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Conference Paper

KIBS and industrial development of cities. Labour mobility, innovation and client interaction

44th Congress of the European Regional Science Association: "Regions and Fiscal Federalism", 25th - 29th August 2004, Porto, Portugal

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Aslesen, Heidi Wiig; Isaksen, Arne; Stambøl, Lasse Sigbjørn (2004) : KIBS and industrial development of cities. Labour mobility, innovation and client interaction, 44th Congress of the European Regional Science Association: "Regions and Fiscal Federalism", 25th - 29th August 2004, Porto, Portugal, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/117189>

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KIBS and industrial development of cities.

Labour mobility, innovation and client interaction

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Paper prepared for the 44th Congress of the European Regional Science Association, Porto 25.-30.august 2004

Abstract:

The paper departs from a seemingly disagreement between theoretical propositions stressing the importance of the KIBS sector as an innovation agent, and empirical results from quantitative innovation surveys. KIBS are increasingly seen to have a strategic role in stimulating innovation processes, particularly in large cities. However, the alleged importance of KIBS does not show up in empirical surveys. The surveys generally regard KIBS (or consultancy firms) to be of less importance as information sources and innovation partners.

The paper somewhat supports the conclusions from the empirical surveys, pointing to the fact that parts of the literature attach larger importance to the role of KIBS in innovation processes than can be confirmed by empirical results. However, the low importance attached to KIBS in quantitative surveys may rely on the fact that surveys only seize some of the roles played by KIBS in innovation processes. Surveys do not map, for example, knowledge spillovers occurring through the mobility of workers. The paper demonstrates that many workers left the KIBS sector in Norway to start working in other sectors during parts of the 1990s, signifying a flow of knowledge following the workers out of the KIBS sector. However, the paper also demonstrates that the flow of knowledge via labour mobility first of all benefits the most central parts of Norway. Less knowledge is seen to flow from the KIBS sector in Oslo and the other large cities to other industries and other parts of the country.

1. Introduction

The economy in western countries is increasingly denoted as a learning economy (e.g. Lundvall and Johnson 1994) or a knowledge economy (e.g. OECD 2001). These conceptualisations have also led to a renewed interest in the role of knowledge-intensive business services (KIBS) in industrial development, and as a trigger of innovation activity. KIBS are private sector firms providing knowledge-based services to other business organisations (cf. Wood 2002, p. 3).

The KIBS sector is, in particular, said to have a strategic role in stimulating innovation processes (Miles 2003). KIBS are seen as a vital source of information, advice and specialised knowledge for other industries. KIBS are seen to provide a point of fusion between i) general, scientific and technical information, ii) internal experience and competence acquired by KIBS firms in interaction with clients, and iii) the more tacit knowledge located within the daily practice of client firms and sectors (cf. Hertog 2002, p. 237). Such linking of diverse information and knowledge enable KIBS firms to solve clients' specific problems and challenges. Thus, Metcalf and Miles (2000) denote KIBS as innovation agents due to the capability of the sector in transferring knowledge and stimulating innovation at clients.

KIBS are particularly seen as a facilitator of innovation and growth in large cities (Daniels og Bryson 2002), and the sector is seen as an important component of metropolitan innovation systems (Fischer m. fl. 2001). KIBS is a fast-growing industrial sector having a rather concentrated location pattern. The software industry and organisational consultancy have, in particular, experienced large growth since 1980 (Wood 2002, p 35, Keeble and Nachum 2002, p 88). In Norway the number of jobs in the software industry nearly quintupled between 1991 and 2002, while the number of jobs among organisational consultants more than doubled in the same period (indeed both sectors started at a low level in 1991). The large cities have more than their share of the jobs in the KIBS sector, and a large part of the job growth has taken place in the cities. The Oslo region, for example, contains 58% of the jobs in the software industry (NACE 722) in Norway, compared with 22% of all jobs. Development and use of knowledge intensive services are seen to benefit from geographical proximity between knowledge providers and their users. By having good access to KIBS, firms in large cities

may become more innovative and then demand more knowledge intensive services than firms in other locations.

However, there seem to be little empirical evidence to back the postulated importance attached to KIBS as a trigger of innovation activity in other industries and as a facilitator of growth in large cities. There are for sure numerous methodological problems in measuring the impact of KIBS firms on the performance of client companies as the relationship between the firms are complicated (Bryson et al. 2004: 91) However, several large-scale, quantitative innovation studies demonstrate that innovative firms regard KIBS (or consultancy firms) as less important information sources and innovation partners, far less important than actors along the value chain and fairs and exhibitions (cf. next section).

The paper digs deeper into the seemingly divergence between theoretical propositions and empirical results from quantitative innovation studies as regards the role of KIBS in innovation processes. The paper will analyse the role of KIBS as a facilitator of growth in Oslo and other large cities in Norway. The empirical part of the paper focuses on the role of KIBS as a knowledge source and innovation agent in two respects, i.e. through knowledge spillovers in the labour market and through client projects. The *main research question* in the paper is to which extent and how KIBS stimulate the innovativeness and competitiveness of firms and industries in Oslo and other large cities in Norway.

In analysing this question the paper draws on several quantitative data sources and surveys. Clients' use of KIBS is analysed by: 1) a telephone survey of knowledge intensive firms in city regions in Norway, with responses from 800 different types of 'knowledge firms', including 200 Consultants, and 200 potential Consultancy clients. The respondents are found in three city areas in Norway, (i) the Oslo region, (ii) the three largest city regions in Norway (following Oslo), and (iii) a group of medium sized cities in Norway. 2) Face-to-face interviews with 27 firm leaders in Consultancy firms in Oslo, including a number of the largest global actors. 3) Data from "Statistics Norway's Central Register of Establishments and Enterprises" are used to describe the distribution of firms and employment in Consultancy by size of firm and region. Labour market mobility is analysed by the use of 4) gross-flow data that measures individuals' mobility between industries and regions.

The rest of the paper is divided into four chapters. The next chapter (chapter 2) discusses why KIBS so often are seen as a trigger of innovation processes in ‘the knowledge economy’.. The part also discusses why quantitative innovation studies do not demonstrate the large importance of KIBS as supposed in the literature. The third and fourth chapter use empirical data to analyse knowledge spillovers from the KIBS sector to other companies and industries in two respects, i.e. through consultancy projects with client firms and through labour mobility and.. Finally, in the fifth chapter we summarise the empirical results, indicating that much of the literature overstates the importance of the KIBS sector in innovation processes in other industries.

