Location Determinants of the Portuguese Creative Class

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Abstract - **The past decade has been a stage to academic and political debate on human capital importance as driver of regional growth as well as for the factors that human capital considers when setting its preferred location. These factors are fundamentally known in empirical literature as 'location determinants' of human capital.**

Many theoretical and empirical studies have arisen, most referencing Richard Florida's 'creative class' in some manner, putting forward evidence regarding the importance of creativity in human capital as well as the importance of understanding human capital location determinants due to linkages to urban prosperity and regional economic development. Hence, serving as an extension to the most recent studies concerning creativity, human capital and its spatial distribution and regional development, this research proposes an updated methodology to accurately analyze a specific class of human capital present inside the Portuguese employment, while also presenting the drivers of its spatial distribution throughout the national territory, supported by the main arguments that contemporary literature considers to be relevant.

It is found a positive statistically significant between the share of creative class participants in the Portuguese workforce and explanatory variables related with the educational level of human capital and the tolerance in the region they belong, as the main empirical literature regarding this subject – mainly from Richard Florida and Edward Glaeser – argue.

1 – Introduction

Regions are actively seeking to improve their growth, through economic development, enabling a fair environment across all enterprises, fostering creativity, openness and innovation. Development models need to have a sustainable basis, promoting social, cultural and economic aspects of the region, caring not only on the short-term growth of the same but also for the long-term needs, enabling that region to thrive in the future (Directorate-General for International Cooperation and Development, 2018).

The underlying driver for a region's economic development is the presence of highly skilled and educated people, or human capital. Its constructive and persistent relationship with a regions' development has been documented in several studies and regions throughout the globe (Simon, 1998). Traditionally, the standard measure for human capital has been educational attainment, however, more recently discussed has been the role of creativity in individuals, working as a source of innovation and growth, a fundamental part of human capital, and, not measured by the traditional standards of educational attainment (Florida, 2004).

Because of the link between human capital and regional development, there has been an increasing interest over the past decade regarding the spatial distribution of human capital, with political and academic debate that gradually highlights the importance of

understanding the geography of knowledge-intensive and skill-rich industries and its employees, since they act as drivers of regional growth. Uneven levels of human capital have been verified across many territories, further increasing gaps of regional growth (Berry & Glaeser, 2005). It has also been found throughout literature that human capital tends to co-locate, further contributing to uneven spatial patterns that still require the explanation of several territorial, sociological and economic determinants (Florida, 2002).

In the current globalized economy where the time span from innovation to imitation is declining in growing rates, enterprises, governments and key decision-makers are required to better understand what factors determine the location of skilled and creative human capital, to best manage its distribution and thus successfully facilitating social and economic development. In that sense, previous statements constitute the motivation for the development of this study, that will follow a methodology centered in an econometric model to provide useful insights on what factors influence the location of a specialized form of human capital, the creative class, in the Portuguese territory.

The paper is structured as follows: after the introduction, section 2 introduces the main theoretical concepts. Section 3 follows, presenting the data and methodology considered. After, section 4 emphases the descriptive analysis conducted, while, the following section 5 focuses in presenting the empirical results from the econometric model. The last section will conclude the paper presenting final remarks and notes for future research.

2 – Creative Class

In earlier theoretical stages, economists grasped to show that the income growth in most countries was not solely explained by the growth of physical capital (Becker, 1964). Theoretical economists suggested that great amounts of natural resources were required to develop a modern economy. Nevertheless, post-World War II, Japan rose as a world economic leader despite its lack of natural resources, demonstrating that resourceful territories and abundance of physical capital are insufficient to explain modern economic growth (Schultz, 1971).

Becker (1994), popularized the human capital theory, as the author argued that differently from a bank account or shares of a public listed company, schooling, education and training can be a form of capital as well, in the sense that they improve wages or other earnings and can add to a person's ability to perform labor and produce economic value. The author states examples such as Japan, Taiwan and other Asian economies that "grew rapidly by relying on a well-trained, educated, hard-working and conscientious labor force" (1994, p. 24). The author Richard Florida, however, argues that there are missing elements in the traditional human capital theory. The main one being creativity, working as a source from which new technologies, new industries, new wealth, and most positive economic things flow (Florida, 2002).

