Knowledge intensive business services in non-core areas

Preconditions and strategies for value creation and competitiveness

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DEPT. OF HUMAN GEOGRAPHY | FACULTY OF SOCIAL SCIENCES | LUND UNIVERSITY

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Preconditions and strategies for value creation and competitiveness

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LUND
UNIVERSITY

DOCTORAL DISSERTATION

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Abstract

Knowledge intensive business services (KIBS) play a key role in economic development. Due to the complex and collaborative nature of their value creation processes, it is conventionally argued that they depend strongly on physical proximity to large client-, and labour-markets, as well as on closeness to advanced knowledge infrastructures. This thesis partially questions such conventional assumptions and investigates how KIBS manage to stay competitive in relatively peripheral locations, aided my modern communication technologies.

The thesis accounts for the results from in-depth qualitative case studies of KIBS in two Swedish non-core areas. How they compensate for local disadvantages, such as the absence of local agglomeration advantages (including a dedicated labour market) and long distances to collaboration partners, is the main focus of the cases studies. In conceptual terms, the thesis finds that a fruitful mechanism for disentangling the need for physical proximity, is the distinction of KIBS' activities into project stages, that are different in character, also when it comes to their requirements on interaction and proximity. Understanding their activities in terms of project stages, becomes the key to understanding when and how firm need to draw from traditional agglomeration advantages, or at least physical interaction, and not.

The thesis finds that local disadvantages and long distances are, in practice and in our type of economy, less limiting for the competitiveness of non-core KIBS than indicated by previous work. There is a strong timeline in this – "borrowed" agglomeration advantages are more accessible to non-core KIBS than ever before, due to very recent ICT developments and increased usage of the Internet. Relational factors, such as reputation and relationships on client markets, are important to the ways in which KIBS do business. However, the thesis clearly shows how technological change has allowed firm to establish those through temporary proximity and maintenance of links across distance. Also, low local labour turnover and dedicated employees in the non-core areas not only enhances KIBS organizational competences under the conditions of continuous learning by employees. It also strengthens long-term relationships on client markets, including extra regional ones. The combination of these advantages to a great extent counterweighs, or compensates for, the absence of traditional location advantages for KIBS in non-core areas.

In sum, for the case firm, the thesis reveals the mechanisms according to which non-core KIBS compensate for absence of local agglomeration advantages and are ultimately able to compete with similar KIBS in large urban areas, on the same markets. This, while the thesis observes firm that do survive competition and not just any firm, provides updated perspectives on firm growth in advanced sectors and in non-core regions, for a post-covid economy.

Key words: KIBS, Services, Non-core areas, Peripheral regions, Agglomeration advantages, ICT technologies.

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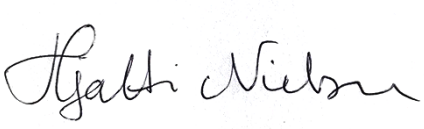
Signature  Date 20121-04-23

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The thesis is dedicated to those who fight against the odds

Table of Contents

List of tables

List of figures

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1. Introduction

1.1 Point of departure

Many peripheral areas in Sweden have for long time been losing people, jobs, and businesses (see e.g. Niedomysl & Amcoff, 2011; Gløersen et al., 2006). Competitive export-oriented manufacturing industries as well as the more traditional industries such as agriculture, fisheries, and mining, previously strong in many peripheral areas, have been recessing and often relocating to other parts of the world (see e.g. Nuur & Laestadius, 2007). Young people often move from peripheral areas to larger metropolitan areas to study and work and do not move back home since work opportunities relevant to their education and competences often do not exist in their home region. As a result, many Swedish peripheral areas have declined in population over the last three decades and this situation is even likely to worsen for some of them in the nearest future (Niedomysl & Amcoff, 2011; Amcoff & Westholm, 2007).

This development has not only applied to increased urbanization patterns in Sweden, but also to the national share of knowledge intensive firm, which are mainly located in large urban areas (see e.g. Martynovich & Henning, 2018; Eriksson & Hansen, 2013; Lundquist & Olander, 2010; Hermelin, 2007; 2009). As an example, when it comes to the creation of new kinds of job and productivity within the more novel and growing parts of the economy, peripheral areas have been lagging behind larger urban areas over the last few decades (see e.g. Martynovich & Henning, 2018; Eriksson & Hansen, 2013; Lundquist & Olander, 2010). Although there are some examples of knowledge intensive economic activities in peripheral areas, such areas have in general had problems in renewing their industrial structure in line with the more extensive development of the international economy towards an increasingly knowledge intensive- and service-based economy (see e.g. The Swedish Agency for Economic and Regional Growth, 2018; Lindberg & Rispling, 2018; Trippl et al., 2015a; Isaksen &

Trippl, 2014; Dubois, 2014; Eriksson & Hansen, 2013; Fitjar & Rodriguez-Pose, 2011; Lundquist & Olander, 2010; Anderson et al., 2010; Nuur & Laestadius 2007; Tödtling & Trippl, 2005). In other words, they have in a way ´lost their wings´ in the recent decades due to increased internationalization of the economy. Hence, introduction of novel economic activities is essential for economic development in such areas, e.g. where new- and old knowledge is combined (see e.g. Isaksen & Trippl, 2014; Asheim etal, 2006). It is therefore important to increase our understanding on how knowledge intensive economic activities are conducted in peripheral areas.

Numerous factors influence the competitiveness of firm and how regional economies evolve. When it comes to the competitiveness of novel and knowledge intensive economic activities, it has been argued that new knowledge is the most important resource and learning the most important process (see e.g. Asheim etal, 2006; Strambach, 2004; Lundvall & Johnson, 1994). The competitiveness of knowledge intensive firm is usually considered to depend on local agglomeration advantages and physical proximity to large and diversified labour-, client-, and knowledge markets (see e.g. Isaksen & Trippl, 2014; Trippl et al., 2015a; Aslesen & Isaksen, 2007; Simmie & Strambach, 2006; Grabher, 2004; Shearmur, 2012; Tödtling & Trippl, 2005; Porter, 1990; 1998; 2002). Such local advantages are however absent in peripheral areas (see e.g. Fitjar & Rodriguez-Pose, 2011; Anderson et al., 2010; Tödtling & Trippl, 2005; Anderson et al., 2001). As an example, relevant competences and knowledge resources, as well as local interfirm-networking opportunities and local demand are scarce (see e.g. Fitjar & Rodriguez-Pose, 2011; Isaksen & Trippl, 2014; Trippl et al., 2015a; Tödtling & Trippl, 2005; Anderson et al., 2010).

Long distances to large client- and knowledge markets have also been identified as a major obstacle for firm in peripheral areas, due to relatively high transport- and transaction cost compared to firm in large urban areas (see e.g. Anderson et al., 2010; Malecki, 2007). Although recent work suggests that firm may draw on distant agglomeration advantages, such logic is nevertheless based on that involved actors are located in large urban areas to begin with, i.e. the ability to draw on or ´borrow´ extra regional agglomeration advantages depends on location in large urban area (see e.g. Meijers & Burger, 2017; Moodysson, 2008; Bathelt et al., 2004). Thus, such logic does not apply to firm in remote- and low populated peripheral areas, which are double disadvantaged in the sense that they have to

compensate for both local agglomeration disadvantages and long distances to nearest ones (see e.g. Grillitsch & Nilsson, 2015; Trippl et al., 2015b).

At first glance, novel and more knowledge intensive economic activities should not do particularly well in peripheral areas. Knowledge intensive firm in such areas are not likely to have the capacity to compete on same markets as similar firm in large urban areas. They are more likely to base their competitiveness primarily on a small local client-, labour-, and knowledge market. However, recent work introduces examples of knowledge intensive firm in such areas that have been able to compensate for local disadvantages through capitalizing on distant ones (see e.g. Grillitsch & Nilsson, 2015; 2017; Jakobsen & Lorentzen, 2015; Drejer & Vinding, 2007; Huggins & Johnston, 2010; Varis et al., 2014; Fitjar & Rodriguez-Pose, 2011). As an example, although it may not be the general rule, a recent study shows that small knowledge intensive firm in peripheral areas have grown faster, or at least equally as fast, as similar firm in large urban areas, in terms of employment- and sales growth (Grillitsch & Nilsson, 2017). This has been displayed statistically on a regional scale, but we still know little about how these firm are able to do so (see e.g. Grillitsch & Nilsson, 2015; 2017; Huggins & Johnston, 2010).

The purpose of this thesis is therefore to investigate how knowledge intensive economic activities succeed in remote and low-populated areas in Sweden, with a specific focus on how software- and advertising firm in such areas create value and compete on client markets. The software- and advertising sectors more broadly belong to knowledge intensive business services (KIBS), which is one of the fastest growing sectors in the economy (see e.g. Strambach, 2001; Bettencourt et al., 2002; European Commission, 2012; 2014). The thesis investigates how local agglomeration disadvantages and long distances to client- and knowledge markets affect their competitiveness and how they compensate for such disadvantages during different stages of value creating processes (VCPs). The analysis explores their strategies on type of clients and projects, how they interact with and create value in collaboration with clients, how they source knowledge needed for value creation and learning, and how they deliver and implement the solution projects.

As discussed in more detail in the following chapter, there are different types of peripheral areas, e.g. ranging from small urban areas occupied by few thousands of inhabitants to very remote and sparsely populated rural areas with only few inhabitants. These may offer very different local business conditions for KIBS and

their abilities to create value and compete on client markets. Thus, in order to specify the type of peripheral areas at focus here I use the term non-core areas. While characterized by low population and long distances to nearest large urban areas, such areas are not rural in character or necessarily facing immediate or constant decline in population. Although far from offering local agglomeration advantages, the areas at focus have some levels of urbanization offering a small local client-, labour-, and knowledge market.

Furthermore, this study, through its specific focus on knowledge intensive VCPs, defines competitiveness as the ability of firm to offer similar type of value as competitors on common markets. As an example, if non-core KIBS offer similar value as similar KIBS in large urban areas do on common client markets, I consider them competitive.

Why non-core KIBS?

Given their key role in the contemporary knowledge- and service-based economy (see e.g. Strambach, 2001; Bettencourt et al., 2002; European Commission, 2012; 2014), KIBS may not only facilitate a positive economic development in large urban areas but also in non-core ones. Although we should avoid emphasizing KIBS as some sorts of divine catalysts in our society, a better understanding on how non-core KIBS create value and compete on client markets should nevertheless provide valuable knowledge for the potentiality of other non-core firm to evolve and develop in line with the more general changes in the international economy. I consider non-core KIBS VCPs and competitiveness appropriate objectives of study in this particular research for three main reasons.

Firstly, our understanding on knowledge intensive economic activities, including KIBS competitiveness, primarily derives from research focusing on large urban areas neglecting such activities in non-core areas (see e.g. Anderson, 2000; Virkkala, 2007; Hermelin & Rusten, 2007). This non-core negligence represents a clear empirical gap, calling for novel conceptual insights on how non-core KIBS create value and compete on client markets in spite of local disadvantages and long distances to large client-, labour-, and knowledge markets.

Secondly, a large and diversified local client-, labour-, and knowledge market is considered a key factor for KIBS competitiveness (see e.g. Shearmur, 2012; Strambach, 2008; 2010; Grabher, 2004; Aslesen & Isaksen, 2007a). Value

creation is characterized by high levels of face-to-face interaction between KIBS and their clients during projects, due to their complex and collaborative nature (see e.g. Strambach, 2008; 2010; Vargo & Lusch, 2004; 2014; Grönroos, 2008; 2011; Løwendahl et al., 2001; Miles et al., 1995; Bettencourt et al., 2002). The importance of physical proximity is therefore emphasized as one of the main reasons why knowledge intensive economic activities are mostly located in large urban areas (see e.g. Herstad & Ebersberger, 2014; Strambach, 2008; 2010; Grabher, 2004; Hermelin, 2007; 2009). Since non-core KIBS are double disadvantaged in this sense, they have to compensate for both absence of local agglomeration advantages as well as long distances to nearest ones through different means in order to create value and compete on client markets. Although recent findings display examples of knowledge intensive firm that have been able to overcome such double disadvantages, it is not clear how they are able to do so (see e.g. Grillitsch & Nilsson, 2015; 2017; Huggins & Johnston, 2010). Hence, in order to shed light on how they accomplish to do so, an analytical focus on different stages of VCPs is a relevant object of study.

Thirdly, KIBS are an appropriate representative for the contemporary knowledge-based economy and the sector has proven to play an important role in the process of economic development and change (see e.g. Strambach, 2001; 2008; 2010; Simmie & Strambach, 2006; Bettencourt et al., 2002; European Commission, 2012; 2014; Miles etal, 1995). I argue that if non-core KIBS are able to create value and compete with similar KIBS in large urban areas on common client markets, there are reasons for optimism regarding other types of non-core firm, whether belonging to the knowledge intensive- or more traditional part of the economy. Hence, the thesis might shed light on the more general possibilities for economic development and renewal in non-core areas.

Taken together, the thesis contributes to current- and larger debates on the ability of non-core firm to create value and compete on client markets in an increasingly global and knowledge-intensive economy. Through applying conceptual thinking from economic geography and service management studies, a sub-field of organizational studies, the thesis reveals if, when, and how local agglomeration disadvantages and long distances affects different stages of projects. The thesis also uncovers how non-core KIBS compensate for such disadvantages and thereby how they create value and compete on client markets.

1.2 Aim and research questions

Departing from the discussions above, *the aim of the thesis is to analyse how advanced and knowledge-intensive firm in non-core areas create value and compete on client markets in spite of local agglomeration disadvantages*. This is important in order to scrutinize further conceptual foundations regarding the competitiveness of such firm in non-core areas.

In order to accomplish the aim of the thesis, the following question is scrutinized:

How do non-core KIBS compensate for absence of local agglomeration advantages and long distances to client- and knowledge markets during different stages of projects?

In order to seek answers for this question, in-depth qualitative case studies were conducted on how VCPs are organized and carried out by software- and advertising KIBS located in non-core parts of Norrbotten County in N-Sweden and Kalmar County in the province of Småland in SE-Sweden. For contrasting purposes, case studies were also conducted on how such processes are organized and performed by similar KIBS in Malmö, constituting context for such processes carried out in areas offering local agglomeration advantages.

For the illustration of differences in regional business environments in the context of KIBS value creation and competitiveness, the study makes use of conceptual work highlighting the importance of local agglomeration advantages, inter-organizational networking, and physical proximity (see e.g. Tödtling & Trippl, 2005; Trippl et al., 2015a; Isaksen & Trippl, 2014; Asheim et al., 2006; Malmberg & Maskell, 1999; 2006; Porter, 1990; 1998). In order to divide projects in different operational stages characterized by high levels of interaction and collaboration between KIBS and their clients the research draws on work from service management studies, a sub-field of organizational studies (see e.g. Løwendahl et al., 2001; Vargo & Lusch, 2004; 2014; Grönroos, 2008; 2011; Aarikka-Steenroos & Jaakkola, 2012). Projects may be divided in three key stages in such context: i) *finding and signing new clients*; ii) *analysis of clients' needs and management of resources*; and iii) *delivery/implementation of the solution*. These form the core analytical aspects of the thesis. The analysis investigates how they are affected by local agglomeration disadvantages and long distances to client- and knowledge markets.

The thesis draws on an activity-oriented approach suggesting that the importance of physical proximity varies during different stages of projects depending on abilities of firm to source and combine local- and extra regional resources (see e.g. Moodysson, 2008; Hansen, 2014). On similar notes, it relies on a relational approach within economic geography, which views economic actions as contextual social actions and highlights the relational and interactive character of knowledge intensive value creation as well as the abilities of economic actors to draw learning and exchange knowledge across spatial boundaries (see e.g. Bathelt & Glückler, 2003; 2005; Torre & Rallet, 2005; Shearmur & Doloreux, 2015; Rodríguez-Pose, 2011). Hence, the research investigates the spatial organization of non-core KIBS VCPs and their relational character during different stages of projects as key analytical elements behind revealing the source of their competitiveness.

The study has an abductive and explanatory character. It may be understood as a conceptually informed empirical illustration characterized by an in-depth qualitative focus on few cases in their causal context. The purpose of the study is not to test conceptual work or provide broad generalizations on all knowledge intensive firm. Broader generalizations rest on large datasets, e.g. based on selected input- or outcome data available in the context of knowledge intensive economic activities. However, such empirical material offers no detailed qualitative insights on the process of value creation. The purpose of the study is therefore to scrutinize current conceptual work and provide new conceptual insights on knowledge intensive VCPs performed by non-core KIBS in their causal context.

The analysis is delimited to a national context, i.e. it focuses on how non-core KIBS create value and compete on client markets within and not across national borders. The main reason for this is that KIBS are by far small in size and they primarily compete on the local-, regional-, and national markets, highlighting the importance of physical proximity (see e.g. Strambach, 2010). In principle, it is large international KIBS that include a focus on global markets and such KIBS are predominantly located in large urban areas, highlighting such areas as entry points to global production networks (see e.g. Jacobs et al., 2016; Strambach, 2010; Hermelin, 2009; Faulconbridge, 2006; Bathelt et al., 2004). Hence, when focusing on the competitiveness of non-core KIBS, which are not typically affiliated with such global network, a national delimitation is reasonable.

For clarification, in the context of local agglomeration advantages (or disadvantages), a distinction can made between business related conditions and other local conditions such as the living environment and quality of life in broad terms for the local inhabitants. The conceptual and analytical focus of the thesis is entirely affiliated with business related conditions.

1.3 Contribution of the thesis

As suggested by Grabher (2018), the field of economic geography often views peripherality in relation to scarcities in, and obstacles to, knowledge intensive economic activities. In such sense, there has been a substantial "urban bias" (Shearmur, 2017), where, although rightfully, large urban areas are emphasized as champions of creativity and growth, while possibilities in peripheral areas are, often wrongfully, downplayed or hidden (Power & Collins, 2021). I argue that the competitiveness of non-core KIBS cannot be explained by conceptual understandings emphasizing the importance of local agglomeration advantages, and most importantly physical proximity to large client-, labour-, and knowledge markets. Based on such conceptual understanding, it is likely that their competitiveness is to some extent limited by absence of local agglomeration advantages and long distances to nearest ones. As an example, when it comes to location and type of clients and projects when compared with similar KIBS in large urban areas.

However, recent work suggests that this is not always the case (see e.g. Grillitsch & Nilsson, 2015; 2017; Jakobsen & Lorentzen, 2015; Shearmur, 2012; Fitjar & Rodriguez-Pose, 2011). This work argues that knowledge intensive firm in non-core areas may be equally or even more competitive as similar firm in large urban areas. Although these arguments are built on few studies and therefore potential residuals from how things are most often, these results imply that spatial dynamics of knowledge intensive value creation are not necessarily similar or parallel to agglomeration economies (see also Shearmur, 2012). This indicates the need to scrutinize previous conceptual work on knowledge intensive value creation and competitiveness. Hence, through focusing on different stages of VCPs in the context of local disadvantages and long distances to client- and knowledge markets, the thesis contributes to previous conceptual work on KIBS value

creation and competitiveness. A key factor in such context lies in highlighting how non-core KIBS compensate for local disadvantages in this sense through different means.

