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Service Innovation and Economic Performance at Regional Level

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1 Economic Performance and Service Innovation in European Regions

Observing the landscape of European regions reveals a great degree of variety in respect of individual specificities. This not only refers to regional sizes, population and economic indicators, but also to the composition of regions' industries, research, technology and innovation.

The focus of this paper is to consider service innovation-related characteristics in relation to the economic performance of European regions, using ESIS data for analysis. ESIS includes 27 EU Member States and their regions and provides a picture of service innovation and its impact. Former analyses (Hollanders et al. 2014b) have shown that service innovation contributes to the innovation performance of European Member States, while at regional level, linking service innovation and innovation performance, as measured in the Regional Innovation Scoreboard, is more complex, partly due to the variation between European regions.

The European Service Innovation Scoreboard provides statistical profiles for 271 European regions at NUTS 2 level. Backed by a methodological model, it uses a broad range of indicators, that are assigned to different dimensions of the (service) innovation process (Hollanders et al. 2014a). For each of the regions, a 'scorecard' presents regional performance for each of the indicators that is compared with the performance of the EU-27. In addition to the service innovation scorecard, economic performance indicators and structural indicators complement the regional pictures.

The following sections aim to investigate European NUTS 2 regions' economic performance and their service innovation characteristics. Table 1 gives an overview of the state of the regional economies, measured by their gross domestic product (GDP) per inhabitant and the disposable income, which have been provided by ESIS.¹

Table 1: Basic characteristics of GDP/capita and disposable income in European regions 2009/2010

Characteristics	GDP/capita 2010 (Euro)	Disposable income 2009 (Euro)
N (number of cases with valid data)	250	267
Minimum	2,900 (BG31 Severozapaden)	4,050 (BG31 Severozapaden)
Maximum	81,100 (UKI1 Inner London)	25,788 (UKI1 Inner London)
Mean value	23,810.05	14,117.01
Median	23,650.00	14,820.00
Standard deviation	11,611.07	4,068.30
EU-27	24,500	14,499

Source: European Service Innovation Scoreboard 2014 (data based on Eurostat)

¹ Data base for these indicators: Eurostat.

Table 1 indicates that the Bulgarian region of Severozapaden has the lowest figures for both GDP per capita and disposable income. At the other end of the spectrum, Inner London has the highest values for both indicators. However, the range between the lowest and the highest figures is more than 4 times as high for the GDP figure with a ratio of 27.9 compared to the ratio of 6.4 for the income value. Mean values and medians, which do not differ largely in both cases, are not far from the EU-27 figures. This first insight shows that the economic performance of European regions varies widely, at least when considering the two selected indicators. However, there is a wider variation for gross domestic product per inhabitant than for disposable income. Since real disposable income may be the result of reallocation mechanisms, GDP may be considered as a more appropriate indicator for measuring economic performance. Relating it to the number of inhabitants takes into account the different sizes of European regions, and thus enables to compare this indicator across Europe.

Table 2 presents service innovation related characteristics. It is based on the five dimensions of the European Service Innovation Scoreboard (see Hollanders et al. 2014a) and additionally includes an indicator on regional specialisation in knowledge intensive services (KIS).² The figures for all six indicators and dimensions indicate a comparatively large variation within Europe, represented in the extensive differences between minimum and maximum values. Undoubtedly, some European regions are less focused on services, and particularly, knowledge-intensive services and input into service innovation as well as throughput and output do not seem to be top priorities in certain parts of Europe. Equally, the outcomes, which are defined as changes in the employment share in service industries with assumed transformative power, also vary widely across knowledge-intensive services, medium-high and high-tech manufacturing and growth in labour productivity.

Table 2: Service innovation characteristics across European regions

Characteristics	<i>Specialisation Knowledge-Intensive Services (KIS) 2011</i>	Wider Framework Conditions (Index)	Service Innovation Input (Index)	Service Innovation Throughput (Index)	Service Innovation Output (Index)	Outcomes (Index)
N (number of cases with valid data)	265	269	269	255	267	269
Minimum	0.30 (RO41 Sud-Vest Oltenia)	18.6 (ES63 Ciudad Autónoma de Ceuta)	5.1 (BG31 Severozapaden, RO41 Sud-Vest Oltenia)	1.4 (BG34 Yugoiztochen)	3.0 (EL41 Voreio Aigaio)	4.0 (BG34 Yugoiztochen)

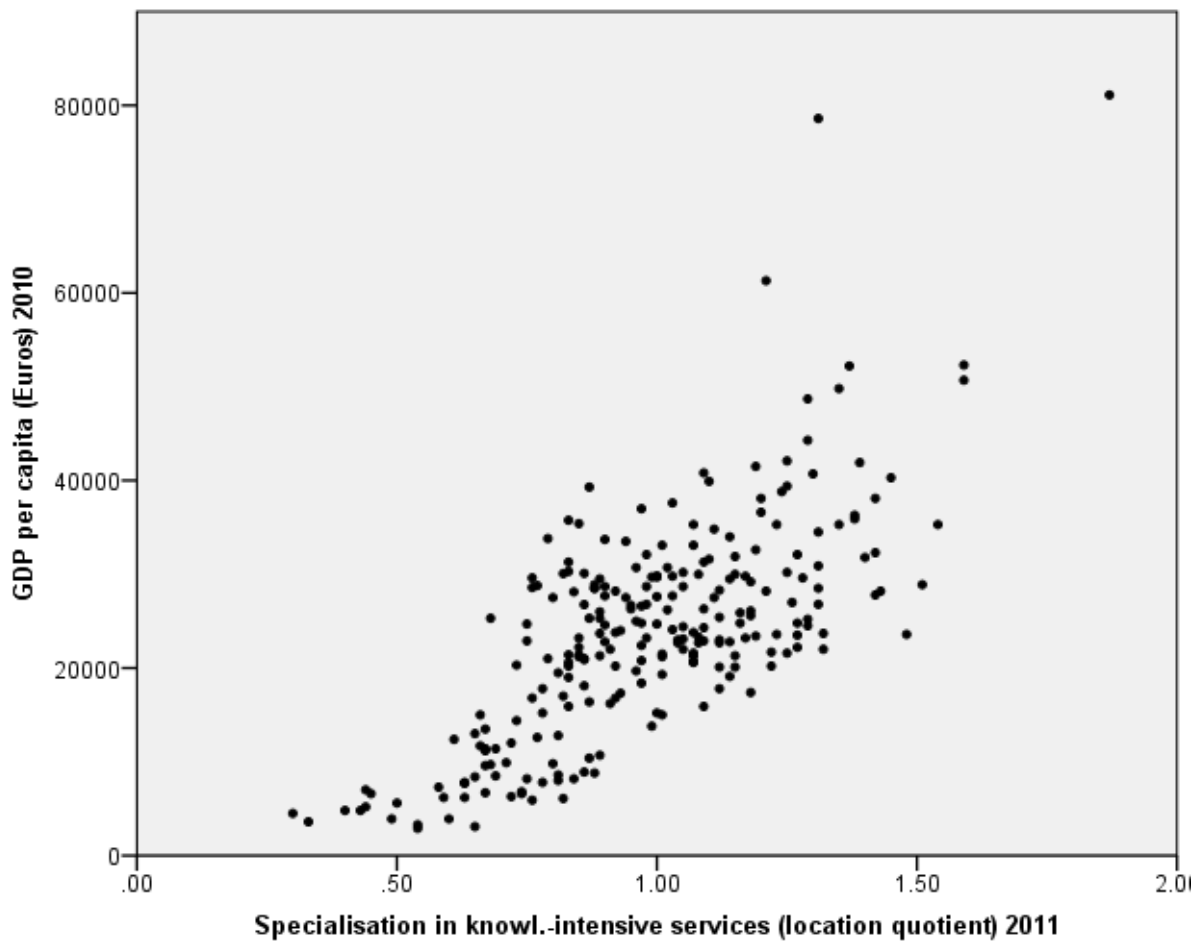
² This location quotient refers to the regions' specialisation in knowledge-intensive services (KIS) in relation to the EU, measured in terms of employment. Values below 1.0 indicate a comparatively lower specialisation while above-average specialisation in KIS is represented through values higher than 1.0

Characteristics	<i>Specialisation Knowledge-Intensive Services (KIS) 2011</i>	Wider Framework Conditions (Index)	Service Innovation Input (Index)	Service Innovation Throughput (Index)	Service Innovation Output (Index)	Outcomes (Index)
Maximum	1.87 (UK11 Inner London)	84.3 (NL31 Utrecht)	73.6 (DK01 Hovedstaden)	61.2 (IE02 Southern and Eastern)	60.6 (ES3 Comunidad de Madrid)	79.5 (DE41 Brandenburg – Nordost, DE42 Brandenburg – Südwest)
Mean value	0.97	54.15	27.30	28.19	28.44	36.48
Median	0.97 (DE11 Stuttgart, DED2 Dresden, ES51 Cataluña, ES64 Ciudad Autónoma de Melilla, FR26 Bourgogne, SI02 Zahodna Slovenija)	56.00 (UKE1 East Yorkshire and Northern Lincolnshire)	26.30 (DE94 Weser-Ems, DEC Saarland, FR63 Limousin, NL32 Noord-Holland)	27.10 (FR23 Haute-Normandie, FR81 Languedoc-Roussillon)	29.80 (FR21 Champagne-Ardenne, FR25 Basse-Normandie)	34.90 (UKN Northern Ireland)
Standard deviation	0.26	13.50	12.14	15.79	12.45	11.84
EU-27	1.00	54.3	27.9	27.9	33.5	25.6