Merging the creativity that some individuals possess and their formal occupation, Florida (2002) introduced the concept of creative class – a class that runs much deeper than a set of changing job categories but goes all the way to the place it occupies socially and economically – as the author argues that the peoples' social identities as well as their cultural preferences, values, lifestyles, consumption and buying habits are all connected to their class. The author argued that differently from the working and service class, these individuals are paid to use the entire scope of their social and cognitive skills instead of mainly physical work, treasuring values of individuality, meritocracy and diversity. Truly creative individuals are driven principally by internal motivations, by the intrinsic rewards and satisfactions of their pursuits. Subsequently, our workplaces, schedules, rules and dress codes are becoming more flexible over time not only to not constrain, but also to capture this entire creative process. Florida's creative class – that focuses not on educational level but on the formal occupation of an individual – is divided as Table A 1 presents.

Marlet and Woerkens (2007) empirically verified that coefficients and levels of significance are both significantly lower for education levels than for the creative class, regarding the Dutch working force, supporting Florida's thesis. Nonetheless, other empirical findings in some regions could be unsupportive of Florida's theories: Hansen (2007) shows, presenting data regarding Swedish individuals, that demonstrate a very strong correlation (0.935) when educational level is correlated with the creative class. The high correlation found is not an isolated case as Finland presents a similar value (0.96) for the same correlation, and, Denmark and Norway present 0.84 and 0.85, respectively (Andersen et al., 2010).

McGranahan and Wojan (2007) pointed out that many of the occupations that made up a large share of Florida's creative class had low creativity requirements. Accordingly, Boschma and Fritsch (2009) mention that distinguishing between creative and noncreative occupations is a rather difficult practical task when solely relying on Florida's vague definitions, arguing that it is required to more precisely define which workers are indeed creative to more directly and correctly link to the relevant variables in the studies performed. Despite the immense literature produced on the topic, numerous challenges still exist in the path to empirically and

quantitatively study creative activities such as broad and confusing definitions of which occupations should the creative class consider or the lack of objectivity in the selection criteria of what is creative and what is not (Boschma & Fritsch, 2009).

Consequently, related concepts such as creative employment location determinants also find a generalized lack of clear definitions and estimations To identify determinant factors for the location of creative class participants at a regional level, as this paper also proposes, following similar methodologies evidenced by literature (cf. Fritsch, 2007) this chapter will present three hypothesis containing the diverse indicators that empirical literature holds as explicative of the share of creative class individuals in different regions.

Agglomeration Economies – Hypothesis 1: agglomeration economies are positively related to creative firm's location choices thus attracting creative employment (Alamá-Sabater et al., 2011; Arauzo-Carod, 2013).

Regional Facilities – Hypothesis 2: Consumer amenities explain the location choices of creative individuals (Glaeser et al., 2001; Clark, 2003); Major research universities drive the location of creative industries attracting creative employment (Audretsch & Feldman, 2004; Audretsch et al., 2005).

Regional Culture – Hypothesis 3: The region's tolerance, talent and technological endowments are positively related to presence of creative individuals (Florida, 2002, 2005).

3 – Data and Methodology

3.1 Data

The primary source of data to be used in the following study will be the *Quadros de Pessoal* (mentioned as *QP* onwards) dataset, which consists on a matched employer-employee database at the national level. This administrative database has been gathered by the Portuguese Ministry of Employment or by the Portuguese Ministry of Labor and Social Security[1] since 1982[2], for the purpose of work inspections and relevant relationships and built from a legally mandatory survey submitted each year by Portuguese private firms with at least one employee to the Ministry. Due to the enormous potential of the database, it has served not only for inspection of work safety and conditions but also has a source of statistical information to many diverse research topics, including an extensive array of information on all private firms, establishments, workers and business owners in the Portuguese economy, considering an average of 145.000 firms and 3 million workers in each annual dataset return (Baptista et al., 2011).

