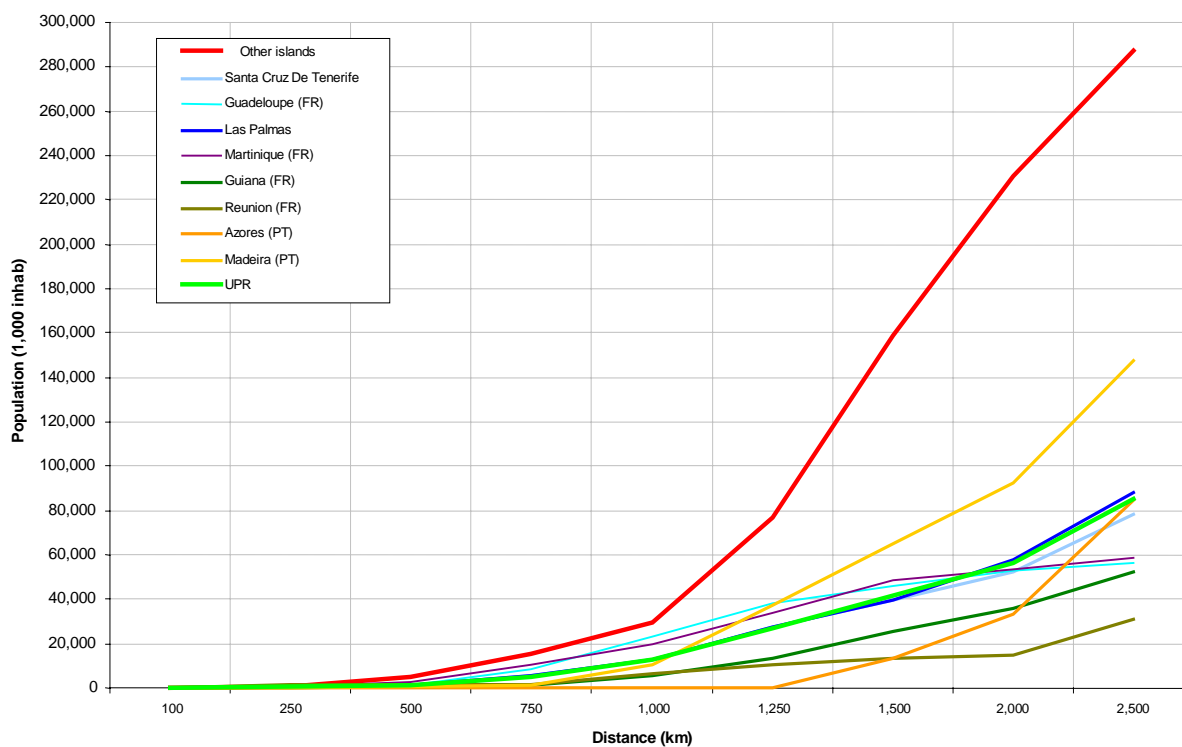


Figure 7 The Accessible Population from the Borders of the Ultraperipheral Regions and other Insular Regions. Source: Authors' own.

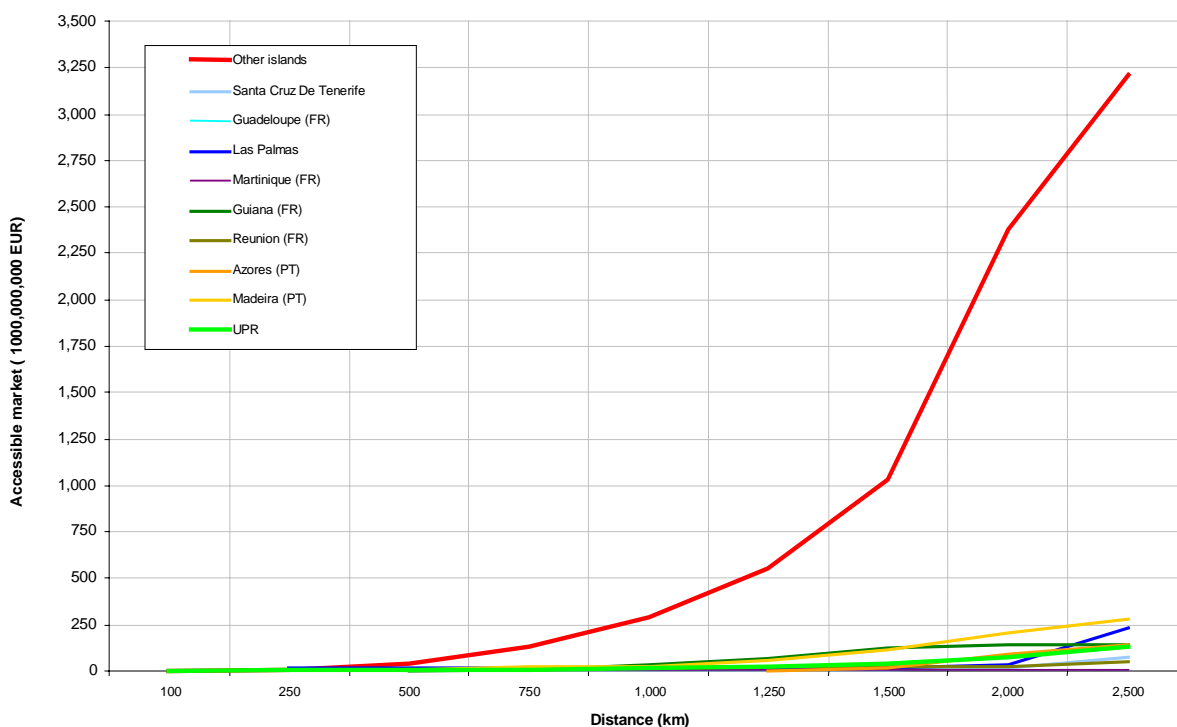


Figure 8 The Accessible Market (in 109 EUR) from the Borders of the Ultraperipheral Regions and other Insular Regions. Source: Author's own.

With the exception of the Canary Islands the rest of the ultraperipheral regions have a low minimum wage with respect to the access cost to their respective capitals (the relationship has a value of between 1,748 for the Azores and 4,98 for the Canary Islands). Although the access cost to Paris is much higher from the French ultraperipheral regions. The Portuguese regions have a lower access cost to Lisbon with relation to minimum wages, owing to the low minimum wages of this country. Other insular European regions have a much greater relationship, with values of between 3.55 (Notio Aigaio in Greece) and 7.98 (the Balearic Islands in Spain).



Coste de acceso a la capital / salario mínimo para regiones insulares

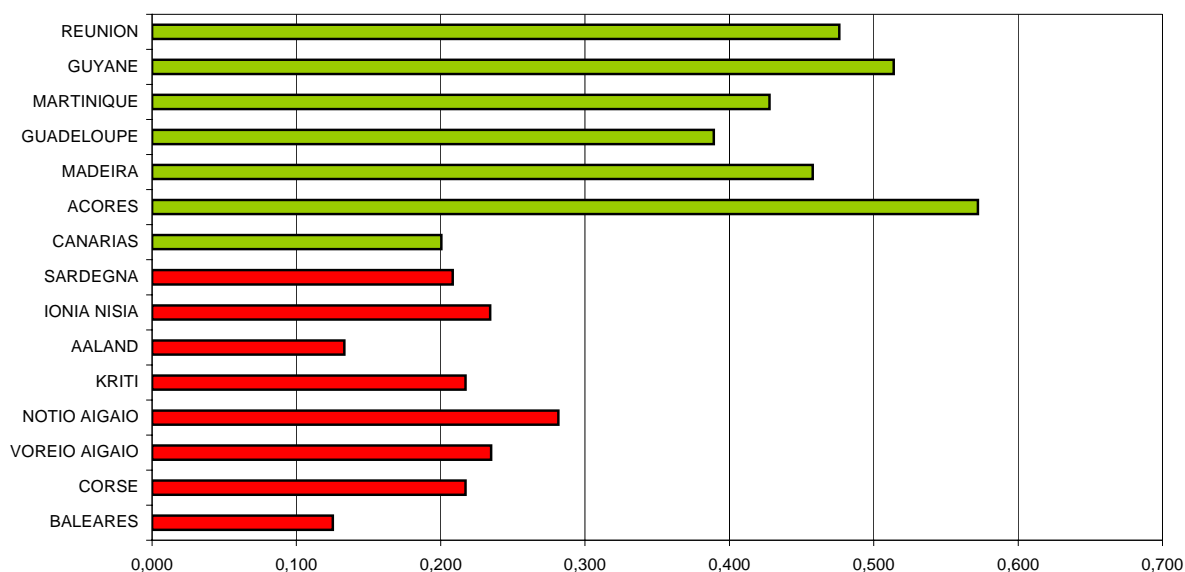


Figure 9 The Relationship between Minimum Wages and the Cost of Access to the Capital of the Mother Country from the Ultraperipheral Regions and other Insular European Regions. Source: Authors' own.

The access cost for all regions in the European continent is equal to the access cost in car or ferry, calculated on the basis of journey time, the value of the time, and the operating costs of the vehicle. For insular and ultraperipheral regions this cost is the minimum between the cost of access in car and ferry and the cost for air travel. This indicator has been calculated only for regions of EU countries with a minimum wage, -data obtained from EUROSTAT databases and from the national statistical institutes of the mother countries of the ultraperipheral regions -.

The ultraperipheral regions have a much lower average relationship compared to the rest of the group of regions (2.55 compared to 36.57 for the regions of the UE15). In other words the rest of the insular regions have an average relationship of twice that which corresponds to the ultraperipheral regions (5.00), followed by the regions of the new EU member countries (6.34) and the other Objective 1 regions of UE15 (16.89).

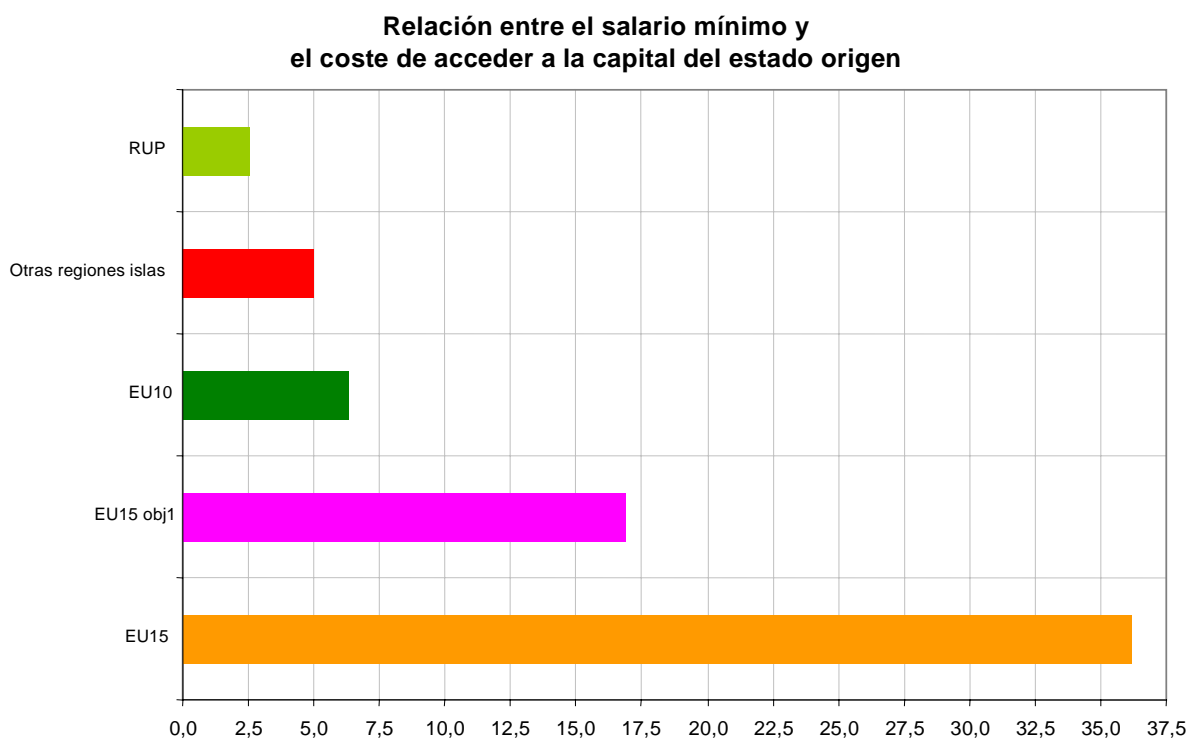


Figure 10: The Relationship between the Minimum Wage and the Cost of reaching the Capital of the Mother Country from Ultraperipheral Regions and the rest of the European Insular Regions. Source: Author's own

The ultraperipheral regions are located more than 3,000 km from the European continent (Maastricht), Madeira, the Canary Islands and the Azores are the closest (**between 3,000 km and 4,000 km**), while Guadeloupe, Martinique, Guiana and Reunion are the furthest away (Reunion is more than 9,000 km away). The other EU29 regions are at an average of 1,000 km.

They are located at a great distance from the capital of their mother country (between 1,000 km and 2,000 km, for the closest -Madeira, the Azores and the Canary Islands -, and between 6,000 km and 10,000 km for the most distanced -Guadeloupe, Martinique, Guiana, Reunion-). The other EU29 regions are relatively close to the capitals of their respective mother countries, with the exception of the Island of Corsica (located at some 870 km).

The potential accessibility by air is the lowest in the EU29 region total (around a value of 36), with 100 as the average value of the European regions as a whole). Those regions with greater potential air access (values above 80) are located close to those airports with greater capacity and services.



The multimodal accessibility potential (in terms of the total number of activities available, weighted in a destination location by the cost of access to them via a determined mode of transport) hardly reaches a value of 40, 100 being the average accessibility value for the European regions as a whole. The potential multimodal accessibility of the rest of the regions is concentrated between the values of 40 and 80, as is the case of the peripheral Nordic regions, followed by the insular regions. The Non-Objective 1 EU15 regions, the Objective 1 EU15 regions and the Objective 1 EU10 regions have a potential accessibility which is equal or superior to this (mainly between 40 and 100).

Low potential accessibility by road (in terms of the total activities available in a destination location per unit of cost), with values of between 0 and 20, (100 being the average accessibility average for the European regions as a whole) which they share with the peripheral Nordic regions. For the other European regions accessibility reaches values from 20 to 180.

Global accessibility (measured in terms of the average distance of a region to the other regions) is equal to or more than 3,000 km (Madeira 2,970 km, the Canary Islands 3,256) reaching the order of 8,000 km (the Azores 4,521 km, Guiana 7,601 km, Martinique 7,882 km, Guadeloupe 7,885 km and Reunion 8,452 km). For the majority of the European regions the average distance to the rest of the EU29 regions is between 1,000 and 2,000 km.

6.1.2 Isolation

Together with the peripheral Nordic regions, these regions are the most isolated in the EU29 group with a **population of below 5 million inhabitants at a distance of 500 km;** while on the continent the population is between 20 and 90 million inhabitants.

The population at a distance of 1,000 km is to the order of 25 million inhabitants; continental regions have an accessible population at this distance of around 60 million to 240 million inhabitants.

The population at 1,500 km of distance is to the order of 50 million of inhabitants with a minimum population figure of 1,295,000 inhabitants (the Azores). The accessible



population of the ultraperipheral regions at 1,500 km is minimal in relation to the rest of the European regions (which reach between 80 and 380 million in habitants).

6.1.3 Fragmentation

The islands-archipelagos are largely the most fragmented regions of Europe (to the order of 0.07 to 0.35 km of coastal length per km² of surface area for each region): Reunion (0.077 km/km²), Martinique (0.156 km/km²), the Canary Islands (0.190 km/km²), Guadeloupe (0.281 km/km²), Madeira (0.333 km/km²) and the Azores (0.340 km/km²). The sole exception corresponds to Guiana (0.015 km/km²) as it is not an island.

The small proportion of surface area of these regions (Martinique 0.2%, Guadeloupe 0.3%, Reunion 0.4%, Madeira 0.8%, the Canary Islands 1.4% and the Azores 2.5%) with respect to the total surface area of the mother country with the exception of the region of Guiana (13.3%). The rest of the European regions, with the exception of the peripheral Nordic regions (between 18% and 42% of surface area), share similar values of between 1% and 15% of surface area.

The archipelago regions such as the Canary Islands, Madeira and the Azores are fragmented territories, and for this reason have extra transport costs for access from each island to the administrative capital of the region. A database has been drawn up of the existing maritime services between the islands of the same region in order to determine the cost, in terms of time and money of this access.

Island of origin	Destination island	Services per week	Average duration (in hours)	Average adult tariff base (in Euros)
Fuerteventura	Gran Canaria	19	4.25	34.47
Lanzarote	Gran Canaria	6	7.13	29.72
La Palma	Gran Canaria	1	24.00	38.12
Tenerife	Gran Canaria	87	2.75	21.30
El Hierro	Tenerife	16	4.00	18.35
La Gomera	Tenerife	153	0.83	13.04
La Palma	Tenerife	15	5.58	26.38

Table 3 Access Cost (Time and Money) to the Administrative Capitals of the Canary Island Region by Sea Transport. Source: Maritime operators.



Island of origin	Destination island	Services per day	Duration (in minutes)	Average adult tariff base (in Euros)
Fuerteventura	Gran Canaria	13	40	35.34
Lanzarote	Gran Canaria	11	45	39.68
La Palma	Gran Canaria	4	50	48.98
Tenerife	Gran Canaria	16	30	30.38
El Hierro	Gran Canaria	2	45	52.70
La Gomera	Gran Canaria	2	40	48.98
La Palma	Gran Canaria	4	50	48.98
El Hierro	Tenerife	4	40	35.34
La Gomera	Tenerife	2	30	35.34
La Palma	Tenerife	12	30	22.94

Table 4 Access Cost (Time and Money) to the Administrative Capitals of the Canary Island Region by Sea Transport. Source: BinterCanarias Islands (weekdays July 2005).

Island of origin	Destination island	Services per week	Average duration (in hours)	Average adult tariff base (in Euros)
Santa María	San Miguel	2	4	32.6
Terceira	San Miguel	1	6	50.75
Graciosa	Terceira	1	3.25	33.65
Sao Jorge	Terceira	0/4	0.5	27.75
Pico	Sao Jorge	4/17	0.66	8.58
Faial	Pico	27/59	0.75	5.87

Table 5: Access Cost (Time and Money) to Ponto Delgada (the Azores) by Sea Transport. Source: Maritime operators.

Island of origin	Destination island	Services per day	Duration (in minutes)	Average adult tariff base (in Euros)
Santa María	San Miguel	2	30	62.48
Terceira	San Miguel	4	40	86.48
Graciosa	Terceira	2	30	62.48
Sao Jorge	San Miguel	2	60	94.48
Pico	San Miguel	1	60	94.48

Table 6 Access cost (Time and Money) to Ponto Delgada (the Azores) by Air Transport. Source: SATA (weekday July 2005).

Island of origin	Destination island	Services per week	Average duration (in hours)	Average adult tariff base (in
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Les Saintes	Guadeloupe	44	0.75	17.33
Marie-Galante	Guadeloupe	43	1	20

Table 7 Access Cost (Time and Money) to Basse Terre (Guadalupe) by Sea Transport. Source: Maritime Operators.

Island of origin	Average duration (minutes)	Average cost (euros)
U.P.R.	450	110.53
Other island regions	360	64.59
Ultraperipheral Nordic regions	171	41.45
EU29	85	21.63

Table 8 Access Cost (Time and Money) to the Regional Administrative Capital from the Provincial Administrative Capitals. Source: Authors' own.

6.1.4 Availability of Resources

Relatively low road density in EU29 regions (with values close to 0.20 km/km²) and particularly higher in the ultraperipheral regions of Martinique (1.820 km/km²), Madeira (0.735 km/km²) and Reunion (0.393 km/km²). However the Canary Islands (0.098 km/km²), Guiana (0.009 km/km²) and the Azores (0.004 km/km²) hardly reach the European average of **0.10 km/km²**.

The capacity of commercial airports of between 500,000 (Guiana) and 13 million passengers a year (the Azores), is similar to the European regions as a whole whose values in some cases exceed 18 million passengers a year. **The Canary Islands have the largest passenger per year capacity of all the ultraperipheral regions (30 million passengers/year).**

The Useful Agricultural Surface Area (UAS) is below 30%. The Azores is the sole exception as it has a UAS which is superior to the majority of EU29 regions (52.711% UAS).

The natural surface area comprises values of between 40% and 50% (the Azores 46.2% and Madeira 46.2%), those with a larger natural surface area (Martinique, Reunion, Guadalupe, and Guiana) have values of above 80% and even 90% (the Canary Islands). The other EU29 regions have a natural surface area which is generally below that of 60%.



6.1.5 Population

A high population density (above 200 inhab/km²), Martinique being the most densely populated region (330 hab/km²), followed by Madeira (310 hab/km²), Reunion (250 hab/km²), the Canary Islands (220 hab/km²), Guadeloupe (210 hab/km²), and the Azores (100 hab/km²); however the region of Guiana has an extremely low density (1.6 hab/km²). Other EU29 regions (EU15, EU10, EFTA, Bulgaria and Rumania) generally have densities which on average are above 100 inhabit/ km².

