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**SPATIAL DIMENSION OF
KNOWLEDGE INTENSIVE
BUSINESS SERVICES IN RUSSIA**

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SPATIAL DIMENSION OF KNOWLEDGE INTENSIVE BUSINESS SERVICES IN RUSSIA²

Knowledge intensive business services (KIBS) are characterized by high concentration in large urban areas due to the presence of more developed infrastructure, higher human capital development, proximity to the large customer, etc. However, companies in the KIBS sector have potential for development (new knowledge, experience) in collaboration with agents located in other regions.

This paper is focused on the spatial aspects of the knowledge intensive business services sector in Russia. The study is based on a unique empirical data from mass surveys of Russian producers and consumers of KIBS. Comparative analysis of the incoming and outgoing flows of KIBS in Russian regions helps us to classify federal districts by their involvement in KIBS exchange, and to map the intensity of these flows. We have identified regions that are actively involved in both the purchase of services and their delivery outside the regional boundaries (Volga and Central Districts); active regions of consumption with an average level of production (Northwestern and Siberian Districts); and the passive regions, who are only weakly involved in inter-regional exchange of knowledge intensive business services (Ural and Southern Federal Districts).

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Introduction

The sector of knowledge intensive business services (KIBS) is a specialist sphere of the new economy which generates and distributes experience and knowledge, thereby promoting more dynamic and innovative development of companies, cities, regions and countries. A prominent topic in the global research community is the study of its spatial dimension.

In general terms, KIBS are mainly concerned with knowledge intensive inputs to the business processes of other organisations, including both private and public sector clients. There is not yet a generally accepted definition of KIBS, however Miles et al. (1995) identified three principal characteristics of KIBS:

1. They rely heavily upon professional knowledge;
2. They are *either* themselves primary sources of information and knowledge *or* they use knowledge to produce intermediate services for their clients' production processes;
3. They are of competitive importance and supply primarily to business.

KIBS offer specialised information and knowledge, providing advanced and often tailor-made services for other industries as well as for the public sector. The KIBS sector does not target private clients but business firms and organisations.

The growing competition among Russian regions, not only for federal financing, but also for other resources such as private investments, human resources etc. encourages regions to seek new ways to improve their attractiveness for their target groups. The interaction with KIBS providers helps customers to find new opportunities for increasing productivity, improving the quality of goods or services, and reducing costs, thereby strengthening the customer company's competitive position in its relations with other market actors.

Certain reservations must be expressed concerning the need for close collaboration between KIBS firms and their clients. As Aslesen and Isaksen have noted:

KIBS firms may also stimulate innovation in firms that are not their clients. New knowledge developed by KIBS firms, for example novel principles for the management of value chains or client relations, may be implemented by a number of firms. Knowledge may be manifested as information in manuals, course books and computer programs that are widely distributed. Firms may adapt the information to suit their own purposes and develop new solutions, without acknowledging the consultancy firm as their source of information (Aslesen & Isaksen, 2007).

In this regard, the development of the KIBS sector may be considered as one of the sources of sustainable economic growth in a region. However, some regions are sceptical about their readiness to use advanced technologies and co-production, and staff readiness to utilise new knowledge and best practices. Therefore, the potential benefits of the KIBS sector very much depend on the given regional business environment. Despite the practical importance of this point, the spatial aspects of the KIBS sector are poorly investigated in the literature.

Muller and Doloreux (2007) reviewed 82 academic papers from 1989 to 2005. They analysed three conceptual dimensions: knowledge, innovation and spatial proximity. Initially, scholars perceived KIBS as a nexus which transfers specialised information to their clients. But it has since been acknowledged that the process is more two-way, with the knowledge basis of KIBS and their clients combining together. In addition, academic perception and analysis of KIBS innovation has evolved over time: from a narrow focus on the adoption of technologies developed by the manufacturing sector, to a recognition of the major influence KIBS can have on their clients' innovative capacities. Muller and Doloreux found that the study of the spatial dimension of the KIBS sector has been neglected in the literature, and has tended to be limited to analysing the location of KIBS and the factors explaining their growth.

Given the acknowledged importance of business services in advanced economies, it is perhaps surprising how little in-depth research is available outside of Anglo-American social science, and from countries with different geographies, economic histories and cultures (Bryson & Rusten, 2005). In Russia, the study of the spatial development of the KIBS sector is limited, possibly due to an underestimation of its importance. Russian regional authorities often discuss the need to diversify their regional economies via the development of services. But by the word 'services' they primarily mean trade and consumer services, rather than knowledge intensive ones. Yet researchers admit that KIBS, due to their positive impact on the competitiveness of consumers, can contribute significantly to the sustainability of regional economic growth.

