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A SYNTHETIC INDICATOR TO MEASURE THE ECONOMIC AND SOCIAL COHESION
OF THE REGIONS OF SPAIN AND PORTUGAL

A Synthetic Indicator to Measure the Economic and Social Cohesion of the Regions of Spain and Portugal[1]

Un indicador sintético para medir la cohesión económica y social de las regiones de España y Portugal

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Abstract

This study aims to propose the construction of a synthetic indicator again to allow us to measure the progress in the objective of economic and social cohesion of the regions of Spain and Portugal, in the framework of the community Regional Policy (CRP). We build a synthetic indicator of a multidimensional approach taking into account a large number of variables defined in the reports on economic cohesion and Social of the Union European, grouped according to the objectives of the Europe 2020 strategy to promote the smart, sustainable and inclusive growth. This indicator allows comparisons among the regions studied, on the basis of information provided by a set of variables. For this purpose, we use the Pena distance method for the year 2012, which is the latest year for which data is available.

Keywords: EU Funds; European Union; Pena Distance Method; Regional Disparities; Synthetic indicators

Resumen

Este artículo tiene como objetivo proponer la construcción de un nuevo indicador sintético, que nos permita medir el progreso en el objetivo de la cohesión económica y social de las regiones de la cohesión de España y Portugal, en el marco de la Política Regional Comunitaria (PRC). Se construye un indicador sintético, con un enfoque multidimensional, teniendo en cuenta un gran número de variables definidas en los informes sobre la cohesión económica y social de la Unión Europea, que se agrupan de acuerdo con los objetivos de la Estrategia Europa 2020 para promover un crecimiento inteligente, sostenible e integrador. Este indicador permite realizar comparaciones entre las regiones estudiadas, sobre la base de la información proporcionada por el conjunto de las variables consideradas. Con este fin, se utiliza el método de distancia de Pena para el año 2012, último año con datos disponibles.

Palabras clave: Disparidades regionales; Fondos de la UE; Indicadores sintéticos; Método de distancia de pena; Unión Europea.

JEL Classification: O47, O52, R1, R58

1. Introduction

Although the Community Regional Policy (CRP) has its first antecedents in the Preamble of the Treaty of Rome itself, with the acknowledgement of the need to reduce the inequalities between European countries and regions through solidarity, this policy did not reach its current dimension until the late 1980s, becoming one of the priority policies of the European Union and replacing its original objective of reducing regional economic disparities, measured essentially by per capita GDP, by another broader concept, economic and social cohesion (Cuadrado and Marcos 2005).

In the slow progress of the CRP, two fundamental factors have conditioned its evolution: the successive expansions of the integrated Europe towards countries with a per capita income notably lower than the community average, and the development of the process of integration, thus increasing the territorial differences. The European Unión (EU) started its regional policy in 1975, after the entry of Ireland (in 1973 and with a GDP less than 60% of the average) when the Council passed the first regulations of the European Regional Development Fund (ERDF) with the aim of correcting the main regional imbalances of the Community and especially those derived from the predominance of agriculture, industrial reconversion and structural underemployment (Calvo 2011).

The Cohesion Policy consists of the distribution of matching grants through the Structural and Cohesion Funds, which were conceived to push up public investments and expenditures in key areas for enhancing growth. These interventions are intended to influence the long-run supply potential of the economy. The supply-side effects stemming from increased capacity (infrastructure, private capital and human capital) operate through lower costs, higher productivity and increased competitiveness, stimulating production, reducing imports and increasing exports (Gramlich 1994).

With the Single European Act (1987), following the entry of Greece (1981) and Spain and Portugal (1986), the CRP reached its stage of maturity, including economic and social cohesion as a key objective in the process of European integration in response to the growing interregional inequalities. In 1988 the Council of Europe committed to doubling the financial endowments of the structural funds in the period 1988-1993 (Delors I Package), reforming the operation of those funds and establishing the four basic principles of the CRP (concentration, programming, co-participation and additionality), which endowed it with a true European dimension (Garrido, Mancha and Cuadrado 2007) and guaranteed the participation of regional institutions in the strategic orientation of programming (Sosvilla 2009).