Source: European Service Innovation Scoreboard 2014 (Data based on Eurostat (R&D Statistics, Community Innovation Survey, Structural Business Statistics, Labour Force Survey), Regional Competitiveness Index 2010 (Annoni and Kozovska 2010), European Values Survey, and ESIC data calculations)

The following section reviews the relationship between economic performance and service characteristics across Europe. GDP per capita is used as the main indicator for economic performance. A first overview of service characteristics and economic performance is given in Figure 1 that maps the specialisation in knowledge-intensive services (KIS) and GDP/capita in European regions. It becomes obvious that these indicators tend to follow a positive trend, with a group of regions presenting below-average specialisation in knowledge-intensive services and a GDP/capita below € 20,000, a larger group of regions with KIS specialisation between about 0.8 and 1.5 and GDP/capita between about € 20,000 and € 45,000, and a final small group of regions whose plotting is comparatively dispersed. This figure seems to indicate the existence of a 'ceiling' for KIS specialisation, as from a certain degree of specialisation, it becomes difficult to specialise even further in KIS employment.

Figure 1: Economic performance and specialisation in knowledge-intensive services in European regions



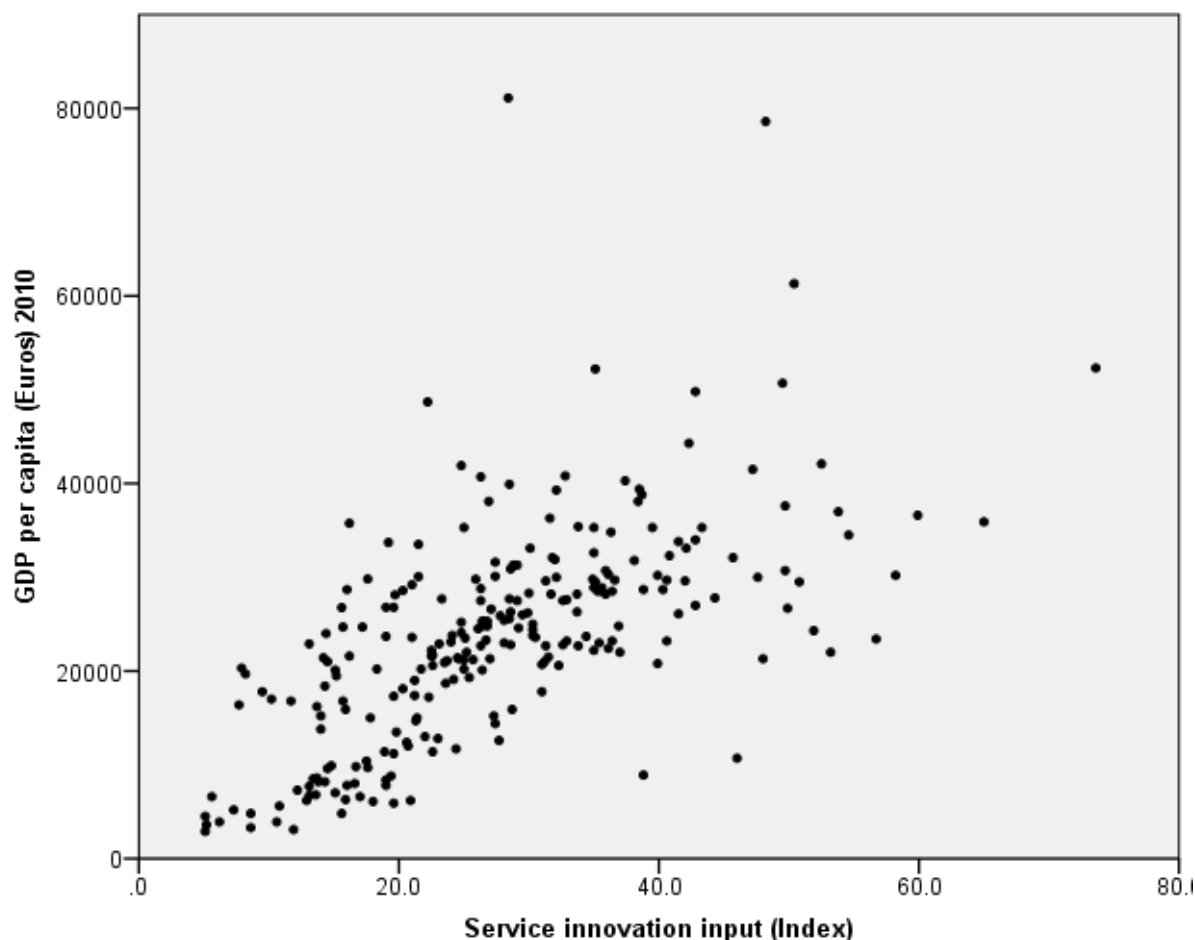
Data source: European Service Innovation Scoreboard 2014

Looking more closely at Figure 1, different degrees of relationship between the two indicators can be identified. On the left side of the figure, the scatter plots show a gentle incline, with per capita GDP values up to approximately € 11,000 being related to an increasing trend in KIS specialisation. This segment is followed by a large element of the plot with an increasing trend and larger deviations. Finally, in the upper part of Figure 1 there are a small number of European regions with high GDP/capita figures and varied KIS specialisations. Overall, it can be assumed that the specialisation of regional employment in knowledge-intensive services and GDP/capita seems to be related to different degrees in different European regions, indicating that economic performance and service orientation follow a relatively even trend in one group of European regions, while this trend tends to be closer in others, predominantly in regions with higher economic performance. Economic performance and wider framework conditions also indicate a positive relationship, see annex 1.

Considering input into service innovation, which is the deliberate development of service innovation according to the methodological model developed by the European Service Innovation Centre (Hollanders et al. 2014a), with economic performance also indicates positive associations in a broader sense, though with a certain dispersion (see Figure 2). Variation in

economic performance seems to increase amongst regions with higher service innovation input. The European regions with the highest economic performance figures do not display the highest engagement in service innovation, but modest GDP/capita figures are generally related to moderate service innovation inputs. This again points to different models of economic activity and performance and argues the need for a more differentiated view of European regions.

Figure 2: Economic performance and service innovation input into European regions