Properties of KIBS

Growing competition, the contraction of product life cycles, and an increasing demand for customised business solutions have all increased the role of knowledge. Access to relevant knowledge becomes crucial for manufacturers, thereby increasing their need for such KIBS as research and product development, new technology, marketing and organizational changes (Daniels & Bryson, 2005).

The importance of knowledge and innovation in modern economies is reflected in the increasing attention given by scholars throughout the world to studies of KIBS. A search for “Knowledge intensive business services” or “KIBS” in the citation database “Web of Science” gave a result of 515 papers. Figure 1 depicts the distribution of these articles by year.

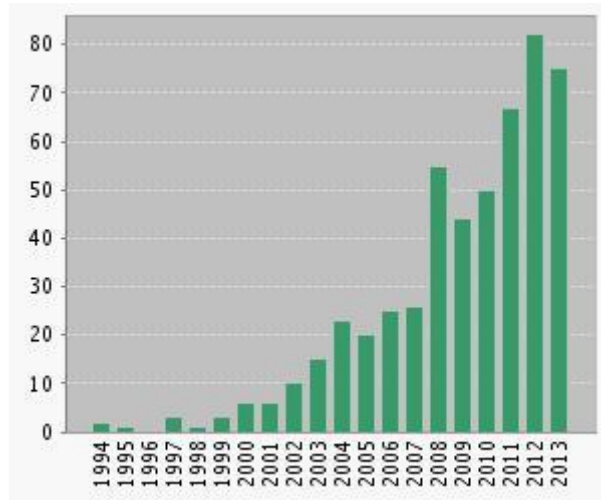


Fig.1. distribution of KIBS articles by publication year

Since the mid-1990s, there has been significant growth in the attention paid to KIBS and their roles and functions in contemporary innovation systems. Nevertheless, Muller and Doloreux (2007) contend that, ‘in comparison to the manufacturing sectors, KIBS remain poorly studied by analysts of innovation and technological change.’

Miles (2003) noted that KIBS are businesses that provide services to other organisations when the latter need solutions requiring special kind of knowledge which they themselves do not possess. Bettencourt et al. (2002) define KIBS as ‘enterprises whose primary value-added activities consist of the accumulation, creation, or dissemination of knowledge for the purpose of developing a customized service or product solution to satisfy the client's needs.’

In order to understand the essence of KIBS it is necessary to classify the different kinds of knowledge that they can utilize:

KIBS firms (ideally) combine i) general, scientific and technological information, ii) experience and competence acquired by KIBS firms through projects carried out for clients, and iii) so-called ‘tacit’ knowledge acquired from clients (i.e. practice and informal rules prevailing in clients’ firms). This fusion of different types of information and knowledge is seen to enable KIBS firms to work out solutions to the specific problems of their clients (Aslesen & Isaksen, 2007).

Customisation is an essential feature: KIBS tend to offer a higher level of service customisation than other service sectors (Corroher et al., 2009). This requires face-to-face interaction with the client through a series of meetings, starting even before the service itself is produced. ‘Interaction with clients also provides incomparable opportunities for learning that KIBS is used to improve their existing services and develop new ones’ (Bettiol et al., 2013). Therefore KIBS are seen as crucial for making the public sector more efficient and for enhancing the competitiveness of industries.

The high level of value added in the KIBS sector can be explained by the low resource-intensity of their production. KIBS involve a specific resource—human capital. KIBS require their employees to have an extremely high level of professionalism and experience in order to ensure the quality of their service; thus, the proportion of employees with higher education is usually higher in the KIBS sector (Aslesen & Isaksen, 2007).

One more crucial feature of KIBS is the co-production process. Clients are not passive in the delivery of knowledge-based solutions; rather, they effectively perform the role of ‘co-creators’ or ‘co-producers’. This is because the clients themselves possess much of the knowledge and expertise that a KIBS provider needs in order to develop its solution. As Bettencourt et al. (2002) explain, ‘[t]his includes codified knowledge (such as current technology platforms and formal reporting relationships) and tacit knowledge (such as who the key players are and how and why things are currently done as they are in the client firm).’

Thus, researchers agree that the main characteristics of KIBS are as follows: they are based on professional knowledge; they are notable for the high value added; they require deep consumer involvement into the process of service provision (co-production); and they improve competitiveness of their consumers.