The European Union's codecision procedure was introduced by the Treaty of Maastricht in 1993 and initially applied to 15 areas of Community activity. Its current version came into force in May 1999 by the Treaty of Amsterdam signed in 1997 (Napel and Widgrēn 2006), including the Regional Development Fund. The next period of programming, 1994-1999, involved a new reform of the CRP aiming to soften the negative impact on regional cohesion that might be caused by the Single European Market.

The Treaty of the European Union (1992) confirms cohesion as one of the essential objectives of the Union, alongside Economic and Monetary Union and the Single Market (Cardenete, Delgado and Lima 2013). Once more, a new advance in the process of integration would translate into a strengthening of cohesion to mitigate its consequences in the more backward regions.

The Delors II Package strengthened the financial resources of the structural funds and created the Cohesion Fund, aimed at co-financing infrastructure and environmental projects in the countries with a per capita GDP of less than 90% of the community average (Spain, Greece, Ireland and Portugal). Other novel aspects were the birth of the Committee of the Regions, as a discussion body (Pachura 2010), the strengthening of the assessment mechanism (Esteban et al. 2009), and the consolidation of the principle of subsidiarity, implying the power of national authorities to select and carry out the projects to be financed, though in coordination with the European institutions (Backhaus 1997).

The expansion of the EU towards Eastern Europe was a new milestone in the evolution of the CRP. But this time, contrary to what happened in the two previous reforms, the 2000-2006 programming period was a turning point in the increasing protagonism of economic and social cohesion, since there was a reduction of resources in relative terms and a fragmentation of the regional policy derived from the principle of subsidiarity and the loss of control on the part of the Commission (Mancha and Gallo 2013).

Although the Treaty of Amsterdam (1997) confirmed the importance of cohesion in the process of integration (Cuenca and Rodríguez 2007), the document "Agenda 2000" (European Commission 1997) was the result of fierce argument between the countries in favour of continuing to drive cohesion and those in favour of reformulating the CRP to limit the financial stress on the EU-15 of the entry of candidates with notable relative income lags.

The 2000-2006 CRP established a budgetary ceiling of 0.46% of community GDP for economic and social cohesion, greater geographical concentration, and a reduction of objectives from 7 to 3. It also strengthened the mechanisms of control and effectiveness. The 3 objectives for the period were: Objective n°1, covering the least developed regions of the UE, with a per capita GDP less than 75% of the UE average (this priority objective absorbed two thirds of the Structural Funds); Objective n°2, for regions that exceeded 75% of the average, but still had structural problems, especially a high level of unemployment; and Objective n° 3, to support the adaptation and modernisation of policies and systems of education, training and employment.

The program period 2007-2013 has seen substantial changes in the CRP derived from the Lisbon and Goteborg agreements, and from the Renewed Lisbon Strategy (RLS), aimed at achieving a more competitive EU, and the growth of productivity and employment (European Commission 2007a). One of the main novelties was the substitution of the previous Objectives 1, 2 and 3. Objective 1 was replaced by the Convergence Objective, which finances poorer regions with a per capita GDP of less than 75% of the EU-25 average for the period 2000-2002 (European Commission 2004).

It also includes, provisionally, regions affected by the statistical effect (*phasing-out*), i.e. regions that did not exceed the threshold with reference to the EU-15 instead of the EU-25, as a consequence of the fall in European average income caused by the expansion towards the East. In this objective is concentrated more than 80% of the total ayuda for cohesion (10 points more than Objective 1) and it is materialised through the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund.

The rest of the regions would be covered by the new Regional Competitiveness and Employment Objective (replacing the previous 2 and 3), absorbing 16% of the Structural Funds and destined for the funding of the objectives of the RLS through the encouragement of innovation, entrepreneurial initiative, protection of the environment, accessibility, the capacity for adaptation and development of the labour market.

The accession of these new member states from Central and Eastern Europe radically reshaped the economic geography of the EU, both lowering the average GDP per capita of the EU regions and also significantly increasing the population in less developed regions (McCann and Ortega-Argilés 2013).

