



CREATIVE SERVICES AGGLOMERATIONS AND THE WEALTH OF EUROPEAN REGIONS

BLANCA DE-MIGUEL MOLINA^{1*}, RAFAEL BOIX²,
JOSÉ-LUIS HERVÁS-OLIVER¹

¹Management & Innovation Network Group Research (MIN). Departamento de Organización de Empresas. Universitat Politècnica de València, Spain. Camino de Vera s/n, 46022 Valencia
²Departament d'Economia Aplicada II. Universitat de Valencia, Spain. Avda. dels Tarongers s/n, 46022 Valencia

Abstract

This paper examines the existence of regional agglomerations of creative services, and analyses the relationship between these industries and the wealth of regions in 250 European regions. The results prove that the richest regions have a larger share of workers in creative services and that an increase of 1% in the share of creative services in the employment of the region produces an increase of 1,600 euro in the GDP per capita. The core importance of this paper is that provides robust evidence that creative services industries have a positive impact on the wealth of the European regions and higher than other knowledge-intensive services and high tech manufacturing.

Keywords: creative industries, creative services, European regions, regional policy

* *Correspondence Address:* Blanca de-Miguel-Molina, Departamento de Organización de Empresas – Universidad Politècnica de Valencia, Camino de Vera s/n, 46022 Valencia, Spain. Email: bdemigu@omp.upv.es

1. Introduction

The location of creative services, as highlighted by the work of Stam et al (2008), Lazzeretti et al (2008), Capone (2008) and Power and Nielsén (2010), is an area of increasing importance in geographic agglomeration literature. These services are in fact specific sector groupings of knowledge-intensive business services (KIBS), which is why their importance is related to the ever-increasing dependence of manufacturing industries on the service sector (Peneder et al, 2003; Pilat and Wölfl, 2005; Drejer and Vinding, 2005; Wood, 2006; Aslesen and Isaksen, 2007b; Dall’erba et al, 2009), and on what we can call the ‘Knowledge and Service Economy’ (Windrum and Tomlinson, 1999; Bishop, 2008; Aslesen and Isaksen, 2007a; Strambach, 2008).

Although existing studies show which activities can be included as creative industries and why these industries form agglomerations (UNCTAD 2010; De Propris 2009; Lazzeretti et al., 2009), the aforementioned analyses have not examined the relationship between creative services and wealth. This paper attempts to fill this void as we are not currently aware of the existence of any paper which focuses on this subject. Moreover, the core importance of this paper is based on the fact that the role of services, and more specifically creative services, in developing economies and bringing prosperity to European regions has been demonstrated empirically.

It is widely accepted that the role of services is fundamental to regional economic growth (Camacho and Rodriguez, 2005; Beyers, 2005). However, it remains to be seen whether this is due to the presence of service activities in the employment structure of a region or whether these services are co-agglomerated. Camacho and Rodriguez (2005) mention ‘very high-skills’ services in regions with higher levels of human capital while Florida et al (2008) explain that some creative occupations have a greater influence on regional development than others. Wedemeier (2010), in line with Florida, also underlines the presence of creative industries. To some extent, the idea of occupations and regional growth is also connected with the concept of “innovation prone societies” by Rodríguez-Pose (1999), when referring to employment in R&D or high-tech intensive industries in regions, among other factors. With regard to the reasons for co-agglomeration in services, it is not clear whether agglomeration benefits are location specific or industry specific (Leydesdorff and Fritsch 2006, Vence-Deza and González-López 2008, Muller and Doloreux 2009, Wernerheim 2010)

This paper examines the existence of agglomerations of creative services, and analyses the relationship between these services and the wealth of regions in 250 European regions across 16 European countries. Data was taken from Eurostat and used to evaluate creative service agglomerations and service structure of regions based on employees.

The results brought forth four important conclusions. First, that the services' structure of each region has a greater influence on regional wealth than the existence of services' agglomerations. Second, that creative services are the most important to explain the differences in GDP per capita across the EU regions. Third, that some creative services are more important in the wealth of regions than others. Finally, we found evidence of a powerful association between the effects of creative services and medium-high- tech manufacturing on the GDP per capita.

The structure of this paper is as follows: Sections 2 and 3 briefly summarise the recent basic theory on the study of service agglomeration and creative industry maps to determine the location patterns and the relationships they have with these studies. Section 4 includes the empirical study where we set out the variables used, the sources the data was extracted from and the methodology used as well as the results obtained. Our conclusions can be found in Section 5.

2. Creative and knowledge-intensive services

According to Pratt (2008), it was toward the end of the 1990s when the terminology of creative industries began to be used in Europe, to be more precise, when the British Department for Culture, Media and Sport (DCMS) drew up its map of creative industries in 1998.

The most widely extended definition of creative industries is that of the DCMS (2009) which defined creative industries, as “those industries that are based on individual creativity, skill and talent. And which have the potential to create wealth and jobs through developing intellectual property”.

The DCMS (2009) definition of creative industries includes advertising, architecture, art and antiques markets, computer and video games, crafts, design, designer fashion, film and video, music, the performing arts, publishing, software, television and radio within these activities, although it excluded the heritage sector, archives, museums, libraries, tourism and sport. However, other authors and

organizations also include heritage, R&D, toys and cultural tourism (Howkins, 2007; UNCTAD 2010).

