NATIONAL RESEARCH UNIVERSITY
HIGHER SCHOOL OF ECONOMICS

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BASIC RESEARCH PROGRAM

WORKING PAPERS

SERIES: SCIENCE, TECHNOLOGY AND INNOVATION
WP BRP 12/STI/2013

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Knowledge Intensive Business Services (KIBS) are widely argued to be important actors in innovation systems. They are active both innovating themselves, and by providing their clients with important knowledge and learning opportunities. This study uses survey data to investigate the mechanisms of knowledge transfer and innovativeness improvement through the provision of KIBS. The empirical core of the paper is a set of Russian surveys of KIBS and their clients: KIBS are a fairly new phenomenon in Russia, so this provides an opportunity to contrast KIBS supplier-client relationships featuring more and less experienced customers. Many of the KIBS firms' services are highly tailored to customer specificities, and we consider how far this is minor customisation and how far novel products (and thus potentially product innovations) are involved. These services typically involve KIBS consumers into a coproduction process, where both the formal supplier and the formal user of the service are engaged together in service production. Knowledge transfers through learning-by-doing in such cases affect customers' propensity to innovate and improve their absorptive capacity. The paper concludes that the generation of innovations through KIBS may well be a self-sustaining process. In this process, service providers are incentivised to engage in service innovations by more innovative customers' demand for highly individualised services. In turn, the process stimulates the innovativeness of customers, as they engage in learning-by-doing through coproduction.

JEL Classification: D83, L84, O32.
Keywords: service innovations, customised service production, knowledge-intensive business services (KIBS), knowledge spill-over, learning-by-doing.

Introduction

Knowledge-Intensive Business Services (KIBS) are seen to be core features of the so-called "knowledge economy", and they already play an important role in developed economies: accounting for over 10 per cent of the total value added in OECD countries [OECD Science, Technology and Industry Scoreboard 2007, p.90]. Miles et al. (1995), in the earliest definitional study of KIBS industries, characterised them as users, carriers and sources of innovation. Analyses using data such as the statistics derived from Community Innovation Surveys have subsequently demonstrated that these KIBS industries have particularly high levels of University graduates in their workforce, and their employees report use of skills associated with knowledge-intensive work (see, e.g. Miles and Martinez-Fernandez, 2011). The knowledge intensity of KIBS makes them "one of the hallmarks of the knowledge-based economy" (Sector Futures, 2004, p.1), and "value added centres" (Gibbons et al., 1994).

It is now widely accepted that KIBS facilitate innovation process and foster technological development (for example, Antonelli, 1998; den Hertog, 2000; Hauknes, 2000; Muller and Zenker, 2001; Tether, 2003; Koch and Stahlecker, 2006; Simmie and Strambach, 2006). This role of KIBS firms is mainly based on their ability to transfer new knowledge through the services provided. In particular, the existing literature stresses that (a) provision of KIBS links the knowledge of the consumer with the knowledge that exists elsewhere, thus improving the exchange, availability and usability of the knowledge, and (b) each KIBS provides a solution to a specific problem of the customer and thus embeds and transfers knowledge that would be otherwise unavailable to or neglected by the customer. (Thus, for example, Muller and Zenker, 2001, p.1504, subdivide knowledge processing within KIBS firms into the integration of external knowledge, acquisition of available problem specific knowledge, and elaboration of the new problem specific knowledge; see Landry et al, 2010, for a discussion of these and other characteristics of KIBS). However little is known so far about the sustainability of this mechanism: does KIBS production simply reflect the outsourcing of troublesome activities, or does it allow for increased specialisation and knowledge generation and diffusion? In particular, the provision of knowledge by KIBS is usually discussed as a demand-driven process (see, e.g. Hipp and Grupp, 2005; Howells, 2006; Tether and Tajar, 2008; Love et al., 2011). KIBS firms are thus seen as passive facilitators or intermediaries, rather than as active generators of innovation. The present study will explore how the provision of KIBS can stimulate the demand

for such services, which ensures sustainability of the mechanism and contributes to the generation of innovations.

An additional contribution of the paper is in filling the gap in the literature on KIBS in emerging markets. There is a large body of literature that examines the role and functioning of KIBS in developed countries; Muller and Doloreux (2007) note that from 82 publications covered in their bibliometric study, only two originated from Eastern Europe. There are a few studies of KIBS in emerging economies in Asia (e.g. Liu, 2009; Wong and Singh, 2004), but the literature on KIBS in transition economies is limited (Balaz, 2004, is a rare example). With the exception of some limited work in China, there are, to the best of our knowledge, no studies of the development of KIBS in non-EU transition economies. Data concerning an emerging market offers an important advantage: we can observe learning processes in this important sector that would be harder to delineate in a more developed market. We show that the insights from the analysis of emerging markets are useful as a sort of a field experiment with a focus on a limited number of factors that would be hard to isolate in a developed economy.

Knowledge transfer and sustainability

Much research into the nature of service activities stresses not only features such as the intangibility of services, the difficulty of storing or transporting them, and the blurring of boundaries between production and consumption, product and process. A term that is often employed in this context is "coproduction" – signifying the role of the customer in generation of the service product. Much of the literature on coproduction has concerned public services (Percy, 1983, Whitaker, 1980 are early examples), but some studies examine consumer and business services (e.g. Marion, 1997, Spohrer and Maglio, 2008) The basic point is that the customers and users of services often have to contribute greater or lesser amounts of effort to the service production process. Sometimes physical presence is enough, but often the client is required to input information and to interact more intensively with the service provider (and sometimes with other clients). Among other things, this can make assessment of service productivity challenging – should we include customer labour inputs alongside those of service workers? How do we assess innovations that shift the division of labour between service supplier and user? In the case of business services, the client organisation is typically required to provide information to the service provider in order for the service to be produced; often there will be extensive interchange, as the service is defined and tailored to customer requirements. Information can flow in both directions, with both partners learning from the experience (Doroshenko, 2012;

Miles, 2012). This role of coproduction in the transfer of knowledge and expertise in many aspects resembles the doing-using-interacting (DUI) mode of intra-company knowledge diffusion studied by Jensen et al. (2007).

Coproduction can be more or less effective. When coproduction works well, the quality of rendered services is high, and customers (typically) have a positive experience. We can expect that they will have learned more, and thus that their innovative potential will increase; and though they have learned through the interaction, we can expect them demand more KIBS in the future since they have also understood the value of specialised external knowledge sources. When coproduction works poorly, the services that are provided will often be less appropriate for client requirements. A negative experience will result, from low quality services; this acts as a signal (that something has gone wrong). This might lead to blaming the specific KIBS firm, or indeed seeing that class of KIBS in general a not really up to the job. Or it could act as an incentive mechanism (where the client concludes that better coproduction would improve satisfaction). These factors should contribute to improving the level of coproduction of these customers in the future.

Poor coproduction could result from numerous causes, for example loss of key staff at critical moments, unanticipated organisational crises, poor management procedures. But we would anticipate that poor coproduction will be most common among inexperienced customers, who have less understanding of the nature of KIBS service. This results from a "turbid glass" effect, whereby customers erroneously see KIBS as homogeneous (standardised) and fail to appreciate that customisation requires coproduction. The DUI type of knowledge diffusion in coproduction helps reduce this effect, and thus improves experience and contributes to future demand for KIBS. To clarify the framework, we first turn to the concepts of standard and customised services and their role in the innovation process. Tether et al. (2001), using German survey data, discuss variations across service firms and sectors (including KIBS industries), in terms of the extent to which they standardise or particularise (or, in other terminology, customise or specialise)[1] their services. The basic idea underlying the first pattern is to produce a large amount of almost identical services, and to benefit from economies of scale achieved through routinised service production. But standard services are not applicable when the service is

[1] While it is possible to draw useful distinctions between different approaches here – see the discussion of customisation later in this paper – there is little consistency in the usage of these terms in the literature.

providing a solution to a problem that has many particularities (or a few very major ones).[2] Such a problem may call for some considerable effort of understanding on the part of the KIBS supplier. It may be that the understanding of the root causes of the problem by the client, as well as by the KIBS firm, is shifted in the course of this phase of "diagnosis" of the problem. The service, as a solution, is individually tailored and tuned to the needs of the particular customer. This tuning is a knowledge-intensive process, which cannot readily be decomposed into a sequence of predetermined operations.[3] Its production needs highly qualified creative human resources (as shown e.g. in Strambach, 1994). These knowledge intensive services are heterogeneous by their nature, and highly relevant for a study of the innovative potential of KIBS. Tether et al (2001), for example, found that in some (but not all) service sectors, high levels of standardisation went along with lower levels of reported innovation (including process as well as service innovation).

It could be argued that if a KIBS firm is creating highly particularised services, then every output is a new service, and thus a product innovation. However, it will also be often the case that the knowledge-intensive service is non-replicable. For instance, it may be so heavily structured around the complex needs of a specific client that it is unlikely that anyone will require the precise configuration of actions again. Or it may be that the service production process involves such a great deal of tacit knowledge from the professionals involved that it is difficult to "capture" and share the learning that has gone into the new service. So, beyond the usual effort to differentiate between "customisation" and "innovation"[4] - which is already problematic in the case of KIBS - there is another issue: whether something that is produced only once and not reproduced is truly an innovation.[5]

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[2] In the case of customisation, it may simply be a matter of adapting an existing service design to a specific client's requirements, as in the case of many adaptations of standard data base systems to specific customers' requirements that differ from each other only in detail. In the case of particularised services, a more distinctive solution is being created, fitting the particular problem presented by the client.

[3] Yet KIBS providers may well use project management tools and best practice handbooks to guide them through the stages of problem diagnosis, service design, and delivery.