The thesis contributes to an empirical gap, given little research focus in the past on how knowledge intensive firm in non-core areas create value and compete on client markets (see e.g. Anderson, 2000; Virkkala, 2007; Hermelin & Rusten, 2007). The field of economic geography has hitherto treated regional- or other spatial levels as economic actors per se (see e.g. Massey, 1985), overshadowing a focus on activities taking place at the firm level (see e.g. Amin & Thrift, 2000). As a result, processes taking place within firm are often neglected, i.e. interactions among individuals within and beyond firm during VCPs (Bathelt, 2006; Bathelt & Glückler, 2003; Maskell, 2001; Swyngedouw, 1997).

Highly cited work within the field of economic geography on regional business environments are helpful in understanding their differences from a broad perspective, i.e. in explaining why some areas offer a better local business environment for knowledge intensive economic activities than other areas (see e.g. Tödtling & Trippl, 2005; Trippl et al., 2015a; Isaksen & Trippl, 2014; Malmberg & Maskel, 2002; 2006). In this context, research and conceptual developments have traditionally been conducted at sectoral levels, i.e. from a more macro and meso perspective (see e.g. Knoben, 2009; Beugelsdijk, 2007). Such work therefore illustrates general and/or aggregated patterns of economic activities and not so much on activities taking place within and between individual firm.

Although a focus on the regional level provides valuable insights about how regional economies develop, e.g. in terms of how regional industries or specific labour markets grow over time, it has also been argued that firm specifics are more important than the local business environment when it comes to understanding their performance (Beugelsdijk, 2007). A focus on processes taking place within and beyond individual firm provides insights on how value creation is organized and conducted during different stages of individual projects in their causal context, i.e. how such processes are affected by location and distances. These two approaches therefore represent two different, yet mutually complementing, ontological levels of investigation.

In order to understand how knowledge intensive firm in non-core areas create value and compete on client markets in spite of local disadvantages and long

distances; I argue that there is a need for research and conceptual development from a more process-oriented perspective focusing on relational activities taking place within and beyond individual firm. Hence, the empirical contribution made by the thesis therefore lies in the empirical material provided through in-depth qualitative case studies on how non-core KIBS compensate for not only absence of local agglomeration advantages but also long distances to the nearest ones, during different stages of projects. Through such a focus the thesis complements the rather traditional focus on the regional level within economic geography (see e.g. Knoben, 2009; Beugelsdijk, 2007).

1.4 Structure of the thesis

The text is structured as followed. In chapter two, a broad descriptive account on KIBS and their characteristics is provided with a special focus on the software- and advertising sectors. Chapter two also discusses different types of peripheral areas, including the type, identification, and selection of the areas at focus. This involves a descriptive account of various demographic- and economic factors in the non-core areas at focus in relation to other parts of Sweden. Chapter three provides a literature review of previous conceptual work relevant to the research focus. In chapter four, the analytical framework of the thesis is presented and discussed. Chapter five discusses methodological- and methodical approaches, including how the KIBS at focus were identified and selected and fieldwork conducted. In chapter six, the empirical findings are presented and discussed in a conceptual context. The final and concluding chapter discusses the main conceptual relevance and contribution of the thesis, including discussions on what its findings indicate for the more general economic development in non-core areas. The final chapter also involves short discussions on the policy relevance of the results and ideas for further research.

2. KIBS and non-core areas

2.1 KIBS

When compared with many of the more mature industrial- and manufacturing sectors of the economy, the evolution of the KIBS sector is a rather recent development (Strambach, 2010). In line with increased share of service industries in GDPs, the KIBS sector has grown faster than other sectors in the economy since the early 1990s in terms of both value creation (i.e. productivity) and employment (see e.g. Greenwood et al., 2005; Løwendahl, 2005; Aharoni, 1993). While the average growth for all sectors in the EU in the period 1999-2009 was 1.1%, business services grew by 2.38% on averages, and their growth is forecasted to continue in such relative terms (European Commission, 2014). In the same period, the average employment growth of all sectors was 0.77% compared to 3.54% in the business service sector. An important reason for this fast growth of the KIBS sector is that firm increasingly outsource parts of their production or services previously conducted in-house (European Commission, 2014).

All sectors of the economy are becoming more knowledge intensive (Miles et al, 1995; Howells, 2012). As pointed out by Kline and Rosenberg (1986), knowledge intensive value creation processes do not only take place within individual firm in a linear fashion. On the contrary, such processes are quite non-linear and collaborative, characterized by constant inter- and intra-organizational interactions and high levels of learning where external- and internal knowledge resources are combined and applied for economic purposes (Muller & Zenker, 2001). In order to stay competitive, firm may have to outsource certain aspects of their production or services, i.e. some parts of their value chain. In the past, outsourced activities mostly belong to the relatively low-skilled and routinized part of the value chain characterized by scale of production (see e.g. Howells, 2012). In line with increased knowledge intensity and complexity of the economy in general, such outsourced activities increasingly belong to the more complex and

knowledge intensive part of the value chain, demanding highly educated and skilled competences (Howells, 2012). As an example, these are marketing and communication management, hardware- and software development, financial services, R&D and protection of innovation to name a few (see e.g. European Commission, 2014; Bughin & Jacques, 1994). This is where KIBS offer their expertise and special abilities in identifying and applying external knowledge, new methods, and hence economic value to their clients´ activities (see e.g. Shearmur & Doloreux, 2019; Werner & Strambach, 2018; Muller & Doloreux, 2009; Muller & Zenker, 2001). Thus, KIBS operate in the more knowledge intensive part of their clients' value chain.

Due to these special capabilities, KIBS play an important role in contemporary economic development and change (see e.g. Werner & Strambach, 2018; Muller & Doloreux, 2009; European Commission, 2012; 2014). KIBS have been referred to as knowledge-brokers due to their abilities to accumulate, create, and disseminate knowledge (see e.g. Strambach, 2001; 2008; Miles etal, 1995; Bettencourt et al., 2002). KIBS continuously draw learning from projects, enhance and develop organizational competences, and then offer what they have learned to future clients (see e.g. Strambach, 2001). Through their services KIBS shape the thoughts and actions of their client firm's managers, which gradually becomes of influence in the economy as a whole (Løwendahl et al., 2001; Nowak & Grantham, 2000). KIBS therefore play an important role in technological- and structural change (Hipp, 1999), towards a more knowledge- and service-based economy (Werner & Strambach, 2018; Muller & Doloreux, 2009; OECD, 2001; Strambach, 1997).

In the European context, most KIBS are small firm with up to nine employees. In Sweden, the share of small IT-services and advertising/marketing firm, with less than 50 employees, represented around 97% of all firm within these two sectors in 2004. At the same time, the share of large firm, employing between 50 to 249 and 250 to more employees, represented less than 1% of all firm within these two sectors (Strambach, 2010). This indicates that scale advantages do not play a decisive role for KIBS abilities to create value and compete on client markets. However, while small KIBS mainly operate on local-, regional-, and national markets, large international KIBS also run a more globally oriented operation (see e.g. Strambach, 2010; Hermelin, 2009; Faulconbridge, 2006). Large international KIBS are also primarily located in large urban areas in physical

proximity to other large international firm (see e.g. Jacobs et al., 2016), highlighting such areas as key nodes in global production networks (see e.g. Bathelt et al., 2004). This therefore indicates that scale plays a more decisive role when it comes to KIBS abilities to create value across national borders.

KIBS are categorized as one of the main knowledge intensive sectors in the economy (OECD, 2001). Although definitions may vary to some degree, most scholars define KIBS in line with NACE (a European classification of economic activities) (see e.g. Muller & Doloreux, 2009). As illustrated in table 1, the KIBS sector may be divided in three main categories; computer and related activities; research and development; and other business activities.

Each of these contains several sub-categories. As an example, computer and related activities has six sub-categories, including software consultancies, which are of special interest here. Research and development have two sub-categories with a focus on natural sciences and engineering on the one hand and social sciences and humanities on the other hand. Finally, the sub-category of other business activities includes advertising consultancies, which are also of special interest here.

Table 1. KIBS sectors and sub-sectors

Computer and related activities
Hardware consultancy, Software consultancy and supply, Data processing, Database activities, Maintenance and repair of office-, accounting- and computing machinery, Other computer-related activities
Research and development
Research and experimental development in natural sciences and engineering, Research and experimental development in social sciences and humanities
Other business activities
Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and managing consultancy; holdings Architectural and engineering activities and related technical consultancy Technical testing and analysis Advertising Other business activities
Reference: Muller and Doloreux (2009: 66)

Although KIBS are divided into different sectors and sub-sectors indicating some level of differences, a few sector-specific commonalities have been identified (Muller & Doloreaux, 2009). KIBS are highly characterized by the knowledge

intensity of services provided (Muller & Zenker, 2001). Knowledge is not only a key resource for KIBS; it is also the good that they sell, and it is not standardized (Strambach, 2008; 2010; Muller & Doloreaux, 2009). KIBS services are non-material in nature, where the main inputs are intangibles such as procedures, methods, and knowledge, as well as the competences of employees to carry these out (Løwendhal, 2005). It is therefore of no surprise that KIBS employ more highly educated employees than most other sectors of the economy (OECD, 2001).

KIBS have different organizational character. As an example, they are public organizations providing various forms of services to private- or public actors, they are specific service units within large organizations, or they are private organizations providing their services on client markets (see e.g. Simmie & Strambach, 2006). The thesis has a specific focus on the last type of KIBS. On these notes, I follow Muller and Doloreux´s (2009: 65) definition on KIBS as „*service firms that are characterized by high knowledge intensity and services to other firms and organisations, services that are predominantly non-routine*".

KIBS value creation and importance of physical proximity

The nature of value creation may be understood differently between different sectors of the economy. As an example, compared with KIBS, value creation conducted by traditional manufacturing firm may be understood as a more standardized and routinized process requiring little direct interaction between producers and end users during such processes. KIBS value creation is however by definition characterized by a high degree of interaction, collaboration, and ad hoc and non-routine customization in line with client needs each time (see e.g. Strambach, 2010; Simmie & Strambach, 2006; Bettencourt et al., 2002; Løwendahl et al., 2001; Vargo & Lusch, 2004; 2014).

KIBS services are primarily project based in nature, which derives from their client specific nature demanding high levels of flexibility as well as comprehensive and specific solutions each time. Due to such client specific context, each project is unique in terms of novelty and may therefore vary a great deal from previous ones (Strambach, 2010). Thus, since each client demand unique solutions, novelty becomes an integral part of the value creation (Løwendhal, 2005).

Due to the complex nature of knowledge intensive value creation, demanding high levels of interaction and collaboration between KIBS and their clients during projects, physical proximity to large client-, labour-, and knowledge markets has been emphasized the main reason for why KIBS are mostly located in large urban areas (see e.g. Herstad & Ebersberger, 2014; Strambach, 2008; 2010; Storper & Scott, 2009; Hermelin, 2007; 2009; Shearmur & Doloreaux, 2008; Yigitcanlar et al., 2008; Keeble & Nachum, 2002; Power, 2002; 2003). Such location patterns also apply to the Swedish KIBS sector (Hermelin, 2017).

Physical proximity to large client- and knowledge markets may however play less important role now than previously due to increased abilities of people and firm to interact and conduct business over distance. Recent work displays that the abilities of KIBS to interact, create value, and compete on extra regional client markets have increased from before (see e.g. Shearmur & Doloreaux, 2015; 2008; Macpherson, 2008; Beyers, 2003; Beugelsdijk & Cornet, 2002). Increased abilities in this sense are evident in Sweden. Exports by Swedish service industries have increased greatly from the 1950s, or from 1.6 billion Swedish Krones in 1950 to 614 billion Swedish Krones in 2016, counting for around 32% of all exports in 2016 (SCB, 2017a). In 2015, firm belonging to the KIBS sector were the largest exporter of services. KIBS such as advertising- and marketing firm, accounting services, and legal services, counted for about 24% of all export in services and KIBS belonging to the ICT sector (Information and Communication Technologies) counted for 21.7% of all export in services (SCB, 2017a).

Hence, this development clearly indicates increased abilities of KIBS to interact and conduct business over longer distances than before. This development may therefore have profound effects on the geography of supplier services as argued by Beyers (2003). I therefore suggest that this more general development regarding increased abilities in this sense also indicates greater potentials for non-core KIBS to draw on extra regional client- and knowledge markets further away than before.

Software- and advertising KIBS

Software KIBS belong more broadly to the ICT-sector, which has grown considerably in the global economy during the last few decades. ICTs are often referred to as one of the general-purpose-technologies (GPT) that have penetrated and dramatically changed most parts of the economy through history (see e.g.

Malecki, 2002). The software sector is therefore considered very influential in general economic development given its value-added contribution to other sectors of the economy (see e.g. Nowak & Grantham, 2000). Although the software sector is relatively young compared with many other sectors (see e.g. Weterings & Boschma, 2006), it quickly became a major sector in the economy (see e.g. Florida et al., 2003). It has a heterogeneous character ranging from micro firm with few (or even no) employees to large international firm with thousands of employees. It is characterized by large share of freelancers, personal leasing, and project-based work (Strambach, 2010).

The software sector may be divided into four main different type of activities: the design of platform technologies; the production of standard software solutions in an industrial manner; the production of customized software where consultation and projects are tailor-made in line with clients' needs; and the provision of after-sales services such as software consultancy and training, as well as information services (see e.g. Isaksen, 2004; Strambach, 2010).

Software KIBS are primarily located in large urban areas and much less in peripheral areas (see e.g. Martynovich & Henning, 2018; Cooke et al., 2008; Florida et al., 2003; Cooke, 2002). Such location patterns are also visible in Sweden. As an example, knowledge intensive IT services are not only mostly located in large urban areas. Regional employment of the sector has also grown much faster in large urban areas than peripheral ones during the last two decades (Martynovich & Henning, 2018). Between 1991 and 2010 the sector grew from about 30.000 to just over 100.000 jobs, of which around 75% were located in Sweden's largest metropolitan areas, Stockholm, Gothenburg and Malmö (Martynovich & Henning, 2018). These location patterns therefore strongly indicate the importance of local agglomeration advantages, such as physical proximity to large client-, labour- and knowledge markets.

Advertising KIBS may be seen as a bridge between the artistic world of ideas, artwork, and creative work and the world of business where things are produced and sold (see e.g. Hermelin, 2009). In an international context, few global media groups dominate the advertising sector, and most of them are based in the USA (Faulconbridge, 2006). Although these global media groups are multinational corporations with subsidiaries in many countries, the creative part of production in each country remains within the national borders of their operation (Hermelin, 2009; Faulconbridge, 2006). The main reason for this has to do with that national

consumer markets differ from each other in terms of culture (see e.g. Gertler, 2001) and that important media factors such as newspapers and radio- and TV stations are primarily nationally based (see e.g. Pratt, 2006).

Due to the symbolic nature of advertising, interaction and knowledge production are highly tacit in nature depending on strong supplier-client relationships as well as high levels of trust and social interaction between participating actors (see e.g. Mould & Joel, 2010; Hermelin, 2009; Pratt, 2006). For this reason, physical proximity to client markets is considered highly important for advertising KIBS and the main ground why they are mostly located in large urban areas and much less in peripheral areas (see e.g. Hermelin, 2017; 2009; Faulconbridge, 2006; Taylor, 2004). In Sweden, the advertising and marketing sector has grown considerably in recent decades. As other KIBS sectors, advertising KIBS are mostly located in large urban areas, and almost half of the national employment in the sector is located in Stockholm (Hermelin, 2017; 2009). Hence, this indicates that advertising KIBS primarily base their competitiveness on large local client-, labour- and knowledge markets.

Increased Web-based services and interaction

Although local agglomeration advantages and physical proximity have been emphasized in the context of KIBS competitiveness, it has also been argued that recent ICT developments and increased usage have opened up new opportunities for firm to market their products and/or services (see e.g. Rodríguez-Pose, 2011).

Web-based advertising and marketing has grown considerably in recent years and characterizes a major part of what advertising KIBS do (EAO, 2017; Hermelin, 2009). As an example of this development, Web-based advertising increased in USA from 4.6 billion USD in 1999 to 88.0 billion USD in 2017 (PWC, 2001; 2018), and increased in Europe from 1.9 billion Euros in 2011 to 3.7 billion Euros in 2016 (EAO, 2017). In this sense, the gap between advertising- and software KIBS, especially those involved in the creation and development of webpages, has narrowed. Such convergences of the type of services offered previously by individual KIBS sub-sectors on client markets have become a growing trend within the KIBS sector (Strambach, 2010).

Internet usage has also grown very fast during the last 30 years (The World Bank, 2020; ITU, 2019). In Sweden the proportion of individuals using the Internet has grown from less than 1% in 1990, to around 46% in 2000, and then to

around 94% in 2019 (The World Bank, 2020). Likewise, the application of ICT related services has grown considerably in Sweden in recent decades. As mentioned above, exports of services have increased greatly in the period 1950-2016, and ICT related services counted for 21.7% of all exported services in 2016 (SCB, 2017a). The amount that Swedish firm spend on software applications has grown from 18 to 28 billion Swedish Crowns in the period 2010-2015 (SCB, 2016). When it comes to all Swedish firm with more than 10 employees, the usage of cloud-services has increased from 40% in 2014 to around 58% in 2018 (SCB 2016; SCB, 2018a). Also, Swedish firm have much faster Internet connection than before. By 2011, around 15% of Swedish firm with more than 10 employees, had between 30-100 Mbit/s Internet connections. This proportion had grown to 37% in 2016. In the same period, i.e. 2011-2016, the proportion of Swedish firm with more than 10 employees that had more than 100 Mbit/s Internet connections grew from 14% to 34% (SCB, 2016).

Based on these few examples, it is obvious that Web-based interaction and services are growing fast and agglomeration of virtual knowledge resources in the cloud is increasing. In return, this indicates increased potentials for firm to interact and draw on more distant and therefore larger client- and knowledge markets than before. As an example, given the Web-based nature of the software sector and increasingly so of the advertising sector, such KIBS in large urban areas may not only be bound to local client markets. They may also have potential client markets in distant areas, e.g. non-core areas where there may be a need to apply new knowledge, technologies, and methods to the often traditional- and sometime struggling industries (see e.g. Trippl et al., 2015b; Isaksen, 2015; Aslesen & Isaksen, 2007b). This may also apply to non-core KIBS, i.e. regarding their abilities to draw on large extra regional client- and knowledge markets.