The Spatial Dimension of KIBS

Interest in the geographical distribution of KIBS extends beyond any particular economic activity, since it is assumed that an appropriate advancement of KIBS industries within a geographical area indicates a certain economic maturity of this area. KIBS may also become a catalyst for other economic activities, playing an increasing role in explaining the varieties of service economies (Daniels et al., 2011).

Researchers have attempted to analyse the locational patterns of KIBS and the socio-economic contexts which might explain their emergence and growth. Acknowledging the

propensity of KIBS providers to concentrate in metropolitan areas is the first step in analyzing the relationships between their activities and their spatial distribution (Wood, 2006).

Researchers usually consider either the national or the local level (Aslesen & Isaksen, 2007). They have provided comparative analyses of different countries (Wood, 2006; Javalgi et al., 2011; Merino & Rubalcaba, 2012); megalopolises within one country (Koch & Stahlecker, 2004); or central and peripheral regions of the same country (González-López, 2009; Martinelli, 1991). They all agree that the companies who provide KIBS are highly concentrated in large urban areas.

The literature offers two main explanations for the concentration of KIBS in big cities: supply side factors and demand side factors. Supply side explanations suggest that big cities have favourable local factors for KIBS development, particularly knowledge-based organisations (such as universities and research institutes) which develop knowledge and educate an appropriate labour force for KIBS firms. Big cities therefore have the easiest access to highly qualified and experienced personnel who are well-equipped to establish and operate new knowledge intensive businesses (Daniels & Bryson, 2005). Moreover, 'KIBS can develop relationships with other KIBS, university departments of research centres in order to access useful information or knowledge or to carry out joint project' (Bettioli, 2013).

Demand side explanations assume that providers of certain types of KIBS must be geographically close to their big clients, mainly the head offices of big corporations and large public organisations. Such clients are mainly located in capitals and other big cities (Aslesen & Isaksen, 2007).

Local clusters such as metropolitan areas and regional innovation systems generally demonstrate a high density of KIBS because these areas generate comprehensive demand for such services and consequently stimulate the foundation and growth of these firms. These local clusters also create a number of other factors related to the localisation of firms that are favourable to KIBS (Andersson & Hellerstedt, 2009).

Another reason for the concentration of KIBS companies in big cities is the fact that not all knowledge can be 'encoded' in the form of text, tables, graphs, etc. that are easily transferred to a remote service provider via standard means of communication. Such knowledge is based on experience and intuition and is known as tacit knowledge. The importance of tacit knowledge again encourages KIBS providers to locate in close proximity to their customers.

However, Merino and Rubalcaba (2013) have challenged the conclusion about the high concentration of KIBS within major metropolitan areas. They argue that the concentration of different types of KIBS varies considerably within one and the same region. This finding is also

supported by Tether et al. (2012). Through a comparative analysis of the two types of KIBS in London—architecture and engineering—they find that architects are significantly concentrated in inner London, whereas engineering consultancies are much more dispersed:

In contrast to the architects, engineering consultants tend to be much larger firms, both in employment size and in their office networks, both at home and abroad. Interestingly, we found a financial benefit to greater worldwide employment size but no benefit to specialization or professionalization, and no benefit to locating the main UK office in inner London.

In general the KIBS sector is highly concentrated in large urban areas. But some empirical evidence suggests that this concentration depends on the type of the service.

Spatial Proximity of Service Providers and Customers

The above logic naturally raises the question of how new technological means of communication may affect dialogues between producer and consumer in the KIBS sector. This includes the means for remote interaction which reduces the importance of spatial proximity. In other words, even if there is physical distance between the customer and the provider, the highest level of service may still be provided.

Nevertheless, a number of researchers still insist on the importance of spatial proximity for KIBS. For example, Antonietti et al. (2012) state that, ‘Spatial proximity to suppliers tends, on the one hand, to reduce transport, search and managerial costs and, on the other, to reduce the scope for opportunistic behaviour by increasing mutual visibility and reciprocal trust.’ Héraud (2000) refers to an ‘apparent paradox in the new knowledge-based economy’—because on the one hand dematerialisation and new communication methods should reduce the significance of distance, but on the other hand the importance of tacit knowledge in complex cognitive processes seems to require proximity, at least initially.

A group of researchers have tried to identify different factors that influence the importance of spatial proximity for KIBS. For example, Wong and He (2005) found that the importance of spatial proximity varies over different phases of the innovation process:

For product innovation support, spatial proximity is most frequently cited as important for 'market analysis' and 'idea generation/feasibility assessment'. For process innovation support, spatial proximity is of greatest importance for 'diagnosis of process problems' and 'process-related training of employees'. It thus appears that spatial proximity is important for the early phases of product innovation support, but for both early and late phases of process innovation support.