The most comprehensive taxonomy of creative industries, which is particularly appropriate to cross-country comparisons, has been proposed by UNCTAD (2010). This classification includes both manufacturing and services industries, although the majority of the sectors included in creative industries are services, especially knowledge-intensive services (KIS). When comparing the definition of creative industries as per the British Department for Culture (Pratt 2008, DCMS 2009) with the characteristics attributed to KIS sectors (Nählinder, 2005; Doloreux et al., 2008; Strambach, 2008; Muller and Doloreux, 2009; Shearmur and Doloreux, 2009), both make reference to the talent and abilities of persons and firms to create knowledge (Larsen, 2001; Aslesen and Isaksen, 2007b). Table 1 contains the transformation to NACE Rev 2 of the creative services activities, showing the relationship with the knowledge-intensive services. The twelve creative services in table 1 were used to evaluate empirically co-locations and the importance of each one on the wealth of regions.

Table 1- Aggregations of creative services based on NACE Rev. 2. Adaptation to 2 digits.

Services	Creative	Non-creative
High-tech Knowledge-intensive services (HTKIS)	59 – Audiovisual, 60 - Broadcasting, 62 – Computer programming, 72 – R&D	61, 63
Other Knowledge-intensive services (OKIS)	58 – Publishing, 71 – Architecture and engineering, 73 - Advertising, 74 – Design, photography, 90 - Arts, 91 - Heritage, 93 - Recreation	50, 51, 64, 65, 66, 69, 70, 75, 78, 80, 84, 85, 86, 87, 88, 92
Less-Knowledge-intensive services (LKIS)	4779 - Retail sale of second-hand goods in stores	45, 46, 47 (except 4779), 49, 52, 53, 55, 56, 68, 77, 79, 81, 92, 94, 95, 96, 97, 98, 99

Source: UNCTAD (2010), DCMS (2009), KEA European Affairs (2006) and Lazzaretto et al. (2008)

3. Maps of creative and knowledge-intensive services agglomerations and their impact on the wealth of regions

Maps of service agglomerations are representations of sectors which are located in a geographic zone, whether it be a city, region or country (Basset et al, 2002; O'Donoghue and Gleave, 2004).

Pilat and Wölfl (2005) and Dall'erba et al (2009) have pointed out that the greatest influence of services on the economy comes from the interrelationship between manufacturing and service industries because the former tends to subcontract activities to firms offering specialised services located in the same country or in a foreign country. What is taken into account in services is knowledge, since the existing relationship between the manufacturing and service industries enables the latter to transfer knowledge to the former as well as to create it (Miles, 2008; Rodriguez and Camacho, 2010). This is why the analysis of knowledge-intensive services (Bishop, 2008) predominates in the service industry, since these services are associated with the knowledge-based economy (Bishop, 2008; Aslesen and Isaksen, 2007a; Windrum and Tomlinson, 1999; Strambach, 2008). Although studies, such as the work by Heidenreich (2009), have found that regions specialise either in manufacturing or in services, existing studies on knowledge-intensive business services (KIBS) explain the dependence that industry has with respect to services (Wood, 2006).

Current studies have detected some patterns with respect to the importance of knowledge-intensive business services (KIBS). Vence-Deza and González-López (2008) point out that the main trend in European regions is toward a geographic concentration of high-tech manufacturing and service sectors and that this concentration takes place in regions with the highest GDP per inhabitant. However, in two studies on Germany and Holland, Leydesdorff and Fritsch (2006) and Leydesdorff et al (2006), have observed that knowledge-intensive high-tech services (KIHTS) have the most important effect on the territorial knowledge base while other knowledge-intensive services (OKIS) have a lesser effect. According to Heidenreich (2009), the richest regions – those with high GDP – have a high percentage of jobs in knowledge-intensive services (KIS). The Center for Strategy and Competitiveness (2009) in its study on KIBS sectors in Europe found that regions with strong KIBS sectors have the highest prosperity levels in Europe.

A specific case study of agglomerations which includes manufacturing and services of different types is that of *creative industries* (Stam et al., 2008; Lazzarretti et

al., 2008; Capone, 2008; De Propis et al., 2009; Power and Nielsén, 2010). The location of creative and cultural industries from an aggregated viewpoint has been studied by Power (2002, 2003), Cooke (2008), Stam et al. (2008), Lazzeretti et al. (2008), Capone (2008), De Propis et al (2009), Baum et al. (2009), and Power and Nielsén (2010). These studies conclude that creative industries tend to be located in the major urban areas of each country (Lazzeretti et al., 2008; Stam et al., 2008; De Propis et al, 2009; Baum et al. 2009; Power and Nielsén, 2010).

In terms of the relationship between location and wealth, the DCMS creative industries concept expresses “their potential for wealth and job creation”. Power and Nielsén (2010) found that creative and cultural industries are located in the wealthiest European regions, while Stam et al. (2008) showed that the presence of the creative class has a higher impact on employment growth than creative industries. Baum et al. (2009) also pointed out that locations need human capital if they intend to prosper in creative industries.