Summary

The KIBS sector has grown faster than other sectors of the economy over the last few decades. This has primarily been driven forward by that firm increasingly outsource parts of their knowledge intensive activities to external suppliers. KIBS therefore play an important role in general economic development. Increased abilities to interact and conduct business over the Internet has enabled firm to seek KIBS services over longer distances than before. This development has therefore opened up possibilities for both the supply- and demand side of KIBS

services when it comes to access to extra regional markets. Although this development has not stopped or turned around uneven agglomeration of economic activities or made distance meaningless, they may nevertheless have facilitated further the ability of individuals and firm to interact and conduct business over distance. It is therefore likely that this development has important implications for the ability of non-core KIBS to create value and compete on extra regional client markets in spite of absence of local agglomeration advantages and long distances to nearest ones.

2.2 Non-core areas

Different types of peripheral areas

There are many ways to define areas that have been coined peripheral. Such areas are far from being homogenous. As an example, they may be defined by demography, e.g. size and density of the population; location, e.g. remoteness or distances to the nearest large urban areas; mobility, e.g. the level or quality of the transport- and communication systems; the level or quality of local public services, e.g. health- and educational organizations; the level or quality of private services, e.g. grocery, other consumption, and leisure; economic factors, e.g. number and type of firm and jobs, or growth in production outputs and added value; social-capital, e.g. the frequency or quality of local interactions; and also by the access to local- and/or extra regional resources, networks, and markets.

Some peripheral regions span over vast geographical areas (see e.g. Gløersen, 2012). Population per land unit are low in such regions, hence sparsely populated regions on averages. However, population may be distributed unequally within such regions, where some areas are relatively highly populated and other areas sparsely populated. Also, different sub-areas within the same region are more remote than others, i.e. in terms of distance to the nearest larger urban area. For instance, some sub-areas within a region may be well located, e.g. in terms of communication-, transport-, and educational infrastructure, or distance to nearest client- and labour markets, retail- and public services, and so on. Other sub-areas within that same region may however be much worse located in such context (see e.g. The Swedish Agency for Economic and Regional Growth, 2018; Nordregio,

2001; 2011). Thus, different locations within the same region may represent different levels of peripherality. It is therefore of no surprise that one of the main challenges identified for people living in the most remote peripheral areas are distances to nearest highly populated areas, e.g. when it comes to access to work, education, and important services (Gløersen et al., 2006).

This is very much the reality for many Swedish peripheral areas (see e.g. The Swedish Agency for Economic and Regional Growth 2018). As an example, if we consider the counties of Norrbotten and Västerbotten in North Sweden, they have been coined peripheral in both Swedish and European context (see e.g. Dubois, 2014; Nuur & Laestadius, 2007; Nordregio, 2001; 2010). However, some municipalities within these vast regions, typically coastal municipalities, have been doing much better than others, e.g. in terms of population development, level of services, connectivity to national infrastructures, economic development, and the proportion of highly educated workforce. Regional averages in this sense gained from large areas as a whole are therefore not likely to capture the different realities of their different sub-areas (see e.g. Gløersen, 2012).

Following this, it is obviously not possible to create one definition criterion that fits all peripheral areas. Different types of peripherality offers different type of local conditions for people and businesses.

Definition criteria for the selected study areas

A key factor in the selection of study areas is that the software- and advertising KIBS have to be located in areas characterized by both absence of local agglomeration advantages and long distances to nearest ones. In other words, they have to be located in low-populated as well as remote areas. The term non-core is used here in order to distinct the areas at focus from low populated areas that are close to nearest large urban area and from highly remote areas with very few inhabitants. These areas offer very different local business condition for KIBS and their abilities to create value and compete on client markets. As an example, areas defined peripheral based on low population alone but are nevertheless close to the nearest large urban area do not fit the research criterion since they enjoy close by agglomeration advantages. Similarly, it is important to distinct the areas at focus from highly remote-, sparsely populated-, and often badly connected rural households/areas offering none of the local business conditions considered

important for KIBS competitiveness. Hence, although absence of local agglomeration advantages is a key criterion, the study focuses on areas that offer at least some levels of urbanization and therefore small levels of a local client-, labour-, and knowledge market. Therefore, remote but nevertheless small urban areas not necessarily facing immediate or constant decline in population were chosen as an appropriate place of investigation.

Based on that KIBS competitiveness depends on highly skilled and educated competences it is relevant to consider their access to relevant labour markets. Swedish research display that the mean distance between place of work and home is on average 10.75 Km, and the median distance on average 5.25 Km (Haugen et al., 2011). Recent studies show that average total daily commuting time between home and work and back home during the period 2010-2015 was around 47 minutes in Denmark and Sweden, and around 45 minutes in Finland (Gimenez-Nadal et al., 2020). Studies have also shown that limits of the one-way commuting time between work and home on daily basis is on average 45 minutes (Isacsson & Svärdh, 2009; Gløersen et al., 2006).

Increased commuting time between home and work on daily basis has also been linked to several negative outcomes. As an example, between increased commuting time and health outcomes (see e.g. Kunn-Nelen, 2016; Hansson et al., 2011) as well as increased sickness absenteeism (see e.g. Gimenez-Nadal et al., 2018; Goerke & Lorenz, 2017), between increased commuting time and subjective and psychological wellbeing (see e.g. Dickerson et al., 2014; Roberts et al., 2011), between increased commuting time and stress (see e.g. Gottholmseder et al., 2009; Novaco & Gonzalez, 2009), and also between increased commuting time and increases in labour costs and reduced productivity (see e.g. Grinza and Rycx, 2020).

The above not only illustrates that most people live rather close to their place of work indicating little will or interest for long distance commuting between home and work on daily basis. Long commuting in this sense is also likely to lead to severe health issues of employees and reduced productivity of firm. Accordingly, KIBS located in low-populated areas outside 45 minutes commuting time from the nearest large urban area offering large local client-, labour-, and knowledge markets, were chosen as an appropriate object of study. At the time when the study areas were selected and the fieldwork conducted, areas corresponding with such criteria were named ´Landsbygd´ by the Swedish Board of Agriculture (Swe:

Jordbruksverket), defined as municipalities with minimum 5 inh/km^2, less than 25.000 inhabitants in its largest urban area, and outside the zone of daily commute distance between home and work to nearest large urban area (Jordbruksverket, 2013).[1]

The selected study areas

The first non-core area at focus fitting these criteria were relatively remote and low-populated municipalities in Kalmar County in Småland province (Swe: Landskap). Large part of the vast Småland province is considered peripheral in the Swedish context (see e.g. Dubois, 2014; Nordregio, 2001; 2010). According to the selection criteria, the identified KIBS have to be located outside the direct influence zone of the largest urban areas in Småland, i.e. Jönköping, Kalmar, and Växjö, as well as Linköping in the adjacent County of Östergotland. Following this, the identified non-core KIBS in Kalmar County (Småland) are located in the largest urban areas in Hultsfred, Vimmerby, and Västervik municipalities.

For contrasting and verification purposes it was important to investigate how KIBS in another non-core area in Sweden are affected by similar local disadvantages. I therefore chose to focus on non-core KIBS in Norrbotten, N-Sweden, which is located far away from Kalmar (Småland) and also considered peripheral in the Swedish context (see e.g. Nuur & Laestadius, 2007; Nordregio, 2001; 2010). According to the outgoing criteria, the identified KIBS have to be located outside the direct influence zone of the largest urban area in Norrbotten, Luleå. In the end, the identified non-core KIBS in Norrbotten are located in the largest urban areas of Piteå, Boden, and Kalix municipalities.

[1] Jordbruksverket changed their definition on Landsbygd after I had finalized the fieldwork in the selected study areas. I therefore mention here their definition on Landsbygd, which they used around the time of the fieldwork (see Jordbruksverket, 2013).

Figure 1. The location of selected study areas

The population in the largest urban areas in the non-core areas at focus ranged between 5.000 and 25.000 inhabitants (see tables 4 & 5). This population size corresponds with ESPON´s (The European Observation Network for Territorial Development and Cohesion) definition for small towns (see e.g. Servillo et al., 2013).

Finally, for core-periphery contrasting purposes, Malmö was selected as an appropriate study area representing large urban areas offering local agglomeration advantages. Malmö is located in the most densely populated part of Scania in S-Sweden. Malmö and Scania are part of the greater Öresund cross-border region, also containing the Zealand region and the capital region of Denmark, Copenhagen. The population in Malmö was 333.633 inhabitants in 2017 (see table 3). The whole Öresund area inhabits around 4 million individuals, of which around 1.8 million live in the Copenhagen region. The travel time from the city centre of Malmö to the city centre of Copenhagen is around 30 minutes by train. The location of the selected study areas is displayed in figure 1.

Core-periphery differences and areas at focus here

Economic development

Western countries, including the Nordic countries have in general terms gone through structural changes from a more traditional agrarian and manufacturing-based industries towards a more service-based economy. In such context, large metropolitan areas account for most new firm formation, knowledge production, and economic growth in national economies (OECD, 2018). Many peripheral areas have however had problems in adapting to this more modern and knowledge-based reality and are lagging behind in such context (see e.g. Lindberg & Rispling, 2018; Trippl et al., 2015b; Tödtling & Trippl, 2005; Isaksen & Trippl, 2014; Dubois, 2014; Fitjar & Rodríguez-Pose, 2011; Anderson et al., 2010; Nuur & Laestadius 2007).

In Sweden, national economic growth is mainly driven by the largest urban areas (see e.g. The Swedish Agency for Economic and Regional Growth, 2018; Lindberg & Rispling, 2018; Dubois, 2014; Eriksson & Hansen, 2013; Lundquist & Olander, 2010; Nordregio, 2010). Income figures are higher in such areas compared with peripheral areas. As an example, in terms of disposable household income, peripheral areas are doing worse than larger urban areas (see e.g. Lindberg

& Rispling, 2018). In 2014 the disposable average household net income in purchasing power parity (PPP) in most inland peripheral areas ranged between 20.000 and 30.000 Euros, while it ranged between 30.000 and 50.000 Euros in and around the largest urban areas and large regional centres (Lindberg & Rispling, 2018). However, since house prices are on averages lower in peripheral areas than large urban areas (see e.g. SCB, 2017b) the cost of living may be lower in such areas, somewhat compensating for the disposable average household net income gap.

Although the general picture demonstrates less economic growth in peripheral areas than large urban areas, some peripheral areas are doing better than others. As an example, some municipalities in Norrbotten display higher annual growth in production per capita compared with national averages (Dubois, 2014). What must however be kept in mind is that their growth has mainly been driven by capital intensive export-oriented industries like mining and forestry, and to a lesser extent by diversified and more knowledge intensive economic activities driving growth in large urban areas (Dubois, 2014; Gløersen et al., 2006). In relation to this, primarily due to declining prices in minerals on world markets, the GRP (Gross Regional Production) declined more than 2% in Norrbotten in the period 2011-2015 (see e.g. Lindberg & Rispling, 2018). This means that peripheral areas characterized by one or few large industries and highly dependent on natural resources may be highly vulnerable to such extra regional chances. Furthermore, while the largest metropolitan areas and most parts of S-Sweden experienced growth in the period 2011-2015, the GRP in Kalmar County (Småland) declined by almost 1% (Lindberg & Rispling, 2018).

This not only illustrates clear difference between non-core and large urban areas when it comes to economic growth. This also demonstrates that large and diversified economies are less vulnerable to extra regional changes than small and less diversified non-core economies. The strong concentration of KIBS in highly populated areas is one of the many reasons behind this polarized development (see e.g. Strambach, 2001; Bettencourt et al., 2002; European Commission, 2014).

General population development in Sweden

The largest share of the Swedish population lives in large metropolitan areas and regional centres (see e.g. SCB, 2015; Roto, 2012). The last two centuries were characterized by rapid urbanization, where people moved from rural to urban

areas. In the beginning of the 1800 over 90% of the population lived in rural areas. Most of the 19th century was characterized by gradual urbanization. In line with rapid industrialization by the end of the 19th century, the pace of urbanization grew rapidly. By 1930, half of the population lived in urban areas. In the period 1930-2010, the share of the total population living in urban areas grew to around 85% (SCB, 2015).

As displayed in table 2, the total population in Sweden grew by more than 1.8 million individuals in the period 1980-2017, or 22%. In this period, out of the 20 counties in Sweden, the population grew in 14 while stagnating or declining in 6 (SCB, 2019). Population growth was greatest in the large metropolitan areas, larger regional centres, and close by municipalities, i.e. within daily commuting range between home and work. In proportional terms, the population has grown fastest in the three largest metropolitan areas, Stockholm, Gothenburg, Malmö, and close by municipalities in the period 1980-2017, or from 30.4% to 36.7%. In the same period, larger regional centres with more than 40.000 inhabitants as well as close by municipalities also grew in terms of population proportion, or from 30.9% to 31.9% of the total Swedish population. However, smaller regional centres with less than 40.000 inhabitants as well as close by municipalities, declined proportionally in population during the same period, or from 38.7% to 31.3% of the total Swedish population (see table 2). Areas defined as non-core here belong to this last group of regions.

Table 2. Population development in Sweden and share of total population by regional groups (% of total populatin) 1980-2017

	1980	1990	2000	2010	2017
Population in Sweden	831 7937	859 0630	888 2792	941 5570	1 012 0242
Metropolitan areas and close by municip.*	30.4%	31.4%	33.5%	35.5%	36.7%
Large regional centres and close by municip.**	30.9%	31.2%	31.6%	31.9%	31.9%
Smaller regional centres and close by municip. ***	38.7%	37.4%	34.9%	32.6%	31.3%
*Stockholm, Gothenburg, Malmö - 46 municipalities. **>40.000 inhabitants - 73 municipalities. ***<40.000 inhabitants - 171 municipalities.					
Own compilation of statistics from Statistics Sweden[2]					

[2] Own compilation of statistics from Statistic Sweden downloaded 26. Dec 2018 from: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101A/BefolkningNy/table/tableViewLayout1/?rxid=47e40bb6-301b-4dfa-8e86-90759b4636d3

Table 3. Population in Swedens largest counties (C) and their largest municipalities (M), 1980-2017

	1980	1990	2000	2010	2017
Stockholm (C)	1 528 200	1 641 669	1 823 210	2 054 343	2 308 143
Stockholm (M)	647 214	674 452	750 348	847 073	949 761
V Götalands (C)	1 391 774	1 441 293	1 494 641	1 580 297	1 690 782
Gothenburg (M)	431 273	433 042	466 990	513 751	564 039
Skåne (C)	1 023 479	1 068 587	1 129 424	1 243 329	1 344 689
Malmö (M)	233 803	233 887	259 579	298 963	333 633

Own compilation of statistics from Statistics Sweden [3]

As displayed in table 3, the population grew considerably in the three largest metropolitan areas in Sweden in the period 1980-2017, i.e. Stockholm, Gothenburg, and Malmö. Stockholm County grew by 51% in this period and its largest municipality, Stockholm municipality, grew by 46.7% in the same period. The population in Västra Götaland County grew by 21.5% in this period, and the population in its largest municipality, Gothenburg municipality, grew over the same period by 30.8%. Skåne County grew by 31.4% in the period 1980-2017 and its largest municipality, Malmö municipality, grew by 42.7% in the same period (see table 3).

Population development in case regions

The population in the two areas at focus here, Kalmar County (Småland) and Norrbotten County, has either stagnated or declined in the period 1980-2017 (see table 4 and 5). This development however varies between different municipalities within these counties.

In 2017 the population in Kalmar County (Småland) reached the same levels as it was in 1980 after period of marginal population decline in the period 1980-2010. This recent population growth in Kalmar County has primarily been sustained by growth in its largest municipality, Kalmar municipality, which grew by 27.6% over the whole period 1980-2017 (see table 4).

[3] Own compilation of statistics downloaded 27. Dec 2018 from: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101A/BefolkningNy/?rxid=7783598b-bd35-47f9-867e-02746995a995

Table 4. Populatin in Kalmar County (C), its largest municipality (Kalmar) and municipalities (M) at focus and adjacent counties and their largest municipalities, 1980-2017

	1980	1990	2000	2010	2017
Kalmar (C)	241 581	241 102	235 391	233 536	243 536
Kalmar (M)	52 846	56 206	59 308	62 815	67 451
Hultsfred (M)	17 794	17 020	15 163	13 696	14 579
Västervik (M)	41 263	39 908	37 433	36 206	36 551
Vimmerby (M)	16 180	15 867	15 776	15 473	15 728
Largest municipalities in adjacent counties to Kalmar					
Östergötland (C)	392 789	403 011	411 345	429 642	457 496
Linköping (M)	112 600	122 268	133 168	146 416	158 520
Jönköping (C)	317 759	325 163	327 829	336 866	357 237
Jönköping (M)	107 561	111 486	117 095	127 382	137 481
Kronoberg (C)	173 691	177 882	176 639	183 940	197 519
Växjö (M)	64 661	69 547	73 901	83 005	91 060

Own compilation of statistics from Statistics Sweden [4]

However, during the same period the population declined in all three municipalities that are at focus in Kalmar, i.e. Hultsfred, Vimmerby, and Västervik (see table 4). Although Hultsfred municipality grew by 9.4% in the period 2010-2017, it declined by 18% in the whole period 1980-2017 (see table 4). Similar development took place in Vimmerby and Västervik municipalities during this period. In Vimmerby, the population grew a little bit in the period 2010-2017 but declined by 2.8% in the whole period 1980-2017. In Västervik, it grew by small margins in the period 2010-2017 but declined by 11.4% in the whole period 1980-2017. Opposite to this development in Kalmar County, the population in its adjacent counties, i.e. Jönköping, Östergötland and Kronoberg, as well as in these counties' largest municipalities, i.e. Jönköping, Linköping, and Växjö, grew gradually in the period 1980-2017 (see table 4).

[4] Own compilation of statistics downloaded from Statistic Sweden 26. Dec 2018:

http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101A/BefolkningNy/table/tableViewLayout1/?rxid=4a60d56e-f975-41aa-ba63-977e1447e24d

Table 5. Population in Norrbotten County (C), its largest municipality (Luleå), and municipalities at focus 1980-2017

	1980	1990	2000	2010	2017
Norrbotten (C)	267 054	263 735	256 238	248 609	251 295
Luleå (M)	66 834	68 412	71 652	74 178	77 470
Kalix (M)	19 599	19 241	17 995	16 740	16 169
Piteå (M)	38 402	40 034	40 363	40 892	42 184
Boden (M)	28 848	29 740	28 679	27 471	28 181

Own compilation of statistics from Statistics Sweden[5]

Norrbotten County has experienced similar population development as Kalmar County. As displayed in table 5, the population in Norrbotten declined by 5.9% in the period 1980-2017. However, similar to Kalmar County, Norrbotten experienced a small increase in its total population in the period 2010-2017. This may primarily be explained by growth in Norrbottens largest municipality, Luleå, which grew by 15.9% in the period 1980-2017. Luleå municipality also exceeded the total growth in Norrbotten County in the period 2010-2017 (see table 5). The population declined in two of the municipalities at focus in Norrbotten in the period 1980-2017, i.e. Kalix and Boden municipalities. In this period, it declined by 17.5% in Kalix and by 2.3% in Boden in spite of 2.6% growth in the period 2010-2017. However, the population in the third municipality at focus here, Piteå, has grown gradually in the period 1980-2017, or by 9.8% (see table 5).