Koch and Stahlecker (2004) in their study of the three largest metropolitan areas in Germany, propose the phase of the life cycle of the company as the main determinant of the importance of spatial proximity. At the early stage of development geographical proximity seems to be significant in order to offset market and technology risks.

One more explanatory factor suggested in the literature is the consumer's competency. Aslesen and Jakobsen (2007) introduce the hypothesis that geographical proximity between KIBS providers and clients is neither a necessary nor a sufficient condition for the establishment of successful relations. Their research shows that head offices which face strategically important issues, tend to search for the best available consultant regardless of location, and that it is possible to achieve personalisation and trust-based relationships in spite of geographical distance.

While large customers may have the resources to seek the necessary knowledge and competence regardless of their geographic location, medium and small companies (SMEs) tend to limit their search to the local market. Miles (2003) argues that the practice of using local KIBS reflects the imperfect nature of market information about the availability of services outside the region. The scarcity of information often results in contacts with consultants being established informally, mostly through friends and acquaintances.

García-Quevedo and Mas-Verdu (2008) analyse the factors which explain the demand for KIBS by SMEs, utilising data from more than 2,000 firms. They found that demand for services increases with the size of the user firm. Spatial proximity between the user and the supplier of KIBS also proves to be a relevant factor. These results seem plausible for two reasons. There is a certain threshold, in terms of both a firm's size and its technological level, which creates barriers to the efficient use of KIBS. On the other hand, small businesses are more seriously challenged by the need for proximities, both geographical and functional, between suppliers and the users of services.

The results of studies on the importance of spatial proximity are ambiguous. Some researchers emphasise that geographical proximity between KIBS providers and their customers is not a necessary prerequisite for a successful relationship. Others argue that spatial proximity matters and depends on various factors. A literature review shows that the latter take into consideration such factors as type of service (Merino & Rubalcaba, 2013; Doloreux & Shearmur, 2011), the nature of knowledge which is used for the production of KIBS (Strambach & Dieterich, 2011), the phases of the innovation cycle (Wong & He, 2005), the stage of the producer lifecycle (Koch & Stahlecker, 2004) or size of the company and existing resources (Aslesen & Jakobsen, 2007).

Interregional Cooperation of Producers and Consumers of KIBS

Spatial proximity is not the only factor that matters, however. Some researchers find that due to interregional differences in networking behaviour, firms from central regions demonstrate better abilities for interregional interactions, while in rural areas intraregional contacts dominate (Muller & Doloreux, 2007).

Many KIBS firms extend their activities beyond their local context, metropolitan area or the regional innovation system where they were initially set up, and some of them develop relationships with customers, suppliers and other actors on an international scale (Bryson & Rusten, 2005).

Aguilera (2003) analyses 250 KIBS providers in the Lyon metropolitan area, and finds that customers outside this area account for 58% of the total turnover of KIBS firms, while foreign customers only account for 6.7%. Aslesen and Isaksen (2007) study two KIBS sectors (software and organizational consulting) which are strongly concentrated in the region of the Norwegian capital, Oslo. They show that within their sample of 600 KIBS, about two-thirds deliver their services outside their local market. Finally, when Koch and Strotmann (2006) focused on the post-entry phase of 446 KIBS companies (up to 8 years old) in three German regions—Bremen, Munich and Stuttgart—the average share of turnover earned outside the regional market was 54%.

Koch and Strotmann (2006) clearly explain why a broad spatial scope may be beneficial to the growth of the KIBS sector: ‘first, a bigger number of potential clients and partners increases the chances of successful contacts, and second, by an expansion of spatial reach, new and different knowledge can enter the firm and potential lock-ins can be more probably avoided.’

A KIBS company may enter the interregional market for several reasons. The most important one is demand for its services in other regions. Knowledge is distributed in space unevenly; its accumulation, use and development have regional specifics. Consequently, the spatial development of the KIBS sector is also uneven. KIBS providers can attract clients from other regions by supplying a certain type of service which does not exist in the territory of the recipient, or by making a more competitive offer than regional producers.

Another reason for expansion into the interregional level is consumer preference towards standardised services. Tether et al. (2012) found that in two typical areas of the KIBS sector—architects and engineering services—a large share of companies provide solely or largely standardised services. Spatial proximity is less important for standardised production because it needs little or no customer co-production (Bettiol et al., 2013). It is important to note that the demand for standardised services tends to be connected with consumers who have had a poor experience of previous KIBS consumption (Doroshenko et al., 2010). Regions with younger markets for KIBS may thus be fertile ground for providers of standard services compared to more mature regional markets.

