



Extended abstract

EXTENDED ABSTRACT

Title:

Economic crisis and regional resilience in the Spanish Labour Market. A spatial perspective

Authors and e-mail of all:

Cueto, Begoña (bcueto@uniovi.es)
Mayor, Matías (mmayorf@uniovi.es)
Suárez, Patricia (suarezcpatricia@uniovi.es)

Department: Applied Economics

University: Oviedo

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Abstract: *(minimum 1500 words)*

1. Introduction

According to the OECD, strengthening economic resilience is a key policy priority in order to reduce the vulnerability of economies to crises at the same time that reinforce their capacity to absorb and overcome severe shocks while supporting strong growth. Martin & Sunley, (2015) have defined regional economic resilience as “the capacity of a regional or local economy to withstand or recover from market, competitive and environmental shocks to its developmental growth path” (p. 13).

In the review of the literature about regional resilience (or resilience in a general sense), there are different definitions and approaches. Following OECD recommendations, policy makers should design policies to improve the resilience of the regions. However, it would be helpful a more consensus on the definition. For instance, Martin and Sunley (2017) asserted that “if we are to put the idea of resilience meaningfully to work in regional policy agendas and practices, then we need to have a clear definition, conceptualization and understanding of precisely what it is we are trying to foster”. Recently, (Fröhlich & Hassink, 2018) analyse using bibliometric techniques if the resilience concept is “fuzzy” or it is suffering for “conceptual stretching”.

In this research, we focus on the behaviour of entrepreneurial activity in the Spanish regions. Given the emphasis in promoting self-employment during the last years, it is valuable to analyse how entrepreneurship contributes to the recovery after economic downturn and if it can limit the negative effect of the crisis. There are some previous contributions in the literature focusing on the analysis of the regional resilience in



Spain. For example, Cuadrado-Roura & Maroto, (2016) focused on the relationship between specialization and productivity in order to explain the economic resilience of some regions and the worse performance of other regions. Angulo, Mur, & Trívez, (2018) analyse the resilience of the Spanish regions considering three different concepts: adaptative, engineering and ecological resilience. They use shift-share analyse to measure the adaptative resilience and estimate a spatial panel model to analyze the “engineering/ecological resilience”.

2. Literature review

In the definition of economic resilience, entrepreneurial activity can play a key role (Martin, 2012; Martin & Sunley, 2015). Therefore, the analysis of determinants of entrepreneurial resilience can help to understand why some regions can retain a higher level of entrepreneurial activity than others. Williams & Vorley, (2014) state that entrepreneurship is critical to the restructuring and adaptation of local economies. It is a way of promoting diversification and capacity building, two features that characterize resilient economies. The authors conclude that “the diversity and flexibility of entrepreneurs represents an integral source of resilience to exogenous shocks and is also critical to an economy’s competitiveness and growth” (p. 260). Huggins & Thompson, (2015) study how community culture affects entrepreneurial resilience. The authors define ‘community culture’ as social structure and features of group life within localities. Their results suggest that openness and diversity of local community cultures are positively associated with the renewal and reorientation of local entrepreneurship in UK.

Therefore, a general objective of this paper is to study entrepreneurial resilience for the case of Spanish regions.

3. Regional Classification: a spatially influenced counterfactual

The first issue is to obtain a classification of the Spanish regions in terms of their capacity to react during the recession period (Recoverability) and their capacity (or not) to react and adapt after the economic downturn (Recoverability).

Martin et al. (2016) analyse how UK regions has reacted to the four major recessions in the last forty years. They focused in the measurement of the resistance and the recoverability using falls and increases of the indicator variable (employment) but they consider such as “a more convincing approach the comparison of these movements to expected or counterfactual falls and increases in the regions analysed”. (Martin, 2012) Fingleton, Garretsen, & Martin, (2012); Martin, Sunley, Gardiner, & Tyler, (2016) propose different alternatives to classify or identify the performance of each region in a certain time period. In this paper, we are going to compute these indices:

$$Resistance_i = \frac{\left(\frac{\Delta E}{E}\right)_i^{Actual} - \left(\frac{\Delta E}{E}\right)_i^{Expected}}{Abs \left[\left(\frac{\Delta E}{E}\right)_i^{Expected} \right]}$$

$$Recoverability_i = \frac{\left(\frac{\Delta E}{E}\right)_i^{Actual} - \left(\frac{\Delta E}{E}\right)_i^{Expected}}{Abs \left[\left(\frac{\Delta E}{E}\right)_i^{Expected} \right]}$$

Both indicators compare the contraction and expansion of a region in relation to a 'counterfactual' which is the national economy. The two measures are centred around zero giving a 2x2 configuration of resilience possibilities. Regions can have strong resistance (more than zero) and strong recovery (more than zero). These are the most resilient regions meaning that they destroy less employment than the national economy and they recover quickly. The least resilient regions are those with weak resistance (less than zero) and weak recovery (less than zero) meaning that they destroy more employment than the national economy and they have a slow recovery. Obviously, we can also have regions with strong (weak) resistance and weak (strong) recovery.

In addition to this preliminary analysis, the role of industrial structure is introduced in the analyse of regions reactions to shocks. To answer these questions, they apply a traditional decomposition technique (shift-share analysis).