To shortly summarize what has been illustrated here, the largest share of the total population in Sweden lives in the largest metropolitan areas, larger regional centres, and close by municipalities. These areas have outgrown rest of Sweden in the period 1980-2017, both in a numerical- and proportional sense (see table 2; see also The Swedish Agency for Economic and Regional Growth, 2018). The population in smaller regional centres and close by municipalities has however decreased in either numerical- or proportional sense or both during the same period (see table 2; see also Nordegio, 2006). With the single exception of Piteå municipality in Norrbotten, this stagnating or declining trend in population

[5] Own compilation of statistics downloaded from Statistic Sweden 26. Dec 2018:

http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101A/BefolkningNy/table/tableViewLayout1/?rxid=4a60d56e-f975-41aa-ba63-977e1447e24d

certainly applies to the non-core areas at focus here during the period 1980-2017 (see tables 4 & 5).

Population density

In a European context, the Swedish population is extremely sparse in terms of inhabitants per land unit due to the vast size of the country (see e.g. The Swedish Agency for Economic and Regional Growth, 2018; Nordregio, 2001). In 2017, the European average was around 73 inh/km2[6], while the national average in Sweden was 24.8 inh/km2 (see table 6). The population density varies however greatly within Sweden.

As an example, Norrbotten is not only low populated; it is also very sparsely populated due to its great size (see e.g. Wiberg & Limani, 2015), with the average of 2.6 inh/km2 in 2017 (see table 6). This however varies greatly between its different municipalities. In 2017, Luleå, which is the most densely populated area in Norrbotten, had 37.1 inh/km2, and the three municipalities in Norrbotten at focus here, i.e. Piteå, Boden and Kalix, had population density between 7 and 13.7 inh/km2 (see table 6).

In 2017, Kalmar County (Småland), had population density of 21.8 inh/km2, and its largest municipality, Kalmar, had population density of 70.5 inh/km2. The three municipalities at focus in Kalmar (Småland), i.e. Hultsfred, Vimmerby, and Västervik, had population density between 13 and 19.5 inh/km2 in 2017 (see table 6). In comparison, the population density in the regional centres of the three adjacent counties to Kalmar are considerably higher than in the non-core areas at focus. In 2017, the population density in Linköping municipality was 111.0 inh/km2, 92.9 inh/km2 in Jönköping municipality, and 54.7 inh/km2 in Växjö municipality (table 6).

[6] https://en.wikipedia.org/wiki/Area_and_population_of_European_countries

Table 6. Inhabitants per km2. Sweden and its largest metropolitan areas, counties and municipalities at focus, and adjacent counties and regional centres, 2017

	Inh/km2
Sweden	**24.8**
Stockholm County	**353.8**
Stockholm municipality (regional center)	5074.7
Västra Götaland Ccounty	**71**
Gothenburg municipality (regional center)	1259.3
Skåne County	**122.6**
Malmö municipality (regional center)	2130.4
Kalmar County (Småland)	**21.8**
Kalmar municipality (regional center)	70.5
Hultsfred municipality	13.0
Västervik municipality	19.5
Vimmerby municipality	13.8
Norrbotten County	**2.6**
Luleå municipality (regional center)	37.1
Kalix municipality	9.0
Piteå municipality	13.7
Boden municipality	7.0
Östergötland County	**43.3**
Linköping municipality (regional center)	111.0
Jönköping County	**34.2**
Jönköping municipality (regional center)	92.9
Kronoberg County	**23.4**
Växjö municipality (regional center)	54.7
Own compilation of statistics downloaded from Statistic Sweden[7]	

Compared with the non-core areas at focus in Kalmar (Småland) and Norrbotten, the population density is much greater in Sweden's three largest metropolitan areas. In 2017, the population density in Stockholm municipality was 5074.7 inh/km2, 1259.3 inh/km2 in Gothenburg municipality, and 2130.4 inh/km2 in Malmö municipality.

[7] Own compilation of statistics downloaded from Statistics Sweden 26. Dec 2018:

Sweden:http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101C/BefArealTathetKon/table/tableViewLayout1/?rxid=c1f680e3-2e4a-4de3-8fce-224822a510a0.

Counties:http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101C/BefArealTathetKon/table/tableViewLayout1/?rxid=29e7ff85-7c95-448e-a4ba-d4c6a5d01290.

Municipalities:http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101C/BefArealTathetKon/?rxid=29e7ff85-7c95-448e-a4ba-d4c6a5d01290

Furthermore, around 75% of Swedish municipalities have less than 31.000 inhabitants (Eriksson & Hansen, 2013). Based on population only, this indicates high levels of peripherality for these municipalities. However, many of them lie close to the nearest large urban area, and/or close to each other, forming larger agglomeration units of a functional market-, labour-, and service area. Such low populated municipalities therefore collectively form or enjoy close by agglomeration advantages to some extent (see e.g. Gløersen et al., 2006). Hence, a focus on KIBS in areas that neither offer local agglomeration advantages or form collective ones with other small close by municipalities, or in areas located close to the nearest large urban area, is relevant in order to understand if and how such local disadvantages affect their abilities to create value and compete on client markets. Such disadvantages certainly apply to the non-core areas at focus here as displayed in tables 3, 4, 5, and 6.

Ageing population and out-migration

Another challenging issue for many peripheral areas in Sweden is the increasing population age (see e.g. The Swedish Agency for Economic and Regional Growth, 2018; Grunfelder et al., 2018). While the ratio of people older than 65 years old has increased in general in Europe, this ratio is among the highest in Sweden (see e.g. Grunfelder & Roto, 2014). In 2012, the ratio of 65+ in Sweden as a share of the population aged 15-64, was 29.2%. This ratio is usually much higher in Swedish peripheral areas (see e.g. The Swedish Agency for Economic and Regional Growth, 2018). As an example, the 65+ ratios in large parts of the two areas of interest here, i.e. N-Sweden and SE-Sweden, is from 30% to over 40% in some cases (see e.g. Grunfelder & Roto, 2014).

When it comes to medium-sized towns and rural areas in Sweden, the primary explanation for population decline is out-migration (Roto, 2012). This development has gradually increased over the last decades, where the general trend is that young people move from peripheral areas to larger urban areas to educate or work, and they rarely move back home (see e.g. Nordregio, 2018; Gløersen et al., 2006). This is an important contributor to the fact that the population is declining in many peripheral areas while growing in larger urban areas (Grunfelder, 2014a).

This development indicates challenges for non-core firm depending on highly educated and experienced competences in novel topics relevant for the

contemporary knowledge intensive economy, e.g. in sectors that compete in new technology-based areas. Hence, it is important to increase our knowledge on how human capital-intensive sectors such as KIBS come to terms with local disadvantages in this sense, i.e. ageing- and out-migrating population, and thin relevant labour market.

Share of people with tertiary education

In the Nordic countries, the proportion of individuals with tertiary education is much higher in large urban areas than in peripheral ones (see e.g. The Swedish Agency for Economic and Regional Growth, 2018; SCB, 2018b; Grunfelder, 2014b; Nordregio, 2010). In Sweden, the general rule is that the level of education rises in line with increased population density. As displayed in table 7, the share of 25–64-year-old individuals in Sweden with three years or more of tertiary education was 26% in 2017. This share was 41% in Stockholm, 35% in Gothenburg, and 33% in Malmö (SCB, 2018b). In comparison, smaller municipalities have much less share in this respect (SCB, 2018b). As an example, in 2017 the three municipalities at focus in Kalmar County (Småland), i.e. Hultsfred, Vimmerby, and Västervik, ranged between 11% and 18% in this respect. The three municipalities at focus in Norrbotten County, i.e. Piteå, Boden, and Kalix, ranged between 16% and 23% in this respect in 2017 (see table 7).

Compared with the non-core areas at focus, this share is higher in the county capitals of Kalmar (Småland) and Norrbotten, i.e. 28% in Kalmar municipality, and 31% in Luleå municipality. Furthermore, compared with the non-core areas at focus in Kalmar County, this share is also much higher in the largest municipalities in its adjacent counties, i.e. Jönköping, Linköping, and Växjö municipalities, ranging between 27% and 37% (see table 7). This difference between small- and large regional centres is consistent with other Swedish counties (see e.g. The Swedish Agency for Economic and Regional Growth, 2018; SCB, 2018b).

This illustration displays a clear difference between highly populated and low populated areas in Sweden when it comes to levels of human capital. Low local levels of human capital are likely to affect and even limit the competitiveness of non-core KIBS given their dependence on highly educated and skilled competences (see e.g. Strambach, 2008; 2010; OECD, 2001). It is therefore

important to investigate how non-core KIBS are affected by such limitations and deal with them strategically.

Table 7. The population and proportion (%) of the population age 25-64 with tertiary education, 2017. Sweden, its largest counties/municipalities, counties and municipalities at focus, and adjacent counties/largest municipalities to Kalmar county

	Population	Higher education	
	25-64 yrs	<3 years	≥3 years
Sweden	5 157 662	15%	26%
Largest metropolitan areas in Sweden			
Stockholm municipality	555 902	17%	41%
Gothenburg municipality	319 224	17%	35%
Malmö municipality	188 128	17%	33%
Norrbotten county			
Luleå municipality	39 568	16%	31%
Piteå municipality	20 753	14%	21%
Boden municipality	13 871	15%	23%
Kalix municipality	7 669	12%	16%
Kalmar county (Småland)			
Kalmar municipality	34 669	17%	28%
Hultsfred municipality	6 869	12%	11%
Vimmerby municipality	7 558	13%	14%
Västervik municipality	17 099	14%	18%
Largest municipalities in counties adjacent to Kalmar			
Linköping municipality	81 604	16%	37%
Jönköping municipality	69 924	17%	27%
Växjö municipality	45 878	18%	30%
Own compilation of statistics from Statistic Sweden[8]			

Summary

These illustrations display clear difference between non-core and large urban areas in Sweden, not only regarding economic development and size of population, but

[8] Own compilation of statistics downloaded from Statistic Sweden 26. Dec 2018:

Sweden and county level: https://www.scb.se/hitta-statistik/statistik-efter-amne/utbildning-och-forskning/befolkningens-utbildning/befolkningens-utbildning/pong/tabell-och-diagram/utbildningsniva-efter-lan-och-kon/

Municipality level: https://www.scb.se/hitta-statistik/statistik-efter-amne/utbildning-och-forskning/befolkningens-utbildning/befolkningens-utbildning/pong/tabell-och-diagram/utbildningsniva-efter-kommun-och-kon/

also population development trends, population density, age of population, and levels of human capital. Recent work argues that local scarcities in highly educated competences have in fact haltered structural changes in many Nordic non-core areas the past, i.e. the development from a more traditional agrarian- and industry-based economy towards a more knowledge- and service-based one (see e.g. The Swedish Agency for Economic and Regional Growth, 2018; Nordregio, 2001). As an example, Norrbotten and Kalmar (Småland) have strong tradition in traditional-, low diversified, and natural resource-based industries such as forestry, agriculture, mining, and the exploitation of watercourses. Further industrial upgrading or renewal in line with increased knowledge intensity of the economy and international competition is likely to demand larger share of people with tertiary education than currently exist in most non-core areas (see e.g. Eklund et al., 2014). Low proportion of highly educated competences is therefore likely to constrain industrial renewal in non-core areas, at least to some extent. Hence, in the light of that KIBS competitiveness is considered to depend on physical proximity to large and diversified client-, labour-, and knowledge markets, it is relevant to investigate how non-core KIBS compensate for local agglomeration disadvantages and long distances in such context.

3. Literature review

3.1 Introduction

Abundance of previous work argues that knowledge production and competitiveness of firm and industries are strongly affected by the local business environment (see e.g. Trippl et al., 2015a; Isaksen & Trippl, 2014; Malmberg & Maskel, 2002; 2006; Tödtling & Trippl, 2005; Feldman, 1999; Porter, 1990; 1998; Moulaert & Sekia, 2003 for overview). Although this line of thought highlights the business environment external to the firm, the importance of activities taking place within firm are also highlighted in this context.

The competitiveness of regional economies in the context of internationalization is considered highly contingent on the abilities of regional actors to transform knowledge and create economic value (see e.g. Tödtling et al., 2012; Archibugi & Lundvall, 2001; Cooke et al., 2008; Malecki, 2010). Knowledge resources, whether within or external to firm, are considered key factors for their competitiveness in such context. The abilities to identify, absorb, and apply external resources in combination with organizational resources are considered vital for the abilities of firm to create value and compete on client markets (Audretsch & Dohse, 2007; Cohen & Levinthal, 1990).

One of the fundamental elements behind the competitiveness of the today´s knowledge-based economy, is that firm continuously have to improve their activities through learning (see e.g. Asheim et al., 2011; Asheim, 1999). On similar notes, it has also been argued that competitiveness of firm depends on that business strategies are developed in the context of available and potential resources (Porter, 1990; 1998; Løwendahl et al., 2001). Hence, in order to understand how KIBS create value and compete on client markets, a focus on the interplay between activities taking place within the firm and the business environment in which they take place is required.

In such context, for the investigation on how non-core KIBS create value and compete on client markets, the thesis draws on conceptual work from the fields of economic geography and service management studies, a sub-field of organizational studies. Conceptual thinking from economic geography is useful in illustrating local business conditions and resources considered important for KIBS value creation and competitiveness, as well as why and how different regional business environments vary in such sense (see e.g. Tödtling & Trippl, 2005; Trippl et al., 2015a; Isaksen & Trippl, 2014; Asheim et al., 2006; Malmberg & Maskell, 1999; 2006; Porter, 1990; 1998). It is also useful in demonstrating increased abilities to interact and conduct business over distance and therefore how non-core KIBS compensate for local agglomeration disadvantages and long distances to large client- and knowledge markets (see e.g. Shearmur & Doloreaux, 2015; Rodríguez-Pose, 2011; Moodysson, 2008; Lagendijk & Lorentzen, 2007; Faulconbridge, 2006; Torre & Rallet, 2005; Amin & Cohendet, 2004; Bathelt et al., 2004; Bathelt & Glückler, 2003; 2005). Conceptual thinking from service management, a sub-field of organizational studies, is useful in unpacking different stages of KIBS VCPs and highlighting important elements that lie behind their success (see e.g. Løwendahl et al., 2001; Vargo & Lusch, 2004; 2014; Grönroos, 2008; 2011).

For clarification, in the context of local agglomeration advantages (or disadvantages), a distinction can be made between business related conditions and other local conditions such as the living environment in broad terms for families and entrepreneurs. The conceptual and analytical focus applied in the thesis is entirely associated with business related conditions.

3.2 Spatial clustering of economic activities

Following the pioneers of location theory, e.g. Marshall (1890) and Weber (1909), scholars of economic development typically seek explanations on how and why different types of firm and/or industries agglomerate more in certain locations and less in others (see e.g. Malmberg & Maskel, 2002; 2006; Scott, 2006; Cooke, 2002; Bathelt et al., 2004; Storper, 1997; Audretsch & Feldmann, 1996, Amin & Thrift, 1994; Glaeser et al., 1992; Romer, 1986; Jacobs, 1969; Arrow, 1962). Much of this work is rooted in Marshall's notion of industrial

districts (Martin, 2006). Marshall (1930) highlights the agglomeration of three main pillars of external economies underpinning the competitiveness of firm and industries: the availability of skilled labour, supporting ancillary trades, and the division of labour amongst local firm regarding different stages in the production chain. He referred to these as the ´local industrial atmosphere´. These positive effects of local agglomeration are understood as spatial economies of scale (Knoben, 2009).

Local agglomeration advantages

Local agglomeration advantages are in simple terms benefits deriving from co-location of firm and people in large urban areas or industrial clusters (Glaeser, 2010). Increased transaction cost overcoming distance is one of the main reasons behind why the competitiveness of knowledge production is strongly linked with co-location (see e.g. Glaeser, 2010; Baranes & Tropeano, 2003; Storper & Venables, 2004; Gordon & McCann, 2000). Accordingly, local knowledge spillover and other local externalities are considered key factors behind increased returns to scale and agglomeration of economic activities within a geographically bounded area (see e.g. Krugman, 1991; Romer, 1986; 1990). As an example, recent work, highlighting the benefits of co-location, argues that high local labour turnover among KIBS in large urban areas facilitates inter-sectoral flow of knowledge, which in return stimulates their productivity and creation of new knowledge (Kekezi & Klaesson, 2020). Such local benefits are one of the reasons why large urban areas are considered engines of new firm formations and knowledge productions, and account for most growth of national economies (see e.g. OECD, 2018). Furthermore, co-location in large urban areas may not only facilitate economic- and social interaction. It may also be a leading mechanism towards further agglomeration (see e.g. Rodríguez-Pose, 2011; Simmie, 2006; Myrdal, 1957). This correlates with Malmberg and Maskell´s (2002; 2006) knowledge-based theory of spatial agglomerations, which highlights the self-reinforcing mechanisms between knowledge dense regions and knowledge intensive value creation.

This line of work highlights two core conceptual elements facilitating success of knowledge production: *localized inter-organizational linkages and agglomeration effects*. The importance of physical proximity is therefore emphasized in the context of knowledge production and competitiveness (Gordon & McCann,

2000). Knowledge production is considered a highly collaborative- and endogenous process, embedded in local networking, personal relations, and interactive learning processes taking place among local actors (see e.g. Granovetter, 1985; Lundvall, 1992; Asheim et al., 2006). This argument relates to all kinds of industries, whether low- or high-tech, but when it comes to the most novel and knowledge intensive economic activities in the contemporary economy; they mostly take place in large urban areas (see e.g. OECD, 2018; Fitjar & Rodríguez-Pose, 2011; Keeble, 1997). In other words, physical proximity to large pool of firm, suppliers, clients, and resources/attributes is considered highly important for knowledge intensive value creation and competitiveness (Malmberg & Maskell, 1999; 2006; Porter, 1990; 1998; Lundvall, 1992; Howells, 2012).

Michael Porter´s (1990; 1998) cluster theory provides a rather comprehensive image of what kind of business environment facilitates best the competitiveness of firm and industries. Porter (1998: 199) defines clusters as "*a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities*". The cluster theory emphasizes rivalry, competitive advantage, and collaboration as key factors behind economic growth that are more likely to take place in areas where various forms of related public and private organizations concentrate, compete, and interact.

Although Porter initially designed the cluster theory with the national level in mind it has widely been used to describe economic activities at the local- and regional levels as well (Asheim et al., 2006). The cluster theory extends agglomeration theories in the sense that it does not only emphasize co-location of firm. It also emphasizes tight vertical- and/or horizontal inter-organizational networks, and often reciprocal interactions among co-located firm, whether direct or indirect (see e.g. Asheim et al., 2006; Swan, 2006; Simmie, 2006). Networking and social interactions among co-located firm may facilitate the creation of shared norms and values bonding local individuals and organizations (Gertler & Wolfe, 2006). On similar notes, co-location in clusters may promote social environment facilitating collective learning and the exchange of tacit knowledge (see e.g. Ter Wal & Boschma, 2011; Malmberg & Power, 2006).

