Innovation Configurations in Knowledge-Intensive Business Services

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Abstract

Knowledge-intensive business services (KIBS) industries demonstrate some of the highest levels of innovation in most developed economies. However, these industries are very heterogeneous. Research on their innovative activities is needed in order to provide evidence to inform policy instruments to support such companies.

In this paper, we analyze the innovation configurations of 477 Russian KIBS companies. First, we use factor analysis to study the key features of their innovative behavior: different innovation types and different features of demand for KIBS from innovative clients (volume, range and level of customization of services). Three factors emerge and the KIBS companies are divided into six clusters through the prism of these factors. The clusters are: non-innovators; organizational change innovators; marketing innovators; technology-oriented innovators; non-technological innovators and diversified innovators. Finally, we examine the distribution of companies across the clusters in terms of their size and the type of services.

Keywords: innovation types; service innovation; knowledge-intensive business services; professional services; SMEs.

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The service sector plays a key role in the modern economy. According to the Organisation for Economic Cooperation and Development (OECD) experts, services make a major contribution to employment growth and increased public well-being in many of the organization's member countries [OECD, 2017]. Within the service industry, knowledge-intensive business services (KIBS) demonstrate particularly high growth rates, including in developing countries [*Janger et al.,* 2017]. In China, the added value created in KIBS industries grew more than fivefold between 2004 and 2014 [*Fang et al.,* 2016].

KIBS rank among the most innovative sectors in the European Union's Community Innovation Survey (CIS). *Gotsch et al.* (2011) demonstrated, using data from CIS-2004, that European KIBS firms were more likely to be engaged in innovation than their manufacturing counterparts.

In Russia, KIBS companies also have a high share of added value in their revenues, despite the appreciable slowdown of the sector's growth after the 2008 crisis — when the average level of added value dropped from 46% in 2007 to 38% in 2013 [*Berezin, Doroshenko,* 2015]. Comparing the dynamics of Russian KIBS with their European counterparts reveals that the shares of leading Russian KIBS companies engaged in technological and marketing innovations (39.6% and 23.8%, respectively) are comparable with typical firms in the UK (39.6% and 20.8%) or Denmark (38.7% and 27.6%)[1]. Meanwhile regarding organizational innovations, these Russian KIBS significantly lag behind those in European nations (the share of companies who use such innovations in Russia is 25.5%, compared with 40.8% in the UK, 41.2% in Germany, and 48.6% in Switzerland).

Some ambiguity remains regarding the sector's scope, in large part because KIBS do not coincide neatly with the sectoral classifications of established statistical systems.[2] The first attempt at a definition, by Miles et al. [*Miles et al.,* 1995], identified the three main characteristics of the relevant enterprises: the active application of professional knowledge; the provision of services, which may serve as knowledge sources alone, or are based on knowledge customers need for their business operations; and a focus primarily on corporate clients (but also supporting business processes at public sector organizations). However, industries displaying the above characteristics still remain highly varied [*Freel,* 2010; *Gotsch et al.* 2011], not least in terms of innovative behavior. The main objective of this paper is to examine the innovation configurations of KIBS firms, while also contributing to empirical studies on this sector in Russia. We can see that innovation type could be influenced by both supply-side (knowledge base) and demand-side (customer requests) factors. However, though demand is often featured as a driver, there is a lack of evidence on its impact on innovation activities in KIBS. In this study, we are able to investigate both sets of issues. We shall examine the relationship between innovation type and market demand, and then relate this to the type of involved service/knowledge base.

The paper begins with a review of earlier empirical studies of KIBS companies and their innovation activities; we then present our sources of information and the methodology used to analyze the innovation configurations of Russian KIBS firms; finally, we then present the results of the analysis, and formulate conclusions.

Literature review

Features of KIBS firms and industries

Two kinds of knowledge-intensive business services are usually defined: the professional services (KIBS I, P-KIBS) and new technological services (KIBS II, T-KIBS) [*Miles et al.,* 1995]. The first type of KIBS comprises companies providing accounting, legal, management consultancy, and similar professional services. A specific feature of such industries, many of which have a long history, is the active application of specialized knowledge in the administrative and organizational domains [*Miles,* 2012] to help their clients deal with problems encountered in these areas [*Miles et al.,* 1995]. T-KIBS have mostly emerged more recently, prompted by the emergence of new technologies and related global challenges [*Miles et al.,* 1995]. Industries belonging in this segment include the design and maintenance of computer systems, software design, and engineering services. The newly created knowledge is closely related to new technologies, and KIBS play a role in creating and transferring such technologies to their clients [*Amara et al.,* 2008; *Landry et al.,* 2012]. Some more recent studies have suggested a third category: C-KIBS [*Miles,* 2012] or CIBS [*Masiello et al.,* 2014] — to highlight creativity-based KIBS, where the critical forms of knowledge are those of a cultural or symbolic nature: advertising and design are examples of this group.