Traditional shift-share analysis allow us to decompose the change in the number of employment and self-employment workers in three effects: national, sectoral and competitive effect.

$$E_{ij}^t - E_{ij}^{t-1} = E_{ij}^{t-1}r + E_{ij}^{t-1}(r_i - r) + E_{ij}^{t-1}(r_{ij} - r_i)$$

We compute the relative contribution of the sectoral and competitive effects during the last recession and recovery periods in comparison with the hypothetical regional growth (the counterfactual based on the national behaviour).

$$\frac{E_{ij}^t - E_{ij}^{t-1}(r_{t,t-1})}{E_{ij}^{t-1}(r_{t,t-1})} = \frac{ES_{ij}}{E_{ij}^{t-1}(r_{t,t-1})} + \frac{EC_{ij}}{E_{ij}^{t-1}(r_{t,t-1})}$$

These effects do not include explicitly the existence of spatial linkages between regions. The existence of these spatial linkages have been highlighted in the literature about regional and local labor markets (Patacchini & Zenou, 2007) so they should be incorporated in the analysis of the regional resilience.

On the other hand, Webber, Healy, & Bristow, (2018) analyze "the relative importance of the national growth path trajectories in the regional ones" using a multilevel regression analysis. If the influence of the nation as a whole may be considered in the analysis, the growth path of the neighbouring regions should also be incorporated in it.

Consequently, we propose the introduction of this spatial structure using spatial shift-share models (Mayor and López, 2008). The hypothesis is that one shock affecting the evolution of the employment in a certain region or municipality may also affect the employment levels in the neighbouring regions. This simultaneity should be incorporated at least in the empirical models to calibrate with a higher accuracy the regional response to recession and consequently obtain a good measure of their resilience.

Mayor and López (2008) developed a spatial shift-share decomposition based on Esteban-Marquillas (1972) where the concept of homothetic employment is computed based on the value that the magnitude of sector i in region j would have taken if the sectoral structure of j were similar to its neighbouring regions.

$$X_{ij}^v = \sum_{i=1}^S X_{ik} \frac{\sum_{k \in V} X_{ik}}{\sum_{i=1}^S \sum_{k \in V} X_{ik}}$$

A more complete option is based on the use of a spatial weights matrix. In this case the economic magnitude is defined as a function of the neighbouring values, and, therefore, the concept of homothetic employment would be substituted by the *spatially influenced employment*, which would be computed according to a certain structure of spatial weights (W) and the effectively computed employment for each region-sector combination.

The following identity would then hold:

$$\Delta X_{ij} = X_{ij}r + X_{ij}(r_i - r) + X_{ij}^{v*}(r_{ij} - r_i) + (X_{ij} - X_{ij}^{v*})(r_{ij} - r_i)$$

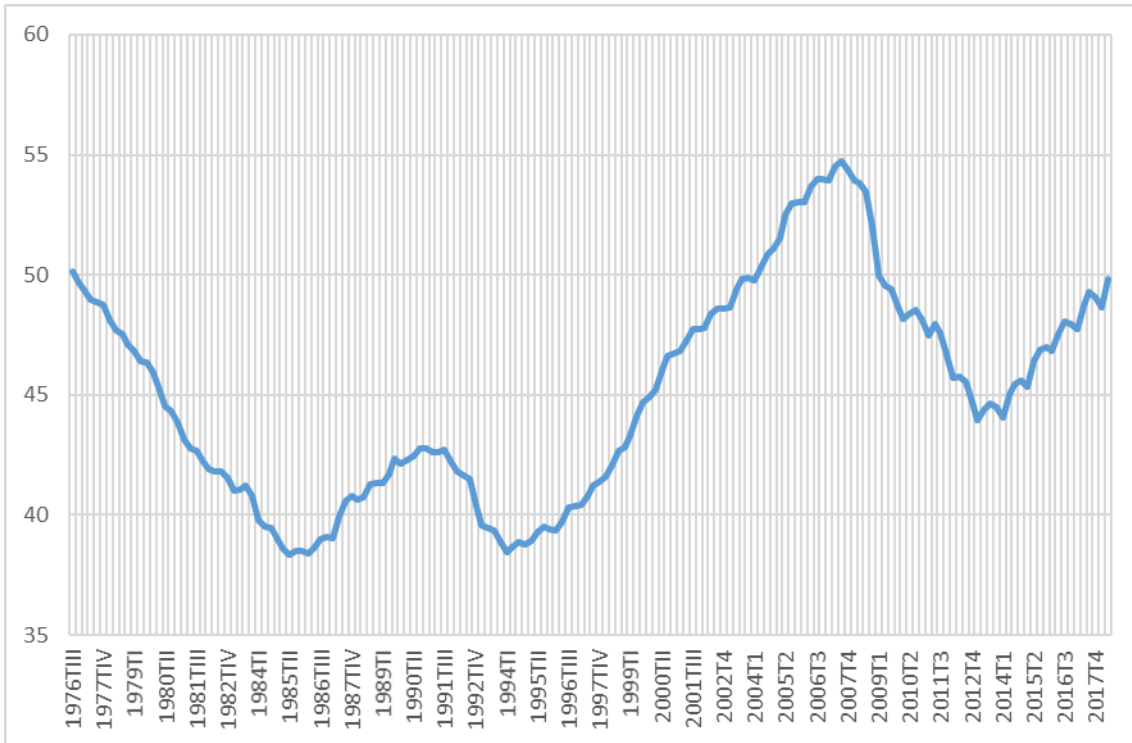
where the value of the magnitude is obtained from its neighbouring regions as:

$$X_{ij}^{v*} = \sum_{k \in V} w_{jk} X_{ik} \quad .$$

4. Data

In the following figure, we present the evolution of the Spanish employment rate for the period 1976-2017. There have been three main recessions namely 1976-1985, 1991-1994 and 2007-2013. The downturn of 1991-1994 was less severe than the other two in terms of job destruction.

