Resilience and economic crisis: typology for Autonomous Communities, based on the profit rate (1965-2011)

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ABSTRACT:

The concept of resilience originates in the field of psychology and environmental sciences, and is resumed for economic analysis from the Great Recession on. Extreme situations (from the psychological sphere) or adverse ecological conditions (under the environmental prism) find, in economic terms, their expression in the negative shocks caused by economic crises. The paper attempts to establish systems for the evaluation of periods of crisis based on the classic analysis of the behaviour of surpluses and the rate of gain as the most appropriate variables that allow us to estimate the capacity of resilience of regions in Spain during periods of crisis, over a long period of time (1965-2011), in order to resist / preserve their productive structure or to recover / adapt to change in the face of adversity. This is an alternative approach to other work on regional resilience based on the behaviour of employment, which enables us to avoid, in times of crisis, overestimations of resilience in those regions which have a very stable employment structure, excess burden of civil servants or the weight of more qualified workers on the part of large companies, as in the case of Madrid; or of underestimations of resilience in those of others which enjoy an extraordinarily flexible labour market, as in the case of the Balearic Islands, which is the leader in Spain in the use of very flexible contracts such as permanent intermittent (seasonal) contracts. As a result, this paper values the need to resume the classical applied economic analysis, based on the concept of surpluses and the rate of gain, as key variables to be retained for the analysis of periods of economic crisis and for an estimate of regional resilience.

JEL CODES: E01, N14, O47.

Resilience and economic crisis: typology for Autonomous Communities, based on the profit rate (1965-2011)[1]

1. Introduction

The concept of resilience originates in the field of psychology and the environmental sciences,[2] and was resumed from the Great Recession on for economic analysis (Fingleton *et alter,* 2012; Cellini-Torrisi, 2014; Di Caro, 2014; Martin-Sunley, 2014; Sánchez Hernández, 2014; Eraydin, 2015; Cuadrado Roura-Maroto 2016; Reig, 2016). What are considered as extreme situations (in the psychological sphere) or adverse ecological conditions (under the environmental prism), find their expression, in economic terms, in the shocks caused by economic crises. In this regard, the studies quoted attempt to establish evaluation systems that measure the capacity of regions to resist / preserve their productive structure or recover / adapt to change in the face of adversity. The first approach, underpinned by preservation, is a static conception of crisis and the competition of capitals, which does not break the stationary equilibrium of an economy; it is more typical of the approach undertaken from the mainstream. The second aspect, based on the criterion of adaptation, is more dynamic – Schumpeterian or lead time –[3], i.e. more typical of the evolutionist approach. This is the vision adopted in this paper in order to contribute to an unorthodox theory of innovation within economic analysis.

The resilience of a regional economy can be defined as its capacity to adapt better than other spaces to the economic difficulties caused by periods of crisis. This capacity is measured by the disparate behaviour between regions of the profitability of productive investments in crisis phases. The key indicator for measuring this capacity of resilience is the positive differential growth of the profit rate, which is explained by the better differential regional behaviour of its explanatory variables: the productivity of capital (π_K) and the share of gross operating surplus (q). These concepts are detailed in the first section of the paper; however, we should point out three methodological

[1] This paper forms part of the research project HAR2015-64769-P, led by Dr. Jordi Catalan Vidal. Our thanks to the Ministry of Economy and Competitiveness.

[2] In the sphere of psychology, resilience is understood as the human capacity to cope with and overcome extreme situations. For the environmental sciences, resilience is the biological capacity to adapt and prosper in adverse conditions.

[3] *Lead time* is a theory of evolutionary economics: it deals with the capacity of local productive systems to adapt to changes in demand and economic difficulties in the shortest possible time (Navinés, 1993a, 1993b).

considerations which are important for our research, as unlike other papers which base their analysis of resilience on the behaviour of employment, we do so in terms of the behaviour of surpluses and the rate of profit:

- Recovery periods are not taken into account, as in this case the resilience estimates based on the behaviour of employment or the differential profit rates may give rise to upward overestimations in the autonomous communities that benefit the most from the increase in regional public expenditure – including European operational programmes -, in public employment and in credit for the construction sector; or in an increase in national tourism demand. These factors occurred in phases of growth, especially throughout the final period (2000-2008) before the Great Recession. In this context, affirming that resilience has improved is a contradiction, as this type of assertion does not tie in with an improvement in production reflected by positive behaviour of the productivity of capital (π_K) and in many cases, there has not been an improvement in the profitability of productive investments either.
- In addition, we consider crisis periods only, which is where one can really evaluate the regional economic system's capacity for resistance to the negative effects of the economic crisis. We base our analysis of resilience not on the behaviour of employment, but on the regional differential of the gross operating surplus (GOS) and the rate of profit. This avoids the bias caused by the behaviour of the public sector, related to different employment growths. Likewise, we elude the differences in the stable structure of quality employment, derived from the presence of large companies, whilst avoiding regional overestimations of resilience in crisis periods, as in the case of Madrid. And at the same time, underestimations in those economies which profit from an extraordinarily flexible labour market are ignored, as in the case of the Balearic Islands which has always been the leader in flexible hiring based on permanent intermittent (seasonal) contracts.
- Notwithstanding the above, our focus may also cause overestimations in the examples in which the excess importance of production structures in public prices, such as energy, imposes an "artificial" overestimation of the gross operating surpluses and the rate of profit. This case may occur in regional economies with an excessive preponderance of non-manufacturing industry in their regional production structure, such as Extremadura.