[4] The Oslo Manual states that "Firms engaged in custom production make single and often complex items according to customers' orders. Unless the one-off item displays significantly different attributes from products that the firm has previously made, it is not a product innovation" (OECD, 2005, p51). But application of this idea of significant difference may be difficult – especially when considering service products than in goods.

[5] Much the same could be said about the "complex product systems" - see, for example, Davies and Brady (2000).

Three remarks are in order, which may not resolve the debate completely, but at least indicate that particularisation of KIBS should not be discounted in innovation analyses. First, the process of generating the KIBS is in many ways like that of other service innovations, which also feature coproduction in the creation and combination of knowledge about requirements, problems and solutions. Second, the KIBS firm may never produce precisely the same service twice, but it may be able to use knowledge, techniques and ideas developed in the course of provision of the particularised solution, even when the service is non-replicable. Elements of the service, and/or of the service production process, may well be replicable. Third, the service client may also be learning about problems, solutions, and the ways of making use of KIBS, through the process of requesting, coproducing, and using the service. Once acquired, this new knowledge, and the practices associated with it, may be applied and reproduced many times over within the user organisation - and perhaps within its wider community.

Drawing on evidence from several surveys, Miles (2008) argues that providers of KIBS rely on the information obtained from their customers more heavily than do manufacturing firms and most other service businesses. Bespoke, particularised, KIBS cannot be properly produced without detailed information about the customer's needs; generic knowledge about a representative consumer is not sufficient. In common with many particularised services, coproduction is important (Miles et al., 1994; Strambach, 1994, den Hertog, 2001 – and note also the use of terms such as cocreation and coinvention, e.g. Bresnahan, 2002). Thus KIBS can be seen as having two producers - the service provider, which inputs mainly its intellectual labour resources (physical capital is less significant in the production of KIBS), and the customer, whose input is information about itself and, sometimes, organisational participation in a process of change. Koch and Strotmann (2006) showed that the market success of KIBS firms crucially depends on the quality of coproduction. Bettencourt et al. (2002) consider coproduction to be a defining characteristic of KIBS; their original contribution is to offer advice to KIBS managers as to how to select and orient clients to achieve successful coproduction.

The particularisation of a service almost inevitably requires some degree of coproduction: the client should be at minimum supplying relevant information about the business processes where there are problems that the KIBS firm is helping to address. Quite often, the client is engaged in prolonged dialogue with the KIBS firm concerning the nature of its problem and the "fit" of possible solutions. (These may be discussed more abstractly, or actually prototyped or trialled in practice.) The DUI-type of knowledge diffusion (as in Jensen et al., 2007, drawing on Arrow’s, 1962, “learning by doing”) ensures knowledge transfer in both directions between the provider and the customer. Although the roles of KIBS in knowledge transfer are widely studied

in the literature (see e.g. Hipp, 1999, for a review) there is little research on just how this knowledge is transferred. Landry et al.'s (2010) study is an exception, in that they study the types of knowledge transferred from KIBS providers to customers, and the factors that facilitate such an exchange of knowledge. We extend their findings by focusing on the channels that enable the innovative impact of KIBS on their customers - a topic addressed by Miles (2007, 2012), but without access to the sort of data we mobilise below.

To date, as noted earlier, KIBS research has mainly focused on developed Western economies. An emerging market for KIBS, as opposed to the markets developed in economies where such firms have been longer established, implies a relatively low level of (business) consumers' knowledge about the sorts of services provided by KIBS firms. This means that it is possible to undertake contrasts that would be much more difficult in more developed economies, between relatively more and less experienced users of KIBS. The difference between experienced and inexperienced customers is highly relevant for our interest in the role and channels of knowledge transfer between KIBS providers and consumers, and the dynamics of coproduction.[6] The main contribution of our study is therefore not in the extension of KIBS research to a region where it has not been previously developed, although this is also important, but in the opportunity to study KIBS supplier-client relations in a changing environment, with high heterogeneity in customers' experience and relatively large (as compared to developed economies) gaps in customers' knowledge about KIBS in general, which exacerbates the role of learning by doing.

[6] We are not aware of other studies, to date, that employ this distinction in an empirical analysis of KIBS.

Methods and Data

The data used here derive from specialised surveys run each year in 2007-10 in Russia, covering 600-800 producers of KIBS annually.[7] While the surveys were fundamentally similar, some questions were only asked in particular years. Thus, when we report on KIBS characteristics below, we use data from various years according to availability. 60 to 80 leading Russian-based producers of KIBS– the market-making big and middle-sized companies [8] – were surveyed each year, for each of the KIBS sectors. Executives answered questions on their own company and on the more general market developments. All surveys are anonymous, some firms may be cropped for several surveys (not necessarily successive), but it does not imply the generalised results. The KIBS sectors covered in the surveys are advertising, marketing, audit, IT-services, recruitment, engineering, financial advice, legal advice, property development services, and business design. This choice includes most of the industries described as KIBS in the existing literature. While there is some disagreement as to the precise statistical identification of KIBS sectors (see e.g. Hipp, 1999; Muller, Koch and Stahlecker, 2006; Doloreux, 2007), it has been common to include most of the industries covered in NACE (Revision 1) divisions 72-74.[9] Our sample contains a good range of these industries, including both long-established

[7] The surveys are designed by the Institute of Statistical Studies and Economics of Knowledge (ISSEK) and are conducted by ROMIR Monitoring using original topic guides and questionnaires developed specially for this research.

[8] KIBS production in Russia is strongly concentrated, roughly following the Pareto principle: 20 per cent of the companies account for 80 per cent of the market. Respondents in each segment are recruited from the top 200 companies (measured by their turnover). While some of the same companies will feature in more than one year, this was not designed as a panel survey. Indeed, data are provided to us anonymously, so we cannot examine the effect of such multiple representation. Foreign-owned companies are excluded from the study, since the large multinationals who do supply Russian markets are believed to provide highly standardised services - as was confirmed by our expert interviewees. Russian companies compete with these multinational firms, in part, through providing more customised services; they would generally fail to compete on the basis of economies of scale.

[9] To be precise, the NACE codings for the sectors studied here are 72.1-72.4 (hardware, software and database consultancy, supply and processing – grouped as IT-services), 73.1 (for engineering), 74.1 (for legal advice, audit and marketing), 74.2 (building, machinery and industrial plan design), 74.4 (advertising), and 74.5 (labour recruitment). The study also included two sectors that are not usually considered KIBS - NACE divisions 70.1 and 70.3 (property development and real estate intermediation) and 65.2 (financial intermediation) with 67.1 (activities auxiliary to financial intermediation). The latter two are often provided jointly by the same entity and it is

professional services and newer technology-related and management services. The survey also included property development and business-facing financial services, and we include analysis of these here too.

The input of this set of industries to the Russian economy is estimated at 3-5 per cent of GDP. This is only half or even a third of the average OECD figure. Nevertheless the growth rate, before the recent downturn amounted to a remarkably rapid 30-50 per cent annually (KIBS growth is generally found to be higher than that of most sectors over recent decades; cf. EC, 2011). In 2009-2010 our expert panel reported that the growth rate was negative, but in 2011 the sector recovered, and renewed growth is anticipated in the near future.

The study is unusual in that we have opportunity to draw on data about KIBS users (though we cannot match specific users and suppliers). In 2007 and in 2011, a parallel survey covered over 700 business consumers of KIBS (firms that used none of the KIBS in our survey were excluded). Each of the business consumers were asked about their experiences with KIBS from different sectors, resulting in over 2000 observations by customers about their experiences with KIBS sectors. (Each respondent answers questions about all KIBS that are used by the company. In 2007 the average company used 4.7 services, and in 2011 4.2, services, so we have about 3300 answers.) Design and analysis of these surveys were also informed by structured interviews, conducted on an annual basis, with at least 6 experts from each KIBS sector. These are drawn from the top executives of the leading provider companies from each sector; their interviews were used for preliminary discussions of research hypotheses, for the scaling of quantitative answers that are later proposed to the participants of mass surveying, and to inform our interpretations more generally.

In the next section we discuss innovations in KIBS and provide some estimates of the sector's innovativeness in Russia, allowing for comparability of our data with the studies of European economies. Further, to support our conceptual framework, we seek empirical evidence of the following relationships. First, we analyse the coproduction in KIBS and the reasons for imperfect coproduction. Second, we provide an evidence of asymmetric perception of the degree of customisation of KIBS as seen by providers and consumers and conclude that this removes incentives for customers to efficiently co-produce. Third, we emphasise the effect of customers' experience on the degree of their involvement in coproduction. Finally, we explore customers' upgrade through coproduction as a knowledge transmission mechanism and study its effect on

hard to separate them. We do specifically focus on companies that provide financial intermediation and associated services to business customers.

customers' innovativeness. This leads us to conclude that the generation of innovations through KIBS is a self-sustaining robust mechanism: a conclusion with important policy implications.

Innovations in the KIBS sector

Tether et al. (2001) drew attention to how standardisation versus particularisation of services can be related to innovation. (Indeed, standardisation and particularisation can themselves be seen as trajectories of innovation. Some innovations result in more mass services with higher economies of scale; some, conversely, in higher value-added and more highly specialised services.) Our survey data addressed this issue in KIBS firms in Russia, with a question asking providers about their experience in replicating service innovations (see Table 1).

Strikingly, over 40 per cent of services are reported as **never** being supplied to other customers. Another 24 per cent are reported as **rarely** replicated in this way. Only 10 per cent are reported to be **often replicated**. Due to the non-random nature of our samples, we shall not analyse sectoral variations in detail. But it is notable that the proportions saying services are "often" replicated vary dramatically - from a low of around 3% to a high around 18%. Those "never" replicated vary from 23% to over 47%. It is not the same two sectors at the extremes of each pole. This reminds us that KIBS are themselves very heterogeneous, both across and within sectors.

