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17

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Firm Foundations in the Knowledge Intensive Business Service Sector.

Results from a Comparative Empirical Study in Three German Regions

Andreas Koch*, Thomas Stahlecker**

Abstract

A key feature of the knowledge-based economy is a remarkable increase in the number of knowledge intensive business service firms (KIBS). KIBS are based upon highly specialised knowledge and they acquire knowledge in the course of the interaction process that takes place whilst they provide their services. As knowledge and its organisation are tied to personal capabilities and information, spatial "proximity" to providers and users of knowledge appears to be crucial for the foundation and early development of KIBS. The quality of regional environments (e.g. configurations of incubator and intermediate organisations or a regional "entrepreneurial climate") and the foundation and development of KIBS are obviously interrelated. Based upon a standardised survey, the present paper analyses regional differences in the foundation process and early development of KIBS in three German regions in a comparative way. The results of our descriptive analysis show strong regional ties of founders and KIBS firms during the founding process as a result of spatial proximity. With only slight differences, those ties could be observed in all three regions. They are primarily related to the former activities of the founder, the transfer of results and experiences into the new firm, and spatial proximity to the most important customers or other partners within the exchange of knowledge. Major differences can be derived with regard to the development of the firms (e.g. Munich KIBS firms show a much better development in employment), obstacles in accessing the regional market, and the general assessment of the regional framework conditions from the point-of-view of the KIBS founders.

Keywords: KIBS; firm foundations; interaction; spatial proximity; Germany

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1 Introduction

The new constitution of regional economies within the context of an altered division of labour depends more and more on the ability to exploit (endogenous) technological and knowledge potentials. The term "knowledge economy" refers essentially to the increasing importance of knowledge as the source of wealth creation. With emerging global markets offering new potential to optimize the production and innovation function for all firms, the value of knowledge and unique practices as a basis for competitive advantages have become even more pronounced. The value of knowledge is obvious in today's economy when small start-up firms with limited resources (plants, people, accumulated capital, land, etc.), but with unique knowledge or practices, fetch very high prices in the stock market. Sölvell and Birkinshaw (2000) point to the example of Lucent Technologies which – on May 28th 1998 – paid roughly 1 billion $ for a tiny company in Maryland called Yurie Systems Inc., specializing in ATM and IP telephone technologies. Yurie had sales of 51 million $ in 1997. Obviously, technology and knowledge intensive firms contribute considerably to innovative activity in newly emerging industries such as biotechnology and computer software (see Audretsch, 1995), as well as in inter-relationship with mature or modernising (manufacturing) branches. It is known from entrepreneurship research that the inter-relations between newly founded innovation-oriented or knowledge-intensive firms and existing firms depend, among other things, on the degree of modernisation on the demand side (e.g. manufacturing or service firms) (Almus et al. 2001, p. 38). Accordingly, it can be assumed that regional innovation and production systems – as they are usually constituted to a large extent by innovation activities of existing firms – have a significant impact on the foundation activities as well as on the development of newly founded firms.[1] Within these processes of inter-relationship – which can also be applied to other organisations (e.g. universities, R&D laboratories, suppliers, etc.) – spatial "proximity" clearly matters.

Speaking of technology and knowledge intensive firms, a remarkable increase in the number, foundation rates, and employees since the 1980s has to be stated for the so-called knowledge intensive business service sector (KIBS). For Czarnitzky and Spielkamp (2000), KIBS are one of the main drivers of technical change and economic progress. These developments combine several sub-trends – shifts in the management philosophy (e.g. towards "leaner" firms, outsourcing of more functions, and towards a greater emphasis on customer relationships), structural shifts in the composition of demand, and unevenness in the application of new technologies to product and process innovation (Miles, 2003).

KIBS include *professional business services* (such as accountants and lawyers) and also services with a *scientific and technical knowledge base* (for instance, various types of engineering and information technology (IT) services). KIBS are knowledge intensive, in the sense that they are founded upon highly specialised knowledge – whether this is the kind of social and institutional knowledge involved in many of the traditional professional services – or the more S&T-related knowledge that came to the fore in recent years. Strambach (2002) points out that the growth of KIBS is an indication of the increasing need for transdisciplinary application of problem-oriented knowledge in innovations systems.

KIBS provide mostly intangible services. Specialised expert knowledge, research and development ability, and problem solving are the real products of KIBS. The provision of these knowledge intensive services requires in-depth interaction between supplier and client.

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[1] Nerlinger (1998) points to a strong orientation towards the regional market in the early phases of newly founded firms. This refers to customer as well as supplier relations and is causative to the small size of young firms.

Hauknes (1999) speaks of "qualified interfaces" in this context. KIBS are more innovative than ordinary service-providing companies. They are rather on the technology-push side and thus perform R&D, engage in innovation co-operations, and possess a larger share of highly skilled employees. KIBS are typically innovative branches of the service sector, with, for example, high levels of IT uptake and pioneer new methods of IT use. They also supply input for their client's innovation processes, by providing their special knowledge that can aid the development, choice, and implementation of innovative solutions to the problems that their clients face (Miles, 2003).

Against the background of an increasing importance of KIBS, both within national and regional innovation systems – and as a key feature of the knowledge-based economy, the 1990s have seen KIBS being examined within the political as well as the scientific debate (Almus et al., 2001; Meyer-Krahmer/Lay, 2001; Strambach, 1995). In entrepreneurship research, KIBS were investigated for example by Almus et al. (2001) or Santarelli/Piergiovanni (1995). They made quantitative studies on KIBS foundations by carrying out econometric analyses at regional levels or by gathering determinants on the start-up intensity. These studies measure, for instance, start-up frequencies, sectoral structures, and regional distribution. Even though important factors with regard to start-up, survival, and growth processes have been identified by generating large statistical data, results, statements, and determinants based on firm-level investigations have rather been the exception. Largely missing are in particular investigations dealing with the relationship between the existing regional economic and institutional structure and the founding pattern (e.g. sectoral distribution, innovation activities, interaction etc.) of young KIBS. These investigations seem even more important, the more obvious it becomes that the competition of regions is much more than just the sum of its competitive firms. Successful regions can be distinguished by their ability to adjust to changing (global) conditions and thus become learning regions. Location and regional renewal appears to be heavily influenced by exchanges of knowledge.

The main objective of this contribution is to analyse regional differences in the foundation process and early development of KIBS in three German regions. The selected regions show different characteristics and of their innovation- and production systems. Thus, spatial proximity within the process of foundation as well as of knowledge-transfer may play a different role.

The paper is organised as follows: In the next section, the conceptual framework of the investigation, particularly with reference to the concept of spatial proximity and its application to newly founded KIBS, will be outlined. Section 3 focuses on the spatial view, explains the selection criteria of the regions and gives an overview of some KIBS related characteristics of the three regions included in the empirical study. The database and methodology will be introduced in section 4. The empirical results of our investigation are described in section 5. Structural firm characteristics of the surveyed KIBS (5.1) are followed by a presentation of the context of the KIBS ventures (5.2). A closer look at aspects of interaction and co-operation activities within the context of knowledge-exchange and its organisation is taken in section 5.3. Finally, section 5.4 comprises the founder's assessment of regional characteristics at the time of foundation. In section 6, the major results of the comparative analysis will be summarised and appraised.

2 Regional innovation and production systems, spatial proximity, and the foundation of KIBS

When explaining the foundation and early development of new firms in general and KIBS in particular, the demand side or "external" factors for firms and entrepreneurs appear to be crucial. In addition to entrepreneur-associated and firm-associated factors influencing the development of start-ups, environmental factors linked to the specific regional environment are current scientific objects studied in entrepreneurship research. Bruyat/Julien (2000) sum up the current debate as *"the dialogic between individual (the entrepreneur) and new value creation, within an ongoing process and within an environment that has specific characteristics."* In brief, entrepreneurship studies show an obvious shift to an interactive perspective, focusing on the interaction between the entrepreneur and his context (Thornton, 1999). For entrepreneurship, the networks (Malecki, 1997) and embeddedness (Granovetter, 1995) of the entrepreneur are regarded as of utmost importance. Entrepreneurship has to be analysed in a spatial context, as it is influenced by geographical variety (economic, political, social, and cultural) and it has an effect on geographical space and place (Stam, 2003).