Growth of the younger population (in terms of the population of between 20 and 29 years of age in the year 2020 with respect to the year 2000) for the Canary Islands (0.601), Madeira (0.753) and the Azores (0.876). These regions have values above the regions of Martinique (1.012), Guadeloupe (1.058), Reunion (1.110) and Guiana (1.584). The average in Europe is between 0.60 and 1.20.

The birth-rate in the Canary Islands (1.29) and Madeira (1.41) is below that of the rest of the EU29 regions which have values of above 1.5; only the Azores (1.67) exceeds this value. The peripheral Nordic regions have a birth rate of between 1.490 (Oevre Norrland) and 2.04 (Pohjois Suomi).

6.1.6 Education

A low percentage of the population with higher education (values below 5%), in particular in the Azores (5%) and Madeira (5%), and **with the exception of the Canary Islands** (32%). The majority of the EU29 regions have percentages of between 10% and 35% of the population with higher education.

6.1.7 Social Welfare

The provision of hospital beds in relation to the European average. The number of beds per 100,000 resident inhabitants is that of some 600 beds while for the rest of the EU29 regions including the Objective 1 regions of the EU10, the number of beds is between 300 and 1,200.



The number of doctors per 100,000 inhabitants for the European regions as a whole is between 200 and 400 doctors. However the **average number of doctors for the ultraperipheral regions is the lowest in the EU29 region (around 200 doctors/100,000 inhabitants)**; Guiana has the least number of these (148.70 doctors), and the Canary islands with the largest number (279.8 doctors).

6.1.8 Economic Activities

The active population figures for the ultraperipheral regions (with values comprising between 40% and 50% of the active population) is comparable to that of the rest of the European regions (between 35% and 55%), and in some cases below that of the EU10 Objective 1 regions. Madeira is notable as it has one of the highest active populations within these regions (with **48% of its population active**) comparable to that of some of the Nordic peripheral regions, while in Guiana (37% active population figures) and Reunion (38% active population figures) the active population is at the lowest levels.

Percentages of population employed in the tourist sector of above 4%: The Canary Islands (12%) takes the first place, followed by Madeira (10%) and the Azores (5%). For the majority of the EU29 regions, the percentage of employees in this sector is inferior (to the order of 1% to 6%).

Between 4% and 12% of the population are employed in agriculture while the Non-Objective 1 (UE15) regions have around 3% of their employed population working in the agricultural sector.

High unemployment figures, even highly superior to those corresponding to the majority of other regions. Reunion has the highest unemployment figure (33.3%), followed by Guadeloupe (29%), Martinique (26.3%) and Guiana (20.5%). The Canary Islands, the Azores and Madeira have values in common with the majority of the EU15 regions (between 2% and 15%).

Per capita income (GDP) medium-low (values of between 8,000 and 15,000 euros/inhabitant/year) with respect to other European regions (15,000 and 35,000 euros/inhabitant/year); are only higher than the per capita income of the Objective 1 regions (below 5,000 euros/inhabitant/year) which correspond to the 10 new member



countries of the EU. The Azores have the lowest GDP (8,337.90 euros/inhabitant/year) followed by Reunion (11,417.20 euros/inhabitant/year) while the highest GDP of these regions corresponds to Martinique (15,403.70 euros/inhabitant/year) and the Canary Islands (14,686.20 euros/inhabitant/year).

The average number of Internet users in relation to the rest of the European regions.

With the exception of the Azores (11.4 users/100 inhabitants) and Madeira (13.7 users/100 inhabitants), the regions of Guadeloupe, Martinique, Guiana and Reunion coincide in the number of internet users per 100 inhabitants (**22.6 users/100 inhabitants**). Above these figures are the peripheral Nordic regions (with values higher than 25 users/100 inhabitants), and below the majority of the Objective 1 regions (with values not exceeding 20 users/100 inhabitants).

The use of new technologies by companies (measured in terms of the proportion of companies with their own website) is around 40% of companies, a percentage which is generally above that of EU10 Objective 1 regions, EU 5 Objective 1 regions, and the values of some non-peripheral insular regions.

The Azores (32.2%) and Madeira (35.3%) have a lower proportion of companies with their own website with respect to the rest of these regions (Guiana 45.3%, Reunion 45.3%, Martinique 45.3%, the Canary Islands 44.7% and Guadeloupe 45.3%).

The ultraperipheral regions of the Azores (580,218 overnight stays), Reunion (1,081,000 million overnight stays) and Madeira (4,961,781 million overnight stays) do not exceed 5 million overnight stays; while **the Canary Islands stands out as the most frequented European region with a total number of 9 million overnight stays.**

In the airports of Madeira, Guiana and the Azores, the number of embarked passengers is 600,000 per year, while the regions of Reunion, Martinique and Guadeloupe have between 600,000 and 1,200,000 embarked passengers a year. The Canary Islands (14,702,000 passengers embarked /year) is the ultraperipheral region with the highest number of embarked passengers per year, which is even higher to the figure of the Balearic Islands (13,257,000 embarked passengers/year). The Non-Objective EU15 regions mostly have values of below 1,200,000 embarked passengers a year; although some have values of below 600,000 embarked passengers a year.

Goods loaded: 71,000 tonnes (Madeira) and 6,818,000 tonnes (the Canary Islands), while some EU15 Non-Objective 1 regions exceed 8,000,000 tonnes. The peripheral Nordic



regions of Mellersta Norrland and Oevre Norrland receive between 1,645,000 and 6,828,000 tonnes a year respectively.

Between 2,077 tonnes (Martinique) and 19,529 tonnes (the Canary Islands) of goods are unloaded every year. The Canary Islands is one of the EU29 regions with the largest number of tonnes unloaded. The EU15 Non-Objective 1 regions unload close to 7,500 tonnes a year, although in some cases they exceed 15,000 tonnes a year. The peripheral Nordic regions of Mellersta Norrland and Oevre Norrland unload 2,564 and 4,135 tonnes a year respectively.

6.2 A COMPARISON OF REGIONAL INDICATORS

This chapter presents a primary synthesis of thematically organised regional indicators in accordance with the territorial and socioeconomic conditions detailed above, and which are presented in graphs which relate them with the GDP/capita. The individual regions are represented by typology in graphs. The objective is to facilitate a primary characterisation of the ultraperipheral regions as a first step in the two analyses which are later undertaken: the analysis of multivariants and the definition of compound indicators.

Legend corresponding to the graphs:

- | | | |
|---|---|-------------------------------------|
| ▲ Other regions non Objective 1 (EU 15) | ◆ Other regions Objective 1 (EU 15) | ■ Peripheral northern regions |
| ◇ Other insular regions | ▲ Other regions non Objective 1 (EU 10) | ▲ Other regions Objective 1 (EU 10) |
| ◆ Ultraperipheral regions | | |



The Relationship between the Distance to the Capital of the Mother Country and the Per Capita GDP

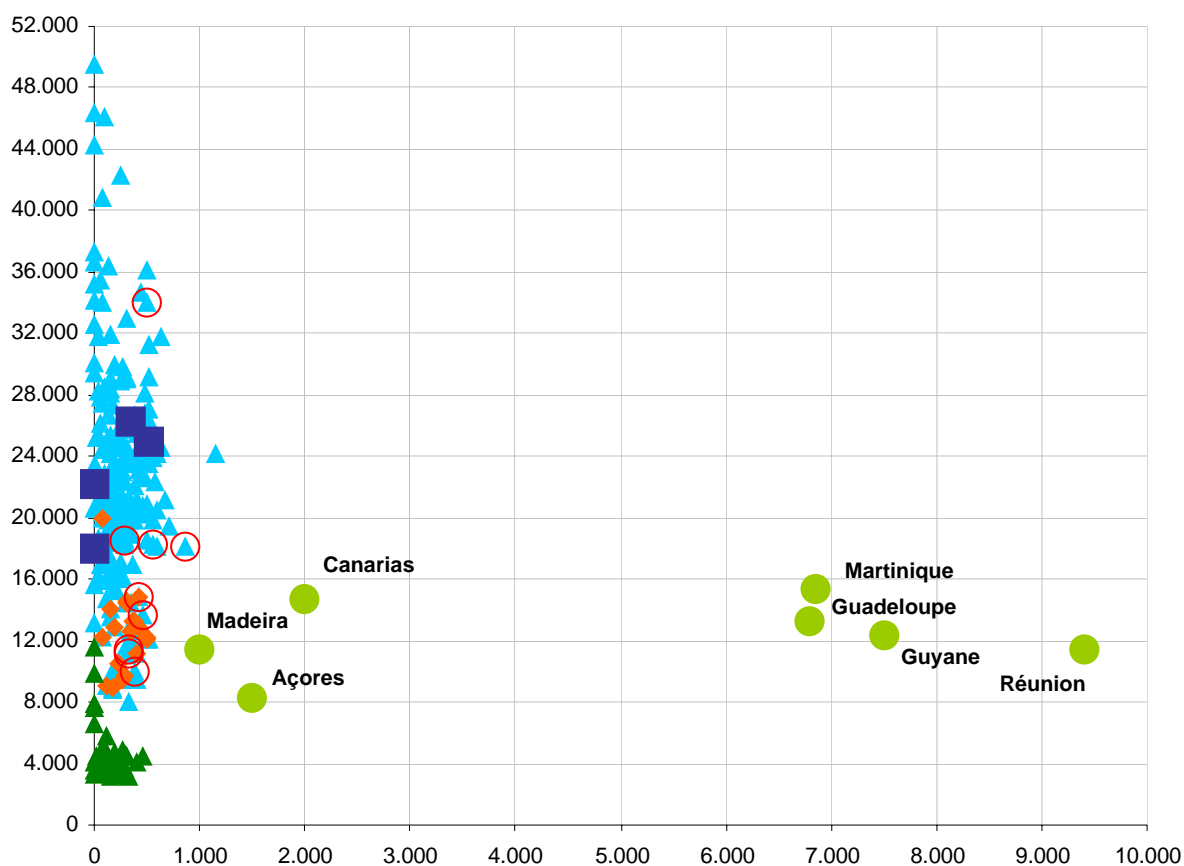


Figure 11 The Relationship between the Distance to the Capital of the Mother Country (in km) and the Per Capita GDP (in euros/inhabitant/year) (2000)

	Distance from the Mother Country Capital	Per capita GDP
The Canary Islands	2,000	14,686.20
The Azores	1,500	8,337.90
Madeira	1,000	11,420.20
Guadeloupe	6,800	13,266.00
Martinique	6,850	15,403.70
Guiana	7,500	12,308.70
Reunion	9,400	11,417.20

The Relationship between the Global Accessibility Index (GAI) and the Per Capita GDP

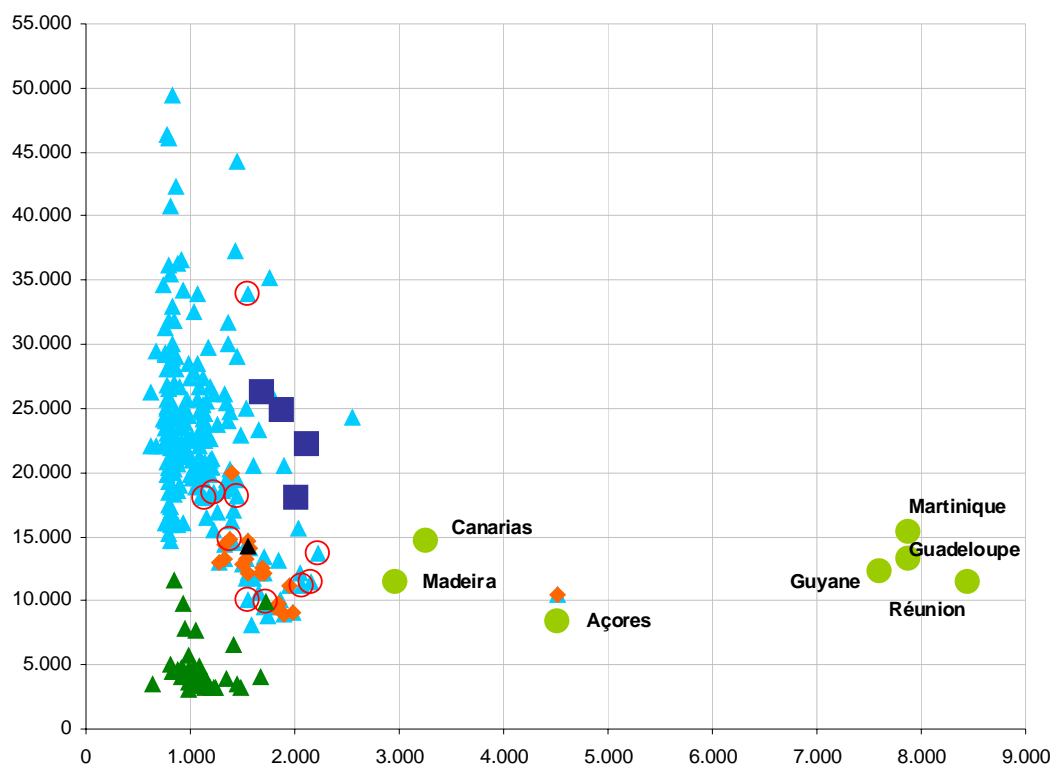


Figure 12 The Relationship between the Global Accessibility Index (GAI) (in km) and the Per Capita GDP (in euros/inhabitant/year) (2000)

	GAI (km)	Per capita GDP
The Canary Islands	3,256.153	14,686.20
The Azores	4,521.016	8,337.90
Madeira	2,970.727	11,420.20
Guadeloupe	7,885.322	13,266.00
Martinique	7,882.085	15,403.70
Guiana	7,601.964	12,308.70
Reunion	8,452.471	11,417.20



The Relationship between the Population at less than 500 km and the Per Capita GDP

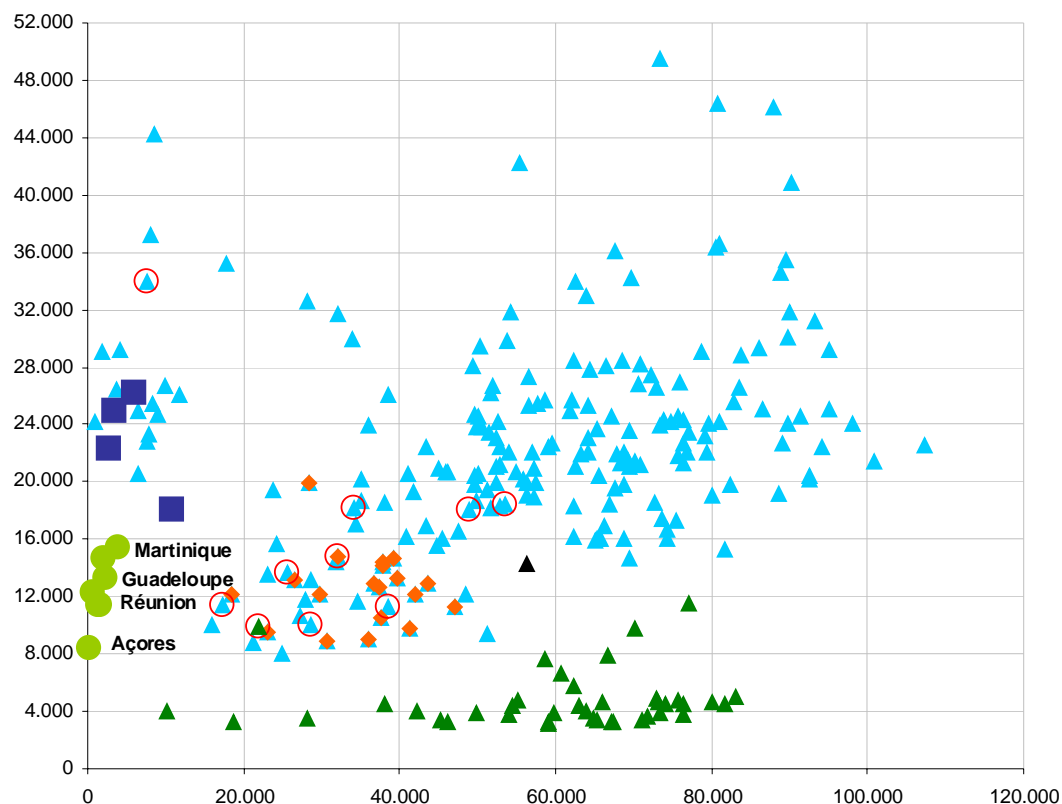


Figure 13 The Relationship between the Population at less than 500 km (*1000 inhabitants) and the Per Capita GDP (in euros/inhabitant/year) (2000)

	Population at less than 500 km	Per capita GDP
The Canary Islands	2,083	14,686.20
The Azores	241	8,337.90
Madeira	1,295	11,420.20
Guadeloupe	2,214	13,266.00
Martinique	3,815	15,403.70
Guiana	685	12,308.70
Reunion	1,716	11,417.20



The Relationship between Coastal Length and Surface Area of Regions and the Per Capita GDP

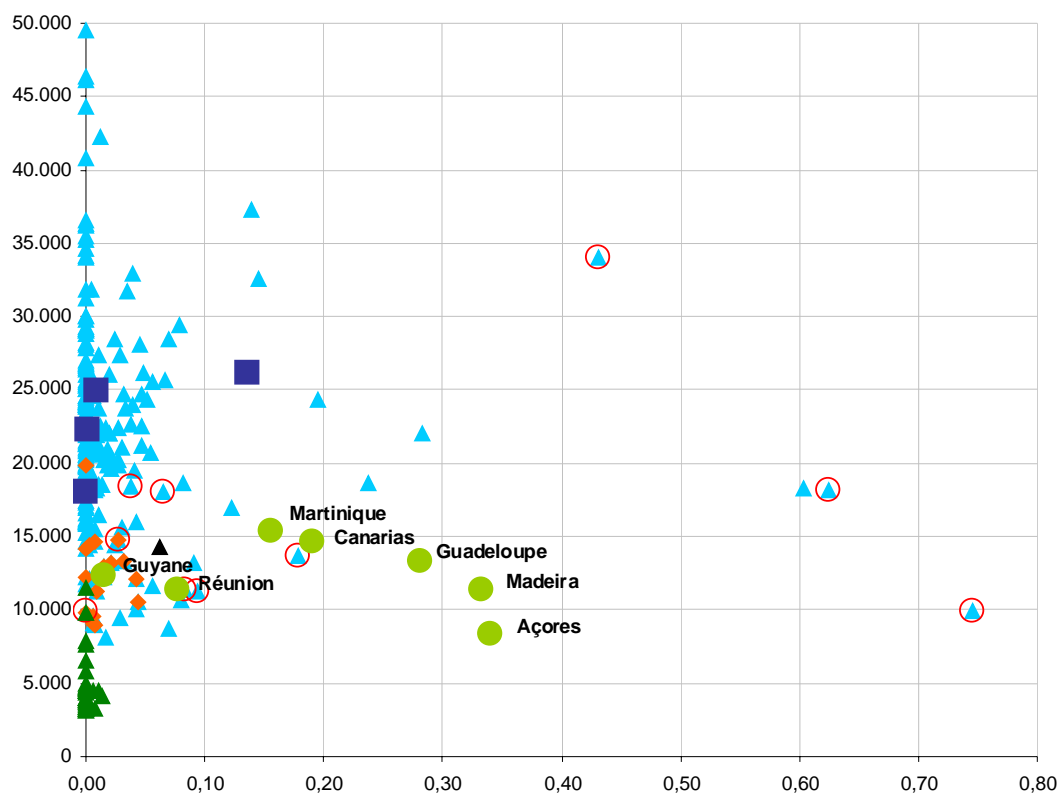


Figure 14 The Relationship between Coastal Length and Surface Area of Regions (in km/km²) and the Per Capita GDP (in euros/inhabitant/year) (2000)

	Coastal Length / Surface Area - Region	Per capita GDP
The Canary Islands	0,190	14,686.20
The Azores	0,340	8,337.90
Madeira	0,333	11,420.20
Guadeloupe	0,281	13,266.00
Martinique	0,156	15,403.70
Guiana	0,015	12,308.70
Reunion	0,077	11,417.20



The relationship between the Surface Area of a Region and the Surface Area of the Mother Country and the Per Capita GDP