4. Methodology

4.1 Sample and variables

The sample comprises 250 European regions. The countries which data was not available, such as Greece, Luxembourg and Malta, were not included.

The data for this study was compiled from Eurostat’s *Structural Business Statistics* (SBS) and *Regional Economic Accounts* (REA) databases and corresponds to 2008.

The variables extracted were used to calculate the *Location Quotient* (LQ) for services in each region with respect to UE27. The location quotient (LQ) is an indicator of the existence of industrial agglomerations in a region and is very common in the analysis of creative industry agglomerations (Lazzeretti et al., 2008; De Propis et al., 2009; Baum et al., 2009):

$$LQ_d = \frac{\text{Employees in NACE}_i \text{ in region A} / \text{Total employees in NACE}_i \text{ in EU27}}{\text{Employees in services in region A} / \text{Total employees in services in EU27}}$$

To calculate regional structures, data on regional jobs was extracted from the previously mentioned NACEs by calculating the percentage of jobs in each service sector with respect to total regional employment. To carry out the statistical calculations, the groupings of services in tables 1 and 2 were used.

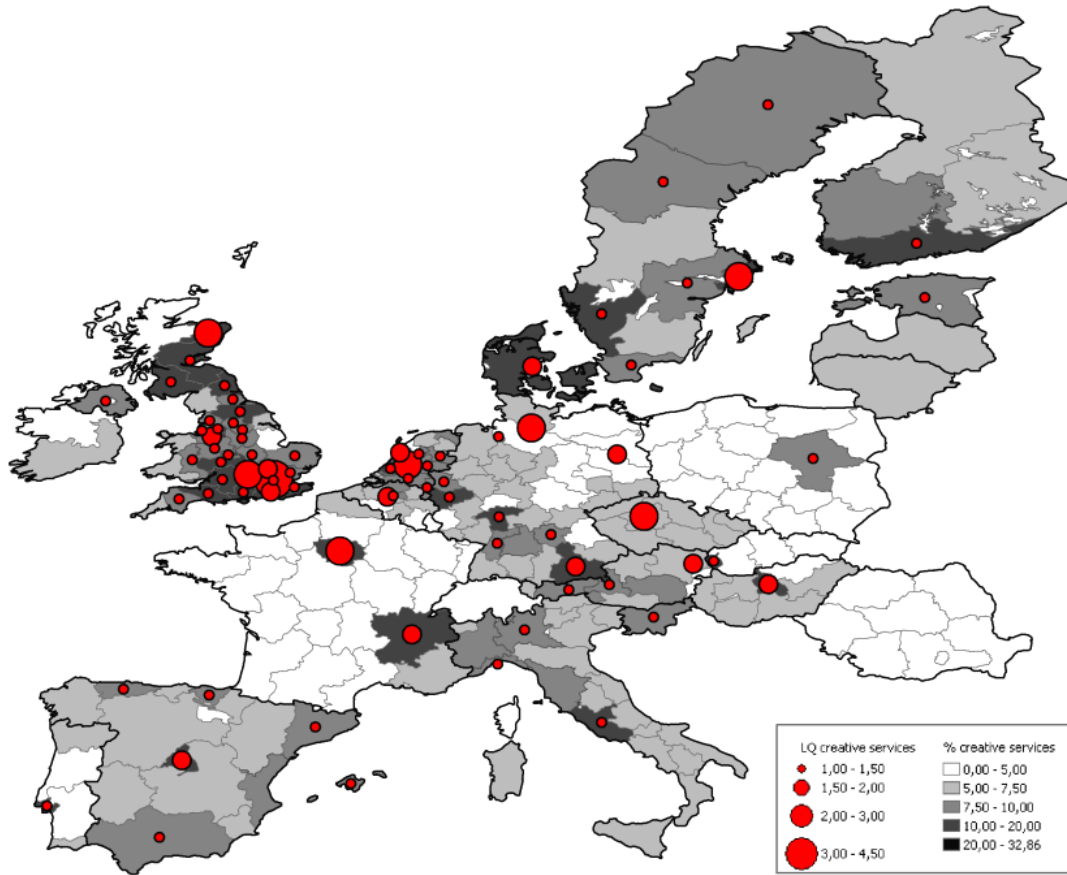
Table 2- Aggregations of creative industries based on NACE Rev. 2. Adaptation to 2 digits.

Manufacturing	Creative	Non-creative
High-tech		21, 26
Medium-high tech		20, 27, 28, 29, 30
Medium-low tech		19, 22, 23, 24, 25, 33
Low-tech	14, 15, 18,	10, 11, 12, 13, 16, 17, 31, 32
Services	Creative	Non-creative
High-tech Knowledge-intensive services (HTKIS)	59, 60, 62, 72	61, 63
Other Knowledge-intensive services (OKIS)	58, 71, 73, 74, 90, 91, 93	50, 51, 64, 65, 66, 69, 70, 75, 78, 80, 84, 85, 86, 87, 88, 92
Less-Knowledge-intensive services (LKIS)	4779	45, 46, 47 (except 4779), 49, 52, 53, 55, 56, 68, 77, 79, 81, 92, 94, 95, 96, 97, 98, 99

Source: UNCTAD (2010), DCMS (2009), KEA European Affairs (2006) and Lazzeretti et al. (2008)

