The creative class and the creative economy in Spain[1]

Abstract

The paper aims to apply Richard Florida's model about the relevance of creativity and the creative class in the economy in general and growth in particular to Spain. Creativity is an indicator that combines the measurement of technology, talent and something new, tolerance. Each index is composed of three sub-indexes. The most important conclusion is that creativity in particular and growth in general is less related to tolerance than the other two indexes. However, in this indicator the sub index of bohemian people seems important, meanwhile the other two (foreigners and gays) do not.

Key words: Development, Creative Class, Inequality, Tolerance,

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1. Introduction

Since Richard Florida (2010) published *The Rise of the Creative Class* in 2002, the notion of the creative class has reached huge popularity within the ambit of social sciences and has stimulated infinite research. Among others Florida himself has produced or directed research about the creative class in Europe (Florida and Tinagli, 2004), worldwide competition to attract creative professionals (Florida, 2005) and the relationship of the creative class with development and changes in cities and regions (Florida, 2005). A short time later, as often happens with high risk, hasty or such high impact proposals, criticisms started to appear such as Peck (2005), Scott and Allen (2006) or Uzzi and Spiro (2005). At the same time research appeared that found the indicator useful for things such as proving that it combined well with urban sustainability policies. (Budd, Lovrich, Pierce, Chamberlain, 2008). In addition, some political decisions were inspired by the Research of Florida, such as the decision by the BBC to transfer certain key activities to the north east of England (Christopher, 2008). On the other hand, other policies such as those applied in Scotland over-estimated the creative environment of territories to attract talent (Houston, D., Finllay, A., Harrison, R. & Mason, C., 2008).

Howkins (2005) stated that due to the creative economy at the end of the 1990s, a lot was said about computer technology and information technology but one thing that was missing was what for many companies is the main objective, *coming up with new ideas.* In a way, innovation seems to address this, above all when Schumpeter defined it as “a rupture with established routines in the productive environment”. However innovation is supposed to have practical effects to differentiate it from invention, the result of a genuine creative activity. On the other hand, it often appears in the guise of an institution or linked to an institution, obviously understandable in symbolic terms, but

where the values, norms and roles are more important than the darkest and most unexpected profound elements of culture of day to day interactions (Fernández Esquino, 2012)[2]. To sum up, it appears that innovation has an established component which is much more important than the establishment. In addition it is aimed at "placing new dominions (science, technology and information)" under the control of the productive and market sphere, by which it is assessed according to the compliance of certain functions (García, 2012). Florida placed himself in an ambiguous position as he bet on creativity rather than rupture, which would lead him to distancing himself from innovation, but continues to interpret it in terms of economic use and dependence on organisations. Creativity questions all established order [3], although this point of view will not be explored here.

2. Method and Procedure

In this document is applied to Spain and its "autonomous regions" the index that Florida used in the United States. He designed the creative indicator combining the indexes of technology, talent and tolerance that in turn were made up of another three sub-indexes. Technology includes sub-indexes related to R&D, Innovation and High Technology. With respect to Talent, its components were the size of the creative classes, the number of graduates and the number of researchers. Finally, Tolerance was measured by the number of foreigners, bohemians and homosexuals. This measurement of tolerance is different to that used later in France (Florida y Tinagli, 2004) in that the attitudes towards minorities, self-expression and values index were taken into account. Although heterogeneity and social tolerance were better measured it was decided not to

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[2] In order to understand the values in emergentistas terms it's need to take into account Hans Joas (Sánchez Capdequí, 2012: 159-183)

[3] The biggest mistake made by those who work in Creativity from an organisational and economic point of view is to ignore Hans Joas (1996: 4). In his opinión "there is creativity in all human actions", including rational actions and those guided by norms, such that Creativity has no residual carácter, as was traditionally suggested.

apply them due to the fact that in Spain this data is not broken down regionally. Furthermore, the reference date is 2001, so that to obtain more recent and previous information it was not always possible. Take into account for example that the 2011 census, essential for the talent and tolerance sub-indexes offer data for several years later.