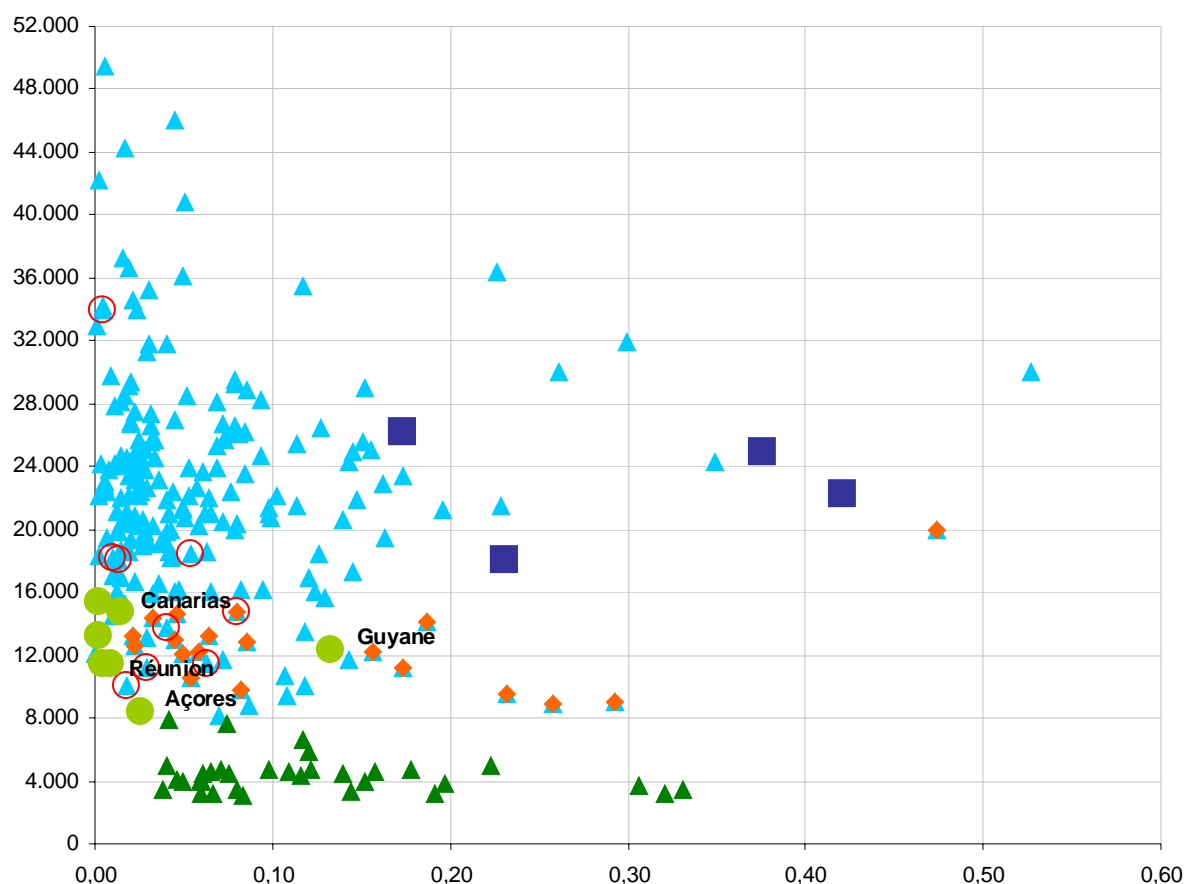


Figure 15 The relationship between the Surface Area of a Region and the Surface Area of the Mother Country and the Per Capita GDP (in euros/inhabitant/year) (2000)

	Surface Area of Region / Surface Area of Mother Country	Per capita GDP
The Canary Islands	0.014	14,686.20
The Azores	0.025	8,337.90
Madeira	0.008	11,420.20
Guadeloupe	0.003	13,266.00
Martinique	0.002	15,403.70
Guiana	0.133	12,308.70
Reunion	0.004	11,417.20



The Relationship between the CORINE Natural Surface Area/ the Total Surface Area and the Per Capita GDP

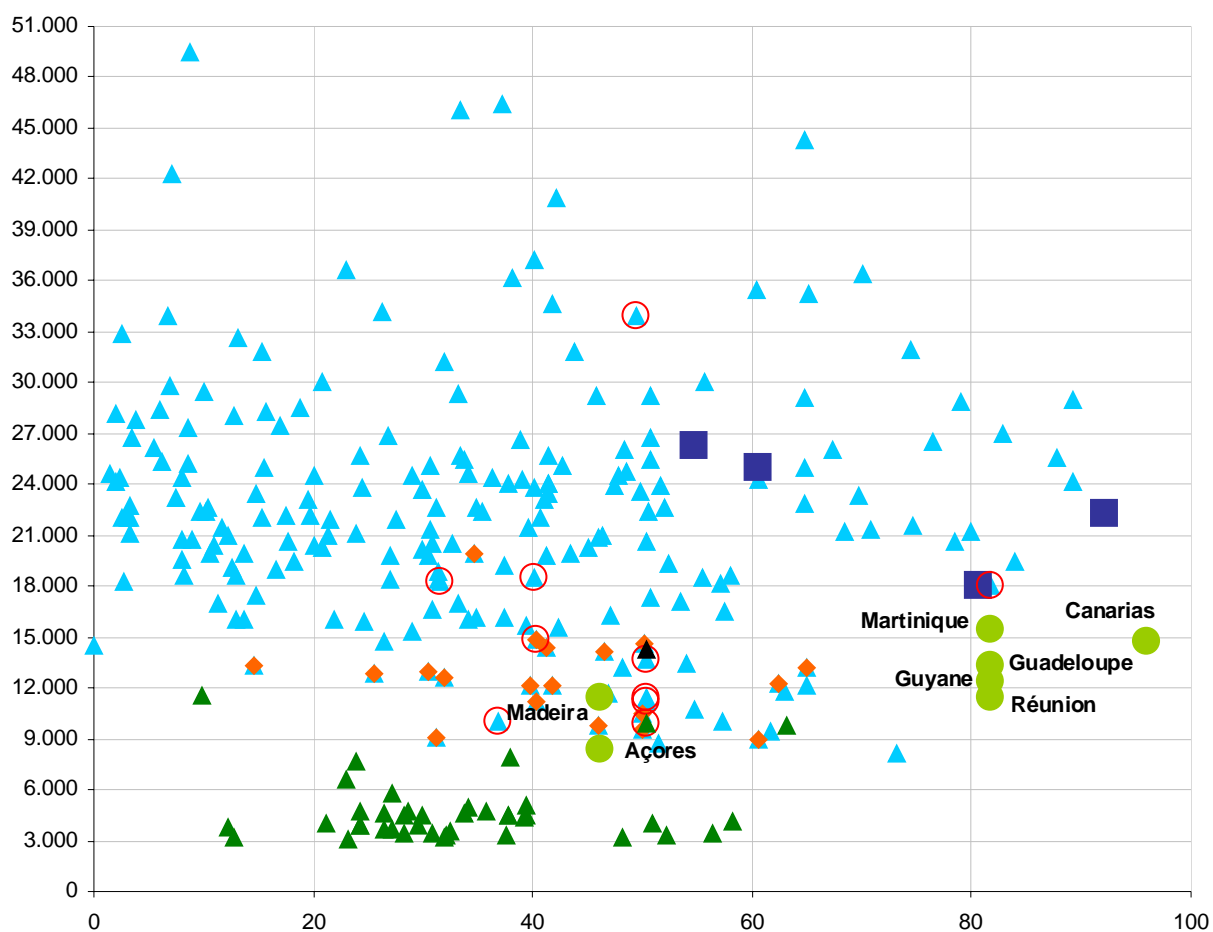


Figure 16 The Relationship between the CORINE Natural Surface Area/ the Total Surface Area and the Per Capita GDP (in euros/inhabitant/year) (2000)

	CORINE Natural Surface Area / Total Surface Area	Per capita GDP
The Canary Islands	96.000	14,686.20
The Azores	46.200	8,337.90
Madeira	46.200	11,420.20
Guadeloupe	81.799	13,266.00
Martinique	81.799	15,403.70
Guiana	81.799	12,308.70
Reunion	81.799	11,417.20



The Relationship between the CORINE Artificial Surface Area/Total Surface Area and the Per Capita GDP

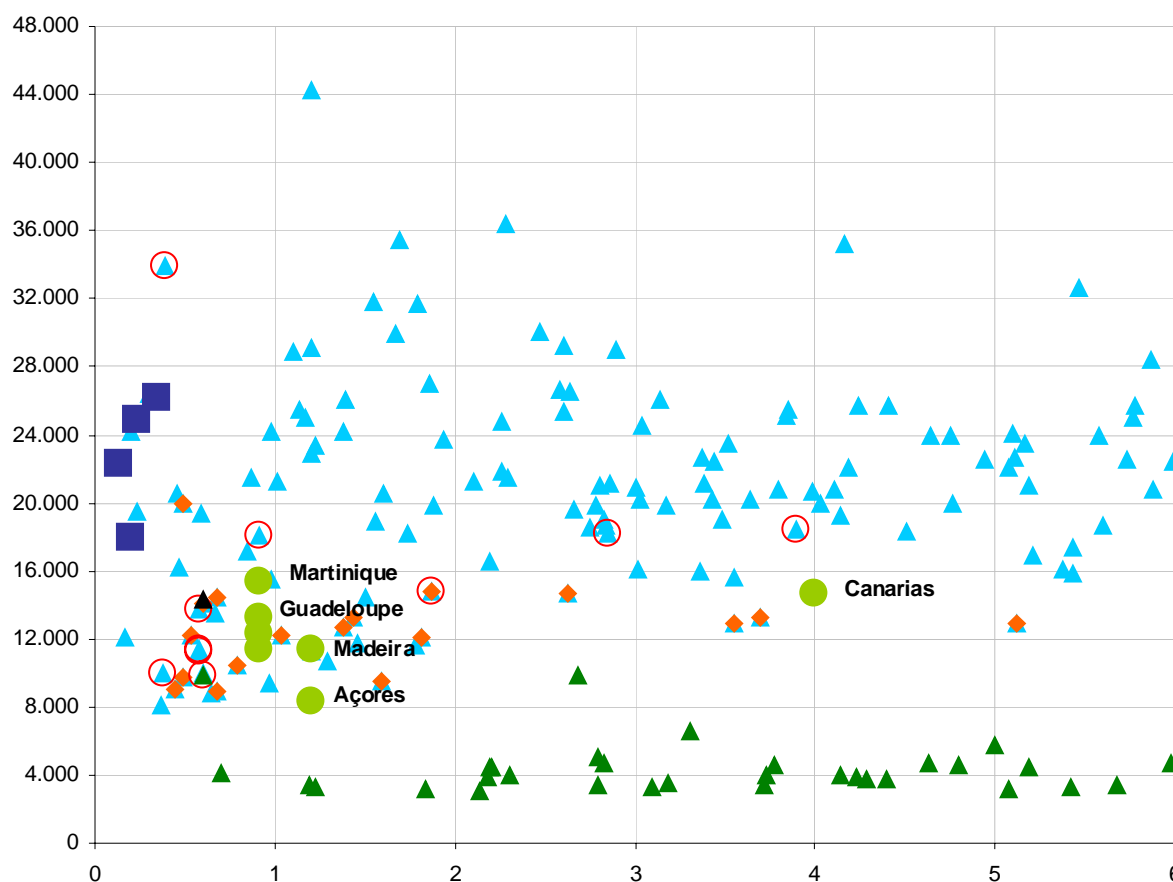


Figure 17 The Relationship between the CORINE Artificial Surface Area/Total Surface Area and the Per Capita GDP (in euros/inhabitant/year) (2000)

	CORINE Artificial Surface Area / Total Surface Area	Per capita GDP
The Canary Islands	3.997	14,686.20
The Azores	1.200	8,337.90
Madeira	1.200	11,420.20
Guadeloupe	0.908	13,266.00
Martinique	0.908	15,403.70
Guiana	0.908	12,308.70
Reunion	0.908	11,417.20



The Relationship between the Population over 65 and the Per Capita GDP

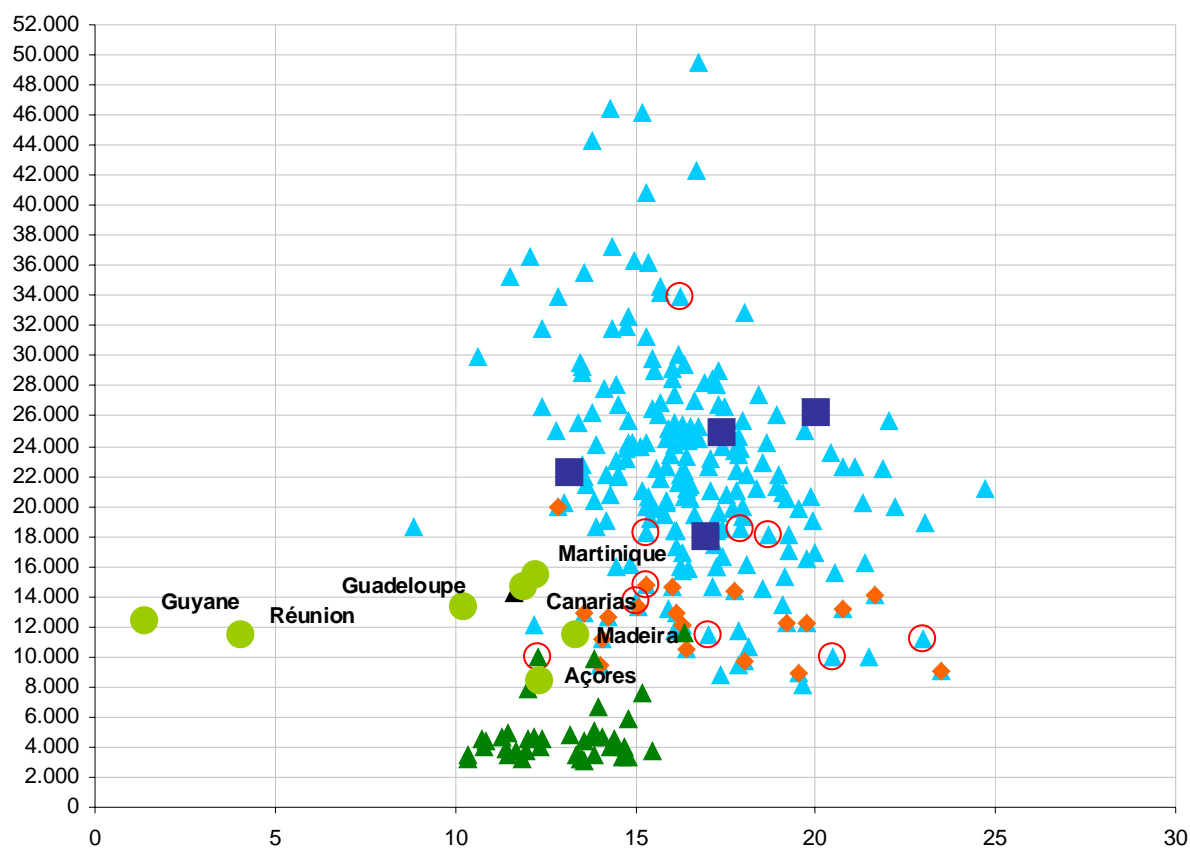


Figure 18 The Relationship between the Population over 65 (in %) and the Per Capita GDP (in euros/inhabitant/year) (2000)

	Population over 65	Per capita GDP
The Canary Islands	11,938	14,686.20
The Azores	12,343	8,337.90
Madeira	13,341	11,420.20
Guadeloupe	10,241	13,266.00
Martinique	12,225	15,403.70
Guiana	1,397	12,308.70
Reunion	4,076	11,417.20



The Relationship between the Number of Hospital Beds /100,000 inhabitants and the Per Capita GDP

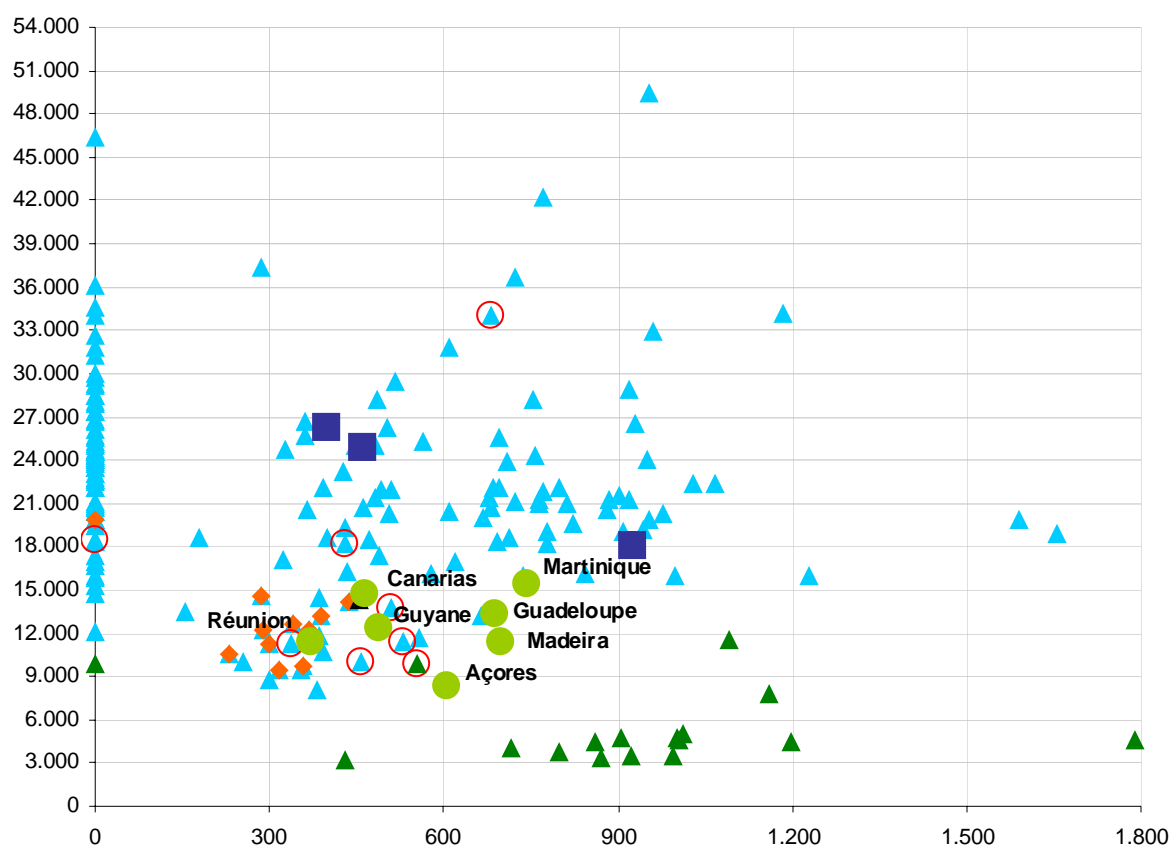


Figure 19 The Relationship between the Number of Hospital Beds /100,000 inhabitants and the Per Capita GDP (in euros/inhabitant/year) (2000)

	Nº of Hospital Beds / 100,000 Inhabitants	Per capita GDP
The Canary Islands	464.30	14,686.20
The Azores	606.20	8,337.90
Madeira	698.30	11,420.20
Guadeloupe	688.30	13,266.00
Martinique	742.70	15,403.70
Guiana	488.40	12,308.70
Reunion	370.90	11,417.20



The Relationship between the Active Population/Total Population and the Per Capita GDP

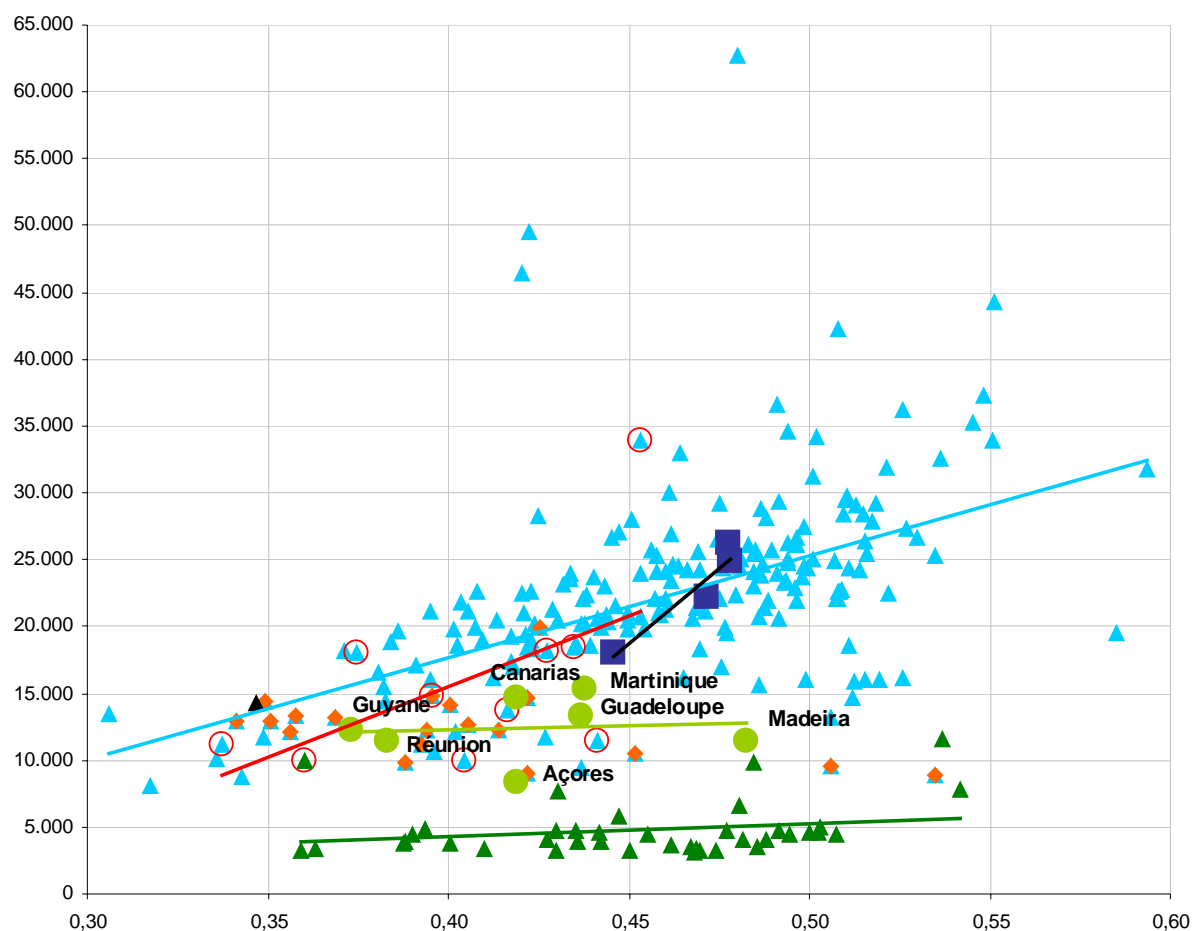


Figure 20 The Relationship between the Active Population/Total Population (1999) and the Per Capita GDP (in euros/inhabitant/year) (2000)