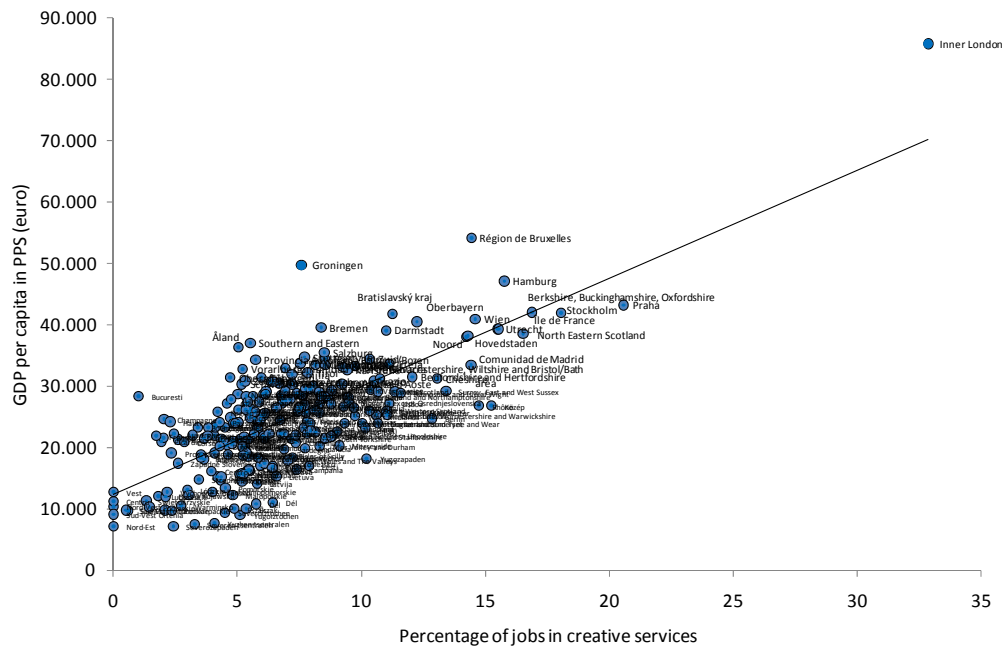
Figure 1 represents the weight of creative services (KIS which are creative) on the regional employment, and the relative specialization of the region (LQs) in creative services in 250 European regions. Additionally, data on GDP per inhabitant for each region was compiled in order to analyse its relationship with creative services and compare it with the results for other services. The figure 2 suggests that there is a strong correlation between the share of jobs in creative services and the GDP per inhabitant. In the next section we will try to reveal if this pattern is causal and if the GDP per capita comes determined by the factors of agglomeration or by the knowledge structure of the regions.

Figure 1. Share of creative services on the regional employment and relative specialization of the region (location quotient) in creative services in 250 European regions



Source: Elaboration from Eurostat.

Figure 2. Correlation between GDP per capita and the percentage of creative services in the European regions



Source: Elaboration from Eurostat.

4.2. Results of the regression analysis

The regression analysis follows the model proposed by De Miguel et al. (2011) to analyze whether the wealth of a region depends on the existence of industrial agglomerations or on its industrial structure. By industrial structure we mean the percentage of jobs in each region that are included in creative and non-creative industries.

In the regression model, the dependent variable was the GDP per inhabitant in PPS and the independent variables were the number of sub-sectors in the industry clustered in the region (number of *LQ or Location Quotients above 1*) and the percentage of workers (Table 3). The LQs were calculated using the number of employees. The first group of variables captures location economies whereas the second approaches the characteristics of the productive structure.

Table 3. Variables in the regression model Agglomeration - Structure (De Miguel et al. 2011)

Dependent variable	GDP per inhabitant
Independent variables	<ol style="list-style-type: none"> 1. LQs: Number of industrial agglomerations in each region for each one of the following collectives: <ul style="list-style-type: none"> • LQs in creative services (LQsCS) • LQs in creative manufacturing (LQsCM) • LQs in non-creative high-tech manufacturing (LQsH) • LQs in non-creative medium-high-tech manufacturing (LQsMH) • LQs in non-creative medium-low-tech manufacturing (LQsML) • LQs in non-creative low-tech manufacturing (LQsL) • LQs in non-creative high-tech knowledge-intensive services (LQsHKIS) • LQs in other non-creative knowledge-intensive services (LQsOKIS) • LQs in non-creative less-knowledge-intensive services (LQsLKIS) 2. Industrial structure of the region: percentage of workers in each region for each of the following collectives: <ul style="list-style-type: none"> • % workers in creative services (LCS) • % workers in creative manufacturing (LCM) • % workers in non-creative high-tech manufacturing (LH) • % workers in non-creative medium-high-tech manufacturing (LMH) • % workers in non-creative medium-low-tech manufacturing (LML) • % workers in non-creative low-tech manufacturing (LL) • % workers in non-creative high-tech knowledge-intensive services (LHKIS) • % workers in other non-creative knowledge-intensive services (LOKIS) • % workers in non-creative less-knowledge-intensive services (LLKIS)

The equation used as the basis of the regression model was:

$$GDP_{perinhab_i} = Const + \beta_1 LQsCS + \beta_2 LQsCM + \beta_3 LQsH + \beta_4 LQsMH + \beta_5 LQsML + \beta_6 LQsL + \beta_7 LQsHKIS + \beta_8 LQsOKIS + \beta_9 LQsLKIS + \beta_{10} LCS + \beta_{11} LCM + \beta_{12} LH + \beta_{13} LMH + \beta_{14} LML + \beta_{15} LL + \beta_{16} LHKIS + \beta_{17} LOKIS + \beta_{18} LLKIS + \varepsilon_i$$

A stepwise regression model was applied, verifying the statistical significance of the model in Table 4. Three relevant results arise: first, the effects of the structure seem to be much more important than the effects of location. In fact, all the variables of location become statistically and economically non-significant when the variables of structure are included in the equation, so that only the second ones are included in Table 4.