In regional science, new firm foundation and development is often attributed to aggregated regional factors, such as urbanization and agglomeration, availability of space, accessibility of networks, or infrastructure (Reynolds et al., 1994; Storey, 1994). The idea that a region – or location – matters to foundation activities (including structural characteristics like growth, sectoral distribution, etc.) primarily derives from the resource-based view in economic geography. This particular conception puts the emphasis on the importance of regional starting conditions for new firms. Factor are the density of the local educational, science, and technology base, as reflected in the characteristics of the labour market (skills and qualifications); the volume and quality of training and education across different levels; the intensity of linkages between universities and industry; the quality and diversity of the research, science, and technology base as well as the availability of intermediate organisations of information and intelligence between economic agents and their wider environment (e.g. technology transfer organisations, financing institutions, consultants, patent attorneys, etc.). In addition to the incubator and intermediate organisations, Sternberg (2000) refers to an appropriate entrepreneurial climate, points to the importance of proximity within the founding process, and identifies egocentric networks as key elements of a regional *"entrepreneurial social infrastructure"*. As a result of the (potential) entrepreneurs' knowledge of those regional advantages, the start-up frequency increases – a self-enforcing cumulative process caused by regional factors is under way. As Richert/Schiller (1994) put it: *"The entrepreneur will select the firms' location because of information advantages and risk-reducing aspects within the region he knows best"* (e.g. former workplace, residence, etc.).

Regarding the foundation and early development of KIBS, beyond the entrepreneur's immobility and the resulting strong ties of founder and firm to the region, the specific characteristics of KIBS – particularly their knowledge-orientation – have to be considered. Strambach (2002) puts forward four main functions of KIBS in systems of innovation:

- the transfer of expert technological knowledge and managerial know-how,
- the exchange of empirical knowledge and best-practice from different branch contexts,
- the integration of the different stocks of knowledge and competencies existing in innovation systems, and
- the adaptation of existing knowledge to the specific needs of clients.

It is assumed that knowledge and its management is tied to personal capabilities and information (know-how, know-who) and has therefore a geographical component (Foray/Lundvall, 1996; Koschatzky, 2001). "Tacit knowledge" incorporated in business behaviour, routines, and attitudes is only available at certain locations where the respective learning processes can be realized. Storper (1995) coined the term "untraded interdependencies". The economic advantages of untraded interdependencies such as commonly shared industrial conventions and business practices, or a culture of co-operation between economic agents, arise from local clustering and specialisation. The latter are claimed to form part of a local nexus of relational assets playing a vital role in securing dynamic efficiency (Amin/Cohendet, 1999). Due to the existence of tacit knowledge, Hausmann (1996) assumes that face-to-face communication is the most effective form of gathering information. Through learning-by-interacting, information and knowledge for innovations occur and will be transmitted or implemented.

Based on these theoretical considerations, the following research questions serve as the guidelines for the empirical investigation:

1. Which patterns of KIBS foundations (i.e. sectoral distribution, R&D and innovation activities, growth) can be observed in the three regions and what are the major differences?
2. What is the regional and institutional provenance of the founders in the surveyed regions? What was typically the former activity/occupation of KIBS founders? What is their major competence with regard to experience and knowledge? Which role does the transfer of results/experience from the former activity into the new firm play?
3. What is the form of the sectoral and regional structure of the turnover? How strong is the regional market orientation of KIBS? What are the major obstacles in accessing the regional market? Are KIBS themselves demanding business services from their region?
4. Which modes of co-operation in knowledge and technology exchange are used?
5. How do newly founded KIBS assess the regional characteristics at the point of foundation? Which conclusions can be drawn from different demands to location conditions with regard to medium-term firm strategies or necessities?

3 A spatial view: selection and characteristics of the surveyed regions

As the aim of the study is a comparative analysis of foundation activities in a regional context, a selection of regions was carried out. Finally, three regions in the western part of Germany have been chosen. The selection of the regions was undertaken on the basis of a list of criteria:

1. In order to be able to account for intra-regional functional inter-dependencies, the study was carried out on the level of Planning Regions.[2]
2. Due to expected higher numbers of firm foundations and higher foundation rates in the KIBS sector, only agglomeration regions were taken into account. By selecting three regions of the same type, we also expected to account for inter-regional comparability.

[2] These German Planning Regions (Raumordnungsregionen, RORs) have no administrative function; however, their boundaries follow the borders of the counties they include; thus, data can be obtained by aggregation of county data. Another advantage of using RORs is that functional linkages between a central city and its region can be included in the analysis.

3. A number of agglomeration regions have been a priori excluded from the study because of special characteristics, which we supposed to have negative influences on their comparability to other regions. These have been, for example, all regions in the New Laender due to their different preconditions, regions inside the Ruhr Basin due to its special industrial structure and its characteristics as a "mega agglomeration" as well as the region of Frankfurt/Main due to the dominance of the bank sector in the city of Frankfurt.
4. The remaining ten regions were characterised along existing statistical data. A trade-off between comparability and also sufficient differences between the regions had to be made. From the existing literature it is known that the foundation rates as well as the intra-sectoral distribution of firm foundations depend upon certain elements of the regional economic structure (cf. Almus et al., 2001, Santarelli/Piergiovanni, 1995). Almus et al. (2001) found out, for example, that the foundation rate in the KIBS sector depends upon the regional industrial structure and the diversification of the regional industry, among others. Thus, our selection criteria were the structure and dynamics of the manufacturing and the service sector.

The three selected regions of Bremen, Munich, and Stuttgart show significant differences regarding the diversification and dynamics of their industrial structure. Moreover, they have undergone distinctive paths of development and they are embedded in different regional settings. However, regarding their size and their political functions (all are federal state capitals) and their institutional endowments (universities, administration, public institutions) they are quite comparable (table 1).

Table 1: Regional characteristics compared with regard to KIBS

	Bremen	**Munich**	**Stuttgart**
Techno-economic pre-conditions	dominance of traditional manufacturing firms and technologies few knowledge-based sectors segmented structure	strong manufacturing-service complex global players & hubs new industries high-technology orientation in various sectors	dominance of mature technologies three overlapping clusters: automobile, engineering, electronics mixture of global players and SMEs
Newly founded KIBS	below average KIBS start-up intensity underdeveloped KIBS sector few fast growing start-ups	above average KIBS start-up intensity cluster dynamics in various KIBS sectors radical innovations most important high-tech region in Germany	average KIBS start-up intensity predominance of technical KIBS strong orientation towards auto cluster incremental innovations
Origin of newly founded KIBS	few science-based KIBS foundations primarily endogenous start-up projects	science-based high-potential KIBS foundations of importance endogenous as well as projects from outside the region	primarily KIBS foundations out of regional economy few science-based "radical" KIBS foundations
Institutional arrangement	limited amount of intermediary actors few redundancies clear competencies "One-stop-shop" (Bremer Innovation Agency)	diversified institutional setting institutional "thickness" with several intermediary actors and redundancies	institutional "thickness" with several redundancies strong focus on "core" manufacturing sectors

Regulation, public support	political regulation and entrepreneurship support through one main institution local industry with small absorptive capacity for KIBS output	strong political intervention: cluster support as well as technology programmes auto, insurance, and finance sector with great demand for KIBS output	strong influence of KIBS foundations through presence and density of large firms numerous public support programmes
Innovation and production networks	well established existing network structure loose collection of ties with open supplier and preliminary work connections	loose coupling in regional innovation system openness to newly founded firms global firms as "hubs" for start-ups	strong network integration high entry barriers for newly founded KIBS into auto cluster closed networks with danger of lock-in
Strengths	open network structure (optimal size of network?) recognition of the importance of new technologies and services for structural change "One-Stop-Shop"	strong techno-economic sector with many innovation-oriented firms high-technology orientation global players "image" and soft factors of the region	powerful regional economic system many innovation-oriented firms mixture of global players and SMEs network integration as a risk-minimizing factor for start-ups?
Weaknesses	catch-up strategy with danger of imitating successful regions and technologies poor economic performance of surrounding territories	high labour costs and rents for offices as problems for start-ups big competition and market pressure as a result of strong existing and new firms	Strong focus of start-ups to regional "lead clients" as an obstacle for global market access dominance of mature branches (lock-in?)