The methodology used in this paper has been employed for other research, with the adoption of the profit rate and the productivity of capital as estimated essential cores, in the Spanish case, based on the BdMores database. Regarding this, the objective is to establish an index of resilience as an indicator that may be useful for regional economic analysis, although we are aware that more in-depth work needs to be done in this field of configuration of individual and synthetic indices in order to improve comprehension regarding the re-adaptive capacities of the regions. The research is organised in two parts, as follows: in the first section the determining concepts are presented which will be used in the explanations of the model of resilience applied to the autonomous communities, with essential emphasis on the notion of the rate of profit and the relation to the productivity of capital. The second section deals with the evolution of the profit rate of the Spanish economy, and for an extended period–1965-2011–, allowing us to identify the cycles of recession, or economic crisis; at the same time, the different typologies (up to eight different modalities) that can be detected are specified, based on the explanatory variables of the profit rate. In turn, the elaboration of the resilience indices is revealed, with the classification of the regions. Finally, the research conclusions offered in the preceding sections are compiled synthetically.

2. The rate of profit and the productivity of capital as key factors[4]

The rate of profit (r), defined as the ratio between the gross operating surplus (GOS) and the capital stock (K), can be expressed as a product of two factors:

- The first, the surplus share (q) that reconciles the gross operating surplus (GOS) percentage in the national income (Y); that is ($q = \frac{EBE}{Y}$).
- The second, the productivity of capital (π_K), the ratio that measures the relationship between the national income (Y) and the capital stock (K), i.e. ($\pi_K = \frac{Y}{K}$), so that:

$$r = EBE/K = Y/K * EBE/Y = \pi_K * q$$

In this mathematical expression of the profit rate, the productivity of capital (π_K) represents the main underlying trend of an economy, as it incorporates the technological change and innovation over time introduced by the investment of capital. Ultimately this determines the pace of growth of productivity of the production factors, of the

[4] For different applications of this model, see: for the case of the United States, Manera, Navinés and Franconetti (2015, 2016); and for the main European economies, Manera, Navinés and Franconetti (2017, 2018).

accumulation rate, of economic growth and of the profit level; whilst (q) acts as a countertrend of the productivity of capital (π_K). Thus, the surplus share (q), which shows the distributive dynamics of income amongst the production factors, informs us of the participation of salaries and profits in the national income, from which we can infer how the level of inequality evolves in an economy.[5] In this regard, when we speak of (q) as a countertrend of the productivity of capital (π_K), there is an indication that in the real economy a momentum of increase in inequality is materialising in favour of capital income, so as to be able to compensate for a drop in productivity (π_K), if one occurs.

Moreover, and following the works of P. Sylos Labini (1988) and F. Navinés (1989), we may observe that national income at the factor cost (Y) is equal to the sum of salaries (W) as compensation for the consideration of the labour factor (L) and that of the gross operating surplus (GOS), i.e.:

$$Y = W + EBE$$

$$\text{From which: } 1-q = W/Y = w^*/ \pi_L$$

And:

q = EBE/Y = gross operating surplus share;

W = income from work or total wages;

Y = national income at the factor cost;

L = employment;

w* = W/L = labour cost per worker or wage;

π_L= Y/L = productivity of labour;

Where: w^*/π_L also expresses the value of Unit Labour Costs (ULC).

At the same time, the condition of maintaining the share of the income from work in the national income, and therefore also that of the income from capital, is:

g (W/Y) = 1; a condition that is fulfilled if, and only if: g (w*) = g (π_L).

With (g) as the growth factor of these variables.

Thus, if the labour cost per worker or wage (w*) grows less than labour productivity (π_L), a distributive momentum of the factor income will occur in favour of