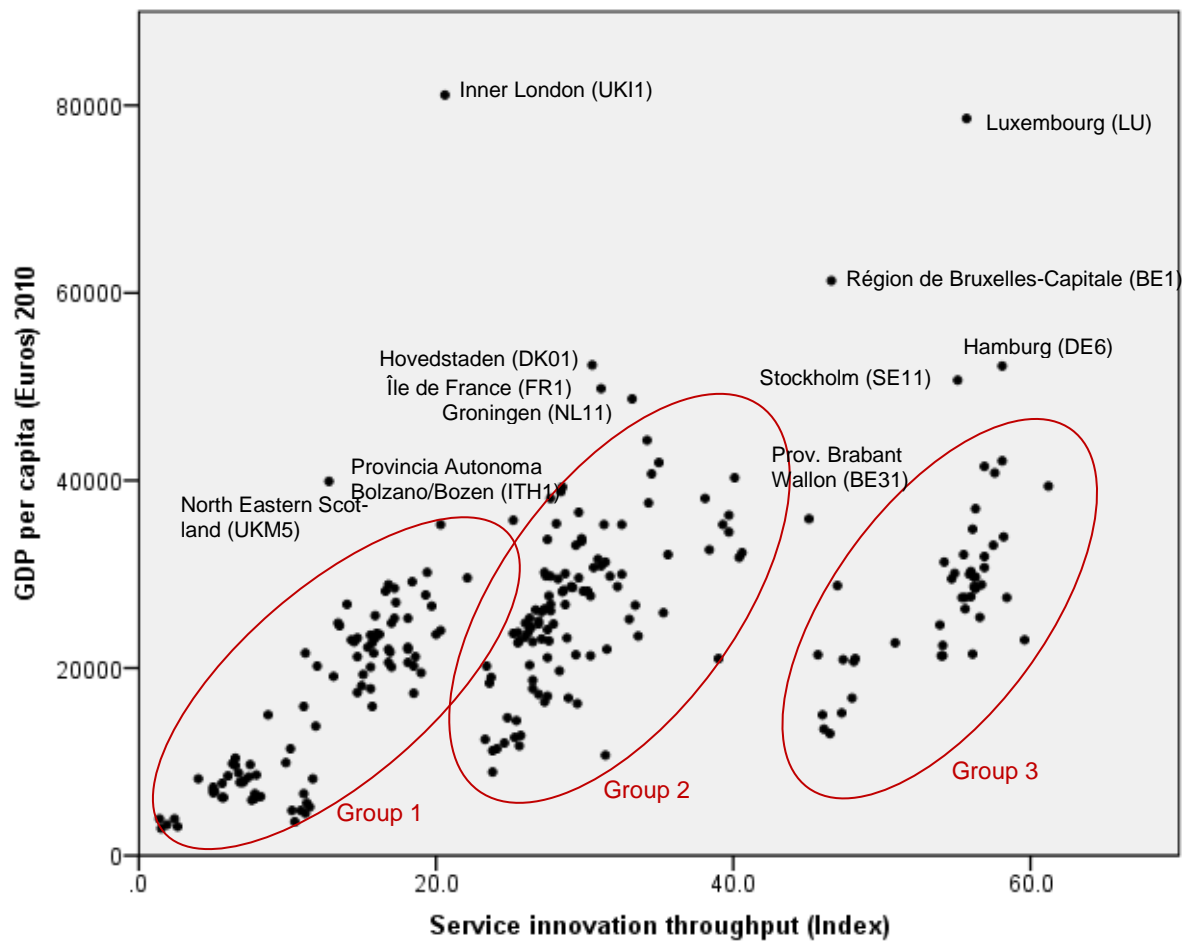


Data source: European Service Innovation Scoreboard 2014

A clear configuration of European regions appears, when service innovation throughput³ is related to the regions' GDP per capita (Figure 3). Figure 3 shows three main groups. Within each of them, a positive relationship with GDP/capita can be assumed, however on different levels and with slightly diverging slopes. The first group is composed of Bulgarian, Slovakian, Romanian, Polish and Hungarian regions, as well as Latvian, UK and Spanish regions and Bratislavský kraj (SK01). These regions have service innovation throughput index values below 22.2 and GDP/ capita below € 35,500.

³ Service innovation throughput is conceived in the ESIC methodological model as the service innovation or the new development itself.

Figure 3: Economic performance and service innovation throughput in European regions

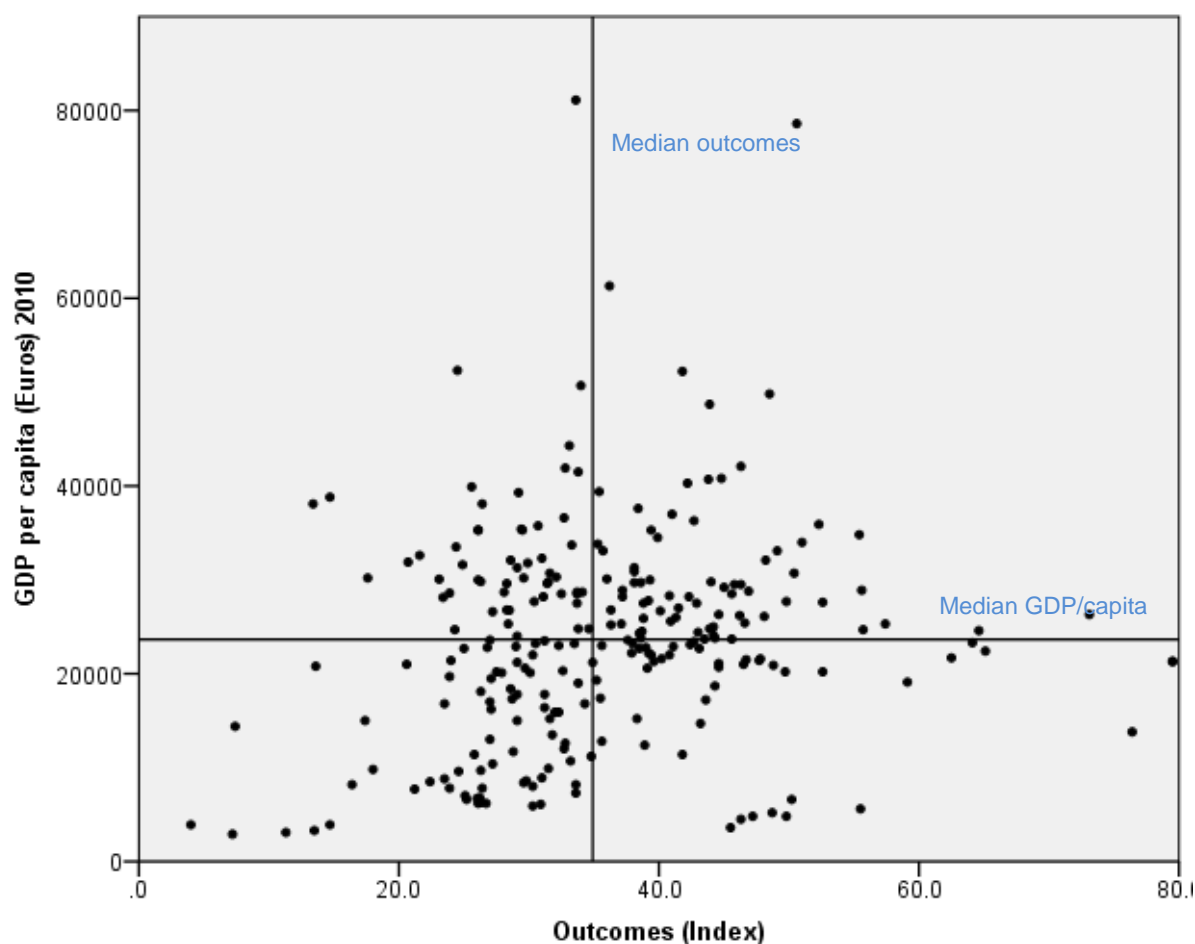


Data source: European Service Innovation Scoreboard 2014

The second group covers a broad range of 96 European regions which are characterised by economic performance between € 8,900 and € 44,300 GDP/ capita and service innovation throughput index values between 23.3 and 40.5. Thus, there are large overlaps with the first group with respect to GDP/capita, but on a higher service innovation throughput level. This group is composed of regions from various EU Member States, mainly from the central and western part of Europe plus Lithuania, the Czech regions, Estonia and Vzhodna Slovenija (SI01). Group three, finally, represents European regions with higher figures for service innovation throughput and a broad range of GDP/capita values that are also found in the second group of regions. This group covers 45 regions from Germany, Ireland and Portugal with the Portuguese regions being mapped on the left hand side of this group. There are some further regions which are mapped on mainly the upper part of the figure and are not included in the three groups that are explained above. These regions are largely European metropolitan regions (Stockholm, Copenhagen, Hamburg, Brussels, Paris, and London), as well as Luxembourg, Groningen, Walloon Brabant, the Bolzano region and North Eastern Scotland. They are characterised by high GDP/capita figures and service innovation throughput index values at different levels.

Relations between economic performance and service innovation output become more disperse, as Annex 2 outlines. Figure 4 shows the outcomes as defined in the ESIC methodological model⁴ and economic performance measures as GDP/capita in European regions. It becomes obvious that GDP/capita and outcomes do not prove to be directly linked, at least not in a simple, linear way. By far the largest share of European regions is dispersed around the medians for both indicators. However, regions with highest outcome figures show rather modest GDP/capita figures, while at the other end of the spectrum, regions with the highest economic performance tend to have outcomes near, or slightly above, the median and not extremely high figures. This might indicate that outcomes are based on dynamic variables, indicating the growth of employment shares and productivity within a certain time span. Higher growth can more easily be achieved when starting on lower levels so that economically strong European regions do not necessarily witness high outcomes results (see also Hollanders et al. 2014b).

Figure 4: Economic performance and outcomes in European regions



Data source: European Service Innovation Scoreboard 2014

⁴ Outcomes are composed of: Change in employment share in service fields with transformative power, in knowledge-intensive services, and in medium-high and high-tech manufacturing as well as labour productivity growth, cf. Hollanders et al. (2014a).

In summary, there are considerable variations across European regions in terms of both the characteristics of economic performance and service innovation. Relationships between these two aspects are neither simple nor linear, but certain trends can be distinguished.

Firstly, higher economic performance by a region tends to be related to increasing specialisation in knowledge-intensive services compared to the EU average, at least up to a certain threshold level.

Secondly, GDP/capita and service innovation characteristics as presented in five ESIS dimensions tend to show increasing levels of dispersion. While GDP/capita and service innovation input follow a positive trend, in throughput three groups of regions can be distinguished.

Finally, the relationship between service innovation output and GDP/capita proves to be more diverse and outcomes vary with economic performance measured in terms of GDP/capita. Thus, the conclusion, which can be drawn, is that economic performance seems to be more strongly related to service innovation input, but also European regions tend to follow different paths in developing service innovations themselves, which leads to various patterns being created across Europe.

2 Service Innovation and Economic Performance in European Regions: A differentiated Picture

The previous section explained that European regions do not seem to follow a unique model of service innovation, but rather various developmental models of service innovation and economic performance tend to prevail.