Not surprisingly, these different types of knowledge mean that companies belonging to different segments of the sector vary in some key respects. In terms of innovation, it is argued that the level of interaction with customers and suppliers is critically important to innovative P-KIBS companies [*Freel,*

[1] The most recent available CIS data (for 2014) for European countries (available at http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database), and data collected in the scope of the HSE ISSEK study "Monitoring of Knowledge-Intensive Business Services in Russia" in 2015 was used for comparison.

[2] In the first version of the standard NACE classification, KIBS could be roughly associated with Industry divisions 72, 73 and much of 74 (but other, more operational services were also located here); in the revised second version of NACE, most KIBS fall into section M, but Information and Communication Technology KIBS are located in section J with many other information and communication activities [*Schnabl, Zenker,* 2013].

2006]. T-KIBS, on the other hand, depend more on their own internal innovation resources. They engage in unusually high levels of R&D for service firms, but Pinto et al. [*Pinto et al.,* 2015] argue that it is the qualifications of their staff that forms the most important contribution. The process of new companies' (start-ups) emergence is also quite segment-specific, with new T-KIBS firms appearing to be much more dependent upon the existing structure of regional economies [*Wyrwich,* 2013].

Factors affecting KIBS companies' innovative behavior

Innovation activities in KIBS are usually viewed through the prism of *modes of innovation*, which involves identifying distinctive patterns of innovative behavior. Three major groups of factors are commonly studied: innovation types; sources of knowledge and information; and companies' expenditures on innovation. The types of innovation are most commonly used to distinguish between KIBS. The standard guide for innovation statistics, the *Oslo Manual*, distinguishes between product, process, marketing, and organizational innovations [OECD, Eurostat, 2005]. Product innovation involves "the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses" [*Ibid.,* p. 48]. Process innovation is "the implementation of a new or significantly improved production or delivery method" for products or services [*Ibid.*, p. 49]. Product and process innovations are often put together into one group of technological innovations; combining them in this way may makes sense for KIBS (and many other services) where the border between a service and the process of its delivery and provision is often unclear [*Santos-Vijande et al.,* 2012]. However, neither product nor process innovation necessarily has to involve new technology. For instance, a KIBS firm specializing in a service like law or engineering may introduce a completely new service — many KIBS firms have developed consultancy offerings — without the use of any new technologies).

The other two innovation types are not linked with production as such. A marketing innovation is defined as "the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing" [OECD, Eurostat, 2005, p. 49]. For example, this might involve the promotion of a new brand. Finally, organizational innovations involve "the implementation of a new organisational method in the firm's business practices, workplace organization or external relations" [*Ibid.*, p. 51].

Other innovation types not specified in the *Oslo Manual* are also frequently considered in KIBS studies. They include, for example, new techniques for conducting client relations [*Amara et al.,* 2009; *Doloreux, Shearmur,* 2010]. The business environment frequently generates such innovation types by itself. For example, Deloitte suggested extending the range of client relations innovations by including service provision and promotion techniques, and by involving customers in co-production. Such innovations are common in the social media [*Keeley et al.,* 2013].

New ways of relating to and cooperating with other external partners, not with customers alone, are also very important to KIBS companies since they involve integrating specific professional knowledge to create new solutions [*Amara et al.,* 2009]. Researchers suggest that the sources of knowledge and information KIBS companies use to create and apply innovations are another important group of factors contributing to the mode of innovation. Customers, suppliers, and competitors are major sources [*Corrocher et al.,* 2009; *Rodriguez et al.,* 2015], while partners such as franchises or professional associations are another [*Rodriguez, Camacho,* 2010]. A third way of acquiring specialized knowledge and information is to purchase it, in particular, from consulting firms [*Asikainen,* 2015]. Finally, KIBS firms may cooperate with the "science base" of universities and research centers, and of course they gather information by participating in relevant conferences and perusing research publications [*Doloreux and Shearmur,* 2010; *Asikainen,* 2015].