Finally, the European Territorial Cooperation Objective, with 2.5% of the funding, from only the ERDF, aims to reduce the importance of the frontiers in Europe through cross-frontier, transnational and interregional cooperation (European Commission, 2007b).

Anther novelty is that the member states must draw up their National Strategic Reference Frameworks (NSRF) and the national and regional Operating Programs (OP) (replacing the previous Community Support Frameworks). Thus, the Commission defines the Strategic Orientations and leaves in the hands of the national authorities the determination of fundable projects and the operational part.

The 2014-2020 CRP, still in the negotiation phase, will be conditioned by the Europe 2020 Strategy of intelligent, sustainable and integrating growth (European Commission 2010). The new proposals aim to reinforce the strategic dimension of regional policy and guarantee that the EU's investment will focus on long term objectives in matters of growth and labour, setting a series of ambitious objectives in 5 priority areas: employment, innovation, education, social integration and climate/energy.

In sum, the CRP is one of the key policies in the construction of Europe, and has meant a stimulus to national investment programs through co-funding from the Structural Funds (European Commission 2011).

In our article, we propose the construction of a synthetic indicator to enable us to measure the progress in the objective of economic and social cohesion of the regions of Spain and Portugal, in the framework of the Community Regional Policy (CRP).

2. Method

2.1. Data

For this, we will use the P_2 distance method developed by Pena Trapero (1977), later expanded by Zarzosa (1996), which has been widely used in similar studies and, more recently, by Somarriba and Pena (2009a), Rodríguez (2011 and 2013); Zarzosa (2012). or Zarzosa and Somarriba (2013).

This indicator permits comparisons between the regions being studied, taking as base the information provided by a set of variables or partial indicators. As a result a territorial ranking is obtained according to the objective that is to be measured; in our case, the level of economic and social cohesion attained by the regions of Europe.

The variables selected for the study were taken from the Reports on Economic and Social Cohesion of the European Union, grouped according to the Europe 2020 Strategy objectives for promoting smart, sustainable and integrating growth. From the portfolio of cohesion indicators considered by the European Statistical Office (Eurostat) to measure cohesion at sub-national levels, those for which there was no information on the regions being studied were rejected. Altogether, a total of 13 cohesion indicators were selected.

The reference year of the data was the closest available to the date of this study. The variables that, when integrated into the synthetic indicator, contribute negatively to the objective of interregional economic and social cohesion were multiplied by (-1), as specified in Table 1.

Table 1 Partial indicators of economic and social cohesion

Objectives Europe 2020 Strategy		Indicators	Data year
Smart growth	Competitiveness and business environment	Gross domestic product (GDP) in PPS per inhabitant	2010
		Unemployment rates (15 years and over) (-1)	2012
		Employment rates of the age group 20-64	2012
	Research & Development	Patent applications to the EPO (average 3 years)	2007-2009
		Total intramural R&D expenditure	2010
	Education	Persons aged 30-34 with tertiary education attainment (%)	2012
		Persons aged 25-64 with tertiary education attainment (%)	2012
		Early leavers from education and training by sex (%) (-1)	2012

Sustainable growth	Transport	Victims in road accidents per million of inhabitants (-1)	2011
		Annual road freight transport by region of loading (Tonnes per inhabitant)	2011
	Environment	Waste generated (Thousands of tonnes per inhabitant) (-1)	2009
Inclusive growth	Social inclusion, poverty and health	People at risk of poverty or social exclusion (% of total population) (-1)	2011
		Life expectancy at birth	2011

Source: Author based on Eurostat data.

2.2. MODEL

The synthetic indicator of economic and social cohesion was constructed using as aggregation method the P_2 distance indicator, devised by Pena Trapero (1977) originally for use in the field of measurement of social wellbeing, though it has subsequently given rise to several studies focussed on different themes.

Among the most recent studies to have used this methodology for the aggregation of variables, in the area of social wellbeing we could highlight those by Zarzosa and Somarriba (2013), Rodríguez (2011), Cuenca and Rodríguez (2010) and Pena (2009). López and Sánchez (2009) and Somarriba and Pena (2009a) have worked on quality of life. Outstanding in the field of European regional development are Ogando *et al.* (2010) and Zarzosa (2009). On the subjects of labour market and quality of employment we can cite the studies by Merino and Somarriba (2008 and 2010). Finally, the DP_2 indicator was also applied to studies relating to the environment (Escobar, 2006) or tourism (Pérez, Blancas *et al.* 2009).