Second, it can be concluded that the variable which has the greatest importance in the income per inhabitant of European regions is the percentage of workers in the creative services. An increase in 1% in the percentage of jobs in creative services in the regions translates to an increase of 0.71% in the GDP per capita, that is, more than 1,600 euro.

As there is a potential problem of simultaneity in the variable (does the percentage of workers in creative services impact on the GDP per capita or, on the contrary, are higher levels of GDP per capita which results in higher shares of workers in creative services?), we reestimated the equation using instrumental variables (table 4, third column) and the results maintain¹.

Third, the effects of creative services and creative manufacturing are radically different so that they should be separated in the analysis. The share of workers in manufacturing creative industries (basically fashion), negatively correlates with the GDP per capita. This is explained because the dual nature of the data, which merges high fashion design in cities like Paris or London with a large number of manufacturers, concentrated in Italy, Portugal and Spain.

Fourth, the share of workers in high-tech non creative services don't have a differential effect on the GDP per capita whereas this effect is positive for other knowledge-intensive services. This is due to the fact that in the first case the shares of these services are very similar in the EU regions whereas for the non-creative OKIS

¹ Instrumental equation is specified following the CAC model by Lazzeretti et al. (2009), where culture and heritage, agglomeration economies and creative class explain the concentration of the creative jobs.

there is more heterogeneity. Therefore, and contrary to Leydesdorff and Fritsch (2006) and Leydesdorff et al (2006), OKIS (Other knowledge-intensive services) are not less important than KIHTS (knowledge-intensive high-tech services).

Finally, the percentage of workers in medium-high technology manufacturing also have a positive impact on the GDP per capita, proving again that some services and manufacturing industries are compatible. In fact, these results suggest a powerful association: creative services with medium-high tech manufacturing.

Table 4. Final estimates (parsimonious model)

Dependent variable: GDP per capita in PPS	OLS		OLS		IV ⁽⁵⁾
	(1)		(2)		(3)
	Coef.	Beta	Coef.	Beta	Coef.
		Coef.		Coef.	
Constant	3055.92 (0.527)		9076.18 (0.000)		8252.64
Creative industries					
% workers in creative services	1688.29 (0.000)	0.7183	1679.93 (0.000)	0.7148	1813.45 (0.000)
% workers in creative manufacturing	-1194.05 (0.040)	-0.1639	-1138.29 (0.005)	-0.1563	-1085.55 (0.006)
Non-creative industries					
% workers in high-tech manufacturing	-424.71 (0.389)	-0.0459			
% workers in medium-high-tech manufacturing	429.68 (0.006)	0.1498	297.97 (0.007)	0.1039	317.81 (0.003)
% workers in medium-low-tech manufacturing	88.61 (0.675)	0.0341			
% workers in low-tech manufacturing ⁽¹⁾	-108.11 (0.510)	-0.0301			
% workers in high-tech services ⁽²⁾	16.24 (0.982)	0.0014			
% workers in other knowledge-intensive services ⁽³⁾	157.93 (0.019)	0.1130	128.39 (0.049)	0.0919	119.85 (0.058)
% workers in less-knowledge-intensive services ⁽⁴⁾	171.11 (0.146)	0.0791			
R2	0.6187		0.6107		0.6077
R2-adj	0.6044		0.6044		
Mean VIF	1.89		1.27		
Obs	250		250		

⁽¹⁾ Excluding wearing apparel, leather, and printing, included in “creative manufacturing industries”.

⁽²⁾ Includes only telecommunications and information service activities as the rest (motion picture, video and television, sound recording and music, broadcasting, computer programming, and scientific research and development) are included in “creative services”.

⁽³⁾ Excluding publishing, architectural and engineering activities, advertising, and arts, entertainment and recreation, included in “creative services”.

⁽⁴⁾ Excluding retail sale of other goods in specialized stores, included in “creative services”.

⁽⁵⁾ Instruments for the percentage of workers in creative services includes cultural endowments, average firm size in the region, average firm size in the creative services in the region, productive diversity in the creative services string, population, population density, productive diversity in the region, patents per million inhabitants, r&d expenditures on GDP, percentage of creative class and percentage of population with third-degree education.

Note: Huber-White robust estimators.