The active development of information and communication technologies also promotes spatial interaction. 3G and 4G mobile communication, cloud computing, video conferencing and so on, all allow producers to stay permanently in touch with their customers, regardless of the geographical location of both parties.

We may thus conclude that KIBS companies are concentrated in large cities, and at the same time may be actively engaging customers from other regions.

Given the findings of the established literature with respect to spatial issues, we propose the following hypotheses with respect to the spatial dimension of the KIBS sector in Russia:

- KIBS providers in Russia are highly concentrated in local markets;
- The KIBS sector in Russia is developed unevenly across the country;
- Regional capitals are the most active participants in interregional business.

Data and Methodology

The empirical base of our study was specialised surveys of Russian KIBS producing and consuming firms in 2011–2013, within the framework of the project Monitoring of Knowledge Intensive Business Services in Russia. The project was carried out by the Institute of Statistical Studies and Economy of Knowledge (ISSEK) of the Higher School of Economics, in partnership with the ROMIR research company.

The scope of the surveys comprised 10 types of KIBS: marketing, advertising, IT consultancy, engineering, financial intermediation, legal consultancy, property development and business design.

The annual survey procedures included two stages. The first was qualitative research in the form of expert panels and/or individual in-depth interviews with experts from leading KIBS providing firms. We discussed our main research hypotheses and the designs of the questionnaires. The outputs of the first stage were transcripts of the experts' responses. The second stage comprised quantitative research and included mass surveys of KIBS providers (about 600 firms per year, with approximately 60 companies for each type of service). To test our research hypotheses, we collected information about all ten types of KIBS broken down by region (see Table 1). The survey covered 12 metropolitan areas in Russia—Moscow, Saint Petersburg, Voronezh, Yekaterinburg, Kazan, Krasnoyarsk, Nizhny Novgorod, Novosibirsk, Omsk, Samara, Tomsk, Chelyabinsk.

Responding companies were recruited from among the biggest Russian-based KIBS providers; the primary information about them was found from various data sources (databases, business cards, previous contacts, and the rating of the largest Russian companies by Expert Rating Agency). Respondents were selected from top management (CEOs and heads of core business departments and/or divisions) who could competently answer questions about the activities of the company and the specialist market as a whole. Interviews ranged from 40 to 90 minutes.

Producers provided information about their companies, gave their expert assessment of the market, and characterized their interactions with consumers of their services.

Tab. 1. Distribution of producer survey respondents in 2013

	Advertising	Marketing	Audit	IT	HR consulting	Engineering	Financial intermediation	Legal services	Development services	Business design	Total
Moscow	22	21	19	22	21	14	21	21	13	21	195
Saint Petersburg	6	6	6	6	5	6	7	6	7	6	61
Kazan	6	1	3	6	4	3	2	3	3	4	35
Krasnoyarsk	5	3	3	3	3	4	3	3	3	4	34

Voronezh	5	7	1	5	1	2	1	2	2	8	34
Nizhny Novgorod	4	8	2	7	3	16	5	3	3	1	52
Novosibirsk	8	3	3	3	3	3	3	3	3	3	35
Omsk	4	3	4	3	4	3	3	3	3	4	34
Samara	2	5	3	3	3	3	3	5	2	5	34
Yekaterinburg	7	2	5	1	3	4	3	3	6	2	36
Tomsk	6	2	5	3	2	5	2	5	3	2	35
Chelyabinsk	7	1	3	5	3	5	2	3	6	3	38
Total	82	62	57	67	55	68	55	60	54	63	623

In 2011 and 2013 mass surveys of KIBS consumers were also conducted. Respondents from consuming firms were asked about all KIBS they used, resulting in a yield of around 3,000 valid questionnaires in both years. The sample was representative of economic sectors and geographical regions.

The rating agency Expert RA's rating of the largest Russian companies consists mostly of industrial and infrastructure companies; this is not surprising bearing in mind that the average firm size in service sectors is smaller than in industrial ones. For this reason it was impossible to achieve sectorial representativeness by involving the biggest companies only. We covered service sectors by adding the largest service firms from relevant sectorial ratings, although they are small- and middle-sized relative to the industrial giants. The distribution of survey participants by sector in 2013 is shown in Table 2. The distribution for the 2011 survey was similar.

Consumers gave opinions on rendered services and relationships with service providers.