Following Pena Trapero (1977), we define the P_2 distance as a synthetic indicator that aggregates the information contained in a set of social indicators and is designed to make interspatial and intertemporal comparisons. In our case, we take as reference a theoretical region that displays the worst values of the variables being studied, such that the indicator DP_2 will return the distances of each region from that theoretical reference region.

As indicated by Somarriba and Pena (2009b), this indicator has the advantage of solving a large number of problems: aggregation of variables expressed in different measurements, arbitrary weighting and duplication of information. These problems are solved by this distance method, since the order of entry of the partial indicators, which will condition the relative weight of each variable, is determined by an algorithm that reaches convergence when the indicator fulfils a series of desirable properties. Furthermore, by means of a corrector mechanism only the new information incorporated in each variable is retained, utilising the useful information and avoiding duplication of information. For an exhaustive study of the P_2 indicator, see Pena (1977) and, subsequently, Zarzosa (1996 and 2005).

The conception of this indicator is based on the information contributed by a series of variables and intermediate indicators. Furthermore this indicator is

oriented towards comparison of different situations in different geographical area. This indicator is defined, for a region *r,* as:

$$DP_2 = \sum_{i=1}^{n} \left\{ \left(d_i \Big/ \sigma_i \right) \left(1 - R^2_{i,i-1,\dots,1} \right) \right\}$$

With $R^2_1 = 0$; where $d_i = d_i\,(r^*) = |x_{ri} - x_{*i}|$, the reference base bieng $X_* =$

$(X_{*1}, X_{*2}, \dots., X_{*n})$, which coincides/agrees with the vector of minima.

Where:
n is the number of variables
χ_{ri} is the value of the variable *i* in region *r*
σ_i, is the standard deviation of variable *i*

$R^2_{i,i-1,\dots,1}$ is the determination coefficient in the regression $X_i, X_{i-1}, X_{i-2}, \dots, X_1$, in- cluded above. This coefficient measures the part of the variance of each vari- able explained by the linear regression estimated using the above variables.

As a result, the factor $(1-R^2_{i,\,i-1,\dots,1})$, called "correction factor" by Pena, avoids redundancy as it eliminates from the partial indicators the information already contained in the preceding indicators (Cuenca and Rodríguez 2010). The syn- thetic indicator thus includes only the new information of each variable.

The advantages of this methodology over others in the construction of syn- thetic indicators can be summarised in two: 1) the mathematical goodness of the aggregation method and 2) the solution to the problems of aggregation of the variables (Pena 2009; Somarriba and Pena 2009b).

Regarding the first, the DP_2 indicator fulfils the properties of existence and determination, monotony, uniqueness, invariance to changes of origin and scale, homogeneity, transitivity, exhaustivity, aditivity, invariance to the refer- ence base and neutrality, as demonstrated by Pena (2009), Rodríguez (2011) and Zarzosa and Somarriba (2013), among others. Regarding the problems of aggregation, and fulfilling the property of neutrality, we find that in the DP_2 in- dicator neither the weight of the variables or partial indicators, nor their orders are determined arbitrarily (Zarzosa, 1996). Also, the resulting synthetic indica- tor eliminates the problems of aggregation of variables expressed in different measurements and the duplication of information that these generate when synthesised in the same indicator.

To determine the discriminatory power of the variables included in the syn- thetic indicator DP_2 (Ivanovic 1974), the "Ivanovic-Pena Overall Information Coefficient" $IC_{(I)}$, we obtain the defined by Zarzosa (1996), will be used. This coefficient takes values between 0 and 2, coinciding with the two theoretical extremes of the power of discrimination. If a variable takes the same value for all countries, the IC will be zero, indicating that this variable possesses no dis- criminatory power. If on the other hand a variable only presents a value other

than zero for one territory (and in the remaining m-1 is zero), it will then take the value two, indicating that the discriminatory power of that variable is total.