	Active Population / Total Population	Per capita GDP
The Canary Islands	0.42	14,686.20
The Azores	0.42	8,337.90
Madeira	0.48	11,420.20
Guadeloupe	0.44	13,266.00
Martinique	0.44	15,403.70
Guiana	0.37	12,308.70
Reunion	0.38	11,417.20



The Relationship between Commercial Airport Capacity and the per capita GDP

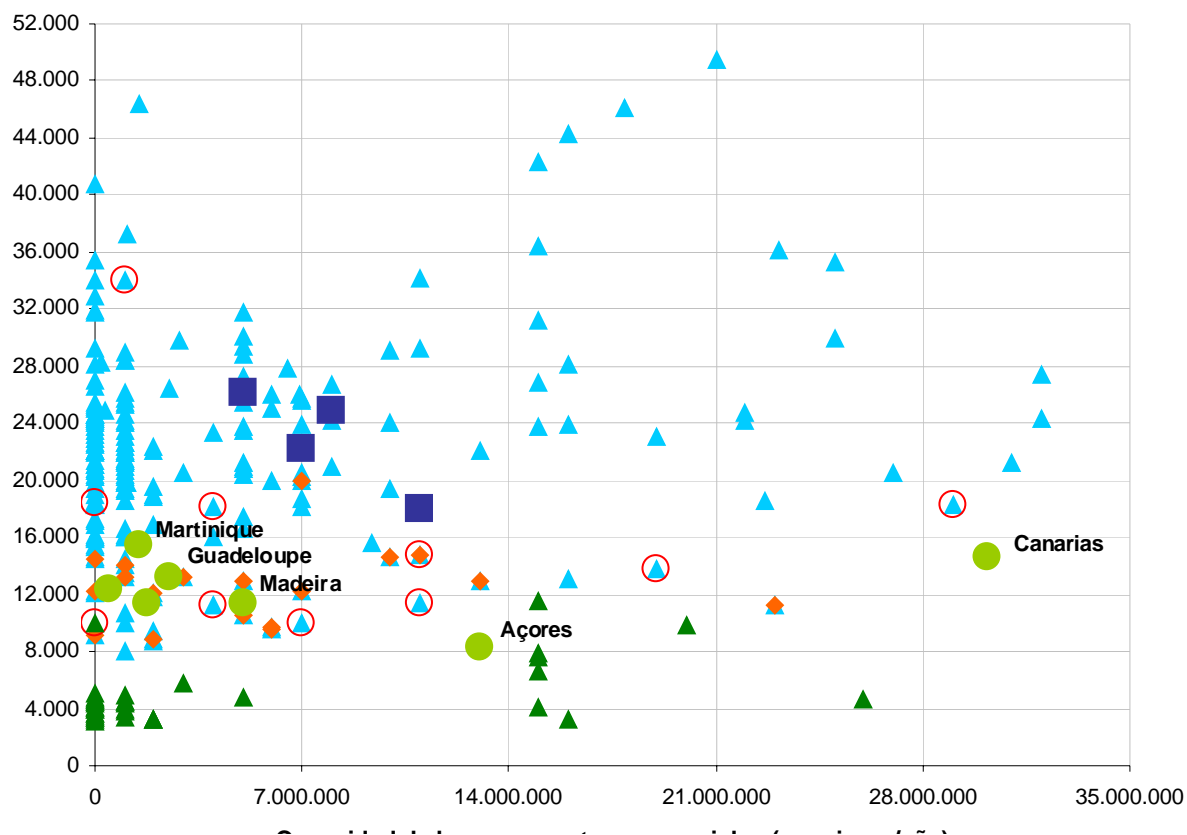


Figure 21 The Relationship between Commercial Airport Capacity (passengers/year) and the per capita GDP (in euros/inhabitant/year) (2000)

	Capacity of Commercial Airports	Per capita GDP
The Canary Islands	30,212,613	14,686.20
The Azores	13,000,000	8,337.90
Madeira	5,000,000	11,420.20
Guadeloupe	2,500,000	13,266.00
Martinique	1,500,000	15,403.70
Guiana	500,000	12,308.70
Reunion	1,750,000	11,417.20



7 MULTIVARIANT ANALYSIS

The multivariate analysis has two objectives;

- To identify the most significant socioeconomic and territorial indicators at the level of the regions' regional development, and their degree of relative dependency or independency (through the analysis of multiple regressions).
- To identify the groups of regions which are more statistically significant (through the analysis of clusters)

The aim of the exercise is to explore up what point the ultraperipheral regions constitute a typology of their own, if those indicators with a greater explanatory capacity at a level of regional development are taken as classification criteria.

7.1 THE CORRELATION BETWEEN INDICATORS (MULTIPLE REGRESSION)

7.1.1 The Relationship of the GDP with Territorial Determining Factors

The results obtained from the regressions made are summarised in the following table:

Territorial Determining Factor	Indicator Selected	Linear Correlation (R²)	Relation	Type of Relation
Distance	Multimodal accessibility	0.993	+	Potential: $GDP = \text{Multimodal accessibility}^{2.1613}$
Isolation	Population at 500 km in a straight line	0.986	+	Potential: $GDP = \text{Pop:500km}^{0.892}$
Fragmentation	Regional surface area / National surface area	0.860	+	Potential: $GDP = \text{Regional area/National area}^{(-2.722)}$
Situation	Probability of winter storms	0.095 (R ² is very low)	-	Linear:



Territorial Determining Factor	Indicator Selected	Linear Correlation (R^2)	Relation	Type of Relation
	and potential earthquake risk	but the average error is less than an equation without a constant)		$GDP = 22,116.513 - EARTHQUAKE * 442.631$
Resources	Artificial area with respect to the total regional area and the capacity of airports	0.542	+	Logarithmical: $GDP = 8677.386 * \ln(\text{artificial surface})$

Table 9 Results obtained from the regressions made. Source: Authors' Own.

Territorial Determining Factor	Selected Indicator	Correlation in a straight line (R^2)	Relation	Type of Relation	Graph
Distance	Multimodal accessibility	0.993	+	Potential: $GDP = \text{Multimodal accessibility}^{2.1613}$	
Isolation	Population at 500km in a straight line	0.986	+	Potential: $GDP = \text{Pop:500km}^{0.892}$	

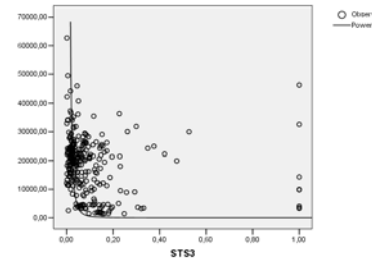
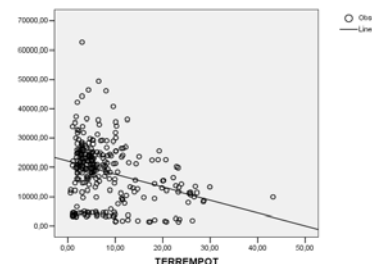
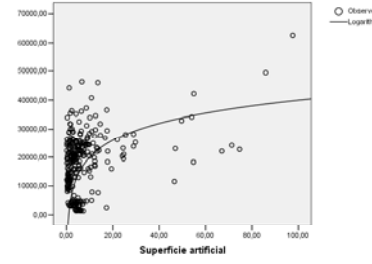
Territorial Determining Factor	Selected Indicator	Correlation in a straight line (R2)	Relation	Type of Relation	Graph
Fragmentation	Regional surface area / National surface area	0.860	+	Potential: $GDP = \text{Regional area/National area}^{-2.722}$	
Situation	Probability of winter storms and <u>potential earthquake risk</u>	0.095 (R2 is very low but the average error is less than an equation without a constant)	-	Linear: $GDP = 22,116.513 - \text{EARTHQUAKE} * 442.631$	
Resources	Artificial area with respect to the total regional area	0.542	+	Logarithmical: $GDP = 8677.386 * \ln(\text{artificial surface})$	

Table 10 Results obtained from the regressions made. Source: Authors' own.

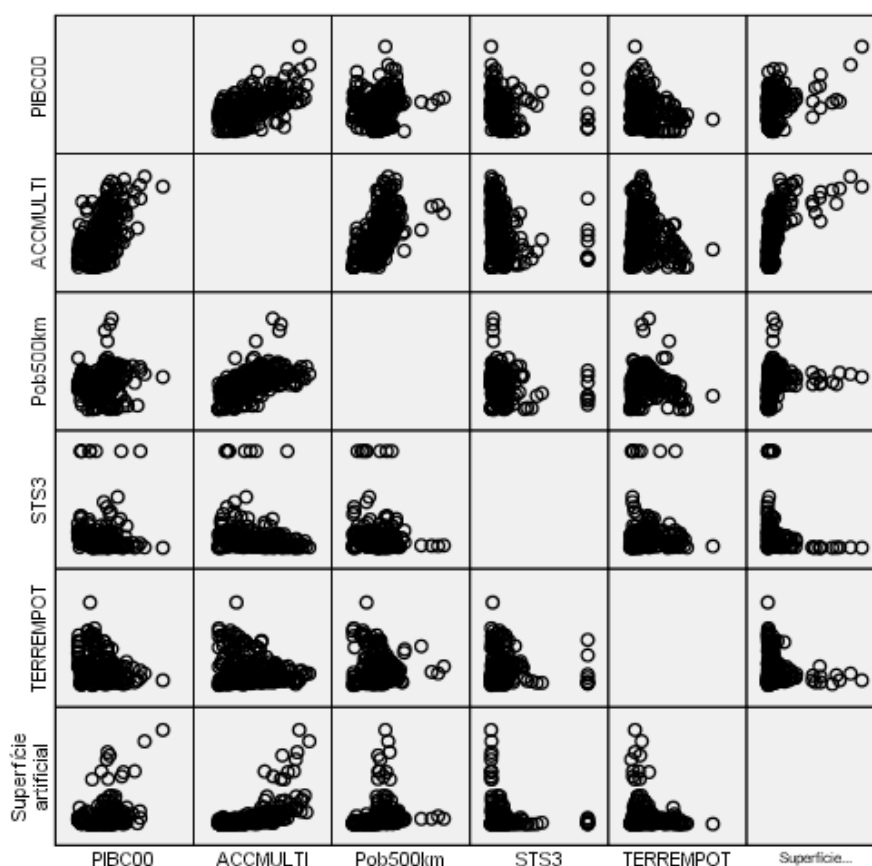
The results show that multimodal accessibility is the variable with greater linear relationship (positive), followed by the percentage of artificial surface area (positive), the threat of earthquakes (negative), the population at 500 km in a straight line (positive), and the regional/national surface areas (negative).

The population at 500 km in a straight line and the regional /national surface area has no lineal relationship with the threat of earthquakes, as was anticipated. The rest do however share some statistical relationships.

Correlations

		PIBC00	ACCMULTI	Pob500km	STS3	TERREMPOT	Superficie artificial
PIBC00	Pearson Correlation	1	,598**	,156**	-,157**	-,308**	,360**
	Sig. (2-tailed)		,000	,009	,009	,000	,000
	N	280	280	280	278	280	280
ACCMULTI	Pearson Correlation	,598**	1	,569**	-,221**	-,260**	,591**
	Sig. (2-tailed)	,000		,000	,000	,000	,000
	N	280	280	280	278	280	280
Pob500km	Pearson Correlation	,156**	,569**	1	-,175**	-,092	,193**
	Sig. (2-tailed)	,009	,000		,003	,125	,001
	N	280	280	280	278	280	280
STS3	Pearson Correlation	-,157**	-,221**	-,175**	1	,006	-,180**
	Sig. (2-tailed)	,009	,000	,003		,920	,003
	N	278	278	278	278	278	278
TERREMPOT	Pearson Correlation	-,308**	-,260**	-,092	,006	1	-,164**
	Sig. (2-tailed)	,000	,000	,125	,920		,006
	N	280	280	280	278	280	280
Superficie artificial	Pearson Correlation	,360**	,591**	,193**	-,180**	-,164**	1
	Sig. (2-tailed)	,000	,000	,001	,003	,006	
	N	280	280	280	278	280	280

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



Graph 1 Diagrams of dispersion between each one of the variables which best express the GDP and the GDP (2000).

If a lineal regression is made with all these variables the model with the highest correlation level (R2) has the following equation:



$$\text{GDP} = 258.045 * \text{Multimodal accessibility} - 0.089 * \text{Population at 500 km}$$

Model Summary^{d,e}

Model	R	R Square ^a	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,924 ^b	,853	,853	8107,78762	
2	,929 ^c	,863	,862	7854,58526	1,023

a. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

b. Predictors: ACCMULTI

c. Predictors: ACCMULTI, Pob500km

d. Dependent Variable: PIBC00

e. Linear Regression through the Origin

Coefficients^{a,b}

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	ACCMULTI	204,627	5,094	,924	40,167	,000	1,000	1,000
2	ACCMULTI	258,045	13,168	1,165	19,597	,000	,140	7,119
	Pob500km	-,089	,020	-,260	-4,376	,000	,140	7,119

a. Dependent Variable: PIBC00

b. Linear Regression through the Origin

It can therefore be affirmed that the variable which best expresses the GDP is that of potential multimodal accessibility.

7.1.2 The Relationship of GDP Variation with the Territorial Determining Factors

The results are summarised in the table below:

Territorial Determining Factor	Indicator Selected	Linear Correlation (R ²)	Relation	Type of relation	Graph
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Territorial Determining Factor	Indicator Selected	Linear Correlation (R ²)	Relation	Type of relation	Graph
Distance	Road access	0.546	+	Cubic: Variation of the GDP = $1.596 * ACC - 0.16 * ACC^2 + 4.06 * 10^{-5} * ACC^3$	
Isolation	Population at 1,000 km in a straight line	0.575	+	Cubic: GDP variation = $0.001 * Pop1000 - 5.8 * 10^{-9} * Pop1000^2 + 8.30 * 10^{-15} * Pop1000^3$	
Fragmentation	There is no significant linear relationship				
Situation	Minimum altitude with respect to the sea	0.057	-	Linear: GDP variation = $37.901 - 0.086 * Spotmin$	
Resources	Natural surface area with respect to the total regional surface area	0.040	-	Linear: GDP variation = $44.843 - 0.307 * Nat. area$	

Table 11 Results obtained from the regressions made. Source: Authors' own.

With respect to the GDP variation the minimum height above sea level – and the variable which has the greatest linear relationship (negative) with this, followed by the percentage



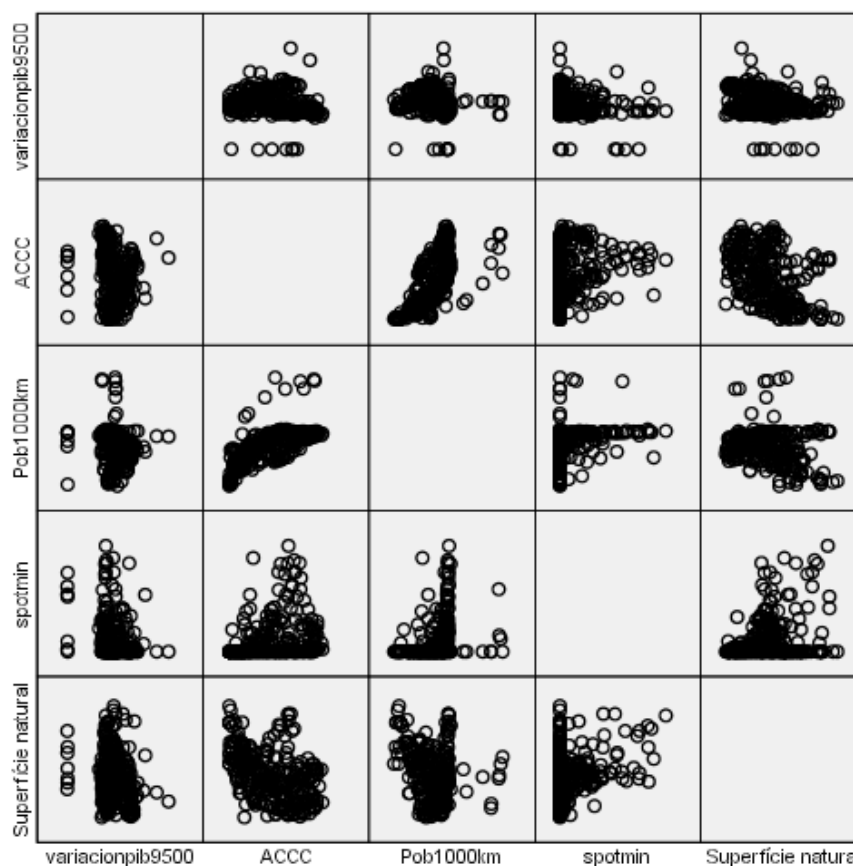
of natural surface area (negative), of the population at 1,000 km in a straight line (negative) and finally, the potential road accessibility (negative).

Correlations

		variacion pib9500	ACCC	Pob1000km	spotmin	Superficie natural
variacionpib9500	Pearson Correlation	1	-,146*	-,174**	-,238**	-,200**
	Sig. (2-tailed)		,014	,003	,000	,001
	N	280	280	280	280	280
ACCC	Pearson Correlation	-,146*	1	,672**	,283**	-,458**
	Sig. (2-tailed)	,014		,000	,000	,000
	N	280	280	280	280	280
Pob1000km	Pearson Correlation	-,174**	,672**	1	,340**	-,252**
	Sig. (2-tailed)	,003	,000		,000	,000
	N	280	280	280	280	280
spotmin	Pearson Correlation	-,238**	,283**	,340**	1	,263**
	Sig. (2-tailed)	,000	,000	,000		,000
	N	280	280	280	280	280
Superficie natural	Pearson Correlation	-,200**	-,458**	-,252**	,263**	1
	Sig. (2-tailed)	,001	,000	,000	,000	
	N	280	280	280	280	280

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

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



Graph 2 Diagrams of Dispersion between each one of the Variables which best express the Variation of the GDP and the Variation of the GDP 2000.



If a linear regression is made with all of these variables the model with the highest R^2 has the following equation:

$$\text{GDP variation} = 0.000135 * \text{Pop: 1000km} - 0.115 * \text{Minimum altitude} + 0.309 \text{ Natural surface area}$$

Although the B coefficient corresponds to the Population at 1,000 km it is the lowest of the three, the Beta coefficient - which indicates the relative importance of each variable independent in the equation of the regression - is the highest. We can therefore affirm that the indicator for population at 1,000 km in a straight line is that which best expresses the GDP variation.

Model Summary^{e,f}

Model	R	R Square ^a	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,611 ^b	,373	,371	37,11658	
2	,634 ^c	,402	,398	36,31486	
3	,660 ^d	,436	,429	35,34996	,760

a. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

b. Predictors: Pob1000km

c. Predictors: Pob1000km, spotmin

d. Predictors: Pob1000km, spotmin, Superficie natural

e. Dependent Variable: variacionpib9500

f. Linear Regression through the Origin

Coefficients^{a,b}

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	Pob1000km	,000	,000	,611	12,888	,000	1,000	1,000
2	Pob1000km	,000	,000	,728	12,933	,000	,679	1,472
	spotmin	-,093	,025	-,206	-3,668	,000	,679	1,472
3	Pob1000km	,000	,000	,545	7,689	,000	,405	2,469
	spotmin	-,115	,025	-,254	-4,537	,000	,649	1,541
	Superficie natural	,309	,076	,281	4,048	,000	,424	2,361

a. Dependent Variable: variacionpib9500

b. Linear Regression through the Origin



7.1.3 The Relationship of the GDP with Territorial and Economic Indicators

A combined group of territorial and socioeconomic indicators has been taken into consideration in order to explore their dependency or relative independence, and their capacity to explain the GDP.