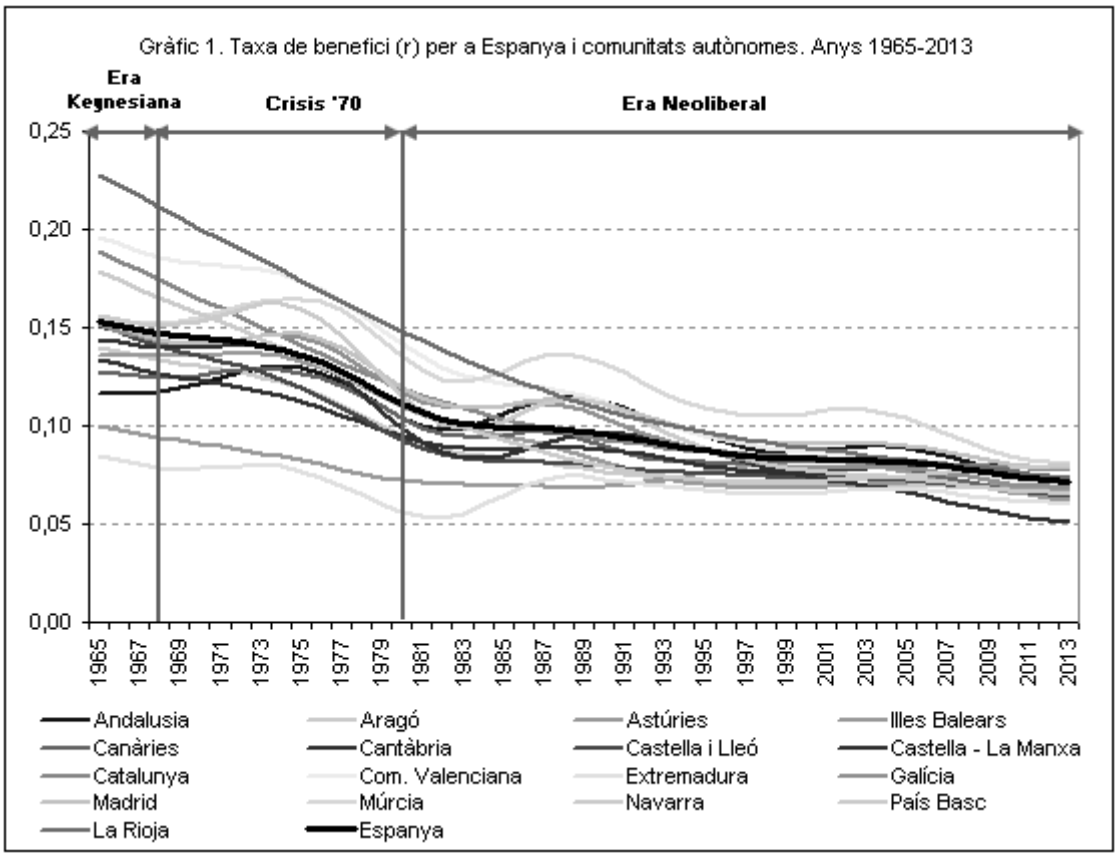
[5] The surplus is comprised of the income from property and enterprise. Therefore, the increase in the surplus will imply an increase in the income of people with greater purchasing power, as it is they who accumulate a substantial share of capital income. This in turn leads to an increase in inequality.

an increase in the gross operating surplus share (q); and the other way round if the growth rates of these variables are reinvested. Therefore, the maintenance of a certain distribution of income involves observing whether wages grow at the same rate as the productivity of labour (π_L).

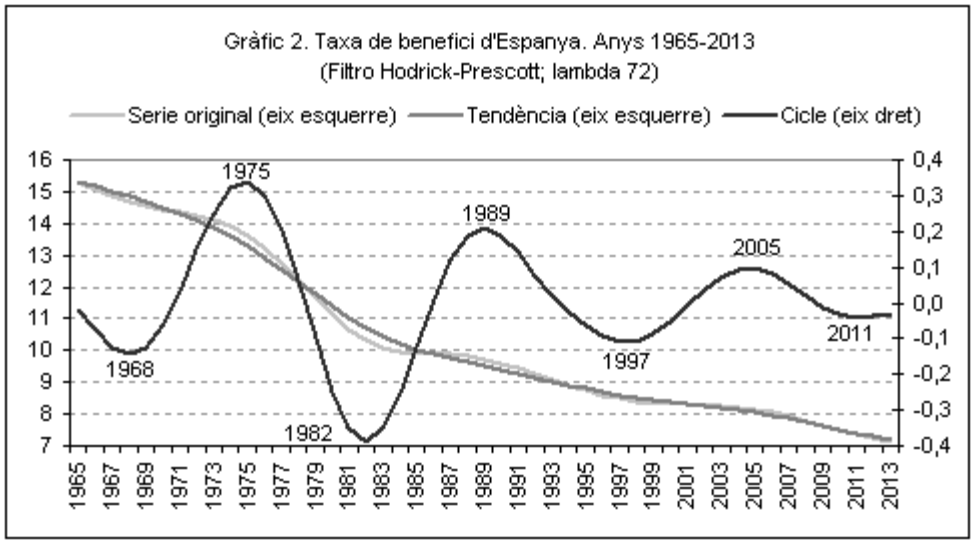
3. The rate of profit, crisis periods and application of the model of resilience