4.3. Paying attention to the co-location of creative services

A key question is if the relation between creative services and GDP per capita holds for every kind of creative service or only for some of them. Table 5 shows the correlation coefficients between the shares of creative services on the regional employment, and with the GDP per capita. The results obtained when relating sectors with GDP per inhabitant, the results obtained show:

- There is a positive correlation between GDP per inhabitant and the localization of creative services (figure 2): every creative service is significantly correlated with the GDP per capita, and the correlations ranges from 0.33 to 0.67 (table 5).
- Taking into account only correlations higher than 0.5, results show that some creative services are more important in the wealth of regions than others. These sectors are: computer programming (HTKIS), advertising (OKIS), publishing (OKIS), audiovisual (HTKIS), architecture & engineering (OKIS), R&D (HTKIS) and creative retail (LKIS).

These results could lead us to believe that the wealth of a region depends on those knowledge-intensive services which are creative.

Moreover, and contrary to Leydesdorff and Fritsch (2006) and Leydesdorff et al (2006), OKIS (Other knowledge-intensive services) are not less important than KIHTS (knowledge-intensive high-tech services), at least in the case of creative services.

Furthermore, from the results in Table 5, we also observe that there is a positive and statistically significant correlation between the different creative services (from 0.2 to 0.8). So, we can conclude that every creative service co-locate with others. Taking correlations of more than 0.5 as strong correlations, the results show that:

- Publishing (OKIS) strongly co-locates with audiovisual (HTKIS), broadcasting (HTKIS), computer programming (HTKIS), and advertising (OKIS)
- Audiovisual (HTKIS) strongly co-locates with publishing (OKIS), broadcasting (HTKIS), computer programming (HTKIS), advertising (OKIS), and design and photography (OKIS)
- Broadcasting (HTKIS) strongly co-locates with publishing (OKIS), audiovisual (HTKIS) and advertising (OKIS)

- Computer programming (HTKIS) strongly co-locates with publishing (OKIS), audiovisual (HTKIS), architecture and engineering (OKIS), R&D (HTKIS), advertising (OKIS), and design and photography (OKIS)
- Architecture and engineering (OKIS) strongly co-locates with computer programming (HTKIS)
- R&D (HTKIS) strongly co-locates with computer programming (HTKIS) and advertising (OKIS)
- Advertising (OKIS) strongly correlates with publishing (OKIS), audiovisual (HTKIS), broadcasting (HTKIS), computer programming (HTKIS) and R&D (HTKIS)
- Design and photography (OKIS) strongly co-locates with audiovisual (HTKIS) and computer programming (HTKIS)
- Finally, cultural and creative retail, as well as arts, entertainment and recreation co-locates with the rest of sector although the coefficient is in every case lower than 0.5

Table 5. Co-location between creative services. Correlation coefficients between the shares of creative services on the total employment of the regions detailed by activity

	GDP in pps	Retail (creative)	Publishing	Audiovisual	Broadcasting	Computer programming	Architecture and engineering	R&D	Advertising	Design, photography	Arts, entertainment and recreation
GDP in pps	1										
Retail (creative)	0.5091*	1									
Publishing	0.6600*	0.2791*	1								
Audiovisual	0.6169*	0.2770*	0.7512*	1							
Broadcasting	0.3847*	0.1833*	0.5993*	0.6581*	1						
Computer programming	0.6873*	0.3092*	0.7248*	0.6041*	0.4315*	1					
Architecture and engineering	0.5300*	0.3641*	0.4408*	0.3729*	0.3068*	0.5011*	1				
R&D	0.5256*	0.3262*	0.4801*	0.4121*	0.2420*	0.6763*	0.4260*	1			
Advertising	0.6733*	0.3022*	0.7966*	0.7399*	0.5889*	0.7563*	0.4168*	0.5013*	1		
Design, photography	0.3716*	0.2044*	0.4924*	0.5716*	0.4061*	0.5337*	0.4625*	0.3270*	0.4727*	1	
Arts, entertainment and recreation	0.3354*	0.2250*	0.4429*	0.4655*	0.3298*	0.4831*	0.2677*	0.3791*	0.4069*	0.4367*	1

* Statistically significant at 5%

5. Conclusions

This paper strives to answer the questions of how much influence the existence of knowledge-based and creative service agglomerations has on the wealth of a region, and what the relationship is between these agglomerations and a region's service structure. To respond to these questions, the industrial agglomerations of services and creative services of 195 regions in 16 European countries were calculated. The service structure of the regions was determined and the correlations between creative services were calculated to find out co-locations, as well as their correlation with respect to GDP per inhabitant.

The studies carried out up to now on manufacturing and service agglomeration maps (Leydesdorff and Fritsch 2006, Leydesdorff et al 2006, Vence-Deza and González-López 2008, Heidenreich 2009) have shown the importance of the relationships between both. However, when analysing whether the most important sectors in the development of a region, measured by GDP, are high-tech manufacturing and services, the results obtained do not always coincide (Vence-Deza and González-López 2008, Leydesdorff and Fritsch 2006, Leydesdorff et al 2006). Additionally, studies usually show incompatibilities between the agglomerations of knowledge-intensive and less knowledge-intensive services within the same region (Heidenreich 2009).

The empirical analysis carried out for services in this paper demonstrates that this incompatibility does occur in most creative service regions, i.e. those which include greater numbers of creative service agglomerations. Thus, the results for services do not coincide with those of Heidenreich (2009) and Robertson & Patel (2007) for manufacturing, who concluded that high-tech manufacturing coexisted with low-tech manufacturing.