The low frequency of replication does not itself establish that there is an inherently low level of replicability. If there were a high frequency of replication, of course, this would tell us that the services in question do display high replicability. But a low level of replication may be a matter of low demand for services of a particular kind, as well as deriving from the tendency for some services to be hard to replicate.

Table 1. Replication of innovations.

Percentage of responses to the question: "How often do you manage to supply service innovation which you co-created with one customer, to other customers?

Percentage of responses	Overall	Sectors									
		AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
Often	9.3	10.4	18.0	4.8	3.3	6.8	5.8	13.0	11.7	10.9	8.1
Sometimes	25.6	23.4	23.0	30.6	43.3	16.9	32.7	20.4	11.7	29.1	25.8
Rarely	23.6	22.1	27.9	24.2	18.3	30.5	38.5	22.2	15.0	12.7	25.8
Never	41.5	44.2	31.1	40.3	35.0	45.8	23.1	44.4	61.7	47.3	40.3

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2011.

The results in Table 1 can be amplified by other findings. KIBS producers were asked to indicate the fraction that services with different levels of standardisation contributed to the total sales value of services that they provided. Three levels of standardisation were proposed - services that were customised, essentially customised service variants around a standard "nucleus", or completely standardised. As Table 2 demonstrated, overall, the KIBS firms reported more than a quarter of their services, in terms of value of sales, to be **completely** customised.

Looking at the distribution of responses, within each KIBS sector, to the question about standardisation (Figure 1), we see that all of the sectors feature some firms reporting extremely high or low levels of standardisation. But in some sectors the great majority of firms report very little revenue coming from standardisation; while in others the focus of activity and income appears to be much more widely distributed, with some firms undertaking considerable degrees of standardisation of their product. Interestingly, some of the more technology-oriented KIBS firms in this sample - notably IT services - quite frequently report high levels of standardisation.[10] , Engineering, legal advice and business design services display less complete

[10] These results diverge from those of Hipp et al. (2000), who reported that German IT and financial services were more likely to provide bespoke, and less likely to produce completely standardised, services than the "other business services". We can only speculate about the extent to which the differences reflect cross-country variations, changes over time in the activities of different types of services, or differences in sampling and surveying. Plausible arguments could be mounted in each direction; and certainly further research – especially cross-national comparative research – is clearly required. But it comes as no surprise, however, that while some IT service

standardisation, and are quite substantially engaged in personalisation of a standard product.[11] Customisation is much rarer in services like marketing and financial advice**.**

Generally, then, high degrees of standardisation are uncommon. Particularisation prevails in the Russian KIBS sector – at least, among these relatively large[12] and leading providers. (We might well expect small and local firms to be providing more routine and elementary services.) It follows that the majority of services that they are supplying can be seen as innovations, in the sense that they are new products created in the course of particular supplier-client interactions.[13] And at least a quarter of their output, in value terms, consists of services that are neither standardised products, nor customised products built around a standard shell.

Table 2. Distribution of KIBS in degrees of standardisation.

Responses to the question: "What share of your sales value in 2010 falls into each of these categories?" (mean shares shown; standard deviations in brackets)

		Sectors									
	Overall	AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
Standard	36.1 (32.6)	30.5 (30.9)	42.0 (32.5)	45.2 (32.9)	43.8 (28.6)	38.7 (30.2)	34.8 (38.5)	34.5 (31.2)	32.9 (35.5)	33.5 (35.5)	25.4 (26.1)
Standard "nucleus" with personalised "shell"	39.2 (31.1)	43.6 (31.6)	43.5 (31.2)	33.4 (29.0)	39.0 (26.0)	44.4 (26.8)	30.6 (32.5)	51.0 (33.6)	28.5 (30.9)	41.9 (36.0)	36.2 (28.0)
Customised	24.5 (29.6)	25.3 (28.1)	14.4 (19.5)	22.5 (27.6)	17.6 (18.0)	18.2 (19.7)	35.0 (39.0)	14.6 (23.6)	38.2 (39.1)	21.6 (27.8)	38.2 (33.1)

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2011.

firms may be writing innovative software to do new things, some are mainly customising existing packages for clients, and others are simply installing routine components of IT systems.

[11] Interestingly, there is a rather prominent set of legal advice firms reporting completely standardized services, alongside their non-standardised peers.

[12] As Table 3 shows, these are mostly medium-sized firms in comparison with other industries in Russia.

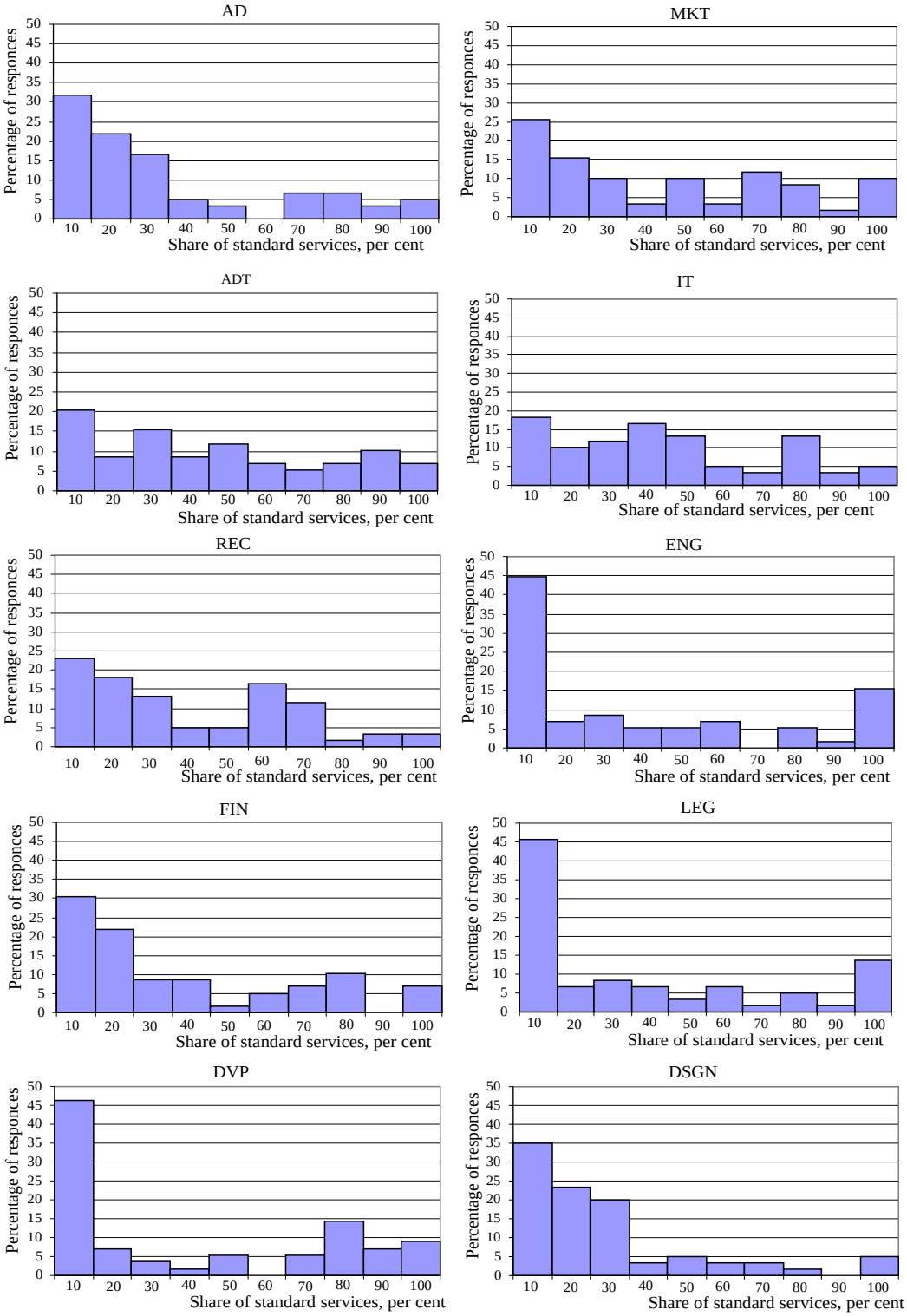
[13] As noted above, some scholars might prefer not to describe these novel products as innovations, on the grounds that the precise service is not being replicated.

At this point, it may be useful to inject a brief mention of the size of KIBS suppliers and users. Russia's leading KIBS firms are mostly medium-sized as compared to firms in other industries. Table 3 displays the 2007 answers to the question "Who are your customer firms?", and relates this to the size of providing firms. Many of the KIBS firms are quite large, and there is a tendency for larger KIBS to service larger customers. But there are many exceptions.

The survey data do not directly reveal how far new knowledge, established in the course of creating novel services, is used in subsequent operations: substantial learning could feed into successive products which are not just simple replications of previous ones. The observations do show that KIBS in Russia exhibit a significant fraction of particularised services: they can be seen as generators of innovations, which is confirmed in that KIBS providers report undertaking high levels of innovation when asked about this in Russian Innovation Surveys (just as in Western European surveys). Table 4 compares the share of output attributed to innovations reported by KIBS providers, to the shares in other industries, using instruments that are compatible with CIS methodology. KIBS are among the sectors with greatest innovation, by this metric. Moreover, during the recent economic slowdown, the share of innovative output increased which the experts interviewed explained as reflecting attention to clients' needs having become more of a vital necessity when the demand for KIBS contracted in 2009 (by 12.5%, according to the average estimate of 600 KIBS providers in 2010).