2. The role of KIBS in innovation processes

The alleged integration of KIBS in the innovation (and production) processes in other industries can be analysed by use of the interactive innovation model (Asheim and Isaksen 1997). Innovation activity is then seen as a complex, interactive, non-linear learning process, which emphasises the importance of co-operation in innovation processes as well as a systemic view of innovation. Moreover, the concept of innovation *system* is based on the idea that the overall innovation performance of an economy to a large extent depends on how firms manage to utilise the experience and knowledge in other firms, research institutions, the government sector etc. and mix this with internal capabilities in the innovation process (Gregersen and Johnson 1997). Firms combine resources and knowledge by many actors in building unique, firm-specific competencies that cannot rapidly be imitated by competitors (Maskell et. al. 1998).

KIBS in the knowledge economy

KIBS is seen to become a more important actor in innovation systems as firms increasingly utilise knowledge-intensive services for innovation purposes (Fisher et al. 2001). The importance of KIBS is said to increase by the development of a more knowledge-based economy. In fact, KIBS is seen as one important sign of the knowledge economy. Business services (NACE 71-74) is part of knowledge –intensive services according to OECD (2001), and the job growth in these sectors is one ingredient in the development of the knowledge economy. Industry is becoming more complex as a result of internationalisation, fast technological development and outsourcing (Gadde and Håkanson 2001, pp. 122 - 124).

Firms focus increasingly on their core competence, while other activities are outsourced to different types of subcontractors. Firms subcontract also knowledge components of the complete product to independent business service companies, and not just physical components (Bryson et al. 2004: 38).

Industry is also meeting ever tougher international competition. Firms in high cost locations are most often unable to compete by lowering costs. Firms in these areas have to found their competitiveness on the ability to introduce new products, alter existing products, use efficient production equipment, organisation methods etc. Thus, it is the capability to learn and innovate, and the ability to connect the innovative effort to wider markets that increasingly is seen to determine the relative position of firms, regions and countries (Lundvall og Johnson 1994). Thus, externalisation and increasing demand for innovation activity are seen to increase the need and demand for knowledge-intensive services from the KIBS sector (Daniels and Bryson 2002). Knowledge intensive services are then increasingly interwoven into industrial production.

However, KIBS firms are first of all regarded as co-players in innovation processes at clients. KIBS firms often develop services and new knowledge in co-operation with their clients to solve clients' specific problems and challenges (Hertog 2002). Advanced consulting may demand dense and lasting co-operation between knowledge provider and client. Software firms, for example, often use pilot customers to come up with ideas and to test new solutions. The quality of software solutions to a large extent then depends on the quality of the co-operation between the software firm and the pilot customers. This kind of co-operation may lead to a two-way learning process (Wood 2002, p. 5). Feedback from clients provides information and signals on how to change and develop services and solutions in KIBS firms, while clients may improve products or ways of producing or organising their activity.

Clustering effects in large cities

KIBS is seen to be an important part of the innovation system in large cities, in particular (Fisher et al. 2001). The importance of KIBS in metropolitan innovation system is explained by both supply and demand factors. Demand explanations are based upon the fact that large cities have location factors benefiting KIBS. Of particular importance is knowledge providing organisations (such as universities and R&D-institutes) developing new, relevant knowledge

and training labour. Large cities are thus overrepresented with highly educated and experienced labour, which may start new firms, and which are specialised labour for KIBS firms (Daniels and Bryson 2002). Demand explanations also draw upon cluster ideas, although it is not straightforward to employ the concept of regional clusters on the KIBS sector (Keeble and Nachum 2002). However, the important point is that co-location of numerous KIBS firms may bring about upgrading mechanisms that stimulate firms innovation processes (Porter 1998, Reve and Jakobsen 2001). Co-location is seen to promote competition between KIBS firms, and rivals are becoming well aware of each other's products, production processes, prices and innovations, and may copy each other's successful innovations (Malmberg and Maskell 2002, p. 444). Information and knowledge flow in different ways between co-locating firms, specific, local competence may develop and be embedded in firms, organisations and labour.

Demand explanations are based on the need for some kinds of KIBS firms for proximity to large clients. These are in particular headquarters of large companies and organisations that are biased towards capital regions and other large cities. Supply of some knowledge-intensive services necessitates dense co-operation and frequent face-to-face interaction between knowledge providers and clients (Leamer and Storper 2001). Firms in large cities have better access to such services than firms in other part of the countries, and above all compared with firms in peripheral areas. Thus, firms in large cities may be more frequent users of the type of consultancy services offered most efficiently by proximity, compared to firms in other areas. Likewise, firms demanding proximity to a range of knowledge-intensive services may choose to locate in large cities. The idea is then that increased demand for knowledge-intensive services in the large cities spur improved supply of such services in cities, stimulating still more demand, and so on.

Knowledge spillovers through labour mobility and consultancy projects

The above discussion underlines an increased role of KIBS in triggering innovation activity in other industries. KIBS is fast-growing and is seen to have increased its role in innovation processes due to the need from a more knowledge-intensive industry meeting harder international competition. KIBS is increasingly integrated in innovation and production processes in other industries. Notwithstanding, an important question is why the large, supposed importance of KIBS do not show up in quantitative innovation studies. Thus, Cooke

et al. (2001, pp. 75-76) find that firms in nine European regions generally have their most important partners in the innovation process along the value chains, first of all customers and second the suppliers. Consultants are partners for far fewer firms, but may provide important know-how for some firms. Based on Eurostat's Community Innovation Survey Isaksen (2003) summarises aspects of firms' innovation performance in eight countries throughout Europe. Corresponding with Cooke et al., the most important external information sources when innovating are partners along the value chain, and in particular clients or customers. Universities, R&D institutes and consultancy enterprises are generally of little importance. Less than seven per cent of firms in the eight countries see these as very important sources for innovation. Professional conferences, journals, computer-based information networks, and particularly fairs and exhibitions are more important sources of innovation than consultants.

The comparatively low score by KIBS in quantitative innovation studies may rely on the fact that these studies only seize some of the roles played by KIBS in innovation processes. Hertog (2002, pp. 238 - 239) distinguishes, thus, three roles played by KIBS firms in supporting innovation at clients. Firstly, KIBS firms may be *facilitators* of innovation, serving as experts in clients' innovation activity. The clients lead the innovation process, while KIBS firms contribute with expert knowledge. Secondly, KIBS firms may be *carriers* of innovation if they contribute in transferring existing innovations from one firm or industry to new firms or industries. The KIBS firms do not have to be the innovators, but have acquired know-how of the innovation by having introduced it in several client firms. Lastly, KIBS firms may be *sources* of innovation if they are important in initiating and developing innovations in client firms, and often in close interaction with the clients. It is first of all in the last case that dense and continuing co-operation between KIBS firms and clients is an advantage.