The design the creative indexproceeded in the following way. Firstly information was obtained about the sub-indexes that make up technology, talent and tolerance (measured as in the United States from the number of foreigners, homosexuals and bohemians, seeing that the data of the World Survey of values that Florida used in the research of Europe were not broken down by regions). For each of the sub-indexes a ranking of the autonomous regions was developed scoring 100 for those regions that have the best results and awarding the rest proportional scores in relation to the maximum score. After obtaining these sub-indexes, the indexes of technology, talent and tolerance were calculated discovering the score average obtained by each region. Finally, the index of creativity for each region was developed by adding the scores obtained in the three T's (Technology, Talent and Tolerance) and obtaining the mathematical average. Therefore, the final ranking of creativity is calculated from a maximum of 100 which would have been obtained by the region that was first in all the indexes and sub-indexes.

The methodology for testing the importance of creativity consisted of introducing as a variable, the creative index in a growth equation. It is not the intention here to solve the enormous ideological and theoretical problem that surrounds "growth", an essential concept that Florida never stops referring to, but also obvious in its limitations. This is why it is proposed to use a well-known piece of research on this topic by Barro and

Sala-i-Martin (2004). In chapter 12 of this work the authors carried out empirical research through a series of short cross-section forecasts, where the dependent variable was the rate of GNP growth per capita. The main independent variables were the following: The initial GNP per capita logarithm, the level of education (measured by the average number of years in secondary and university education for males), life expectancy (in particular the opposite of life expectancy at the age of one), the fertility rate (number of successful births per wo man throughout her life), public consumption ratio (subtracting the real cost of defence and education), the degree of law abiding (a subjective measurement taken from the *International Guide to Country Risk*), the degree of democracy (another subjective measure taken from the *Freedom House Organisation*), international openings (the ratio between total imports and exports and GNP), the real relationship of exchanges (it's growth rate), the investment ratio (real gross national investment/real GNP) and the inflation rate.

3. Creativity

According to the measurements, the creative class in Spain makes up 23.9% of the population, far different from the United States (30%) and central and northern European countries (28%-29%), although above Italy and Portugal (15%). The Spanish region closest to the European average is Madrid, with a creative class of 25%.

Below (Diagram 1), shows in descending order the regional results of Creativity and its three components. This order allows me to distinguish between 5 groups of regions:

a) The group of outstanding communities is formed by Madrid, Catalonia, Navarre and the Basque Country and is characterized by a final score superior to 64% of the maximum possible score. From this group, the excellent score of the Community of Madrid: 88.1% can be highlighted, which is mainly due to its scores in the technological and in particular the talent (100) indices. Catalonia, nevertheless, obtains some very

similar numbers in the three indices, whereas the Community of Navarre and the Basque Country obtained a normal score in the tolerance (44.3% and 32.9% respectively). This is due essentially to its bad results in the homosexuality index.

b) The group of regions with an average score are made up of 8 Regions: Aragón, Valencia region, La Rioja, Baleares, Canaries, Asturias, Castilla y León and Murcia, and is characterized by a score of between 40 and 50 points (although Murcia was just under 40 points). None of these regions has a score more or less homogenous in the three sub-indexes. In addition, we can highlight the case of Aragón, which obtained a poor score in tolerance (31.6) due to the scarce presence of homosexuals in the region in particular. The case of the two archipelagos is also relevant: Canaries, which has a reasonable score in talent (55.6) and tolerance (55.4), however only achieved 16 points in technology, this is a consequence of the low number of patents, in other words it's low industrial development. The same can be said of the Balearic Islands, although the scores of this region are more unequal. They obtained an excellent score in tolerance (3rd in the ranking) but only 9.5 points in technology (last in the ranking). The cases of Asturias and Castilla y Leon are also significant in this sense. Both regions scored mediocre results in technology and tolerance but very good scores in talent, 4th and 5th in the ranking in this sub-index.

c) The group of regions with lower scores is made up of Andalucía, Galicia and Cantabria, with scores a little over 35 points. The profile of these three regions is very similar: poor scores in technology and tolerance and a good score in talent. Although we have to take into account that the average region in this last sub-index (69.1) is far higher than the other two (technology 36.8, tolerance 38.6), which makes us doubt its discriminatory power.

d) The group of regions with the lowest score is made up of Extremadura and Castilla-La Mancha, two regions which achieved less than 30% of the total score. Obviously their bad results are a consequence of the poor scores achieved in the three indexes (they occupy the last but two and the last but one in technology). However there is a 12 point difference in talent due mainly to the small number of researchers in the Castilla La Mancha region, which occupies the last place in this index.