Source: Stahlecker/Koch (2004, p. 20)

Both Stuttgart and Bremen possess a relatively high percentage of employees in the manufactuirng sector (close to the West German average and thus above the average of the metropolitan regions), while Munich shows a clear prevalence of employees in the service sector. Regarding economic change, Munich clearly is the most dynamic of the three regions. The service sector there grew significantly, but also – similar to Stuttgart – employment in the manufacturing sector declined during the 1990s. Bremen was less dynamic in this respect. Neither increased the percentage of employment in the service sector like the West German average, nor was the decline of the level of employment in the manufacturing industry as serious as in the other regions.

Based on a high-quality data source providing reliable information about KIBS foundation activities (special analysis of the ZEW Foundation Panel, cf. ZEW 2003), a few remarks with regard to the regions under investigation should be made: Concerning firm foundations in the KIBS sector, different trends are observable in the three regions. Apart from an increase (and a subsequent decrease) at the end of the 1990s (boom of the new economy), the foundation rates remained rather stable in the KIBS sectors of the three regions. The foundation rates are highest in Munich with a yearly average of 1.74 foundations per 1,000 employees. The respective rates for Bremen and Stuttgart amount to 0.53 and 0.87, respectively (West-German average: 0.85). In all regions, there is a prevalence of technical KIBS which is most distinctive in Stuttgart where they amount for almost two third of all foundations in the KIBS sector between 1995 and 2001.

With regard to KIBS, the foundation pattern (i.e. intensity, functionality, quality, and success) is closely interwoven with the regional economical and technological structure as well as the institutional set-up (Stahlecker/Koch, 2004). Particularly in regions with a dominance of the manufacturing sector, the pattern of start-ups is clearly inter-connected with these dominant branches. A strong economic as well as institutional influence – especially from embedded large firms – could influence the start-up dynamics, the specialisation pattern and finally the survival rate or the success of young companies. In analysing the regional pre-conditions for

KIBS foundations in Bremen, Munich, and Stuttgart it has to be noted that especially the structure of the regions‘ enterprise population (i.e. number of firms, size, sectoral distribution, technology/ innovation orientation, R&D intensity, regional vs. global market, etc.) and network configurations within their respective innovation and production systems differ significantly. The manufacturing sector in the region of Stuttgart for example – compared to Bremen and Munich – is dominated by a few large or global enterprises with strong linkages and networks in the region. Obviously the combination of a strong economic sector with a few core technology fields and the institutional (political) influencing control with regard to regional framework conditions strongly affects the KIBS founding pattern in various ways. KIBS firms unable to get access to already existing production and innovation networks (entry barriers) have – although their services may well be innovative – a clear disadvantage concerning growth or success.

In analysing the origin of the KIBS foundations in the three regions, differences can also be noticed: compared to the other regions, the KIBS sector in Bremen seems to be less developed and dynamic.[3] Munich has quite a few science-based, fast growing radical innovators in the shape of new KIBS (e.g. bio- and nanotechnology, ICT) and therefore gives evidence of an innovation system that is open to new technologies (Stahlecker/Koch, 2004). Although the Stuttgart region has some successful science-based KIBS start-ups, the innovation system seems to favour incremental over radical innovations. In fact, more “traditional“ or “conservative“ business plans – close to the existing technology paths of the automotive, engineering and electronics cluster - appear to be realised.

4 Database and methodology

As adequate firm micro data for an analysis of regional differences in the characteristics of new firms in the KIBS sector is missing, a new dataset has been created. In October and November 2003, a telephone survey with founders of start-ups in the KIBS sector was conducted in the three selected German regions (KIBS Foundation Survey).

The KIBS sector was defined according to the mainstream of relevant publications (for an overview and discussion of different definitions see Stahlecker/Koch 2004) and includes firms classified under the NACE-Codes 72, 73 and 74.1-74.4[4]. The surveyed population was restricted to firms that were founded between 1996 and 2003. Additionally, only originary foundations listed in the trade register have been considered.[5]

Based on these restrictions, the total population size in the three regions was 7,714 firms. The population sizes differed significantly between the regions: while Bremen had a total population of only 658 firms, the respective numbers were 3,995 for Munich and 3,061 for Stuttgart. Subsequently, all firms in Bremen have been included in the sample while in Munich and Stuttgart random samples, stratified by the 3-digit sectoral attribution, of 734 and 720 firms respectively have been drawn.

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3 Several interviewees pointed to the small number of (fast) growing KIBS firms in Bremen.

4 Some sub-sectors of 744 have been excluded; for example, a significant proportion (up to nearly 40% in a region) of firms is classified as “Management Activities of Holding Companies” (74.15) that we did not consider as KIBS. Generally, it is distinguished between Technical KIBS (72.1-72.6, 73.1, 74.2-3) and Professional KIBS (73.2, 74.1, 74.4). For the exact nomenclature of the relevant sub-sectors see the Annex of the paper.

5 Subsidiaries, branch offices, new firms arising from mergers & acquisitions and firm reformations have been excluded from the survey.

Out of that sample, 547 successful interviews could finally be conducted, resulting in a quite satisfactory rate of return of almost 26%. The sectoral distribution of the firms included in our dataset corresponds by and large with the data provided by the Foundation Panel of the Centre for European Economic Research (ZEW) which can be regarded as the most reliable and detailed data source for firm foundations in Germany (see above, ch. 3).

In principle, the founder of the firm was interviewed. In case of firms founded by more than one person, one of these founders was interviewed. For the interviews, a standardised questionnaire covering a total of 29 questions was developed. The first part of the interview concerned individual attributes of the founder (e.g. context of business idea, former occupation and location of workplace, skills, etc.), the second part dealt with start-up characteristics of the firm and its development over time. In the following chapter, the prior outlined theoretical considerations will be examined along a descriptive analysis of the present dataset.

5 Empirical Results

According to the research questions raised in section two, the empirical analysis will cover the following aspects:

- Structural firm characteristics,
- context of the venture (i.e. former regional and institutional activities of the founders, existence of regional lead clients),
- interaction and inter-organisational relationships,
- assessment of regional characteristics at the time of foundation.