- Dependent variable: GDP year 2000
- Independent variables:
 - Multimodal accessibility
 - Population at 500 km in a straight line
 - Length of coastline/Regional surface area
 - Average height in relation to the sea
 - Maximum height with respect to the general surface area
 - Capacity of commercial airports (passengers/year)
 - Cost of access to the capital of the mother country with respect to minimum wage
 - Accessible market at 500 km (10^6 euros)
 - Accessible market at 1000 km (10^6 euros)
 - Accessible market at 1500 km (10^6 euros)

The following table shows the linear relationships which exist between the dependent variable with all the independent variables as well as the relationships between the independent variables. The GDP has the highest significant linear relation with multimodal access, but is closely followed by the accessible market at 1,500 km, 1,000 km and 500 km, the minimum cost of access to the capital with respect to the minimum wage and the capacity of the airports.



Correlations

		Accesibilidad multimodal	Población a 500 km	Longitud de costa / Superficie regional	Altitud media	Altitud máxima / Superficie regional	Capacidad aeropuertos	Coste acceder a la capital/salario mínimo	Gdp (millones eur) a 500 km	Gdp (millones eur) a 1000 km	Gdp (millones eur) a 1500 km	PIB/capita 2000
Accesibilidad multimodal	Pearson Correlation Sig. (2-tailed)	1	,569**	-,081	-,191**	-,078	,290**	,522**	,635**	,577**	,550**	,598**
	Sum of Squares and Cross-products	301571,100	145239980,0	-1546,281	-531978,275	-3826,224	2,194E+010	123101,249	55823489,928	147122760,8	197255814,0	55328615
	Covariance	1080,900	520573,405	-5,542	-1920,499	-13,714	113087571,1	683,896	202994,509	531129,100	712114,852	198310,448
	N	280	280	280	278	280	195	181	276	278	278	280
Población a 500 km	Pearson Correlation Sig. (2-tailed)	,569**	1	-,081	,086	-,077	,004	,210**	,405**	,349**	,309**	,156**
	Sum of Squares and Cross-products	145239980,0	2,16E+011	-1309146,0	203332718	-3209962,5	2,833E+011	32364834,741	29973132302	75368786529	93877779907	1,22E+010
	Covariance	520573,405	775102254	-4692,280	734053,135	-11505,242	1460150385	179804,637	108993208,4	272089482,1	338908952,7	43688340
	N	280	280	280	280	280	195	181	276	278	278	280
Longitud de costa / Superficie regional	Pearson Correlation Sig. (2-tailed)	-,081	-,081	1	,054	,998**	-,044	-,042	-,041	-,040	-,044	-,031
	Sum of Squares and Cross-products	-1546,281	-1309146,0	1194,843	9454,656	3084,556	-251931487	-763,013	-228325,647	-648107,816	-992408,503	-179565,67
	Covariance	-5,542	-4692,280	4,283	34,132	11,056	-1298615,914	-4,239	-830,275	-2339,739	-3582,702	-643,605
	N	280	280	280	278	280	195	181	276	278	278	280
Altitud media	Pearson Correlation Sig. (2-tailed)	-,191**	,086	,054	1	,079	-,093	-,185*	-,115	-,098	-,107	-,012
	Sum of Squares and Cross-products	-531978,275	203332718	9454,656	25891948,5	36077,882	5,917E+010	-382244,829	-93937105,00	-232705788,5	-354766119,3	-10318830
	Covariance	-1920,499	734053,135	34,132	93472,738	130,245	-306604490	-2147,443	-342836,150	-843136,915	-1285384,490	-37252,095
	N	278	278	278	278	278	194	179	275	277	277	278
Altitud máxima / Superficie regional	Pearson Correlation Sig. (2-tailed)	-,078	-,077	,998**	,079	1	-,046	-,042	-,042	-,041	-,046	-,027
	Sum of Squares and Cross-products	-3826,224	-3209962,5	3084,556	36077,882	7998,729	-681585323	-2067,888	-599608,051	-1713814,116	-2671883,519	-399468,79
	Covariance	-13,714	-11505,242	11,056	130,245	28,669	-3513326,407	-11,488	-2180,393	-6187,055	-9645,789	-1431,788
	N	280	280	280	278	280	195	181	276	278	278	280
Capacidad aeropuertos	Pearson Correlation Sig. (2-tailed)	,290**	,004	-,044	-,093	-,046	1	,289**	,393**	,498**	,533**	,227**
	Sum of Squares and Cross-products	21938988789	2,83E+011	2,52E+008	5,917E+010	6,82E+008	2,693E+016	14143937770	9,660E+012	3,640E+013	5,459E+013	5,14E+012
	Covariance	113087571,1	1,46E+009	-1298615,9	-306604490	-3513326,4	1,388E+014	110499513,8	50842393585	1,896E+011	2,843E+011	2,65E+010
	N	195	195	195	194	195	195	129	191	193	193	195
Coste acceder a la capital/salario mínimo	Pearson Correlation Sig. (2-tailed)	,522**	,210**	-,042	-,185*	-,044	,289**	1	,347**	,311**	,274**	,308**
	Sum of Squares and Cross-products	123101,249	32364835	-763,013	-382244,829	-2067,888	1,414E+010	280379,150	12709501,853	37167921,036	50855301,974	21583200
	Covariance	683,896	179804,637	-4,239	-2147,443	-11,488	110499513,8	1557,662	71805,095	208808,545	285703,944	119906,667
	N	181	181	181	179	181	129	181	179	179	179	181
Gdp (millones eur) a 500 km	Pearson Correlation Sig. (2-tailed)	,635**	,405**	-,041	-,115	-,042	,393**	,347**	1	,921**	,862**	,484**
	Sum of Squares and Cross-products	55823489,928	3,00E+010	-228325,65	-93937105,0	-599608,05	9,660E+012	12709501,853	25859014027	68787266230	90469617521	1,30E+010
	Covariance	202994,509	108993208	-830,275	-342836,150	-2180,393	5,084E+010	71805,095	94032778,279	250135513,6	328980427,3	47228539
	N	276	276	276	275	276	191	178	276	276	276	276
Gdp (millones eur) a 1000 km	Pearson Correlation Sig. (2-tailed)	,577**	,349**	-,040	-,098	-,041	,498**	,311**	,921**	1	,980**	,480**
	Sum of Squares and Cross-products	147122760,8	7,54E+010	-648107,82	-232705789	-1713814,1	3,640E+013	37167921,036	68787266230	2,164E+011	2,980E+011	3,73E+010
	Covariance	531129,100	272089482	-2339,739	-843136,915	-6187,055	1,896E+011	208808,545	250135513,6	781173383,0	1075946815	134729354
	N	278	278	278	277	278	193	179	276	278	278	278
Gdp (millones eur) a 1500 km	Pearson Correlation Sig. (2-tailed)	,550**	,309**	-,044	-,107	-,046	,533**	,274**	,862**	,980**	1	,498**
	Sum of Squares and Cross-products	197255814,0	9,39E+010	-992408,50	-354766119	-2671883,5	5,459E+013	50855301,974	90469617521	2,980E+011	4,272E+011	5,44E+010
	Covariance	712114,852	338908953	-3582,702	-1285384,49	-9645,789	2,843E+011	285703,944	328980427,3	1075946815	1542369260	196276193
	N	278	278	278	277	278	193	179	276	278	278	278
PIB/capita 2000	Pearson Correlation Sig. (2-tailed)	,598**	,156**	-,031	-,012	-,027	,227**	,308**	,484**	,480**	,498**	1
	Sum of Squares and Cross-products	55328614,865	1,22E+010	-179565,67	-10318830,2	-399468,79	5,140E+012	21583200,059	12987848089	37320031044	54368505377	2,83E+010
	Covariance	198310,448	43688340	-643,605	-37252,095	-1431,788	2,649E+010	119906,667	47228538,505	134729353,9	196276192,7	101603628
	N	280	280	280	278	280	195	181	276	278	278	280

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

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

Table 12 The Linear Relationships which exist between the Variable Dependent with all the Independent Variables and the Relationships between the Independent Variables. Source: Authors' own.

With respect to the degree of independence among the independent variables, multimodal accessibility has a high linear relationship with the variables of the accessible market, with the population at 500 km in a straight line, with the capacity of the airports and with the average height above sea level. The same occurs in relation to the population at 500 km in a straight line, with the exception that it has no linear relationship with the capacity of the airports. The length of the coast with respect to the regional surface area has the greatest linear relationship to the maximum height with respect to regional surface area, and has no linear relation with the rest of the independent variables.



Taking these correlations into account, and with the intention of establishing a linear regression among all the variables, the results which are obtained are as follows: the model has a coefficient of determination (0.946) which relates the GDP to all the independent variables which have been considered.

Model Summary^{c,d}

Model	R	R Square ^a	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,946 ^b	,895	,885	6975,01683	1,417

- a. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.
- b. Predictors: Gdp (millones eur) a 1500 km, Longitud de costa / Superficie regional, Altitud media, Coste acceder a la capital/salario mínimo, Capacidad aeropuertos, Población a 500 km, Gdp (millones eur) a 500 km, Accesibilidad multimodal, Gdp (millones eur) a 1000 km, Altitud máxima / Superficie regional
- c. Dependent Variable: PIB/capita 2000
- d. Linear Regression through the Origin

According to the table below, the independent variable which has greater influence in the value of the GDP (with the highest Beta) is that of multimodal accessibility, followed by the accessible market at 1,500 km and 1,000 km, the maximum altitude with respect to regional surface area, the length of the coastline with respect to the regional surface area, and the population at 500 km in a straight line.

Coefficients^{a,b}

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	Accesibilidad multimodal	201,227	27,451	,895	7,330	,000	,061	16,389
	Población a 500 km	-,074	,036	-,195	-2,030	,045	,099	10,114
	Longitud de costa / Superficie regional	-1544,291	4268,645	-,231	-,362	,718	,002	449,638
	Altitud media	4,580	2,477	,086	1,849	,067	,423	2,366
	Altitud máxima / Superficie regional	629,194	1655,319	,244	,380	,705	,002	453,755
	Capacidad aeropuertos	-8,2E-005	,000	-,053	-1,219	,225	,478	2,094
	Coste acceder a la capital/salario mínimo	-11,625	20,329	-,024	-,572	,569	,528	1,893
	Gdp (millones eur) a 500 km	,333	,390	,117	,854	,395	,049	20,519
	Gdp (millones eur) a 1000 km	-,340	,222	-,394	-1,530	,129	,014	72,890
	Gdp (millones eur) a 1500 km	,288	,098	,540	2,939	,004	,027	37,205

- a. Dependent Variable: PIB/capita 2000
- b. Linear Regression through the Origin



7.2 REGIONAL GROUPING (CLUSTER ANALYSIS)

The objective of the cluster analysis made is to explore the distinct regional groups which would define some indicators as criteria of classification. In order to attain an overall view of the problem, both the distinct groups of indicators (the most explanatory of the regional variations of the GDP, or those which intuitively appear more directly related to ultraperipherality), and pre-established groups in groups of various sizes. In order to define the groups, the cluster method basically consists of the definition of an optimal indicator (the combination of all the indicators proposed by the analyst) and maximises the distances between the averages of the groups, and minimises the distances between the average of each group and the regions which the group consists of.

7.2.1 Grouping using the most Explanatory GDP Territorial Indicators

The indicators which have been considered for a primary analysis are those territorial indicators which have been proven to statistically improve the definition of GDP:

- Global Accessibility Index
- Population at less than 500 km
- Length of coastline/ Regional surface area
- Average height above sea level
- Capacity of commercial airports

5 groups are established. These groups are shown in the table below. The Canary Islands form part of Group 4, the Azores from Group 1, Madeira form Group 3 and the French ultraperipheral regions form Group 3.

Final Cluster Centers

	Cluster				
	1	2	3	4	5
IAG	1344,71	961,21	1379,67	1475,71	970,33
Población a 500 km	45252,24	78699,20	52571,35	42029,56	69502,15
Longitud de costa / Superficie regional	,02	,00	,29	,05	,05
Altitud media	289,90	70,39	314,79	311,79	218,84
capacidad aeropuertos	1E+007	7E+007	2835045	3E+007	5E+007



Number of Cases in each Cluster

Cluster	1	32,000
	2	2,000
	3	138,000
	4	17,000
	5	5,000
Valid		194,000
Missing		86,000

7.2.2 Grouping incorporating Socioeconomic Indicators

The analysis was then carried out incorporating several socioeconomic indicators which were theoretically relevant in order to define ultraperipherality. In this case the decision was taken to establish 2 groups.

The results are shown below:

Final Cluster Centers

	Cluster	
	1	2
Población a 500 km	53114,69	48902,29
Longitud de costa / Superficie regional	,06	,36
Altitud media	296,00	288,06
Accesibilidad multimodal	105,40	82,40
Altitud máxima / Superficie regional	,24	1,05
Capacidad aeropuertos	3E+007	4245204
Gdp (millones eur) a 500 km	7109,51	3908,24
Gdp (millones eur) a 1000 km	25790,66	12732,94
Gdp (millones eur) a 1500 km	45024,46	21720,05
PIB/capita 2000	23234,82	17408,50
Coste acceder a la capital/salario mínimo	34,71	19,95

The ultraperipheral regions belong to Group 2, with the exception of the Canary Islands which belong to Group 1.

Repeating the exercise without the variable of the minimum access cost to the capital in relation to minimum wages, the results were similar.



Final Cluster Centers

	Cluster	
	1	2
Población a 500 km	53689,18	51102,77
Longitud de costa / Superficie regional	,05	,24
Altitud media	276,29	309,70
Accesibilidad multimodal	103,37	86,50
Altitud máxima / Superficie regional	,17	,73
Capacidad aeropuertos	3E+007	4793592
Gdp (millones eur) a 500 km	13175,33	5630,31
Gdp (millones eur) a 1000 km	45999,38	16075,31
Gdp (millones eur) a 1500 km	72663,22	25912,39
PIB/capita 2000	23711,63	19182,30

Number of Cases in each Cluster

Cluster	1	24,000
	2	167,000
Valid		191,000
Missing		89,000

Carrying out the same exercise, but with three groups, the Canary Islands became part of the second group together with the Azores. The rest of ultraperipheral regions were transferred to Group 3 together with other insular regions, with the exception of the Balearic Islands which formed part of Group 2. With respect to the peripheral Nordic regions, all formed part of Group 3.

**Final Cluster Centers**

	Cluster		
	1	2	3
Población a 500 km	72129,88	49046,85	51041,23
Longitud de costa / Superficie regional	,04	,03	,27
Altitud media	176,42	284,43	316,95
Accesibilidad multimodal	136,57	102,31	82,89
Altitud máxima / Superficie regional	,13	,19	,81
Capacidad aeropuertos	5E+007	2E+007	3364662
Gdp (millones eur) a 500 km	29835,92	9877,98	4640,36
Gdp (millones eur) a 1000 km	111054,97	25669,05	14023,28
Gdp (millones eur) a 1500 km	166043,44	40186,91	23279,37
PIB/capita 2000	29309,50	21273,02	18913,30

7.2.3 Grouping using Fixed Indicators with Expert Criteria

A subgroup of both territorial and socioeconomic indicators has been defined below, in theory, it was considered that these indicators would adequately characterise regional development.

The indicators which were taken into account for this exercise were as follows:

- Global Accessibility Index (GAI)
- Length of coastline / Regional Surface Area
- Regional Surface Area / National Surface Area
- Maximum Altitude/ Regional Surface Area
- Accessible Market at 500 km
- GDP (standardised by the median of EU29=100)
- Active population / GDP
- Population density

7 groups were established. The results show that 5 of the 7 ultraperipheral regions (the Azores, Guadeloupe, Martinique, Guiana and Reunion) are grouped together (in Group 1) as regions characterised by a low Global Accessibility Index, with a high length of coastline with respect to the regional surface area, with uneven terrain, a reduced accessible market at 500 km, and a GDP below that of the median of the EU29 regions, as well as a small active population in relation to GDP. The Canary Islands and Madeira form part of another group (Group 5), which is formed by 60% of the EU29 regions, the peripheral Nordic regions and other insular regions.



Final Cluster Centers

	Cluster									
	1	2	3	4	5	6	7	8	9	10
IAG	7268,57	829,97	893,41	768,81	1331,39	770,97	782,38	909,49	879,14	927,69
Longitud de costa / Superficie regional	,11	,01	,02	,00	,25	,00	,00	,00	,00	,01
STS3	,03	,07	,04	,04	,13	,02	,01	,02	,05	,07
Altitud máxima / Superficie regional	,54	,10	,19	,12	,75	,10	,07	,02	,13	,15
PIB (EU29=100)	53,80	111,04	174,30	149,25	62,48	136,15	124,20	162,00	110,00	104,15
Població activa / PIB	,01	,05	,04	,06	,12	,06	,08	,15	,11	,04
Densidad de población	,16	,72	3,46	,30	,36	,54	1,00	,91	,43	,47
Gdp (millones eur) a 500 km	4,62	17046,60	28369,91	50210,74	1267,02	46491,28	58515,34	68676,18	37302,72	7521,19

Territorial and socioeconomic indicators were added in order to attempt to distinguish the ultraperipheral regions from the other regions in a group of their own. The indicators which facilitate this type of grouping should logically be those which best characterise the ultraperipheral regions.

The indicators considered in these cases were the following:

- Distance to the European Continent (Maastricht) (in km)
- Distance to the capital of the mother country (in km)
- Length of coastline / Regional Surface Area
- Regional Surface Area / National Surface Area
- Maximum Altitude/ Regional Surface Area
- Population density
- Employees in the agricultural sector/ Total number of employees (in %)
- Employees in services / Total employees (in %)
- Population with higher education (%)
- Unemployment

The grouping exercise with 5 established groups gave the result that the Canary Islands, the Azores and Madeira form Group 2, Guadalupe, Martinique and Guiana, Group 3, and Reunion forms Group 4 on its own. The other insular regions and the peripheral Nordic regions formed part of Group 5, while other European regions were included in Group 1. This conclusion has a character which is merely exploration, of relative distances between the regions using the socioeconomic indicators established, and it cannot be affirmed that results would be necessarily identical if other indicators with other methods of regional discrimination which may be available in the future were to be used.



Final Cluster Centers

	Cluster				
	1	2	3	4	5
Disteu_km	520,12	3448,67	7453,67	9606,00	1510,27
Distcapital	252,56	1833,33	7050,00	9400,00	226,18
Longitud de costa / Superficie regional	,02	,39	,15	,08	,40
STS3	,08	,02	,05	,00	,16
Altitud máxima / Superficie regional	,16	2,31	,53	1,08	1,11
Densidad de población	,46	,37	,18	,25	,43
Empleados en servicios/Empleados total	66,06	61,60	78,18	79,31	57,77
Empleados en agricultura/Empleados total	66,06	61,60	78,18	79,31	57,77
Porcentaje de población con educación superior	21,58	11,24	26,25	26,25	19,25
Desempleo	6,91	6,03	25,27	33,30	10,96



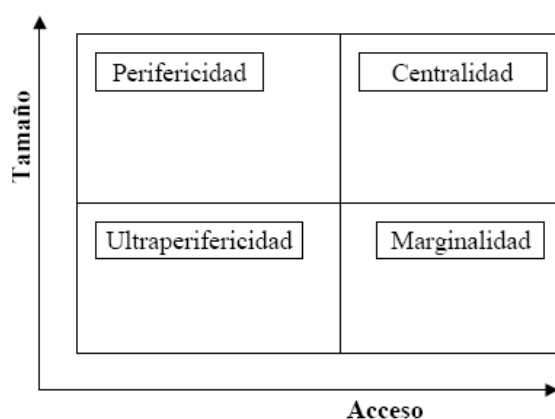
8 THE DEFINITION OF AGGREGATED AND COMPOUND INDICATORS

The characterisation of the problems and opportunities of regional development demand the consideration, in an accumulative manner, of all the territorial and socioeconomic factors which simultaneously effect in an interrelated manner, their patterns of regional development. The hypothesis used in this exercise is that a compound indicator with these characteristics should reveal the singular and specific nature of the U.P.R.'s.