Figure 1. Sectoral distribution of the levels of standardisation

Responses to the question "What share of sales was earned by standard services?" Bar charts indicate numbers of respondents estimating values within the given percentile ranges.



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Source: ISSEK-ROMIR survey, 2011.

Table 3. Size structure of KIBS firms and their clients

Providers / Customers	Total	Number of employees					
		Under 15	15-50	51-150	151-1000	1001-2500	Over 2500
Small private domestic companies	58.9%	81.1%	82.4%	58.3%	52.6%	50.0%	32.4%
Big private domestic companies	52.6%	44.9%	43.0%	49.9%	52.9%	69.0%	68.9%
Public companies	11.3%	3.9%	6.1%	10.2%	12.7%	17.8%	17.6%
Companies with foreign ownership	10.8%	0.0%	1.1%	9.7%	15.3%	12.8%	21.6%
International companies	6.8%	0.0%	0.4%	6.2%	6.5%	14.0%	27.0%
TOTAL SHARE OF ANSWERS	**100.0%**	**4.3%**	**13.2%**	**35.5%**	**33.1%**	**9.4%**	**4.5%**

Note: the sums in columns exceed 100%, because respondents might choose up to three answers.

Source: ISSEK-ROMIR survey, 2007.

Table 4. Innovative outputs by sector, 2011

Sales of innovative products in total sales, per cent	
Mining and quarrying	6.7
Manufacturing, total	6.7
- High tech	12.1
- Medium high tech	12.8
- Medium low tech	4.3
- Low tech	4.1
Electricity, gas and water supply	0.6
Services	8.3
KIBS	15.4

Source: Higher School of Economics (2012), apart from the last row, which is from our 2011 survey, which employed the same methodology to assess innovative outputs.

Coproduction and the role of experience

To study the level of coproduction, KIBS providers were asked to estimate the level of customers' involvement in the service production on a scale ranging from 1 (minimum participation, no inputs provided except the terms of reference for the service contract) to 10 (maximum participation, joint project implementation). Table 5 presents data from the 2007 and 2011 surveys: the score for coproduction in most sectors exceeds 6 out of 10, indicating that

customers do often participate quite substantially in coproduction of their services. Moreover, 30 per cent of KIBS firms report scores of 8-10, in both samples. Overall, there is little change between periods. Individual sectors move in different directions, but generally to very limited extents, despite the economic downturn.[14] It may be that some firms are pushed towards more light-touch service provision, while others seek more coproduction, as a result of economic stringency.

Table 5. Coproduction of KIBS in Russia

Responses to the question: "Please estimate the degree to which the customers are involved in the production of services, on the scale 1 to 10" (mean scores shown; standard deviations in brackets).

		Sectors									
	Overall	AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
2007	**6.1**	5.2	6.1	5.6	6.4	5.7	6.2	7.0	5.6	6.3	6.5
	(2.4)	(2.4)	(2.1)	(1.8)	(2.4)	(3.1)	(2.4)	(1.7)	(2.5)	(2.7)	(2.6)
2011	**6.3**	5.9	6.0	7.3	6.2	6.2	6.2	6.5	6.0	6.4	6.2
	(2.4)	(2.2)	(2.3)	(2.6)	(2.6)	(2.2)	(2.1)	(2.5)	(2.6)	(2.6)	(2.4)

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR surveys, 2007 and 2011.

There has been considerable discussion about the role of clients in coproduction, with some consultancy firms arguing that clients' participation is an important determinant of performance - and presenting some evidence to support their view (for example PricewaterhouseCoopers, (2006); for a study from a management science perspective, see Bettencourt et al 2002). Our survey asked about the quality of coproduction, and the factors that were involved when this was low. Less than half (46.5 per cent) of the Russian KIBS producers in 2011 considered that they received *excellent* coproduction from their counterparts. Most respondents who answered that coproduction was imperfect, saw this as less a matter of misunderstanding the need for coproduction, than of the poor coproducers being either unwilling or unable to co-produce (see Table 6).

[14] Since we do not have panel data we cannot test the possibility that there is more volatility at the firm level – we think this unlikely.

Table 6: Reasons for imperfect coproduction.

Responses to the question: "Why have you been unable to achieve the required level and quality of coproduction?". (Per cent of responses)

	Overall	Sectors									
		AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
The clients fail to understand why we need coproduction	**7.7**	18.2	5.4	10.0	10.5	13.9	6.3	0.0	3.0	3.2	2.6
Insufficient qualification of customers makes them poor co-producers	**24.0**	20.5	27.0	20.0	26.3	13.9	40.6	23.3	33.3	19.4	17.9
The clients want to save their employees' work time	**14.6**	11.4	8.1	16.7	13.2	22.2	9.4	23.3	6.1	12.9	23.1
The clients follow the principle "We pay - you work"	**24.9**	20.5	27.0	26.7	26.3	19.4	12.5	20.0	18.2	35.5	41.0

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2011.

Various studies have demonstrated that clients who should be co-producers can often fail to appreciate this role - Bettencourt et al (2002), PricewaterhouseCoopers, (2006). The reason may lie in a mismatch of perceptions that was first noticed in the Russian case in the 2007 survey. Providers and customers differ in their views of the extent to which KIBS services are customised/particularised (and thus the extent to which they are novel and potentially innovative) - see Table 7.[15] For all KIBS sectors, producers on average considered a smaller share to be standardised than did consumers.

[15] This question was only asked in 2007.

Table 7. Standard services in Russia as seen by service providers and consumers

Responses to the question: "What was the share of standard services in the total volume of services provided/ordered by your company?" (standard deviations shown in brackets). Consumers could answer questions for multiple KIBS sectors resulting in the high number of total responses, *N, in the final row*)

			Sectors									
		Overall	AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
Providers	Share	**47.0**	45.8	36.5	60.4	59.7	40.5	47.0	59.2	50.1	48.4	23.5
		(32.2)	(28.6)	(29.2)	(28.4)	(29.0)	(34.9)	(27.6)	(29.9)	(32.9)	(33.4)	(29.8)
	N	**612**	68	59	62	63	53	60	63	53	63	68
Consumers	Share	**54.6**	52.8	54.8	59.6	59.3	56.1	52.8	61.1	52.5	53.1	46.6
		(23.0)	(22.8)	(22.2)	(22.0)	(22.5)	(23.6)	(21.2)	(23.5)	(25.8)	(21.7)	(21.8)
	N	**2422**	515	187	256	283	236	196	139	210	164	236

Notes: N differs for providers (it is here the number of firms, which equals the number of answers), and for customers (it is the number of valid answers, which exceeds the number of firms). Notation for sectors: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2007.

The striking result is that, in all the sectors of KIBS, consumers underestimate the degree of individualisation of services as compared to the providers' view (which should be based on superior knowledge). This *asymmetry in perception* differs from the usual notion of asymmetric information as applied to services. The usual argument is that because the service product is not visible before it is produced, the customer will know less about the likely service quality than will the supplier. (Service marketing often uses a related concept: services ' lack of demonstrability .) The key difference between the usual notion of asymmetric information and the idea of asymmetric perception introduced here, is that the former is isolated from the market -it refers to the asymmetry in information between the two parties involved in one single deal[16] - whereby the latter refers to other services (and goods) of a similar nature that are provided to other consumers in the market. A customer may be fully informed about the service that has been

[16] There can be differences in the definition of the information that the parties view asymmetrically: efforts, technology, knowledge, quality etc.; but in all cases it is the information available to one party about the other party of the same contract.

rendered, but is still liable to consider it identical to the services that are being provided to other consumers (of which they know little). As a result, customers of a tailored service may believe that they have purchased a standard service.

The asymmetry of perception stems from different degrees of awareness of the service process, rather than of the service product. If we accept the KIBS suppliers' viewpoint, the clients are frequently underestimating the particularisation involved in this process. The producers of services know the technology of service production *intimately* and can judge the degrees of individualisation and innovativeness of the service based on knowledge of *how* the service was produced. In contrast, consumers will not be fully aware of the technology, work organisation and activities involved in service production - although they can be highly aware of the properties of the service rendered. In estimating the degree of standardisation, consumers *subjectivel*y compare the service that they have obtained with their ideas of similar services ("services of the same name") supplied to other consumers. Such a comparison is a *"turbid glass"* effect. When one looks through a turbid glass, superficially similar objects may seem identical[17]. Likewise consumers of KIBS see a vague image of rendered services, where their differentiation and individuality are indistinguishable. The "turbid glass" effect prevents customers from distinguishing between a knowledge-intensive service innovation and a replication.

It is worth noting that asymmetric information and asymmetric perception co-exist in these cases. For the consumer to assess the particularisation of the product ultimately requires a comparison with other products (is there a product in the market that would better suit this particular consumer's needs?); but such a comparison is not usually feasible. The consumer is not able to compare the service product, in advance, with other products to establish if there is a product on the market that would better suit their particular needs; to assess the particularisation of the product is likewise unfeasible. The consumer can neither compare the service with other products, nor observe the process and judge on the particularisation (since the process is opaque).[18] Making the process more transparent (removing asymmetric information between the

[17] A similar formulation is in St Paul's letter to the Corinthians, where he writes of seeing things "through a mirror, darkly" – sometimes translated as "through a glass, darkly" (1 Cor. 13: 12) - referring to the blurring of an image by a poorly reflective mirror. The latter version, even if misinterpreted, does have resonance with the "turbid glass" idea. Philip K Dick's 1977 novel A Scanner Darkly takes the metaphor to new levels, in the context of police investigative services being so far undercover that agencies end up mistakenly tracking their own agents.