Table A 2 presents the adapted taxonomy for the creative employment, keeping out many occupations considered as non-creative, in the healthcare and education sectors. The CPP2010 at 3- and 4-digit level codes will be used to identify creative occupations in the *QP* employees' dataset, and the CAE-Rev.3 codes will be used to identify creative firms in the *QP* employers' dataset, ultimately enabling the descriptive analysis on the Portuguese creative employment.

3.2 Methodology

The following work will begin with a cross-section descriptive analysis for the year 2012 – the most recent *QP* dataset available where the NUTS III regions are considered – where the number of creative class participants in the Portuguese private sector will be determined, alongside with a thoroughly descriptive analysis of the Portuguese creative employment.

A correlation analysis of the explanatory variables will be performed to confirm that the variables are indeed independent, Breusch-Pagan and White tests to verify that there is no heteroskedasticity in the data, and, Variance Inflation Tests on each regression to inspect if multicollinearity is not verified. The objective is to introduce to the econometric model independent variables with low multicollinearity but with high correlation with the variable of interest (Gabriel & Vale, 2012). The share of creative class individuals per NUTS III region regarding 2012 will be used as the variable of interest (dependent variable) as this paper hopes to examine which location determinants factors have a significant relation with the share of creative class individuals in each specific region of the Portuguese territory.

The explanatory variables to test the hypothesis presented in section two consider regional characteristics such as concentration of population, tolerance in the region, presence of consumer amenities and universities, education levels and average wages. It is determined a cross-sectional regression model as follows:

$$S_n = \beta_0 + AE_n\beta_1 + RF_n\beta_2 + RC_n\beta_3 + \varepsilon_n$$

(1)

where n indexes the specific NUTS III region being examined regarding the year 2012; S_n is the share of create class individuals regarding region n in that

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[1] Currently Ministry of Labor, Solidarity and Social Security

[2] Except for the years 1990 and 2001

period; β_0 is the constant term; AE_n is a vector of regional characteristics considering all indicators for agglomeration economies; RF_n is a vector of regional characteristics considering all indicators for regional facilities; and RC_n is a vector of regional characteristics considering all indicators for the regional culture (cf. **Error! Reference source not found.**); ε_n is the error term that can account for a number of factors such as non-identified externalities or spatial correlation spillovers.

4 – Descriptive Analysis

The 2012 *QP* dataset relative to employees considers a total of 2,617,133 entries. To depict more accurate results, all 55,253 duplicate or incorrectly filled entries were removed from the dataset. The total number of entries after duplicates were removed, each mentioning one Portuguese employee, cumulated in 2,562,080 entries.

Table 1 contains the distribution of the creative workers and non-creative workers divided by each educational level present in the 2012 *QP* dataset. Such table enables a detailed characterization of the educational levels of individuals belonging to the Portuguese workforce and considered in the *QP*.

The first observable difference is that almost the entire creative class has at least the level of basic education attained, differently from the non-creative workers. Individuals with basic education or less consist in over two thirds[3] of the entire non-creative workers segment and the percentage of workers with tertiary[4] education in that same segment is less than 10 percent. Oppositely, over a third of all creative class workers has tertiary education, with particular focus on the super creative core segment of the creative class where almost 90 percent of its participants have obtained such educational level.