Competitiveness

Competitiveness is understood and valuated through different approaches. It is therefore important to clarify how competitiveness is defined in this thesis. A distinction can be made between the environment that firm or industries compete in on the one side, and what they do on the other side. As an example of the former, previous work anchors competitiveness with local agglomeration advantages (see e.g. Malmberg & Maskell, 1999; 2006; Porter, 1990; 1998; 2003; Tödtling & Trippl, 2005). As an example, through considering population size and the level of human capital, local demand and rivalry, supply and level of local education, R&D investments, and so on. The agglomeration of such local advantages however does not necessarily secure the success of all local firm or industries, i.e. they may enhance some types of firm or industries but not necessarily others types (see e.g. Lechner & Leyronas, 2011). Also, if local agglomeration advantages are used as a proxy for competitiveness, firm or industries in areas characterized by absence of such advantages, e.g. non-core areas, would not be considered competitive at all. Such an approach is therefore not a prominent way to evaluate the competitiveness of individual firm within geographical areas.

As an example of the latter, i.e. what firm or industries do, previous work measures competitiveness through performance, e.g. growth in employment or sales (Grillitsch & Nilsson, 2017), turnover growth and profitability (see e.g. Huggins & Johnston, 2010), and/or growth in export and gross value added per employee (Love et al., 2010). However, such parameters depict the end results of value creation but not the process of value creation itself. A narrow focus on end results of production therefore does not shed light on such processes.

Hence, considering the nature of the research question, the thesis studies competitiveness of firm through focusing on the process of value creation in its causal context, i.e. how things are done and how they are affected by location and distances during different stages of VCPs. Departing from this, competitiveness is defined here as the ability of firm to offer same type of value as competitors on common markets, as mentioned in the introduction chapter. This means that if non-core KIBS offer same value to clients as similar KIBS in large urban areas do on common client markets, I consider them competitive.

Different types of business environments

In line with the unequal distribution of knowledge intensive economic activities, regional characteristics may vary greatly, representing different types of business environments, benefiting different types of economic activities. With the purpose to contrast between different types of regional business environments, a distinction was made between peripheral and large urban areas at the start of the thesis. These two types of areas represent two opposite extremes with regards to what kind of business environment they provide for knowledge intensive value creation and competitiveness. In simple terms, on the one side large urban areas provide favourable circumstances for knowledge intensive firm to create value and compete on client markets (see. e.g. Storper & Venables, 2004). On the other side peripheral areas are less favourable in such context (see e.g. Fitjar & Rodríguez-Pose, 2011).

However, a simple two-fold distinction between such two opposite extremes does not illustrate the great varieties or complexities of neither regions nor knowledge productions. There are examples of economic successes in peripheral areas (see e.g. Grillitsch & Nilsson, 2015; 2017; Jakobsen & Lorentzen, 2015; Fitjar & Rodríguez-Pose, 2011) just as there are examples of economically stagnated large urban areas, e.g. old industrial regions and fragmented metropolitan regions (see e.g. Tödtling & Trippl, 2005). Some large urban areas seem to facilitate knowledge production and competitiveness while others do not, and the same goes for peripheral areas.

Hence, there is not one type of large urban areas and one type of peripheral areas that are either facilitative in this sense or not. Regional business environments should therefore not be understood merely in such a two-fold manner, i.e. where large urban areas are at the outright considered favourable for knowledge intensive value creation and peripheral areas not. This indicates that knowledge production and competitiveness depend on more factors than just location or the size of the local population.

Thick business environments

Regional business environments considered likely to facilitate knowledge intensive value creation and competitiveness have been coined *organizationally and institutionally thick and diversified* (Isaksen & Trippl, 2014; Trippl et al., 2015b; Isaksen & Karlsen, 2016). Such regions are characterized by a critical mass

of firm, higher education, research-, and support organizations, unions, and associations, to name a few. The term thick suggest that such an environment is found in highly populated areas. A critical mass of highly skilled and educated competences is found in these more favourable areas (see e.g. Florida, 2005).

A clear connection between the competitiveness of firm in certain industries and the level of regional competences relevant to that particular industry has been argued for (see e.g. Neffke et al., 2014; Lawson, 1999). Co-location of many different yet related industries may facilitate the competitiveness of knowledge production. Due to some level of relatedness between such industries there are good possibilities for cross-sector knowledge flow leading to new re-combinations of knowledge (Boschma, 2014).

This work argues that favourable business environments are characterized by diverse and open knowledge networks within and across regions (Isaksen & Trippl, 2014), and that knowledge productions are facilitated by heterogenous social capital favourable both for bonding networks within social groups and bridging networks across different social groups and regions (see e.g. Malecki, 2012; Granovetter, 1973; 1985). The broad idea is that bonding social capital is considered important for regional economies in order to ´get by´ while bridging social capital is considered important for regional economies in order to ´get ahead´ (see e.g. Putnam, 2000). Regional conditions facilitating both inter- and intra-regional networking in this sense are considered favourable for the ability of local firm and industries to constantly evolve their activities into new but related activities, e.g. through labour mobility, spin-offs, and diversification processes (Boschma & Frenken, 2011; Boschma, 2014).

Together, all of these different factors are likely to facilitate the combination of local and global knowledge resources, hence the abilities of local firm to produce new knowledge (Bathelt et al., 2004). Strength in all of these regional characteristics have been deemed important elements regarding the abilities of firm to produce knowledge competitively, especially when it comes to knowledge intensive value creation (see e.g. Asheim et al., 2006). However, with increased peripherality, the accumulations of these factors are much less evident and even non-existing in some cases.

Thin business environments

Tödtling and Trippl´s (2005) definition on peripheral regions correspond with the type of areas at focus here, i.e. remote and low-populated areas characterized by absence of local agglomeration advantages and long distances to nearest ones – or non-core areas. They define peripheral regions as *organizationally thin*, referring to local absence of a critical mass of firm, higher education, research- and support organizations, unions, associations, hence little opportunities for local inter-organizational networking (see e.g. Trippl et al., 2015b).

Opposite to organizationally thick and diversified regions, peripheral regions are scarce in most if not all of the different factors discuss above considered important for knowledge intensive value creation and competitiveness of firm (see e.g. Trippl et al., 2015b; Isaksen & Trippl, 2014; Tödtling & Trippl, 2005). As an example, the term thin indicates scarcities in relevant competences for knowledge intensive firm (see e.g. Isaksen & Trippl, 2014; Isaksen, 2015; Hermelin, 2007; 2009; Power, 2002; 2003). This is likely to be challenging for non-core KIBS, since a core factor behind KIBS abilities to create value and compete on client markets is good access to highly educated competences with special sector-based skills (see e.g. Strambach 2010; Muller & Doloreaux, 2009; Simmie & Strambach, 2006; Bettencourt et al., 2002; Løwendal, 2005; Muller & Zenker, 2001). In such context, recent work argues for a positive relationship between increased share of people with tertiary education and regional development and economic growth (see e.g. Eklund et al., 2014).

Most firm in peripheral areas are small to medium sized enterprises (SMEs) in traditional sectors and may have lower absorptive capacity compared with firm in organizationally thick areas (Tödtling & Trippl, 2005). Local demand and rivalry are also scarce when compared with large urban areas, indicating little opportunities for non-core KIBS to engage in local inter-organizational networking and knowledge sharing (Tödtling & Trippl, 2005; Isaksen & Trippl, 2014). As an example, networks between peripheral firm and knowledge productive organizations such as extra regional universities and R&D organizations are usually weakly developed or even non-existing (Tödtling & Trippl, 2005; Isaksen & Trippl, 2014).

Finally, peripheral areas are typically characterized by high levels of bonding social capital considered important for local networking, but lower levels of bridging social capital considered important for the establishment of new networks across

sectors and across regions (see e.g. Malecki, 2012; Putnam, 2000; Granovetter, 1973; 1985).

Regional lock-ins

If regional economies are not able to explore new opportunities and develop in line with the international economy, they run risk of ending up in a negative lock-in situation. Three forms of negative lock-ins have been identified: *cognitive-, functional-, and political* (Grabher, 1993). Cognitive lock-ins occur when local industries are increasingly based on a common knowledge base and worldview, characterized by myopic or short-sided search processes (see e.g. Maskell & Malmberg, 2007). Functional lock-ins take place when local economies are characterized by strong endogenous interdependencies and well-established value chains hampering the exploration and application of extra-regional resources and opportunities. Political lock-ins emerge when ruling elites maintain a status quo in different parts of the local economic system (Grabher, 1993).

Lock-ins do not always lead to negative outcomes. Regional economies sometimes specialize in certain niches, leading to temporary successes and positive lock-ins where local firm are able to exploit a window of opportunity and grow for some period of time. However, if they maintain a strong exploiting strategy and do not explore and develop new opportunities in the long run, they are likely to gradually head into a negative lock-in situation.

While large urban economies are most often characterized by economic diversity and strong potentials for cross-sectoral collaborations, non-core areas are most often characterized by one or few dominating sectors and little potentials for cross-sectoral collaborations. If the dominating sectors in non-core areas are not able to explore new opportunities and gradually develop their activities in line with international and/or sectoral changes, such areas risk a gradual development towards negative lock-ins, characterized by economic stagnation leading to closure of firm, loss of jobs, decreasing- and ageing population, and so on. Hence, a more stable regional economic development in the long run depends on well balanced exploiting- and exploring strategies where firm at the same time capitalize on current opportunities and explore future possibilities (see e.g. March 1991).

Based on the illustrations above, it is likely that non-core firm are less able to explore and apply new opportunities than firm in large urban economies.

Balanced exploiting-exploration strategies are more likely to succeed in large urban areas where firm complement local agglomeration advantages with extra-regional ones (Isaksen & Trippl, 2014; Meijers & Burger, 2017; Alonso, 1973). Local agglomeration disadvantages and long distances to nearest ones however imply less abilities of non-core firm to do so. Non-core economies are therefore more vulnerable for international changes and more likely to head into lock-in situations than large economies.

3.3 Physical proximity and knowledge production

Tacit and coded knowledge

One of the key factors behind why co-location is considered important for knowledge production and competitiveness is that physical proximity facilitates the communication, absorption, and application of intangible benefits such as unintended diffusion of tacit knowledge (see e.g. Malmberg & Maskell, 1999; 2006; Gertler, 2003; 2004; Porter, 1990; 1998; Owen-Smith & Powell, 2004; Kogut, 2000; Dyer & Hatch, 2006; Howells, 2012; Jaffe et al., 1993). In such context, it has been argued that production of new knowledge depends on the abilities to create and disseminate local tacit knowledge (see e.g. Morgan, 2004; Lawson & Lorentz, 1999).

Organizational- and relational resources are *intangible* in nature, opposite to the *tangible* nature of physical resources. The former type of resources strongly applies to the tacit nature of KIBS VCPs (Strambach, 2010). While physical resources tend to depreciate over time, intangible resources may be developed further and refined over time through experience (Penrose, 1959). Therefore, instead of physical assets, are intangible resources understood as the core competence of firm and not the other way around. In such context, a dynamic aspect of resources has been highlighted (see e.g. Penrose, 1959; Teece et al., 1989; Itami, 1987). What is important in such an aspect is that resources have no intrinsic value per se; their value is only unveiled when they deliver services that are of some value to users (Penrose, 1959). As an example, a tool or a method may be useless for its user unless he or she is thought how to apply it in different contexts. Such teaching may demand high degrees of tacit knowledge interaction.

Unlike codifiable resources, tacit resources are most effectively communicated through face-to-face interaction and are therefore considered locally bounded and not easily communicated over distance (see e.g. Asheim, 1999; Gertler, 2001; 2003; 2004). The significance of trust between economic actors has been emphasized in this context (Asheim, 2000). Trust is considered a principal element behind mobilization of local resources (Echebarria & Barrutia, 2013), especially when it comes to the communication of tacit knowledge resources (Fukuyama, 1995). Hence, coexistence of trust and physical proximity is stressed when it comes to communication of tacit knowledge resources.

Some economic geographers are concerned that such explanations might just reinforce place bound restrictions of tacit knowledge interaction as well as reinforce the misleading dualism between tacit and codified knowledge (see e.g. Faulconbridge, 2006; Amin & Cohendet, 2004; Bathelt et al., 2004; Allen, 2000). Instead, the relational nature of knowledge production and learning is suggested, where both local- as well as extra regional spaces are investigated (see e.g. Bathelt & Glückler, 2005; Faulconbridge, 2006; Moodysson, 2008; Moodysson & Jonsson, 2007; Bunnel & Coe, 2001). A relational view on resources is considered a suitable approach in order to analyse the interactive character of knowledge intensive value creation and learning (see e.g. Bathelt & Glückler, 2003; 2005). Such a perspective reflects the interactive- and contextual nature of how resources are selected, used, and created.

A relational view on knowledge production

The field of economic geography has in the last decades been evolving towards a more relational view on knowledge production (see e.g. Bathelt & Glückler, 2003; 2005; Lundvall, 1985; 1994). Learning by interacting is the central theme of analysis in such a view (see e.g. Gertler, 1993; 1995; Lundvall & Johnson, 1994). Accordingly, value creation should be understood and analysed as a relational process rather than a static event of single transaction where a supplier delivers a solution to the buyer in a one-way manner. As I have mentioned before, this is based on the notion that individual agents do not create value in isolation and without context (Granovetter, 1985). Economic transactions are thus considered contextual social actions highlighting their relational character (see e.g. Bathelt & Glückler, 2003; 2005). Accordingly, the fields of economic geography and organizational studies have increasingly shifted attention from producers' output

in form of products or services, towards a stronger focus on value creation as contextual- and relational processes, highlighting more strongly the role of clients in such processes (see e.g. Bathelt & Glückler, 2003; 2005; Gummesson, 1995; Grönroos, 2008; 2011; Vargo & Lusch, 2004; 2014; Lusch et al., 2008; Vargo et al., 2010).

A relational approach fits well with KIBS VCPs, which are characterized by high levels of interaction and collaboration between KIBS and their clients during projects, where both actors contribute vital inputs and resources (see e.g. Strambach, 2010; Vargo & Lusch, 2004; 2014; Lusch et al., 2008; Vargo et al., 2010; Grönroos, 2008). Good relationships between KIBS and clients are therefore considered a key factor behind successful interactions, facilitating maximum benefits in the process of value creation (see e.g. Grönroos, 2008; Gruner & Homburg, 2000; Lundkvist & Yakhlef, 2004; Payne et al., 2008).

The relational aspect of knowledge production has been suggested as a central mechanism in decoupling social relations and cognitive spaces from the local scale (see e.g. Amin & Cohendet, 2004). As an example, recent work focusing on global relational spaces illustrates how tacit knowledge interactions may take place over long distances through intrafirm network management strategies within different branches of transnational corporations (TNCs) (see e.g. Faulconbridge, 2006; Amin & Cohendet, 2004; Bunnell & Coe, 2001). This work highlights knowledge management practices fostering production of new knowledge and understanding through social interaction (see e.g. Faulconbridge, 2006; Amin & Cohendet, 2004; Wenger, 1998). It is argued that such interactions enable individuals to learn from experiences and ideas of others (see e.g. Alvesson, 2004).

With the purpose to further develop our understanding on the geography of tacit knowledge interactions; Faulconbridge (2006) suggests the importance of differentiating *social production* of new knowledge from knowledge transfer in the form of *best practice and routines*, i.e. where the same approach is produced in one place and then replicated in different places (see e.g. Gertler, 2001; 2003; 2004). The latter approach has been coined problematic due to the ´local fix´ of tacit knowledge and differences in social contexts. As an example, differences in language, culture, and systems of regulations between nation states may limit the ability of actors to transfer and apply knowledge in the form of practice and routines across national borders (Gertler, 2001). Faulconbridge (2006), Amin and Cohendet (2004), and Wenger (1998) however argue that development of new

knowledge over distance involving communication of tacit knowledge is best facilitated through management practices fostering social interaction, i.e. through a relational approach.

Relational and organizational proximities

What is relevant in this context is that knowledge production and interaction may also be facilitated by other forms of proximity than just physical proximity, namely various forms of *relational proximities* (see e.g. Moodysson, 2008; Moodysson & Jonsson, 2007; Lorentzen, 2007; Bathelt & Glückler, 2005). As an example, these may be institutional proximity, e.g. where actors may or may not adhere the same set of norms and rules (see e.g. Kirat & Lung, 1999), and social proximity, e.g. where individuals may or may not sense that they belong to groups of individuals (see e.g. Boschma, 2005). The strength of these relational proximities relies on the level of trust among economic actors. Torre and Rallet (2005) subsume these different forms of relational proximities under the term *organizational proximity.*

Torre and Rallet (2005) distinct organizational proximity from geographical proximity (see also Rallet & Torre, 2000). Their definition on geographical proximity should however not be equated with physical proximity, i.e. the state of being close to someone or something. Geographical proximity deals not only with physical distances between units, e.g. between KIBS and client- and knowledge markets, but also with actual mobility in a both material and virtual sense, i.e. in terms of the ability and willingness to travel and interact over distance (see e.g. Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007). Geographical proximity may be a product of historical accumulation of where people live and meet, as well as territorial constructions of the transport- and communication infrastructures. It may also be influenced by subjective judgements made by individuals, e.g. how they perceive close by or distant. Such judgements may vary between individuals, e.g. in terms of gender, age, social background, or occupation (Torre & Rallet, 2005). Geographical proximity thus underpins the connectivity and positionality of actors in relative terms, "*both in a more objective (what is easy and affordable to reach) and subjective sense (what feels near)*" (Lagendijk & Lorentzen, 2007: 460).

Torre and Rallet (2005) draw a sharp distinction between spatial (i.e. geographical) and non-spatial (i.e. relational) dimensions of proximity.

Organizational proximity is not geographical it is relational. It is constituted on the "*logic of similarity"*, and the "*logic of belonging"* (Torre & Rallet, 2005: 50). It denotes the ability of organizations (or their inabilities) to engage their members to form and participate in intra- as well as inter organizational relationships (Lagendijk & Lorentzen, 2007). Hence, this work highlights organizational proximity, or relational proximity, as a complementary factor to physical proximity, which facilitates knowledge interaction and value creation over distance.

Torre and Rallet (2005: 50) illustrate four situations in which either organizational- or geographical proximity is only at work, or that both are at work simultaneously. When geographical proximity is only at work, we may have agglomeration of different economic actors without any direct interaction or coordination between them. When organizational proximity is only at work, interactions may primarily be conducted over distance, e.g. between different branches of large international firm or different actors in value chains where interaction and value creation is co-ordinated through organizational rules and ICTs. In situations where both geographical- and organizational proximities are at work simultaneously, we have agglomeration of local systems of value creation (Rallet & Torre, 2000; Torre & Rallet, 2005). Such situations are characterized by high levels of interactions and coordination, and/or temporary forms of face-to-face interaction. As an example, this may apply when new relationships are established, new projects initiated, core needs analysed, or conflicts managed. Torre and Rallet (2005) emphasize the abilities of large firm to organize interactions between their different branches over distance, but underline that small firm are more dependent on temporary proximity during different stages of projects.