However, Hertog (op. cit.) only mentions situations in which KIBS firms and clients interact physically. But knowledge may flow from KIBS firms even though the firms do not interact with clients. Thus, it may be useful to distinguish between 'embodied' and 'disembodied' inter-agent or inter-industry knowledge flows, (Smith 2000, Fisher et al. 2001, p. 5). Embodied flows include knowledge within capital equipment, while 'disembodied flows involve the use of knowledge, transmitted through scientific and technical literature, consultancy, education systems, and movement of personnel and so on' (Smith 2000, p. 20). Thus, KIBS firms may stimulate innovation also in organisations not being customers. This

may take place when knowledge developed by KIBS firms, such as new principles of supply chain management or customer relation management, are made use of by many companies. Knowledge may be manifested as information in manuals, books and software programmes that are widely distributed, both through embodied and disembodied flows. Firms may adjust and use the information to their own purpose, but without acknowledging the KIBS company as information source.

The rest of the paper examines in more detail two types of knowledge spillovers in the context of the KIBS sector in Norway. The first type is information exchange and learning through consultancy projects. KIBS companies, and in particular management consultants, specialise in transferring fairly basic recipe knowledge between firms (Bryson et al. 2004: 100) that can be organized across many geographical scales. Nonetheless, some consultancy projects require a degree of continuity and stability in inter-firm relations that is likely to be facilitated by spatial proximity. It is also increasingly recognized that *new* scientific and technological knowledge contains complex, uncodifiable information, and thus have important elements of tacitness and firm specificity (Acs et. al 2002: 4). The knowledge is sticky because humans are the containers for storing and transferring uncodifiable information. Much of the information needed to innovate in knowledge intensive sectors is, thus, 'available only through access to the right persons, often few in numbers, who are working in a given problem area' (Leamer and Storper 2001: 655). The paper examines to which extent and how KIBS firms do affect their customers' knowledge base and innovation activity through consultancy projects. Does KIBS trigger innovation activities in firms in Oslo and other large Norwegian cities, in particular?

The other type of knowledge spillover examined is mobility of workers between industries and geographical areas. By job change workers take their accumulated skills and know-how with them to new firms. Mobility of workers is of particular importance in KIBS as 'the core competence of professional service firms is the expertise, experience and reputation of their staff, the asset base is knowledge and the competitive advantage is reputation' (Bryson et al. 2004: 87). Important knowledge in KIBS firms is embedded in individual employees and knowledge follows employees when they change job. The paper examines to which extent knowledge flow to and from the KIBS sector through the labour market. Which industries and geographical areas recruit former KIBS employees? Do for example knowledge flow to other

industries and from Oslo to other parts of Norway through the mobility of workers? More details on methodology for measuring gross labour market flows is to be found e.g. in Persson (ed. 2001), Edvardsson et al. (2002), Stambøl (2002 and 2003a,b) and Stambøl et al. (2003).

3. Knowledge intensive services in innovation

This part will focus on KIBS' alleged role as "agents of innovation" (Metcalf and Miles, 2000) through their knowledge transfer capacity and ability to co-produce innovation (den Hertog, 2002) with their clients in projects. This chapter will focus on what roles KIBS' play in direct relation to clients' innovation processes, and particularly what kinds of clients that are positive to use of consultants as information sources in the innovation processes. This chapter is based on three main data sources as described in chapter..

In order to understand the degree to which and how KIBS can be 'agents of innovations', we must take a closer look at how knowledge is managed and transferred between KIBS and clients. A number of characteristics of both KIBS and clients determine the outcome of such cooperation. Interaction is a two-way process, in which the client is involved in shaping innovation in KIBS, and vice versa, KIBS helping to shape client innovation (Hertog and Bilderbeek, 1998).. It is often hard to trace learning and innovation generated by this interaction.

3.1 The purchase of knowledge-intensive services and innovation

So why do clients purchase knowledge-intensive services from KIBS? Table 3.1 provides the KIBS' answer to this question. Clients are, according to KIBS, first and foremost interested in obtaining relevant, specialised knowledge that they themselves do not possess. It lends support to the assumption that the transfer of knowledge-intensive services may affect the competence base of clients and as such indirectly generate learning and innovation. Solely on the basis of the telephone survey we are not able to identify the type of specialised knowledge in force, but according to KIBS it is indeed specialised. Moreover, table 3.1 shows that a number of clients (according to KIBS) do pursue a strategy for the purchase of knowledge-intensive services, and that such purchases are of a limited time scale, maybe because of a lack of capacity among clients. The table shows that a large number of organisational consultants believe the rationale behind clients' purchase of such services is previous experience of satisfactorily deployment. One explanation may be that organisational

consultants often carry out long-term projects. The consultant contributes to non-technological innovation such as in relation to organisational procedures, reorganisation involving increased use of IT, management of human resources, marketing and logistics (Wood, 1996). It often necessitates consultant-client relations at several stages and over time (Wood 2002), and in which close personal ties are often established.

Table 3.1 KIBS evaluation of why clients purchase their products/services rather than developing such services themselves. Average score (1= irrelevant and 6=of great importance). (Sample size=570).

	Client lacks relevant special knowledge	Client has an deliberate strategy to purchase such products/services externally	Client lacks capacity	Client has previous experience with satisfactory deployment	Client is in need of strategic advice	A time-limited project
Organisational consultants	5,4	4,6	4,5	4,6	4,3	4,2
Software company	5,2	4,5	4,7	3,9	4,3	3,8
Average	5,3	4,6	4,6	4,3	4,3	4,0

Source: The author's survey

The definition and conception of the term 'innovation' have changed in recent years as it is no longer used solely in relation to technological innovations, but also to denote organisational and market-related change (EC 1995). This has had the effect of directing attention at the potential role of consultants in influencing innovation strategies in companies. On the basis of interviews with organisational consultants and software companies, we believe that KIBS may pursue three roles in clients' innovation activities: 1) KIBS may offer 'complementary knowledge' to facilitate innovation. 2) KIBS may organise innovation processes in Client companies. 3) KIBS may provide advice on the direction and type of innovations clients should accomplish.

Offer complementary knowledge

KIBS were asked whether they, in projects carried out in cooperation with clients, worked on clients' innovation activities and as such were close to the clients' core activities. Most organisational consultants answered definitely no to this question. The services of the consultants were mainly applied to 'adjacent' activities. It is the clients themselves that possess the unique competence needed for their own innovation, and consultants are seldom able to directly contribute to innovation. The main responsibility of the consultant is often to enable the client company to use its expertise in the most efficient and profitable way. 90% of a consultant's work is connected to secondary knowledge such as organisational development, management training etc. Only 10% of the consultant's work is associated with the core competencies of the client. "In a project situation you will only get a glimpse of the client's innovation efforts and core competencies" - Interview with an organisational consultant.

Software companies, as opposed to the organisational consultants, believe that they contribute directly to innovation in client companies. New software solutions may be central components in the reorganisation and improvement of administrative routines, administrative handling procedures, client support etc., and in the development of new Internet services and Web solutions. Clients often have expressed needs and ideas on change, while software companies contribute the necessary competence to bring these ideas to life.