Table 1. Distribution of creative class and non-creative workers by educational level

Educational Level	Super Creative Core	Creative Professionals	Employed Bohemians	Non-creative workers	Total
Without educational degree or less than entire Basic Education	-	-	121 (0.3)	18,592 (1.0)	18,713 (0.7)
Basic Education	2,758 (3.1)	192,114 (34.3)	16,482 (36.0)	1,262,696 (67.7)	1,474,050 (57.5)
Secondary Education	8,849 (9.8)	148,896 (26.6)	13,082 (28.5)	431,173 (23.1)	602,000 (23.5)
Post-secondary non-tertiary education	634 (0.7)	5,605 (1.0)	540 (1.2)	6,550 (0.4)	13,329 (0.5)
Bachelor's degree	67,332 (74.4)	197,965 (35.3)	14,583 (31.8)	136,331 (7.3)	416,201 (16.2)
Master's degree	7,470 (8.26)	12,325 (2.2)	839 (1.8)	6,031 (0.3)	26,665 (1.0)
Doctorate degree	2,289 (2.5)	2,184 (0.4)	112 (0.2)	736 (0.1)	5,321 (0.2)
Not-filled	1,124 (1.2)	1,468 (0.3)	75 (0.1)	3,134 (0.2)	5,801 (0.2)
Total	90,446 (100.0)	560,557 (100.0)	45,834 (100.0)	1,865,243 (100.0)	2,562,080 (100.0)

Regarding the literature that has been presented, the previous numbers fit in line with Glaeser (2005) critiques that the creative class is just another way of measuring education, as in the Portuguese case, the majority of this class does have a substantially higher degree of education than the non-creatives. Table 2 shows how the different educational levels are distributed at the NUTS II level.

Table 2. Education levels distributed by NUTS II regions

NUTS II	Without educational degree or Basic education	Secondary or post-secondary below Bachelors' degree	Bachelor, Masters or Doctorate degree	Total
Norte	575,445 (66.3)	170,042 (19.6)	122,629 (14.1)	868,005 (100.0)
Centro	307,080 (65.2)	96,920 (20.6)	66,862 (14.2)	470,862 (100.0)
Lisboa	434,826 (46.2)	286,165 (30.2)	223,718 (23.6)	946,709 (100.0)
Alentejo	84,800 (65.9)	27,775 (21.6)	15,997 (12.4)	128,572 (100.0)
Algarve	56,071 (62.9)	21,804 (24.5)	11,287 (12.7)	89,162 (100.0)
Açores	679 (36.3)	733 (39.2)	457 (24.5)	1,869 (100.0)
Madeira	31,971 (62.6)	11,876 (23.3)	7,217 (14.1)	51,064 (100.0)
Total	1,492,763 (58.4)	615,329 (24.1)	448,187 (17.5)	2,556,279 (100.0)

Table 3 as developed, where the workers with 'no wages considered' in the dataset were removed and the wage scale was reduced as well, merging some of the segments in that same scale. The first segment of wages in the mentioned table corresponds to the minimum wage before tax in the year 2019[5]. As the table details, the creative class segments are much significant in the higher wages segments. Over 90 percent of the non-creative

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[3] The values inside the parenthesis are the percentages and the total value is summed by column.
[4] Bachelor's, Master's and/or Doctorate degrees.

[5] Considering the minimum agriculture wage, *salário mínimo agrícola*, retrieved from PORDATA.

workers situate in the two first segments where total monthly earnings do not exceed the 1,500 euros and less than one percent of these workers are placed in the highest wage segment, exceeding 3,750 euros monthly.

Table 3. Creative and non-creative workers' wages (summarized)

Wage Scale	Super Creative Core	Creative Professionals	Bohemians	Non-creative workers
Less than 599 euros	8,022 (9.3)	41,352 (10.1)	7,842 (19.1)	665,500 (37.0)
[600, 1499] euros	37,291 (43.1)	204,570 (49.9)	23,192 (56.3)	1,016,901 (56.5)
[1500, 3749] euros	36,255 (41.9)	134,615 (32.8)	8,619 (20.9)	113,335 (6.3)
Over 3750 euros	4,990 (5.8)	29,312 (7.2)	1,505 (3.7)	3,996 (0.2)
Total	86,558 (100.0)	409,849 (100.0)	41,158 (100.0)	1,799,732 (100.0)

5 – Results

As previously mentioned, the logarithm of each value was considered to reduce the skewness of the data and reduce the effect that outliers might have and could ultimately influence the results obtained in the regressions. The literal interpretation of the estimated coefficients β associated will be that a one-unit increase in the dependent variable will produce an expected increase in the independent variable of β units (Benoit, 2011), since the logarithmic values tend to correspond better to the assumption of a normal distribution than do the original values. A first step of data preparation was undertaken, developing scatter plots and histograms to ensure the linearity and normality (normal distribution) of the variables to be considered in the model.