Lagendijk and Lorentzen (2007) add the fifth situation in this context where both geographical- and organizational proximity are to a large extent absent. As an example, such a situation may apply to economic activities in non-core areas, where local agglomeration is absent, opportunities for local organizational networking are scarce, and distances to nearest large client- and knowledge markets are long. In such context they argue that although mobility has increased in both physical- and virtual sense, especially for more advanced social groups or individuals with high levels of human capital, e.g. academics or managers in large international firm, large part of the local population in any given region still

experience their life strongly territorially bound (see e.g. Lagendijk & Lorentzen, 2007; Jones, 2005). Hence, they argue that although spatial mobility of individuals and ideas has increased, people are nevertheless socially- and institutionally embedded. The local context therefore plays an important role in order to understand how economic value is created in different places (see also Massey, 2005). They nevertheless emphasize that organizational proximity plays an important role in understanding how non-core firm interact and conduct business over distance (see also Lorentzen, 2007).

I therefore argue that it is likely that organizational- or relational proximities between distant economic actors have been facilitated further by increased mobility of people and ideas in both actual- and virtual sense (see e.g. Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Lorentzen, 2007). Such factors are therefore relevant topics of investigation when it comes to the abilities of non-core KIBS to interact, source knowledge, and create value over distance and consequently compete on extra regional client markets.

3.4 Increased abilities to interact and conduct business over distance

Although many non-core areas offer abundance of various natural resources, they are usually scarce in local factors considered important for knowledge intensive economic activities. As discussed above, while firm in large urban areas may complement local agglomeration advantages with extra regional ones, firm in non-core areas have to compensate for both local disadvantages as well as long distances in this sense. The latter is therefore to some degree problematic from a conceptual perspective (see e.g. Trippl et al., 2015b).

However, recent work shows examples of knowledge intensive firm in peripheral areas that have been able to compensate for local disadvantages through drawing on extra regional resources (see e.g. Grillitsch & Nilsson, 2015; Jakobsen & Lorentzen, 2015; Drejer & Vinding, 2007). Grillitsch and Nilsson (2017) found that small knowledge intensive firm in peripheral areas with less than fifty employees show similar if not greater growth in terms of sales and employment than similar firm in large urban areas. These firm have therefore found ways to

compensate for local disadvantages through alternative means and compete with firm in large urban areas. Although these studies do not display how they do so on daily basis, these are vital findings since they indicate increased possibilities for knowledge intensive value creation in peripheral areas. As discussed above, it is likely that increased abilities of people and businesses to interact and conduct business over distance through ICTs play an important role in this context (see e.g. Rodríguez-Pose, 2011; Fitjar & Rodríguez-Pose, 2011; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007).

Debates on how ICTs affect the geography of knowledge production

Having said that, arguments advocating for decreased importance of local agglomeration advantages for knowledge production due to ICT developments have for long fuelled lively debates within the field of economic geography. As an example, following Cairncross´ (1997) predictions about the ´death of distance´ due to such development, many scholars were keen to argue for the opposite in the following years (see e.g Leamer & Storper, 2001; Malecki, 2002; Morgan, 2004; Castells, 2000). They argued that geography still matters in spite of ICT development and increased usage. As an example, Malecki (2002) argued that the enormous increase in Web-based dataflow in fact reinforces the urban hierarchy. In this context, he highlights that most infrastructure investments have been made within and between large urban areas, "*reinforcing old patterns of agglomeration*" (Malecki, 2002: 419).

On similar notes, at the same time as Castells (2000) discusses various global possibilities due to ´the rise of the network society´, he also highlights global unevenness in such context. He underlines that societies have different abilities to master technology and that "*while technology per se does not determine historical evolution and social change, technology (or the lack of it) embodies the capacity of societies to transform themselves*" (Castells, 2000: 7). He argues that countries that are slow in adapting to new ICTs find themselves in a digital divide leading to Internet access inequalities, e.g. in relation to accessing and using social support, as well as knowledge resources needed for value creation and learning.

Leamer and Storper (2001) argued that historical changes or infrastructure improvements have always had a double effect. In this context, they highlighted that at the same time that certain routine activities have dispersed due to

infrastructure advancements, e.g. in transport and telecommunication, the level of complexity, specialization, and time-dependence of production has also increased (Leamer & Storper, 2001). This means that while infrastructural improvements have facilitated centrifugal effects in some mature and highly routinized manufacturing industries, such improvements have also caused centripetal effects where agglomerations of knowledge intensive economic activities gain importance. Thus, although general improvements in the communication- and transport systems in the 20th Century have gradually facilitated increased geographical fragmentation of production (see e.g. Arndt & Kierzkowski 2001), a shift from traditional agglomeration tendencies of producers had not been detected in the early 2000s (see e.g. Scott & Storper, 2003).

Furthermore, in 2001 Leamer and Storper also argued that future development of ICTs would not turn around agglomeration tendencies of knowledge production. They based this not only on the increased complexities of knowledge intensive production but also on that such activities require high levels of trust and understanding, which in return demand physical proximity and face-to-face interactions among participating actors (Leamer & Storper, 2001). In other words, Leamer and Storper claimed in 2001 that the importance of local agglomeration and physical proximity would continue to grow in spite of future ICT developments.

Recent ICT developments and increased usage

Moving closer to the current date, although not haltering agglomeration of economic activities, it is likely that more recent advancements in ICTs and increased usage have enabled knowledge intensive firm to interact and conduct business over distance more successfully than before (see e.g. Rodríguez-Pose, 2011). Borrowing Leamer´s and Storper´s (2001) own terminology, the 20th Century version of the Internet created possibilities of transmitting messages and information, indicating its limitations when it comes to complex interactions. This lies at the core of their argument why physical proximity and agglomeration advantages would continue to grow in importance for knowledge intensive economic activities. It is however relevant to mention that their argument regarding this development was put forward in times when the generation *´read-only Web 1.0´* was still very much in use, merely enabling users to send and receive static information. In this context, the more evolved generations *´read-and-write*

Web 2.0', a term coined in 2004, and the *'semantic Web 3.0'*, launched in 2014, has converted the Web into a huge database and increased considerably the ability of individuals, groups, and firm to interact, share knowledge, draw learning, and conduct business over the Internet (see e.g. Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012).

Another important factor in this context is that ICT usage has increased greatly during the last decades. In a global sense, the proportion of individuals using the Internet has grown from less than 0.1% in 1990, to around 6.7% in 2000, and then to over 53% in 2019 (ITU, 2019; The World Bank, 2020). This growth varies however greatly between different parts of the world (see e.g. OECD, 2018). In 2019, the proportion of Internet users in the most developed countries was around 87%, around 47% in the developing countries, and around 19% in the least developed ones (ITU, 2019). This rapid increase in Internet usage indicates that Web-based resources and creativity have increased as well, leading to a virtual agglomeration of knowledge accessible to those enjoying a good Internet connection.

The adaptability of these technological improvements has positively been connected with high proportion of young employees in firm (see. e.g. Meyer, 2011; de Koning & Gelderblom, 2006; Schleife, 2006). This indicates that younger generations, already used to Web-based interactions most of their life, are more likely able and willing to interact and participate in knowledge intensive business transactions over distance than previous generations that grew up in a less technologically connected world. It is therefore likely that recent ICT developments and increased usage have raised similarity and belonging among today's users of ICTs in such context (see e.g. Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007). It is thus plausible that increased will and ability to participate in Web-based interactions have also increased the level of trust and hence relational proximity between economic actors when it comes to interacting and conducting business over distance.

Due to increased abilities in this sense, recent work argues that physical proximity between KIBS and client- and knowledge markets are less important today than previously (see e.g. Shearmur & Doloreaux, 2015; 2008; Macpherson, 2008; Beyers, 2003; Beugelsdijk & Cornet, 2002). As an example, Macpherson (2008) studied the relationships between the innovativeness of manufacturing firm in New York State and the location of KIBS providing them services during the

period 1992-2005. In the beginning of the period their innovativeness was negatively affected by increased distance to the KIBS. By 2005, the level of innovativeness based on such collaborations was equal across the State, i.e. distance did not play a role in this respect. Macpherson (2008) highlighted increased abilities to interact and conduct business over the Internet as a key factor in this context.

A more recent study by Shearmur and Doloreux (2015) from the Quebeck region in Canada supports Macpherson´s findings, i.e. that distance between KIBS and clients no longer effects the propensity to innovate. They also argue that physical proximity between KIBS and client markets now play a lesser role than previously due to increased abilities of actors to interact and conduct business through the Internet. They in fact display evidence that the innovativeness of manufacturing firm is more strongly connected with KIBS services when distance increases (Shearmur & Doloreux, 2015). They argue that buyers of knowledge intensive services are more willing to reach over long distances than those seeking less knowledge intensive- and more routinized services. They also argue that manufacturers choices of KIBS services are much more dictated by the appropriateness of the supplier rather than physical proximity (see also Beugelsdijk & Cornet, 2002). However, since their study reveals that interactions between manufacturing firm and KIBS primarily take place within the Quebeck region, Shearmur and Doloreux (2015) also emphasize that geographical boundaries exist, e.g. due to national and/or regional differences in culture and languages (see Polése & Shearmur, 2004). Their findings nevertheless clearly display increased abilities of KIBS and other economic actors to interact and conduct business over distance.

Although increased abilities in this sense have not made distance meaningless, they most certainly indicate that firm are less constrained by the local business environment than before. While it is probable this development applies to all firm regardless of location, I suggest that it should be understood especially important for non-core firm due to local agglomeration disadvantages and long distances to large client- and knowledge markets. I argue that it is likely that this development has facilitated further the abilities of non-core firm, whether knowledge intensive or belonging to the more traditional parts of the economy, to interact and communicate knowledge over longer distances than before (see e.g. Fitjar & Rodríguez-Pose, 2011; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007). Put

differently, further enabled them to compensate for local agglomeration disadvantages and long distances to extra regional ones, hence their abilities to follow structural changes in the international economy. At least firm in areas that are well connected in terms of communication- and transport infrastructures.

3.5 Compensating local disadvantages

Building on the discussions so far, I argue that a key factor behind understanding how knowledge intensive firm in non-core areas create value and compete on client markets is to consider their abilities to compensate local agglomeration disadvantages and long distances to nearest ones through alternative means.

The interplay between firm strategies and available and potential resources

Porter (1990) and Løwendahl et al. (2001) stress that firm need to have clear strategies regarding what they want to do and emphasize that such strategies must be set in balance with available and potential resources or attributes in the local business environment. Porter (1990) nevertheless stresses that weakness in or absence of some local factors may under certain circumstances become a driving force behind economic novelty and competitiveness. In such context, Porter proposes scarcities, opposite to abundance of factors, a key element behind true competitive advantage. When firm are faced with scarcities in certain local factors of production, their competitiveness depends on abilities to find alternative solutions. If they are successful in doing so, their action may lead to novelty and competitive advantage on client markets. This suggests that scarcities in some local factors of production do not necessarily limit the abilities of firm to create value and compete on client markets. Local scarcities may very well be a driving force for new discoveries and new approaches. In such circumstances, firm are simply pressured to innovate around local disadvantages if they want to be or stay competitive on client markets.

However, Porter´s (1990) argument in this sense is grounded in situations where strengths in very few local factors of production are absent. Porter stresses that competitiveness of firm requires certain levels of local agglomeration advantages,

e.g. regarding demand- and rivalry, inter-organizational interactions, as well as relevant local competences and resources, to name a few. Although not being precise on how many, he argues that too many central deficiencies in such structural factors would halter the abilities of firm to compensate for local disadvantages. Porter´s argument therefore corresponds in this sense with a more recent work arguing that knowledge intensive firm in large urban areas may complement local resources through drawing on extra regional ones (see e.g. Moodysson, 2008; Bathelt et al., 2004).

This work nevertheless indicates the significance for firm to be located in large urban areas, at least to some extent characterized by local agglomeration advantages, in order to be able to do so. Such preconditions do not apply to non-core firm as discussed previously. In spite of Porter´s (1990), Moodysson´s (2008), and Bathelt´s et al (2004) argument in this sense, I argue that today's knowledge intensive firm are more able to compensate local disadvantages through different means than in 1990, when the selective factor disadvantages argument was put forward. However, knowledge intensive firm in non-core areas need to find ways to compensate for both local agglomeration disadvantages and long distances in order to enhance organizational competences, create value, and compete on client markets. Although such double disadvantages are problematic from Porter´s perspective, I find refuge for my argument in recent work highlighting increased abilities to interact and conduct business over distance (see e.g. Fitjar & Rodríguez-Pose, 2011; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012). Hence, this work indicates increased abilities to draw on extra regional client- and knowledge markets.

General transformation pressure benefitting non-core firms

As discussed earlier, recent work indicates that knowledge intensive firm in non-core areas are increasingly able to compete with similar firm in large urban areas (see e.g. Grillitsch & Nilsson, 2015; 2016; Jacobsen & Lorentzen, 2015). This has been facilitated by that people and businesses are in general today more able to interact and conduct business over distance through ICTs than before (see e.g. Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012). Thus, this development should be understood as a general transformation pressure affecting and benefitting all firm and individuals regardless of location as long as

they are connected to the Internet. This indicates that not only firm in large urban areas are able to complement local resources through drawing on extra regional ones. It is likely that this development has also enabled knowledge intensive firm in non-core areas to do the same and therefore to some degree compensate for local disadvantages, i.e. in situations where most relevant local factors of production are largely absent. Otherwise, it is likely that such firm would have limited abilities to create value and compete with similar firm in large urban areas on common client markets.

Hence, in spite of Porter´s (1990) emphasis on the significance of strength in most local factors of production, I argue that it is relevant and of value to borrow from his discussions on selective factor disadvantages. This is relevant in order to understand how knowledge intensive firm in non-core areas compensate local disadvantages and long distances to client- and knowledge markets through alternative means, hence understand their abilities to create value and compete on client markets.

Important compensating factors

It is beyond this research to cover all possible compensating factors in the context of KIBS VCPs. I therefore focus on potential compensating factors related to resources considered most important for KIBS competitiveness, i.e. competences, client relations, and knowledge needed for value creation and learning. In such context, it is relevant to consider the role of the communication- and transport infrastructures.

Competences and role of labour mobility

Good access to highly educated and skilled competences is considered critical for KIBS competitiveness (see e.g. Howells, 2012; Taylor, 2006; Løwendahl, 2005; Florida et al., 2003; Dayasindhu, 2002; Grimaldi & Torrisi, 2001). Recent work argues that high local labour mobility among KIBS in large urban areas facilitates inter-sectoral flow of knowledge, which in return stimulates productivity and enhances competitiveness (Kekezi & Klaesson, 2020). Focusing on KIBS inter-sectoral labour mobility in 290 Swedish municipalities during the period 2002-2010, this work argues that such benefits are greater in large urban areas than non-core ones where labour turnover is much lower.

However, although for opposite reasons, it is nevertheless likely that low labour turnover in non-core areas plays an important role when it comes to local scarcities in relevant competences. When employees stay long with firm, they achieve high levels of experience-based and sectoral specific competences over time, i.e. through solution of projects and continuous learning (see e.g. Isaksen, 2015; Isaksen & Karlsen, 2016). This indicates that non-core KIBS are able to gradually enhance organizational competence over time, hence their competitiveness. I therefore argue that low labour turnover in non-core areas should be considered an important compensating factor regarding local scarcities in relevant competences and low (or even absence of) local inter-sectoral labour mobility.

In relation to competences, I also argue that non-core KIBS may also benefit from individuals that move to non-core areas, e.g. from larger urban areas. Migrants not only offer new competences and knowledge; their personal and professional relationships may also lead to new valuable relationships on client markets (see e.g. Solheim & Fitjar, 2018; Martynovich, 2017; Saxenian, 2007). These are often returnees, i.e. individuals that return back home to their place of birth. As an example, Saxenian (2007) discuss individuals from India that moved to USA in order to study and work within the ICT sector and then later in their lives moved back home and established new businesses. A core factor in Saxenian´s story is that when they moved back to India after many years in USA, they not only brought with them experience-based competences, but also well-established business networks on client markets in USA and elsewhere. This, in combination with being local to begin with, i.e. already enjoying established networks back home, facilitated the growth and success of their businesses. Saxenian (2007) emphasises this a key facilitating factor regarding fast growth of the Indian ICT sector on global markets.

Hence, labour mobility involves double advantages in this sense, i.e. offering both individual competences and the business networks they entail. Although this should be understood important for all knowledge intensive firm regardless of location, I suggest that this should be understood especially important for non-core ones. Not only due to local scarcities in relevant competences but also little opportunities for local inter-organizational networking and thin local client market in such areas (see e.g. Tödtling & Trippl, 2005; Aslesen & Isaksen, 2007; Isaksen & Trippl, 2014). I therefore argue that such double advantages should be understood as an important compensating factor for non-core KIBS, since they

both strengthen organizational competences as well as lead to new relationships on extra regional client markets.

Client relationships and role of reputation

This leads us towards looking closer on how non-core KIBS establish and maintain relationships on client markets, especially extra regional ones. It is difficult for firm seeking KIBS services to realize potential value adding of projects in advance since they only unfold over time (Tuli et al., 2007). It is even more difficult for them to valuate in advance the abilities of unfamiliar or newly established KIBS in this sense. Reputation and relationships on client markets play an important role in this context (see e.g. Alvesson, 2004; Løwendahl et al., 2001; Clark, 1995). Reputation is based on previous work and is facilitated by references from current or previous clients (Alvesson, 2004). Good reputation and relationships on client markets is likely to reduce marketing costs and be helpful in attracting and signing new clients, even in new client markets (see e.g. Alvesson, 1990; 2004; Løwendahl et al., 2001; Clark, 1995; Greenwood & Empson, 2003; Åge, 2011). As an example, if KIBS and their employees have established good reputation and relationships on client markets through delivering good and reliable services in the past, it is more likely that clients, whether old or new, trust them to deliver good services in the future (see e.g. Alvesson, 2004; Greenwood & Empson, 2003; Tuli et al., 2007).

I argue that this especially applies in situations when well establish KIBS initiate new projects with previous clients or when they sign new clients through positive reference from previous or current clients, i.e. good reputation increases their trustworthiness on client markets. If, however, they are new in business and have not yet established a client base and project portfolio, hence no or little reputation on client markets, it is more likely that the process of finding and signing new clients is rather challenging and also quite sensitive to distance. The establishment of new relationships on extra regional client markets are likely to demand more face-to-face interactions for newly established KIBS than older ones, demanding more travel time leading to higher costs of projects, and hence decrease margins for potential profits. Although this may apply to all KIBS, no matter where they are located, it is likely that good relationships and reputation on client markets are especially important for non-core ones due to a thin local market and long distances to larger ones. It is likely that if non-core KIBS want to sustain or grow their client portfolio, they have to focus on extra regional client markets. KIBS in

large urban areas already enjoy a large local client market and are therefore less dependent on focusing on extra regional ones than non-core KIBS in order to grow.