Tab. 2. Distribution of consumer survey respondents in 2013

Scope of business	Number of companies
Companies from the ranking of the largest companies in Russia	300
FMCG industry	60
Mobile market, tourism and entertainment	60
Sector of durable goods	60
Banks and insurance companies	60
Sector of trade and dealerships	60
Total	600

The questionnaire for consumers was designed to mirror the questionnaire for producers, i.e. the two questionnaires contained twin questions, thus making it possible to compare producer and consumer points of view on the same research topic. This survey design enabled us to elucidate key characteristics of the spatial dimension of the KIBS sector in Russia from both supply-side and demand-side perspectives.

The Current State of the KIBS Sector: the Spatial Aspect

The economic crisis of 2008–2009 had a strong impact on the KIBS sector. Leading experts of the research holding ROMIR, which monitored this sector for ISSEK, concluded that, ‘contraction of demand for services of an intellectual nature predetermined their slump.’ (Berezin & Milehin, 2011). In 2013, however, the sector showed a positive trend and, on average, KIBS providers reported an increase in turnover. Nevertheless, companies in the KIBS sector remained highly concentrated within their regions both during the economic slowdown and in the period of economic recovery.

On average, during the three-year period analysed, only one-fifth of responding customers had any experience of KIBS consumption outside their region. 79% of consumers in 2011 and 85% in 2013 reported that they only purchased KIBS located in their own region. The concentration of KIBS providers in their local market is weaker, but still noticeable. About two-thirds of responding providers did not work with customers from other regions.

It should be noted that providers from Moscow and Saint Petersburg are also strongly concentrated in their regions. But in comparison with other regions, they demonstrate more active interaction with consumers from other regions.

The spatial interaction of consumers and producers of KIBS by types of services in 2013 is shown in Table 3.

Tab. 3 Number of regions where actors of KIBS markets demanded (consumers) and supplied (providers) KIBS in 2013

		KIBS Providers					
		1-5	6-10	11-20	21-30	41-50	51-60
KIBS Customers	1-5				Design	Engineering	
	6-10	Development services		Legal services	HR consulting		Marketing
	11-15			Audit Financial intermediation			
	16-20				IT		
	31-35		Advertising				

Comparisons of the interregional activities of consumers and producers revealed significant regional differences. Producers of design, engineering and marketing services indicated a large number of regions with strong demand for their services. At the same time their consumers reported only few regions (from 3 to 7) where they purchase these services. This may

be indicative of the specialization of certain regions in the supply of these types of services. For example, marketing services were commissioned in the Central Federal District, Ural and Southern Federal District. Consumers of engineering services selected mostly Central, Ural and Siberian regions. Only the Central Federal District was mentioned as one that provided produced design services in 2013.

Consumers of advertising services, in contrast, reported a large number of regions where services were ordered (more than 30), despite the fact that providers only mentioned about 10 regions of sales. This may be explained by the flexibility of choice between service providers among the abundance of supplying firms and strong competition between them.

The study of spatial dimensions of the KIBS sector in Russia allows us to map the interregional flows of KIBS, and in general the involvement of regions in the exchange of KIBS. Figures 2 and 3 are based on data obtained from respondents who provide services or consume them outside their own region. Respondents were asked to name up to five regions with which they interact most frequently. These answers were grouped by Russian federal districts. The regions are shaded according to the number of respondents who mentioned them as regions of demand (Fig. 2) or regions supply (Fig. 3).