Due to the manner on how some indicators on the first hypothesis were calculated, presenting a direct linear relationship with the dependent variables at study, and other indicators being inserted as control variables for the size of the population in each region, the previously mentioned hypothesis 1 (*H1*) was dissolved, having already provided insights in the descriptive statistics section.

The proposed cross-sectional regression model will consider only the two remaining hypotheses to test – the previously presented hypothesis 2 (*H2*) linking creatives with regional facilities and hypothesis 3 (*H3*) linking creatives with regional culture. The previously

presented equation *(1)* for the cross-sectional model, shown in the methodology chapter, further proceeds in this dissertation derived in the following vectors:

$$S_n = \beta_0 + RF_n\beta_1 + RC_n\beta_2 + \varepsilon_n$$

(2)

Due to the existence of multicollinearity among the explanatory variables, the regressions considering the share of creative class workers as a dependent variable, will be presented considered in different models, each categorizing the independent variables as follows:

- model (I) containing all independent variables regarding hypothesis 2 (*H2*);
- model (II) containing all independent variables regarding hypothesis 3 (*H3*);
- model (III) considering all independent variables regressed simultaneously to verify the hypothesis altogether;
- model (IV) considering, again, all independent variables from both hypothesis except for those who are excluded from the Variance Inflation Factor test due to indices of high multicollinearity (variables with VIF value over 10 removed);

Table 4 presents the regression results for the determinants of the regional share of Portuguese creative workers. The first column considers model I and it is observable that none of the explanatory variables enters the model significantly. Different are the results for model II where the Bohemian Index indicator exhibits statistical significance evidencing its positive relationship with the share of creative class workers in the Portuguese context. The same holds for models III and IV, considering all variables, which reveals the importance of the subset of the Bohemians as an attractive element to the remaining creative class, as Florida argued.

It is fundamental to notice that the difference between the R squared and adjusted r-squared values decreases from model III to model IV, and, the positively related explanatory variables increase its level of statistical significance due to the exclusion of multicollinear independent variables. It is valid to argue that model IV better suits in explaining the dependent variable.

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Table 4. Determinants of the regional share of Portuguese creative class workers

	Share of Creative Class Workers			
	(I)	(II)	(III)	(IV)
Population density	-0.01 (0.35)	-0.04* (-1.5)	-0.05** (-3.1)	-0.03*** (-3.4)
Constructed Amenities Index	0.01 (0.301)	-	0.01 (0.440)	0.01 (0.45)
University proximity	0.02 (1.19)	-	0.01 (0.647)	-
Public Provision Index	-0.03 (-1.0)	-	0.03 (1.20)	0.01 (0.63)
Population with tertiary Education (proportion)	0.31*** (4.41)	-	0.28*** (6.10)	0.32*** (9.77)
Enrollment in upper secondary education (proportion)	-0.04 (-0.33)	-	0.06 (0.574)	0.10 (1.35)
Employment growth rate	0.64 (1.96)	-	-0.01 (-0.03)	-0.08 (-0.35)
Purchasing power (proportion)	0.05 (0.329)	-	-0.07 (-0.41)	-
Average monthly earnings	0.04 (0.283)	-	0.14 (1.24)	-
Bohemian Index	-	0.16* (2.38)	0.07* (2.12)	0.07** (2.89)
Foreign Population	-	0.07 (2.67)	0.04** (2.72)	0.03*** (3.33)
Private R&D Investment	-	-0.00 (-0.26)	-0.01 (-0.73)	-0.01 (-1.7)
R&D Human Capital	-	-0.15 (-1.9)	-0.02 (-0.35)	-0.03 (-1.0)
Industry Technology Intensity	-	-0.10 (-0.81)	-0.22*** (-3.8)	-0.22*** (-4.3)
Constant	0.40 (0.517)	1.54*** (7.78)	1.62** (3.04)	1.94*** (4.42)
F test	0.0000	0.0024	0.0000	0.0000
R squared	0.9277	0.6422	0.9818	0.9788
Adjusted R squared	0.8844	0.5229	0.9564	0.9608