4. Economic Growth

Below shows a forecast a growth equation similar to that of Barro and Sala-i-Martin (2004), for those countries included in Florida and Tinagli´s work (2004), using the creative index as an explanatory variable, built with our methodology but using the data provided by the authors. In order to carry out this forecast practically the same variables were used as the basic model of Barro and Sala-i.Martin, although the two variables with a subjective nature: the degree of law abiding and the level of democracy were eliminated.

The dependent variable is the annual growth rate of GNP per capita and the explicative variables are the following: the initial GNP per capital logarithm (with which we aim to discover the convergence effect, i.e. a higher growth in those countries with a lower initial GNP per capita), the education level (measured by the spend per student as a percentage of GNP per capita in primary, secondary and university education), life expectancy (i.e. life expectancy since birth, measured in years), the fertility ratio (total births per woman), consumption (total spend in public and private final consumption as a percentage of GNP), the international opening ratio (the total of imports and exports as a percentage of GNP), the real relation of exchange (its growth rate), Gross Capital formation (as a percentage of GNP) y and the inflation rate (the annual growth rate of prices for consumers).

All the data is averaged out for the period of 1995-2005, except the real relation of exchange, of which we don't have data for 1995 and the initial GNP per capital logarithm, which corresponds to 1995. Its source is the OECD data base.

Diagram 2 shows the Pearson coefficients of correlation among all the variables. There are 4 variables with results contrary to expectations: education and life expectancy with negative results, on one hand, and fertility and inflation with positive results, on the other.

One can see what happens with the correlations among creativity and the other variables (diagram 3). For the creative variable we have used the creativity index using the data from Florida and Tinagli (2004) and using the same methodology seen in previous sections of this research. Of particular interest is the positive and significant score (5%) of the correlation of the initial GNP per capita logarithm, indicating the absence of a convergence effect, i.e.: the economies with a greater initial GNP per capita are the ones that have a higher creativity index. On the other hand, the negative and significant scores (1%) of FBC and inflation appear to indicate that the more creative economies are those with less investment and greater price stability.

The forecast for the Minimum Ordinary Squares (MOS) model with all the previously commented variables did not have good results, which is why it was decided to eliminate those variables with a low explicative power. The basic model, with all the significant coefficients and with all the expected theoretical scores includes, in addition to a constant, the following variables: the initial GNP per capita logarithm, the real relationship of exchanges, openings and creativity. Modifying this basic model can increase the coefficients of determination although at a cost of slightly reducing the value of the F statistic and the significance of the coefficient of the openings variable.

Diagram 4 shows the coefficients of the model, adding the gross capital formation variables and fertility. In this case, the coefficient of determination is equal to 0.747 and the corrected one 0.557, meanwhile the value of the F statistic is 3.928 with a significance of 3.9%. As one can see, the variables with a significance of less than 5% are the initial GNP per capita logarithm, the RRE and creativity, all of these have expected scores. In other words, among these 15 countries a convergence effect in growth is created and a positive effect in RRE and creativity. If one focuses on the column of typified coefficients, it can be seen that the variable with the greatest influence in growth is our creativity index, which in a way, confirms Florida's thesis.

To dig a little a deeper into this idea, one must return to our creativity variable about GNP per capita. The forecast for MSO without a constant shows a coefficient of determination equal to 0.846, corrected to 0.834. The statistics F and t of the coefficient of regression are situated at 76.618 and 8.753, respectively, both with a significance of 0%. To understand better this increasing relationship between growth and creativity, we have constructed the dispersion diagram between both variables (graph 1).

Observing this graph clearly shows, on one hand, the previously stated increasing relationship between both variables and, on the other hand, suggests the grouping of some countries on the basis of their growth and creativity values. On the top right hand side, two countries stand out with high values on both variables: Finland and Sweden. Two countries which have learnt to translate their high levels of creativity into GNP per capita growth. The same can be said but to a lesser extent of the United Kingdom. In the bottom right hand side, we have a group of countries with high creativity and acceptable growth rates: United States, Holland, Belgium and Denmark. Creativity in Germany appears sufficient but its GNP per capita had the lowest growth rate during the decade. However, the difficulties that arose from its unification are responsible for this.

Austria and France could belong to the US group as long as the former increases its level of creativity and the latter obtains better results in both variables. In the top left hand side of the graph, we have a group of countries with high growth, but low creativity: Spain, Ireland and Greece. As can be clearly seen in the last few years of the recession, the growth models of these countries have not been the most successful for a sustainable long term growth.