3. Results

The values of the synthetic indicator DP_2, constructed from the variables shown in Table 1, show an ordering of the regions according to the partial indicators of economic and social cohesion used. Table 2 presents the regions of Spain and Portugal in descending order of our synthetic indicator DP_2, the last column containing their classification in the current programming period of the Community Regional Policy (2007-2013), according to the criterion of per capita GDP.

According to the three objectives of the CRP in the period 2007-2013, we have divided the regions into three groups:

Group 1 = Regions covered by the Convergence Objective.

Group 2 = Phasing Out Regions (Convergence Objective)

Group 3 = All other regions (not covered by the Convergence Objective)

The ordering of the regions of Spain and Portugal according to the synthetic indicator DP_2 of economic and social cohesion, establishes a distance of 10.39 points between the best positioned region (Basque country in Spain) and the worst positioned (Autonomous City of Ceuta in Spain). It can therefore be affirmed that there is a high degree of heterogeneity among the regions analysed according to the degree of cohesion established by the partial indicators forming the synthetic indicator DP_2.

Of the five regions that present the best results in the indicators of cohesion, four are located in the north-west of Spain (Basque Country, *Comunidad Foral* of Navarre, Catalonia, and Aragón), and one in the centre of the peninsula (Community of Madrid), where the capital of the kingdom is situated. In the case of Portugal, the first region to appear in the ranking is Lisbon, occupying the sixth position, understandably due to the influence exercised by the country's capital on the economic and social development of the region.

On the other hand, at the bottom of the classification we find the regions of the centre-south of the peninsula (Alentejo and Algarve in Portugal, and Extremadura, Andalusia, Castilla-La Mancha and Murcia in Spain), the two Spanish autonomous cities (Ceuta and Melilla) and the so-called ultra-peripheral regions (Azores and Madeira in Portugal, and the Canaries in Spain). The average for the synthetic indicator DP_2 of these worst positioned regions is 4.62 points, more than 9 points from the highest-scoring region (Basque Country), which shows the existence of significant disparities.

When the information relating to the eligibility of the regions is incorporated in the current program period 2007-2013 of the Community Regional Policy (last column of Table 2) it is evident that, among the ten regions worst situated in the synthetic indicator DP_2, two no longer receive cohesion funds against the Convergence Objective: specifically, Madeira in Portugal and the Canaries in Spain, both of them being ultra-peripheral regions.

Also, it is striking that the Autonomous Cities of Ceuta and Melilla are considered *phasing out* regions in the 2007-2013 period, when they appear in the last positions of our indicator DP_2, which means that they have recorded the worst values in nearly all the partial variables used and are those most distant in terms of social and economic development. It is also noteworthy that two regions that receive funds under the Convergence Objective hold high positions in the indicator DP_2, specifically the Principality of Asturias and Galicia in 7th and 10th place in the table.

These maladjustments must be corrected in the next program period, 2014-2020, if it is intended to achieve greater effectiveness of the Community Regional Policy in pursuit of the objective of economic and social cohesion of the European regions. The above results reveal that, in recent years, there has been a worsening of the economic and social development of some regions that were catalogued, either as *phas*ing out regions in 2006 (the case of Ceuta and Melilla), according to the per capita GDP criterion, or excluded from the Convergence Objective, like the Canaries and Madeira. As we have seen, these regions occupy the lowest places in the classification of our synthetic indicator, revealing their distancing from the objective of regional cohesion.