Manage innovation processes

Although KIBS possess competencies that are important to the innovation of clients, they seldom possess the expertise needed to further develop clients' products or services. This type of competence is held by the clients' themselves. Consultants may however take an active role in managing and organising innovation processes in client companies. The consultants will then administrate and organise innovation processes rather than generate ideas for innovation in the client company.

Provide advice on direction and types of innovations needed

Consultants providing enterprise-level strategic advice may affect the direction of a client's innovative activities through advice on the type of products or processes needed in order to improve the competitive standing of the client's business. Such consultants are often employed in global consultancies, which enable them to "benchmark" the client's activities

vis-à-vis similar companies abroad. By informing on market trends and developing alternative forward-looking scenarios, the consultants will provide companies with a better decision-making platform on which to base their future strategies. Consultants may also be the 'bearers' of innovation in that they transfer knowledge and information between clients.

3.2 Who employ KIBS in internal innovation processes and what is the significance of geographical proximity?

We have pointed to the fact that KIBS may be an important source of knowledge in relation to innovation, as well as an important source of information about 'best practices' and experiences of other companies. Wood (2002) argues that some groups of companies, located in specific industries, which are small and medium sized, and located in more peripheral geographic areas, will experience increased difficulties due to limited access to external knowledge-intensive services since the KIBS sector is concentrated in a limited number of areas. The innovation survey carried out by Statistics Norway (Statistisk Sentralbyrå, SSB) in 2001 reveals a rather limited overall use of KIBS in innovation. Companies were asked about the relative importance of different actors as sources of information in innovation processes. The results show that 55% of the companies have *not* employed *consultants* as a source of information in innovation, and 56% of those making use of such consultants argue that their relative importance is low. This is in line with Cooke et al.. (2001) and Isaksen (2004) demonstrating that firms across European regions and countries regard consulting companies as comparatively less important sources of information and partners in innovation processes. We shall however consider those companies stating that consultants¹ were of medium or great importance as a source of information. With this as our point of departure we will analyse the types of companies that actively employ consultants in innovation processes.

Table 3.2 demonstrates a clear correlation between company size and the use of consultants as a source of information in innovation. Only 17% of companies with 10-19 employees employ consultants (to some degree) in innovation, as opposed to 32% of companies with over 250 employees. The low user-rate among smaller companies may be owing to the general difficulties with which small businesses obtain information about, absorb, and exploit knowledge from external actors. The problems relate to the lack of relevant, internal receiver-competence within the client firm, and to the costs and time consumption involved in the

¹ The group 'consultants' includes mainly software companies and organisational consultants.

employment of external actors in innovation processes. Small companies often carry out small, incremental innovations. Companies often display a reactive inclination towards input from external actors and suppliers (Kaufmann and Tödtling 2003). Thus innovation processes are carried out on an ad-hoc basis, in which external actors only to a limited extent are taken advantage of.

The size of client companies is often raised as a factor to underline the importance of a *local availability* of KIBS services (alternatively local branches of global or national KIBS). Large client companies often search for knowledge where it may be found, while small and medium sized companies restrict their search to the local community. Miles (2003) argues that differing practices in relation to the use of local KIBS is a reflection of imperfect market information about what consultants actually have to offer. Lack of information often means that personal contacts through friends and acquaintances become the right of access to such consultancy services. The implication of this is that small companies, in particular, look to the local markets. Other studies have also focused on the rather limited scope of companies search for consultants (Bryson and Daniels, 1998, Rusten, 2000), which, in the studies, is seen to be derived from the problems associated with determining the quality of the consultants' expertise.

Table 3.2 Companies stating that consultants are of medium or great importance as a source of information in innovation. (Sample size=1687).

Number of employees	10-19 employees	20-49 employees	50-99 employees	100-249 employees	250+ employees
Share of companies	17	27	30	28	32

Source: SSBs Innovation survey 2001

There is a widespread assumption that the rapid development of information- and communication technology improves communication and the exchange of knowledge across geographic space, and that knowledge-intensive services may be obtained regardless of location (Gillespie et.al 2001). KIBS sectors are concentrated in large cities. Thus one must assume that knowledge-intensive services contribute to knowledge transfer and innovation in larger cities in particular, because:

...the quality of business services in and around cities compared with elsewhere should benefit from economies of scale, and especially from economies of scope, with competition and specialization supporting a greater variety of high-quality service provision” (Marshall and Wood, 1995, s. 124-127).

Proximity to larger constellations of specialised KIBS reduces the problem that potential clients may encounter in attempting to find companies able to provide relevant knowledge. Proximity also reduces problems generated by the imperfect market of knowledge-intensive services, among other things by allowing a potential client to draw on the experiences of other companies and their use of different consultants. A large and varied supply of knowledge-intensive services may lead to increased use of such services, which in turn may encourage internal innovation processes. Table 3.3 confirms that a much larger proportion of companies within the Oslo-area, than in other parts of the country, view consultants as an important source of information in innovation. Moreover, our telephone survey shows that two-thirds of consultant users are of the opinion that geographic adjacency to consultants stimulates increased use. Clients demand knowledge and expertise of a national and international standard, but they also demand local (on-site) attendance in order to be able to cooperate closely with the consultancy firm.

Table 3.3 Companies maintaining that consultants are of medium or great importance as a source of information in innovation, by geographic location (Sample size=1687)

	Oslo-region	Stavanger, Bergen, Trondheim	Medium sized cities	Remainder regions
Share of companies	29	19	20	23

Source: SSBs Innovation survey 2001

Based on our empirical findings we have found that KIBS supply expert knowledge to their clients, often in relation to time limited projects and on an ad-hoc basis, questioning the possibility of knowledge creating processes leading to innovation. KIBS are important in providing specialised knowledge to firms that use them; however, our focus is on KIBS as ‘*drivers of innovation*’. We do not find support for this in our empirical study, but we do find that KIBS are important in ‘making possible’ innovation projects initiated by their clients in

that they supply complementary knowledge, organise innovation projects and act as advisors in relation to direction and type of innovation. Those actors that do value consultants' contribution as information source in innovation projects the most are larger firms and firms located in city areas where the largest number of KIBS are found. This suggests that both firms' characteristics and proximity to knowledge intensive service provider are factors influencing the effects of KIBS on innovation processes, and that there are certain conditions that must be put in place before KIBS can be said to have a strategic role in firms' innovation processes, in general.