Below, a growth equation for the autonomous regions can be forecasted, inserting the creative index as one of the explicative variables obtained in the previous section. The basic model used once again, is that proposed by Barro and Sala-i-Martin (2004), although we have also tried other variables whose influence on growth is considered plausible. As the author's themselves recognise the question of what "regressors" to include in the equation are still open, fundamentally for two reasons: firstly, because economic theories are not sufficiently accurate at the time of identifying the growth determinators and secondly, because such theories are not mutually exclusive which means the job of specifying the independent variables of the model are complex.

This model also used GNP per capita (ΔGNPpc) growth as a dependent variable. The data is an average of the period 1996-2005. The explicative variables are the following (all the data including the dependent variable are supplied by the INE, (National Institute of Statistics). In order to calculate the possible convergence effect, the initial GNP per capita logarithm (LogGNPpc), i.e. from 1995 is forecasted . Its expected theoretical score is negative, indicating a higher growth in those more backward regions.

On the other hand, in order to calculate the positive effect of education (defended by almost all theories on growth), public spending on education (EPS) is used, which

includes the spending of all public administrations at all levels and all types of centres both public and private. The data is an average from the 2000-2005.

For the positive effect of healthcare, the number of operating hospital beds per 1,000 inhabitants (CH) are looked at. This data is an average from the period 1995 – 2005. The other positive effect, also supported by a large section of the theory, is due to the growth in population. In order to calculate this effect the growth rate of the population can be used (ΔP) (from the first of July of each year), this data is an average of the period 1996-2005.

To understand the negative effect of price instability the annual growth rate of the CPI (I) are used. The data is an average of the period from 1995-2005. Finally, and as previously stated, one can also introduce as a regressor our creativity index (C) calculated by the autonomous regions for the year 2001.

Diagram 5 has been constructed with Pearson's coefficients of correlation among all the stated variables. In bold are the coefficients with a significance of at least 5%. These coefficients appear to indicate a convergence effect in education spending, i.e., the regions with lower initial GNP per capita have a greater education spending. However, with relation to the number of hospital beds and creativity, the relationship is inverse. It is surprising to see the negative and significant coefficients between GNP per capita growth and the population on one hand, and creativity and education spending on the other.

The forecast of the MOS model generates the coefficients that are shown in the second column of diagram 6 with their correspondent significance of statistic t in the third column. The latter values tell us that the accuracy of the forecast is reduced, which is supported by the coefficient of determination, equal to 0.583 (corrected to 0.333), and by the value of the statistic F equal to 2.332 and with a significance of 0.113. In any

case, and this is what is most interesting from the forecast, the creativity variable is the one which has a better significance, offering the highest positive value coefficient.

If one eliminates the three variables with the worst significance, the forecast improves substantially, obtaining the coefficients of the fourth column with their corresponding significance in the next column. The corrected coefficient of determination is equal to 0.478 and the value of statistic F is equal to 5.878 with a significance of 0.009. The positive score of the LogGNPpc coefficient variable (with a significance of 3.1%) confirms once again the existence of a convergence effect between autonomous regions. On the other hand, the negative score of the population growth variable (contrary to what was theoretically expected), appears to indicate that the size of the autonomous region represents an obstacle in the growth of GNP per capita.

Finally, the positive and significant score of the creativity variable supports once again the importance of our index in order to explain growth, in this case, of the autonomous regions. Graph 2 shows the dispersion diagram between the growth variables and creativity. In contrast to graphic 3, this time the bottom right box is empty. Most of the regions are located in the top left hand side, i.e. in the area that we can call *false growth,* due to the fact that its high growth rates during the study period are difficult to maintain due to its scarce level of creativity. In this way one can highlight the regions of Extremadura and Cantabria. The best placed are those with a high growth rate and creativity, i.e. Pais Vasco, Madrid, Navarra and Cataluña. Lastly the worst situated with low levels of both variables are Castilla-La Mancha, La Rioja, Canarias and Baleares. These last two have a strong dependence on the tourist sector.

The relatively good results of our Creativity Index, as an explanatory variable of economic growth (see diagram 7), appears to support the thesis of creativity as a

fundamental productive factor. However, this thesis has been the object of certain criticism that will now be analysed and tested as far as possible with the data.