Based on the concepts expounded, and using the BdMores base for economic analysis as we propose, two determining diagrams have been drawn up with one objective: observing resilience linked to the evolution of the rate of profit based on identifying the crisis periods of the Spanish economy throughout the period 1964-2011. In diagram 1, the series trend of rates of profit (r) of the regions and the whole of Spain is presented. One can see a common, decreasing pattern of the profit rates from the end of the Keynesian regulation phase until the neo-liberal phase (Franconetti, 2016; Franconetti *et alter*, 2016), a process already detected for the United States and the big European economies in other research projects (Manera-Navinés-Franconetti, 2017, 2018). In this context, it is interesting to specify the recessive or crisis phases, which limit the timeline. In order to develop the cycle-trend analyses applied to the original series of the rate of profit of the Spanish economy, the Hodrick-Prescott filter has been used with lambda equal to 72 (λ=72),[6] and the signs of tendency and cycle represented in diagram 2 were obtained, enabling one to identify six periods: three of economic recovery (1968-1975, 1982-1989 and 1997-2005) and three of recession and crisis (1975-1982, 1989-1997 and 2005-2011). On the basis of this periodisation, one can define complete cycles with an average duration of 14 years, with periods of recover and of recession/crisis of 7 to 8 years.

[6] This method of selecting the lambda value (λ) can be consulted in the doctoral thesis of J. Franconetti, *Ensayo comparativo sobre el ciclo económico a partir de un enfoque clásico basado en la evolución de la tasa de beneficio, la distribución de la renta y la desigualdad social,* ["Comparative essay on the economic cycle through a classical approach based on the evolution of the profit rate, distribution of income and social inequality"], February 2016, UNED, Madrid.



Source: BdMores and the authors.



Source: BdMores and the authors

Having identified the recession periods, one can approach the regional resilience model for all of the autonomous communities.[7] The model used to analyse the different

[7] As a precedent, the formulation of this resilience model takes the works of Balagué-Navinés (2005, 2006); Navinés-Balagué (2010) on the definition of a model of competitiveness for the Balearic economy.

regional typologies of resilience, based on the explanatory variables of the profit rate, is based on the classification of the modalities shown in chart 1, with their corresponding representation (diagram 3).

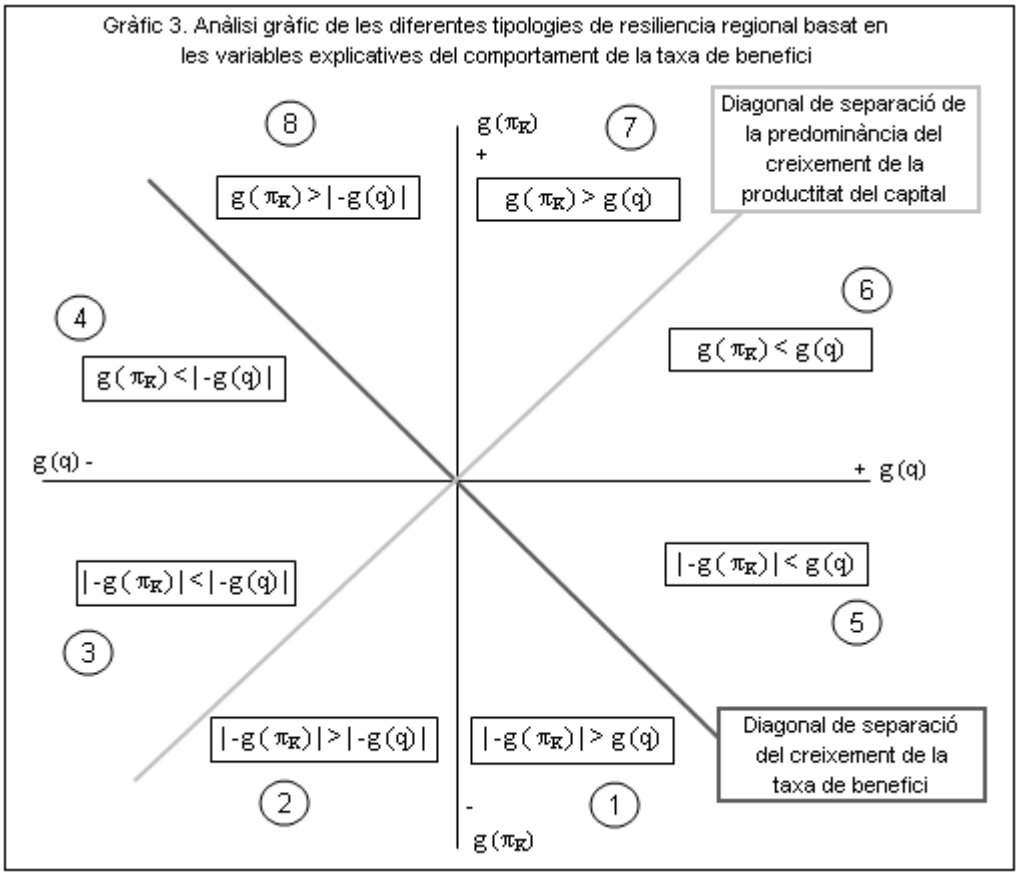
Chart 1. Classification of the typological modalities of resilience		
Modalities	Expression	Growth r
Modality 8	$g(\pi_K) > \lvert -g(q)\rvert$	> 0
Modality 7	$g(\pi_K) > g(q)$	> 0
Modality 6	$g(\pi_K) < g(q)$	> 0
Modality 5	$\lvert -g(\pi_K)\rvert < g(q)$	> 0
Modality 4	$g(\pi_K) < \lvert -g(q)\rvert$	< 0
Modality 3	$\lvert -g(\pi_K)\rvert < \lvert -g(q)\rvert$	< 0
Modality 2	$\lvert -g(\pi_K)\rvert > \lvert -g(q)\rvert$	< 0
Modality 1	$\lvert -g(\pi_K)\rvert > g(q)$	< 0

Source: prepared by the authors.