4. Labour mobility in the KIBS-sectors

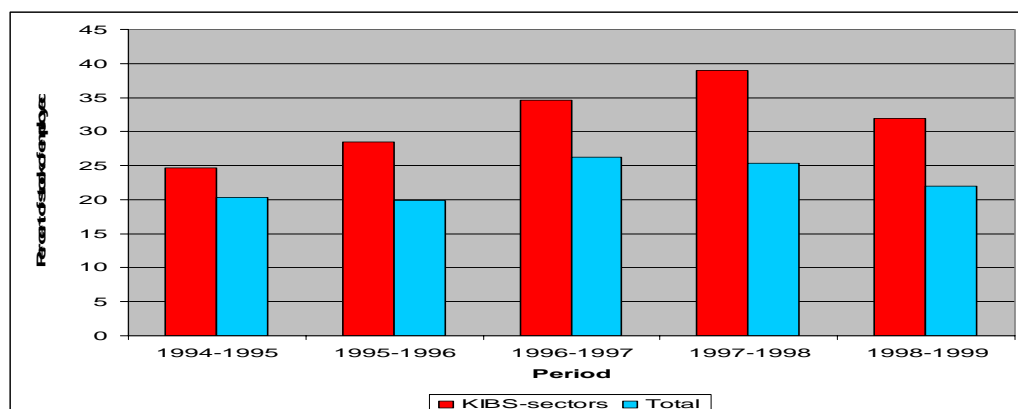
4.1 Regional distribution and net change of employment

The knowledge intensive business services are strongly concentrated to the largest labour market regions in Norway. The four largest city regions include approximately 60 per cent of the total national employment in the KIBS-sectors. During the 1990s there have been a tendency towards increased concentration due to the fact that all remaining regions share of the employment did decrease from about 40 per cent in 1994 to approximately 38,5 per cent in 1999. The concentration is further illuminated by an increase in the share of employment in the capital city of Oslo from around 21 per cent up to about 24 per cent during this period. The net increase of employment was also much higher in the KIBS-sectors than in the general economy.

4.2 The level and structure of gross recruitment

There are reasons to expect higher gross mobility in the KIBS-sectors than in the general economy. In figure 4.1 the gross entries to job in the KIBS-sectors are compared with the total gross mobility to job in all sectors of the economy. The figures represent the national average in the time period 1994-1999, and the rates are measured in relation to the total stock of employed in the KIBS-sectors the first year in each two-year periods. There are clearly higher mobility in the KIBS-sectors compared with the total economy. The differences seem to be positively correlated to the business cycle, with the highest differences in mobility in the strongest growth years of 1997 and 1998.

Figure 4.1 Total gross entries to the KIBS-sectors and to all sectors 1994-1999. Norway.
Per cent of stock of employed.



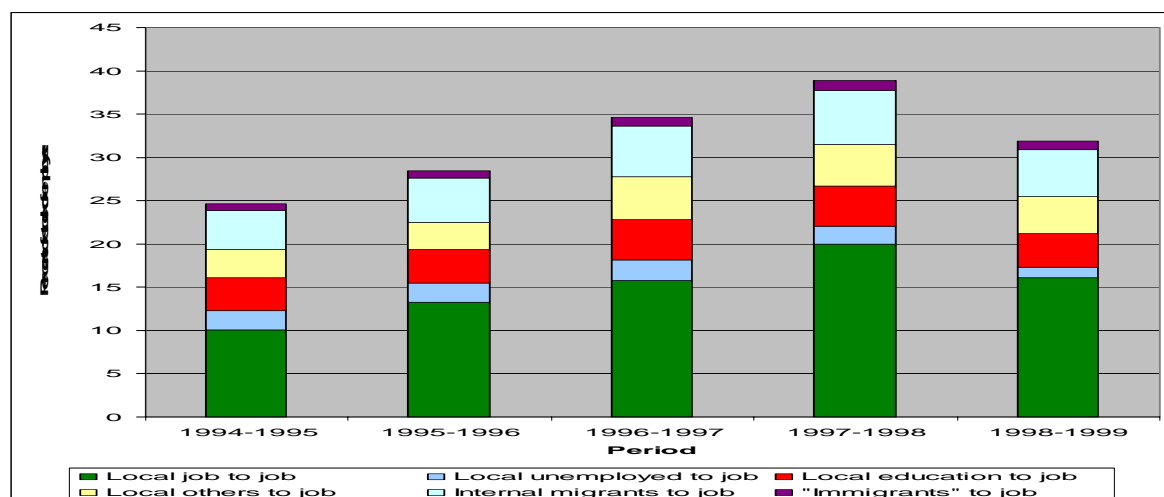
Gross recruitment by labour market statuses

What do characterize the flows of recruitment to the KIBS-sectors? From which types of persons (status groups) do the sectors recruit? As underlined above KIBS seems to be increasingly interwoven in innovation and production processes in other industries. As the sector is also fast growing, we would expect recruitment directly from the educational system as well as from other branches. The more marginal part of the labour market, here represented by the unemployed and other persons outside the labour force, should accordingly be expected to represent a somewhat less important "pool" for recruitment. On the other hand geographical mobility is expected to be of importance. Due to the fact that the KIBS-sectors have a central location, the pattern of migration is also expected to be more than average centralised. International recruitment may as well be of importance. Much international co-operation across countries may encourage labour mobility both within the sectors and between countries.

In figure 4.2 different status groups break down the total *gross* entries to the KIBS-sectors. The figures are also here derived from the national average.. The figure shows the importance of recruitment through job-to-job mobility. In the first part of the time period the job-to-job mobility represents slightly below 50 per cent of all gross mobility to the sector. This figure increases to well above half of the total gross mobility towards the end of the 1990s. Transitions directly to job from the education system are definitely of importance, but the recruitment from in-migration from other regions in Norway is generally of even higher importance. The recruitment from persons outside the labour force, "local others to job", is

also of importance and in the end of the period almost as important as transitions from the education system. The transition to job from unemployment and immigration is of somewhat minor importance.

Figure 4.2. Gross entries to the KIBS-sectors 1994-1999 broken down by different status groups. Norway. Per cent of stock of employed.