A deeper understanding of the relationships between the relevant indicators can be facilitated by correlation analyses.⁵ Positive and very significant (on the 0.01 level) correlations of GDP/capita with all the other indicators analysed are revealed, as Annex 3 shows. The highest figures are obtained for the correlation between GDP/capita and wider framework conditions (0.785), GDP/capita and service innovation input (0.695), GDP/capita and specialisation in knowledge-intensive services (0.672) and GDP/capita and service innovation throughput (0.669). This means that European regions with higher scores for the general framework conditions for (service) innovation, as well as service innovation input and throughput, and those which tend to be more specialised in knowledge-intensive services belong to those regions that have higher GDP/capita. These results also support the findings of the descriptive analysis in the previous section. Wider framework conditions, KIS specialisation, service innovation inputs and service innovation throughputs are also interrelated by positive and significant correlations (see Annex 3).

As the scatter plots in Section 2 revealed, service innovation-related indicators tend to be more associated with lower economic performance levels. In order to verify this assumption,

⁵ Since the data set used does not follow a normal distribution, Spearman's rank correlation coefficient (two-tailed significance) was used for the correlation analyses presented in the following section.

the whole sample of European regions was divided into four groups of regions with respect to their economic performance - measured as GDP/capita 2010 and in relation the EU-27 median. This analysis showed that the highest number of significant (rank) correlations and higher correlation coefficient values were achieved amongst the 44 regions with the lowest GDP/capita (see Table 3).

Table 3: Rank correlations of European regions with respect to economic performance (GDP/capita in 2010 <50% EU average or <€ 12.250)

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
GDP/cap.	1.0						
Spec. KIS	0.602	1.0					
Wider Framew. Cond.	0.767	0.632	1.0				
Service innov. Input	0.712	0.614	0.723	1.0			
Service innov. Throughput	0.411	0.102	0.129	0.394	1.0		
Service innov. output	0.392	0.022	0.271	0.355	0.740	1.0	
Outcomes	0.094	-0.151	-0.123	0.052	0.761	0.593	1.0

Dark grey: significant two-sided correlations coefficient (Spearman) on the 0.01 level

Light grey: significant two-sided correlations coefficient (Spearman) on the 0.05 level

N=44

Conversely, Europe's 23 regions with the highest GDP/capita in 2010 produce a lesser degree of correlations and lower correlation coefficient figures (see Table 4). This underpins the results of the descriptive analyses and also the scatter plots shown above. 'Wealthier' European regions seem to be quite heterogeneous concerning service innovation and its results, while the relationship between economic performance and service innovation characteristics tends to be stronger for the less wealthy regions in Europe.

Table 4: Rank correlations of European regions with respect to economic performance (GDP/capita in 2010 <150% EU average or € 36,785/capita and higher)

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
GDP/cap.	1.0						
Spec. KIS	0.589	1.0					
Wider Framew. Cond.	0.552	0.389	1.0				
Service innov.	0.103	-0.158	0.221	1.0			

	GDP/cap.	Spec. KIS	Wider Framework. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Out- comes
Input							
Service innov. Throughput	0.075	-0.036	-0.147	0.295	1.0		
Service innov. output	0.161	0.055	0.283	0.555	0.070	1.0	
Outcomes	0.314	0.029	-0.080	0.117	0.559	0.005	1.0

Dark grey: significant two-sided correlations coefficient (Spearman) on the 0.01 level
N=23

In order to shed more light on the developmental models of European regions that have a specific focus on service innovation, a cluster analysis⁶ was performed which led to the identification of five regional groups or clusters with different characteristics (see Table 5).⁷

Table 5: Basic characteristics of five clusters of European regions with respect to service innovation

	Cluster	GDP/cap.	Spec. KIS	Wider Framework. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Out- comes
Min	1	13,800	0.87	36.7	14.0	11.9	26.0	26.1
	2	20,700	0.76	51.9	22.2	12.8	17.9	13.4
	3	8,900	0.86	42.1	15.1	11.2	6.3	25.0
	4	8,200	0.61	26.8	7.7	9.9	22.8	7.4
	5	2,900	0.30	18.6	5.1	1.4	5.3	4.0
Max	1	40,300	1.45	65.6	47.6	55.6	59.7	79.5
	2	61,300	1.59	84.3	73.6	61.2	53.2	55.6
	3	78,600	1.54	76.1	48.2	55.7	27.9	62.5
	4	81,100	1.87	75.3	46.0	48.2	60.6	46.5
	5	20,200	1.01	54.0	21.4	23.4	37.6	55.5
Average	1	25,319.35	1.04	56.08	28.87	31.16	34.96	49.97
	2	32,850.62	1.11	66.77	37.98	42.72	33.27	37.04
	3	24,428.57	1.21	60.93	29.95	17.11	12.28	38.06
	4	21,303.54	0.85	46.45	20.32	25.79	36.48	29.68
	5	7,183.78	0.65	38.71	13.75	7.21	20.87	28.96

⁶ The hierarchical cluster analysis was based on the following indicators: GDP/capita; specialisation in knowledge-intensive services; wider framework conditions; service innovation input; service innovation throughput; service innovation output; and outcomes. The cluster analysis was obtained using the method of linkage within groups based on the squared Euclidian distance with z transformed variables. A total of 24 regions could not be included in the analysis due to missing values. Cluster membership of the European regions is detailed in Annex 5.

⁷ Annex 4 displays the results of the analyses cited in the following section.

	Cluster	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
Median	1	24,700.00	1.03	56.80	28.60	27.10	32.80	44.20
	2	31,300.00	1.09	65.90	35.40	39.70	32.50	37.20
	3	23,000.00	1.22	61.10	28.50	15.80	11.30	37.60
	4	19,950.00	0.83	47.20	19.75	25.50	34.35	29.10
	5	6,700.00	0.65	40.40	13.80	6.80	18.10	26.30
Standard deviation	1	4,255.85	0.13	6.65	6.57	11.17	6.61	13.42
	2	7,968.14	0.20	6.45	10.54	12.36	8.63	9.12
	3	10,327.25	0.14	7.08	8.23	7.13	4.14	8.44
	4	10,399.97	0.18	9.70	7.42	9.22	8.69	5.93
	5	3,277.07	0.17	9.11	4.74	3.90	8.12	12.76
	EU 27	24,500	1.0	54.30	27.90	27.90	33.50	25.60

Cluster 1 is composed of 31 regions mainly from France and Germany (5 German and 21 of the 22 regions from metropolitan France), as well as Prague, the Finnish Länsi-Suomi and Åland regions, and the capital regions of Bucharest and Bratislava. The median GDP/capita is slightly above the EU-27 figure, and regions in this cluster tend to have a similar specialisation in knowledge-intensive services to that of the EU-27. This ranges from 0.87 to 1.45, which indicates cluster members with an above-average KIS specialisation. As far as the wider framework conditions and the three service innovation-related index indicators are concerned, the mean values of the cluster do not show any great variations from the European average. However, European regions belonging to this cluster have a much higher outcome index than the EU as a whole with even the minimum value being above the EU average. Looking deeper into the clusters' relationships in terms of economic performance and service innovation-related characteristics, positive correlations become apparent between GDP/capita and KIS specialisation, wider framework conditions, service innovation input, throughput and output.⁸ However, GDP/capita and outcomes show a negative relationship and the same is the case for outcomes and KIS specialisation, outcomes and service innovation input, and outcomes and output. Interestingly, cluster 1 is the only cluster with a negative, though not significant, relationship between wider framework conditions and KIS specialisation.⁹ However, service innovation input and throughput are positively correlated in a very significant way at the 0.01 level, and throughput is positively, but not significantly, related to output and outcomes.

⁸ See Annex 4.

⁹ In fact, average and median values for both indicators are above the EU level, however looking at their ranges shows that some regions have modest results, particularly for wider framework conditions.

The 81 regions in **Cluster 2**¹⁰ have the highest average GDP/capita of European regions, as the Median is € 31,300 compared to € 24,500 in EU-27. While figures for their KIS specialisation vary between 0.76 and 1.59 producing a median close to the EU level, this cluster has the highest average score for wider framework conditions and by far the highest figures for service innovation input and, particularly, for service innovation throughput. Results obtained by delving into the cluster structures and examining correlations between the indicators mirror these findings to a certain degree. Positive and very significant correlations (at the 0.01 level) between GDP/capita, and KIS specialisation and wider framework conditions become evident. In addition, there are positive and very significant correlations between:

- Service innovation input and service innovation output;
- Service innovation throughput and service innovation output;
- Service innovation throughput and outcomes. and
- Service innovation output and outcomes.