The first of these comes from the comparison between the traditional explanatory factors of growth and the factors related to creativity. For example, Donegan and Lowe (2008) contrasted four traditional factors (the percentage of adults with certain training, with earnings from the industrial sector, with earnings from business services and earnings from property) with five factors related to creativity (the percentage of the population that belongs to the creative class and four indexes: technological, the bohemian population, the gay population and the *bohemian population). The comparisons are made to test which variable is the best predictor of the three measurements of economic results: the rate of change in the workplace and the revenue per capita and job instability. The main result is that the measurement of human capital and sector distribution improve the measures of talent, technology and tolerance, i.e.: for these authors there is a clear superiority of traditional factors.

The comparison of traditional factors versus creativity factors. The procedure has been to build, with both types of variables, equations that had a minimum significance (statistic F and explicative power R^2). The main results are in diagram 8. One can see, contrary to the research commented on in the previous paragraph, that in both cases (USA-EU and the autonomous regions) the superiority of the creative factors is clear.

A relevant aspect of this controversy between traditional and creativity factors, is in the human capital versus the creative class discussion. In Donegan and Lowe (2008), the percentage of adults with the training (human capital) variable, clearly beats the creative class one: the first one is significant at 1% in two of the three forecasted models, meanwhile the second one is also significant in two of the models but at a significance of 5%.

However, the results of both variables in the Florida et. al. (2010) research are very similar. For these authors both the human capital as well as the creative class are strongly associated with regional development in Canada. However, these opted for the creative class variable. Most economic literature conceptualises human capital as a resource stock, which belongs in a particular place, in the same way as a natural resource. But the reality is that human capital is *fluid,* a highly mobile resource that can be, and in fact is, in many occasions, moved to another place.

In another previous work Florida et. al. (2008) the same authors also defended that both variables significantly influenced regional development, although in different ways. The creative class exercises such influence through salaries and its effect on work productivity. On the contrary, human capital (the level of education) operates by increasing regional revenue and well-being. The difference is not trivial, as the salaries indicate the ability of a region to generate productivity and therefore well-being; meanwhile revenues are based on the ability of a region to attract well-being.

No significant correlation has been foundbetween the growth of autonomous regions and the proportion of adults with any type of education level. However, if one calculates the correlation with respect to the initial GNP per capita logarithm, the folloing significant correlations are obtained, 0.574 (with a significance of 0.016) with primary education or lower, 0.595 (0.012) with the second stage of secondary education and 0.790 (0.000) with superior education.

5. Discussion.

The first conclusion to highlight is the consistency in the construction of the Index, this is reflected in the positive and significant scores of a large number of the coefficients of correlation between indicators and sub-indexes. However, these

coefficients also brought to light the fact that the main weakness of the Index (and probably the entire Florida thesis) is in the Tolerance sub index. In much the same way are the criticisms of Glaeser, although these are focussed on the percentage of the bohemian population.

According to Florida the climate of tolerance that could be represented through a high presence of a homosexual and/or immigrant population, is the reflection of low population entry barriers and allows the creation and diffusion of new ideas. In Florida et. al. (2008) ´s research they defended the fact that tolerance is significantly associated to the creative class as well as the human capital one as well as salaries and revenue. In other words this is strongly associated to the other two T´s, (Technology and Talent) in addition to regional development. However, the authors recognise that the cause relationship is not clear in its model. In a later research, Florida and Mellander (2010) defended a positive and significant relationship between the gay-bohemian index with regional revenues, salaries, technology and human capital. Also, Florida et. al. (2010) defended the importance of tolerance in developing regional talent, obtaining a positive and significant relationship with technology. However the results do not support these statements: the tolerance sub index has the lowest correlation with the rest of the index and obtains a lower number of significant coefficients.

Although with this data (autonomous regions and provinces) it is precisely the bohemian population which obtains all the positive and significant correlations, which appears to indicate that the problems are in the percentages of the foreign and homosexual population. In fact, the bohemian sub index works very well in measurement[4].

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[4] Boschman y Fritsch (2009), using information from 500 regions in 7 countries in central-northern Europe, also concluded that there is a close relationship between the proportion of bohemians and the volume of the creative class, that the presence of bohemians is as important as job opportunities and that

On the other hand, the sub index that appears to work better is the technology one. A result which agrees with Florida et. al. (2010) that shows the importance of technology for regional development in Canada. However, my technology sub index worked so well that in fact it beat the creative index itself in the equations of the autonomous regions, which questions the appropriateness of building it.