The concept of reputation is strongly related to the concept of trust (Alvesson, 2004). Previous work argues that establishment and maintenance of trust depends on physical proximity and face-to-face interaction (Gertler, 2001; Granovetter, 1985; Polanyi, 1958; Howells, 2012; Malecki & Tootle, 1996; Huggins & Johnston, 2010). From such a conceptual perspective, the ability of non-core KIBS to establish and maintain trust on extra regional client markets may be considered problematic, at least to some extent. I nevertheless argue that in situations where non-core KIBS have already established good relationships and reputation on extra regional client markets through previous work signalling their competences in interacting and creating value over distance, they are also likely to strengthen their trustworthiness among new potential clients on such markets. Well established reputation is therefore likely to enable abilities to find and sign new clients, even on extra regional client markets. This is likely to facilitate the establishment of relationships of trust between KIBS and new clients, which may in return reduce the need for face-to-face interaction and the likelihood of misunderstandings and conflicts during projects, and therefore even increase their marginal profits (see e.g. Grönroos, 2008; Gruner & Homburg, 2000; Aarikka-Steenroos & Jaakkola, 2012). Hence, although good relationships of trust and reputation on client markets are important for all KIBS, regardless of location, I argue that they should be considered especially important for the competitiveness non-core KIBS.

Knowledge resources and the role of extra regional agglomeration advantages

As discussed above, KIBS abilities to create value and compete on client markets depends on good access to large pool of relevant knowledge resources needed for learning and solution of projects (see e.g. Teece et al., 1989). A key factor behind the competitiveness of firm has to do with their abilities to make use of available- and potential resources within and beyond the firm in a superior manner (see e.g. Maskell, 2001; Løwendhal et al., 2001; Lusch et al., 2008; Vargo et al., 2010). This is especially important for KIBS, since knowledge markets they operate in are highly fluid and constantly developing (see e.g. Strambach, 2010). Therefore, KIBS employees continuously have to learn new things and share what they have learned with each other in order to follow sectoral changes. For this reason, KIBS

are understood as learning organizations characterized by continuous improvements in individual- and organizational competences through interacting (see e.g. Vargo & Lusch, 2004).

This begs the question how non-core KIBS compensate for local agglomeration disadvantages and long distances in this sense. The idea that economic interactions stretch beyond the local space has been around for some time. As an example, formulating his "*borrow size*" concept, Alonso (1973) argues that if small cities are weak in certain factors of production, they may draw on or "borrow" agglomeration advantages from adjacent larger urban area. He nevertheless limited his concept to activities taking place within the borders of series of urban areas forming large metropolitan area, stressing the importance of physical proximity.

Stretching the concept of borrow size further, Meijers and Burger (2017) emphasize that not only small cities draw on large cities in this sense. They argue that large cities also capitalize on networks with smaller cities, which help them maintain a more metropolitan function than they could otherwise support independently. They also highlight the relational nature of such interactions and propose that the borrow size concept needs to be stretched over wider networks of cities, i.e. on multiple spatial scales over longer distances than Alonso (1973) did in his original argument (Meijers & Burger, 2017). They therefore suggest that physical proximity plays now a less important role than before in this context. The stretched borrow size argument therefore corresponds with Shearmur and Doloreux´s (2015) findings displaying that KIBS services can now be conducted over longer distances than before.

The borrow size concept, as presented by Alonso (1973) and Meijers and Burger (2017), is built around the idea that firm in large urban areas are able to borrow extra regional agglomeration advantages through networking with firm in other large urban areas. Thus, the concept does not take account of non-core firm. However, considering recent work suggesting increased competitiveness of knowledge intensive firm in non-core areas (see e.g. Grillitsch & Nilsson, 2015; 2017; Jacobsen & Lorentzen, 2015), it is likely that firm in such areas are also able to capitalize on extra regional networks of agglomeration advantages. As an example, increased abilities to interact and conduct business over distance due to recent ICT developments and vast increase in usage may have advanced further their abilities in this sense (see e.g. Jacksi & Abass, 2019; Salmon, 209; Algosaibi

et al., 2017; Berthon et al., 2012). I therefore argue that it is likely that the abilities of non-core KIBS to draw on extra regional agglomeration advantages such as large client- and knowledge markets have increased from before. Although this development is likely to benefit all KIBS, regardless of location, I nevertheless argue that it should be understood especially important for non-core KIBS given absence of local agglomeration advantages and long distances to nearest ones.

Communication- and transport infrastructures

Finally, a good and dependable communication- and transport infrastructures are highly important in the context of the potential compensating factors discussed above, simply because they shorten the lines of communication between participating actors and facilitate access to relevant extra regional factors of production (Simmie & Strambach, 2006; Porter, 1990). As an example, non-core KIBS cannot benefit from recent ICT developments if there is no or poorly structured communication infrastructure in place. Likewise, if such infrastructure is in place, but nevertheless slow and unable to carry large amounts of data, it is not likely that non-core KIBS are able to compete with similar KIBS in areas enjoying high-speed Internet capable to mobilize large amounts of data in short time. A good and dependable communication infrastructure should therefore be understood a key compensating factor behind the abilities of non-core KIBS to interact, create value, and compete on distant client markets.

A good and dependable transport infrastructure is also likely to play an important role in this context. As an example, good and dependable transport system, i.e. in terms of time and cost of travel (see e.g. Gløersen et al., 2006), may stretch the size of the labour market area, and hence the pool of potential relevant competences. Also, a good and dependable transport infrastructure may reduce the time and cost of travel if non-core KIBS have to visit extra regional clients for some reasons. It may even increase the size of their potential client market area. Again, although good and dependable communication- and transport infrastructures are likely to be highly important for all KIBS, regardless of location, I argue that such infrastructures are in particular beneficial for non-core ones due to local disadvantages and long distances to client- and knowledge markets.

4. Analytical framework

4.1 Analysing knowledge intensive value creation

Knowledge intensive value creation should not be understood or analysed as an isolated- or static event. Rather, it is a complex process taking place over time, characterized by different operational stages where something existing is evolved to a more desired state (see e.g. Vargo & Lusch, 2004; 2014; Lusch et al., 2008; Vargo et al., 2010; Grönroos, 2006; 2008; Løwendahl, 2005; Stabell & Fjeldstad, 1998; von Hippel, 1994). Such processes are characterized by high levels of interaction and collaboration between KIBS and clients during projects (see e.g. Strambach, 2010; Løwendahl et al., 2001; Gustafsson et al., 2012).

To begin with, KIBS have to find and sign new clients or start new projects with previous clients. The important role of relationships and reputation has already been discussed in this context. What is also important at this stage is that KIBS must sustain a strategic balance between available and potential resources and type of clients and projects. A mismatch in such context is likely to upset their abilities to successfully create value and compete on client markets (see e.g. Løwendahl et al., 2001; Porter, 1990). Available and potential resources may both enable and constrain the development of strategies on type of clients and projects. Similarly, new strategic goals on type of clients and projects affect the direction of what resources are needed in order to develop individual- and organizational competences in line with new demands. Also, during project work, KIBS may develop further strategies on type of client and projects as well as their resource base derived from learning gained from current and previous projects (Løwendahl et al., 2001). Thus, KIBS abilities to create value and compete on client markets rest on their abilities to combine external resources with learning drawn from current and previous projects, and then utilize for the benefits of future clients (see e.g. Strambach, 2001).

When clients have been signed, projects are formally started. To begin with, a good understanding is required about clients' needs and what competences and other resources are needed for the solution of projects (see e.g. Sawhney, 2006; Lapierre, 2000; Bettencourt et al., 2002; Aarikka-Steenroos & Jaakkola, 2012). The success of this depends on that clients actively participate in defining their needs, provide information on operational- and technological factors as well as insights into their own client market and the usage context of the project, and also participate in selecting and testing potential solutions during different stages of projects (see e.g. Miles et al., 1995; Bettencourt et al., 2002; Løwendhal, 2005; Ballantyne & Varey, 2006; Grönroos, 2000; 2008; Vargo & Lusch, 2004; 2014; Aarikka-Steenroos & Jaakkola, 2012). Clients need to provide financial resources and be willing to dedicate time and inhouse competences to the project (see e.g. Lapierre, 2000; Bettencourt et al. 2002).

In some cases, size and complexity of projects may lead to failures in communication between KIBS and clients (Shostack, 1987). Problems often derive from that clients fail to understand the importance of their participation during projects, and they sometimes fail to cope with their non-routine and uncertain nature (Alejandro et al., 2011). Clients do not always know what they want or need, nor have abilities to communicate such information to the KIBS. This is likely to increase further the level of complexity, which may increase the need for face-to-face interactions during projects (see e.g. Möller & Törrönen, 2003). For this reason, the success of value creation strongly depends on that KIBS establish good relationships with clients and thoroughly analyse their needs at the beginning of projects (see e.g. Gustafsson et al., 2012; Tuli et al., 2007; Nordin & Kowalkowski, 2010; Sawhney, 2006; Lapierre, 2000; Bettencourt et al., 2002). Prioritizing such strategies reduces the likelihood of misunderstandings and conflicts during their later stages. This reduces the need for face-to-face interaction throughout projects, which in return increases their potential marginal profits (see e.g. Grönroos, 2008; Gruner & Homburg, 2000; Aarikka-Steenroos & Jaakkola, 2012).

Finally, the delivery/implementation of the solution may take place gradually during projects, not necessarily just at their end (Løwendahl et al., 2001; Vargo & Lusch, 2004; 2014; Grönroos, 2008; 2011). This may demand some levels of interaction between KIBS and their clients. Client participation is sometimes demanded in order to test, evaluate, and develop the solution further. In some

cases, the KIBS need to train their clients´ employees on some aspects of the solution. The need for face-to-face interaction however varies greatly during this stage. Some projects demand more client participation than others, depending on size and complexities of projects (Aarikka-Stenroos & Jaakkola, 2012). The need for face-to-face interactions during delivery/implementation processes is therefore likely to increase in line with increased need for participation in this sense.

4.2 Analytical framework for knowledge intensive value creation

The complex nature of knowledge intensive value creation begs the question how such processes should be analysed and understood. Drawing on previous work, it is assumed that the absence of local agglomeration advantages and long distances to client- and knowledge markets are constraining for the competitiveness of non-core KIBS (see e.g. Strambach, 2010; Luthje et al., 2005). As an example, local thinness and long distances may limit choices on type of clients and projects, as well as abilities to source knowledge, create value, and therefore abilities to compete and grow on distant client markets. There are however reasons to assume that non-core KIBS are able to compensate, at least to some extent, for such disadvantages through alternative solutions, as I have discussed before.

A key factor in this context is that the significance of physical proximity is likely to vary during different stages of projects (see e.g. Moodysson, 2008; Hansen, 2014). I argue that such an action-oriented reasoning is an important analytical feature in order to analyse if and how different stages of projects are affected by local disadvantages and long distances to large client- and knowledge markets. Through analysing if, when, how, and why physical proximity is important and distance problematic (or not) during different stages of projects, as well as how non-core KIBS compensate for such disadvantages; I provide answers to the research question of the thesis.

In order to divide projects in different operational stages the thesis draws on work from service management studies (Løwendahl et al., 2001; Vargo & Lusch, 2004; 2014; Grönroos, 2008; 2011; Aarikka-Steenroos & Jaakkola, 2012). Projects may be divided or described by three key stages characterized by high levels of

interaction and collaboration between KIBS and their clients: i) *finding and signing new clients*; ii) *analysis of clients' needs and management of resources*; and iii) *delivery/implementation of the solution*. Although these different stages are discussed and presented here in a linear manner for simplification purposes, they should not primarily be understood as such. Different stages of such complex processes often take place simultaneously, are revisited during projects, or may even never take place (Løwendahl et al., 2001; Vargo & Lusch, 2004; 2014; Grönroos, 2008; 2011; Aarikka-Steenroos & Jaakkola, 2012). These three key stages of projects form the core analytical aspects of the thesis.

Analytical limitations

A regional resource base perspective provides us with a framework to understand the relationship between firm and the local business environment they operate in. This is based on the idea that there is a strong relation between regional resource bases and the type of industries that prosper in such regions (see e.g. Neffke et al., 2014; Lawson, 1999). Therefore, when applying a resource base perspective, a clear understanding must be established about what resources are relevant for the type of economic activity at focus, both within and beyond the firm (Maskell, 2001). There are numerous possible resources that could be considered relevant in a favourable business environment. Porter (1990) argues that the mix of factors differs widely among industries, where some factors are more important than others, and some even not important at all. The important question is therefore what factors are at focus in research each time.

Hence, the focus here is only on factors considered important for the ability of KIBS to create value and compete on client markets and those that are not relevant are left out. As an example of the latter, the thesis does not focus on physical resources such as land, water, minerals, timber deposits, and fishing grounds. Capital resources have little relevance here since software- and advertising KIBS start-ups are not capital intensive (see e.g. Strambach, 2010; Weterings & Boschma, 2006). Likewise, it is beyond the reach of the analysis to focus on the role of sectoral price strategies or how governmental actions or the national structure of the KIBS sector shape or condition value creation and competitiveness (see e.g. Porter, 1990). All of these may be specific research topics by themselves.

Based KIBS characteristics discussed above, the analytical focus is primarily on resources such as competences, client relations, and external resources needed for value creation and learning. There are numerous of possible resources in this context, e.g. related to knowledge on new technologies, methods, sectoral trends, and market demand development in software and advertising to name a few. In such context, the analysis considers wherefrom and through which channels resources needed for value creation and learning are sourced from. As I have argued, it is relevant to include an analytical focus on if and how recent ICT developments and increased usage have enhanced the abilities of non-core software- and advertising KIBS in this sense (see e.g. Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012; The World Bank, 2020). In such context, it is relevant to include a focus on the qualities of the communication- and transport infrastructures (see e.g. Simmie & Strambach, 2006; Porter, 1990).

Based on the discussions above regarding the significance of good client relations for the success of value creation (see e.g. Strambach, 2010; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007), the role of reputation and relationships on client markets is analysed. This is done in the context of both finding and signing new clients as well as increased abilities to interact and create value over distance (see e.g. Alvesson, 1990; 2004; Åge, 2011; Greenwood & Empson, 2003; Clark, 1995).

Finally, the analysis also considers the role of general transformation pressure likely to affect all firm regardless of location. Recent ICT advancements and increased usage are examples of such general forces. Such forces may either benefit or hamper non-core KIBS compared with KIBS in large urban areas or affect them equally. Thus, in order to understand the source of non-core competitiveness, the analysis distinguishes between if their abilities to compensate for local agglomeration disadvantages and long distances are explained by general transformation pressure, by their own local specific strategic actions, or by the combination of these two distinct forces.

4.3 Core analytical aspects

Stage 1: Finding and signing new clients

Type of clients and projects

A thin local client- and knowledge market and long distances to large ones are likely to affect or even limit non-core KIBS strategies on type of clients and projects. Recent findings however indicate increased abilities of knowledge intensive firm in non-core areas to compensate for such disadvantages and compete on distant client markets. Increased abilities to interact and conduct business over distance play an important role in this context. It is nevertheless unclear if and how local disadvantages and long distances affect location of and the type of clients and projects non-core KIBS are strategically able to focus on. Hence, the analysis focuses on if and how local disadvantages and long distances affect their strategies in such sense. For contrasting purposes, the analysis also focuses on if there is any noticeable difference on type of clients and projects between the non-core and the Malmö KIBS.

The role of reputation on client markets

In order to grow their client and project portfolio, software- and advertising KIBS need to find and establish relationships with new clients or start new projects with current or previous clients. Non-core KIBS may have to focus on extra regional client markets in order to complement a thin local one in this sense. I have argued that good reputation is likely to enable them to establish new relationships of trust on extra regional client markets, and hence reduce the time needed to find and sign new clients. Thus, the analysis focuses on if and how reputation affects the abilities of non-core KIBS to find and sign new clients on distant client markets. In such context the analysis considers the role of recent ICT developments and increased usage.

Although good reputation is likely to be a general factor important for all KIBS, I have argued that it should be understood especially important for non-core ones. While KIBS in large urban areas may be less dependent on reputation on extra regional client markets due to a large local one, good reputation is likely to be highly important for the abilities of non-core KIBS to focus on extra regional ones

in order to grow. That is, good reputation may reduce the negative effects of long distances to client markets. Hence, in the context of abilities to focus on extra regional client markets, the analysis examines if good reputation affects all software- and advertising KIBS equally regardless of location or if it is more beneficial for non-core KIBS compared to those located in large urban areas.

Stage 2: Analysis of client needs and management of resources

Analysis of client needs

The success of value creation depends on a thorough analysis on clients' needs at the beginning of projects. This demands much interaction and collaboration between KIBS and their clients. The question here is if and how long distances to clients affects non-core KIBS abilities in this sense. As an example, if and how much of the analysis demands face-to-face interaction, if and how long distance affects the success of the analysis, and if the analysis or parts of the analysis can be conducted over distance. I have argued that it is likely that increased abilities to interact and conduct business over distance due to recent ICT development and increased usage have enabled them to not only focus more on extra regional client markets, but also to conduct the analysis or part of the analysis over distance. Hence the study investigates if and how long distances affect the abilities of non-core KIBS to thoroughly analyse client needs and how they compensate for such disadvantages. The analysis considers the role of client relationships and temporary proximity in such context.

Although good client relationships, temporary proximity, and increased abilities to interact and conduct business over distance may benefit all KIBS regardless of location, I have argued that they are especially important for non-core KIBS. Increased abilities in this sense are likely to reduce the time needed for face-to-face interaction during projects and therefore the negative effects of long distances to client markets. Hence, in the context of analysing clients' needs, the study focuses on if this affects all software- and advertising KIBS equally regardless of location or if it is more beneficial for non-core KIBS compared to those located in large urban areas.

Management of resources

- *Competences*

Relevant competences are alongside good client relations key resources behind KIBS abilities to create value and compete on client markets. Local scarcities in relevant competences are therefore likely to challenge or even limit the abilities of non-core KIBS in this sense. I have nevertheless argued that it is likely that non-core KIBS are able to compensate for such local disadvantages through different means. Hence, the analysis focuses on if and how local scarcities of relevant competences affects their abilities to create value and compete on client markets as well as if and how they compensate for such disadvantages through different means. The study considers the role of returnees and low labour turnover in non-core areas in such context. It also investigates if there is a noticeable difference in this sense between non-core areas and large urban areas, either favouring or hampering non-core KIBS compared with those located in large urban areas.