Beta coefficients for the multiple linear regressions; t-values in parenthesis; *statistically significant at the 5 percent level, **statistically significant at the 1 percent level, ***statistically significant at the 0.1 percent level; number of observations: 25.

Regarding the regression in model IV, a positive effect can be found for the population with tertiary education, Bohemian Index and Foreign Population, while a negative significant effect in the Industry Technology Intensity indicator. It is important to notice however that the greater and positive statistically significant value is for the first indicator mentioned, with a beta coefficient – by far – larger than the remaining. It can be concluded for the presented results that while Florida's argument regarding the importance of a Tolerant region hold – due to the positive statistical significance of the Bohemian Index and Foreign Population indicators – a larger, more strong relationship exists for the case of Glaeser who critiques Florida's thesis, due to the strong linkages between the creative class and individuals with a high level of education. The characteristics of the region however, or Consumer Amenities as many authors – including Glaeser - refer to it, do not hold such strong relations regarding the share of creative individuals in specific regions.

6 – Conclusions and Future Research

This study first achievement towards the fulfillment of the proposed objectives was the selection of variables and indicators to consider, and the treatment of the same. Literature has shown that in every step of the empirical analysis, many authors argue for different definitions, approaches and methodologies that yield diverse results. It has been shown as well that a single taxonomy for creative class occupational codes cannot be directly applied to empirical studies that compare different countries since most used national databases apply occupational codes that are country-specific and that the disaggregation levels of territorial unit to be use should vary as well according to the objective of the subject (Cruz, 2014). Hence, this dissertation reviewed and applied the approaches and methodologies that already has significant linkages to the Portuguese context, further improving them to yield a more accurate Portuguese creative class, which in turn hoped to provide more accurate and reliable results related to the objectives in scope.

The first objective of this study, to characterize the Portuguese landscape in regards of location at the NUTS III level, segmenting workers by industry, earnings and educational level, through an extensive descriptive analysis of the 2012 *QP* database was fully achieved. Aligned with the vast empirical literature presented, the descriptive analysis shown that creative class participants are highly concentrated on the largest cities, with approximately 56% of the entire creative class belonging to the two main major NUTS III regions in Portugal: *Região Metropolitana do Porto* and *Região Metropolitana de Lisboa* – aligned with Alamá-Sabater et al. (2011) arguments that agglomeration economies, have higher levels of formal education than the non-creatives and are also among the highest earning workers. Accordingly, the same regions also concentrate 65% of the total Portuguese population with tertiary education and 66% of the total population who earns more than 1500 euros monthly. While previous empirical literature had already shown that being a creative worker presented advantages at the level of earning and education. This dissertation, however, further shown that such advantages are not homogenous throughout the Portuguese territory, when examined at the NUTS III level of geographic disaggregation.

Regarding the second objective of this study, a model to show what location determinants of the creative class had higher positive statistically significant value was also developed and evaluated. The main critics about Florida's approach to talented human capital (e.g. Glaeser, 2005) stating the author measures the impact of qualification on economic development, must not be hold as valid for the Portuguese context, as the model results

shown that while it is found a high positive statistical significant relation between the share of all segments of the creative class – except for employed bohemians – and the proportion of population with tertiary education, it was also found a positive statistically significane with Florida's (2002, 2004) arguments of the importance of a Tolerant region towards attracting creative, talented human capital.