However, despite the previously mentioned criticism, the results in this part back up to a certain degree the thesis about the importance of the creative economy. The creativity variable is the biggest positive and significant coefficient in almost all the regressions carried out. On the other hand, the components of the creativity index also beat (although not convincingly) the traditional variables to explain growth (a result contrary to Donegan and Lowe, 2008).

However, it is believed that the importance given to creativity by Florida is excessive. An example of this is the defence of the scarce relationship between education and health care with regional development in Florida et. al. (2008), in the face of other sectors such as information technology, engineering, business management and finance. There is no doubt about the relevance of these sectors but it is believed that these authors did not take into account in their work the totality of social wellbeing generated by the education and health care sector.

On the other hand, the analysis of creativity is skewed in favour of cities or regions, in particular towards large cities or regions (Florida, 2005; Donegan y Lowe., 2008), which means applying this data to countries is not ideal.

Finally, to conclude with warning of the statistical limitations in the research. On one hand, all forecasts are of a short nature with the problems that this entails, in particular

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the volume of leisure and recreational activities only influences the quantity of the creative class if the bohemian population declines.

the “homoscedastic” of the minimum forecast used. On the other hand, the populations are limited, above all in the case of forecasting the countries in the EU and the USA (15) and the autonomous regions (17).

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Diagram 1. Creative Index by Autonomous Region (2001)

	RANKING	Technology	Talent	Tolerance
Madrid	88,1	91,8	100,0	72,4
Cataluña	72,2	67,2	70,6	78,9
Navarra	67,6	76,8	81,8	44,3
País Vasco	64,9	80,4	81,5	32,9
MEDIA CCAA	48,2	36,8	69,1	38,6
Aragón	47,8	42,5	69,4	31,6
Valencia	44,8	34,2	57,9	42,4
La Rioja	44,1	31,6	62,8	38,0
Baleares	43,0	9,5	48,0	71,4
Canarias	42,3	16,0	55,6	55,4
Asturias	40,9	23,5	75,1	24,1
Castilla y León	40,6	30,8	73,2	17,9
Murcia	39,2	25,6	53,0	39,0
Andalucía	36,4	19,6	61,0	28,5
Galicia	36,0	23,5	59,6	24,8
Cantabria	35,8	21,4	61,6	24,3
Extremadura	29,8	14,6	58,3	16,4

(Source: INE and the Spanish Patents and Brands Office. Personal compilation)

Diagram 2. Correlations between all the variables

	E	GNPlog	Edu	Fer	Cons	Open	RRE	FBC	Infl
GNPpc	-0,276	-0,392	-0,061	0,204	-0,05	0,095	0,267	0,031	0,189
Education		0,351	-0,069	0,184	-0,308	0,064	-0,444	-0,302	**-0,62**
InitialGNPpc Log			-0,146	**0,536**	-0,4	0,244	-0,12	-0,468	-0,463
Life Expec				-0,462	0,04	-0,14	-0,164	-0,218	-0,157
Fertility					-0,245	0,238	0,048	-0,511	-0,327
Consump						**-0,767**	0,308	-0,067	0,306
Int Open							-0,2	0,141	-0,116
RRE								0,028	0,456
FBC									**0,641**

(Source: OCDE, 1995. Personal compilation from SPSS v.19)

Diagram 3. Correlations of Creativity with different variables

ΔGNPpc	0.120	Consumo	-0.187
Educación	0.487	Int Open	0.022
InitialGNPpc	**0.562**	RRE	-0.382
Life Expectancy	0.090	FBC	**-0.733**
Fertility	0.502	Inflation	**-0.653**