This cluster does not have the highest average figures for output and outcomes but demonstrates above-average outcomes figures compared to the EU27 level, which appears to suggest that the different stages of the service innovation model are interlinked in a 'cascade-like' fashion, at least in terms of throughput, output and outcomes. A direct link between input and throughput is not visible as there is no positive or significant correlation between those two indicators.¹¹

Cluster 3 has the highest average specialisation in knowledge-intensive services. The variations between regions in this cluster are modest which indicates that this cluster includes the 'Knowledge-intensive service specialists' throughout Europe. Cluster 3 includes 33 of the 37 UK regions, as well as Luxembourg and Lithuania. This cluster contains a wide spectrum of regions, which results in slightly below-average figures for GDP/capita, compared to EU-27 in a broad range from € 8,900 to € 78,600. The wider framework conditions are good and above-average being in the second position for all clusters. Both service innovation input and particularly outcomes are above the EU average, but throughput and output are comparatively modest. Looking at cluster-internal correlation reveals positive and very significant relationships between GDP/capita, KIS specialisation and wider framework conditions. Interestingly, rank correlations show that while the service innovation output of this cluster is at a below-average level, there is a positive and very significant correlation with all other indicators except outcomes. A further positive and significant correlation exists between service innovation input and throughput resulting in an overall 'chain' of positive, and significant at the 0.01 level, correlations between service innovation input and throughput, throughput and output and input and output.

¹⁰ Austrian, Belgian, German, Danish, Irish, Dutch, and Swedish regions, as well as Île-de-France (FR), Lisboa (PT) and North Eastern Scotland (UKM5).

¹¹ Spearman's correlation coefficient between these indicators is -0.063, which refers to a slightly negative and non-significant relationship between input and throughput.

Cluster 4 is composed of 60 regions from various European Member States. These include seven of the eight Czech regions, Cyprus, Estonia, 18 Spanish regions¹², all 21 Italian regions, 6 Portuguese regions¹³, Central Hungary (Közép-Magyarország, HU1), Eastern Slovenia (Vzhodna Slovenija, SI01), the all Slovakian regions except Bratislava, and Inner London (UKI1). In general, this cluster has below-average figures for GDP/capita, specialisation in knowledge-intensive services and wider framework conditions. These three indicators are positively correlated in a significant way. The cluster has the highest service innovation output figures among all of the clusters and also above-average outcomes but these are on a comparatively modest level compared to the other clusters. The high output is correlated with the wider framework conditions and service innovation input in a positive and very significant way. However, service innovation throughput and output are negatively correlated. In a similar way, service innovation throughput and outcomes are negatively and significantly correlated at the 0.01 level, while output and outcomes show a positive relationship but this is not especially significant. The cluster analysis assigns Inner London to cluster 4. This EU region has the highest specialisation in knowledge-intensive services, GDP/capita and disposable income (see Table 1). Its membership of this cluster reflects in particular London's above-average service innovation output, below-average input and a throughput which is above that of the UK's, but below the EU level.

Cluster 5, the last cluster, comprises 37 regions including Bulgarian, Hungarian, Polish and Romanian regions, as well as Ciudad Autónoma de Ceuta (ES63) and Latvia (LV). This cluster has the lowest averages for GDP/capita and also for specialisation in knowledge-intensive services. In addition, it scores quite low in terms of the other clusters in wider framework conditions, the three service innovation related dimensions and the outcomes. However, the outcome figures are still slightly above the European average, which has its origin in a high range of values, meaning that some regions of this cluster score especially high in this respect. A more considered review of cluster structures and relationships reveals high and positive correlations, significant at the 0.01 level, amongst all the indicators except service innovation input.¹⁴ The correlations between service innovation throughput and output on the one hand and outcomes on the other hand are particularly high at 0.741 and 0.842, respectively. These results indicate a high level of interrelationship between the indicators analysed.

3 Policy implications

This discussion paper is based on the results of specific analyses related to service innovation characteristics for European regions deriving from the European Service Innovation Scoreboard (ESIS). It focuses on index values selected in the frame of the ESIS investigations (cf. Box 1).

¹² All Spanish regions except Ciudad Autónoma de Ceuta which belongs to cluster 5.

¹³ All Portuguese regions except Lisboa (PT17) which is member of cluster 2.

¹⁴ Rank correlation analysis produces positive figures for the relationship between these two indicators, but not in a significant way.

Box 1

The specific index values depicting the selected dimensions of the analysis are related to:

- wider framework conditions;
- service innovation input;
- service innovation throughput;
- service innovation output;
- service innovation outcomes;
- regional GDP/capita (as an indicator for economic performance); and
- specialisation in knowledge-intensive services (as a descriptor for regional service characteristics).

The first descriptive analysis pointed up positive associations between economic performance, KIS specialisation, service innovation input and wider framework conditions but also referenced a broad variety of regional-specific cases throughout Europe.

The second part of the examination consisted of correlation analysis allowing a better understanding in terms of different 'models'. Some core findings are resulting from the performed statistical analyses (cf. Box 2).

Box 2

- Despite the large variety of 'service innovation models' in European regions, further analyses (such as statistical cluster analyses) should be able to generate some common types could pooling different regions (independently from their belonging to Member States).
- There is no 'one-size-fits-all' service innovation model in Europe, but several types with specific characteristics and behaviours could be detected;
- In terms of general conclusions, the most coherent service innovation model seems to be relevant to regions with lower GDP/capita figures, while more wealthy regions are more heterogeneous in respect to their service innovation characteristics. In such cases, it can be postulated that their high GDP/capita figures are not only related to service innovation, but also to their more divergent modes of innovation.

The core results of the analysis concern some the positive correlations that may be of primary importance for future policy making efforts (cf. Box 3).

Box 3

The most crucial positive correlations resulting from the analysis are to be found between:

- Economic performance and
- Specialization in knowledge-intensive service in all regions;
- Wider framework conditions;
- Service innovation input.

As a consequence of the investigation it can be stated that: (i) economic performance seems to be particularly high in European regions with positive framework conditions for (service) innovation and a focus on knowledge-intensive services; (ii) a broad spectrum of factors supporting service innovation seem to have positive effects in terms of regional ability to support service innovations and (iii) a strong heterogeneity in terms of service innovation models at regional level must be considered across Europe.

Finally, in terms of policy implications resulting from the ESIS, the following three core recommendations can be formulated.

First of all, no "one fits to all" policy should be expected and/or performed at regional level within the EU regarding the support of service innovation capacities. In other words, due to the observed heterogeneity in terms of starting or existing economic pre-conditions, service innovation-related policies must clearly be tailored. In this respect, using demonstrator regions for a deeper and differentiated understanding showed the way for future reflections and actions.

A second recommendation deals with the specific case of "less advanced regions" since they display the highest potential in terms of transformative power of innovation services at regional level. *A contrario*, regions already benefiting from better starting conditions may not see their propensity to benefit from additional efforts significantly reinforce the economic impact of their service innovation performance. In other words, due to threshold effect expectations related to service innovation-related policies in terms of transformation of regional economies must necessarily be modulated.

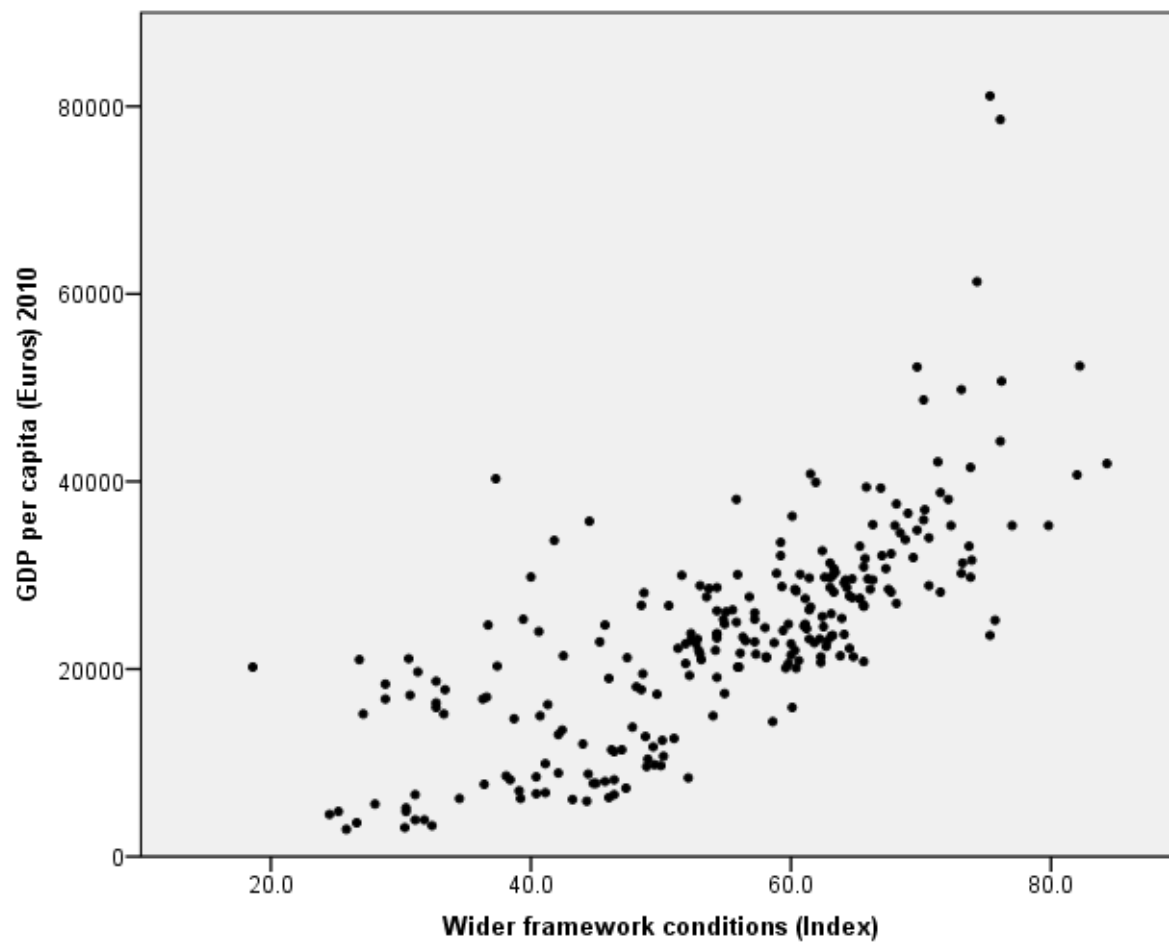
Last but not least, a final recommendation relates to the complementary character of national regional development policies and EU-wide service innovation related policies based on the hypothesis of the existence of a regional transformative power. In fact the first are not necessarily strongly innovation-based and if they are mostly oriented toward manufacturing activities. Innovating service industries may be considered as strategic targets for policy making (e.g. ICT or creative industries) nevertheless the transformative power of service innovation is mostly neglected even if part of it is taking place in manufacturing firms.