4.3 The structure of net recruitment in the KIBS-sectors

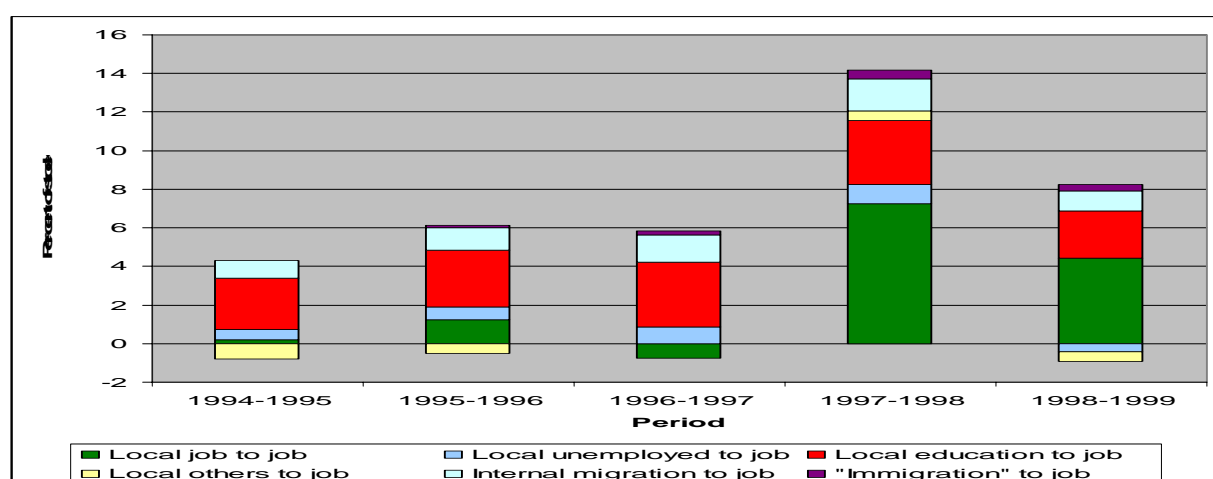
Net recruitment by labour market statuses:

The gross recruitment flows to the KIBS-sectors have also its opposite transition flows out of the sectors.. It is perhaps even more interesting to measure the net effects of these gross mobility flows of labour. Are the job-flows to the KIBS-sectors from other sectors higher or lower than the flows of labour from the KIBS-sectors to other sectors? Are the KIBS-sectors winners or losers in the competitions of mobile labour?

Figure 4.3 shows the *net* entries to the KIBS-sectors broken down by different status groups. The figure represents the average for the whole nation and all net flows are measured in relation to the total stock of employed in the KIBS-sectors. When we turn from gross to net entries the transitions from education to job definitely increase in importance. This is due to the fact that the recruitment from education is more one-way directed compared with all other types of transitions. The net effect of this transition was highest in the strongest growth years of 1997 and 1998. The net recruitment through internal migration is also generally positive, which means that the number of in-migrants to jobs in the KIBS-sectors is higher than the corresponding number of out-migrants from jobs in the KIBS-sectors. The importance of

migration is as well highest in the strong growth year of 1998. Recollecting the strong importance of recruitment through gross job-to-job mobility, it is remarkable to notice that the gross flows out of the KIBS-sectors to other sectors were almost as high as the in flows during the three first years of the period, and from 1996 to 1997 even higher than the gross in flows. Thus, in these years many workers have left the KIBS-sectors to start working in other sectors, signifying a flow of knowledge embedded in workers from the KIBS-sectors. This changed remarkable towards the end of the 1990s where the net recruitment from job-to-job mobility definitely became the most important transition. One possible explanation is that the KIBS-sectors first start to become the winners in the job-to-job mobility when the general labour market is passing a certain threshold of tightness. The number of jobs in Norway increased throughout the whole period from 1993 to 1999, but it was first in the last years of the 1990s that the increased tightness gave severe bottleneck problems in the labour market. The results indicate, however, that the KIBS-sectors were able to increase its employment strongly at the expense of other sectors by positive net effects of the job-to-job mobility in the local labour markets in the end of the 1990s. The net effects of unemployment to job were also positive, except from the year 1999. The net effects of immigration to and emigration from job are mostly positive with a slight increase towards the end of the period. The net effects of mobility to and from others outside the labour force are mostly negative except from the strong growth year of 1998.

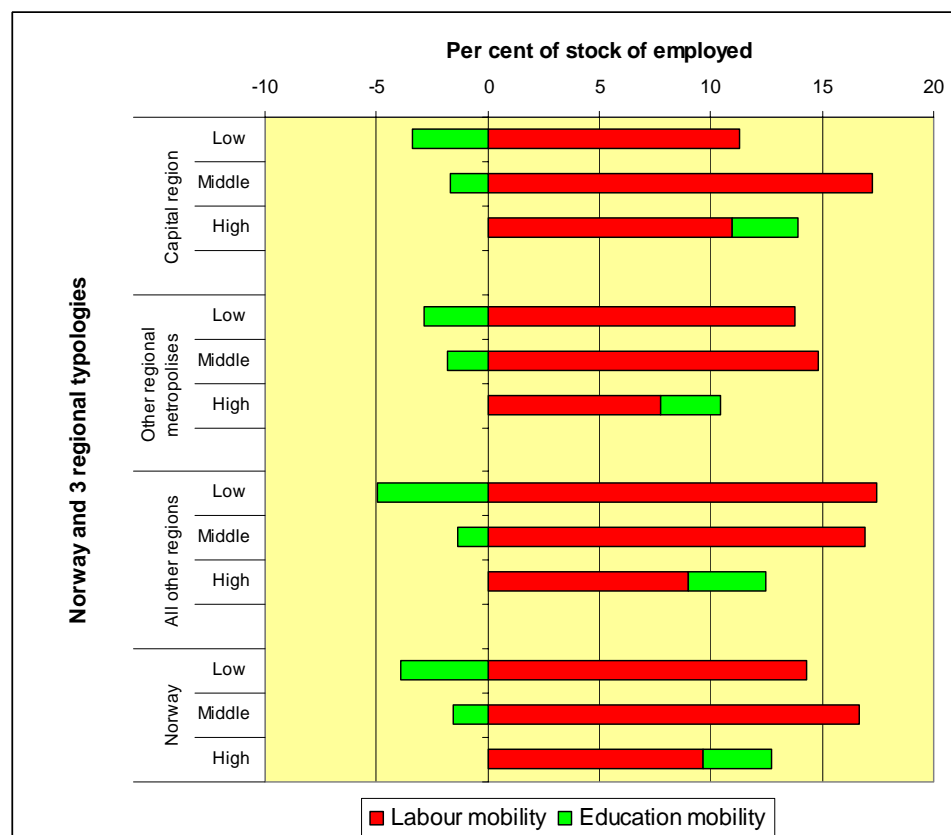
Figure 4.3. Net entries to the KIBS-sectors 1994-1999 broken down by different status groups. Norway. Per cent of stock of employed in the KIBS-sectors.