[18] In a context of financial intermediation, Vinogradov (2012) discusses a situation in which two parties have perfect information about each other, but cannot observe the actions of the third party, and thus have different

two parties) contributes to the better understanding of particularisation. It reduces asymmetric perception - but does not necessarily eliminate it, because asymmetry is generated by the limited availability of information about the whole range of (potential) services on the market. We thus expect that if there is knowledge and information transfer during coproduction, then this reduces asymmetric information (in future, and quite possibly over the course of the transaction itself), which in turn helps reduce asymmetric perception.[19]

Customers with a prior experience in consumption of KIBS thus should have a better understanding of the specifics of particularised services and thus appreciate the role of coproduction as a signalling device about the level of particularisation. To analyze the effect of experience we divided KIBS consumers into two groups:

- "*Experienced customers*" who were defined as those who had used more than the average number of different services during the last three years (58.1% of the sample),
- "*Inexperienced customers*" who had purchased fewer services than average (the remaining 41.9% of the sample).[20]

On average, inexperienced customers as defined above estimate the level of particularisation of services to be 10% lower than do experienced ones. The perceived particularisation of services by consumers strongly correlates with the number of services that have been purchased earlier (the Pearson correlation coefficient is 0.61). This supports the assertion that diverse experience overcomes the "turbid glass" effect – the more types of services

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perceptions of the third party's actions even though they are equally uninformed about them. This highlights the point that, even in the absence of asymmetric information between the two parties, they can have different perceptions of the outer world. It is the outer world that creates the problem. In the KIBS setting, however, the problem may be partly resolved by convincing the consumer that there is no need to compare the service rendered with the outer world (other service products) since the service is particularised in the course of its production process.

[19] The turbid glass does not disappear completely, but consumers become more confident that the service provided to them is particularised and thus unlikely to be a replica of other services in the market.

[20] In answering our question on the borderline between experienced and inexperienced consumers, 61.8% of KIBS producers agreed with the operational division used here. 16.4% suggested that experienced customers are those who consumed one and the same service from different suppliers, while 14.5% considered that experienced consumers were those who consumed different services from one and the same supplier. The Russian sample is probably particularly useful in terms of providing us with a large pool of inexperienced users; it would be interesting to know how far such users are prevalent in other economies.

consumers use, the better they recognise service differentiation. On the contrary, 61 per cent of inexperienced consumers believe services of the same name are standardised.

Coproduction should ensure that the service is tuned to the needs of the customer and that the customer appreciates the usefulness of the service.[21] In order to identify the impact of experience we asked those consumers of KIBS who had reported an incomplete absorption of services (26.5% of service providers and 24.5% of consumers on average across all sectors), why it was that full absorption failed - Table 8. The majority of the respondents (over 50% of service providers and over 60% of consumers) indicated that either the service did not match the needs of the customer or that they considered that the customer did not really need the service.[22] Both accounts suggest failures in coproduction.

On average, over 40 per cent of all KIBS consumers concede that they paid for services that did not match their needs. The range is huge - from as low as 10% for design to as high as 80% for engineering.

If coproduction is required to achieve a fine-tuning of the service, this unsatisfactory experience should act both as a strong signalling device (indicating insufficient coproduction) and as an incentive mechanism (sending the message that it will be beneficial to coproduce in future). In Table 6 only one out of the four factors behind poor coproduction seems to be irreparable: this is the qualification of the customer, accounting for about 25% of poor coproduction. The remaining three factors, accounting for about 75%,, can be nullified by the customer. These are the willingness to engage in, the time taken in, and the relative financial burden of, coproduction. We might therefore expect that even customers with an unsatisfactory experience could demonstrate a higher propensity to innovate in the future. Therefore, both good and bad experiences matter.

[21] Although poor coproduction need not necessarily imply poor absorption - a customer can still appreciate and absorb the service even if coproduction is poor. But the opposite does not hold: poor absorption suggests failures in coproduction. There are usually exceptions to such a rule of course, and here we might cite cases such as those when key members of staff in the customer firm depart, meaning that the coproduction effort is poorly reflected in the experience of new staff.

[22] The exact wording for the service providers was “the service was not needed (ordered for future needs, just in case)” and for consumers – “the service was not needed/useful”.

Table 8. Main reasons for imperfect service absorption

Responses to the question: "Why were the rendered services not fully absorbed? Choose ONE answer." Per cent of responses given by producers/consumers.

	Overall	Sectors									
		AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
Poor quality of the service	-/ 11.1	-/ 10.0	-/ 8.1	-/ 0.0	-/ 0.0	-/ 9.1	-/ 0.0	-/ 0.0	-/ 8.3	-/ 50.0	-/ 20.0
Service does not match the needs of the customer	19.4/ 40.5	16.7/ 45.0	21.1/ 56.8	0.0/ 61.5	20.0/ 42.9	25.0/ 36.4	23.1/ 80.0	41.7/ 25.0	20.0/ 33.3	9.1/ 16.7	10.0/ 10.0
The service was not actually needed	35.8/ 22.8	33.3/ 15.0	31.6/ 10.8	9.1/ 0.0	40.0/ 57.1	20.0/ 27.3	38.5/ 0.0	41.7/ 37.5	60.0/ 25.0	72.7/ 33.3	40.0/ 20.0
Poor qualification of the customer	19.4/ 15.7	27.8/ 20.0	21.1/ 18.9	27.3/ 23.1	20.0/ 0.0	25.0/ 27.3	23.1/ 0.0	8.3/ 25.0	0.0/ 16.7	9.1/ 0.0	10.0/ 30.0
The management of the customer company did not care whether the service was absorbed or not	17.2/ 9.8	5.6/ 10.0	15.8/ 5.4	54.5/ 15.4	13.3/ 0.0	25.0/ 0.0	7.7/ 20.0	8.3/ 12.5	20.0/ 16.7	0.0/ 0.0	30.0/ 20.0
Other	8.2/ -	16.7/ -	10.5/ -	9.1/ -	6.7/ -	5.0/ -	7.7/ -	0.0/ -	0.0/ -	9.1/ -	10.0/ -

Notes: For each suggested answer the table shows the percentage of respondents in the form *x*/*y* where upper figure (*x*) represents the answers of service providers, lower figure (*y*) represents the answers of the consumers; "-" = option not offered as a possible answer. Notation for sectors: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2010.

Changes in Customers' Innovativeness through Coproduction

The production of KIBS by definition differs from the customer firm's principal activity. KIBS customers are not educated in the field of service production. The suppliers of KIBS estimate that only just over a third of their customers have expertise in the services, while over a quarter have poor or no understanding (see Table 9).

Table 9. Customers' expertise in KIBS

Responses to the question: "What share of your customers falls into each of these categories in terms of their expertise in KIBS production? (Mean shares; standard deviations in brackets).

	Overall	Sectors									
		AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
Experts	35.63 (30.6)	33.38 (26.3)	43.74 (30.3)	38.46 (34.5)	40.36 (32.4)	46.49 (30.6)	37.71 (33.2)	33.91 (28.0)	22.75 (27.2)	22.49 (23.7)	36.85 (31.8)
Have a general idea	37.24 (25.2)	41.68 (23.4)	35.21 (21.9)	41.54 (30.9)	36.22 (24.9)	33.49 (24.0)	32.58 (20.7)	32.45 (21.4)	38.31 (28.9)	40.42 (27.6)	38.16 (25.4)
Poor or no understanding	27.13 (26.6)	24.95 (20.2)	21.05 (21.9)	20.00 (26.5)	23.42 (26.0)	20.02 (21.4)	29.71 (27.9)	33.64 (27.5)	38.93 (33.3)	37.09 (29.4)	24.98 (24.3)

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2011.

The route to increased expertise through coproduction is learning by doing. Since Kenneth Arrow's seminal contribution (Arrow, 1962) learning-by-doing is widely treated as an important contributor to productivity growth. Jensen et al. (2007) contrasted the innovative propensity of Danish firms who use codified/documented (science-technology-innovation, STI) and/or experience-based (doing-using-interacting, DUI) transfer of knowledge within and between organisations. They stressed that the DUI-type of learning contributes both to specific and to general expertise of subjects. KIBS customers are no exception: through interactive coproduction of these services, they are liable to acquire new knowledge and skills beyond their core activities, and thus to upgrade their business competences. Coproduction is based on close interaction; Howells (2006, p.717) emphasizes that these interactions are "close and continuous" and "involve crucial… functions in supporting innovative change" in clients. KIBS analysis suggests that the effects of the DUI-mode of knowledge diffusion apply not only on an intra-company level, but can be apparent in inter-company cooperation (between KIBS suppliers and their customers).

Experienced KIBS customers escape the "turbid glass" effect, and thus come to expect more personalised services. Our expert interviews - with KIBS providers with long-term customer relationships and thus with an ability to follow their customers' progress - tended to give the view that experienced customers are aware of the benefits of outsourcing and thus have fewer incentives to attempt to produce KIBS for their needs in-house. As for the firms

themselves, Table 10 provides the answers of KIBS customers to the questions about their reasons for outsourcing.

Strikingly, price considerations (being "less expensive") are the least important among the responses. 22% of respondents indicate that they do not need outsourced services on a regular basis, suggesting that the cost of maintaining in-house production capabilities is a consideration, too. Importantly, the most popular answer refers to the complexity of the services, implicitly indicating that there are demands for new or complicated knowledge that can be supplied by KIBS providers. The remaining answers support this knowledge-based view as they mainly refer to the qualification of the staff.