5.1 Structural firm characteristics: sectoral view, R&D and innovation activities, growth in employment

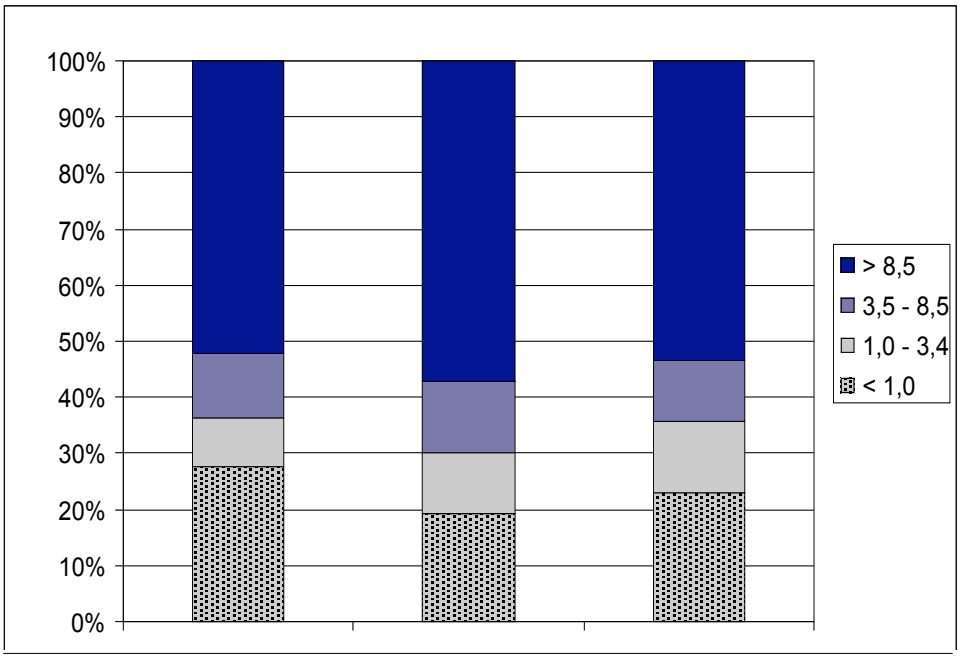
Out of the 547 interviewed firms, 61% are technical KIBS. In Bremen, their share is of only 52%, in Munich it is 60% while they account for more than 68% of all KIBS in Stuttgart. Nearly half of the firms in our sample were founded in the years of 1998, 1999 and 2000, roughly one third was founded in the subsequent years (2001-2003) while only 20% were founded in 1996 and 1997. More than 83% of the firms were founded as limited liability companies. The average age of the founders at the time of foundation was with nearly 38 years (39.9 in Bremen, 36.6 in Munich and 37.7 in Stuttgart) higher than in other studies (e.g. Brüderl et al. 1996).

The sectoral distribution of the interviewed KIBS in the three regions indicates, that the groups “Legal activities, tax consultancy, market research, business and management consultancy” (NACE group 74.1), “Architectural and engineering activities, related technical consultancy” (NACE group 74.2) and “Software consultancy and supply” (NACE group 72.2) present the highest share in our sample. Although our aim was not to measure KIBS foundation rates, the sectoral distribution of the KIBS firms in our sample reflects more or less the foundation pattern since 1996. Thus, our sample could well be – at least in a sectoral view – considered as being representative. It corresponds roughly with the data of the whole KIBS foundation activities provided by the Chambers of Industry and Commerce as well as the above mentioned data from the ZEW Foundation Panel (Centre for European Economic Research, ZEW 2003).

The amount of research and development (R&D) activity is certainly one of the most important indicators in assessing the quality of new firm formations in general or their knowledge-

intensity in particular. Firms carrying out R&D and innovation activities usually have a better performance, open new technological potentials, create employment opportunities, and serve as knowledge-bridges between providers and users (Nerlinger, 1998, p. 44). Usually, R&D activity is measured by the input factor "share of R&D expenditures in total turnover" (Pfirrmann, 1994). In the KIBS Foundation Survey, the interviewees declared that they had very high investments in R&D, up to 100% of the total annual turnover. On average, the investments in R&D have been at 18.3% of the annual turnover. In regional comparison, the R&D intensity between KIBS located in Bremen and Stuttgart is pretty much the same. On the basis of the four groups specified in figure 1, more than half of the KIBS in Bremen and Stuttgart have R&D expenditures larger than 8.5% of the total turnover. For Munich, this particular group of KIBS is even bigger: approximately 57% of the KIBS in our sample spend more than 8.5% of the total turnover for R&D activities.

Figure 1: R&D intensity as percentage of total turnover in 2003



Regarding innovation activities, the dataset allows to distinguish three types of innovation behaviour: (1) the development of own new services, (2) the improvement or further development of own existing services (incremental innovations), and (3) the incorporation of already developed services into the own portfolio. As the percentages indicate, a majority of the interviewees are engaged in various types of innovation activities. In total, only 13.6% of the interviewees stated that their firm did not engage in any innovative activity. In regional differentiation, despite slight variations concerning the sectoral distribution of the KIBS foundations, no significant differences are apparent. Most of the firms carry out multiple innovation activities. The formation of own new services in combination with an improvement of own services are the most common innovation pattern. Whether the formation of own new services can be used as an indicator for radical innovations with corresponding effects to regional economic or technological development is doubtful. Based on results of personal interviews with firm founders in the regions of Bremen, Munich, and Stuttgart (see Stahlecker/Koch, 2004), KIBS seem to carry out primarily incremental innovations, or at most, adding their services to more or less radical innovation activities conducted by their

clients. As will be shown in chapter 5.2, KIBS linkages to scientific institutions (e.g. universities and non-university research centres), occasionally being considered as inevitable for radical innovations, appear to be the exception rather than the rule. The integration of external services as yet another possibility to engage in service innovation activities is of secondary importance. The mean in all three regions is below 30%.

The development of the firms in our sample – measured in employment growth between the year of foundation and the end of 2003 – is shown in figure 2. The analysis must consider the fact that different foundation cohorts are regarded and that only surviving firms are included. The founding years vary between 1996 and 2002.[6] In order to compare the figures, average values were calculated for the end of the foundation year and for the end of 2003.

The employment figures show that KIBS located in Munich have obviously the best employment performance. This applies to the year of foundation (with 4.21 employees on average per KIBS firm, including the entrepreneurs) as well as to the end of 2003 with 8.14 employees on average. The KIBS in Bremen created on average 3.24 jobs at the end of the first year, while the respective value for the end of 2003 is 6.5 employees. Analogously, Stuttgart shows numbers of 3.67 employees at the end of the first year and 7.1 employees on average at the end of 2003. All in all, concerning employment growth, Munich seems to be the best seedbed for newly founded KIBS. Taking into consideration the fact that the foundation intensity of KIBS and thus the selection pressure in Munich is much higher than in the two other regions, the surviving firms in Munich obviously show a much better performance.

In addition to the better economic performance of the firms in Munich, it has to be noted that Munich has a higher percentage of team foundations (consisting of two and more founders) than the other two regions. In reverse, a high percentage of team foundations may also be an important reason for a better performance. Approximately 70% of the KIBS in Munich were founded by two or more persons.[7] The respective values for Bremen and Stuttgart amount to slightly more than 60%.

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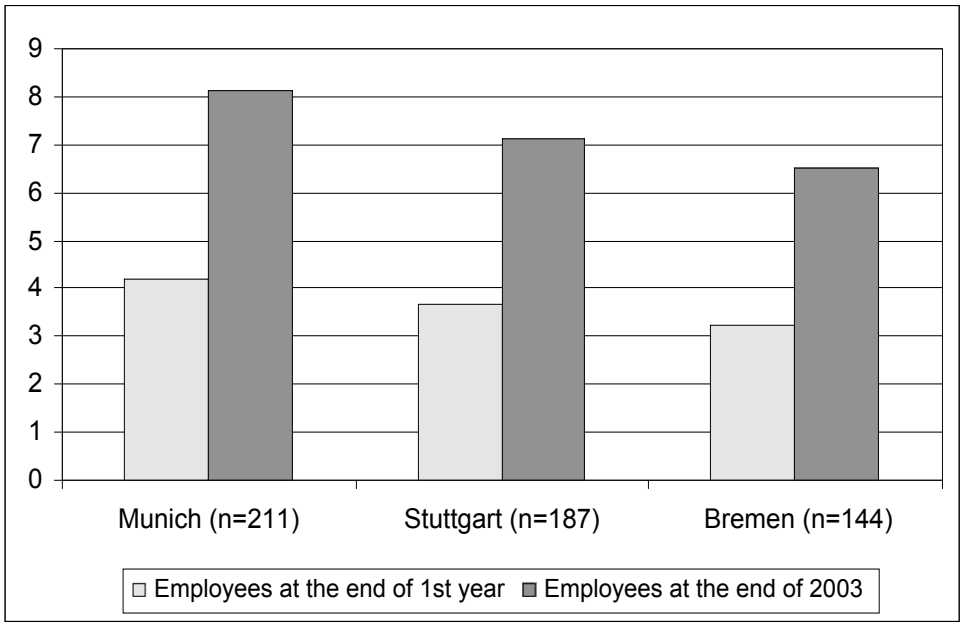
[6] Most of the firms were founded in the years 1999 and 2000 (foundation boom in the IT-sector). 2002 is the last year that could be compared with 2003 in terms of employment growth.