Net recruitment by education

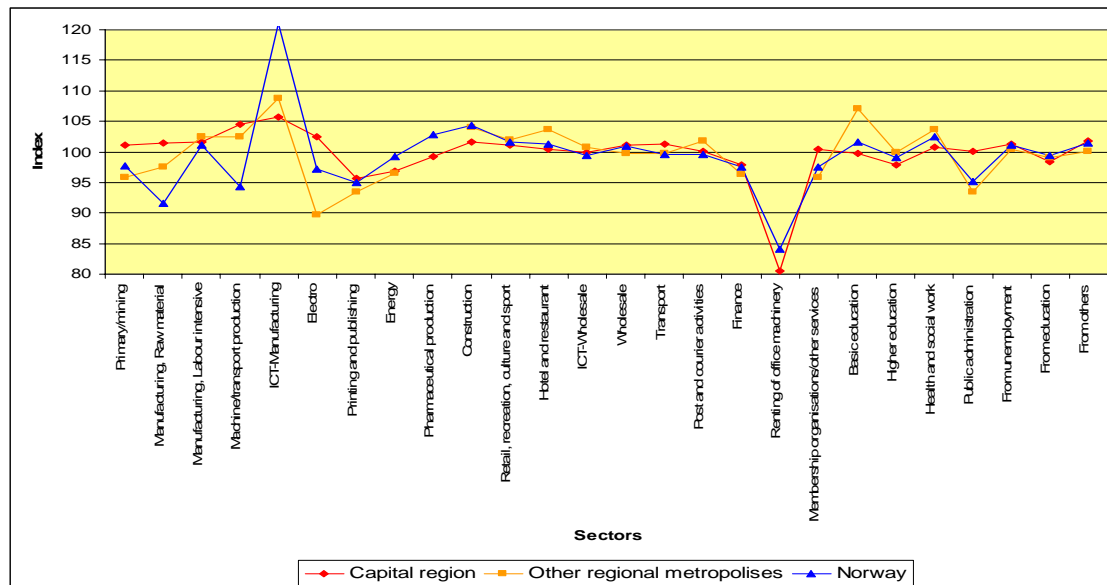
Figure 4.4 shows the employment change in the KIBS-sectors by education, which is further broken down by the effects of labour mobility and education mobility. The education mobility means that employed persons change their education level from lower towards higher education, which here means from low (compulsory), middle (secondary) and high (post-secondary) education. The results are presented for the nation as a whole and broken down by three typologies of regions. The effect of labour mobility is dominating the total change of employment. The national figures shows that the net growth of both low and middle educated employed were somewhat higher than the growth of high-educated persons. The growth rates are especially high for middle educated labour in the capital region and for low and middle educated labour in regions outside the biggest urban regions. There are generally positive effects of labour mobility and the capital region shows stronger labour mobility effect for higher educated labour than the other regions. It is, however, important to have in mind the educational structure of the KIBS-employment, where the employed at the national level is distributed with approximately 5, 44 and 49 per cent on low, middle and high education respectively. The highest share of high-educated labour is to be found in the most central regional typologies with 57 per cent in the capital region and almost 53 per cent in other regional metropolises.

Figure 4.4. Net change of employment in the KIBS-sectors by education 1997-1998 broken down by the effects of labour mobility and education mobility. Norway and 3 typologies of regions. Per cent of stock of employed.



In figure 4.5 the net recruitment to the KIBS-sectors from other sectors within the local labour markets is measured by average educational level. We use the average number of years under education both for persons leaving the KIBS-sectors as well as for those entering the sector. This brain-gain/brain-drain process is measured in relation to other sectors. The figures indicate a clear brain gain *to* the KIBS-sectors from parts of the manufacturing sectors, and especially then from ICT-manufacturing, and from construction and most distribution services. On the other hand there is observed a clear brain drain *from* KIBS to the large finance sector and especially to the smaller sector of renting of office machinery.

Figure 4.5. Average education level of persons that enter and exit the KIBS-sectors within the local labour markets 1997-1998 by sectors and main regions. Index: The education level of persons leaving the KIBS is set at 100.