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Appendix

Table A 1. Defining the Creative Class

Super-Creative Core
Computer and mathematical occupations
Architecture and engineering occupations
Life, physical, and social occupations
Education, training, and library occupations
Arts, design, entertainment, sports and media occupations
Creative Professionals
Management occupations
Business and financial operations occupations
Legal occupations
Health-care practitioners and technical occupations
High-end sales and sales management

Source: Florida (2012, p.401)

Table A 2. Creative occupations and industry codes

Creative Class Groups	Occupational Categories Descriptions	Portuguese Standard Occupational codes CPP – 2010 (3- and 4-digit summary categories)	Industry Sectors	Portuguese CAE – Rev. 3 Industry codes (SIC)
Super Creative Core	. Computer and mathematical occupations; . Architecture and engineering occupations; . Life, physical and social science occupation; . Education, training and library occupations;	. Physicists, Chemists and related professionals (211); . Mathematicians, Statisticians and related professionals (212); . Life Science professionals (213); . Engineers and engineering professionals (214); . Electrotechnology engineers (215); . Architects, urbanists and product designers (2161, 2162, 2164, 2165); . University and higher education teachers (231); . Vocational, technological and artistic education teachers (232); . Social Science and related professionals (263); . Software, Web and application analysts and developers (251); . Databases and networks specialists (252);	Engineering and Architectural activities	711; 712
			Scientific investigation and R&D activities	721; 722
			Post-secondary educational activities	854;
			Software and Digital Media: Software publishing; Computer programming/ consultancy; Data processing/hosting/web portals	5821; 5829; 6201; 6202; 631;
			Libraries/archives/museum activities	910
Creative Professionals	. Management occupations; . Business and financial operations occupations;	. Directors, senior managers and managers (1); . Health professionals (except nursing) (221, 224, 225, 226); . Nursing and midwifery professionals (222);	Legal activities	691
			Accounting and auditing activities	692

			Activity	Code
	. Legal occupations; . Healthcare practitioners and technical occupations; . High-end sales and sales management; . Administrative associate professionals;	. Finance professionals (241); . Administration professionals (242); . Legal professionals (261); . Archivists, museum curators and related information professionals (262); . Physical and engineering sciences technicians (311, 312, 313, 315); . Life science technicians and relates associate professionals (314); . Medical and pharmaceutical technicians and health associate professionals (321, 324, 325); . Financial and mathematical associate professionals (331); . Sales and purchasing agents and brokers (332); . Business services agents (333); . Administrative, legal, social and specialized secretaries and related professionals (334); . Regulatory government associate professionals (335); . Information and communications technology operations and user support technicians (351);	Business and Management consulting activities	702
			Veterinary activities	750
			Public administration activities	841
			Professional and cultural educational activities	855
			Health activities	861; 862; 869;
			Financial services	641; 642; 643; 649; 651; 661;
			Associative organization activities	941; 942;
Bohemians (Contained in the Super Creative Core group)	. Arts, design, entertainment, sports and media occupations;	. Musicians, Actors and other creative and performing artists (265); . Artistic, Entertainment and Sports associate professionals (342; 343); . Fashion and other models (5241); . Telecommunications and broadcasting technicians (352); . Product and garment designers (2163); . Graphic and multimedia designers (2166); . Advertising and marketing professionals (2431); . Public relations professionals (2432); . Creative and performing artists not elsewhere classified (2659); . Qualified jewelers, artisans and precision instruments specialists (731); . Authors, journalists and linguists (264);	TV and Radio activities	6010; 6020; 6391
			Film, Video and Photography: Motion Picture, video and television production, post-production and distribution activities	591
			Music/Entertainment and the Performing Arts: Sound recording/ music publishing activities; Performing arts and support activities; Amusement/recreation activities	592; 900; 931; 932;
			Photography activities	742
			Design and Visual Arts activities	741
			Advertising and Marketing: Market research, Public opinion pooling, Advertising	731; 732
			Crafts and Others	321; 322; 325; 264; 265; 266; 267; 231; 232; 233; 2341
			Publishing of books, periodicals/others; New agencies activities	581; 6391; 6399
			Translation/interpretation activities	743

Source: Cruz S., (2014) adapted from Boschma and Fritsch