[7] Noteworthy is the high number of KIBS founded by more than two persons: More than 40% of the KIBS were founded by teams consisting of more than two persons.

Figure 2: Annual growth in employment between year of foundation and 2003



5.2 Context of the venture

New ventures can be differentiated by the context of their origin. By this context we refer to the provenance of the founder, as he is the main driver of his new venture. Principally, it can be distinguished between a spatial and an institutional context.

The spatial context is defined by the regional origin of the founder. From various existing studies it is known that the majority of the founders (generally around 80%) start their new businesses in the place where they have been living and/or working in before (Cooper, 1985; Schmude, 1995). The reasons therefore are mostly seen in the personal and social networks of the founders in the region where they live. Thus, there are better chances to perceive business ideas and opportunities and there is a higher probability to raise the necessary resources (Sorenson, 2003). However, sectoral and regional differences between the rates of founders with a local origin may exist. Some locations (like agglomerations) may attract business founders from outside; highly specialised branches may similarly require qualified entrepreneurs from outside (pull factors). Otherwise, structurally "strong" regions may also dispose of a larger "reservoir" of potential firm founders and may thus have higher rates of local founders; there may also be push factors, if for example the hinterland of a region offers few opportunities for start-ups. As table 2 indicates for our sample, in the region of Bremen, a significantly higher number of firm founders originate from outside the region. Regarding the relatively weak structure of the Bremen region, this might be rather attributed to the small "reservoir" of potential entrepreneurs than to the attractiveness of the region to potential firm founders from outside the region.

Table 2: Regional provenance and institutional activity of the founders immediately before founding

in %	Bremen (N=145)	Munich (N=210)	Stuttgart (N=190)	**Total (N=545)**
Founder stems from the region	72.4 *(0.052)**	80.5 *(0.357)*	80.9 *(0.314)*	**78.5**
University/public research	13.8 *(0.696)*	11.9 *(0.600)*	13.2 *(0.874)*	**12.8**
Large company (more than 500 employees)	22.8 *(0.757)*	21.9 *(0.975)*	22.0 *(0.746)*	**21.8**
SME (less than 500 employees)	35.9 *(0.110)*	28.1 *(0.340)*	29.0 *(0.573)*	**30.5**
Freelancer / own firm	25.5 *(0.040)***	36.2 *(0.111)*	32.6 *(0.849)*	**32.1**

/ significant on 10%/5%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

Second, founders also have an institutional background. This is referring to their activities immediately before the foundation of their new venture. As is known from the literature, most founders were employed in other firms before founding their own business (Koch, 2003, Koster/van Wissen, 2004). Another significant part starts a new business after working as a freelancer or even after already having started a new firm (serial or portfolio entrepreneurs, see Westhead et al., 2003). Founders from universities or public research institutions are the focus of many policy initiatives, but they only play a minor role regarding their quantity.

The institutional background of an entrepreneur could have implications for the early development of the new venture. The experiences, knowledge, and networks of the founder are influenced by his former activity. From a spatial point of view, the regional institutional structure may be reflected in the institutional background of the founders. Regions with a strong industry mainly based on large corporations, for example, can be expected to generate a higher rate of founders originating from these corporations. In the present empirical study, the differences between the examined regions are rather low (see table 2). However, while the rates for the different backgrounds of the founders in Munich and Stuttgart are nearly equal, in Bremen there is a significantly higher percentage of founders employed in small and medium-sized enterprises before the foundation, while the rate of founders who were self-employed or free-lancers before is low in comparison to the other regions. This can be attributed to the lower importance of the KIBS sector in Bremen[8] and to the overall weaker structure regarding the demand for KIBS (see Stahlecker/Koch, 2004).

Similarly, the former experiences of a firm founder, his routines and heritage (Klepper, 2001) as well as formal and informal transfers of subjects relevant for the new firm could influence the development of the venture. By our survey data, we are able to account for a selection of these transfers (table 3). In all regions, around 85% of the interviewed firm founders stated that they have been able to transfer anything resulting from their former activity. The most frequently mentioned objects of transfer have been services and products, business contacts,

[8] As a matter of fact, foundations by freelancers or self-employed are normally carried out in the sector of the former activity.

and business ideas. The inter-regional differences are insignificant, with one interesting exception. The transfer of business contacts from the former activity into the new one has been significantly less important in Bremen while it played a major role in Stuttgart. The fact, that more KIBS founders located in Bremen transferred results from the former activity into the new venture, and at the same time, business contacts seem to be less often transferred, appears to be a contradiction. Obviously, these two transfer types do not have to be connected. The reason, why business contacts were less often transferred in Bremen seems to have more to do with fewer business opportunities – due to a lower degree of modernisation of the Bremen business sector – for innovative KIBS firms.

Table 3: Transfer of results from former activity into the new venture

Transfer of… (in %)	Bremen (N=146)	Munich (N=210)	Stuttgart (N=189)	**Total (N=545)**
… results from former activity into new venture	87.0 *(0.407)*	84.8 *(0.921)*	83.6 *(0.527)*	**85.0**
… business ideas	31.5 *(0.442)*	26.7 *(0.340)*	29.6 *(0.812)*	**29.0**
… technologies	19.9 *(0.962)*	17.1 *(0.179)*	23.3 *(0.176)*	**20.0**
… services and products	37.0 *(0.646)*	31.4 *(0.121)*	38.6 *(0.259)*	**35.4**
… business contacts	24.7 *(0.050)**	30.5 *(0.889)*	36.0 *(0.063)**	**30.8**

** significant on 10%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

The context of a new venture does not only indicate the character of the origin of the new firm, it is also a means to describe the intensity of the linkages to the former activities of the founders. Subsequently, it can also be used as an indirect indicator for the potential of a new firm to contribute to regional and/or technological change. For example, founders originating from universities and research institutions can be supposed to create more radical innovations than founders who just continue the ideas they developed in former jobs. A transfer of well-known and already manufactured products and technologies may boost a secure development of a new venture, but it is more unlikely to contribute to radical changes in its environment.

In this context, the present empirical investigation accounted for one more indicator about regional change. The interviewees were asked whether they had a lead client in the initial stage of the development of their firm and whether this lead client was decisive for the firm's foundation. Table 4 reveals that in Bremen significantly less firms had such a lead client at the time of the firm's foundation. However, regarding the influence of the lead client on the firm's foundation, a higher (although not significant) percentage of the founders in Bremen declared that the lead client was decisive for the foundation. This result can be justified by the fact that Bremen (due to its economic structure) has a smaller pool of potential lead clients for new KIBS. Nevertheless, also due to the relative weakness of the regional economy in comparison to the other regions, it seems to be more important for new KIBS to rely upon a lead client in the early stages of the firm's development.