8.1 EXPLANATORY MODELS OF ULTRAPERIPHERALITY

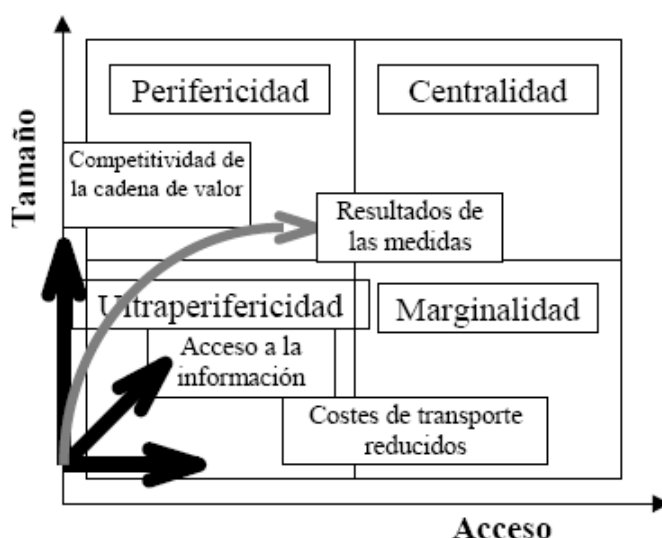
8.1.1 The Model developed by the University of the Azores

The model developed in the University of the Azores by M. Fortuna is especially interesting in the context of research due to its focus on the conceptualisation of ultraperipherality. The model is based on two factors, *size* and *access*, in order to explain the situation of each region. From this perspective ultraperipherality would be an economic and social problem associated to a geographical structure which is characterised by two elements: size and distance. Reduced size implies that the valuable but scarce resources of such regions can only be fully taken advantage of by the utilisation of external markets. The consequences of this would be the lack of space and useable land, the reduced size of the local market, the difficulty of the mobilisation of risk capital, the scarcity of a specialised workforce, and the lack of economies of scale in the provision of normalised public services.





The model of analysis proposed expresses product and accessibility in terms of competitiveness and the production of transport costs respectively. Competitiveness can be evaluated by observing the *volume* and *profitability* of production, and can be explained by the independent operation of the economy and by the effect of *political intervention*. Accessibility can be examined by attending to the traffic and transport costs, and can be explained by the independent operation of the economy and by transport policies. An appropriate “management of ultraperipherality” would be represented as follows:



8.1.2 Explanatory Models adopted to define Aggregated Indicators

The objective of the conceptual model used in order to carry out the aggregation of partial indicators is not to establish causalities among the distinct concepts with the objective of constructing a mathematical model of regional macro-economic simulation, but to formulate the most complete vision possible of the distinct territorial and economic elements which effect the development opportunities and problems of the distinct European regions.

The territorial determining factors would refer basically to geographical aspects and natural and human resources as basic conditions for economic activities.

TERRITORIAL DETERMINING FACTORS (Application for ultraperipheral regions)				
LOCATION	ACCESSIBILITY	SURROUNDINGS	INTEGRATION	RESOURCES



Oceanic	Remote	Isolated	Fragmented	Scarce
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Economic conditions would refer basically to aspects relative to economic activities themselves, production, sectorial specialisation, and long-term stability, the efficiency of the markets and public investments, and the level of external dependence.

ECONOMIC DETERMINING FACTORS (Application for ultraperipheral regions)				
INCOME	SPECIALISATION	STABILITY	EFFICIENCY	INTERDEPENDENCE
Medium-low	Monocultivation	Seasonal and unstable	Structural inefficiencies	Exterior dependence

The process for defining the aggregated and compound indicators has been carried out as follows:

- Partial indicators have been selected for each conditioning factor in the conceptual scheme shown
- The partial territorial indicators have been integrated in an aggregated territorial indicator as the sum of normalised relative values.
- The more explanatory economic indicators have been integrated into an aggregated economic indicator as a sum of relative normalised values.
- The aggregated indicators have been integrated into a compound indicator as a product of the territorial and economic aggregated indicators.

This approach is based on the criteria which have been considered to be the most suitable to the objectives of the research (*to characterise the ultraperipheral regions among all the European regions*, rather than emphasise which development policies would be necessary for them, or forecast their potential impact). For this reason:

- The partial indicators must be the most explanatory with regard to the particular characteristics of the distinct European regions.
- The partial indicators should be as independent as possible among each another in order to avoid redundancies in the information they contain.



- The formulation of the aggregated and compound indicators must be as simple as possible, avoiding parameters and weightings which are unjustifiable in practice.

This approach has several limitations which must be considered when analysing the results obtained:

- Territorial and macroeconomic indicators are used. Microeconomic, social and institutional indicators do not exist at a regional level.
- Time series which allow the exploration of developments do not exist. Regions which at a certain time may have coinciding values for aggregated indicators could have had distinct past developments and future inertias.

8.2 AGGREGATED AND COMPOUND INDICATORS

The following proposal of partial territorial indicators resulted from the explanatory capacity of the GDP and the relative independence of the indicators:

Territorial Determining Factors	Indicators
LOCATION	Maximum height /Regional surface area
DISTANCE	Multimodal accessibility
SURROUNDINGS	Access to market
INTEGRATION	Population at 500 km (in a straight line)
RESOURCES	Length/Regional surface area Airport capacity Artificial surface area

The following proposal of partial territorial and economic indicators resulted from the cluster analysis of the indicators:

Territorial Conditioning Factors	Indicators
LOCATION	Maximum height /Regional surface area
DISTANCE	Regional surface area / National surface area
SURROUNDINGS	Population density
INTEGRATION	
RESOURCES	



Socioeconomic Conditioning Factors	Indicators
INCOME	Employees in services / Total employees (in %)
SPECIALISATION	
STABILITY	Unemployment
EFFICIENCY	Employees in the agricultural sector / Total employees (in %)
INTERDEPENDENCE	Population with higher education (%)

Finally the following proposal of partial indicators was adopted:

TERRITORIAL DETERMINING FACTORS				
LOCATION	ACCESSIBILITY	SURROUNDINGS	INTEGRATION	RESOURCES
Potential earthquake threat	Distance to the national capital	Population (or market) at less than 1.000 km	Coastal length /Regional surface area	Artificial surface area

ECONOMIC DETERMINING FACTORS				
INCOME	SPECIALISATION	STABILITY	EFFICIENCY	INTERDEPENDENCE
GDP/capita	Employees in services/ Total employees	Unemployment ratio	Density of airport infrastructures	Personnel in R+D

	Amenaza potencial regional de terremotos	Distancia a la capital del estado (en km)	Población a menos de 1.000 km (en 1.000 habitantes)	Longitud de costa / Superficie región (km/km2)	Superficie artificial CORINE
CONDICIONANTES TERRITORIALES					
Ultraperipheral Regions	2.05	13.37	0.09	1.25	0.33
Periferic regions in Nordic countries	0.32	0.57	0.15	0.23	0.36
Other EU 15 regions Not Objective1	1.02	0.69	1.03	1.19	2.35
Other EU15 regions Objective1	1.22	0.72	0.58	0.11	1.02
Other EU10 regions Objective1	0.74	0.42	1.09	0.01	1.72
Non ultraperipheral EU islands	1.91	1.19	0.80	1.43	0.00
Ultraperipheral Regions	1.73	12.96	1.00	1.24	2.02
Periferic regions in Nordic countries	0.00	0.15	0.94	0.22	2.00
Other EU 15 regions Not Objective1	0.69	0.28	0.06	1.19	0.00
Other EU15 regions Objective1	0.90	0.31	0.51	0.11	1.33
Other EU10 regions Objective1	0.42	0.00	0.00	0.00	0.64
Non ultraperipheral EU islands	1.59	0.77	0.29	1.42	2.35

	Empleados en hoteles y restaurantes / Empleados totales (2002)	Ratio de desempleo 2001	PIB per cápita 2000	Densidad de aeropuertos	Deficit en personal I+D (2002)
CONDICIONANTES ECONOMICOS					
Ultraperipheral Regions	2.10	2.18	0.64	3.07	0.38
Periferic regions in Nordic countries	0.75	1.21	1.17	0.83	1.74
Other EU 15 regions Not Objective1	1.05	0.84	1.15	1.10	1.09
Other EU15 regions Objective1	1.16	1.56	0.74	0.78	0.72
Other EU10 regions Objective1	0.64	1.62	0.24	0.36	0.56
Non ultraperipheral EU islands	2.70	0.97	0.82	3.83	0.30
Ultraperipheral Regions	1.46	1.34	0.54	2.70	1.36
Periferic regions in Nordic countries	0.11	0.37	0.00	0.46	0.00
Other EU 15 regions Not Objective1	0.41	0.00	0.02	0.74	0.64
Other EU15 regions Objective1	0.53	0.72	0.44	0.42	1.02
Other EU10 regions Objective1	0.00	0.78	0.93	0.00	1.17
Non ultraperipheral EU islands	2.06	0.12	0.35	3.47	1.44

Figure 22 Partial Results of the Normalised Aggregated Indicators

8.2.1 Results

The main results are shown in the graphs below. The first shows the average values obtained for the regional typologies adopted in the research.

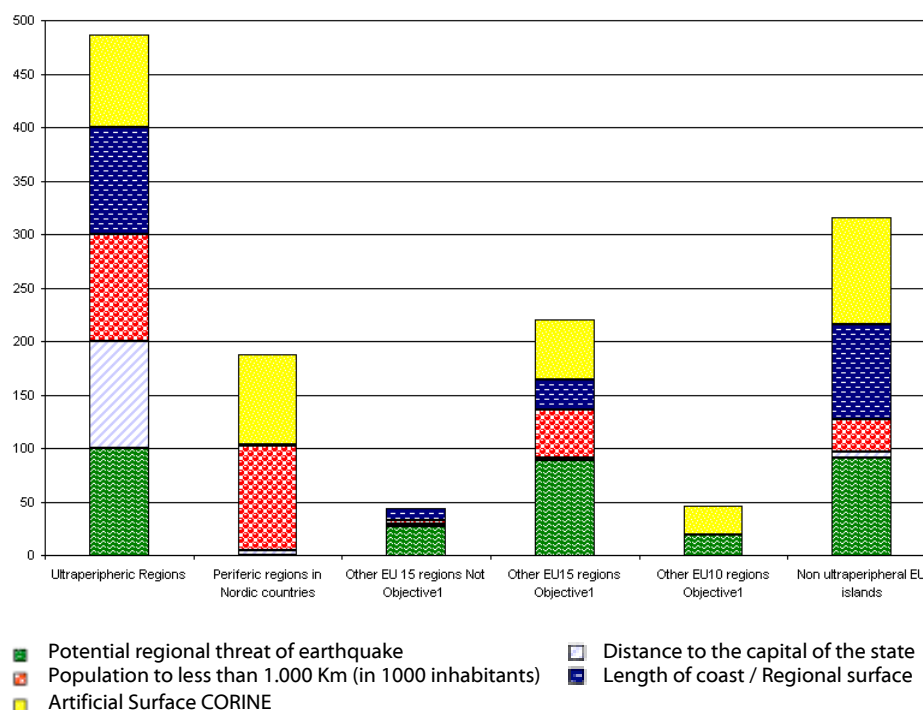


Figure 23 Average Values obtained for the Typologies adopted in the Research. The values of the indicators for *artificial surface area and population at less than 1,000 km* have been inverted in order to reflect the relative deficit among the regions. Source: Authors' own



A second graph shows the results for the aggregated indicator of economic conditioning factors:

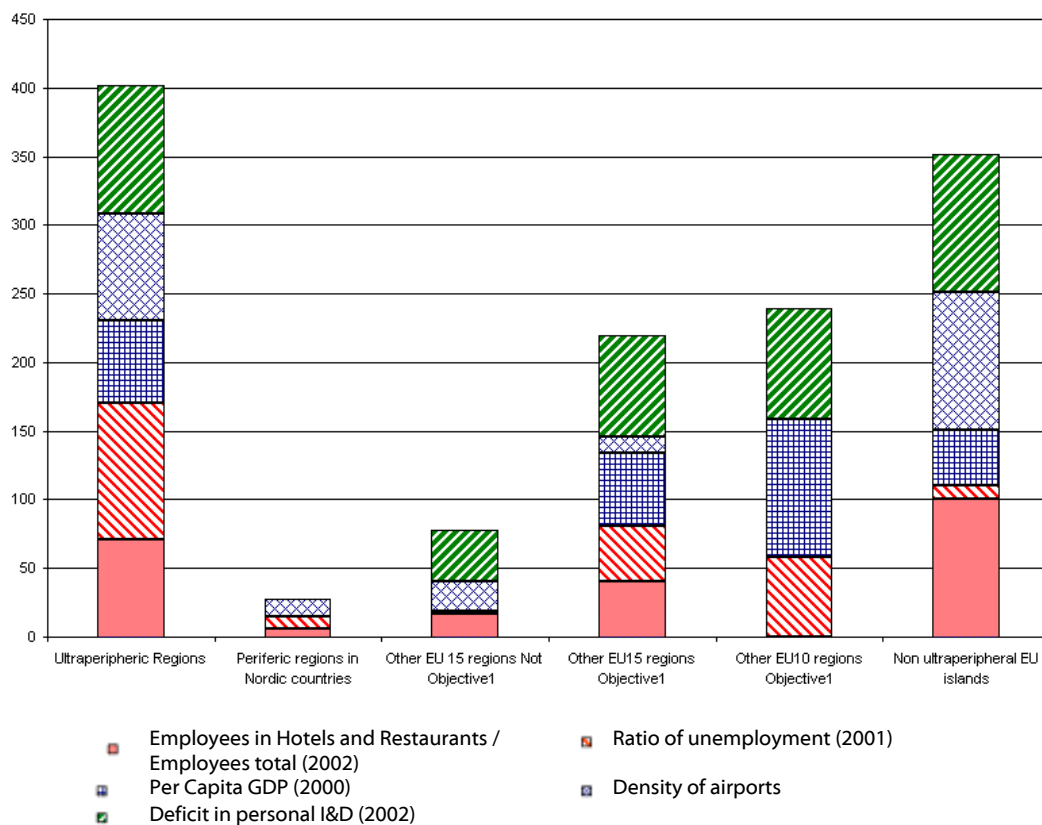


Figure 24 Results for the Aggregated Indicator of Economic Conditioning Factors. The GDP per capita values have been inverted to reflect their relative deficit. Source: Authors' own



The following graph shows the economic and territorial indicators, expressed in averages, among the distinct typologies used in order to better characterise the relative situation of each group of regions.

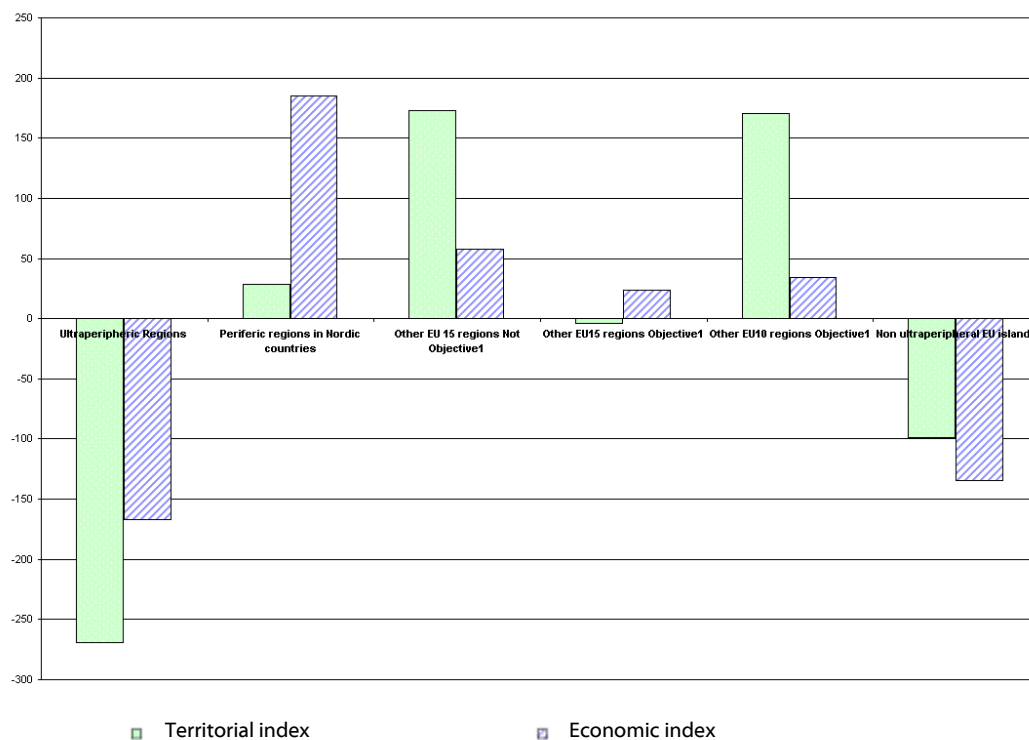


Figure 25 Compound Indicator of the Territorial and Economic Indicators expressed in Averages among the distinct Typologies used. Source: Authors' own



The following map represents the value of the aggregated territorial indicator. The representation intervals used classify the same number of regions in each group:

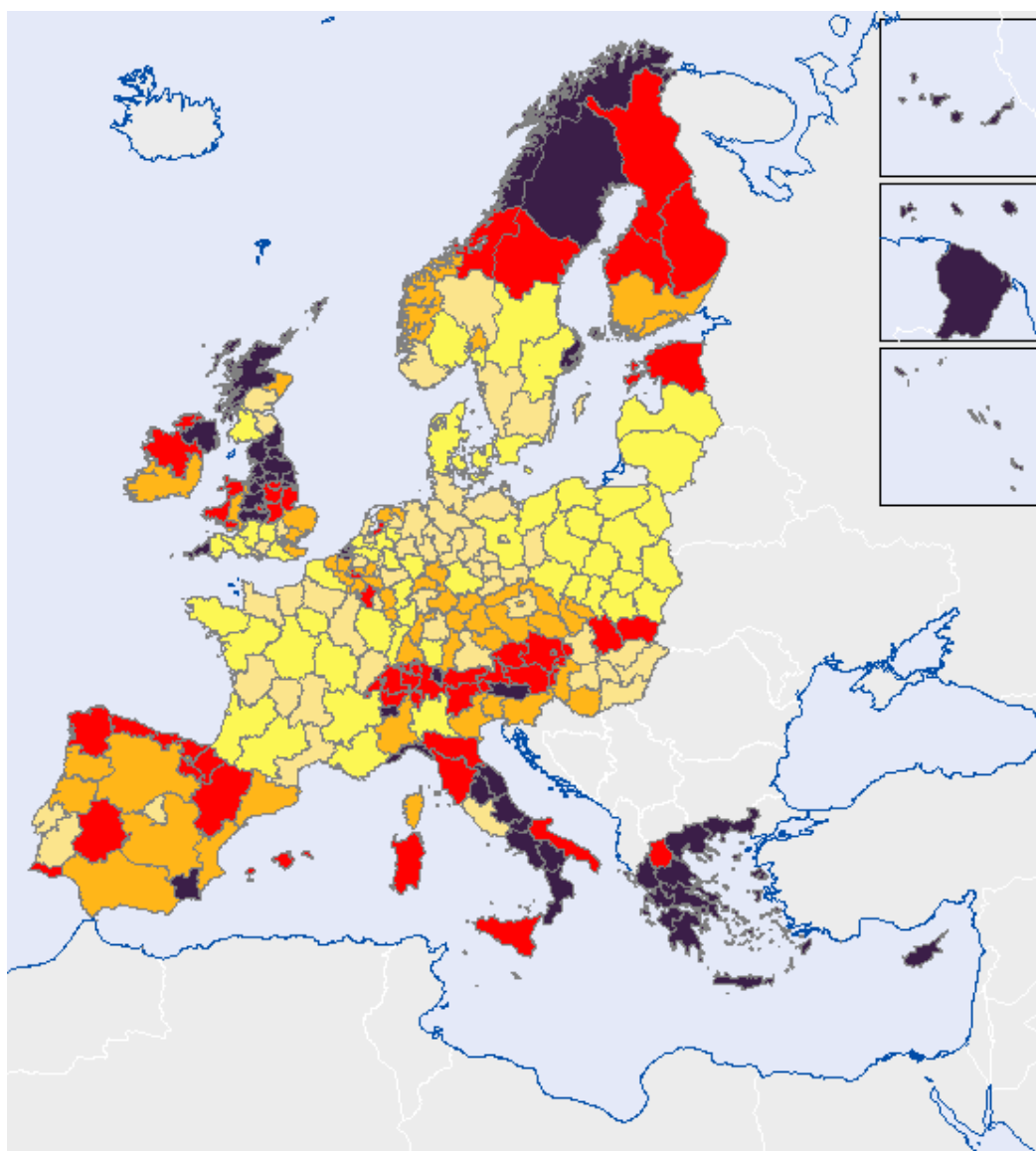


Figure 26 The Value of the Aggregated Territorial Indicators. The representation intervals used classify the same number of in each group. Source: Authors' own

The following map represents the value of the aggregated economic indicator. The representation intervals used classify the same number of regions in each group:

