

# **Knowledge Intensive Business Services KIBS as an indicator of economic level: the position of Visegrad regions in the European Union**

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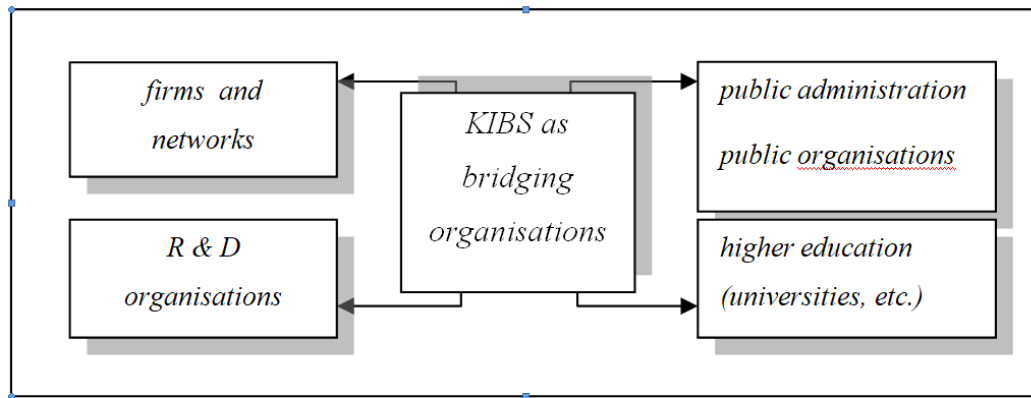
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# Introduction

- The high concentration of firms with significant differentiation in specialisation within the region raises the need of special services, known as Knowledge Intensive Business Services (KIBS).
- Knowledge-based economies are characterised by an above-average share of R&D and Knowledge-Intensive Business Services (KIBS) activities within economic structures (Attiah, 2019; Merino and Rubalcaba, 2013).
- These services currently represent a highly dynamic area of economic activity. They are characterised by a high level of expert knowledge, which is used as an external source of information for the innovation capabilities of the entities which use KIBS.
- Technology-intensive manufacturing and knowledge-intensive services are more concentrated in developed regions (Delgado-Márquez and García-Velasco, 2013).
- Theoretically the regional innovative system theory may be applied for an analysis of the KIBS role within the regional economy, because theory emphasises the broadly developed infrastructure of the organisations and institutions which support the emergence of the innovations in interaction with the production sphere in the region.
- ***The aim of the paper is to analyse how the regions of Visegrad countries are developed in the field of knowledge-based intensive services in comparison with other EU regions***
- ***and whether the position of these regions is improving, as it can be assumed that the degree of KIBS is also an indicator of the degree of economic development.***

# Relationship between KIBS and the regional innovative system



Source: own elaboration based on [Thomi and Böhm \(2003\)](#)

According to [Betioli and Di Maria \(2012\)](#), KIBS determinants within the regional innovation system include the size of the regional market, specific experience and knowledge, investment in network technologies, and the standardisation of services.

Some identical properties of KIBS and RIS include direct and substantial interaction with universities for their development ([Pinto, Fernandez-Esquinas and Uyarra, 2013](#)), as also demonstrated by [Johnston and Huggins \(2010\)](#) in the example of the peripheral regions having worse conditions for the development of and development of the regional innovation system.

The regional innovation environment produces a system in which those entities which increase their knowledge level are involved: for example research institutes, universities, R&D parks as well as organisations all cooperate with each other in order to commercially use new knowledge, learning, and innovations ([Coe, Dicken and Hess, 2008](#)).

Regional innovation systems use a more unique institutional environment and higher levels of relationships ([Wyrwich, 2013](#); [Ciarli, Meliciani and Savona, 2012](#)).

Within the region, the integration of the innovation environment occurs between production organisations, universities, R&D organisations, and the public sector while the regional networks mutually interconnected through KIBS in society can exist.

# Methodology

It is suitable to use more indicators to analyse the regional processes which are sufficiently representative with long-term statistical monitoring. The paper uses a group of selected indicators which sufficiently describe the main developmental changes within the selected fields of knowledge intensive based services and levels of gross domestic product.

The analysis of knowledge-intensive business services was based on a dataset relating to employment in different areas. Eurostat database sources were used for the analysis and the following indicators were used for comparison with GDP per capita in purchasing power standard (PPS):

- employment share in knowledge-intensive high-technology services section (KIHT)
- employment share in knowledge-intensive market services section, except financial intermediation and high-technology services (KIMS)
- employment share in other knowledge-intensive services section (KIOS)

These indicators show the capability of the regions to establish a competitive regional labour market characterised by the higher number of jobs in KIBS.

