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Sustainability in the trans-border regions? The case of Analusia – Algarve

Abstract

The goal of this work is to detect the basic characteristics of the development of the southern border between Spain and Portugal.

This trans-border area is described and analyzed comparing the region of Algarve, in Portugal and the region of the County, in Huelva, Spain. The method used 15 quantitative indicators, desegregated at municipal level, obtained from different official sources and applied to 30 municipalities. The analysis includes multivariate statistic methods.

The conclusions show that those indicators related to national governance systems are of utmost importance in the cluster classification. Furthermore, those municipalities with higher development levels are also less sustainable from the environmental point of view – this is probably due to the fact that tourism supports the fragile socio-economic systems in many of such regions. Significantly, the clustering tendencies show that the Portuguese municipalities are tourism oriented (or less tourism oriented) and the Spanish ones are agri-business (or less agribusiness oriented). Lastly, such geographic structures seem to have its roots in long term paths of development.

Key Words: Sustainable Development, Spain, Portugal, Trans-border Regions

1. Introduction and justification

During the last century, Western economies have had an average growth of 2 percent per year, yet there is a clear discrepancy in economic performance of different European regions, calling for the cohesion goal as a priority of the European Commission. All over Europe, the border regions of the different countries have been the focus of regional policies, tending to catch up specific financing and cooperation programs (exp. INTERREG) for proposes of sustainable development. Still, most of such areas differentiate from others by the existence of growing imbalances. They may be defined as *lagging* with, at least, three types of bottlenecks to be overcome: their relative peripheral location, their structural atrophy and their lack of coherent and integrated development strategies from the part of the stakeholders at national, regional or local levels.

Yet, in such cases, plenty of challenges could be settled on a basis of different market structures or different regional/national cultural backgrounds to get advantages for growth and development. Those regions that form the border between Portugal and Spain and, in particular, those to be the object of this study are included in this group.

In this type of regions, most of the development processes, normally driven by technological change, do not occur simply. As argued in Stough and Nijkamp, 2009, their governance systems incorporate *filters* blocking knowledge spillover effects or positive entrepreneurial attitudes towards investment and innovativeness. A possible interface between the institutional and the historical context may be decisive for the territorial atrophy but, at the same time, it constitutes the only platform to push further the learning processes. That is why, frequently, in peripheral areas or lagging regions the dynamics of regional development is also deeply related to the strategic choices of a few successful firms or a few local leaders.

But, lagging regions, peripheries and trans-border areas also require as incentives for technological change and innovation a particular attention for the environment, in addition to the intrinsic ability of companies to compete. The article by Cheshire and Malecki, 2004, clearly points out the importance of diversity in promoting local innovation systems as a key factor for development – enabling regional economies of opportunity and intensifying

external relations. A good example on this can be presented by the signals given by the intensification of scientific and business exchanges (Lester, 2006).

However, not being particularly attractive to business, it is expected that institutional arrangements in such areas may play a founder role in the development process. But are institutions here located effectively able to play this role?

Press, 2007, illustrates the differences between firms individually acting or collectively interacting with results that suggest more stable productive processes for the last ones, acting under the impulse of collective local cultures. This view had already been introduced by Vaz et al., 2004, in earlier studies.

The previous group of arguments was applied by Vaz and Neto, 2005, to present cases of research and development carried out on the trans-border region of the Alentejo (Portugal) and Extremadura (Spain). The examples confirmed, amongst others, the increasing relevance and the leading role of the regional stakeholders in the development process of lagging areas.

European integration proclaims the development of dynamic forms of interdependent adjustment: meaning a macro economic convergence accompanied by integration at regional level, cooperation among actors as well as excellent firms' performances at micro-levels of production, consumption and distribution. But, how do southern European regions contrast in achieving such a broad-band goal?

The differences by country that can be observed in this study are an example of the different influences that cultural and historical structures have had upon local and regional development. These macro-structures impose on the local economic organization criteria as noted by Parr, 1987. Also, it has been accepted for several decades that the models and behaviors related to the "classic" development concept cannot progress continuously and indefinitely (Catton and Dunlap, 1978). However, those clear advances in the development strategies required for promoting a sustainable development in peripheral, lagging or less developed areas did not take place so far.