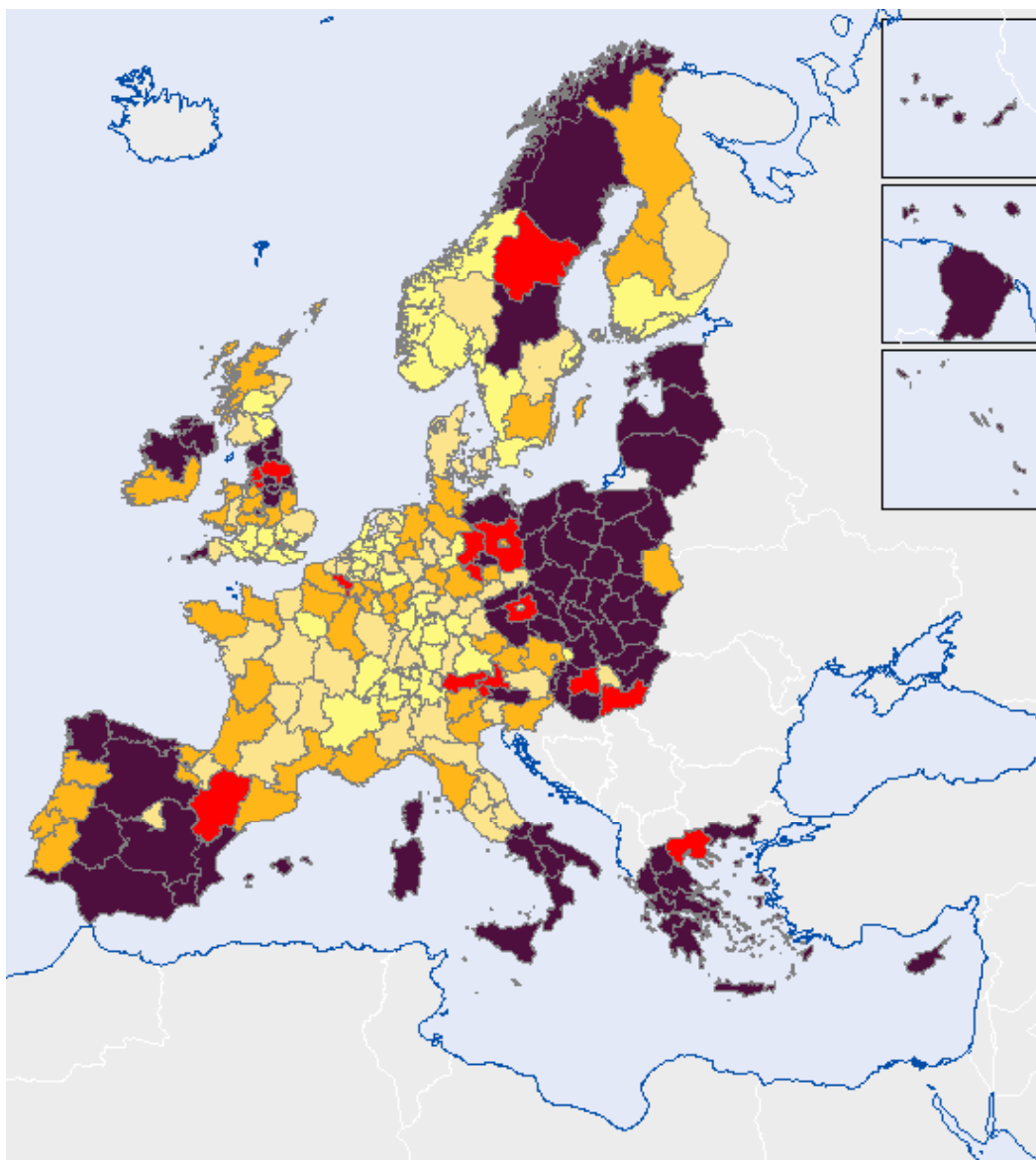


Figure 27 The Value of the Aggregated Economic Indicators. The representation intervals used classify the same number of regions in each group. Source: Authors' own

The map below represents the value of the compound indicator, integrating the territorial and the economic indicator. The intervals have been established so that the ultraperipheral regions are represented only with the other European regions which share their minimum and maximum values.

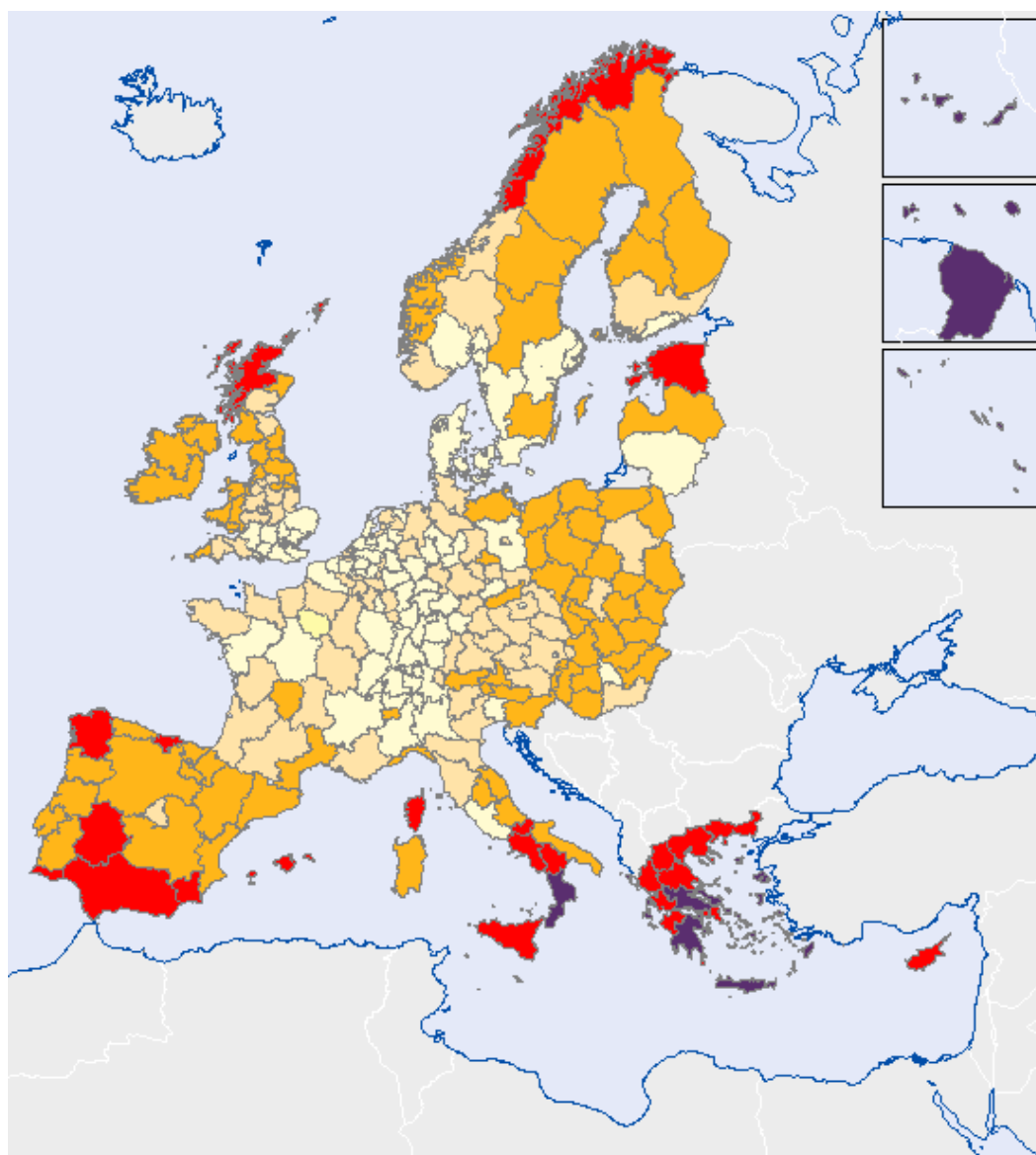


Figure 28: The Value of the Compound Indicator, integrating the Territorial and Economic Indicator.

Source: Authors' Own

8.2.2 An Analysis of the Results

The results obtained, both in relation to the territorial and the economic indicators confirm the hypothesis of the research, as while the ultraperipheral regions show relatively high values for all the partial indicators, the other groups of regions show both high and low values. Territorially, the results confirm the results of previous investigations in broad terms.



The following graph shows the values of the final compound indicator by groups of regions:

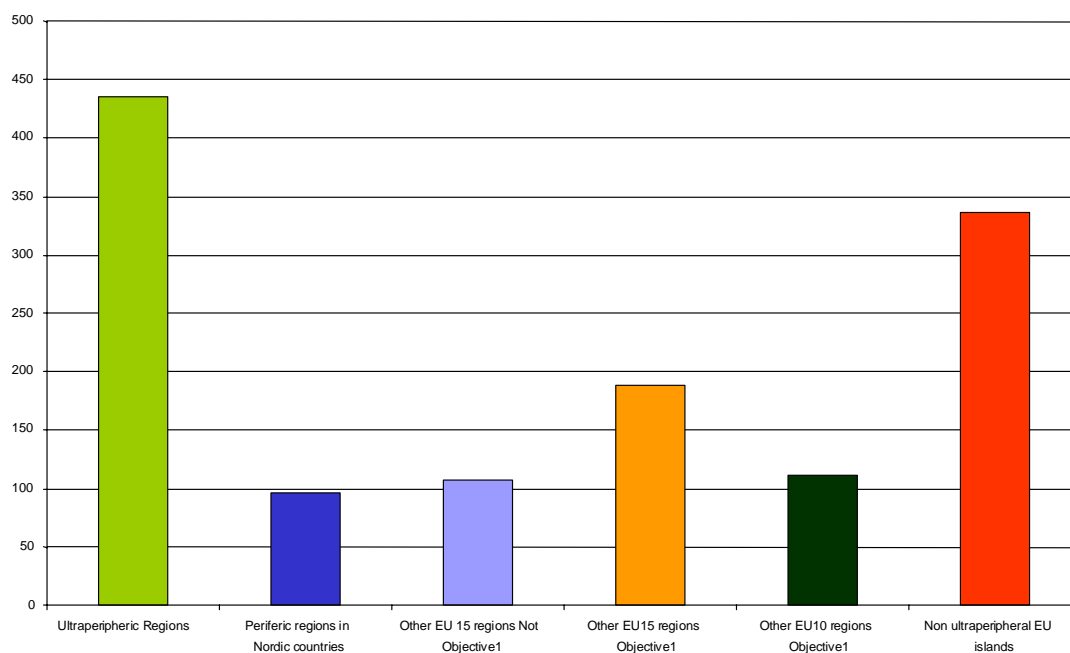


Figure 29 Compound Territorial and Economic Indicator. Source: Authors' own

Important differences exist between the distinct regions included within each typology, and it is therefore necessary to investigate the differences between them in order to see up to what point the general averages of the group represent each individual region. The following graph represents the deviation between regions in an accumulated form. It can be seen that the deviations in the ultraperipheral regions are, as was anticipated, larger, but not significantly greater than those which exist in the rest of the regional groupings.

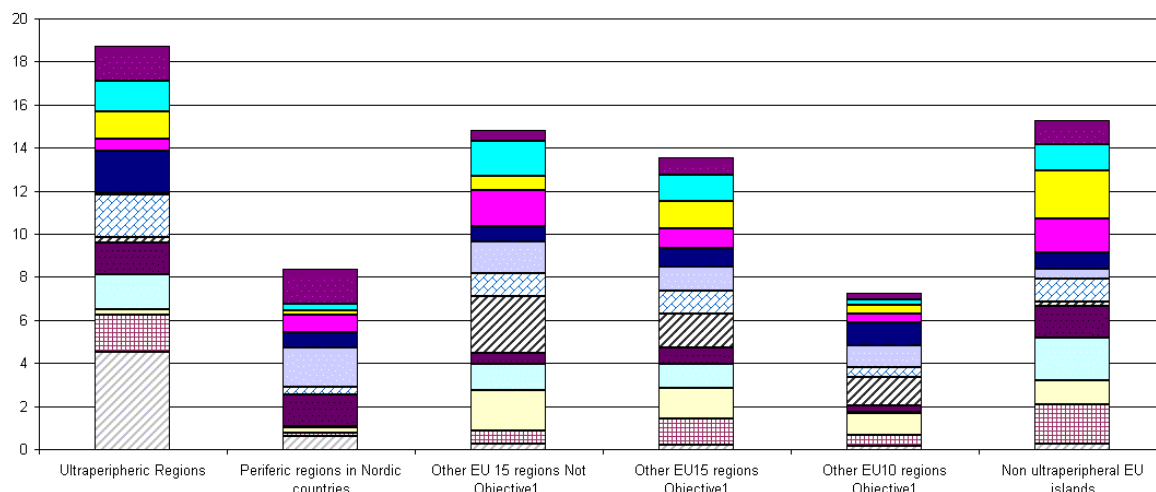


Figure 30 Deviations among Regions. Source: Authors' Own

- Total airports
- Arrival tourist (2000)
- Staff in hotels and restaurants / Total staff (2002)
- Relative Per Capita GDP (2000)
- Ratio of unemployment (2001)
- Total staff by each 1.000 active people (2002)
- Changes in the Natural Potential of Growth: between 20-29 years in 2020 / between 20-29 years in 2000
- Artificial surface CORINE in percentage
- Cost of access by car and ferry to the administrative capital NUTS2
- Length coast / Surface region (Km/km2)
- Population to less than 1000 km (in 1000 inhabitants)
- Potential regional threat of earthquakes
- Distance to the capital of the state (in Km)

A more detailed inspection of the results, region by region is shown in the graph below, which integrates the aggregated values for territorial and economic conditioning factors; it can be seen that the distribution of the regions in the distinct quadrants follow a certain ordered pattern. It is significant that the most populated areas of the graph correspond to those quadrants with values above and below those of the indicators.



The Relationship between the Sum of the Territorial Conditioning Factors and the Sum of the Territorial Socioeconomic Factors

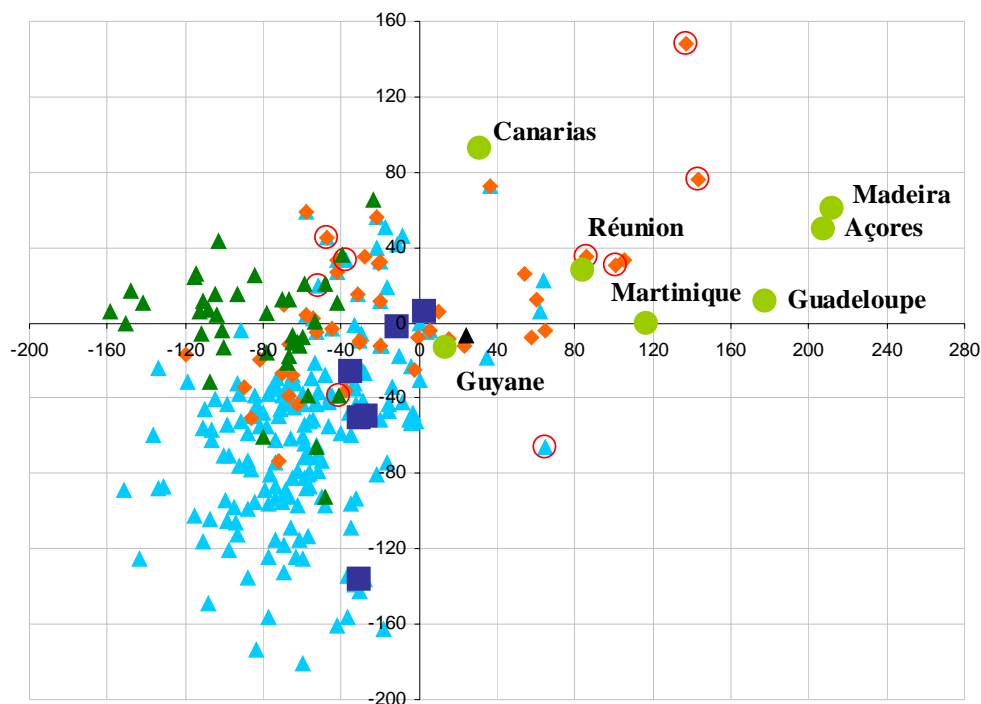


Figure 31 The Relationship between the Sum of the Territorial Conditioning Factors and the Sum of the Territorial Socioeconomic Factors. Source: Authors' own from ESPON data

The graph above corresponds to the conceptual scheme considered as a reference of the research which classified the European regions in four groups (peripheral, ultraperipheral, marginal and central) using the concepts size and accessibility.



9 CONCLUSIONS

A selection of the results obtained is presented below in a summarised manner in order to help characterise the European ultraperipheral regions in relation to other European regions.

1. The territorial conditioning factors for development have been classified using the following table:

TERRITORIAL DETERMINING FACTORS OF DEVELOPMENT				
LOCATION	ACCESSIBILITY	SURROUNDINGS	INTEGRATION	RESOURCES
(Location on the planet?)	(Distance in relation to the rest of Europe?)	(Geopolitical surroundings?)	(Territorial integration?)	(Available human and natural resources?)

2. The ultraperipheral regions are similar to each other in terms of territorial characteristics and distinct to other European regions in these terms. This can be expressed in a qualitative manner as follows:

TERRITORIAL DETERMINING FACTORS				
LOCATION	ACCESSIBILITY	SURROUNDINGS	INTEGRATION	RESOURCES
Oceanic	Greater distance from the centre of Europe	Surroundings with less economic development	Archipelago or insular type character	Relative scarcity of resources

HISTORY OF ECONOMIC DEVELOPMENT				
INCOME?	SPECIALISATION?	STABILITY?	EFFICIENCY?	INTERDEPENDENCE
MEDIUM LOW	"MONOCULTIVATION"	VULNERABILITY, SEASONAL NATURE	INEFFICIENT	DEPENDENCY



3. With the aim of advancing the more precise quantification of these concepts, a database at a regional level using the existing information in official sources (EUROSTAT, ESPON-EUROSTAT, UNED, ETIS, etc.), completed with new indicators was calculated especially for the investigation. With all this, and although the existing quantity of information at a regional level in Europe is scarce, comparative research has been carried out at a regional level with a sufficient degree of distribution.
4. The most significant new indicator calculated for characterising the isolation of the ultraperipheral regions has been the calculation of the population and the accessible market from the frontiers of the ultraperipheral regions. This indicator distinguishes the ultraperipheral regions in relation to the Mediterranean or Baltic islands. On the other hand this indicator reflects a type of structural conditioning factor which is hardly susceptible to change in the short or medium term.
5. Bivariant graphs have been made crossing economic and territorial variables with the objective of visually illustrating the relative situation of the ultraperipheral regions in relation to the other regions. Comments on these graphs have been added to facilitate comprehension. The European regions have been classified in 7 typologies, one of them being ultraperipherality, in order to facilitate the observance of the relative position of each group of regions in the graphs. The objective has been to present a panoramic vision of the ultraperipheral regions from multiple points of view.
6. A summarised description has been drawn up which offers a summary of the characteristics of the ultraperipheral regions which are grouped around the basic territorial determining factors of ultraperipheral regions, including both quantitative and qualitative information.
7. In order to further investigate the selection of the most significant indicators, the correlations which occur between them and their explanatory capacity of the per capita GDP have been analysed through a multiple regression analysis. It has been verified that the territorial indicators do not contribute to the explanation of the variations of the GDP (1995-2000), but do contribute to the explanation, up to a certain point, in relation to the relative income differences between regions. The partial indicators which are more correlated with the PIBC were relative to accessibility and resources. However, as can be verified through some of the results of the tests carried out to evaluate the quality of the adjustment of the regression models, above all the Durbin-



Watson¹ statistic, one must not reject the hypothesis of alternative models which reveal a greater explanatory capacity of the GDP from the variables analysed in this research, or others which are theoretically appropriate.

8. A cluster analysis was carried out of the indicators with the greatest explanatory capacity of the GDP in order to analyse up to which point the ultraperipheral regions become integrated into a single typology, in a manner in which it could be considered that their characteristics were well described by the selected indicators. The result was not significant in statistical terms.
9. A cluster analysis was also carried out with those indicators which, using expert criteria based on the observation of the bivariate graphics and the exploration of the database, it was considered that a group of ultraperipheral regions should be delimited, independently of their capacity for the explanation of the GDP. The results show that 5 of the 7 ultraperipheral regions (the Azores, Guadalupe, Martinique, Guiana and Reunion) are grouped together as regions (Group1) characterised by a low Global Accessibility Index, with a high length of coastline with respect to the regional surface area, with uneven terrain, a reduced accessible market at 500 km and a GDP below the EU29 region average, as well as the low active population (with respect to total population) in relation to GDP. The Canary Islands and Madeira however form part of another group.
10. The third cluster analysis was carried out as indicators were selected, one by one, in a way that the ultraperipheral regions were always grouped together in a single group. The indicators, in accordance with those which were used to group the ultraperipheral regions into a single group, do not include in any case indicators which integrate economic aspects (GDP, market in terms of population or an economic product accessible at a determined cost, etc.). The indicators are as follows:
 - Distance to the European continent (Maastricht) (in km)
 - Distance to the capital of the mother country (in km)
 - Coastal length / Regional surface area
 - Regional surface area / National surface area
 - Maximum height/ Regional surface area
 - Population density
 - Employees in the agricultural sector / Total employees (in %)
 - Employees in services / Total employees (in %)
 - Population with higher education (%)

¹ Demasiado alejado de los valores adecuados



- Unemployment

The grouping exercise with 5 centres gave the results that the Canary Islands, the Azores and Madeira form Group 2, Guadalupe, Martinique and Guiana Group 3, and Reunion forms on its own, Group 4. The other insular regions and the peripheral Nordic regions form part of Group 5, and the others, Group 1.