Table 2 Regional Classification by DP2 indicator and regional eligibility in Program period 2007-2013

Regions	Country	DP2 Indicator	Classification of region
Basque Country	Spain	13.78	3
Comunidad Foral of Navarre	Spain	13.67	3
Community of Madrid	Spain	12.25	3
Catalonia	Spain	10.30	3
Aragon	Spain	10.23	3
Lisbon	Portugal	9.91	3
Principality of Asturias	Spain	9.71	2
Cantabria	Spain	9.08	3
La Rioja	Spain	8.38	3
Galicia	Spain	8.24	1
Castilla and León	Spain	8.20	3
Valencian Community	Spain	7.91	3
North	Portugal	7.73	1
Centre	Portugal	7.40	1
Balearic Isles	Spain	7.27	3
Murcia Region	Spain	5.79	2
Algarve	Portugal	5.43	2
Castilla-la Mancha	Spain	5.24	1

Regions	Country	DP2 Indicator	Classification of region
Autonomous Region of Madeira	Portugal	5.11	3
Canaries	Spain	4.89	3
Andalusia	Spain	4.74	1
Extremadura	Spain	4.68	1
Alentejo	Portugal	4.42	1
Autonomous Region of the Azores	Portugal	3.61	1
Autonomous City of Melilla	Spain	3.52	2
Autonomous City of Ceuta	Spain	3.38	2

Classification of the regions in the current program period (2007-2013):

1 = Regions covered by the Convergence Objective.

2 = *Phasing Out* Regions (Convergence Objective)

3 = All other regions (not covered by the Convergence Objective)

Source: Author based on Eurostat data.

Looking at the discriminatory power of the variables included in the synthetic indicator DP_2, we observe in Table 3, that the most discriminatory variable is *Annual road freight transport by region of loading*, revealing appreciable differences between the volume of goods generated by the regions with a more developed secondary sector, and that generated by the less industrialised ones.

We next highlight two variables relating to the level of innovation, both in the resources invested in its development and enhancement (*Total intramural R&D expenditure*), and in the results obtained (*Patent applications to the EPO*). In this sense, it is important to emphasise that one of the priorities of the Europe 2020 Strategy is to favour smart growth by means of more effective investments in education, research and innovation (European Commission 2011), something that is not being achieved in the regions of Spain and Portugal, to judge by the above results.

The fact that these two variables are among those of greatest power of discrimination means that appreciable disparities exist among the regions analysed, which will require the efforts of the Community Regional Policy to be directed in the next program period, 2014-2020, if it is desired to achieve this objective.

TABLE 3 RANKING OF PARTIAL INDICATORS BY VALUES OF THE IVANOVIC-PENA OVERALL INFORMATION COEFFICIENT IC(I). 2012

Variable	Ivanovic-Pena Overall Information Coefficient IC(i)
Annual road freight transport by region of loading (Tonnes per inhabitant)	0.80
Patent applications to the EPO (average 3 years)	0.79
Total intramural R&D expenditure	0.57

Victims in road accidents per million of inhabitants	0.43
Persons aged 25-64 with tertiary education attainment (%)	0.36
Persons aged 30-34 with tertiary education attainment (%)	0.24
Early leavers from education and training by sex (%)	0.22
Unemployment rates (15 years and over)	0.21
People at risk of poverty or social exclusion (Percentage of total population)	0.20
Waste generated (Thousands of tonnes per inhabitant)	0.19
Gross domestic product (GDP) in PPS per inhabitant	0.16
Employment rates of the age group 20-64	0.07
Life expectancy at birth	0.04

Source: Author based on Eurostat data.

Together with the foregoing two variables, high values in the IC(I), are also presented by three variables relating to education: Persons aged 25-64 with tertiary education attainment (%), Persons aged 30-34 with tertiary education attainment (%) and Early leavers from education and training by sex (%).

These results tend to reinforce the need to invest in education, as a factor driving the smart growth to which the Europe 2020 Strategy alludes, and which in turn is connected with the results obtained in research and innovation. These are therefore factors of great importance in the synthetic indicator DP_2, being determinants of the degree of economic and social cohesion reached by the regions analysed.

Finally, Employment rates of the age group 20-64 and Life expectancy at birth, are partial indicators with a lo discriminatory power and rank last in the final classification of the regions (Table 3).

4. Conclusions

The European Community Regional Policy arose from the need to reduce the territorial disparities within the Union, as the process of expansion towards new countries with lower income levels advanced, requiring a supplementary effort to standardise internal cohesion in social and economic matters. In the mid-1980s, coinciding with the incorporation of Spain and Portugal in 1986, the Single European Act was signed, including for the first time the objective of achieving economic and social cohesion among the European regions, as a key element in guaranteeing the success of the European integration process in the face of substantial interregional inequalities.