Apart from the specific service knowledge, KIBS' clients can gain knowledge about their own business through the service relationship. The interviews indicate that KIBS suppliers believe that their customers often do not know exactly what they need at the outset. The clients have only general and fairly nebulous ideas about the service they require, e.g. "I need your marketing efforts to promote my new product", or "We need somebody for the post of project manager". When the demand is fairly unspecified, it is obviously difficult to produce a tailored service. The KIBS suppliers make efforts to specify particular service parameters; this process of clarification may well last into later stages of the relationship.

Four opportunities to improve customers' knowledge about their core activities can be identified:

a) Reflection upon KIBS providers' questions and requests can lead the customers to articulate a more comprehensive understanding of their needs, and the state of their business. (One KIBS provider told us that at the beginning of co-operation the typical client's answer to any question is "Never thought about it before".)

b) In the process of cooperation, consumers acquire general knowledge about their business environment from information supplied by KIBS suppliers (such as lawyers, financial and marketing consultants, recruiting agencies, etc.). [23]

[23] It may also be that in-house knowledge resources are unlocked, so that senior management listen to the KIBS equivalent personnel in the firm.

Table 10. Major incentives to outsource KIBS production

Responses of KIBS customers to the question: "What are the main reasons for outsourcing the KIBS production?" (percentage of responses).

	Overall	KIBS Sectors to which outsourced									
		AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
We outsource complicated problems while standard problems are solved inside	**26.4**	29.6	20.8	23.9	34.2	29.0	25.0	32.2	27.7	24.6	29.4
The quality of outsourced services is higher than of those produced by our own staff	**24.5**	20.0	26.7	32.4	24.8	18.8	20.8	28.9	15.4	15.4	23.5
We do not need these services on a regular basis	**22.5**	18.3	23.6	17.9	21.1	36.5	12.9	23.3	33.9	26.2	23.5
Our staff is not competent enough to produce the necessary services	**22.2**	16.5	22.3	17.9	29.1	37.6	8.6	26.7	13.8	16.9	31.4
It is more difficult to produce some services on our own than to find an external service supplier	**21.5**	27.8	25.5	11.9	26.3	18.8	30.2	15.6	16.9	23.1	15.1
Outsourcers produce services quicker than our own staff	**18.7**	24.3	17.0	21.2	11.4	7.3	30.0	21.1	21.5	20.0	15.1
Outsourced services are less expensive	**16.9**	15.7	17.9	12.0	15.0	13.0	24.0	26.4	18.5	16.9	13.4

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2007.

c) Communication with service providers reveals new opportunities that customers did not know or failed to appreciate previously. For example, recruiting agencies not only find candidates for existing vacancies, but also propose alternative forms of employment ("outstaffing" is a popular example in Russia[24] - many customers first heard this word when asking for recruitment services); real estate agencies organise 3D virtual tours inside and outside office buildings; and so on.

d) Customers may improve their expertise in problem setting. For example, they may find that their initial ideas are unrealistic. Their first approaches may be beyond the law or liable to meet with huge opposition, or they may be technically unachievable. They can learn to avoid time-wasting, by making more realistic demands to begin with.

Coproduction therefore upgrades customers, who learn more about their business and acquire new knowledge beyond their principal activities. Furthermore they can participate in co-creation of innovative services, especially within bespoke production. In this sense, customers acquire additional expertise in knowledge-intensive performance and thus improve their own innovative potential. This argument is supported by survey results. Table 11 summarises the answers of customers themselves about external effects of KIBS consumption. They indicate that their general propensity to innovate improves as a result of KIBS use.

Table 11. Effects of using various KIBS on customers' propensity to innovate

Responses to the question: "Please, estimate the impact of KIBS consumption on your own propensity to innovate" (percentage of responses)

		KIBS Sector from which consumption derives									
	Overall	AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
Positive effect	**65.8**	73.3	81.9	56.1	73.7	63.4	61.2	64.6	47.6	47.3	72.0
Negative effect	**0.8**	0.7	0.9	1.7	0.0	0.0	0.0	0.0	2.5	1.5	0.0
No effect	**33.4**	25.9	17.3	42.9	26.3	36.6	38.8	35.4	49.7	51.6	28.0

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2011.

[24] See, for example http://www.talentpool.ru/en/text/info/outstaffing__hows_and_whys (accessed 14/08/2012).

Two thirds of consumer respondents reported improvement of their general propensity to innovate due to their experience with KIBS consumption and coproduction. The most powerful influences appear to come from marketing consultants, who stimulate positive shifts in 80 per cent of customer firms, according to their customers. Consultants in the spheres of business design, IT and advertising are reported to have influenced over 70 per cent of their consumers. Legal services demonstrate a less frequent effect, with just under half of their customers reporting positive effects. Strikingly, a negative impact was reported by less than one per cent of respondents – and no at all in the case of several KIBS.

Table 12 presents data for the 66 per cent of the sample who reported that the use of KIBS had improved their innovativeness. They were asked about the intensity of the impact, answering on an ordinal scale ranging from 1 (weak effects) to 3 (radical effects). More than half of these customers reported substantial shifts in their innovation behaviour after obtaining experience with KIBS. The overall average positive impact of experience with KIBS reaches 2.5 (out of a possible 3) points, in terms of strength of impact. The most radical improvements appear in the case of business design, legal and IT services.[25]

This evidence suggests that the KIBS sector generates strong external incentives for its clients to innovate. These incentives are likely to originate from new knowledge and skills acquired during service coproduction into their principal activities. We would expect that the degree of generality will vary across various kinds of acquired expertise.

Accordingly, we asked KIBS customers to estimate the extent of impact upon different types of innovations. The types of innovations are from *Indicators of Innovation Activities* (2010), enabling comparisons with other Russian industries. Their answers are quantified by the same ordinal variables as in Table 12 (from 1 = weak impact, to 3 = radical impact). The results are summarised in Table 13. We see a tendency to report stronger, rather than weaker, impacts in all of the five categories of innovation. The set of innovations where lowest impact is apparent is marketing innovations. (In contrast, use of marketing KIBS is, not surprisingly, seen as influential; indeed, there seems to be general correspondence between the types of KIBS and the types of innovation).

[25] Since these answers come from firms reporting positive effects in the earlier question, we have an apparent paradox. In legal services we observe the least frequent positive effect among all KIBS - but when it is positive, it is one of the strongest. A plausible interpretation of this result is that if legal services support new business start-ups then they are highly relevant for innovations; however if the services refer to more general legal issues, as they presumably do much more commonly, then there is generally no link to innovation activities at all.

Table 12. Degree of impact of KIBS experience, as seen by customers reporting positive effects of KIBS.

Responses to the question: "Please estimate the degree of positive impact of KIBS consumption on your propensity to innovate, on the scale 1 to 3" (percentage of responses)

Degree	Overall	Sectors									
		AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
1	**9.3**	8.4	11.4	9.6	11.0	7.7	17.1	12.2	1.9	18.5	4.5
2	**33.0**	33.6	38.6	44.7	26.4	38.5	22.9	22.0	26.4	33.3	28.8
3	**57.7**	57.9	50.0	45.7	62.6	53.8	60.0	65.9	71.7	48.1	66.7
Mean grade	**2.5**	2.5	2.4	2.4	2.5	2.5	2.4	2.5	2.7	2.3	2.6

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2011.

Table 13. Degree of impact of KIBS experience on different service innovations

Responses to the question "Please estimate the degree of positive impact of KIBS consumption on your propensity to different types of innovations, on the scale 1 to 3" (mean grades, standard deviations in brackets)

Innovations	Overall	Sectors									
		AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
Communication	**2.39**	2.38	2.30	2.15	2.59	2.27	2.44	2.45	2.47	2.52	2.48
		(0.7)	(0.7)	(0.7)	(0.6)	(0.7)	(0.7)	(0.7)	(0.6)	(0.8)	(0.7)
Product	**2.37**	2.37	2.46	2.30	2.43	2.28	2.51	2.18	2.36	2.00	2.60
		(0.7)	(0.7)	(0.7)	(0.7)	(0.8)	(0.7)	(0.7)	(0.7)	(1.0)	(0.6)
Technological	**2.36**	2.25	2.49	2.41	2.42	2.17	2.61	2.19	2.25	2.35	2.59
		(0.8)	(0.7)	(0.7)	(0.8)	(0.8)	(0.6)	(0.8)	(0.8)	(0.8)	(0.6)
Organisational	**2.34**	2.33	2.43	2.31	2.21	2.25	2.08	2.41	2.62	2.44	2.37
		(0.7)	(0.7)	(0.7)	(0.8)	(0.7)	(0.7)	(0.7)	(0.6)	(0.8)	(0.7)
Marketing	**2.14**	2.26	2.41	2.06	1.88	1.94	1.91	2.27	2.22	1.63	2.27
		(0.7)	(0.6)	(0.7)	(0.8)	(0.7)	(0.8)	(0.7)	(0.8)	(0.7)	(0.8)

Notes: AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2011.

Innovation through services seems to be self-sustainable, part of a virtuous circle. Indeed, the incentive to absorb services in all their knowledge-intensity inspires innovations in customer firms, according to whom more intensive and more sophisticated KIBS are demanded by more innovative consumers (see Table 14).

Very few respondents – less than 5 per cent – report a reduction and/or simplification of demand; in most cases such decreases are minimal or zero. About one quarter of respondents report no influence from their innovative activities on their demand for KIBS. But the majority report that their growing innovativeness inspires them to increase their demand for KIBS both quantitatively and qualitatively. Almost 40 per cent of customers tend to order more services; 30 per cent become interested in new types of services which mean diversification of demand; 20 per cent use services more frequently and thus are able to upgrade their experience and expertise more rapidly; 20 per cent want more innovative services; and 15 per cent ask for more customised services.