Figure 1. Spanish employment rate. 1976Q3-2018Q2



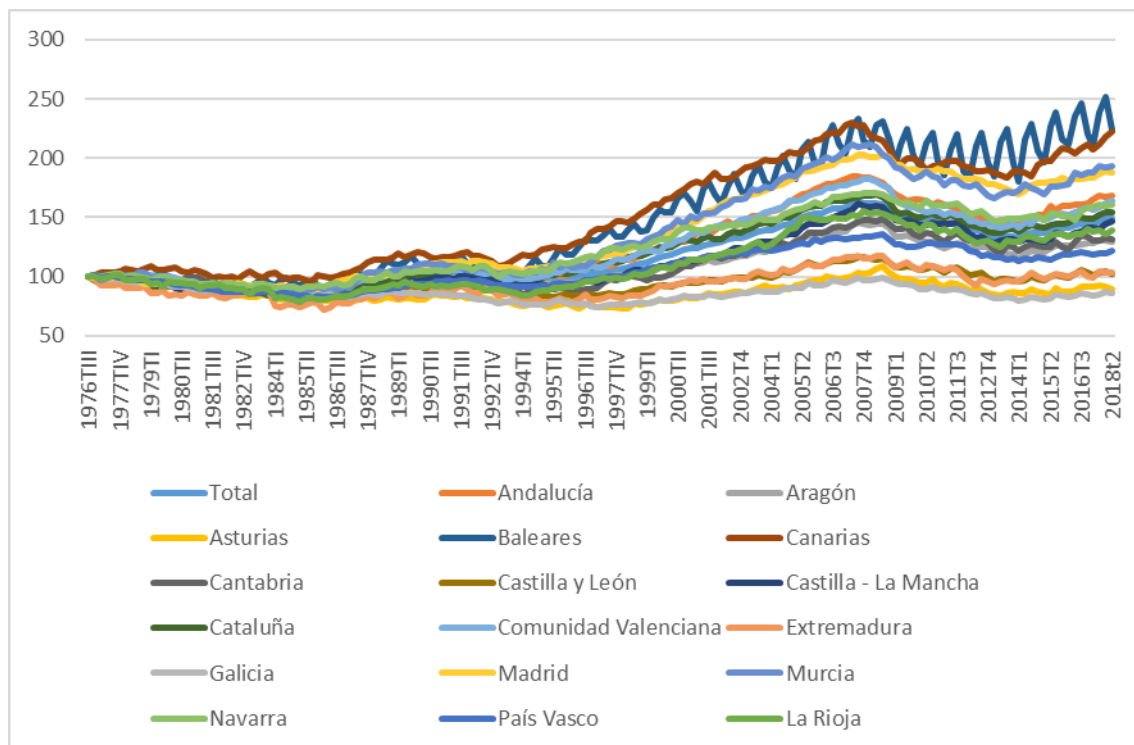
Source: LFS.

The series in Figure 2 suggest that the intensity of employment contraction have varied across regions. And, also, the speed and extent of the recovery are quite different. However, there are differences among the three recessions. During the first one, the evolution of employment was similar for all the regions. The recovery of that crisis

shows the beginning of divergence. Madrid, the East and the West recover quickly the pre-recession level of employment. On the other side, the North West keeps the level of employment of the crisis, only with a slight increase before the onset of the following crisis. In the same way, job destruction in 1991-1994 was similar for all the regions but, again, the recovery was quicker for the East, the South and Madrid. Employment recuperation was much longer for the West, the Center and the North East. In fact, these regions recover the pre-recession level of employment in 1999-2000, three years later than the former ones. Regarding the downturn of 2007-2013, the employment destruction was stronger for the South and the East than for the rest of the country. Moreover, the recovery is clear for these regions and for Madrid while it is still pending for the other regions.

Therefore, we can conclude for these figures that the impact of the recessions on employment is quite similar for all the regions while the recovery is quite different in terms of speed and intensity.

Figure 2. Employment in the Spanish regions (NUTS-1). 1976Q3-2016Q1



Source: LFS.