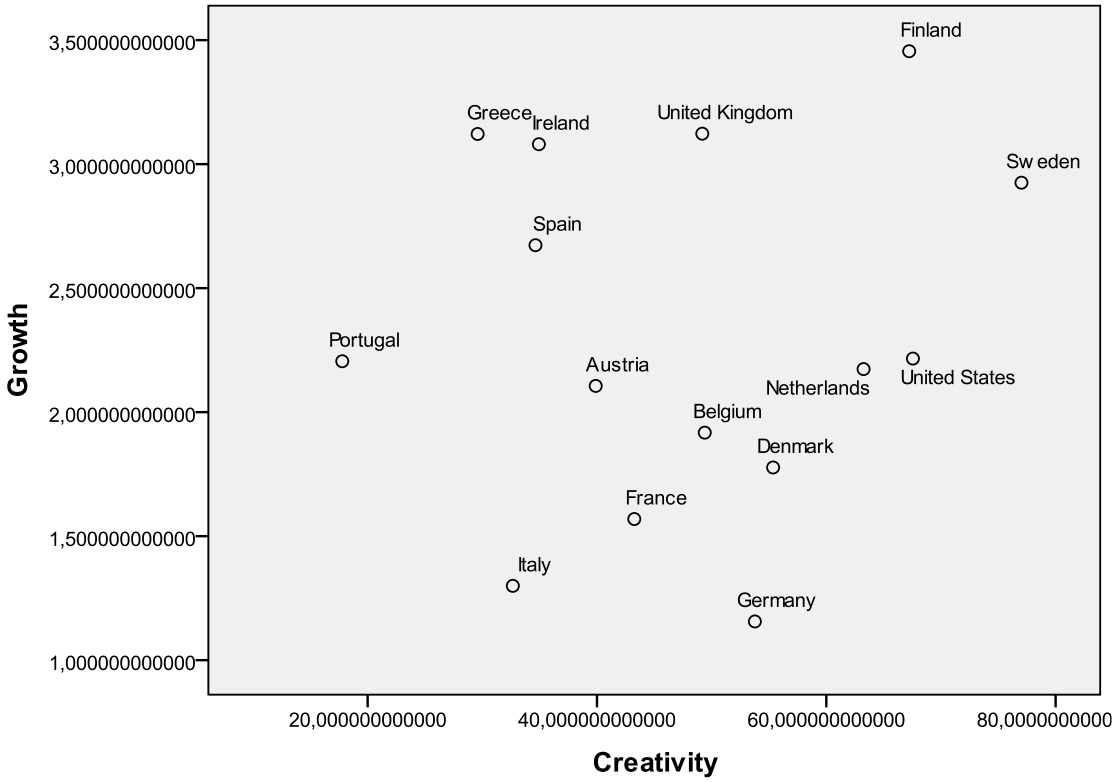
(Source: Personal compilation from SPSS v.19)

Diagram 4. Coefficients of Growth equation

	Non-standard Coefficients		Tipificado Coefficients		
	B	Error tip.	Beta	T	Sig.
(Constant)	32,648	9,383		3,479	0,008
InitialGNPpc Log l	-8,432	2,156	-0,926	-3,911	0,004
RRE	0,358	0,139	0,574	2,585	0,032
Int Open	0,5	0,381	0,269	1,311	0,226
Creativity	0,044	0,015	1,028	3,043	0,016
FBC	0,126	0,08	0,466	1,568	0,155
Fertility	0,935	0,687	0,33	1,361	0,21

(Source: Taken from SPSS v.19. Forecasted by MSO. Dependent Variable : GNP per capita growth)

Graph 1. Growth-Creativity. USA-UE



Output from SPSS v.19

Diagram 5. Correlations among all variables. Autonomous Regions

	LogPIBpc		GPE	CH	I	C	ΔP
ΔGNPpc	-,373	,396	-,093	-,195	-,001		**-,611**
GNPLogpc		**-,923**	**,507**	,481	**,805**		,343
GPE			-,420	-,475	**-,689**		-,389
CH				,105	,384		,066
I					,285		,166
C							,172