In this sense, the main contribution of this paper has been to draw up a synthetic indicator to enable measurement of the degree of economic and social cohesion among the regions of Spain and Portugal, using for the purpose the variables or partial indicators defined by the European Commission to moni-

tor them. This methodology constitutes a novelty with respect to other earlier studies carried out to measure interregional economic and social cohesion.

As set out in the course of this paper, the P_2 distance method of Pena Trapero permits integration of a large number of variables expressed in different measurements, eliminating the duplication of information and their arbitrary weighting. Also, from the mathematical point of view, it fulfils a series of properties desirable in a synthetic indicator, making it more suitable than other multivariate methods of aggregation (Somarriba and Pena 2009a).

The results obtained have implications for the future of the Community Regional Policy, in that it will be necessary to redefine development strategies in a scenario of budgetary containment, to achieve greater effectiveness in the objective of reducing regional disparities and strengthening economic and social cohesion. As has been shown, notable differences exist among the regions of Spain and Portugal according to the indicators of cohesion analysed, only a year from the next program period, 2014-2020, and not yet having culminated the negotiation phase.

The synthetic indicator DP_2 that we have constructed has revealed a distance of more than 10 points between the best and worst positioned regions. The Autonomous Cities of Ceuta and Melilla occupy the last places in the ranking, and paradoxically, were classified as *phasing out* regions in 2006, on the basis of per capita GDP, in line with the concerns raised by Del Campo et al. (2008).

According to the values taken by the synthetic indicator, with data mostly from 2011 and 2012, Ceuta and Melilla find themselves today in a worse socioeconomic situation than at the start of the current program period, 2007-2013, which will require greater resources in order to accelerate their convergence with the more developed regions in the coming years.

Furthermore, our synthetic indicator has made manifest the great contrasts existing between the regions of the north of the peninsula and those of the centre-south and the so-called ultra-peripheral ones, in line with the conclusions of the work by Lahusen (2013). The most advanced regions are located in the north-west of Spain, with the exception of those containing the capitals of the two countries (Community of Madrid, and Lisbon), located in the centre.

Notable among these regions are the Principality of Asturias, and Galicia, which appear among the top ten places of the indicator DP_2, despite receiving funds in the current program period towards the Convergence Objective.

The analysis of the power of discrimination of the variables included in the synthetic indicator DP_2 has revealed that the most discriminatory are those relating to the smart growth objective established in the Europe 2020 Strategy, specifically research, innovation and education. Also, the variable presenting the most disparate values among the regions of Spain and Portugal has been *Annual road freight transport by region of loading,* which is associated with the regions' degree of industrialisation (Koliousis, Koliousis and Papadimitriou 2013).

In the current context, after several years of economic recession in most countries of the European Union, and with important pending challenges marked in the Europe 2020 Strategy, the design and implementation of ap-

propriate and well-focussed actions and measures is required, to generate the greatest impact in terms of results, with the lowest budgetary cost possible.

The study that we present has revealed significant disparities among the regions of Spain and Portugal, in line with the concerns raised by Viegas and Antunes (2013), thus demonstrating that the objective of economic and social cohesion inherent to the project of European integration is not being attained entirely.

Finally, our study has delimited the dimensions or areas of development in which the efforts of the CRP should be concentrated, in line with the conclusions of the work by Puga (2002) and Cuadrado and Marcos (2005), since they are those that register the most substantial disparities between regions, and contribute with greatest intensity to achieving a more uniform economic and social cohesion.

These areas are directly connected with the objective of intelligent growth set in the Europe 2020 Strategy, and focus on R&D and innovation, on creating a universal education of quality that will allow the population to achieve high qualifications, and on continuing to reduce the regional disparities in per capita income levels.

Consequently, we propose that priority should be given within the cohesion funds for the coming period, 2014-2020, to actions and measures bounded in the areas identified in our study, alongside others that could be contributed by future studies with similar objectives. A crucial part of this process is the collection and use of evidence and options and on what works and what does not, with a particular focus on the work that should be done in advance of implementation (OECD 2008).

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