$g(\pi_K)$: Differential growth factor with regard to Spain of regional capital productivity.

g(q): Differential growth factor with regard to Spain of la quota regional gross operating surplus.

Growth r: Differential growth factor with regard to Spain of regional profit rate.



Source: prepared by the authors.

We have defined regional resilience in the sense of positively discriminating those regions which, in periods of crisis, have maintained a positive growth differential

of their profit rate. Thus, we can classify the modalities 8 to 5 in this positive resilience category, as those that are found above the diagonal separation line of the profit differential rate. If the contrary is the case, i.e. resilience is negative, here we find modalities 4 to 1, which are located below this diagonal separation line. We move on to determine the characteristics of these eight regional resilience modalities and assign them scores according to their higher or lower level of regional resilience:

A/ Modalities of positive regional resilience ordered by their score:

- Modality 8 (or the inverse of modality 1): we award this modality the maximum score of 8 points, because it is the only modality in which, in a phase of economic crisis, the positive differential growth of the regional profit rate is explained exclusively by the positive differential growth of the productivity of capital. At the same time, there is joint differential improvement in the share of salaries in the regional income.
- Modality 7 (or the inverse of modality 2): with a score of 7 points, because it is the only modality in which, in a phase of economic crisis, the positive differential growth of the regional profit rate comes from the positive differential growth of the productivity of capital. At the same time, there is a joint differential loss of the share of salaries in the regional income, but at a lower rate than that of the growth of the productivity of capital.

Modalities 8 and 7 are the only ones with growth of the differential profit rate, and belong to the positive zones of the diagonal separation line of the predominance of differential growth of the productivity of capital.

- Modality 6 (or the inverse of modality 3): with 6 points, this is the only one in which, in economic crisis, the positive differential growth of the regional profit rate is justified by the regional differential growth of the productivity of capital.
- Modality 5 (or the inverse of modality 4): 5 points, because it is the only one in which, in a phase of economic crisis, the positive differential growth of the regional profit rate is explained by the regional differential growth of the gross surplus share; the productivity of capital shows a negative differential growth.

Modalities 6 and 5 have growths in differential profit rates that do not belong to the positive zones of the diagonal separation line of the predominance of the differential growth of productivity of capital.

B/ Modalities of negative regional resilience ordered by their score:

- Modality 4 (or the inverse of modality 5): a score of 4 points because in a phase of economic crisis, the differential growth of the regional profit rate is negative. This is explained by the fact that, in spite of having positive differential growths of the productivity of capital, this growth does not yet compensate the differential drop in the gross operating surplus.
- Modality 3 (or the inverse of modality 6): with a score of 3 points, in a phase of economic crisis the differential growth of the regional profit rate is negative. This fact can be explained because it occurs in conjunction with a negative differential growth of the productivity of capital and of the gross operating surplus, although in this case with a higher drop of the gross surplus share in comparison to that of the productivity of capital.

Modalities 4 and 3 are the only regional ones, with a drop in the differential rate of profit, which still belong to the positive zones of the diagonal separation line of the predominance of the differential growth of productivity of capital.

- Modality 2 (or the inverse of modality 7): a score of 2 points, because in a phase of economic crisis the differential growth of the regional profit rate is negative, which is explained by the fact that it occurs in conjunction with a negative differential growth of the productivity of capital and of the gross operating surplus, although in this case with a lower drop in the gross operating surplus share in comparison to that of the productivity of capital.
- Modality 1 (or the inverse of modality 8): this modality is given a score of 1 because during an economic crisis, the differential growth of the regional profit rate is negative, and this is explained exclusively by the dro pin the differential productivity of capital, as the regional gross surplus share presents positive differential growth.

Les modalities 2 and 1 are the only ones with a drop in the different rate of profit, and they also belong to the negative zones of the diagonal separation line of the predominance of the differential growth of productivity of capital.