4 References

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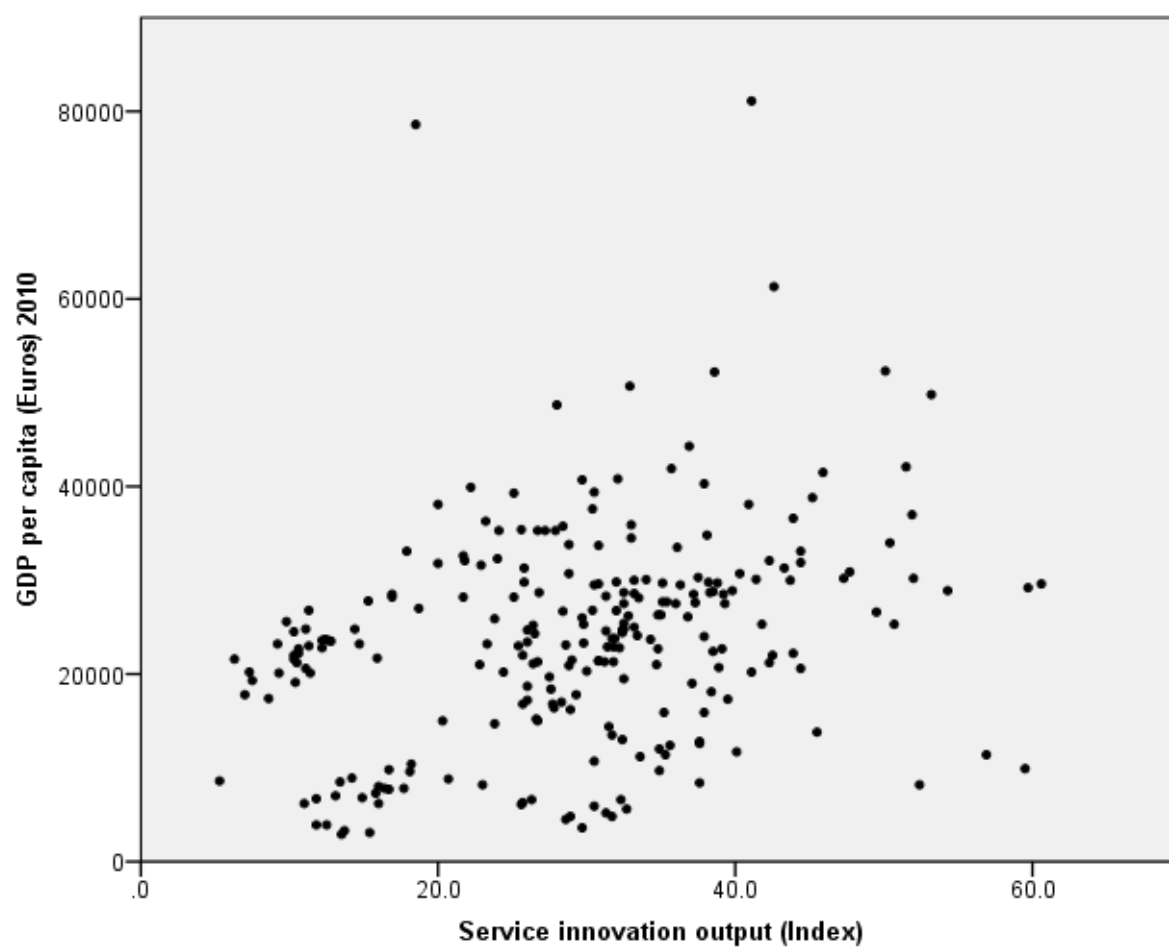
Annexes

Annex 1: Economic performance and wider framework conditions in European regions



Data source: European Service Innovation Scoreboard 2014

Annex 2: Economic performance and service innovation output in European regions



Data source: European Service Innovation Scoreboard 2014

Annex 3: Results of the rank correlation analysis (Spearman) for European regions

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
GDP/cap.	1.0						
Spec. KIS	0.672	1.0					
Wider Framew. Cond.	0.785	0.735	1.0				
Service innov. input	0.695	0.642	0.752	1.0			
Service innov. Throughput	0.669	0.335	0.516	0.559	1.0		
Service innov. output	0.331	0.067	0.241	0.303	0.447	1.0	
Outcomes	0.186	0.155	0.116	0.173	0.305	0.070	1.0

Data base: ESIS 2014

Dark grey: significant two-sided correlations coefficient (Spearman) at the 0.01 level.

Light grey: significant two-sided correlations coefficient (Spearman) on the 0.05 level

Annex 4: Results of the rank correlation analysis (Spearman), following a hierarchical cluster analysis

Data base: ESIS 2014

Legend: The table presents the type of relationship between the indicators (positive/ negative) and shows two-sided significant correlations on the 0.05 (light grey) and 0.01 (dark grey) levels.

Cluster 1

CZ01 Praha, DE41 Brandenburg – Nordost, DE42 Brandenburg – Südwest, DEB1 Koblenz, DEB2 Trier, DED2 Dresden, FI19 Länsi-Suomi, FI2 Åland, FR21 Champagne-Ardenne, FR22 Picardie, FR23 Haute-Normandie, FR24 Centre, FR25 Basse-Normandie, FR26 Bourgogne, FR3 Nord - Pas-de-Calais, FR41 Lorraine, FR42 Alsace, FR43 Franche-Comté, FR51 Pays de la Loire, FR52 Bretagne, FR53 Poitou-Charentes, FR61 Aquitaine, FR62 Midi-Pyrénées, FR63 Limousin, FR71 Rhône-Alpes, FR72 Auvergne, FR81 Languedoc-Roussillon, FR82 Provence-Alpes-Côte d'Azur, FR83 Corse, RO32 Bucuresti – Ilfov and SK01 Bratislavský kraj

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
GDP/cap.	1.0						
Spec. KIS	+	1.0					
Wider Framew. Cond.	+	-	1.0				
Service innov. input	+	+	+	1.0			
Service innov. Throughput	+	+	+	+	1.0		
Service innov. output	+	+	+	+	+	1.0	
Outcomes	-	-	+	-	+	-	1.0

Cluster 2

AT11 Burgenland, AT12 Niederösterreich, AT13 Wien, AT21 Kärnten, AT22 Steiermark, AT31 Oberösterreich, AT32 Salzburg, AT33 Tirol, BE1 Région de Bruxelles-Capitale, BE21 Prov. Antwerpen, BE22 Prov. Limburg, BE23 Prov. Oost-Vlaanderen, BE24 Prov. Vlaams-Brabant, BE25 Prov. West-Vlaanderen, BE31 Prov. Brabant Wallon, BE32 Prov. Hainaut, BE33 Prov. Liège, BE34 Prov. Luxembourg, BE35 Prov. Namur, DE11 Stuttgart, DE12 Karlsruhe, DE13 Freiburg, DE14 Tübingen, DE21 Oberbayern, DE22 Niederbayern, DE23 Oberpfalz, DE24 Oberfranken, DE25 Mittelfranken, DE26 Unterfranken, DE27 Schwaben, DE3 Berlin, DE5 Bremen, DE6 Hamburg, DE71 Darmstadt, DE72 Gießen, DE73 Kassel, DE8 Mecklenburg-Vorpommern, DE91 Braunschweig, DE92 Hannover, DE93 Lüneburg,