5. Empirical analysis

5.1. Classification

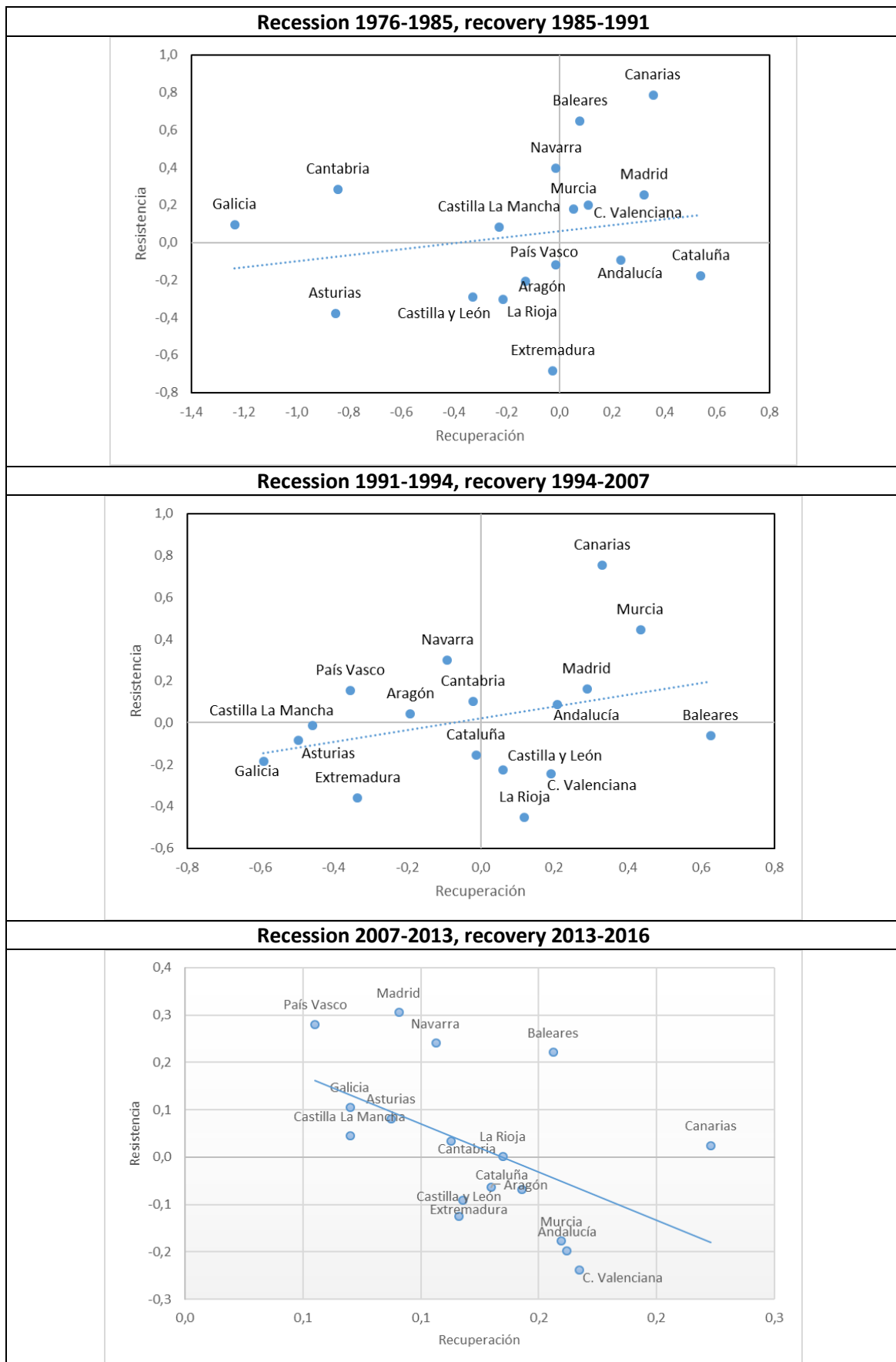
We have measured resistance and recovery following the equations by Martin et al. (2016). Both indicators compare the contraction and expansion of a region in relation to a 'counterfactual' which is the national economy. Regions can have strong resistance (more than zero) and strong recovery (more than zero). These are the most resilient regions meaning that they destroy less employment than the national economy and they recover quickly. The least resilient regions are those with weak resistance (less than zero) and weak recovery (less than zero) meaning that they destroy more employment than the national economy and they have a slow recovery.

This typology is shown in Figure 3 for each recession-recovery cycle. Apart from the last cycle, there has been a negative relationship between resistance and recovery across



regions, that is, regions that have been less resistant to recession have enjoyed the strongest recovery. This relationship is particularly strong in the case of the period 1991-2007. In the case of the last cycle, there is a different pattern, with a positive relationship between resistance and recovery. However, we have to take into account that job creation is still a weak process, meaning that the cycle is not complete.

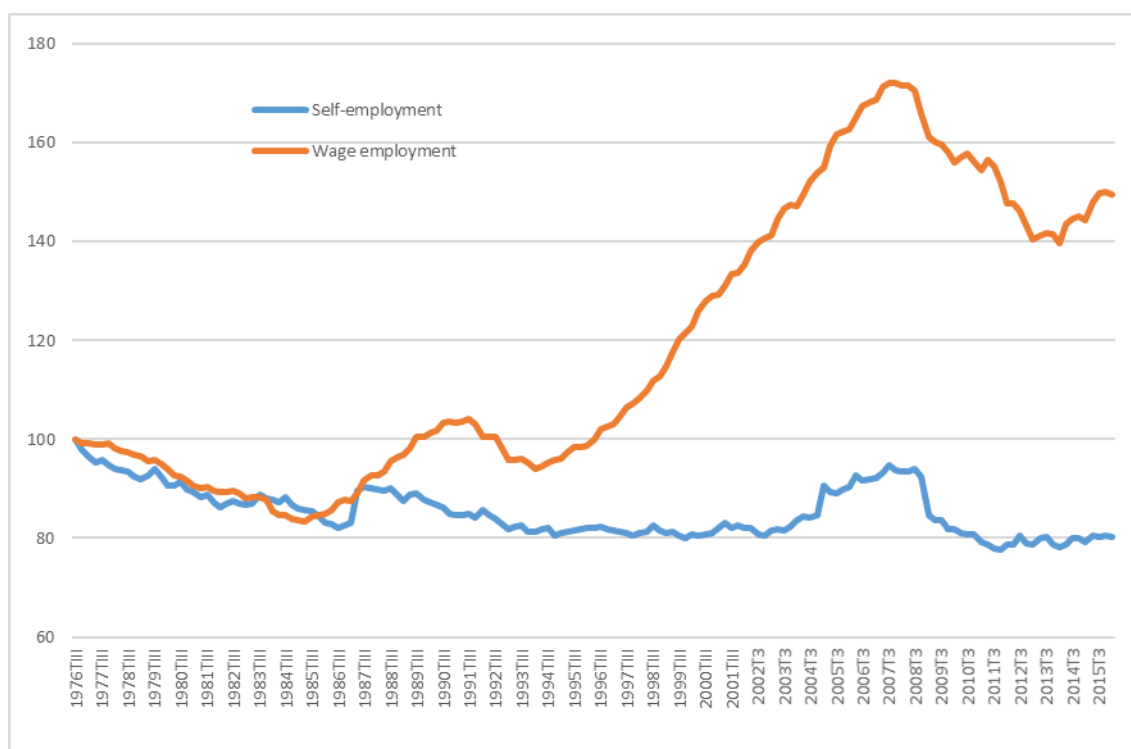
Figure 3. Regional resistance and recovery for the last three cycles