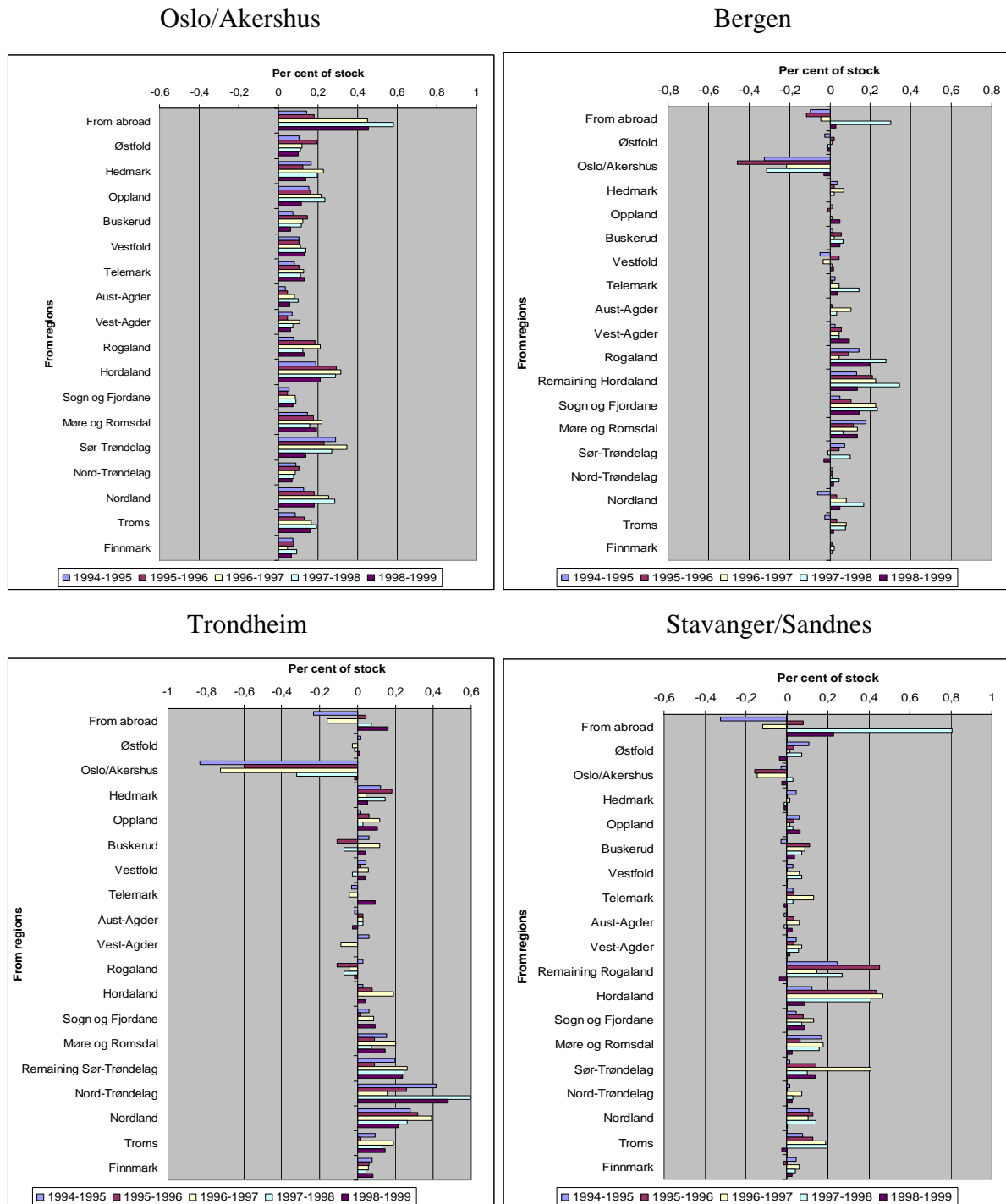


Recruitment by net in-migration

Figure 4.6 shows the net migration to the KIBS-sectors. The tendency of centralisation is clearly visible due to the fact that the capital region of Oslo/Akershus generally shows positive net in-migration to the KIBS-sectors from all other counties during the whole period 1994-1999. The highest net effects are to be found in relation to the counties of Hordaland and Sør-Trøndelag featuring the regional metropolises of Bergen and Trondheim respectively. The net effects of migration to the KIBS-sectors in the other main regions show a clearly neighbourhood structure, due to the fact that the gross in-migration from the surrounding counties are much higher than the corresponding gross out-migration. The KIBS-sectors in the regional metropolises of Bergen and Trondheim clearly show negative net effects in the migration with Oslo/Akershus. In spite of the fact that much of the gross in-migration to the KIBS-sectors in Bergen and Trondheim had its origin in Oslo/Akershus, the gross streams in opposite directions are clearly higher. This indicates, however, that the flows of labour to the KIBS-sectors through migration to a large extent become recruited from the largest university and high school regions. However, in the 1990s there seem first of all to be a flow of labour to the KIBS sector in the Oslo region and to some extent to the other large cities. Thus, the KIBS sector in the central regions of Norway benefits most from labour mobility. Less labour is

seen to flow from the KIBS sector in Oslo and the other large cities to other industries and other parts of the country.

Figure 4.6.. Net migration to the KIBS-sectors 1994-1999 in the main urban centres of Norway by county and abroad. Per cent of stock of employed.



Beyond the quantitative migration measures above it is also important to analyse the quality of the migration streams. Table 4..1 below shows like figure 4.5 above the in- and out-migration of labour measured by the average number of years under education. The average educational level of out-migrants is set at 100, so indexes above or below 100 indicates a brain gain or brain drain through the migration processes. It is, however, important to notice that the average educational level of out-migrants from the KIBS-sectors in Norway exceeded the corresponding educational level of in-migrants to the sector in this period. One reason may be the very strong growth in this sector in a generally very tight labour market, making it necessary to employ labour from more marginal parts of the labour force. The capital region did, however, experience a brain gain in the migration processes with all other regions except from other regional metropolises. All regions outside the capital region experienced a brain drain in the KIBS-sectors through the migration processes in this period.

Table 4..1.. Average education level of in- and out-migrants to the KIBS-sectors 1997-1998 by typology of region. Index: The education level of out-migrants is set at 100.

To region:	From region:	Capital region	Other regional metropolises	All other region	Norway
Capital region	-	-	98,8	100,2	-
Other regional metropolises	98,2	98,2	96,9	97,0	-
All other region	98,4	98,4	98,9	98,4	-
Norway	-	-	-	-	98,4

5. Conclusion

The paper departs from a seemingly disagreement between theoretical propositions stressing the importance of the KIBS sector as an innovation agent, and empirical results from quantitative innovation surveys. KIBS are increasingly seen as a vital source of information, advice and specialised knowledge for other industries and are seen to have a strategic role in stimulating innovation processes, particularly in large cities. However, the alleged importance of KIBS does not show up in empirical surveys. The surveys generally regard KIBS (or consultancy firms) as less important information sources and innovation partners, far less important than actors along the value chain, and than information from fairs and exhibitions.

The paper somewhat supports the conclusions from the empirical surveys, pointing to the fact that parts of the literature attach larger importance to the role of KIBS in innovation processes

than can be confirmed by empirical results. Thus, the Norwegian section of the Community Innovation Survey demonstrates that 45% of Norwegian firms do employ consultants as an information source when innovating. More than half of these firms again rate the importance of consultants as low, meaning that just about 20% of Norwegian firms see consultants as being of some or of high importance as information source. These clients seem first of all to obtain relevant, special competence that they do not have themselves from the consultants, according to our own survey to consultant firms. Thus, consultants do not engage so much in upgrading of the core competence of their customers.

Interesting enough, a larger part of firms in the Oslo region than in the rest of Norway regards consultants as an important information source when innovating. According to our survey two thirds of the clients think that proximity to consultants stimulate increased use of these in innovation processes. Supply of some knowledge-intensive services is also seen to necessitate dense co-operation and frequent face-to-face interaction between knowledge providers and clients. Thus, firms in central areas may benefit more from collaboration with consultants than firms in less central areas, as often stated in the literature.

The low importance attached to KIBS (or consultants) in for example the Community Innovation Survey in Norway may rely on the fact that the survey only seizes some of the roles played by KIBS in innovation processes. Surveys do not, for example, map knowledge flowing from KIBS firms that do not interact directly with other firms. An important type of knowledge spillover is seen to occur through the mobility of workers. Knowledge may flow from KIBS firms to other industries when employees change job. Thus, the paper discusses the question if knowledge flows from the KIBS sector to other industries, and from Oslo to other parts of Norway through the mobility of workers.

We are not able to give a definite answer on this question by use of the data in the paper. However, the result shows that the gross flows to and from the KIBS sectors are much higher than in the general economy. The job-to-job mobility contributes with more than 50% of the annual gross recruitment to the sector. The data also demonstrate that the gross flows of workers out of the KIBS sector to other sectors were almost as high as the in flows to the KIBS sector several years in the 1990s. Thus, in these years many workers left the KIBS sector to start working in other sectors, signifying a flow of knowledge following the workers

out of the KIBS sector. This direction of the net flow changed remarkable towards the end of the 1990s when the KIBS sector expanded significantly. This sector then gained a lot from the mobility of workers between industries. The figures indicate a clear brain gain to the KIBS-sectors from parts of the manufacturing sectors, and especially from ICT-manufacturing, and from construction and most distribution services. On the other hand there is observed a clear brain drain from KIBS to the large finance sector and especially to the smaller sector of renting of office machinery.

Studying mobility of workers between geographical areas, a clear pattern emerges as regards the Norwegian KIBS sector. The 1990s demonstrated first of all a flow of knowledge to the KIBS sector in the Oslo region and to some extent to the other large cities. Thus, the KIBS sector in the central parts of Norway benefits most from labour mobility. Less knowledge is seen to flow from the KIBS sector in Oslo and the other large cities to other industries and other parts of the country.

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