A wide reflection is necessary which is able to incorporate the socio-cultural and environmental dimensions of development, balancing the concept of "classic" development. This imposes a new and necessary scenario, key for strategic development. Inevitably, local production, local forms of distribution, traditional ways of interpersonal relations, skills and abilities that characterize a municipality or region are issues to be better addressed (Vázquez Barquero, 1997). Few other different studies approach these dimensions: Aguado and Nicieza 2008, Cracolici, Cuffaro and Nijkamp 2008, Engelbrecht 2010, Fernández and Rivero 2009, Jha and Murthy 2003, Morse 2003, Morse, McNamara and Acholo 2004, Mukherjee and Chakraborty 2010.

In this context, the goal of this work is to detect the basic characteristics of the development of the southern border between Spain and Portugal.

In Noronha Vaz et al, 2003, a study was undertaken on the general global conditions of regional attractiveness of rural areas in the southern Europe. After having identified a set of indicators of regional attractiveness, the authors classified all the southern European regions (Italy was excluded due to data inconsistencies) into three groups. Table 1 shows the groups of regions formed on the basis of their characteristics of attractiveness for businesses: In a first group, the conditions of attractiveness to business are inadequate; in a second one, some potential for growth seems to start indicating medium attractiveness; and, finally, the third group shows to have successful conditions to establish corporate structures and keep them self-sustaining and stable.

Algarve and Andalusia, the selected regions for the present study, are included in two of those clusters or, in others words, they situate at different levels of attractiveness to business and have contrasting socio-economic and governance structures.

The group of regions that belong to the first *cluster*, where Algarve is included, exhibits low accessibility by roads or railways. In many areas in the interior, its low population density combined with a lack of large urban centers has led to the loss of population density and a low investment level of private activities; here, and contrarily to the rest of the Algarve region, tourism as an activity represents an exception. With regard to R&D activities as a basis to evaluate prospect for innovativeness, these are basically supported by the public sector, with minor private participation. In this group of regions, a poor training of the

workforce may have serious implications when considering the growing demand for attributes of flexibility and professional qualification in business as a factor in regional attraction. On the other side, a situation of vicious cycle is being generated by the lack of stability obtained by jobs with superior qualification. Indeed, this frequent problem should be considered as a symptom of an immature business environment not yet ready to absorb permanent and well paid staff with more advanced skills.

Table 1

Territorial systems for the regions of southern Europe

Cluster 1 Inadequate conditions	Cluster 2 Potential for growth	Cluster 3 Successful conditions
Anatoliki Makedonia, Thraki	Attiki	Champagne-Ardenne
Kentriki Makedonia	Galicia	Picardie
Dytiki Makedonia	Asturias	Haute-Normandie
Thessalia	Cantabria	Centre
Ipeiros	Pais Vasco	Basse-Normandie
Ionia Nisia	Navarra	Bourgogne
Dytiki Ellada	Rioja	
Sterea Ellada	Aragón	
Peloponnisos	Madrid	
Voreio Aigaio	Castilla-Leon	
Notio Aigaio	Castilla-La Mancha	
Kriti	Extremadura	
Baleares	Cataluña	
North	Comunidad Valenciana	
Centro (P)	**Andalusia**	
Alentejo	Murcia	
Algarve	Canarias	
Azores	Lisbon and Tagus Valley	
Madeira		

Source: Noronha Vaz et al, 2002

The second observed group includes Andalusia and consists of regions that benefit from good access roads, particularly roads and larger urban centers that have maintained their population density. It is very important to note that in these regions, the effort in R&D is significant and the firms located in this group are aware of the fundamental importance of R&D, showing signs of wanting to integrate such activities in their own production processes. Besides public institutions, several technology centers provide useful results to streamline businesses (the Instituto Andaluz de Tecnologia is a good example). Also in this case, the extremely high values in advanced training in higher education, often relatively wasted should be considered. Curiously, for this group of regions the previous phenomenon is associated to a lack of training of the general population.

In order to achieve the main goal of this work the previous results will be observed in deeper detail by detecting the major characteristics of these two different profiles, in terms of development and sustainability.

So far, the relationship between development and sustainability has not been clearly raised up in this study. However, the issue is of utmost importance for Algarve and Andalusia, both located in a unique ecological system of the Mediterranean region and, in certain areas, frequently exposed to mass tourism.

The concept of sustainability such as defined by the Brundtland report, 1987, gave place to many studies related to regional sustainability (Giaoutzi and Nijkamp, 1994, Gutman, 2007 or Wallis et al., 2007). In general, these studies have been excellent contributions to a better understanding of the concept but remained incomplete in what concerns the clarification of the measurement criteria for judging sustainable development. These require not only interdisciplinary research but also the inclusion of environmental, ecological and social factors in the analyses. As Batabyal and Nijkamp, 2009:11, some important questions are challenging further analyses: *How can green regional product accounts be designed in order to pay the due attention to local and regional information needs? Is there a trade-off between regional economic growth and regional environmental quality?*

The present study provides some insights for future empirical research and therefore, contributes to answer these and other questions.