An analysis of the periodisation of 1964-2011, based on the behaviour of the profit rate, specified as crisis periods in the Spanish economy the years 1975-1982, 1989-1997 and 2005-2011; the statistical annex presents the analysis of data for each sub-period. As a result, these data trace out the chronological framework in which one may apply – on the theoretical and methodological premises set out above – an index of

resilience, which has been weighed up on the basis of their behaviour throughout the three aforementioned periods of recession and crisis. The final consideration and securing of a synthetic index was established taking, as a significant factor, the sum of the order of the years which each period presents – with the objective of prioritising the proximity in time of the individual indices -, taking the order 1 for 1975 and following the chain to the order 37 for 2011. The respective weights for each of the periods define the consideration of each individual index over the synthetic one, as we explain below. In this way, we determine the following expressions for the different periods:

Period	Value of the typology in the period	Years	Order of the years
1	I_1	1975 to 1982	1 to 8
2	I_2	1989 to 1997	15 to 23
3	I_3	2005 to 2011	31 to 37

And we define the following values for the periods 1, 2 and 3

$$b_1 = \sum_{t=1}^{t=8} = 36$$

$$b_2 = \sum_{t=15}^{t=23} = 171$$

$$b_3 = \sum_{t=31}^{t=37} = 238$$

With the sum of the above values being:

$$b_T = b_1 + b_2 + b_3 = 445$$

Thus, the different weighting factors for the periods is equal to the quotient

$$\beta_1 = \frac{b_1}{b_T} = \frac{36}{445} = 0{,}081$$

$$\beta_2 = \frac{b_2}{b_T} = \frac{171}{445} = 0{,}3843$$

$$\beta_3 = \frac{b_3}{b_T} = \frac{238}{445} = 0{,}5348$$

And the expression, in mathematical terms, of the Synthetic Index, is:

$$I_s = \beta_1 I_1 + \beta_2 I_{2+} \beta_3 I_3$$

With:

I_s= Synthetic Resilience Index (SRI).

Chart 2 shows the Synthetic Resilience Index (SRI) for the autonomous communities ordered from highest to lowest over the three crisis periods stated. The information is complemented with the differential ratios for autonomous communities according to their processes of greater or lesser industrial dynamism. We understand that this is an important determinant of the evolution of the productivity of capital in the regional economies, albeit differentiating the behaviour of manufacturing companies with closer links to private initiative and the export markets from the large, non-manufacturing companies that are more closely linked to public services (as in the case of energy) and/or the corporatism of the public sector (mining, petrochemical industry, shipyards, etc.), which justify the differential between the statistical series of the total industrial sector and that of the manufacturing sector (these data were obtained from the BdMores database for the period 1975-2011).

Chart 2. Resilience index of the Autonomous Communities for the three crisis periods. Years 1975-1982; 1989-1997; 2005-2011			
	Resilience index	Growth factors of regional industry * compared to Spain	Growth factors of regional manufacturing industry compared to Spain
1. Basque Country	7 (6.98)	1.393	1.279
2. Extremadura	7 (6.90)	28.510	3.035
3. Catalonia	5 (5.38)	0.319	0.936
4. Galicia	5 (5.16)	16.445	26.683
5. Aragon	5 (5.06)	23.828	26.693
6. Navarre	5 (4.84)	28.382	31.082
7. Cantabria	5 (4.69)	-1.959	-2.654
8. Balearic Islands	**5 (4.56)**	**1.059**	**-21.461**
9. Andalusia	4 (4.39)	-13.751	-20.555
10. Asturias	4 (4.22)	-23.748	-15.783
11. Canary Islands	4 (4.16)	-19.517	-17.587
12. Castilla - La Mancha	3 (3.30)	19.976	17.567
13. Madrid	3 (3.17)	7.790	1.058
14. La Rioja	3 (2.92)	41.527	49.520
15. Murcia	2 (2.40)	-12.246	-3.231
16. Valencia	2 (1.92)	7.239	5.732
17. Castile and León	1 (1.08)	16.069	17.567

Source: prepared by the authors.
(*) Includes manufacturing and the non-manufacturing industry
The difference between the two columns is explained by the behaviour of non-manufacturing industry

The model of resilience presented enables us to define a certain typology of regions and hierarchize them by Synthetic Resilience Index (SRI) for the period 1975-2011, albeit differentiating their behaviour by the three sub-periods of crisis defined s: 1975-1982; 1989-1997; 2005-2011.

The typologies are as follows:

1) Autonomous communities with a longstanding industrial tradition: Catalonia and the Basque Country.
2) Tourism-oriented autonomous communities, with negative industrial indices: Andalusia, Balearic Islands, Canary Islands and Murcia.
3) Non tourism-oriented autonomous communities with negative industrial indices: Asturias and Cantabria.
4) Non tourism-oriented autonomous communities with positive industrial indices: Galicia, Aragon, Navarre, Castilla-La Mancha, La Rioja and Castile and León.

There are also three singularities: Madrid, Extremadura and Valencia.