These results suggest the need to define more pertinent and important indicators with regard to the specific reality of the ultraperipheral regions.

11. Using the conditions described a compound indicator was defined in order to measure both the territorial conditions and the socioeconomic conditions of the European regions, with the objective of characterising them rather than classifying them.

12.

The compound indicator has been defined as the multiplication of an aggregated indicator of territorial conditioning factors and socioeconomic conditioning factors, which are in turn defined as totals without weighting the simple indicators with reference to the average, standardised European values. The total has been adopted without weighting the partial indicators for which both a relative independence and a certain degree of substitution between them is presupposed, and in contrast the multiplication for the final compound indicator has been chosen for which substitution is more difficult, in accordance with the functions of conventional regional productivity.

13. The indicators which are added for the formulation of the aggregated indicator of territorial conditioning factors were the following:

TERRITORIAL DETERMINING FACTORS				
LOCATION	ACCESSIBILITY	SURROUNDINGS	INTEGRATION	RESOURCES
Potential earthquake threat	Distance from the national capital	Population (or market) at less than 1.000 km (in terms of relative deficit)	Length of coastline /Regional surface area	Artificial surface (in terms of relative deficit)

14. The indicators which are added for the formulation of the aggregated indicator of the socioeconomic determining factors are as follows:



TERRITORIAL DETERMINING FACTORS				
INCOME	SPECIALISATION	STABILITY	EFFICIENCY	INTERDEPENDENCE
GDP/capita (in terms of relative deficit)	Employees in services/ Total employees	Ratio of unemployment	Density of airport infrastructures	Personnel in R+D (in relative deficit)

15. The partial territorial and economic indicators were aggregated the direct sum of the normalised relative values; the compound indicator which integrates both was constructed simply as a product of the two.
16. The results of both the partial indicators, the aggregated indicators and the indicator facilitate the appropriate characterisation of the U.P.R.'s
17. The detailed inspection of the deviations of the regions in relation to each indicator confirms that, in view of the available indicators, there are no great differences between distinct groups of regions.
18. For historical and geopolitical reasons, and reasons of social perception, there are a number of additional considerations which are impossible to measure with the databases available in Europe, but which in all cases are abundant in their specific character, and which are difficult to assimilate in the Mediterranean, Baltic or North Atlantic regions.
19. The material produced has been organised into Excel databases and integrated into a Geographical Information System.
20. A web-site of the investigation and the references used has been created where the investigation will be published after checking so that it can be used for later studies.
21. The available regional indicators in Europe are today much more numerous than those in existence a few years ago. Both EUROSTAT and ED/DGREGIO have, through the ESPON programme, carried out a notable effort in updating basic indicators. It is known that the most relevant deficits refer to provisional series (historical series do not exist), to social indicators (concerning differences of income, social institutions, etc.) and institutional indicators (public investment and transfers among public administrations). In relation to the specific study of ultraperipheral regions, the follow up of indicators relative to the development of transport and traffic markets, commercial interchanges,



and the evolution in terms of employment and innovation generated by large companies located in each region would also be important.

10 THE INFORMATION BASE AND INVESTIGATIONS

10.1 THE GEOGRAPHICAL INFORMATION SYSTEM (GIS)

The system of indicators is integrated into a Geographical Information System (GIS) in order to represent the indicators using the maps available (NUTS 0, NUTS II and NUTS III). The system has also been used to carry out the calculation of new indicators which are relative to accessibility. This GIS system has standard visualisation and mapping tools as well as common GIS functions:

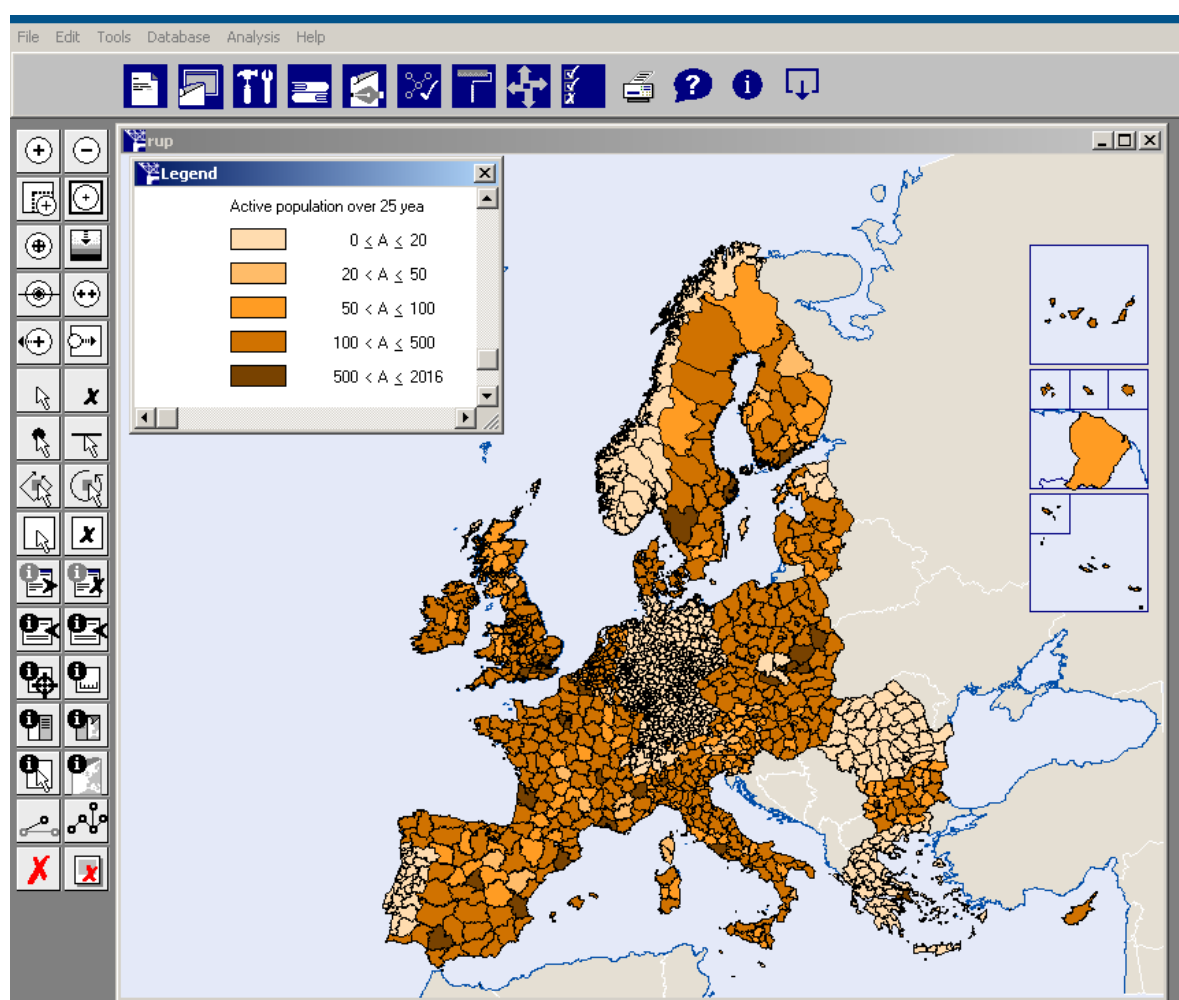


Figure 32 Geographical Information System. Source: Authors' own using EUROSTAT data

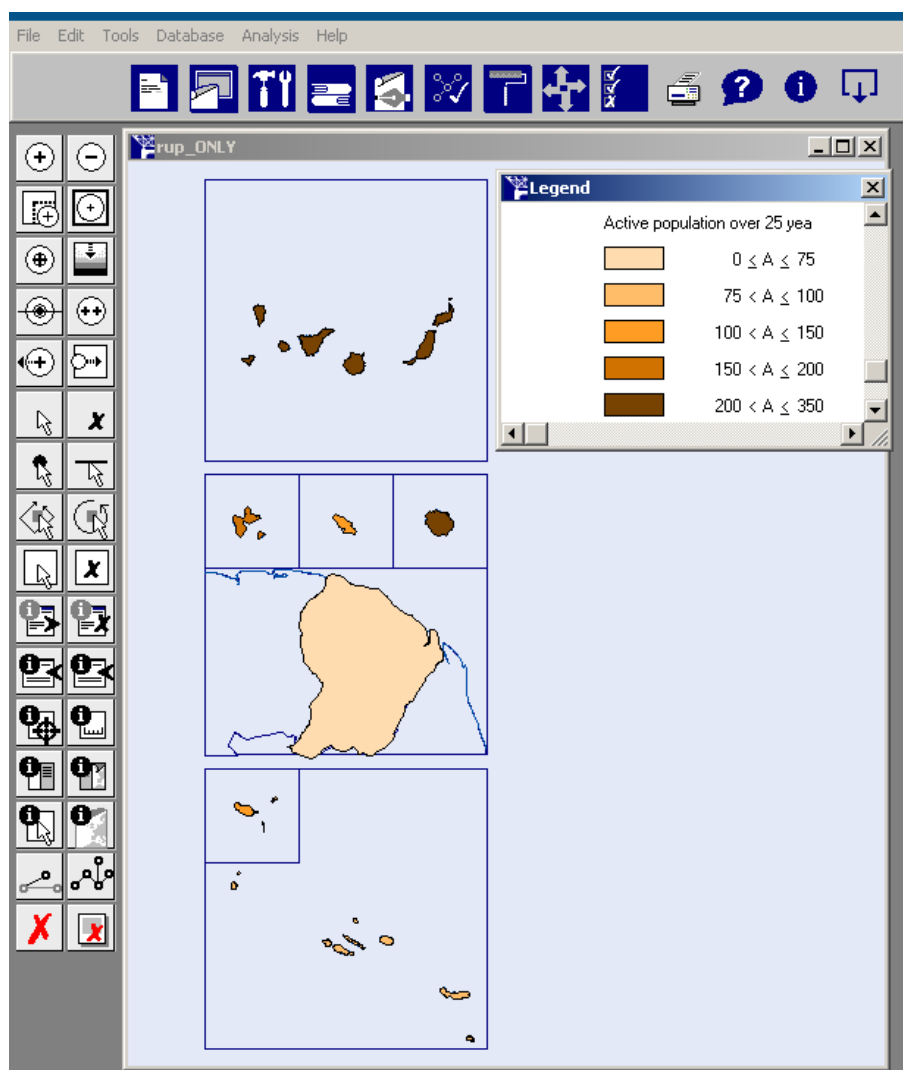


Figure 33 Geographical Information System. Source: Authors' own using EUROSTAT data

10.2 THE WEBSITE OF THE INVESTIGATION

A web page has been specifically designed for this investigation (with restricted access), with the general information, the references and the main results obtained.

The general information section is open to the public and has (see Figure 3) the following contents:

- Presentation and objectives
- References (policies, experts, conferences and institutions, existing investigations and databases)
- Gallery of maps

The information regarding the investigation is restricted.

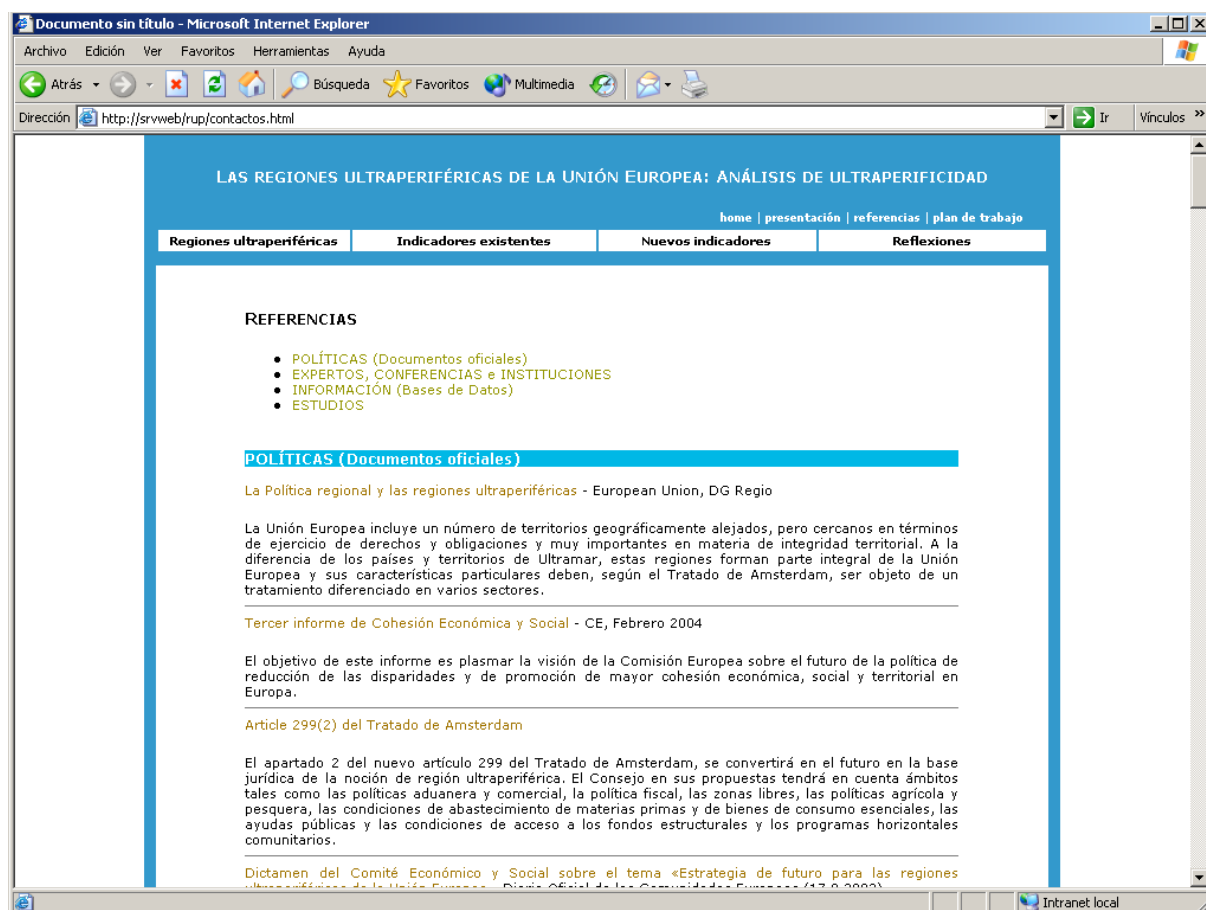


Figure 34 Reference Pages regarding European Ultraparipheral Territories on the Investigation Website. Source: Authors' own



11 THE CONTINUATION OF THE INVESTIGATION

This section includes the evaluation of the work and the future lines of investigation proposed by Professor José A. Cabral Vieira.

A escassez de dados regionais, a qual, do ponto de vista dos autores, condiciona a análise deste fenómeno, encontra-se presente no trabalho. Apesar de tudo, julgo que os dados obtidos e referenciados no trabalho revelam um esforço significativo por parte da equipe de trabalho.

Os meus comentários vão essencialmente para aspectos metodológicos e para a análise de regressão a qual, na minha opinião podia dar resultados mais aprofundados. Sendo certo que a ultraperiferia condiciona o crescimento económico e como tal o PIB per capita (PIBpc), penso que a utilização deste indicador para aferir o impacto da ultraperiféricidade é adequada. Além disso, a análise de regressão (análise multivariada) parece-me, nesse contexto, a mais apropriada. Algumas dúvidas se levantam no entanto sobre a metodologia, a qual pode condicionar os resultados finais.

Em primeiro lugar, verifico que a análise não deixa que o modelo determine de forma livre a ordenada na origem, ou seja a constante da regressão. Em vez disso, parece-me que esta é imposta ao modelo obrigando a passar pelo nível 0 (zero). Tal significa que na ausência das variáveis utilizadas para caracterizar a ultraperiferia o valor PIBpc seria nulo. A forma mais correcta seria deixar sempre o modelo determinar livremente o ponto de intercepção com o eixo dos y. Assim sendo, haveria um nível médio de PIBpc o qual se iria atenuando (pelo menos assim era de esperar) à medida que o efeito (nível) dos indicadores de ultraperiferia se fossem agravando e vice-versa. Além disso, a inclusão da constante na regressão contribui para captar elementos não observados pelo analista. A omissão deste termo normalmente enviesaria os coeficientes obtidos para cada um dos regressores.

Um segundo aspecto, também ele ligado a possíveis enviesamentos e à especificação do modelo de regressão, tem a ver com o que se segue. Imagine-se que o nível do PIBpc é efectivamente – e não parece muito difícil aceitar que assim seja –, determinado com base em factores não estruturais (OF) os quais podem ser objecto de alteração através de medidas de política como por exemplo o investimento em educação e através de um conjunto de factores específicos, adversos e duradouros, caracterizadores de uma situação ultraperiférica (FUP). Assim sendo suponha-se que o modelo correcto, o qual também deve incluir um termo constante, é do tipo:



$$\text{PIBpc} = \text{FUP}'\beta + \text{OF}'\alpha + \varepsilon \quad (1)$$

onde

FUP – são factores caracterizadores duma situação ultraperiférica, estruturais, estáveis, e por isso difíceis de manipular através de medidas de política;

OF – são outros factores que contribuem para a determinação do PIB per capita, entre os quais se inclui, por exemplo, o montante e a utilização e a utilização de capital humano (captado talvez pela % de população com diferentes níveis de ensino).

O problema é que ao não incluir na regressão estes outros factores (OF), alguns dos quais, apesar de alteráveis através de medidas de política que se traduzam, por exemplo, através de discriminações positivas a favor das ultraperiferias (caso do investimento em educação e capital físico), podem estar, mesmo assim, correlacionados com a situação de ultraperiféricidade. Se assim for, e não considerando a inclusão de OF, estes factores passam a fazer parte da componente estocástica, ou seja do erro, da regressão. A correlação entre o erro e a variável explicativa, que supostamente capta o impacto de um elemento específico associado à ultraperiferia, faz com que o coeficiente deste facto fique enviesado.

Imagine-se, e vamos simplificar considerado apenas um factor estrutural e outro não estrutural, que o verdadeiro modelo é dado por:

$$\text{PIBpc} = \text{FUP}\beta + \text{OF} * \alpha + \varepsilon \quad (2)$$

e que, além disso, $\text{cov}(\text{FUP}, \text{OF}) \neq 0$ (por exemplo as regiões com maior distância a um centro também possuem menor nível de capital humano).

Proposal for the Continuation of the Investigation

Se em vez de (2) eu estimar o modelo (o qual também deve incluir uma constante):

$$\text{PIBpc} = \text{FUP}\beta + \varepsilon \quad (3)$$



Então eu tenho que o valor esperado do parâmetro estimado, ou seja $E(\hat{\beta})$, é dado por:

$$E(\hat{\beta}) = \beta + \alpha \text{cov}(\text{FUP}, \text{OF}) / \text{var}(\text{OF}) \neq \beta,$$

sendo o enviesamento negativo e dado por:

$$\text{Env} = \alpha \text{cov}(\text{FUP}, \text{OF}) / \text{var}(\text{OF})$$

Uma alternativa à especificação (1) seria seguir um procedimento em dois passos:

Num primeiro passo, pode-se estimar um modelo do tipo:

$$\text{PIBpc} = \text{OF}' \alpha + v,$$

onde v é a componente estocástica e apurar para cada região os valores:

$$\hat{v} = \text{PIBpc} - \text{OF}' \hat{\alpha}$$

Estes valores indicariam as diferenças no PIBpc entre as diferentes regiões que não são explicadas por factores não estruturais.

Num segundo passo estima-se então até que ponto é que aqueles valores, já expurgados dos factores que podem ser alterados através de medidas de política, dependem de cada uma das variáveis caracterizadoras duma situação ultraperiférica. Ou seja, estima-se um modelo do tipo:

$$\hat{v} = \text{FUP}' \beta + \eta$$

Este modelo permite construir para cada uma das regiões um índice (de *ultraperiféricidade*) do tipo:

$$\hat{I}_i = \text{FUP}_i' \hat{\beta},$$

onde $i=1, \dots, N$ indica a região e é o $\hat{\beta}$ o vector de *ponderadores* (ou seja, coeficientes estimados) que determina a contribuição de cada uma das variáveis para o índice final (este índice pode também ser obtido com recurso à equação (1)).



A apresentação gráfica de um índice desta natureza permitiria, talvez, verificar até que ponto é que as RUPs constituem um conjunto diferente das restantes incluídas na amostra. Se tal se verificasse, permitiria ainda traçar uma linha divisória entre a ultraperiferia e, por exemplo, a insularidade. Não sei, no entanto, até que ponto é que os resultados deste indicador divergiriam dos apresentados no estudo.



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