Table 4: Existence and significance of regional lead client at the time of foundation

in %	Bremen (N=145)	Munich (N=211)	Stuttgart (N=189)	**Total (N=545)**
Had a lead client in the region at the time of foundation	42.1 *(0.045)***	50.7 *(0.570)*	52.9 *(0.205)*	**49.2**
The existing lead client was decisive for the firm's early development (only firms who had a lead client)	67.2 *(0.237)*	57.9 *(0.436)*	60.0 *(0.833)*	**60.8**

*** significant on 5%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

5.3 Interaction and Co-operation

For all newly founded enterprises, but especially in the knowledge intensive and innovative branches, interaction and networking are important features for the development of the companies. Regarding the KIBS sector, user-producer interaction during innovation and service provision between service provider and client is frequently emphasised.[9] In the following, some important aspects of relational and spatial interaction of the firms in the KIBS Foundation Survey will be worked out and analysed. The aim of this section is to outline the role of regional settings for newly founded KIBS. First we will account for the significance of the local and regional market. Second, the role of spatial proximity in activities of knowledge creation and acquisition will be shown.

Demand for knowledge intensive business services in close spatial proximity can be an important factor for the development of newly founded KIBS. Since personal interaction between supplier and client is regarded as crucial for the provision of knowledge intensive services, it can be vital for the KIBS sector as a whole to be able to draw back upon a reservoir of potential clients in close spatial proximity. This might be especially important in the early stages of a firm's development as clients in long spatial distances require more resources, e.g. for travelling and communication. Moreover, the personal networks of business founders are normally focused on partners in close spatial proximity.

Regarding the regional distribution of the turnover of the firms surveyed within the KIBS Foundation Survey, the following can be observed (table 5): while in Bremen a significantly lower percentage of the turnover of the firms is effectuated in close spatial proximity, in Stuttgart a higher, although not significant, part of the turnover of the newly founded firm is generated inside the region. In line with other observations regarding the economic structure of the regions, it can be deduced that the potential of the Bremen region regarding the demand for KIBS is lagging behind. However, the firm's concentration upon the region of Stuttgart must not be exclusively positive. A lower outside orientation might also lead to lower exchange activities and thus to a higher risk of regional lock-ins. However, it can be

[9] On the basis of the KIBS foundation survey, Koch/Strotmann (2004) have recently examined the impact of functional and regional interaction and integration on the employment growth of the newly founded firms. They found out that close functional integration clearly matters for growth while, regarding regional integration, it is particularly a high spatial diversification (interaction on various geographical levels) that influences the early performance of the start-ups positively. In another recent research paper based on a qualitative study of newly founded KIBS, Koch/Stahlecker (2004) have described the significance of networks and interaction for the early development of newly founded KIBS along in-depth case studies.

observed that the economic structure of the region with regard to KIBS is partially reflected in the regional distribution of turnovers of the newly founded firms. Regarding the expansion of the spatial reach of the clients of the newly founded firms, no significant differences between the regions can be observed.

Table 5: Structure and dynamic of regional distribution of turnover

	Bremen (N=141)	Munich (N=205)	Stuttgart (N=184)	**Total (N=530)**
Percentage of turnover generated in the region of the firm	40.5 *(0.059)**	46.1 *(0.914)*	49.7 *(0.106)*	**45.9**
Percentage of turnover generated in the rest of Germany	47.8 *(0.208)*	43.9 *(0.801)*	42.4 *(0.362)*	**44.4**
Percentage of turnover generated in foreign countries	11.8 *(0.174)*	10.0 *(0.783)*	7.8 *(0.089)**	**9.7**
Expansion of spatial reach since foundation (% yes)	36.2 *(0.841)*	33.2 *(0.378)*	37.5 *(0.480)*	**35.5**

** significant on 10%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

Another example for the reflection of regional economic structures in the characteristics of firms in the KIBS sector is the sectoral structure of the clients of the newly founded KIBS (table 6). The most noticeable observation is the outstanding concentration of the KIBS in Stuttgart on clients in the manufacturing sector. This fact can be surely attributed to the regional industrial structure. On the other hand, it has to be remarked that Bremen has – regarding the sectoral distribution of employment – a similar structure, although this structure is not reflected in the structure of turnover of the KIBS in that region. This fact might point to internal characteristics of the manufacturing sector in Bremen that lead to a weaker demand for knowledge intensive services. The service orientation of the economy in Munich is – although weakly – reflected in the stronger significance of clients from the service sector. Also the importance of the public sector as a client in Bremen is noteworthy.

Table 6: Structure of turnover by clients

in %	Bremen (N=143)	Munich (N=207)	Stuttgart (N=185)	**Total (N=535)**
Turnover with clients from manufacturing industry	48.2 *(0.343)*	47.4 *(0.089)**	56.5 *(0.008)****	**50.7**
Turnover with clients from service industry	32.9 *(0.774)*	36.8 *(0.100)**	30.7 *(0.142)*	**33.6**
Turnover with other clients (e.g. public institutions)	19.7 *(0.062)**	15.8 *(0.982)*	12.9 *(0.044)***	**15.8**

//*** significant on 10%/5%/1%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

An important question is whether the newly founded KIBS intend to access the regional market and which obstacles they encounter thereby (table 7). In the KIBS Foundation Survey, it can be observed that no significant differences between the regions exist regarding the intention of the firms to access the market in close spatial proximity. Similarly, in all regions no more than one third of the interviewees indicated that they are able to access the regional market without any obstacles. An interesting fact is that supplier structures and networks seem to be significantly easier to access in Bremen than in the other two regions.

Table 7: Obstacles in accessing the regional market

% yes	Bremen (N=144)	Munich (N=206)	Stuttgart (N=190)	**Total (N=540)**
Not intended to access regional market	18.1 *(0.659)*	15.5 *(0.517)*	17.4 *(0.815)*	**16.9**
No obstacles in accessing regional market	31.3 *(0.728)*	35.4 *(0.243)*	30.0 *(0.375)*	**32.4**
No regional demand	17.4 *(0.338)*	12.1 *(0.157)*	15.8 *(0.644)*	**14.8**
Supplier networks not accessible	13.9 *(0.024)***	22.3 *(0.259)*	21.6 *(0.457)*	**19.8**
High regional competition	27.1 *(0.654)*	31.1 *(0.309)*	26.8 *(0.523)*	**28.5**

*** significant on 5%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

As cooperation, knowledge, and innovation are basic features of KIBS, it is important to shed a light upon these factors. The KIBS Foundation Survey accounts for the relevance as well as for the regional and institutional background of partners providing the access to new knowledge and technologies for the newly founded KIBS. It accounts moreover for different forms of cooperation in processes of knowledge acquisition and innovation.

The results of the KIBS foundation survey reveal no significant differences regarding the regional orientation of cooperation between the observed regions (table 8). It has to be noted, however, that in Stuttgart regional partners play a minor role than in Bremen and Munich. It is possible that the access to extra-regional partners is easier for the firms in Stuttgart due to the fact that a larger number of clients can be supposed to be large and global players, which enable the access to partners from outside the region. However, this result is somewhat in

contrast to the fact that the structure of the turnover in Stuttgart is oriented more strongly towards the region. It can be deduced that there is no compulsive correlation between clients and partners.

Table 8: Cooperation

% yes	Bremen (N=117)	Munich (N=175)	Stuttgart (N=156)	**Total (N=448)**
Larger or equal number of regional partners than partners from outside the region	47.9 (0.559)	48.6 (0.304)	40.3 (0.109)	**45.5**
Larger number of private partners than public ones	49.6 (0.000)***	72.0 (0.026)**	71.2 (0.078)*	**65.8**

//*** significant on 10%/5%/1%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

Highly significant differences between the regions can be observed when regarding the institutional structure of partners (table 8). Hereby, once more the relative "weakness" of the private sector in the Bremen region with regard to KIBS is reflected in the results. The majority of the interviewees in Bremen indicated that public partners are more important than private ones. In Munich and Stuttgart, contrarily, a significant number of respondents declared to mainly fall back on private partners. This detail is gaining more seriousness when considering the fact that the public research sector in Munich an Stuttgart must be regarded as better developed than the one in Bremen. While the potential of the private sector in Munich seems to be quite appropriate for newly founded KIBS, the opposite seems to be the fact in Bremen. With regard to future prospects for the development of the KIBS sector, this might be an eminent disadvantage of the Bremen region.