This underpins the assertion that improved innovativeness of KIBS customers expands and upgrades their demand; it is the reason for arguing for the self--sustainability of service innovations. More sophisticated demand generates incentives to co-create more innovative services. This upgrades not only the services produced themselves, but also the customer firms as well; additional innovation experience makes them smarter consumers, with higher propensity to innovate. These increased innovation activities are facilitated by support from more innovative services, and thus the whole cycle is liable to repeat in a virtuous circle. This suggests that the KIBS sector may increasingly become the point of sustainable generation of both service and industrial innovations.

Table 14. Impact of customers' increased innovativeness on their demand for KIBS

Consumers' responses to the question: "How does the increase of your innovativeness impact on your future demand for KIBS" (percentage of responses)

		Sectors									
	Overall	AD	MKT	ADT	IT	REC	ENG	FIN	LEG	DVP	DSGN
We demand a larger amount of services	38.9	46.2	37.9	21.6	39.1	41.7	34.7	31.5	22.5	33.8	46.5
We demand more types of services	30.0	33.8	26.6	17.6	41.3	24.3	29.2	20.5	20.2	25.4	34.3
No effect	27.4	14.2	16.9	39.7	19.6	20.4	29.2	31.5	40.3	43.7	15.2
We demand services more frequently	20.5	27.8	17.7	15.1	18.8	17.5	13.9	12.3	12.4	18.3	20.2
We demand more innovative services	20.5	20.5	20.2	14.1	29.0	23.3	23.6	19.2	7.8	18.3	17.2
We demand more personalised services	14.8	17.5	13.7	9.5	15.9	14.6	11.1	11.0	12.4	9.9	15.2
The level of coproduction increases	7.8	5.7	10.5	7.0	6.5	9.7	4.2	5.5	6.2	4.2	14.1
The level of coproduction decreases	1.7	2.4	2.4	0.5	1.4	1.0	2.8	2.7	0.8	1.4	0.0
We demand more standard services	1.0	0.9	0.8	0.0	0.7	1.0	1.4	0.0	1.6	2.8	1.0
We demand services less frequently	0.5	0.3	0.0	0.0	0.7	1.0	0.0	2.7	0.8	0.0	0.0
We demand less innovative services	0.2	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
We demand fewer types of services	0.2	0.0	0.0	0.0	0.7	1.0	0.0	0.0		0.0	0.0
We demand a smaller amount of services	0.2	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0

Notes: Multiple answers possible thus columns do not add to 100%; AD = Advertising; MKT = Marketing services; ADT = Audit; IT = Information technology services; REC = Recruitment services; ENG = Engineering services; FIN = Financial advice services; LEG = Legal advice services; DVP = Property development services; DSGN = Business design

Source: ISSEK-ROMIR survey, 2011.

Conclusions

The evidence from these Russian studies generalizes and extends the thesis, advanced mainly in studies of Western European countries, that the KIBS sector possesses a high innovative potential. KIBS sectors can generate service innovation of two types: commoditisation and personalisation of services. The KIBS sector's share of innovative outputs is comparable with the most advanced industrial sectors. Importantly, it also supports innovation among its users, and this support is a self-sustaining mechanism.

The study explores the issue of asymmetric perception of the standardisation/ particularisation of KIBS by providers and consumers, which is part of the explanation for insufficient engagement in coproduction by inexperienced customers. As if looking through a turbid glass, they see all services essentially similar, and do not see the benefits from coproduction. Lack of coproduction, due to customers' failure to understand why coproduction is needed, means that services are not always fully absorbed. They may be inadequately tuned to the needs of the customer, or customers may be underequipped to absorb them; both problems are repairable through coproduction. The empirical data support the idea that customers with prior experience in KIBS consumption better understand why they need KIBS and what the benefits from coproduction are.

The survey data also indicate that KIBS consumption can affect innovativeness, and when it does so this effect tends to be positive and strong. Increased innovativeness is reported to directly contribute to intentions to consume KIBS further, thus creating a virtuous circle. Conceptually, these effects are linked to the knowledge transfer during coproduction: customers acquire both specialised and general knowledge as well as improve their skills and abilities. This makes them better understand their own needs, and incentivizes them to demand more particularised KIBS in the future.

This discussion leads us to suggest that a rather non-standard way of stimulating innovative economic development could involve support for the KIBS sector. However, fiscal stimuli that only target KIBS providers would be least efficient. Tether and Tajar (2008) give an example of design services provided by some universities at highly subsidised prices; as a result, the demand is shifted away from the private sector, while the quality of the services - provided by organisations with other core missions - may be uneven. It is doubtful that such strategies of "enforcing" or subsidizing provision of KIBS by public bodies contributes to the development of the sector as a whole in many cases. Alternatively, policy could target KIBS consumers, creating incentives for them to make use of KIBS suppliers, and to actively engage in coproduction. Our

observations show that a lack of experience (or, possibly, an interruption in experience with KIBS) can be an obstacle for effective coproduction, and hence for an improvement in innovativeness.

One task for the government then could be to seek to exogenously create such an experience. Can the example of subsidised KIBS provision (design services) through universities, for example, be seen as such an exogenously created KIBS experience? There may be conditions where this is achieved, but such arrangements typically fall short on two important aspects: (1) a non-profit institution lacks the market-based incentives to coproduce as effectively as a private company would do - it is far from clear that the incentives with most public and non-profit bodies are sufficient to mobilise their professional staff accordingly, though exceptions are possible and there may be scope for designing new mechanisms here. (2) There is no guarantee that customers for whom price considerations are important will move on to non-subsidised businesses, rather than simply return to the subsidised provider whenever a similar KIBS is needed again; unless provisions are built in to prevent this sort of "crowding out", the private KIBS sector may remain disadvantaged.

The public sector, however, can also be a significant consumer of KIBS (to support its own business processes). Another step towards exogenous creation of KIBS experiences could involve outsourcing some public services to KIBS providers (e-Government is one possible example); or the policy mix for public-private cooperation in the KIBS sector could be diversified. This will require changes in public procurement procedures, since they tend to emphasise the price factor when selecting service providers. In contrast, the firms studied in this essay are ones where the price factor is subordinate to concerns about the knowledge-intensity and quality of the outsourced services, when selecting KIBS providers. A straightforward application of competitive price-based selection procedures in the KIBS sector is rarely possible, and thus procurement policies face a strong challenge here. (cf. Edler and Georghiou, 2007; Satzger et al, 2009,).

Finally, there may be roles for public authorities in supporting training and skills development for KIBS provision (and absorption), and assisting quality control (for example, by promoting standards and professional self-regulation - though there are dangers of professionals erecting entry barriers to defend their interests rather than more general welfare). We have suggested that the KIBS sectors are liable to become increasingly the point of sustainable generation of both service and industrial innovations. Thus it is important that KIBS professionals are well-informed about the grand challenges facing our societies. These grand challenges - climate and demographic change, food, water and energy security, and so on - need

to be taken into account in business decision-making (as well as in government policies) if longer-term environmental and social sustainability is to be attained. KIBS are liable to be central in the great responses that these grand challenges require, so KIBS professionals need to be well-aware of longer-term considerations, not just short-term solutions to short-term problems. Education and professional standards are evidently part – even if only part - of the necessary response of the KIBS sectors and professions.

References

Antonelli, C. (1998). Localised technological change, new information technology and the knowledge and the knowledge-based economy: the European evidence. *Journal of Evolutionary Economics*, v. 8, pp. 177-198.

Arrow, K.J. (1962). The Economic Implications of Learning by Doing. *Review of Economic Studies*, Vol. 80, pp. 155–173.

Audretsch, D.B. Klomp, L. and Thurik, R.A. (1999). Do Services Differ from Manufacturing? The Post-Entry Performance of Firms in Dutch Services, in: Audretsch, D.B. and Thurik, R.A. (eds.) *Innovation, Industry Evolution, and Employment*, Cambridge: Cambridge University Press, pp. 230-252.

Balaz, V. (2004). Knowledge-Intensive Business Services in Transition Economies, *The Service Industries Journal*. Vol. 24. No 4. pp. 83–100.

Bansal, H.S. and Taylor, S.F. (1999). The Service Provider Switching Model (SPSM): A Model of Consumer Switching Behavior in the Services Industry. *Journal of Service Research*, Vol. 2. No. 2, pp. 200-218.

Barras, R. (1986). Towards a Theory of Innovations in Services. *Research Policy*, Vol. 15. No. 4, pp. 161-173.

Bettencourt, L.A. Ostrom, A.L. Brown, S.W. and Roundtree, R.T. (2002). Client Coproduction in Knowledge-Intensive Business Services. *California Management Review*, Vol. 44. No 4, pp. 100-128

Bilderbeek, R. and den Hertog P. (1996). Innovation in Knowledge Intensive Business Services. Lessons from Case Studies. Paper for the Roskilde seminar on *Innovation in Business Services*. Roskilde University.

Biyalogorsky, E. Gerstner, E. Weiss, D. and Xie, J. (2005). The Economics of Service Upgrades. *Journal of Service Research*, Vol. 7. No. 3, pp. 234-244.

Bresnahan, T.F. (2002). Prospects for an Information-Technology-Led Productivity Surge, pp. 135-162 in: A. B. Jaffe, J. Lerner and S. Stern, (editors) *Innovation Policy and the Economy*, Vol. 2, Cambridge, Mass.: National Bureau of Economic Research.

Clark, C. (1940). *Conditions of Economic Progress*. London: Macmillan.

Cohen, W. and Levinthal, D. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, Vol. 35, pp. 128–152.