An aggregate indicator (KIAG) was designed for research as the following formula:

$$KIAG_{(1-n)} = KIHT_{(1-n)} + KIMS_{(1-n)} + KIOS_{(1-n)}$$

The years for the analysis of the changes were defined in a sufficient scale, a period of 10 years and the years 2008 and 2018. NUTS 2 regions in Visegrad countries were analysed.

# Results

## *Characteristics of the employment structure of KIBS in 2008 and 2018*

Group	Number of EU regions 2008	Number of Visegrad regions 2008	In %	Number of EU regions 2018	Number of Visegrad regions 2018	In %
A	13	3	23,1	17	4	23,5
B	39	1	2,6	43	0	0
C	83	0	0	66	0	0
D	70	6	8,6	81	8	9,9
E	67	27	40,3	65	25	38,5
total	272	37		272	37	

## *Characteristics of the groups with GDP per capita in 2008 and 2018*

Group	Number of EU regions	Number of Visegrad regions 2008	In % 2008	Number of EU regions	Number of Visegrad regions 2018	In % 2018
I	24	2	8,3	24	4	16,7
II	97	2	2,1	97	0	0
III	121	15	12,4	121	27	22,3
IV	30	18	60	30	6	20
total	272	37		272	37	

Group A is characterised by the highest mean values of the KIBS category variables and consisted of 17 EU regions in 2018, 4 of which are Visegrad regions.

Cluster I is characterised by the highest average GDP per capita levels in PPS, this group consisted of 24 EU regions in 2018, of which 4 are Visegrad regions. Although the number of regions in this category within the EU has remained unchanged, the share of Visegrad regions in this cluster has increased by two regions. In the following clusters, the mean values of the variables decrease.

## ***Correlation dependency of indicators from Visegrad regions***

Group	Number of EU regions	KIAG	KIHT	KIMS	KIOS	GDPp c
<b>KIAG</b>	Pearson Correlation	1	,607**	,530**	,768**	,497**
	Sig. (2-tailed)		,000	,001	,000	,003
<b>KIHT</b>	Pearson Correlation	,607**	1	,908**	-,023	,899**
	Sig. (2-tailed)	,000		,000	,898	,000
<b>KIMS</b>	Pearson Correlation	,530**	,908**	1	-,121	,865**
	Sig. (2-tailed)	,001	,000		,495	,000
<b>KIOS</b>	Pearson Correlation	,768**	-,023	-,121	1	-,102
	Sig. (2-tailed)	,000	,898	,495		,567
<b>GDP</b>	Pearson Correlation	,497**	,899**	,865**	-,102	1
	Sig. (2-tailed)	,003	,000	,000	,567	

The resulting data confirms a statistically significant dependence between GDP per capita on the aggregate indicator of the share of employment in KIBS, especially in its two important sub-sectors, namely the Knowledge-Intensive High-Technology services section (KIHT) and the Knowledge-Intensive Market Services section, except financial intermediation and high-technology services.

The degree of economic development of a region is undoubtedly more important for a higher concentration of KIBS. The development of the KIBS sector is supported by the localisation of university education and scientific research facilities. The effect of the regionally specific conditions on the development of KIBS is also pointed out by the research of Ženka, Novotný, Slach and Ivan (2015), describing the problems of regions with a low quality of regional universities and weak local industrial links.

Further causes of regional differences in the concentration of KIBS are related to the restructuring and modernisation of regions, which has been accelerated by the regionally differentiated inflow of direct foreign investment, start-ups etc.

# Conclusion

- The narrowing of the employment gap within the European Union in knowledge-intensive sectors is a positive development, although it mainly concerns regions with capital cities.
- The situation is weaker within other regions, which are mostly among the groups of EU regions with lower levels of employment in knowledge-intensive sectors. On the other hand, there is some improvement in this group of Visegrad regions as well, including in other indicators.
- These regions are adopting technologies rather than developing them. Employment in knowledge-intensive industries has a small share in total employment, but with the growth of the Czech economy, we can expect an increased demand for highly educated labour capable of working in knowledge-intensive industries in these regions too.
- Therefore, the economic growth of the region depends on its capability to utilise the national and supranational sources of information, communication, investment, and production. Public administration (Hlaváček, Žambochová and Siviček, 2015) should support the transfer of information for the establishment and development of entrepreneurship in KIBS

Thank you for your attention