This paper also verifies that the wealth of a region is not only related to the agglomerations of manufacturing industries found in a region, but also to creative services that are located there. Another relationship which has been verified in this paper those between creative services and knowledge-intensive services, and the theory which emphasises their importance in the creation of knowledge and regional development (Windrum and Tomlinson 1999, Bishop 2008, Aslesen & Isaksen 2007a, Strambach 2008).

Four important conclusions can be inferred from the results obtained in this paper. The first is that the service structure of each region has a greater influence on regional wealth than the existence of service agglomerations. According to the obtained results, it is confirmed the existence of a close (and positive) relationship between the agglomeration of very high-skills services in one region and the level of human capital in that region (Camacho and Rodriguez 2005). The second is that creative services play an important role in the wealth of a region. The third is that some creative services are more important in the wealth of regions than others. Finally, there is evidence of association between creative services and medium-high-tech manufacturing in explaining the wealth of regions.

The contributions and results brought to light in this work are important for both academia and policymakers. For the former, it opens new lines of research in the relationships between industries as it goes beyond those carried out on manufacturing and services. Policymakers will find the study of use because the results show the role creative services play on regional wealth, in addition to demonstrating that the most creative regions have a need for knowledge-intensive services.

This field of study focused on creative industries requires further research as there is still much work to be done to determine which sectors can be included in this category. To do so, the necessary sectorial data must be obtained. This is lacking at times in statistical databases and is their principal limitation.

Acknowledgements

The authors would like to thank Ministry of Science and Innovation and Universitat Politècnica de València (Spain) for financially supporting this research (ECO2010-17318 MICINN Project and Research Project n. 2677-UPV)

References

- Aslesen, H.W. and Isaksen, A (2007a) New perspectives on knowledge-intensive services and innovation. *Geografiska. Annaler, Series B: Human Geography*, 89(1), pp. 45–58
- Aslesen, H.W. and Isaksen, A (2007b) Knowledge Intensive Business Services and Urban Industrial Development. *The Service Industries Journal*, 27(3), pp. 321-338
- Bassett, K., Griffiths, R., Smith, I. (2002) Cultural industries, cultural clusters and the city: the example of natural history film-making in Bristol. *Geoforum*, 33, pp. 165–177
- Baum, S., O'Connor, K. and Yigitcanlar, T. (2009) The implications of creative industries for regional outcomes. *Int. J. of Foresight and Innovation Policy*, 5 (1-3), p. 44-64.

- Beyers, W. B. (2005) Services and the changing economic base of regions in the United States. *The Services Industries Journal*, 25(4), pp. 461-476
- Bishop, P. (2008) Spatial spillovers and the growth of Knowledge intensive services. *Tijdschrift voor Economische en Sociale Geografie*, 99(3), pp. 281-292
- Camacho, J.A. and Rodríguez, M. (2005) Services and regional development: an análisis of their role as human capital drivers in the Spanish regions. *The Service Industries Journal*, 25(4), pp. 563-755
- Capone, F. (2008) Mapping and analysing creative systems in Italy (1991-2001). In Cooke, P and Lazzaretti, L. (2008) *Creative cities, cultural clusters and local economic development*. Edward Elgar. Chapter 14, pp. 338-364
- Center for Strategy and Competitiveness (2009) Priority Sector Report. Knowledge Intensive Business Services. In www.clusterobservatory.eu
- Cooke, P (2008) Culture, clusters, districts and quarters: some reflections on the scale question. In Cooke, P and Lazzaretti, L. (2008) *Creative cities, cultural clusters and local economic development*. Edward Elgar. Chapter 1, pp. 25-47
- Dall'erba S., Percoco M. and Piras G. (2009), Service Industry and Cumulative Growth in the Regions of Europe, *Entrepreneurship and Regional Development*, 21(4), 333-349.
- DCMS (2009) Creative Industries Economic Estimates Statistical Bulletin.
- De Miguel, B., Hervás, J.L., Boix, R. and De Miguel, M. (2011) The Importance of Creative Industry Agglomerations in Explaining the Wealth of European Regions, *European Planning Studies* (forthcoming).
- De Propriis, L., Chapain, C., Cooke, P., MacNeill, S. and Mateos-García, J. (2009) The geography of creativity. NESTA Interim Report, August.
- Doloreux, D., Amara, N. and Landry, R. (2008) Mapping Regional and Sectoral Characteristics of Knowledge-Intensive Business Services: Evidence from the Province of Quebec (Canada). *Growth and Change*, 39(3), pp. 464-496
- Drejer, I. and Vinding, A. L. (2005) Location and Collaboration: Manufacturing Firms' Use of Knowledge Intensive Services in Product Innovation. *European Planning Studies*, 13(6), pp. 879-898
- Florida, R., Mellander, C. and Stolarick, K. (2008) Inside the black box of regional development – human capital, the creative class and tolerance. *Journal of Economic Geography*, 8(5), pp. 615-649
- Heidenreich, M. (2009) Innovation patterns and location of European low- and medium-technology industries. *Research Policy*, 38(3), pp. 483-494
- Howkins, J. (2007) *The creative economy. How people make money from ideas*. Penguin Books. England.
- KEA European Affairs (2006) The economy of culture in Europe. European Commission Directorate - General for Education and Culture. Brussels.
- Larsen, J.N. (2001) Knowledge, Human Resources and Social Practice: The Knowledge-Intensive Business Service Firm as a Distributed Knowledge System. *The Service Industries Journal*, 21(1), pp. 81-102
- Lazzaretti, L., Boix, R., Capone, F. (2008) Do creative industries cluster? Mapping Creative Local Production Systems in Italy and Spain. *Industry and Innovation*, 15(5), pp. 549-567
- Lazzaretti, L. Boix, R. and Capone, F. (2009): "Why do creative industries cluster? An analysis of the determinants of clustering of creative industries", IERMB Working Paper in Economics, nº 09.02, April 2009