The most resilient regions are those with good resistance and good recovery while the least resilient are those with weak resistance and weak recovery. Then, we have obtained a general overview of the regional response (in terms of employment) during and after the different downturns, we focus on the role of self-employment in resilience and recovery. Specifically, we wonder about the existence of different spatial linkages between regions in terms of employment and self-employment. Entrepreneurship is characterized by a high degree of time persistence and spatial stickiness (Fritsch & Wyrwich, 2014) which may imply a lesser influence from the neighboring regions and/or the nation as a whole.

As it can be observed in Figure 4 the three main recessions -namely 1976-1985, 1991-1994 and 2007-2013- explained for the whole economy are not equally represented. Self-employment is more stable than wage employment, especially during the recovery period. Employment growth during the second half of the eighties was much lower in the case of self-employment. In fact, while a relevant increase in wage employment is observed, the number of self-employed workers remains stable or even decrease. In the same way, employment growth was really high for the case of wage employment from 1994 to 2007 while, only at the end of this period, self-employment increases.

Figure 4. Employment in Spain by labour status, 1976Q3-2016Q1 (1976Q3=100)



Source: LFS.

Self-employment rates are quite different across regions. While in some of them self-employment rate is below 15% (Madrid), in other ones it is over 25% (Balears, Aragón, Galicia, La Rioja). Since self-employment is more stable than wage employment, those regions with high rates of entrepreneurship can have more resistance to recessions, although less speed of recovery. The analysis will allow us to explain the contribution of self-employment to resilience.

Regarding to the self-employment resilience in the Spanish province, we use the information from the Social Security database and these are the results in terms of resistance and recovery.

Figure 5. Regional resistance and recovery (Wage employment) using social security data during the Great Recession (Spanish Provinces)