2. Material and Methods

Our sample is composed by two trans-border regions with some common practices and some very distinct behaviors, corresponding to thirty municipalities: in the Spanish region known as The County[1](Huelva, Spain): Almonte, Bollulos Par del Condado, Bonares, Chucena, Escacena del Campo, Hinojos, La Palma del Condado, Lucena del Puerto,

1The region known as *The County* does not appear as a territorial demarcation with its own administration. It is a group of municipalities interconnected both historically and culturally and thus recognized by the local population. They are only institutionally related as far as the common managing of some resources or interests are concerned. This explains that, according to our sources, we find some municipalities that can or cannot be part of this region.

Manzanilla, Niebla, Paterna del Campo, Rociana del Condado, Villalba del Alcor, Villarasa; In the Algarve (Portugal): Albufeira, Alcoutim, Aljezur, Castro Marim, Faro, Lagoa, Lagos, Loulé, Monchique, Olhão, Portimão, São Brás de Alportel, Silves, Tavira, Vila do Bispo and Vila Real do Santo Antonio (VRSA).

The Spanish municipalities are laid in a west to east longitudinal axis by the A49 Huelva-Seville highway. The strategic situation of this region is based on its geographic proximity to Seville, the capital of the Autonomous Community of Andalusia. The highway is its longitudinal axis of road communications, which connects the province of Huelva with Seville and the rest of Andalusia to the east, and with Portugal to the west. Likewise, the network of local roads is in good condition, and the Huelva-Seville railway line crosses the region. Among the various options for future transport links is the Huelva-Cádiz motorway, departing precisely from the *El Condado* A-49 junction. This motorway would go round the south –west of Seville therefore improving the communications of the region with the area of Seville known as *Aljarafe Sur*, the lower Guadalquivir and Cádiz Bay; three areas of a high commercial, agricultural and industrial density, respectively. Due to the proximity to Doñana National Park (a reserve of the biosphere), there is a seasonal tourism which only supplements an economy based on agriculture with an unequal structure, where areas of high-intensity farming can be found next to extensive agricultural ones.

The Portuguese part of the sample is completed by a total of sixteen municipalities of the Algarve. They occupy the southern part of Portugal, from the Spanish border to the most south-westerly part of Europe. This area is longitudinally crossed by the A22 highway and integrates the National Park of Ria Formosa, a protected area which located the Faro international airport as well as the University of the Algarve – the biggest regional employer and a very significant responsible for increases in residential construction in the surrounding area.
Algarve has a residential population of less than 400.000 inhabitants, but it touristic visitants may reach 2M visitants per year. This phenomenon started in the middle of the last century with Portuguese and English tourists and progressed continuously. Most of the economic activity is sector focused and the region has a clear dichotomy between interior and the see-border.

In the analysed trans-border region, less developed municipalities can be identified. Mostly, they are dependent of traditional and barely commercialised (or oriented towards consumption) activities. In general, activities are structurally p, little profitable and products have few added value. There is a relatively high risk of social exclusion with significant percentages of stagnating or in recessing population. Closed by, other municipalities have experienced a spectacular social and economic change in the last decades. Some are leaders in incorporating local resources to their development as well as being a beacon for both national and international immigrants.

The dataset used in this study was gathered from three official sources. The information relative to the Spanish region was compiled from the Municipal Information System of Andalusia (SIMA), which is part of the Statistics Institute of Andalusia. The information relative to the Portuguese region was gathered mainly from the National Institute of Statistics of Portugal. Information regarding the Portuguese job market was extracted from the database of the Institute of Entrepreneurship and Professional Training.

Due to the required the high level of desegregation, the data set has been selected under very restrictive availability conditions of both Spanish and Portuguese sources,. Furthermore, another determining factor for the analyses was the lack of comparable data for all the municipalities involved – both, in terms of measured concepts or in the collection of primary data.

The used variables are: population, net demographic growth, number of immigrants, waste production, water consumption, number of businesses, electric consumption, number of bank branches, volume of car sales, number of landline phones, hotels' capacity, number of households, income, number of marriages and unemployment. All the variables – with exception of population, net growth and demographic density – have been used as per capita values in order to meet comparability[2], adequacy and standardization criteria. This set of variable has submitted a factorial analysis, in order to contrast possible latent dimensions which transcend mere numeric indicators.