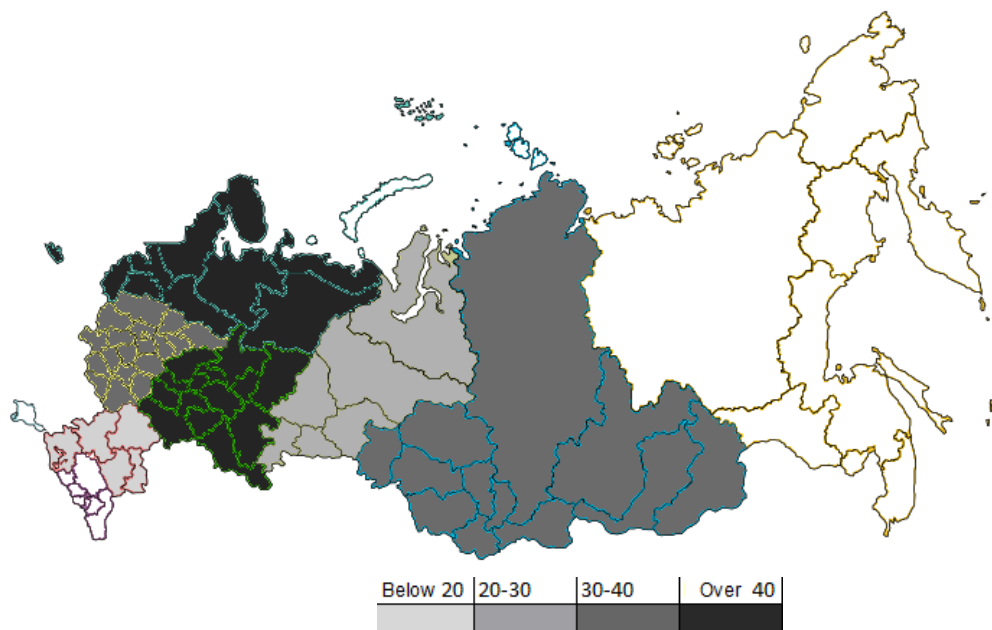


Fig. 2. Regions from which KIBS are most intensively demanded

It is important to note that the picture of service demand among regions remained stable and did not change significantly over the three-year period analysed. Meanwhile, the spatial distribution of supply *did* change significantly between 2011 and 2013.

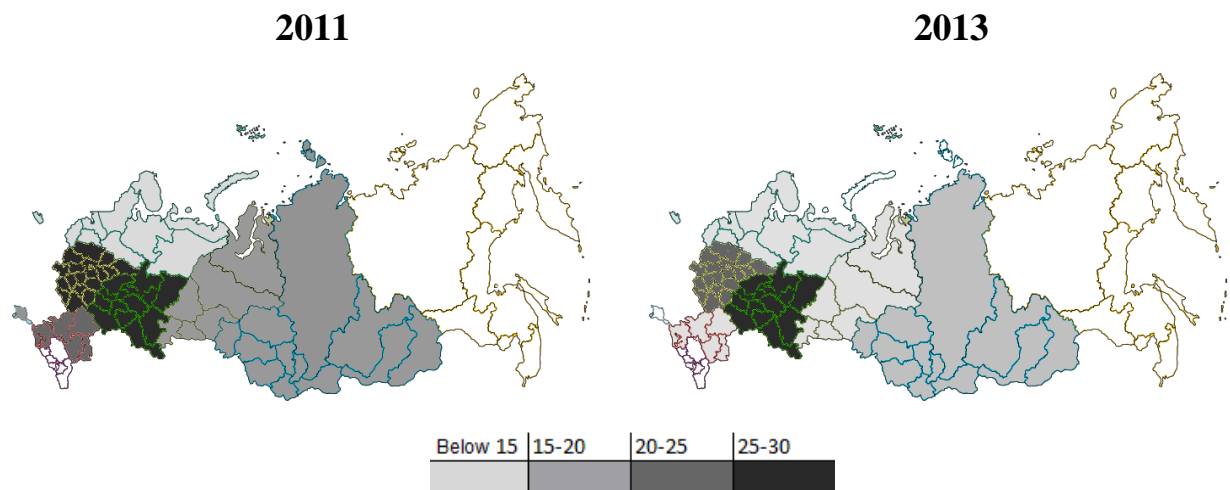


Fig.3. Regions where KIBS are most intensively supplied

The Volga Federal District is the most active macro-region in KIBS exchange. Its constituent regions were marked by the greatest number of consumers who bought services there (outgoing flow of services), and the greatest number of producers who sold services there (incoming flow of services).

Although Moscow is the capital and has the highest level of KIBS sector development, the Central region, in comparison with 2011, moved into second place by incoming and outgoing interregional flows of KIBS.

The Northwestern and Siberian Federal Districts showed strong involvement in procurement of KIBS from other regions, but much lower levels of activity in terms of providing services for other regions.

Producers of KIBS demonstrated a stable average level of supply to the Urals, but in 2013 consumers were less involved in purchasing services from this region compared to 2011.

The Southern Federal District in 2013 demonstrated minimal involvement in interregional cooperation, both in terms of KIBS procurement and sales. It is important to note that in 2011 the Southern Federal District demonstrated intensive demand for KIBS from other regions. In our opinion, this surge in demand appeared due to the preparation for the Winter Olympic Games in Sochi in February 2014 (the 2013 survey was conducted towards the end of the year, by which time the vast majority of procurement and intellectual business services for the Olympics had already been concluded).

Data on the spatial distribution of interregional supply and demand for KIBS is summarized in the form of a pivot table (Table 4). These data describe not potential, but actual deals with KIBS in 2013.