A more thorough explanation of the typologies stated throws up the following considerations:

1) Longstanding industrial tradition (Catalonia and Basque Country): the one that obtains the best SRI is the Basque Country (6.98), representing the maximum value for the regions as a whole, whilst Catalonia, with its SRI of 5.38 lies in third place, after the singularity of Extremadura. This leadership of the Basque Country is due to its good differential behaviour in the three explanatory variables of the SRI (profit rate, productivity of capital and surplus share) over the last crisis period of 2005-2011; whilst Catalonia shows better results in the rest of the periods analysed. In the case of Catalonia, we should say that it has progressively been losing industrial weight in a more accentuated manner than the Basque Country, and in exchange has reinforced its specialisation in an advanced tertiary sector with high added value (based on knowledge hubs and support for industry 4.0) and in particular tourism, leading the rankings of the international tourism statistics in Spain as a whole.

2) Tourism-oriented with negative industrial indices (Andalusia, Balearic Islands, Canary Islands and Murcia): the community with the best SRI is the Balearic Islands (4.56), followed by Andalusia (4.39), the Canary Islands (4.16) and Murcia (2.40). This better result of the Balearic Islands is basically inferred from its good differential behaviour of the three explanatory variables of the SRI (profit rate, productivity of capital and surplus share) over the crisis period of 1989-1997. The Canary Islands shows better differential behaviours in these variables over the period 2005-2011, and in profit rate and productivity of capital over 1975-1982; in this last phase, it is Andalusia which attains the best behaviour in terms of surplus share.

3) Non tourism-oriented with negative industrial indices (Asturias and Cantabria): Cantabria has a higher SRI (4.69) than Asturias (4.22), and also shows a better behaviour for the three explanatory variables of the SRI in all the periods, except for the crisis period 2005-2011.

4) Non tourism-oriented with positive industrial indices (Galicia, Aragon, Navarre, Castilla-La Mancha, La Rioja and Castile and León): Galicia (5.16: textile, automobile, fishing industry), Aragon (5.06: automobile and logistics) and Navarre (4.56: automobile and manufacturing), can be considered cases of "successful" late industrialisation, as compared to those with resilience indices of below 4.5, such as

Castilla-La Mancha (3.30), La Rioja (2.92) and Castile and León (1.08), which marks the minimum SRI value. This pattern of behaviour is maintained for the last crisis sub-period, since Galicia, Aragon and Navarre have positive differential behaviours for the three explanatory variables of the SRI, whilst in the case of Castilla-La Mancha, La Rioja and Castile and León they are negative, except for the surplus share of Castile and León. All of these regions reflect negative differential behaviours of these variables for the period 1989-1997, except for Castilla-La Mancha with regard to the productivity of capital and Castile and León for the gross surplus share. For the first period, 1975-1982, the positive differential behaviour of Galicia in terms of the profit rate and productivity of capital stands out.

5) With regard to the three singularities, we should point out:

a) Madrid is an exceptional case, because of the effect of being a capital and because it enjoys the maximum economies of agglomeration, representing as it does the main metropolitan area of the country. In terms of SRI, it has a value of 3.17 and is located in thirteenth position. With regard to the analysis of sub-periods, there is a progressive degradation by typology of resilience, as it passes from typology 7 for the period 1975-1982, to 4 for 1989-1997, and 2 in 2005-2011.

b) Valencia is another exception, as it is the only tourism-oriented region with a positive industrial index. In terms of SRI, it has a value of 1.92 and is ranked in the penultimate position in the classification. It is an unsuccessful case of consolidation of its industrial base, and of its tourism sector, as it failed to attain a typological value of more than 2 in any of the sub-periods analysed.

c) In the case of Extremadura, we are faced with the most significant differential growth of the non-manufacturing industry in regional spheres (with the maximum positive differential between the two columns on chart 2). This is due to the energy sector which, benefitting as it does from public prices, is characterised by a less cyclical and sensitive behaviour towards the crisis by its surpluses. And this explains why, in the case of Extremadura, we are confronted with the second-best SRI, with a value of 6.90: maximum score with a value of 8 for the period 1989-1997, and the second-best datum for the last period of 2005-2011, in contrast to the first crisis period of 1975-1982, in which it recorded the minimum score of 1.

4. Conclusions

The results of the research can be synthesised as follows:

1. The regional typologies defined imply that, in terms of resilience, it is important to maintain or consolidate a certain industrial base. The paradigmatic case of this affirmation is the Basque Country, which is the region that presents the highest SRI. It also enables one to explain the good behaviour of Catalonia; and that of the "successful new industrialisations", such as Galicia, Aragon and Navarre. In all these cases, we are talking of SRIs of above 4.5 (on a scale that has a maximum value of 8 and a minimum of 1).
2. By contrast, there also seems to be another possible line of resilient specialisation, albeit with slightly lower resilience values, situated between a fork of 4.5 to 4. This would be the case of the autonomous communities with more intense specialisation in tourism, which has enabled them to compensate their high level of deindustrialisation, for example the Balearic Islands, Andalusia and the Canary Islands. We should point out that, in the case of the Balearic Islands, the model of resilience avoids underestimation of the capacity of resilience of the economy in crisis periods, as it is not based on the employment variable.
3. Cantabria and Asturias are also in this intermediate situation, with SRIs of 4.6 and 4.2 respectively, making for a path of resistance to significant deindustrialisation processes, in part due to the contribution by the European cohesion fund and without heading towards an intense specialisation in tourism.
4. Below 4, we find the regions of "new, unconsolidated industrialisation", i.e. Castilla-La Mancha, La Rioja and Castile and León; or those with an intense, unsuccessful specialisation in tourism, which is the case of Murcia.
5. Finally, three singularities are put forward. Madrid, because of the effect of being a capital and which, in terms of public employment, brings about an upward bias in the estimation of the SRIs; our model, which rests on the variable of the gross operating surpluses, avoids this appreciation. Extremadura, due to the excessively weighty role the gross operating surpluses of the energy sector play in its economy, as a result of which in our model, its SRI result is overestimated, being the second most important after the Basque Country. And