A third group of factors used in considering KIBS companies' modes of innovation comprises relevant expenditures. Innovation studies have tended to focus on R&D expenditures, but R&D is much less prevalent in the service industries than in manufacturing. T-KIBS are an exception here, and some firms are very R&D-intensive. Traditionally these first of all include internal and external R&D infvestments [*Rodriguez, Camacho,* 2010; *Rodriguez et al.,* 2015]. However, KIBS companies frequently lack specialized R&D departments and place much emphasis on the role of human capital [*Schricke et al.,* 2012]. Therefore in-house and external staff training and other personnel development activities become important areas for expenditures [*Corrocher et al.,* 2009; *Asikainen,* 2015; *Rodriguez et al.,* 2015].

As in other industries, another major spending area, often the largest, can also be understood as expenditures on external sources of knowledge and information. This includes the acquisition of specialized equipment, software and other information and communication technologies as well as data procured from consulting companies [*Doloreux, Shearmur,* 2010; *Rodriguez, Camacho,* 2010]. Finally, the protection of intellectual property is an important innovation-related investment area [*Asikainen,* 2015]. Patents are not particularly relevant for most in the KIBS sector, though there are exceptions for some T-KIBS. However, copyright, trademarks, and other mechanisms can be used. In common with many industries, less formal methods of protection, such as secrecy and employee confidentiality are often used [*Miozzo et al.,* 2016; *Schricke et al.,* 2012].

Table 1. **Descriptive statistics**

Indicator	N	Average (0 = no innovation, 1 = innovation)	Standard deviation
Application of technological innovations	477	0.42	0.49
Application of marketing innovations	477	0.29	0.45
Application of organizational innovations	477	0.37	0.48
Application of communication innovations	477	0.40	0.49
When customers' own innovation activities increase, they step up orders	477	0.36	0.48
When customers' own innovation activities increase, they extend the range of services they order	477	0.32	0.47
When customers' own innovation activities increase, they order more customized services	477	0.18	0.39

Source: calculated by the authors.

Data and methodology

The data used in this study of Russian KIBS derives from a survey ("Monitoring of Knowledge-Intensive Business Services in Russia" study conducted by the HSE ISSEK in 2013). A two-stage quota sampling method was used. Quotas for company location[3] were first established and followed by quotas set for company size and industry. The data thus date from before the external political and, subsequently, the economic crisis that began in 2014. The sample consists of firms in ten KIBS industries (advertising, marketing, audit, information technology, HR consulting, engineering, financial brokerage, legal services, property development services, and design). Companies unable to answer questions regarding specific features of their innovative behavior were excluded from the original sample of 623 firms, leaving 477 companies in the final sample.

In terms of company size[4], small and medium companies with fewer than 250 employees made up the bulk of the sample: 29% were micro-enterprises with 15 employees or fewer, while 42% employed between 16 and 49 people. In terms of revenue,[5] 56.6% of companies generated less than 150 million rubles of sales turnover, which puts them in the Russian definition of small and medium sized enterprises[6]. When asked about their size relative to other firms in their sector, 46% of the surveyed companies positioned themselves as medium-sized and 36% as small.

KIBS companies' innovation configurations were analyzed using a two-stage procedure similar to that employed in earlier studies [*Camacho, Rodriguez,* 2008; *Corrocher et al.,* 2009; *Rodriguez, Camacho,* 2010]. In the first stage, factor analysis was employed (using the principle components analysis technique with a varimax rotation); this effectively reduced the number of indicators that we examined to a smaller set of distinctive compound variables (factors). In the second stage, scores on these factors were used in a cluster analysis (based on the k-means technique), which locates companies belonging to specific clusters. The clusters are differentiated in terms of the involved factor scores.

The variables considered in this analysis reflect those discussed in the literature review, taking into account what questions actually were asked in the survey. Specifically, we studied the incidence of various innovation types across companies. Along with the types described in the Oslo Manual (technological, marketing, and organizational innovations), we also took into account communication innovations, i.e., the mechanisms companies use to interact with their customers and others. Respondents were asked about the introduction of innovations in the current year. Questions about CIS, in contrast, concern the preceding three years.

Customers are often a key source of corporate knowledge and information for KIBS firms, and cooperating with them in designing and producing services may lead to innovations [*den Hertog,* 2000]. Three variables concern the relationship between the clients' innovative activities and their demand for KIBS (not only in terms of the amount of services required, but also their range and degree of customization). Descriptive statistics for these variables are shown in Table 1.