Regarding the forms of cooperation (table 9), it can be observed in the KIBS Foundation Survey that in Bremen more intense forms of cooperation like joint projects or cooperation contracts play a minor role than in Munich or Stuttgart. This can be interpreted as an additional evidence for the low potential of the private sector in Bremen with regard to the demand for and the cooperation with specialised knowledge intensive business services.

Table 9: Forms of cooperation in innovation processes

(% yes)	Bremen (N=128)	Munich (N=189)	Stuttgart (N=169)	**Total (N=486)**
Mission oriented research	19.5 *(0.736)*	20.1 *(0.479)*	16.0 *(0.281)*	**18.5**
Joint projects	48.4 *(0.001)***	67.7 *(0.023)***	64.5 *(0.323)*	**61.5**
Cooperation contracts	45.3 *(0.218)*	51.9 *(0.516)*	51.5 *(0.635)*	**50.0**
Informal contacts	68.0 *(0.301)*	72.5 *(0.731)*	73.4 *(0.526)*	**71.6**

/ significant on 5%/1%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

Last but not least, it is an important question whether the newly founded KIBS themselves create a demand for other business services. This is another indicator for the relevance of interaction. Moreover, by detecting the regional impacts of this kind of interaction, this can give further evidence to the role of regional characteristics in the foundation processes of new firms in the KIBS sector.

In table 10, the structure of demand for business services (like software, attorneys, etc.) is outlined. It is clearly perceivable that the demand for business services in Bremen can be satisfied quite less inside the region than it is the case in Munich. Stuttgart maintains a position near the average in this respect. This is an expression of the fact that the knowledge intensive service sector in Bremen is weaker established than in the other regions. The situation of Munich is, contrarily, outstanding in this respect.

Table 10: Demand for business services

% yes	Bremen (N=145)	Munich (N=209)	Stuttgart (N=188)	**Total (N=542)**
No demand	51.0 *(0.619)*	52.2 *(0.287)*	44.7 *(0.120)*	**49.3**
Demand principally satisfied in the region of the firm (those demanding services)	52.1 *(0.058)**	74.0 *(0.001)****	56.7 *(0.181)*	**61.8**

/* significant on 10%/1%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

Regarding the spatial and institutional patterns of interaction it has turned out that Munich and Stuttgart seem to be quite advanced in relation to Bremen. In Bremen, it is not only the regional market and the regional economic structure that offers less opportunities and potential to KIBS firms, but it is also the KIBS sector itself that is underdeveloped.

5.4 Assessment of the regional characteristics at the time of foundation

In addition to determinants focussing on the context of the venture and the interaction with external partners, the database also comprises information with regard to the assessment of regional characteristics at the time of foundation. As it is argued here that not only market and national framework conditions play a significant role within the founding and development process of new firms, but also the region, the founders were asked to indicate which role certain regional characteristics actually played at the moment of foundation. The following characteristics were indicated: (1) Importance of potential clients in the region, (2) Importance of companies carrying out the same business and innovation activities, (3) Importance of regional suppliers, (4) Assessment of regional business and innovation atmosphere, (5) Availability of qualified personnel and (6) Public research and technology institutions (table 11).

Table 11: Assessment of regional framework conditions at the time of foundation

Average assessment values given by the interviewees (1=unimportant … 5=very important)	Bremen (N=140)	Munich (N=205)	Stuttgart (N=187)	**Total (N=532)**
Importance of potential clients in the region	3.39 *(0.030)***	3.75 *(0.133)*	3.67 *(0.611)*	**3.63**
Importance of companies carrying out the same business and innovation activities	2.54 *(0.396)*	2.67 *(0.470)*	2.63 *(0.948)*	**2.62**

Importance of regional suppliers	2.00 *(0.032)***	2.31 *(0.155)*	2.25 (0.632)	**2.21**
Regional business and innovation atmosphere	2.63 *(0.013)***	3.08 *(0.036)***	2.93 (0.794)	**2.91**
Availability of qualified personnel	3.14 *(0.478)*	3.26 *(0.615)*	3.24 *(0.879)*	**3.22**
Public research and technology institutions (e.g. universities, non-university research institutes)	2.12 *(0.012)***	1.83 *(0.392)*	1.77 *(0.100)**	**1.89**

/ significant on 10%/5%-level, two-sided t-test with unequal variances; P-value for significance of differences in parentheses; calculation based on dummy-variables for the respective regions (e.g. for Bremen: 1=Bremen, 0=other).*

Source: KIBS Foundation Survey 2003, own calculations

As already pointed out in chapter 2, clients are the most important partners of KIBS. However, as to their disposability in spatial proximity, clear differences exist between the examined regions. While the founders in Munich and Stuttgart assess the existence of clients in the region of their firm as important, the figure in Bremen differs significantly. The search for geographical "proximity", both for KIBS and their clients, seems to be a common feature in all three regions. The slightly higher values in Stuttgart and Munich point to a bigger regional market with more opportunities (but also more competition among newly founded KIBS).

Compared to clients, companies carrying out the same business and innovation activities (serving as potential partners within the horizontal knowledge-exchange) as well as regional suppliers (including patent attorneys, lawyers, tax consultancy, etc.) obviously play a minor role. While no significant differences exist regarding the potential partners, the regional supply in Bremen is assessed less important than in the other regions. This fact corresponds with the regional structure of the markets, which is also weaker in Bremen (cf. table 5).

Asked about the assessment of the regional business and innovation atmosphere – as a "soft" indicator for the milieu in which firms are operating – as expected, this indicator is appraised significantly more important in Munich and less important in Bremen. A strong orientation towards the regional market and the institutional set-up (e.g. business behaviour, routines, organisation of the innovation process, access to regional networks) or a regional integration accordingly increases the demand for high-quality location conditions.

The availability of qualified personnel is certainly crucial for young (and small) KIBS. Disadvantages of small start-ups compared to large companies with regard to this particular location factor are evident. This applies primarily to regions as location for global players, like for example DaimlerChrysler in Stuttgart and BMW in Munich.

Finally, the KIBS founders were asked which role regional research and technology institutions played at the moment of foundation. As expected, the public research landscape is by and large assessed as mostly unimportant. However, it is interesting that in Bremen this factor is evaluated as significantly more important, even though public research in this region can be judged as relatively weaker compared to Munich and Stuttgart. This particular circumstance appears to be the reverse of strong links towards clients and an innovation process that is mainly shaped with knowledge that is tacit and experience-based and as Strambach (2002) accentuates, which is created in the context of use and which is not available from scientific institutions.

6 Summary and Conclusions

The results derived from the investigation of regional differences in the foundation process and structural characteristics of knowledge intensive business service firms can be summarised according to the research questions raised at the end of section 2:

1. *Which patterns of KIBS foundations (i.e. sectoral distribution, R&D and innovation activities, growth) can be observed in the three regions and what are the major differences?*

There is a general prevalence of technical services (groups 72.1 – 72.6, 73.1, 74.2/74.3) in the surveyed time period in all three regions (most significant and constant in Stuttgart). Munich is the city with the highest rate of KIBS foundations; on average of the seven years there were more than twice as many foundations of KIBS per 1,000 employees than in the West German average. In Stuttgart, the foundation of technical services is above the average while the professional business services are outperformed by the West German average. Bremen has **foundation rates** constantly below average.

The regional comparison shows that the **R&D intensity** between KIBS located in Bremen and Stuttgart is pretty similar: more than half of the KIBS in Bremen and Stuttgart have R&D expenditures larger than 8.5% of the total turnover. For Munich, this particular group of KIBS is even bigger: 57% of the KIBS in our sample spend more than 8.5% of the total turnover for R&D activities. With regard to innovation, a majority of the firms is engaged in various types of **innovation activities**. Only 13.6% of the interviewees stated that their firm did not perform any innovative activity. Concerning regional differentiation, despite slight variations in the sectoral distribution of the KIBS foundations, no significant differences are apparent. The formation of own new services in combination with an improvement of own services is the most common innovation pattern of KIBS.