DE94 Weser-Ems, DEA1 Düsseldorf, DEA2 Köln, DEA3 Münster, DEA4 Detmold, DEA5 Arnsberg, DEB3 Rheinhessen-Pfalz, DEC Saarland, DEE Sachsen-Anhalt, DEF Schleswig-Holstein, DEG Thüringen, DK01 Hovedstaden, DK02 Sjælland, DK03 Syddanmark, DK04 Midtjylland, DK05 Nordjylland, FR1 Île de France, IE01 Border, Midland and Western, IE02 Southern and Eastern, NL11 Groningen, NL12 Friesland, NL13 Drenthe, NL21 Overijssel, NL22 Gelderland, NL23 Flevoland, NL31 Utrecht, NL32 Noord-Holland, NL33 Zuid-Holland, NL34 Zeeland, NL41 Noord-Brabant, NL42 Limburg, PT17 Lisboa, SE11 Stockholm, SE12 Östra Mellansverige, SE21 Småland med öarna, SE22 Sydsverige, SE23 Västsverige, SE31 Norra Mellansverige, SE32 Mellersta Norrland, SE33 Övre Norrland and UKM5 North Eastern Scotland

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
GDP/cap.	1.0						
Spec. KIS	+	1.0					
Wider Framew. Cond.	+	+	1.0				
Service innov. input	+	+	+	1.0			
Service innov. Throughput	-	-	-	-	1.0		
Service innov. output	+	-	+	+	+	1.0	
Outcomes	-	-	-	+	+	+	1.0

Cluster 3

LT Lithuania, LU Luxembourg, UKC1 Tees Valley and Durham, UKC2 Northumberland and Tyne and Wear, UKD1 Cumbria, UKD3 Greater Manchester, UKD4 Lancashire, UKE1 East Yorkshire and Northern Lincolnshire, UKE2 North Yorkshire, UKE3 South Yorkshire, UKE4 West Yorkshire, UKF1 Derbyshire and Nottinghamshire, UKF2 Leicestershire, Rutland and Northamptonshire, UKF3 Lincolnshire, UKG1 Herefordshire, Worcestershire and Warwickshire, UKG2 Shropshire and Staffordshire, UKG3 West Midlands, UKH1 East Anglia, UKH2 Bedfordshire and Hertfordshire, UKH3 Essex, UKI2 Outer London, UKJ1 Berkshire, Buckinghamshire and Oxfordshire, UKJ2 Surrey, East and West Sussex, UKJ3 Hampshire and Isle of Wight, UKJ4 Kent, UKK1 Gloucestershire, Wiltshire and Bristol/Bath area, UKK2 Dorset and Somerset, UKK3 Cornwall and Isles of Scilly, UKK4 Devon, UKL1 West Wales and The Valleys, UKL2 East Wales, UKM2 Eastern Scotland, UKM3 South Western Scotland, UKM6 Highlands and Islands and UKN Northern Ireland

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
GDP/cap.	1.0						
Spec. KIS	+	1.0					
Wider Framew. Cond.	+	+	1.0				
Service innov. input	+	+	+	1.0			
Service innov. Throughput	+	+	+	+	1.0		
Service innov. output	+	+	+	+	+	1.0	
Outcomes	+	+	+	-	+	+	1.0

Cluster 4

CY Cyprus, CZ02 Střední Čechy, CZ03 Jihozápad, CZ04 Severozápad, CZ05 Severovýchod, CZ06 Jihovýchod, CZ07 Střední Morava, CZ08 Moravskoslezsko, EE Estonia, ES11 Galicia, ES12 Principado de Asturias, ES13 Cantabria, ES21 País Vasco, ES22 Comunidad Foral de Navarra, ES23 La Rioja, ES24 Aragón, ES3 Comunidad de Madrid, ES41 Castilla y León, ES42 Castilla-La Mancha, ES43 Extremadura, ES51 Cataluña, ES52 Comunidad Valenciana, ES53 Illes Balears, ES61 Andalucía, ES62 Región de Murcia, ES64 Ciudad Autónoma de Melilla, ES7 Canarias, HU1 Közép-Magyarország, ITC1 Piemonte, ITC2 Valle d'Aosta/Vallée d'Aoste, ITC3 Liguria, ITC4 Lombardia, ITF1 Abruzzo, ITF2 Molise, ITF3 Campania, ITF4 Puglia, ITF5 Basilicata, ITF6 Calabria, ITG1 Sicilia, ITG2 Sardegna, ITH1 Provincia Autonoma Bolzano/Bozen, ITH2 Provincia Autonoma Trento, ITH3 Veneto, ITH4 Friuli-Venezia Giulia, ITH5 Emilia-Romagna, ITI1 Toscana, ITI2 Umbria, ITI3 Marche, ITI4 Lazio, PT11 Norte, PT15 Algarve, PT16 Centro, PT18 Alentejo, PT2 Região Autónoma dos Açores, PT3 Região Autónoma da Madeira, SI01 Vzhodna Slovenija, SK02 Západné Slovensko, SK03 Stredné Slovensko, SK04 Východné Slovensko and UKI1 Inner London

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
GDP/cap.	1.0						
Spec. KIS	+	1.0					
Wider Framew. Cond.	+	+	1.0				
Service innov. input	+	+	+	1.0			
Service innov. Throughput	+	-	-	-	1.0		

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
Service innov. output	+	+	+	+	-	1.0	
Outcomes	-	-	-	+	-	+	1.0

Cluster 5

BG31 Severozapaden, BG32 Severen tsentralen, BG33 Severoiztochen, BG34 Yugoiztochen, BG41 Yugozapaden, BG42 Yuzhen tsentralen, ES63 Ciudad Autónoma de Ceuta, HU21 Közép-Dunántúl, HU22 Nyugat-Dunántúl, HU23 Dél-Dunántúl, HU31 Észak-Magyarország, HU32 Észak-Alföld, HU33 Dél-Alföld, LV Latvia, PL11 Łódzkie, PL12 Mazowieckie, PL21 Małopolskie, PL22 Śląskie, PL31 Lubelskie, PL32 Podkarpackie, PL33 Świętokrzyskie, PL34 Podlaskie, PL41 Wielkopolskie, PL42 Zachodniopomorskie, PL43 Lubuskie, PL51 Dolnośląskie, PL52 Opolskie, PL61 Kujawsko-Pomorskie, PL62 Warmińsko-Mazurskie, PL63 Pomorskie, RO11 Nord-Vest, RO12 Centru, RO21 Nord-Est, RO22 Sud-Est, RO31 Sud – Muntenia, RO41 Sud-Vest Oltenia and RO42 Vest

	GDP/cap.	Spec. KIS	Wider Framew. Cond.	Service innov. input	Service innov. Throughput	Service innov. output	Outcomes
GDP/cap.	1.0						
Spec. KIS	+	1.0					
Wider Framew. Cond.	+	+	1.0				
Service innov. input	+	+	+	1.0			
Service innov. Throughput	+	-	-	+	1.0		
Service innov. output	+	-	+	+	+	1.0	
Outcomes	+	-	-	+	+	+	1.0

Not included in the cluster analysis due to missing values:

DED1 Chemnitz, DED3 Leipzig, EL11 Anatoliki Makedonia, Thraki, EL12 Kentriki Makedonia, EL13 Dytiki Makedonia, EL14 Thessalia, EL21 Ipeiros, EL22 Ionia Nisia, EL23 Dytiki Ellada, EL24 Sterea Ellada, EL25 Peloponnisos, EL41 Voreio Aigaio, EL42 Notio Aigaio, EL43 Kriti, FI13 Itä-Suomi, FI18 Etelä-Suomi, FI1A Pohjois-Suomi, FR91 Guadeloupe, FR92 Martinique, FR93 Guyane, FR94 Réunion, MT Malta, SI02 Zahodna Slovenija, UKD2 Cheshire, UKD5 Merseyside

Annex 5: Overview of regional membership in clusters

Region	No. cluster
BE1 Région de Bruxelles-Capitale	1
BE21 Prov. Antwerpen	1
BE22 Prov. Limburg	1
BE23 Prov. Oost-Vlaanderen	1
BE24 Prov. Vlaams-Brabant	1
BE25 Prov. West-Vlaanderen	1
BE31 Prov. Brabant Wallon	1
BE32 Prov. Hainaut	1
BE33 Prov. Liège	1
BE34 Prov. Luxembourg	1
BE35 Prov. Namur	1
BG31 Severozapaden	2
BG32 Severen tsentralen	2
BG33 Severoiztochen	2
BG34 Yugoiztochen	2
BG41 Yugozapaden	2
BG42 Yuzhen tsentralen	2
CZ01 Praha	3
CZ02 Střední Čechy	4
CZ03 Jihozápad	4
CZ04 Severozápad	4
CZ05 Severovýchod	4
CZ06 Jihovýchod	4
CZ07 Střední Morava	4
CZ08 Moravskoslezsko	4
DK01 Hovedstaden	1
DK02 Sjælland	1
DK03 Syddanmark	1
DK04 Midtjylland	1
DK05 Nordjylland	1
DE11 Stuttgart	1
DE12 Karlsruhe	1
DE13 Freiburg	1
DE14 Tübingen	1
DE21 Oberbayern	1
DE22 Niederbayern	1
DE23 Oberpfalz	1
DE24 Oberfranken	1