[3] The survey was carried out in large cities from those Federal Districts which contributed more than 10% to GDP in 2012. The five federal districts and cities were: Central (Moscow, Voronezh), North-West (St. Petersburg), Volga (Kazan, Nizhny Novgorod, Samara), Siberia (Krasnoyarsk, Novosibirsk, Omsk, Tomsk) and Ural (Yekaterinburg, Chelyabinsk).

[4] In line with the criteria specified in the Federal Law № 209-FZ "On development of small and medium entrepreneurship in the Russian Federation" (as amended on 03.07.2016).

[5] In line with the Regulation No. 101 "On maximum revenue from each small and medium enterprises group" of 09.02.2013. However, now income from entrepreneurial activities are used to classify SMEs rather than revenue (Regulation No. 265 of 04.04.2016).

[6] 37.7% of companies did not provide data on their revenue.

Table 2. **Factor analysis results**

Indicator		Factor		
		Marketing	Technologies and Scale	Organisational Changes and Customization
Application of technological innovations		–0.11	**0.57**	–0.01
Application of marketing innovations		**0.53**	–0.03	–0.07
Application of organizational innovations		–0.07	0.04	**0.60**
Application of communication innovations		**0.52**	–0.01	–0.01
When customers' innovation activities increase, they step up orders		0.06	**0.52**	–0.13
When customers' innovation activities increase, they extend the range of services they order		0.01	**0.35**	**0.31**
When customers' innovation activities increase, they order more customized services		–0.02	–0.10	**0.61**
Kaiser-Meyer-Olkin (KMO) sampling adequacy measure			0.507	
Bartlett's sphericity test	Approximate chi-square value		550.282	
	Number of degrees of freedom		21	
	Significance		0.000	

Source: calculated by the authors.

As all variables in Table 1 are binary, the averages can be interpreted as the percentage of firms reporting this sort of innovation, or giving an affirmative answer to the questions. We see from these results that each of the types of innovation was reported as undertaken by a minority of the KIBS, though this was always substantial (ranging from 29% for marketing innovations to about 40% for the other types). Innovation on the part of customers is seen as driving demand for KIBS to a lesser extent: the least significant effect was reported in terms of increasing demand for customized services. Only around a third of the firms reported increases in the range or volume of services required.

Figure 1 presents data on the shares of KIBS firms undertaking two, three, or four of the discussed types of innovation. It is clear that many companies focus only on one type of innovation, with two innovations reported only marginally more so than no innovations at all (about 20% of the companies).

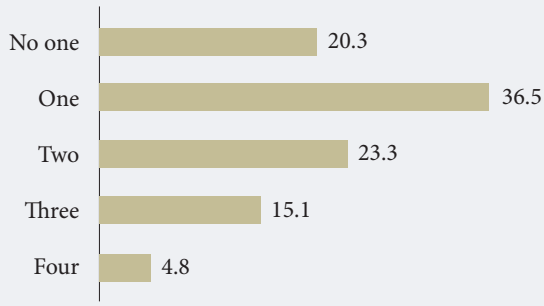
We can contrast firms of different types (in terms of their size and the services they provide), in terms of innovation types, but we must first explore how these variables relate to one another. By so doing we will reduce the number of variables, and thus make the analysis more concise.

Factor and Cluster Results

Factor analysis results are presented in Table 2[7]. Three factors with eigenvalues greater than 1 account for more than 62.5% of the variance[8].

The most striking feature of these results is that different types of innovation emerge as distinctive and independent dimensions, with one exception: communication and marketing innovations are closely related. The implication is, with this exception, that there is little tendency for one or another innovation to accompany each other in this sample of KIBS firms, despite the assertion that is often made in the

Figure 1. **Numbers of types of innovations implemented by KIBS** (%)



Source: calculated by the authors.

[7] Factor analysis is, strictly, not applicable to non-parametric data, and our variables are binary. However, many researchers find the application of these methods useful for pointing out meaningful patterns in the data, as appears to be the case in the present study.

[8] We validate the sample adequacy with the Kaiser-Meyer-Olkin test and the strength of correlation between variables using Bartlett's test of sphericity. Both tests indicate that the factor analysis could be applied to the data with an accepted level of relevance.