3. Results and discussion

2Differences in the sources: waste production (County 2007, Algarve 2005), water consumption (County 2001, Algarve 2006), number of businesses (County 2006, Algarve 2007), number of households (County 2001, Algarve 2006, number of marriages (County 2007, Algarve 2008).

Both the coordinated variables and the sense of the respective correlation, indicate the existence of what can be defined by a trend of *classical development* (CD), on one hand, and a lack of *sustainability*, on the other[3].

In the next Table 2, positive high correlation in all the variables, except in the case of the unemployment which correlates inversely, can be observed. The variables show a higher correlation pinpoint to environmental, waste production or use of resources aspects, and are followed by economies developed in a classical sense: cars, hotels and households. The variable less correlated with the factor (.138) is the number of landline phones – precisely the indicator with the lowest reference to the concept showed to us by the factor. Lastly, the value revealed by the unemployment factor and its negative sign, is also coherent in theoretical terms because when classical development is higher, less unemployment occurs in the concerned area.

Simultaneously to those variables showing a higher correlation with the factor DC, a few others were able to express a different trend – the environmental realm: waste production, water consumption and electricity consumption.

This particular result motivated a subsequent new factorial, looking for a trend of sustainable behavior. The sequential developed tests suggested a new factor: from now on defined as *degree of lack of sustainability* (INSOS as acronym). This indicator, also a future endogenous variable is combined of the three variables cited earlier, alongside the number of inhabitants per household. From a conceptual point of view, this variable is considered in the current investigation's geographical and historic context, to provide interesting information in line with the lack of sustainability of the municipalities[4]. Also in this case, correlation coefficients of the main components are very high.

3At this point, it becomes necessary to highlight that any subjacent dimension to data, as in the case of the ones shown here, is relative to the data compiled and the geographic areas selected for its study. Therefore, the positions of each municipality in such dimensions and their consequent indicators always have to be understood in relative terms.

4It concerns areas over which there are real-state interests, as well as having been object of a rapid urbanization process oriented towards the second-hand market (i.e.: the least environmentally sustainable type of urbanization and construction possible).

In order to contrast the relationship between the lack of sustainability of the municipalities' behavior and the classical format of development of the municipalities with the highest score in the relative scale created, the presence of indicators of lack of sustainability had to be eliminated from DC. By doing so, possible multicolinearity between DC and LOS (lack of sustainability from now on) was prevented. For this function, DC2 is expressed as in the next Table 4.

Table 2

The contribution of variables for Classical Development (DC)

Correlation of each variable with the dimension DC
DC
Urban waste kg/inhabitant
Water consumption m³/inhab.
No of businesses/inhab.
Electricity consumption kwh/inhab.
Volume of car sales /1000 inhab.
Landline phones /100 inhab.
Hotels' capacity/1000 inhab.
Households/inhab.
Unemployment rate/1000 inhab.

Source: own production

Main components method. Kaiser-Meyer-Olkin's measure of sample adequacy: .642, Sig. .000

Table 3

The contribution of variables for Lack of Sustainability (INSOS)

Correlation of each variable with the dimension INSOS
INSOS

Urban waste kg/inhab.
Household water consumption
Electricity consumption Kwh/inh.
Households/inhab.

Source: own production

Main components method. Kaiser-Meyer-Olkin's measure of sample adequacy: .679, Sig. .000

Table 4
The contribution of variables for Classical Development (DC2)

Correlation of each variable with the dimension DC2
DC2
Businesses/inhab.
Volume of car sales
Landline phones/100 inhab.
Hotels' capacity/1000 inhab.
Unemployment rate

Source: own production

Main components method. Kaiser-Meyer-Olkin's measure of sample adequacy: .521, Sig. .003

It can be observed that the correlations with the factor show coherence with the dimension initially defined ("classical development"), even extracting four out of the nine components which established it. Analyzing the interrelations between DC2 and LOS, we find a R2 Pearson's correlation coefficient of 0 .75, sig.000. This implies that the least unsustainable behaviors are more likely to occur in the more cases. Using the median as a division criterion in both distributions, we can observe a 66.6% of coincidences of cases. This is to say: there is a 66.6% of probability for a municipality which has achieved a relatively high score in an index, to do so in the other one or, equally, a municipality which develops just a slightly sustainable behavior is likely to develop the typical behavior of development in a classical sense.