Valencia, which appears to represent a failed path in terms of the consolidation of a certain industrial and tourism-oriented specialisation, although it is true that our model may include an underestimation due to the effect of its having a greater percentage of informal economy, which could result in an underestimation of profit margins (precisely the contrary to that which occurs in Catalonia).

In short, this methodology, which emphasizes the importance of the profit rate and the productivity of capital, can provide a complementary vision – and even a ground-breaking one – as regards the economic evolution of the autonomous communities. The relevance of the model presented is that it can be applied to different economic realities, with a disparate format and different structures, as long as one has the suitable statistical materials to process it.

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STATISTICAL ANNEX (Source: prepared by the authors; see text)

Annex 1. Typological analysis of resilience by Autonomous Communities. Years 1975-1982				
	g(q)	$g(\pi_K)$	g (r)	Typology
Andalusia	3.909	5.395	+ 8.574	7
Aragon	-3.313	-4.183	- 6.590	2
Asturias	-0.554	-0.496	- 0.934	3
Balearic Islands	**-1.285**	**9.531**	**+ 7.562**	**8**
Canary Islands	0.806	12.199	+ 12.200	7
Cantabria	0.476	1.916	+ 1.920	7
Castile and León	-1.667	-5.139	- 6.100	2
Castilla - La Mancha	-2.163	-5.996	- 7.277	2
Catalonia	-0.090	-6.141	- 5.741	2
Valencian Com.	0.592	-0.929	- 0.350	1
Extremadura	2.871	-5.107	- 2.375	1
Galicia	-1.913	10.207	+ 7.570	8
Madrid	0.107	7.772	+ 7.274	7
Murcia	3.084	4.871	+ 7.316	7
Navarre	-1.292	0.418	- 0.738	4
Basque Country	-0.449	-7.081	- 6.893	2
La Rioja	-1.315	-2.404	- 3.326	2

Annex 2. Typological analysis of resilience by Autonomous Communities. Years 1989-1997				
	g(q)	$g(\pi_K)$	g (r)	Typology
Andalusia	-4.590	-1.126	- 5.302	3
Aragon	-2.324	-0.340	- 2.477	3
Asturias	-1.558	-4.766	- 6.057	2
Balearic Islands	**6.986**	**6.764**	**+ 13.589**	**6**
Canary Islands	4.956	-6.358	- 1.987	1
Cantabria	1.462	-2.222	- 0.866	1
Castile and León	0.437	-0.499	- 0.089	1
Castilla - La Mancha	-3.171	1.191	- 1.8	4
Catalonia	-0.143	3.504	+ 3.31	8
Valencian Com.	-1.662	-4.365	- 5.76	2
Extremadura	-4.561	4.798	+ 0.282	8
Galicia	-0.983	-4.519	- 5.311	2
Madrid	-1.123	0.685	- 0.373	4
Murcia	-2.503	-3.554	- 5.724	2
Navarre	-1.462	-5.049	- 6.246	2
Basque Country	-0.786	1.753	+ 0.984	8
La Rioja	-2.753	-0.373	- 2.904	3

Annex 3. Typological analysis of resilience by Autonomous Communities. Year 2005-2011				
	g(q)	$g(\pi_K)$	g(r)	Typology
Andalusia	1.200	-0.690	- 0.299	5
Aragon	1.046	2.475	+ 3.472	7
Asturias	3.963	3.229	+ 6.832	6
Balearic Islands	**-1.476**	**-0.079**	**- 1.335**	**3**
Canary Islands	1.437	0.252	+ 1.485	6
Cantabria	1.795	3.095	+ 4.780	7
Castile and León	0.471	-0.510	- 0.129	1
Castilla - La Mancha	-3.750	-2.552	- 5.728	3
Catalonia	-0.746	0.506	- 0.114	4
Valencian Com.	-0.147	-1.380	- 1.549	2
Extremadura	0.809	1.995	+ 2.765	7
Galicia	0.232	2.719	+ 3.014	7
Madrid	-0.612	-1.210	- 1.763	2
Murcia	-1.464	-2.856	- 4.153	2

Navarre	0.475	1.632	+ 2.098	7
Basque Country	0.429	6.703	+ 7.319	7
La Rioja	-2.726	-0.205	- 2.524	3