Table 3. **Cluster analysis results**

Cluster	Factor			Number of companies
	Marketing	Technologies and Scale	Organizational Changes and Customization	
Non-innovative	–0.61	–0.65	–0.78	121
Organizationally oriented innovators	–0.81	–0.33	0.89	103
Marketing-oriented innovators	1.41	0.12	–0.74	89
Technological innovators	–0.69	1.30	–0.44	78
Non-technological innovators	1.09	–0.69	1.19	60
All-round innovators	0.78	1.60	1.19	26

Source: calculated by the authors.

literature that technological and organizational change will necessarily go hand-in-hand. If there are such relationships, the data suggests that there are lags of various sorts involved, so the innovations do not happen simultaneously.

The first factor, which we label "Marketing", involves innovation activities dealing with marketing and communication. We interpret this factor as those activities aimed at attracting new clients and retaining existing ones, promoting services, and maintaining relationships with customers (and other partners). A study of innovation patterns across a wider range of services in Poland [*Szczygielsk, Grabowski,* 2014] arrived at a similar conclusion as to such a distinctive marketing factor. There is no substantial association between the measures of client demand and this factor. It is plausible that KIBS firms that are experiencing growing customer demand are not encouraged to engage in new marketing efforts. The second factor, which we label "Technologies and Scale", reflects companies' focus on technological innovations. Our data does not distinguish between product and process innovations (both are regarded as technological), but the result appears consistent with those of Rodriguez and Camacho [*Rodriguez, Camacho,* 2010] who identify a factor that reflects companies' orientation towards product innovation. In addition, our factor relates also to customers' innovation activity: innovative clients require more and, to a lesser extent, a wider range of services from KIBS. Technologically innovative KIBS firms seem to be subject to demand from such clients, which suggests that innovative customers, having their own new products and processes, require more services to support these. Technological innovation may be used by a KIBS firm to extend its scale of operation and to support the introduction of new services. Finally, the third factor is labeled "Organizational Changes and Customization", since it brings together the application of organizational innovations on the part of the KIBS firm, with innovative customers requiring a wider range of services and, in particular, more customized services. A factor that described companies' focus on organizational innovations was also identified in the course of analyzing the Italian KIBS sector [*Corrocher et al.,* 2009].

Factor analysis reduces the number of variables but does not reveal their distribution at the corporate level [*Doloreux, Shearmur,* 2013], thus creating the need for further analysis. The k-means clustering technique was applied with the so-called "elbow rule" determining the optimal number of clusters (at the level after which a distinctive break of the scree plot occurs) [*Mooi, Sarstedt,* 2011]. Six clusters were identified, which represent groups of companies with relatively similar innovative characteristics (Table 3).

The *non-innovative companies* cluster was the largest, about 25% of the total sample of firms that report little innovation of any type.[9] Such a cluster was also identified over the course of European studies of KIBS [*Asikainen,* 2015] and is found in studies of innovation configurations in many sectors.[10]

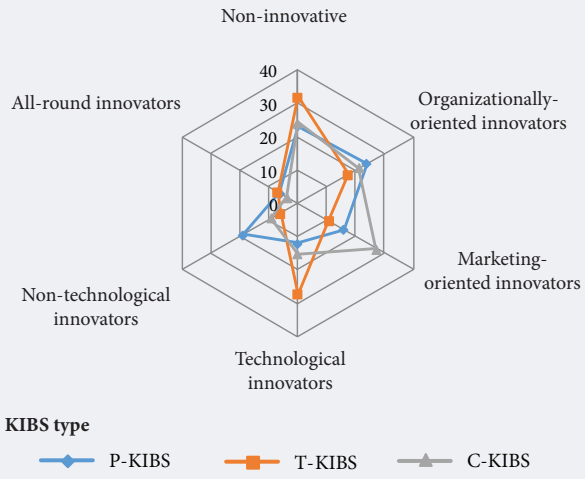
The *organizationally oriented innovators* cluster comprises companies that use organizational innovations and whose customers, as they step up their own innovation activity, demand increasingly customized services. Companies in this cluster achieve low scores in terms of technological innovation, and even more so in terms of marketing or communication. *Marketing-oriented innovators* tend to actively apply the latter but in turn do not apply organizational innovations (and are not distinguished in terms of technological innovation).