The values indicating **growth in employment** show that KIBS located in Munich have obviously the best performance. This applies to the year of foundation as well as to the end of 2003. In total, the interviewed KIBS firms founded in Munich created over 2,500 highly qualified jobs. The KIBS in Bremen created on average 3.24 jobs at the end of the first year after foundation, while the appropriate figure for the end of 2003 is 6.5 employees. Analogously, Stuttgart shows figures of 3.67 employees at the end of the first year after the foundation and 7.1 employees on average at the end of 2003.

2. *What is the regional and institutional provenance of the founders in the surveyed regions? What was typically the former activity/occupation of KIBS founders? What is their major competence with regard to experience and knowledge? Which role does the transfer of results/experience from the former activity into the new firm play?*

Regarding the **regional provenance of the founders**, there are no significant differences between the regions of Stuttgart and Munich. Bremen, however, has a significantly smaller percentage of founders stemming from the region. This fact can be contributed to the weaker pool of potential entrepreneurs in the region.

As to the **institutional origin of the founders** it is again a deviating characteristic of Bremen, which is noticeable: in this region, a significantly smaller percentage of the KIBS founders has been active as free-lancers or self-employed before starting their own firm. This can probably be contributed to the low relevance of such professions in the region. The somewhat weaker demand for KIBS might be another reason. Moreover, a higher (although not significant) percentage of founders in Bremen originate from SMEs what might be a result of the weaker industry structure with mainly subsidiaries in the region.

Another important indicator of the context of the venture is the **transfer of results from the former activity** into the new firm. A transfer of existing results can mean an elevated security for the development of a new firm. In an aggregated view, an amount of such transfers can signify an obstacle for radical regional and technological change. Regarding the KIBS

Foundation Survey, the interviewed business founders had similarly high (85%) rates of transfers of results from their former activities similarly in all regions. Regarding the transfers on a more detailed level, it can be observed that the founders in Bremen have significantly less transfers of existing business contacts while those in Stuttgart have significantly more. Once more, a linkage to the economic structure in the regions might be drawn from that fact.

3. *What is the form of the sectoral and regional structure of the turnover? How strong is the regional market orientation of KIBS? What are the major obstacles in accessing the regional market? Are KIBS demanding business services themselves from their region?*

The **sectoral structure of the turnover** has different orientations in the examined regions: while the KIBS in Stuttgart effectuate a significantly higher percentage of their turnover with clients from the manufacturing industry (what can be attributed to the high significance of the manufacturing sector in the region), in the more service oriented region of Munich this percentage is significantly smaller. In Bremen, a significantly higher percentage of turnover is effectuated with public clients and the like (which can be regarded as a further evidence for the improper industry structure with regard to KIBS).

The **regional structure of the turnover** of the interviewed firms shows some differences as well. Once more, Bremen reveals to have a weaker demand for KIBS. A significantly lower percentage of the turnover is effectuated inside the region. This is also reflected in the **obstacles of accessing the regional market**. In Bremen, a slightly higher (but not significant) percentage of the firms does not intend to access the regional market and also a slightly higher percentage indicates that there is no regional demand for their services. On the other hand, it is surprising that the **access to supplier networks** is regarded to be significantly less difficult Bremen. This might be contributed to the higher competition in the regions of Munich and Stuttgart where the entrance of newly founded firms is much more difficult.

The **demand of the newly founded KIBS for business services** is an important indicator for their networks and their effects on the economic development. The outlined regional characteristics are also reflected in the regional structure of this demand. It is an indicator for the weakness of the KIBS sector in Bremen, that the interviewed firms can satisfy their own demand for business services quite less inside their region. In Munich, contrarily, a significantly lower percentage of firms has to satisfy its demand outside the region (strength of Munich).

4. *What are the characteristics of co-operation in knowledge and technology exchange and how is the exchange organised?*

Concluding from **regional co-operation** activities within the **knowledge-exchange** process, we may state that proximity to knowledge-providers and knowledge-users like clients, suppliers, other KIBS, R&D institutions, etc. clearly matters. The organisation of the co-operation projects happens primarily via informal contacts. This is the most common form in inter-firm co-operation. There is also a very high degree of firms co-operating through joint projects and co-operation contracts, which can be taken as an indicator for the user-producer interaction in the innovation process. Regarding the characteristics of co-operation in innovation processes and knowledge acquisition, differences between the regions exist. First, it is perceptible that close interaction with clients is less important in Bremen. For example, joint projects and cooperation contracts are significantly less important. Second, private partners are very much less important for knowledge acquisition in Bremen while in Munich they are extraordinarily important. This fact may point to the improper structure of the private sector for KIBS in Bremen.

5. *How do newly founded KIBS assess the regional characteristics at the point of foundation? Which conclusions can be drawn from different demands to location conditions with regard to medium-term firm strategies or necessities?*

As clients are the most important partners of KIBS, it is no surprise that a big majority of KIBS founders indicated that the **existence of potential clients** in the region was an important factor at the time of the foundation of the firm. Geographical „proximity", both for KIBS and their clients, seems to be a common feature in all three regions. The slightly higher values in Stuttgart and Munich point to a bigger regional market with more opportunities (but also more competition among newly founded KIBS), especially in growing markets with low entry barriers (e.g. IT and multimedia firms). Compared to clients, companies carrying out the **same business and innovation activities** – as partners within the horizontal knowledge-exchange – obviously play a minor role. Between the regions, no significant differences exist. The availability of qualified personnel is certainly crucial for young (and small) KIBS. Regarding this factor, disadvantages of small start-ups compared to large companies are evident. Asked about the role of regional (public) **research and technology institutions**, the vast majority of the founders declared that this factor has no significant importance. This particular circumstance appears to be the reverse of strong links towards clients and an innovation process that is mainly shaped with knowledge that is tacit and experience-based rather than science-based. Although the assessment of regional framework conditions from the point-of-view of the founders gives hints to the regional "atmosphere" for firm foundations in the KIBS sector, it remains an open question, whether medium-term necessities are satisfied as well. The advantages for KIBS as being strongly embedded during the early stages of the firm's existence – particularly by producing highly specialised services for regional clients – may well turn disadvantageous if the region as an arena for client-oriented knowledge-transfer remains the primary focus of the developing KIBS.

With this paper, we were able to show significant differences in the patterns of KIBS foundations in three German regions. By examining the foundation of KIBS on a firm level, the contribution is filling a gap in the existing entrepreneurship research literature, where firm foundations in the service sector have only been examined on highly aggregated levels so far. The theoretical assumptions as well as results from earlier qualitative studies could be mostly confirmed. It turned out, that there are strong inter-relations between the existing economic and institutional structure of a region and the foundation patterns in the KIBS sector. This is especially obvious for the region of Bremen. Between Munich and Stuttgart, the inter-regional differences seem to be on a more subtle level.

However, some interesting questions remain to be analysed as, for example, the assessment of the concrete contribution of KIBS for regional and/or technological development and change. Furthermore, our dataset certainly will allow to conduct more in-depth, multivariate examinations of the foundation patterns and its influencing factors.

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Annex

KIBS and sub-sectors in the NACE-classification

NACE-Code	3-digit sector (name)
72.1	Hardware consultancy
72.2	Software consultancy and supply
72.3	Data processing
72.4	Data base activities
72.5	Maintenance and repair of office, accounting and computing machinery
72.6	Other computer related activities
73.1	Research and experimental development on natural sciences and engineering
73.2	Research and experimental development on social sciences and humanities
74.1	Legal, accounting, book-keeping and auditing activities / tax consultancy / market research etc.
74.2	Architectural and engineering activities and related technical consultancy
74.3	Technical testing and analysis
74.4	Advertising

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