Table 5
Distribution of the municipalities by quarters, according to their punctuations in DC2 and LOS

Quarter	DC2	LOS
4	Albufeira	Albufeira
	Loule	Almonte
	Lagos	Loule
	Portimao	Lagoa
	Lagoa	Portimao
	Faro	Paterna
	Almonte	La Palma
3	VRSA	Vila do Bispo
	Tavira	Lucena
	Vila do Bispo	Escacena
	Niebla	Rociana
	Aljezur	Lagos
	La Palma	Castro Marim
	Castro Marim	Manzanilla
	Sao Bras	Niebla
2	Manzanilla	Hinojos
	Silves	Villarasa
	Villalba	Villalba
	Bollullos	Chucena
	Olhao	VRSA
	Hinojos	Faro
	Bonares	Bollullos
	Lucena	Tavira
1	Rociana	Silves
	Monchique	Bonares
	Escacena	Aljezur
	Chucena	Sao Bras
	Villarasa	Olhao
	Alcoutim	Monchique
	Paterna	Alcoutim

4. Conclusion

Simulating two different clustering alternatives, two different solutions have been obtained. Solution 1 brings us the first interesting find: the distribution of the municipalities is made on a national basis. C1, C2 and C3 are Spanish and C4, C5 and C6 are Portuguese. This implies the existence of different structures of development that can be distinguished

according to the country in which they have taken place. They would be explained by historic, political, economic, social and cultural differences between Spain and Portugal, meaning a very high relevance for the governance systems and, eventually, other macro economic conditions.

Furthermore, in solution 1, C1 shows a cluster of municipalities in which agriculture prevails as the main sector of economic activity. Nevertheless, this is an agriculture which has evolved in the last two decades, having become more specialized and intensive due to investments in technology and infrastructure. These municipalities produce, fundamentally, strawberry and citrus fruit, having associated a complex agribusiness system and some export activities. On the other hand, C3 is a group of municipalities where an extensive and dry type of agriculture prevails and where traditional methods of farming are still followed. C2 includes just a municipality, *outlier*, which keeps mixed characteristics.

Solution 1 – clustering in 6 groups				
C1	C2	C3	C4	C5
Almonte	Chucena	Escacena	Albufeira	Alcoutim
Bollullos		Hinojos	Castro Marim	Aljezur
Bonares		Manazanilla	Faro	Monchique
La Palma		Niebla	Lagoa	Vila do Bispo
Lucena		Paterna	Lagos	
Rociana		Villalba	Loule	
		Villarrasa	Portimao	
			Silves	
			Tavira	
			VRSA	

The strong stability of this distinction based on nationality was aggravated when limiting the analysis to three clusters, in solution 2 – see below. In this case, all the Spanish municipalities clustered in CB1, while the Portuguese divided into two clusters CB2 and CB3

Solution 2 – clustering in 3 groups	
C1B	C2B
Almonte	Albufeira
Bolullos	Castro Marim
Bonares	Faro

Chucena	Lagoa
Escacena	Lagos
Hinojos	Loulé
La Palma	Portimao
Lucena	Silves
Manzanilla	Tavira
Niebla	VRSA
Paterna	
Rociana	
Villalba	
Villarrasa	

The Portuguese municipalities have a quite different profile as they display three different clusters. C4 includes touristic municipalities and respective influence areas, while C5 shows five councils of traditional inland society, culture and economy, still quite far from tourism influences. The C6 cluster represents also a set of *outlier* municipalities marked by other determinants such as a dispersing industrial policy in the case of Olhão or a slight trend to tourism as in Monchique or Alcoutim – but still a very traditional area.

This detailed observation of the trans-border region Andalusia – Algarve suggests at least three quite different governance systems that should motivate an analyses on which determinants are the most important to justify these distinct regional profiles: Regression or correlation analyses should be called to help in the next research steps. Unfortunately, for this application the number of the considered municipalities is not sufficient to get statistically significant values. Further results are expected by enlarging the analyzed sample.

All together, the conclusions show that those indicators related to national governance systems are of utmost importance in the cluster classification. Furthermore, those municipalities with higher development levels are also less sustainable from the environmental point of view – this is probably due to the fact that tourism supports the fragile socio-economic systems in many of such regions. Significantly, the clustering tendencies show that the Portuguese municipalities are tourism oriented (or less tourism oriented) and the Spanish ones are agri-business (or less agribusiness oriented). Lastly, such geographic structures seem to have its roots in long term paths of development.

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