In contrast, firms in the *technological innovators* cluster apply exclusively product and process innovations and do not create or use marketing ones. Some international studies put companies oriented only towards product innovations (a subset of technological innovations) into a specific cluster of their own [*Camacho, Rodriguez,* 2008]. The *non-technological innovators* cluster comprises companies specializing in marketing, communication, and organizational innovations, similar to the ones presented in [*Rodriguez, Camacho,* 2010].

[9] This figure is somewhat larger than the indicator listed in Figure 1 as not undertaking innovations, since the factor scores used in this part of the analysis also take demand into account.

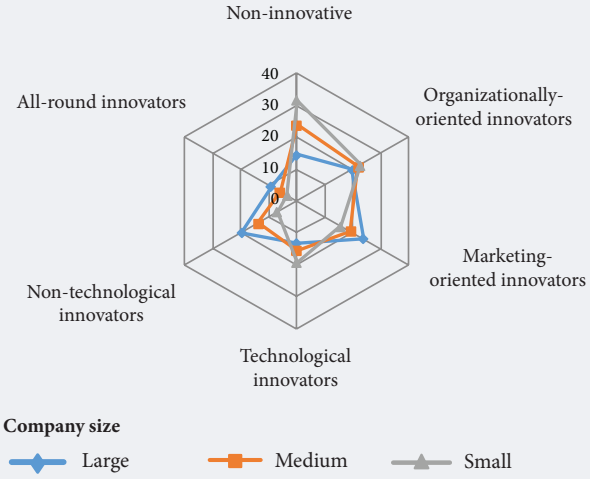
[10] It is worth noting that the share of Russian manufacturing companies that are innovative also remains modest [*Gokhberg at al.,* 2010].

Figure 2. **Distribution of KIBS firms across clusters** (%)



Source: calculated by the authors.

Figure 3. **Company clusters' shares by company relative size** (%)



Source: calculated by the authors.

Finally, the *all-round innovators* cluster is the smallest one (just over 5% of the respondents). Companies in this group apply all of the above innovation types — technological, marketing, organizational, and communication ones. Indicators such as organizational change and customization (1.19) and technologies and scale (1.60) tend to have higher values in this cluster than in those specializing in the aforementioned relevant innovation types (organizationally oriented (0.89 for the first factor) and technological innovators (1.30 for the second factor), respectively). With many types of innovation being reported, we can expect that these companies display very high levels of innovation activity and quite possibly are ones that are changing their business models.

Now, membership in these clusters is quite likely to be related to the sorts of knowledge that a particular type of KIBS employs. We can examine how different broad classes of KIBS firm fall into the six clusters identified above. It could be expected that industries providing services with properties that are more material, and closer to those of goods (e.g., computer software), tend to display more technological innovations unlike those producing less tangible (and often more unique) services (e.g., consulting firms) [*Doloreux, Shearmur,* 2010]. Similar results were obtained by Amara et al. [*Amara et al.,* 2016] who reported that firms operating in technology-based industries are more likely to be the developers of process innovations than their counterparts from traditional professional industries. However, the latter more frequently implements strategic innovations. Figure 2 depicts the distribution of P-KIBS, T-KIBS and C-KIBS[11] across the clusters.

As we would expect, T-KIBS are particularly active as technological innovators, though a surprising share of these firms are not active innovators. This suggests that these firms are primarily engaged in rather basic technology transfer and, perhaps, in some minor customization activity for standard products to meet specific client needs. There are also very few of these firms in the "non-technological" cluster, which tends to attract the other types of KIBS (The firms undertaking two of the innovation types thus appear to be combining organizational and marketing innovations). The T-KIBS firms do fairly often employ organizational innovations without technological innovations. Presumably such firms have established services that they are coming to produce through new organizational forms, for example, to work on a larger scale. Note too that there are a number of all-round innovators who are T-KIBS.

A smaller, but still substantial, share of companies specializing in professional business services (P-KIBS) are also non-innovative. Among the innovative P-KIBS, organizationally oriented innovators are the most numerous, while relatively few report focusing on technological innovation (non-technological and marketing innovators are more common). This is not so surprising given that their knowledge base is more a matter of social and administrative systems. In the future, it may well be that new technologies, such as those related to data analytics, will make inroads into professional services[12], but this has yet to happen in Russia.

Innovative providers of creative business services (C-KIBS) resemble P-KIBS in many ways, but strikingly feature a large share of firms who develop and apply marketing and communication innovations, and who combine this with organizational innovations. We can interpret this as confirming that customers

[11] P-KIBS include audit, HR consulting, financial intermediation, legal services and property development services; T-KIBS include information technologies and engineering; advertising, marketing and design are considered C-KIBS.