Davies, A. and Brady, T. (2000). "Organisational capabilities and learning in complex product systems: towards repeatable solutions", *Research Policy*, Vol. 29, pp. 931–953

den Hertog, P. (2000). Knowledge Intensive Business Services as Co-producers of Innovation . *International Journal of Innovation Management*, Vol. 4. No. 4, pp. 491-528.

den Hertog, P. (2002). Co-producers of Innovation: On the Role of Knowledge-Intensive Business Services in Innovation, in Gadrey, J. and Gallouj F. (eds.) *Productivity, Innovation and Knowledge in Services – New Economic and Socio-economic Approaches*, Cheltenham, UK, Edward Elgar.

Dick, P.K. (1977). *A Scanner Darkly.* New York: Doubleday.

EC (2011). *European Competitiveness Report 2011*, Luxembourg: European Commission (available at http:.ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item_id=3908 accessed 23/11/2012).

Edler J. and Georghiou L. (2007), Public procurement and innovation: resurrecting the demand side, *Research Policy*, vol. 36, pp. 949-963.

Evangelista, R. and Savona, M. Patterns of Innovation in Services: The Results of Italian Innovation Survey. (1998). Paper Presented at the *7th Annual RESER Conference*, Berlin, 8-10 October, 1998.

Fisher, A.G.B. (1939). Production, Primary, Secondary and Tertiary. *Economic Record*, No 15 (June 1939), pp. 24-38.

Gallouj, C (1997). Asymmetry of Information and the Service Relationship: Selection and Evaluation of the Service Provider. *International Journal of Service Industry Management*, Vol. 8 Iss. 1, pp. 42-64.

Gibbons, M. Limoges, C. Nowotny, H et al. (1994). *New Production of Knowledge: Dynamics of Science and Research in Contemporary Societies*. London: Sage.

Hauknes, J (2000). 'Dynamic Innovation Systems: What is the Role of Services?', in M. Boden & I. Miles, (eds.) *Services and the Knowledge-based Economy* Continuum, London.

Hipp C. (1999). Knowledge-Intensive Business Services in the New Mode of Knowledge Production. *AI & Society*, Vol. 13. No. 1-2, pp. 88-106.

Hipp, C. (2000). Information Flows and Knowledge Creation in Knowledge-Intensive Business Services: Scheme for a Conceptualisation, in: Metcalfe, J.S. and Miles, I. (eds.), *Innovation Systems in the Services Economy: Measurement and Case Study Analysis*. Kluwer Academic Publishers, Boston, pp. 149-168.

Hipp, C. and Grupp, H. (2005). Innovation in the Service Sector: The Demand for Service -Specific Innovation Measurement Concepts and Typologies. *Research Policy*, Vol. 34. No. 4, p. 517-535.

Howells J. (2006). Intermediation and the role of intermediaries in innovation, *Research Policy*, Vol. 35, pp. 715-728.

HSE (2012). *Indicators of Innovation Activities: Data book*. Moscow, Higher School of Economics.

Jensen, M.B. Johnson, B., Lorenz, E. and Lundvall, B.A. (2007). Forms of knowledge and modes of innovation, *Research Policy*, Vol. 36, pp. 680-693.

Koch, A. and Stahlecker, T. (2006). "Regional Innovation Systems and Foundation of Knowledge Intensive Business Services". *European Planning Studies*, 14 (2), 123-146.

Koch, A. Strotmann, H. (2006). Impact of Functional Integration and Spatial Proximity on the Post-Entry Performance of Knowledge Intensive Business Service Firms . *International Small Business Journal*, Vol. 24. No 6, pp. 610–634

Kuusisto, A. and Kuusisto, J. (2007). *Use of Knowledge Intensive Business Services by SMEs – Some Policy Implications*. SC-Research, Lappeenranta University of Technology, Finland.

Landry, R., Amara, N. and Doloreux, D. (2010). Knowledge-exchange strategies between KIBS firms and their clients, T*he Service Industries Journal,* Vol. 32, No 2, pp. 291-320

Liu, S. (2009). "Determinants of service innovative dimensions in Knowledge Intensive Business Services: evidence from PR China*" International Journal of Technology Management,* Vol 48 No 1 pp95-114.

Love, J.H., Roper, S. and Bryson, J.R. (2011). Openness, knowledge, innovation and growth in UK business services, *Research Policy*, Vol. 40, pp.1438-1452.

Marion, F. (1997). "Service Coproduction and Customer Participation", in H. Mühlbacher and J.-P. Flipo (eds.) *Advances in Services Marketing*, Wiesbaden, Germany: Gabler-Verlag, pp. 17-26.

Miles, I. Kastrinos, N., Flanagan, K., Bilderbeek, R., den Hertog, P., Huntink, W. and Bauman, M. (1995). *Knowledge-intensive business services. Users, carriers and sources of innovation*. Manchester: PREST. (Report to the EC DG XIII Sprint EIMS Programme, Luxembourg.)

Miles, I. (2007). Business Services and their Users: A Literature Review, in Kox, H and Rubalcaba, L (eds.) *Business Services in European Economic Growth* London: Palgrave Macmillan, pp.39-61.

Miles, I. (2008). Patterns of Innovation in Service Industries. *IBM Systems Journal*, Vol. 47, No 1, pp. 115-128.

Miles I. (2007). Knowledge-Intensive-Services and Innovation, in Bryson, J. and Daniels, P. (eds.) *The Handbook of Service Industries* Aldershot (Ch. 15, pp. 277-294), Edward Elgar

Miles I. (2012). "KIBS And Knowledge Dynamics In Client-Supplier Interaction" in Di Maria, E., Grandinetti, R. and Di Bernardo, B. (eds.) *Exploring Knowledge-Intensive Business Services*: *Knowledge Management Strategies*, London, Palgrave

Miles I. and Martinez-Fernandez, C. (2011). Implications for Skills, Employment and Management, in Martinez-Fernandez, C., Miles, I. and Weyman, T. (eds.) *The Knowledge Economy at Work: Skills and Innovation in Knowledge Intensive Service Activities*, (Ch. 11, pp242-272), Cheltenham, UK and Northampton, MA, USA: Edward Elgar

Miles, I. and Rigby, J. (2013). "Demand-Led Innovation" pp6-33 in Deborah Cox and John Rigby (eds.) 2013 *Innovation Policy Challenges for the 21st Century* London: Routledge/Taylor & Francis

Muller, E. Doloreux, D. (2007). The Key Dimensions of Knowledge-Intensive Business Services (KIBS) Analysis: A Decade of Evolution. Fraunhofer ISI *Working Papers Firms and Region* No. U1/2007.

Muller, E. and Zenker, A. (2001). "Business services as actors of knowledge transformation: the role of KIBS in regional and national innovation systems", *Research Policy* , vol. 30, no. 9, pp. 1501-1516.

OECD (2005). *Oslo Manual* (3rd edition) Paris: OECD.

Percy, S. L. (1983). Citizen coproduction: Prospects for improving service delivery. *Journal of Urban Affairs* Vol. 5 (Winter) pp203-210.

Roth, S. Woratschek H. Pastowski S. Negotiating Prices for Customised Services (2006) . *Journal of Service Research*. Vol. 8. No 4, pp. 316–329.

Satzger, G. et al, (2009). *Knowledge Intensive Services Procurement Strategy*, Karlsruhe: Karlsruhe Service Research Institute (KSRI)

Sector Futures (2005). *"The Knowledge-Intensive Business Services Sector"* Dublin, European Monitoring Centre on Change, European Foundation for the Improvement of Living and Working Conditions.

Simmie, J. S. Strambach, (2006). "The contribution of KIBS to innovation in cities: an evolutionary and institutional perspective", *Journal of Knowledge Management*, Vol. 10 Iss: 5, pp.26 – 40.

Spohrer J. and Maglio P. P. (2008). The Emergence of Service Science: Toward systematic service innovations to accelerate co-creation of value, *Production and Operations Management* vol.17 (3) pp1–9.

Strambach, S. (1994). Knowledge-Intensive Business Services in the Rhine-Neckar Area. *Tijdschrift voor Economische en Sociale Geografie*, Vol. 85 No 4 (November 1994), p. 354-365.

Tether, B. S. (2003). "The Sources and Aims of Innovation in services: variety between and within sectors". *Economics of Innovation and new technology*. 12 (6), 481-505.

Tether, B. S. Hipp, C. (2000). Competition and Innovation amongst Knowledge Intensive and Other Service Firms: Evidence from Germany. In: Andersen, B. Howells, J. Hull, R. Miles, I. Roberts, J. (Eds.), *Knowledge and Innovation in the New Service Economy*. Edward Elgar.

Tether, B.S. Hipp, C. Miles, I. (2001). Standardisation and Particularisation in Services: Evidence from Germany. *Research Policy*, Vol. 30, pp. 1115-1138.

Tether, B.S. Tajar, A. (2008). Beyond industry-university links: Sourcing knowledge for innovation from consultants, private research organisations and the public science-base, *Research Policy*, Vol. 37, pp. 1079-1095

Van der Haar, J. Kemp, R. Omta, O. (2008). Creating Value that Cannot be Copied. *Industrial Marketing Management*. Vol. 30. No 8. P. 627–636.

Vinogradov D. (2012). Destructive Effects of Constructive Ambiguity in Risky Times. *Journal of International Money and Finance*, Vol. 31, pp. 1459-81.

Walsh, K., Enz, C.A., and Canina, L. (2008). The Impact of Strategic Orientation on Intellectual Capital Investments in Customer Service Firms. *Journal of Service Research*. 2008. No 10. P. 300–317.

Whitaker, G. P., (1980). "Coproduction: Citizen participation in service delivery," *Public Administration Review,* Vol.40 (May/June) pp 240-246.

Wong, P.K. and A. Singh (2004). 'The pattern of innovation in the knowledge intensive business services sector of Singapore', *Singapore Management Review*, **26**(1) pp21–44.

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