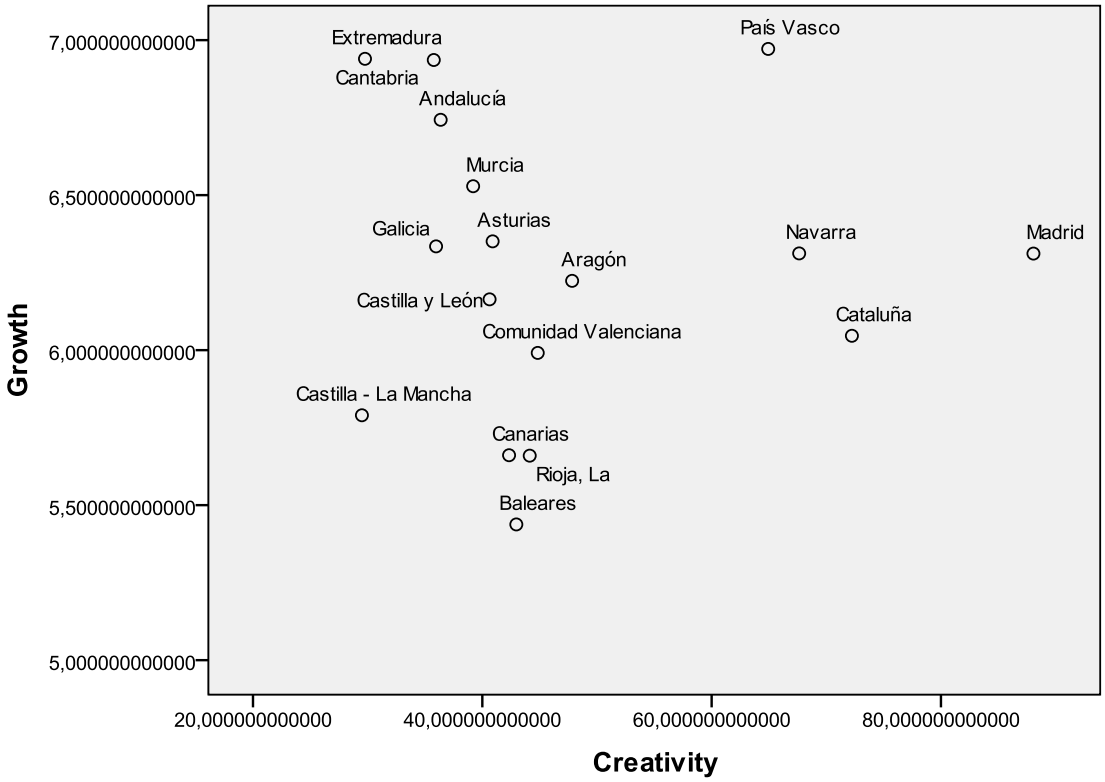
(Personal compilation from SPSS v.19)

Diagram 6. Coefficients and significance of the MOS forecast. Autonomous Regions

	Coefficients classified	Significance	Coefficients classified	Significance
LogGNPpc	-1.012	0.202	-2.423	0.031
GPE	-0.143	0.804		
CH	0.029	0.912		
I	0.081	0.745		
C	0.760	0.067	2.298	0.039
ΔP	-0.461	0.079	-2.362	0.034

(Personal compilation from SPSS v.19. Dependent Variable: ΔGNPpc)

Graph 2. Growth-Creativity. Autonomous regions



Output from SPSS v.19

Diagram 7. Values and significance of the coefficients of the Creativity Index and its components

	Coefficients tipificados	Significance	F(value)	F (significance)	R^2	R^2 corrected
USA-EU.						
Creativity	1.028	0.016	3.928	0.039	0.747	0.557
Technology	0.963	0.057	2.613	0.105	0.662	0.409
Talent	0.651	0.051	2.715	0.096	0.671	0.424
Tolerance	0.422	0.335	1.426	0.313	0.517	0.154
Autn Regions.						
Creativity	0.712	0.039	5.878	0.009	0.576	0.478
Technology	0.760	0.014	7.426	0.004	0.631	0.546
Talent	0.601	0.059	5.311	0.013	0.551	0.447
Tolerance	0.149	0.743	2.991	0.070	0.408	0.272
Tolerance	0.398	0.077	4.857	0.005	0.241	0.191

(Personal compilation from SPSS v.19). Dependent Variable: ΔGNPpc)

Diagram 8. Traditional Factors versus Creativity

	Traditional Factors			**Creativity**		
	Coeffcients classified	Value	Significance	Coefficients tipificados	Value	Significance
USA-EU	Fertility	0.530	0.079	Scientific Talent	1.589	0.038
	Consumption	-0.301	0.270	I+D	-1.474	0.078
	RRE	0.243	0.336	Self Expression	-0.727	0.074
	F	2.392	0.120	F	3.151	0.064
	R^2	0.489		R^2	0.558	
	R^2 corrected	0.285		R^2 corrected	0.381	
Autn	Hospital Beds	-0.052	0.843	I+D	0.631	0.008
Regions.	Growth población	-0.561	0.035	Foreigners	-0.395	0.080
	F	2.951		F	7.972	0.003
	R^2	0.405		R^2	0.648	
	R^2 corregido	0.268		R^2 corrected	0.567	

(Personal compilation from SPSS v.19). Dependent Variable: ΔGNPpc)