[12] Cf [*Susskind, Susskind,* 2015].

play an important role in the use of such companies' innovations [*Marasco et al.,* 2011], but further study would be required to explain their low presence in the "non-technological" cluster.

We can further examine the propensity to fall into one or another cluster by seeing how it relates to the various company sizes studied in the survey,[13] which revealed several patterns (Figure 3).

Most notably, the firms who assessed their companies as small in relation to the rest of the market had a larger share of non-innovative companies, but a much smaller share of firms with the *all-round innovator profile*. It is common in innovation surveys to find that firm size is positively correlated with the propensity to undertake innovations. It is interesting to note that here the tendency appears to be for (relatively) smaller firms to more commonly to avoid undertaking multiple innovations. They actually tend to pursue technological innovations more often than larger firms. It is possible that we see here more young companies with less need to work on restructuring their marketing or organizational features.

It is the relatively large firms that are the least likely to enter the non-innovator cluster, and more likely to be all-round or non-technological innovators than medium and small firms. Otherwise, relatively large and medium-sized firms have fairly similar profiles.

Conclusions

We have analyzed the innovation activities of Russian KIBS companies. The KIBS industries are widely recognized to be important in terms of their own innovations and their support in helping foster innovation in client industries. They are, however, very heterogeneous and there is great need to deepen our understanding about the types of innovations they undertake. A detailed analysis of their innovation patterns and strategies could be useful for government efforts to promote industrial innovation. Failing to identify and explain the varied innovation profiles may undermine the efficacy of relevant policies.

The bulk of the sample in the survey reported here consists of small and medium-sized enterprises, as is typical of KIBS and many other services. The first point to make is that the majority of firms were innovative in one way or another and actually reported one or more innovations in the previous year. While a sizeable number of firms (especially the smaller firms) did not report innovation activity, several different patterns emerged concerning those who engaged in one or more types of innovation. We found that innovation clusters vary not just in terms of the type of innovation, but also in terms of the relationship between the demand for knowledge-intensive business services and customers' own innovation activity in terms of the amount, range, and degree of customization of the services they procure. A comparative analysis of companies belonging to different KIBS segments (P-, T-, and C-KIBS) and operating on different scales (in their own estimation of size relative to other firms in their sector) allowed us to group them into the following clusters: non-innovative companies, organizationally oriented, marketing-oriented, non-technological, technological, and *all-round* innovators.

It was demonstrated that relative size matters. For example, as KIBS companies' assessment of their own size in relation to the market grows, the share of *all-round* innovators among them also increases, and that of non-innovators diminishes. The clusters are not industry-specific: in each of the clusters, including non-innovators and all-round innovators, P-KIBS, T-KIBS, and C-KIBS firms are represented. There are, however, differences in their propensity to engage in certain innovative activities. Thus, T-KIBS companies are largely concentrated in the technological innovators cluster, C-KIBS firms in the cluster specializing in marketing and communication innovations, and P-KIBS predominantly use organizational innovations.

Further research would help overcome the limitations of our study and provide a deeper understanding of KIBS companies' innovation mechanisms. Different aspects of innovation activities were beyond the purview of this study (expenditures on different functions, the use of different sources of information, the involvement of clients in co-production, and so on) and should be examined. Different types of innovation can be examined in terms, for example, of the degree of novelty (to the firm/sector/world; whether it is radical or incremental, etc.). The scope for differentiating between product (new service) and process innovation should be explored. Barriers to innovation, and drivers of activity, can also be considered, and may be of particular interest to policymakers. We have speculated about the reasons for the distinct relationships that emerge between different types of client demand and different types of innovation on the part of the KIBS firms. More investigation is required to establish the causal processes behind these correlations. While further study is certainly necessary, this essay has, hopefully, contributed to the exploration of distinctive patterns of innovation in this important, but rather neglected, part of the economy.

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[13] We relied on the respondents' estimates of their company size in relation to the market. This approach was chosen due to the great heterogeneity in KIBS. For example, in 2013, the recruitment and personnel management services market was estimated at 18–35 billion rubles, the audit and managerial consulting services market at 81 billion rubles, the legal services market at 160–200 billion rubles, and the advertising market at 419 billion rubles [*Berezin,* 2016].

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