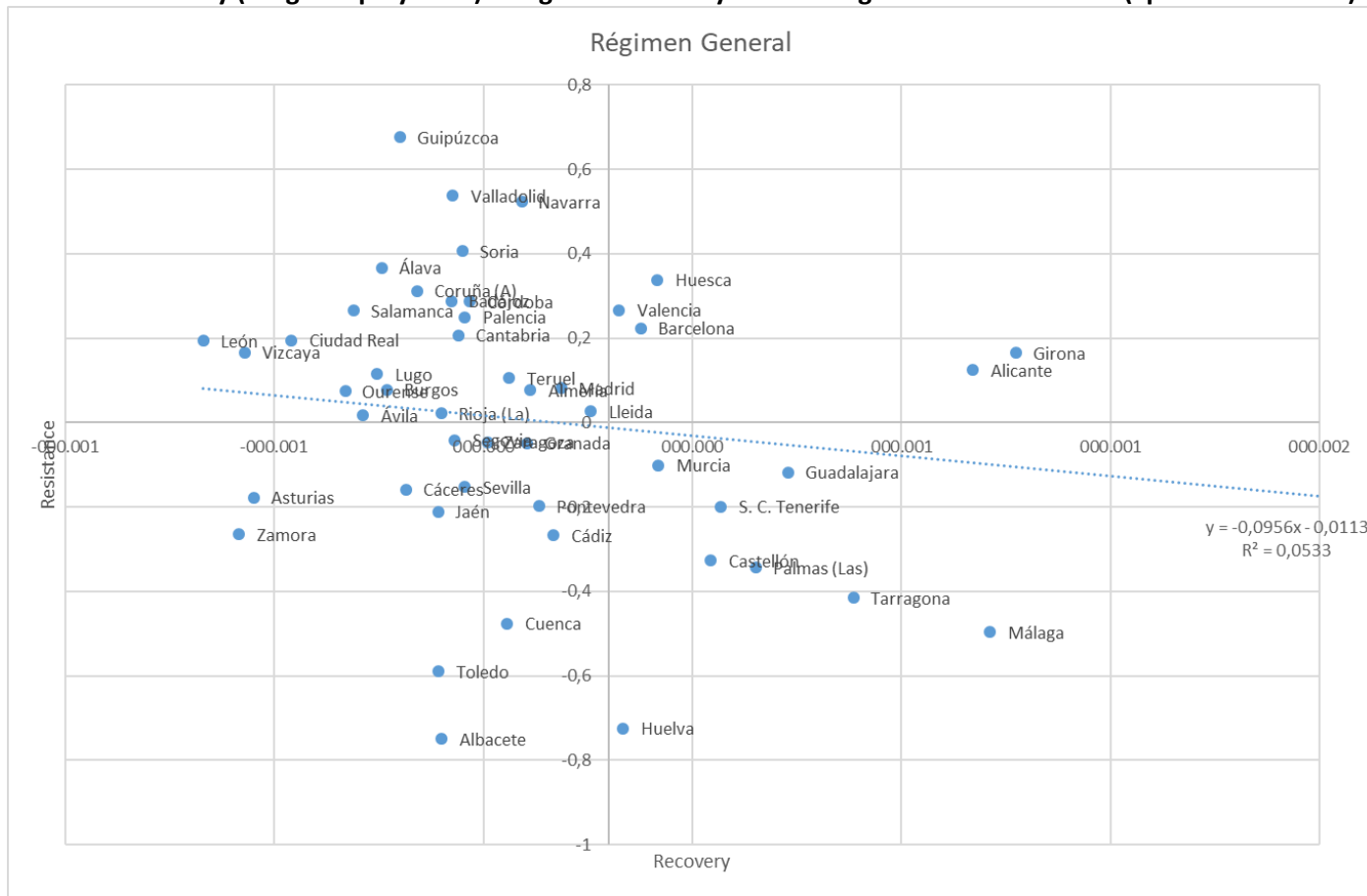
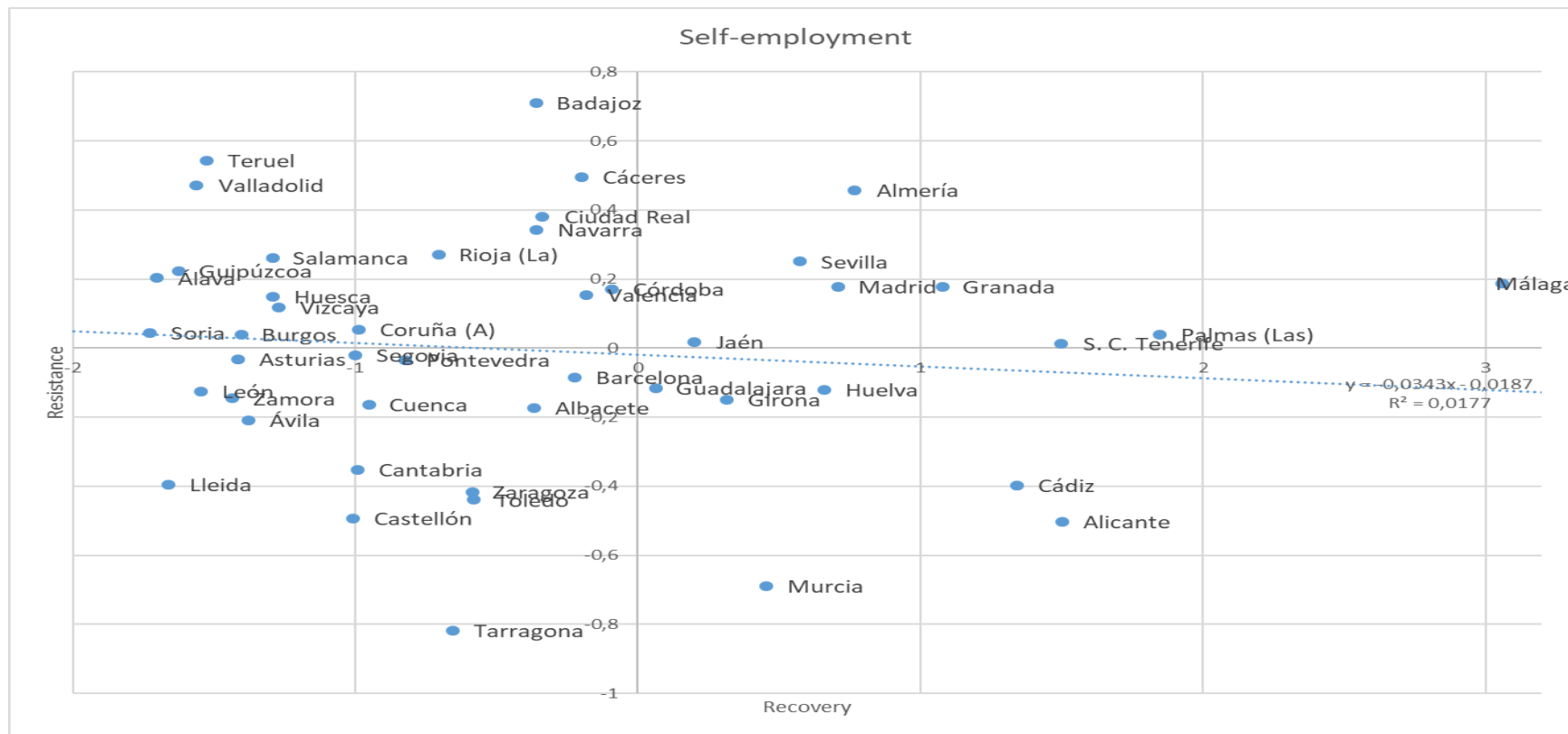