Tab. 4. Spatial dimension of KIBS sector in Russia by federal districts

	Low Demand	High Demand
Low Supply	Southern Ural	Northwestern Siberian
High Supply	-	Central Volga

No federal district is characterized by low demand and high supply; that is to say, no region managed to be active in providing KIBS to other regions without demanding them from other regions. The lowest level of involvement in interregional KIBS exchange in the country was demonstrated by the Southern and Ural Federal Districts. The Central and Volga Federal Districts showed the highest level of both demand and supply of KIBS to/from other regions. North-Western and Siberian Federal Districts were active consumers of KIBS, but rarely offered KIBS to other regions of the country.

Our analysis of the involvement of regions in the process of exchange of KIBS from the spatial point of view, and of the intensity of incoming and outgoing flows of services, demonstrates the existing imbalances in their spatial allocation. There are regions with excess interregional demand (Northwestern and Siberian), and regions with excess supply (Central and Volga). Both situations offer opportunities for regional development. The former would appear to have good opportunities for the diversification of their economies by moving towards service provision. The latter may have the potential for extending their activities over the territory of Russia, i.e. by more active development of their branch networks.

Discussion and Conclusions

Intensifying market competition, decreasing product lifecycles, and growing demand for individualized customer services have boosted the role of knowledge and access to information for manufacturers. Firms are increasingly experiencing the need for KIBS for research, product development, organizational changes, and the introduction of new technologies in order to secure a competitive advantage on the market [10].

This study has verified the hypothesis about the high concentration of providers and consumers of KIBS in regional markets. Only one third of providers and only one fifth of consumers of KIBS are involved in interregional cooperation and participate in other regional

markets. We can conclude, therefore, that the spatial dimension of the KIBS sector in Russia is characterised by a high intraregional concentration of providers and consumers.

The hypothesis that the Central Federal District is the most active participant in the interregional exchange of KIBS has been partially verified. Specifically, the Volga Federal District demonstrates high levels of supply and demand for KIBS in the interregional market, along with the Central Federal District. The Volga Federal District is an active supplier of advertising, auditing, and financial intermediary services.

The Southern and Ural Federal Districts are the regions least involved in the interregional exchange of intellectual services in Russia. For the Ural Federal District, this situation can be attributed to the region's raw material orientation, which is considered less risky than innovative strategies driven by the use of KIBS. The low demand for KIBS in the Southern Federal District is probably because it is primarily an agricultural region and agriculture is less receptive to innovation in general. In both districts, low demand hampers the development of supplying KIBS.

In considering the number of cooperative regions in the context of types of services from the perspective of providers and consumers, important spatial features are established. In the case of design, engineering, and marketing services, many regions are characterized by demand and only few regions provide services. This can be an indicator that some regions specialize in providing these types of services or that there is a more competitive offer (in terms of both price and quality) in the regional market. Furthermore, the provision of such services requires a narrow set of professional skills, which can also limit the number of companies able to provide high quality services. The grouping of the responses by federal districts shows that there was no offer of marketing services in the Volga and Siberian Federal Districts. Consumers of engineering services referred to regions of cooperation, such as the Central, Ural, and Siberian Federal Districts. Only the Central Federal District was cited as one that provided design services in 2013.

In contrast, a wide range of regions offer advertising services, for which few regions have demand. This can be explained by the absence of stringent requirements on the selection of a supplier and the large number of companies offering advertising services (wide offer) as well as high competition in the market. It is also important to consider the nature of the advertising market, which often requires access to many regions of the country and consequently leads to a variety of contractors. For example, the respondents referred to all regions where advertising services were purchased, with the Volga and Siberian Federal Districts predominant.

Our analysis confirms the last research hypothesis: that the KIBS sector in Russia is unevenly developed on the territory of the country.

The key findings of this paper enable us to construct the spatial pattern of the KIBS sector in Russia. A comparative analysis of the supply and demand of KIBS in Russian regions helps us to classify federal districts and macro-regions by their involvement in the process of KIBS exchange, and to map the intensity of these flows.

The practical importance of this study on the spatial dimension of the KIBS sector in Russia is that the knowledge of factors that drive the development of the sector can be used by regional authorities to assess the development capacity of an area and predicting the development of one of the economic components. In addition, a better understanding of the spatial dimension of the KIBS sector can be beneficial to both consumers and providers of services. The former, due to the uneven distribution of information in regions and the lack of qualified specialists in certain areas, can use this information to locate the sources of services which meet their demand. The latter, in turn, can use this knowledge to develop a competitive strategy, understanding where, geographically, there may be demand for their services and considering the factors that either facilitate or hinder the development of interregional customer networks when building their customer strategies.

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