- Leydesdorff, L. and Fritsch, M. (2006) Measuring the knowledge base of regional innovation system in Germany in terms of a Triple Helix dynamics. *Research Policy*, 35(10), pp. 1538-1553
- Leydesdorff, L., Dolfsma, W. and Van der Panne, G. (2006) Measuring the knowledge base of an economy in terms of triple-helix relations among “technology, organization and territory”. *Research Policy*, 35(2), pp. 181-199
- Miles, I (2008) Knowledge services. En Hearn G and Rooney D (2008) *Knowledge Policy. Challenges for the 21st Century*. Edward Elgar. Chap. 2, pp. 11-26
- Muller, E. and Doloreux, D. (2009) What we should know about knowledge-intensive business services. *Technology in Society*, 31(1), pp. 64-72
- Nählinder, J (2005) Innovation and Employment in Services. The case of Knowledge Business Services in Sweden. Unityck Linköping. Sweden.
- O’Donoghue, D. and Gleave, B. (2004) A Note on Methods for Measuring Industrial Agglomeration. *Regional Studies*, 38(4), pp. 419–427
- Peneder, M., Kaniovski, S. and Dachs, B. (2003) What Follows Tertiarisation? Structural Change and the Role of Knowledge-Based Services. *The Service Industries Journal*, 23(2), pp. 47-66
- Pilat, D. and Wölfl, A. (2005), *Measuring the Interaction Between Manufacturing and Services*, OECD Science, Technology and Industry Working Papers, 2005/5, OECD Publishing.
- Power, D. (2002) Cultural industries in Sweden: An assessment of their place in the Swedish Economy. *Economic Geography*, 78(2), pp. 103-127.
- Power, D. (2003) The Nordic cultural industries: a cross-national assessment of the place of the cultural industries in Denmark, Finland, Norway and Sweden. *Geografiska Annaler, Series B, Human Geography*, 85(3), pp. 167-180.
- Power, D. and Nielsén, T. (2010) Priority Sector Report: Creative and Cultural Industries. European Commission, Europe Innova -European Cluster Observatory.
- Pratt, A.C. (2008) Creative cities: the cultural industries and the creative class. *Geografiska Annaler: Series B. Human Geography*, 90(2), pp. 107-117
- Robertson, P.L. and Patel, P.R. (2007) New wines in old bottles: Technological diffusion in developed economies. *Research Policy*, 36(5), pp. 708-721
- Rodriguez, M. and Camacho, J.A. (2010) Are Knowledge-Intensive Business Services so “hard” innovators? Some insights using Spanish microdata. *Journal of Innovation Economics*, 1(5), pp. 41-65
- Rodríguez-Pose, A. (1999) Innovation Prone and Innovation Averse Societies: Economic Performance in Europe. *Growth and Change*, 30(1), pp. 75-105
- Shearmur, R. and Dolireux, D. (2009) Place, Space and Distance: Towards a Geography of Knowledge-Intensive Business Services Innovation. *Industry and Innovation*, 16(1), pp. 79-102
- Stam, E., de Jong, J.P.J and Marlet, G. (2008) Creative industries in The Netherlands: structure, development, innovativeness and effects on urban growth. *Geografiska Annaler: Series B, Human Geography*, 90(2), pp. 119-132
- Strambach, S. (2008) Knowledge-Intensive Business Services (KIBS) as drivers of multilevel knowledge dynamics. *International Journal of Services Technology and Management*, 10(2/3), pp. 152-174
- UNCTAD (2010) Creative economy. Report 2010. UNDP-UNCTAD. Geneva – New York.

Vence-Deza, X. and González-López, M. (2008) Regional concentration of the Knowledge-based Economy in the EU: Towards a Renewed Oligocentric Model? *European Planning Studies*, 16(4), pp. 557-578

Wedemeier, J. (2010) The impact of the creative sector on growth in German regions. *European Planning Studies*, 18(4), pp. 505-520

Wernerheim, C. M. (2010) The tendency of advanced services to co-locate and the implications for regional government policy. *The Services Industries Journal*, 30(5), pp. 731-748

Windrum, P. and Tomlinson, M. (1999) Knowledge-intensive Services and International Competitiveness: A Tour Country Comparison. *Technology Analysis & Strategic Management*, 11(3), pp. 391-408

Wood, P. (2006) The regional significance of knowledge-intensive services in Europe. *Innovation*, 19(1), pp. 51-66