Figure 6: . Regional resistance and recovery (self-employment) using social security data during the Great Recession (Spanish Provinces)



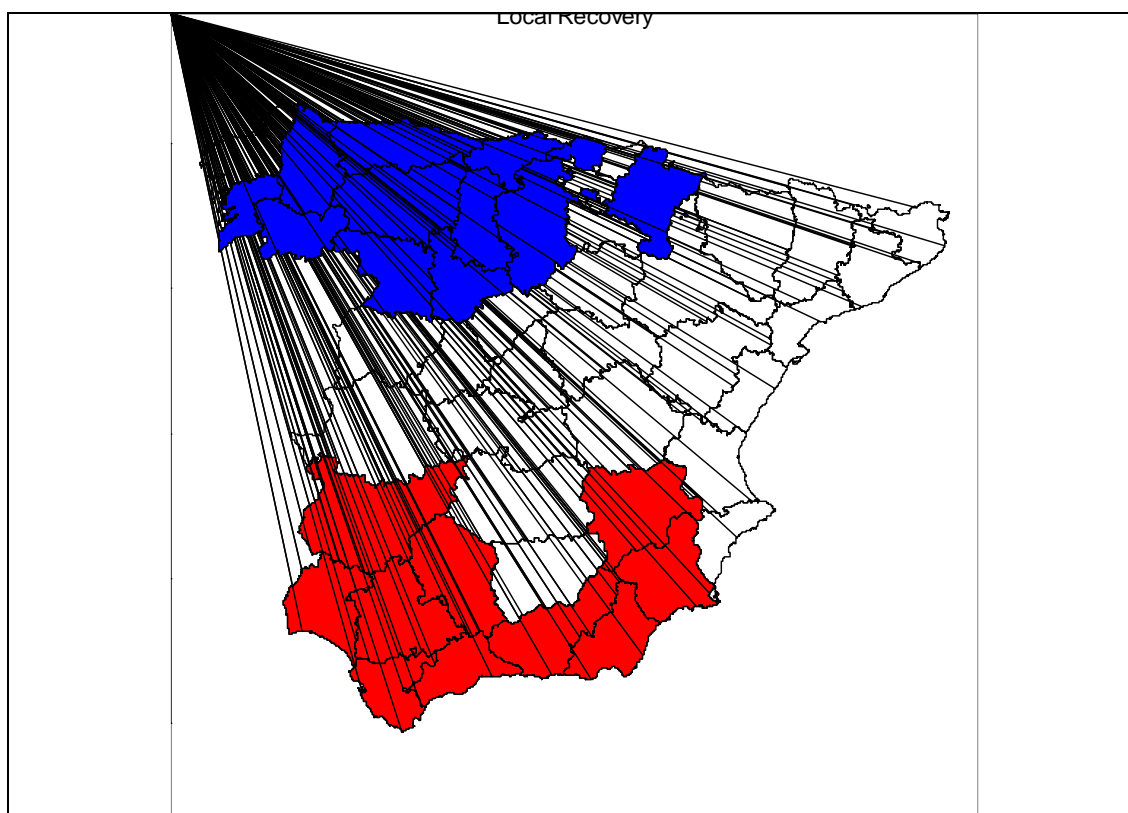
Source: own elaboration.

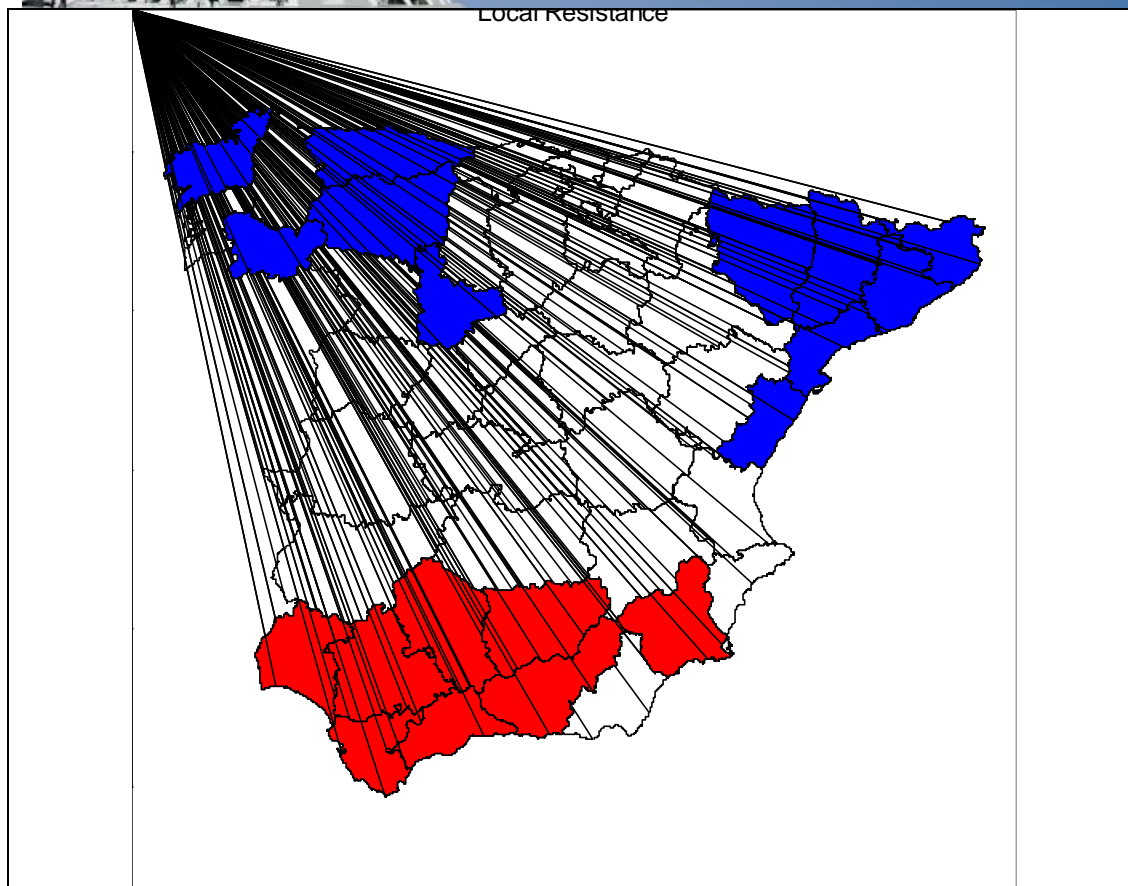
In both figures, we find a slightly negative relationship between the resistance and recovery indicators. In general terms, we found an important number of regions with a negative-negative combination. In the case of wage employment only five provinces show positive values in both index: Huesca, Valencia, Barcelona, Girona y Alicante. Also, it is remarkable that the provinces with a positive value in these indices are Balearic and Canaric Islands together with provinces of the south Spain (these regions are characterized by an important weight of the tourism activities in their economic structure).