Region	No. cluster
DE25 Mittelfranken	1
DE26 Unterfranken	1
DE27 Schwaben	1
DE3 Berlin	1
DE41 Brandenburg - Nordost	3
DE42 Brandenburg - Südwest	3
DE5 Bremen	1
DE6 Hamburg	1
DE71 Darmstadt	1
DE72 Gießen	1
DE73 Kassel	1
DE8 Mecklenburg-Vorpommern	1
DE91 Braunschweig	1
DE92 Hannover	1
DE93 Lüneburg	1
DE94 Weser-Ems	1
DEA1 Düsseldorf	1
DEA2 Köln	1
DEA3 Münster	1
DEA4 Detmold	1
DEA5 Arnsberg	1
DEB1 Koblenz	3
DEB2 Trier	3
DEB3 Rheinhessen-Pfalz	1
DEC Saarland	1
DED1 Chemnitz	0
DED2 Dresden	3
DED3 Leipzig	0
DEE Sachsen-Anhalt	1
DEF Schleswig-Holstein	1
DEG Thüringen	1
EE Estonia	4
IE01 Border, Midland and Western	1
IE02 Southern and Eastern	1
EL11 Anatoliki Makedonia, Thraki	0
EL12 Kentriki Makedonia	0
EL13 Dytiki Makedonia	0
EL14 Thessalia	0

Region	No. cluster
EL21 Ipeiros	0
EL22 Ionia Nisia	0
EL23 Dytiki Ellada	0
EL24 Sterea Ellada	0
EL25 Peloponnisos	0
EL41 Voreio Aigaio	0
EL42 Notio Aigaio	0
EL43 Kriti	0
ES11 Galicia	4
ES12 Principado de Asturias	4
ES13 Cantabria	4
ES21 País Vasco	4
ES22 Comunidad Foral de Navarra	4
ES23 La Rioja	4
ES24 Aragón	4
ES3 Comunidad de Madrid	4
ES41 Castilla y León	4
ES42 Castilla-la Mancha	4
ES43 Extremadura	4
ES51 Cataluña	4
ES52 Comunidad Valenciana	4
ES53 Illes Balears	4
ES61 Andalucía	4
ES62 Región de Murcia	4
ES63 Ciudad Autónoma de Ceuta	2
ES64 Ciudad Autónoma de Melilla	4
ES7 Canarias	4
FR1 Île de France	1
FR21 Champagne-Ardenne	3
FR22 Picardie	3
FR23 Haute-Normandie	3
FR24 Centre	3
FR25 Basse-Normandie	3
FR26 Bourgogne	3
FR3 Nord - Pas-de-Calais	3
FR41 Lorraine	3
FR42 Alsace	3
FR43 Franche-Comté	3

Region	No. cluster
FR51 Pays de la Loire	3
FR52 Bretagne	3
FR53 Poitou-Charentes	3
FR61 Aquitaine	3
FR62 Midi-Pyrénées	3
FR63 Limousin	3
FR71 Rhône-Alpes	3
FR72 Auvergne	3
FR81 Languedoc-Roussillon	3
FR82 Provence-Alpes-Côte d'Azur	3
FR83 Corse	3
FR91 Guadeloupe	0
FR92 Martinique	0
FR93 Guyane	0
FR94 Réunion	0
ITC1 Piemonte	4
ITC2 Valle d'Aosta/Vallée d'Aoste	4
ITC3 Liguria	4
ITC4 Lombardia	4
ITH1 Provincia Autonoma Bolzano/Bozen	4
ITH2 Provincia Autonoma Trento	4
ITH3 Veneto	4
ITH4 Friuli-Venezia Giulia	4
ITH5 Emilia-Romagna	4
ITI1 Toscana	4
ITI2 Umbria	4
ITI3 Marche	4
ITI4 Lazio	4
ITF1 Abruzzo	4
ITF2 Molise	4
ITF3 Campania	4
ITF4 Puglia	4
ITF5 Basilicata	4
ITF6 Calabria	4
ITG1 Sicilia	4
ITG2 Sardegna	4
CY Cyprus	4
LV Latvia	2

Region	No. cluster
LT Lithuania	5
LU Luxembourg	5
HU1 Közép-Magyarország	4
HU21 Közép-Dunántúl	2
HU22 Nyugat-Dunántúl	2
HU23 Dél-Dunántúl	2
HU31 Észak-Magyarország	2
HU32 Észak-Alföld	2
HU33 Dél-Alföld	2
MT Malta	0
NL11 Groningen	1
NL12 Friesland	1
NL13 Drenthe	1
NL21 Overijssel	1
NL22 Gelderland	1
NL23 Flevoland	1
NL31 Utrecht	1
NL32 Noord-Holland	1
NL33 Zuid-Holland	1
NL34 Zeeland	1
NL41 Noord-Brabant	1
NL42 Limburg	1
AT11 Burgenland	1
AT12 Niederösterreich	1
AT13 Wien	1
AT21 Kärnten	1
AT22 Steiermark	1
AT31 Oberösterreich	1
AT32 Salzburg	1
AT33 Tirol	1
PL11 Łódzkie	2
PL12 Mazowieckie	2
PL21 Małopolskie	2
PL22 Śląskie	2
PL31 Lubelskie	2
PL32 Podkarpackie	2
PL33 Świętokrzyskie	2
PL34 Podlaskie	2

Region	No. cluster
PL41 Wielkopolskie	2
PL42 Zachodniopomorskie	2
PL43 Lubuskie	2
PL51 Dolnoslaskie	2
PL52 Opolskie	2
PL61 Kujawsko-Pomorskie	2
PL62 Warminsko-Mazurskie	2
PL63 Pomorskie	2
PT11 Norte	4
PT15 Algarve	4
PT16 Centro	4
PT17 Lisboa	1
PT18 Alentejo	4
PT2 Região Autónoma dos Açores	4
PT3 Região Autónoma da Madeira	4
RO11 Nord-Vest	2
RO12 Centru	2
RO21 Nord-Est	2
RO22 Sud-Est	2
RO31 Sud - Muntenia	2
RO32 Bucuresti - Ilfov	3
RO41 Sud-Vest Oltenia	2
RO42 Vest	2
SI01 Vzhodna Slovenija	4
SI02 Zahodna Slovenija	0
SK01 Bratislavský kraj	3
SK02 Západné Slovensko	4
SK03 Stredné Slovensko	4
SK04 Východné Slovensko	4
FI13 Itä-Suomi	0
FI18 Etelä-Suomi	0
FI19 Länsi-Suomi	3
FI1A Pohjois-Suomi	0
FI2 Åland	3
SE11 Stockholm	1
SE12 Östra Mellansverige	1
SE21 Småland med öarna	1
SE22 Sydsverige	1

Region	No. cluster
SE23 Västsverige	1
SE31 Norra Mellansverige	1
SE32 Mellersta Norrland	1
SE33 Övre Norrland	1
UKC1 Tees Valley and Durham	5
UKC2 Northumberland and Tyne and Wear	5
UKD1 Cumbria	5
UKD2 Cheshire	0
UKD3 Greater Manchester	5
UKD4 Lancashire	5
UKD5 Merseyside	0
UKE1 East Yorkshire and Northern Lincolnshire	5
UKE2 North Yorkshire	5
UKE3 South Yorkshire	5
UKE4 West Yorkshire	5
UKF1 Derbyshire and Nottinghamshire	5
UKF2 Leicestershire, Rutland and Northamptonshire	5
UKF3 Lincolnshire	5
UKG1 Herefordshire, Worcestershire and Warwickshire	5
UKG2 Shropshire and Staffordshire	5
UKG3 West Midlands	5
UKH1 East Anglia	5
UKH2 Bedfordshire and Hertfordshire	5
UKH3 Essex	5
UKI1 Inner London	4
UKI2 Outer London	5
UKJ1 Berkshire, Buckinghamshire and Oxfordshire	5
UKJ2 Surrey, East and West Sussex	5
UKJ3 Hampshire and Isle of Wight	5
UKJ4 Kent	5
UKK1 Gloucestershire, Wiltshire and Bristol/Bath area	5
UKK2 Dorset and Somerset	5
UKK3 Cornwall and Isles of Scilly	5
UKK4 Devon	5
UKL1 West Wales and The Valleys	5
UKL2 East Wales	5
UKM2 Eastern Scotland	5
UKM3 South Western Scotland	5

Region	No. cluster
UKM5 North Eastern Scotland	1
UKM6 Highlands and Islands	5
UKN Northern Ireland	5