5.2. Resilience determinants: a spatial modelling approach:

The second aim of this research is to analyse if there is any spatial pattern in this different behaviour of the Spanish provinces. Firstly, we analyse the existence of spatial clusters of regions considering the resistance and recoverability index which has been previously calculated. To do this we compute local spatial autocorrelation measures (LISA) and we detect a north-south division in the economic performance of the Spanish provinces (see next figures):

Figure 7 y 7: Local Spatial autocorrelation resistance and recovery





One of the differences between both figures is the poor evolution of the self-employment in Cataluña after the economic crisis. As it was said above, the positive evolution in terms of self-employment of the Andalucía's provinces could be explained by the higher weight of the tourism activities in this area.

Once, we have previously analysed the spatial pattern of these indicators we propose two empirical to determine if variables such as human capital or the specialization degree may explain these regional disparities. In both models we consider the existence of spatial pattern using a spatial econometric specification. In this case, we will only consider both global and the local spillovers, although the significance of global spillovers may only be determined by the omission of other spatially lagged explanatory variables (Corrado & Fingleton, 2012));

We propose a Spatial Durbin Model to collect a global spatial process and we also estimate models which only accounts for exogenous spatial spillover: the SDEM (Spatial Durbin Error Model), which includes spatial lags for the explanatory variables and the error term, and therefore nests the following models; the SLX (Spatial Lag of X), which only includes spatially lagged explanatory variables and whose estimated parameters should be unbiased despite the SDEM being the true model, since spatial dependence in the disturbances represents only an efficiency problem.

Table 1: Resistance-A spatial Durbin model

Type:	SDM			
Coefficients:	(asymptotic	standard	errors)	
	Estimate	Std.Error	z-value	p-value
(Intercept)	1.46559	2.44799	0.5987	0.54938
K8	1.62804	0.70884	2.2968	0.02163
LQ08	3.48351	3.19895	1.089	0.27617
lag.K8	-2.45502	1.102	-2.2278	0.0259
lag.LQ08	13.44799	7.39525	1.8185	0.06899
Rho:	0.46505,	p-value:	0.0046225	
Impact measures (mixed, trace):				
	Direct	Indirect	Total	
K8	1.475705	-3.021618	-1.545913	
LQ08	4.835400	26.815326	31.650727	

Table 2: Resilience-A SLX model

Impact measures (SLX, estimable):			
	Direct	Indirect	Total
K8	1.343581	-2.903563	-1.559982
LQ08	5.369756	18.360905	23.730661

Table 3: Recoverability-A Spatial Durbin Model

Type:	SDM			
Coefficients:	(asymptotic	standard	errors)	
	Estimate	Std.Error	z-value	p-value
(Intercept)	2.582486	2.252429	1.1465	0.25157
K12	0.890869	0.653376	1.3635	0.17273
LQ13	-1.889081	3.297311	-0.5729	0.5667
PARO	0.039071	0.021026	1.8582	0.06314
lag.K12	-2.374337	1.019235	-2.3295	0.01983
lag.LQ13	5.541815	7.773962	0.7129	0.47593
lag.PARO	0.04667	0.055139	0.8464	0.39732
Rho:	0.48446,	p-value:	0.0046075	
Impact	measures	(mixed,	trace):	
	Direct	Indirect	Total	
K12	0.70527889	-3.5828047	-2.8775258	
LQ13	-1.44709861	8.5324172	7.0853186	
PARO	0.04533723	0.1209762	0.1663135	

Table 4: Recoverability- A SLX model

Impact measures (SLX, estimable):

	Direct	Indirect	Total
K12	0.69106328	-3.61320128	-2.9221380
LQ13	-1.38087948	4.27789870	2.8970192
PARO	0.04411052	0.05914998	0.1032601

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