- *Resources needed for value creation and learning*

KIBS depend on good access to relevant knowledge markets for learning and solution of projects. A thin relevant local knowledge market and long distances to larger ones are therefore likely to limit the abilities of non-core KIBS to create value and compete on client markets. Recent findings nevertheless indicate increased abilities of knowledge intensive firm in non-core areas to compensate for such local disadvantages. Hence, the analysis focuses on if and how non-core KIBS compensate for local disadvantages and long distances to relevant knowledge markets. In such context, it considers on the role of increased abilities to interact and conduct business over distance due to recent ICT development and increased usage.

Again, although increased abilities in this sense are likely to benefit all KIBS regardless of location, I have argued that they are especially important for non-core KIBS given thin knowledge markets in such areas and long distances to larger ones. This development is likely to have reduced the negative effects of such local disadvantages. It is probable that KIBS in large urban areas are less dependent on extra regional knowledge market due to thick local ones. The analysis therefore also investigates if there is a noticeable difference between non-core and large

urban areas in this sense, either favouring or hampering non-core KIBS compared with those located in large urban areas.

Stage 3: Delivery/implementation of the solution

The delivery/implementation of the solution demands some levels of interaction depending on size and complexities of projects. It is however not clear if or how much face-to-face interaction is demanded and how much of the delivery/implementation can be conducted over distance. Hence, the analysis focuses on if and how long distances to clients affect the delivery/implementation of projects and how non-core KIBS compensate for such disadvantages through different means. In such context, it investigates if general transformation pressure such as recent ICT development and increased usage affecting all KIBS regardless of location favours or disadvantages non-core KIBS compared to those in large urban areas.

Connecting this last stage of projects to their beginning, the analysis also considers client relationships given their significance for the success of projects, including the delivery/implementation of the solution. Good client relationships are likely to strengthen the level of trust among economic actors, which in return is likely to strengthen their ability to interact and create value over distance. It is also likely that fostering good client relationships during the delivery/implementation may even lead to new projects or new clients. Although good client relations are likely to be a general factor important for all KIBS, I have argued that it may be understood especially important for non-core ones. Good client relations may facilitate their abilities to find and sign new clients and primarily interact and deliver the solution of projects over distance, and hence compensate for long distances to client markets and therefore time allocated in travels. Thus, in the context of delivery of delivery/implementation of the solution, the analysis investigates if good relationships as well as recent ICT developments and increase usage affect all software- and advertising KIBS equally regardless of location or if they are more beneficial for non-core KIBS compared to those located in large urban areas.

5. Methodological considerations

5.1 Grounding research in established methodological practices

Social scientist ground their work in some methodological or philosophical tradition whether they realize it or not (Rosenberg, 2012). This is a key factor behind the production new scientific knowledge and how to anchor it with and reflect on previous knowledge. As a point of departure, two opposite views may be contrasted in this respect, *positivism* (or naturalism) (see e.g. Friedman, 1994) and *interpretation* (see e.g. Geertz, 1994). These two views reflect polar extremes on a continuum that social scientist ground their work (see also e.g. Hausmann, 1992; Hacking, 1999). Researchers adhering to positivism understand the social world as the natural world in the sense that it is guided by underlying general laws that yield the same effects everywhere and can be detected and measured. Researchers adhering to interpretation reject such an understanding, and rather focus on the meaning of individual actions and understand individuals as socially constructed and claim that there are no general laws within the social world. Between these two extremes are many intermediary theories (see e.g. Rosenberg, 2012, for overview).

This thesis draws on one of those intermediary theories, the critical realist methodology, which is strongly associated with work within the field of human geography (Sayer, 1992; 2000). Although critical realism does not provide instructions on what kind of methods should be applied in research, such an approach is helpful to frame research and anchor it to previous academic work. In my case, it helped me to understand and frame how new scientific knowledge is produced through series of reflections between conceptual work and empirical findings, i.e. process of abduction (see e.g. Alvesson & Skjöldberg, 2009). It also

helped me to understand the importance of context and frame causal relationship between different units of analysis, as I illustrate further below.

Critical realist methodology is a philosophical approach most often associated with Roy Bhaskar. In his work, Bhaskar (e.g. 1975; 1979; 1986) tried to combine a general theory of philosophy of science, i.e. transcendental realism with a philosophy of social science. Critical realism in short acknowledges that researcher's knowledge of the world is to some extent fallible and theory-laden, but at the same time acknowledges the existence of a world independent of our knowledge of it (see e.g. Bhaskar, 1975; 1979; 1986; Sayer, 1992; 2000; see also discussions on Foucault, Bourdieu, Habermas and critical theory in Rosenberg, 2012: 153 - 163).

Bhaskar (1975) distinguishes between three ontological levels of reality: *the real*, *the actual,* and *the empirical*. Although not observable by humans, things exist in the level of real along with mechanisms, structures, and causal powers. These mechanisms and structures may cause events in the actual domain, whether humans observe them or not. The observation of different phenomenon, impressions and phenomena take place at the empirical level (Bhaskar, 1975). Hence, by definition, observations cannot be conducted at the level of real while experiences of the real may be observed at the other two levels. The level of real nevertheless provides us with an outgoing context guiding our journey in developing understanding about the social world. Through studying various phenomena at the empirical level, we get closer to understand the various mechanisms and structures that define our social world found at deeper levels. In a sense, we use the level of real as a point of departure, while at the same time our main goal is to increase our understanding about it and how it guides our actions.

A key feature in critical realism is the necessity to always consider the context these overarching structures are at work each time and what mechanisms are activated due to different conditions (Sayer, 2000). Such structures should not be seen as universal since the same powers may yield different observable events in different places, as well as different results in same place if observed in different time periods. In my view, this is a core factor within the field of human geography, which also highlights the role of time and space in order to understand unequal social development (see e.g. Asheim, 2020), i.e. context is key - the same powers may yield different outcomes in different locations and different time periods.

To give an example in the context of this research, market powers may yield different outcomes in different geographical settings. Local agglomeration advantages and physical proximity have been conceptualized as an important causal mechanism in knowledge intensive markets. Non-core KIBS neither enjoy local agglomeration advantages nor physical proximity to nearest ones and do therefore not create value under the same local mechanisms as found in large urban areas. This means that if non-core KIBS want to compete with similar KIBS in large urban areas on common client markets, they may have to do so through alternative means where other mechanisms are activated. Hence, different conditions may either yield different outcomes or demand alternative value creating strategies if the goal is to compete with similar firm operating under different conditions. This critical realist view of causation is illustrated in figure 2.

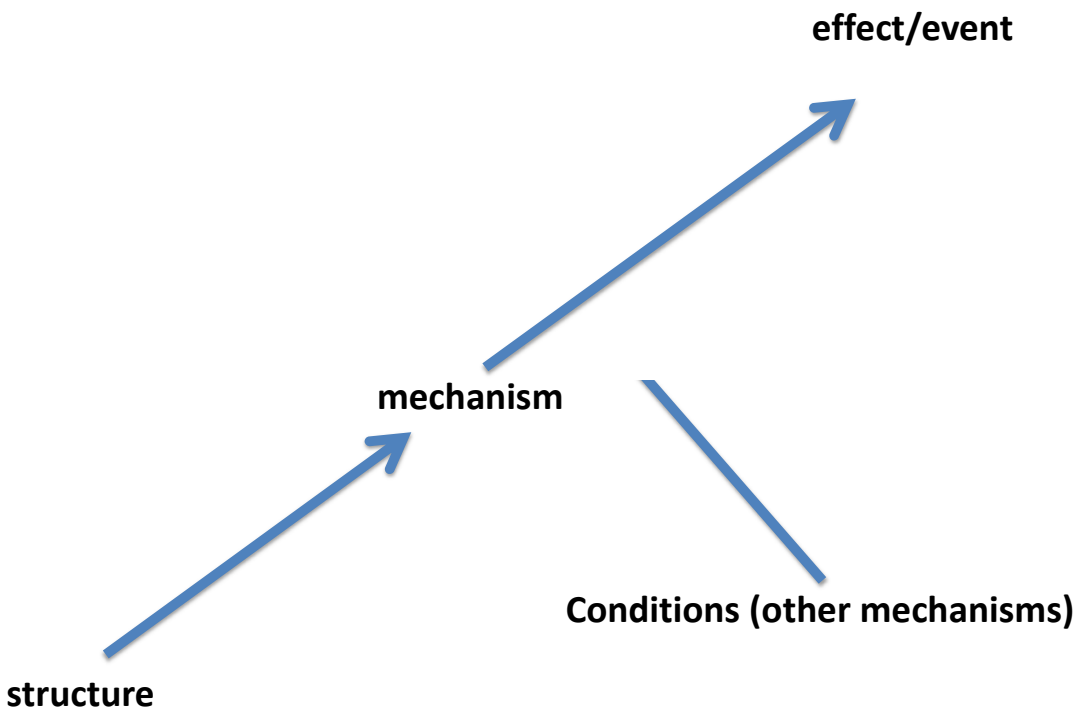

Figure 2. Critical realist view of causation (Reference: Sayer, 2000: 15)

The importance of conceptual context

Critical realism advocates conceptually informed research (see e.g. Asheim, 2020). As pointed out by Yin (1984), a process of conceptualization is our way to get closer to understanding the underlying structures guiding the social world, or the domain of the real. The aim is to "*distinguish the incidental from the essential*" (Sayer, 1992: 88). This is part of what is called abstract research (Sayer, 1992; 2000), which can be helpful in order to conceptualize the underlying powers and mechanisms of objects (Yeung, 1997).

What is important here is that although knowledge is considered fallible from a critical realist standpoint, it is not considered equally fallible. It is logical to consider established conceptual knowledge as one of the most reliable sources of knowledge as a point of departure in research. Such knowledge has been developed and scrutinized through scientific methods characterized by processes of continuous critique where sources of errors are identified (Yeung, 1997).

Due to the subjectivity of researchers, a broad understanding about commonly used concepts and theories in the field of study, is a reliable point of departure and of great value as a study framework. This is a process where previous knowledge in the field of study is sorted out in order to build the research on already established epistemological foundations.

A balance or coherence between aim and research question on the one hand, and the conceptual- and analytical framework on the other hand, is also required (Yin, 1984). When such a balance is reached, the collection and processing of the empirical material can take place in an organized and interpretable manner. The process that follows is characterized by constant reflections where the empirical material is processed and reflected upon the conceptual- and analytical framework, which is then further developed and reflected back upon the empirical material, and so on. This process may also be influenced by continuous interaction with academic peers where the ongoing work is discussed and scrutinized. The construction of theory in this sense is therefore conducted rather simultaneously in a deductive-inductive dialectic (Yeung, 1997), characterized by constant shift between the empirical material (the concrete) and theory (the abstract). This approach is often referred to as retroduction (Sayer, 1992; 2000; Bhaskar, 1975) or abduction (Alvesson & Sköldberg, 2009). Such an abductive character of

research lies at the heart of critical realist approach to science (see e.g. Sayer, 1992; 2000; Bhaskar, 1975).

Although this research takes a clear conceptual point of departure it is nevertheless partially explorative, given its abductive nature. Such an explorative conceptual approach helped me not only to illustrate under which conditions KIBS value creation and competitiveness are considered to thrive best in or should not thrive particular well in, when I first started to collect and analyse the empirical material. It also helped me at later stages of the research to identify and propose alternative conceptual operationalizations on how non-core KIBS compensate for local disadvantages and long distances through different means.

5.2 Research design

Units of analysis

In order to analyse the qualitative nature of knowledge intensive VCPs in the context of underlying causal mechanism, the thesis makes use of a conceptually informed case study approach (see e.g. Yin, 1984). Such an approach is appropriate when the researcher has limited knowledge about the unit of analysis in advance, which was very much present in this research. Core units of analysis are non-core KIBS VCPs conducted in the context of the local business environment. I especially focus on how non-core KIBS compensate for local agglomeration disadvantages and long distances to large client- and knowledge markets through different means during different stages of projects.

Two phases of empirical collection

As an important part of the research design and in line with its abductive nature, the empirical material was collected in two main phases. Such an approach corresponds with Yeung´s (1997) suggestion on the importance of revisiting the research topic empirically several times in order to uncover or even revise causal mechanisms.

Drawing on previous work on KIBS geography and characteristics, a broad conceptual framework was established as a point of departure for phase one of empirical collection. In this phase, empirical material on numerous factors of production was collected based on such broad conceptual context. As an example, relevant information on type of services and short history of the KIBS; background and education of employees and managers; access to relevant competences and knowledge resources needed for value creation- and learning processes; and location, type and size of clients, as well as their role during projects, was collected. Both local and extra-regional contexts were investigated in relation to these main analytical aspects.

In the first phase of empirical collection, software- and advertising KIBS were visited in non-core parts of Småland and Norrbotten. In order to study if there are any fundamental differences in how similar KIBS in large urban areas do things, similar KIBS were also visited in Malmö, i.e. representing areas offering local agglomeration advantages. All of the KIBS at focus were treated with the same analytical focus. However, in line with the overarching aim of the thesis, the core of the analysis focused on if and how local disadvantages and long distances affected the abilities of non-core KIBS to create value and compete on client markets.

Although findings from phase one of interviews provided wide variety of valuable information and strong indications on how non-core KIBS create value and compete on client markets, they also called for further conceptual nuancing and empirical validation. Hence, through reflecting the original research framework on the empirical material collected in phase one of interviews, the conceptual and analytical framework was developed further. In return, the further developed framework demanded empirical validation. In other words, the findings from phase one of interviews called for a second phase of interviews.

This development led the analysis in phase two of interviews towards a narrower focus on if and how local agglomeration disadvantages and long distances to large client- and knowledge markets affected different stages of VCPs. A key analytical factor in the second phase of interviews was how non-core KIBS complement or compensate for such local disadvantages through different means. As discussed further in the fieldwork section below, in line with the specific non-core focus of the research, only KIBS in Kalmar (Småland) and Norrbotten were revisited in the second phase of interviews. Finally, the further developed conceptual- and

analytical framework was reflected on the empirical material collected in both first- and second phases of interviews.

Methods

Critical realism does not provide ´cookbook prescriptions of methods´, and rejects such prescriptions (Sayer, 2000: 19). Researchers approach their work differently, depending on the aim and research question each time (Silverman, 2001; Yin, 1984). In order to explain the choice of methods in this research it is helpful to contrast between intensive- and extensive research designs. Intensive research has a strong qualitative focus on processes in small number of cases, e.g. what produces changes and the role of agents in such processes. Extensive research has a strong quantitative focus on patterns and regularities that may be distinguished in large data samples, e.g. how a certain objects or characteristics are geographically distributed (Cloke et al., 2004).

Typical methods in the former are interactive interviews where agents and processes are studied in their causal contexts. The latter approach is often characterized by statistical analysis, large-scale surveys, standardized interviews, and formal questionnaires for large population samples. Extensive research provides "[*d*]*escriptive ´representative´ generalizations, lacking in explanatory penetration*". Intensive research however provides causal explanations of the production of certain events or objects although they may not be generalizable (Sayer, 1992: 243). This does not mean that qualitative case studies focusing on small sample sizes in specific place-based contexts cannot have any trans-contextual relevance in conceptual development (Bathelt & Glückler, 2003). Processes taking place in most places are after all affected by extra-regional relationships and therefore affected by general conceptualizable processes, which render them some value in the process of developing such concepts in a more general sense (see e.g. Hassink, 2019; Barnes & Christophers, 2018).

An important criterion in research is that its design and methods are chosen and applied in the context of aim and research question (Yin, 1984; Silverman, 2001). The research focus here is on knowledge intensive VCPs conducted in specific regional contexts. Knowledge intensive value creation is understood as a series of processes and not as a static event, and their success depend on constant learning, interaction, and communication of tacit knowledge (see e.g. Strambach, 2008;

2010; Muller & Doloreaux, 2009; Løwendahl et al., 2001). It is difficult to grasp the qualitative nature of such processes through applying extensive quantitative approaches. Such approaches are not ´equipped´ to capture and explain how such complex processes take place at the level of interaction and what is of influence and why.

Hence, given the qualitative nature of the research question and knowledge intensive VCPs, an intensive case study design was chosen as an appropriate research approach. Following such an approach, in order to gain qualitative learning on different stages of knowledge intensive VCPs and in order to "*give an authentic insights into people´s experiences*" (Silverman, 1993: 91), the empirical material was collected through in-depth semi-structured interviews with owners, managers, and/or employees of the KIBS.

Analysis of the empirical material

The interviews where electronically recorded. The empirical material was transcribed and coded in order to detect underlying structures relevant to the object of study and provide meaningful answers to the outgoing research question. Such a process is a helpful approach in research in order to organize and categorize compiled qualitative empirical material into different themes (or codes) (see e.g. Cloke et al., 2004). Then, through the content of these themes, answers are provided to the research question(s) and its/their significance or meaning(s) discussed in a conceptual context. In short, this process was conducted in the following steps.

After the interviews from phase one of interviews had been transcribed, they were read thoroughly several times in order to gain deeper understanding about their content and detect underlying themes or patterns in what the interviewees discussed. Then, based on the themes detected during the repeated readings, an open coding was conducted on the empirical material collected in phase one of interviews. Opposite to primarily following pre-established codes, open coding is a process where the researcher remains open to whatever he or she detects in the empirical material, even to themes that may not be relevant to his or her original research problem (see e.g. Esterberg, 2002). This was an important approach given the broad empirical focus in phase one of interviews. Such a broad focus was important due to lack of empirical and conceptual work addressing directly how knowledge intensive firm in non-core areas create value and compete on

client markets. Hence, although the main focal points of the analytical framework were kept in mind in this process, other possible and unexpected patterns were thoroughly searched for as well (see e.g. Alvesson & Sköldberg, 2009).

The analysis of the empirical material collected in phase two of interviews was approached in a similar manner, i.e. the transcripts were read over several times before the coding process was initiated. However, the coding at this stage, was more directly guided by the analytical framework developed following phase one of interviews (see e.g. Esterberg, 2002). Such a guided thematization was more appropriate than in the previous phase of coding, given the more detailed and narrower analytical focus in phase two of interviews. Finally, in order to evaluate the empirical material from both phases of interviews from the same analytical angle, the empirical material from phase one of interviews was re-analysed applying this further developed and narrower analytical framework. A schematic diagram of the coding process may be viewed in figure 3. The three boxes with thick line represent the core analytical aspects discussed above, i.e. i) finding and signing new clients; ii) analysis of client needs and management of resources; and iii) delivery and implementation of the solution. The other boxes (thin line) represent different codes or themes related to the three core categories.

In the final empirical analysis, the coherent view of interviewees was methodically thematized and discussed in the context of analytical aspects in the empirical chapter. Contingent on if some interviewees contrasted the common view, such differences were also methodically noted. In order to illustrate the rationale behind the thematized findings to the reader, a number of selected interview quotes were included in the text. The selected quotes were subjectively chosen as appropriative representatives for either the common- or alternative view regarding particular thematic issues each time. For further support to the arguments put forward in the empirical findings, a more comprehensive list of interview quotes is provided in appendix I, organized in the context of the core analytical aspects.

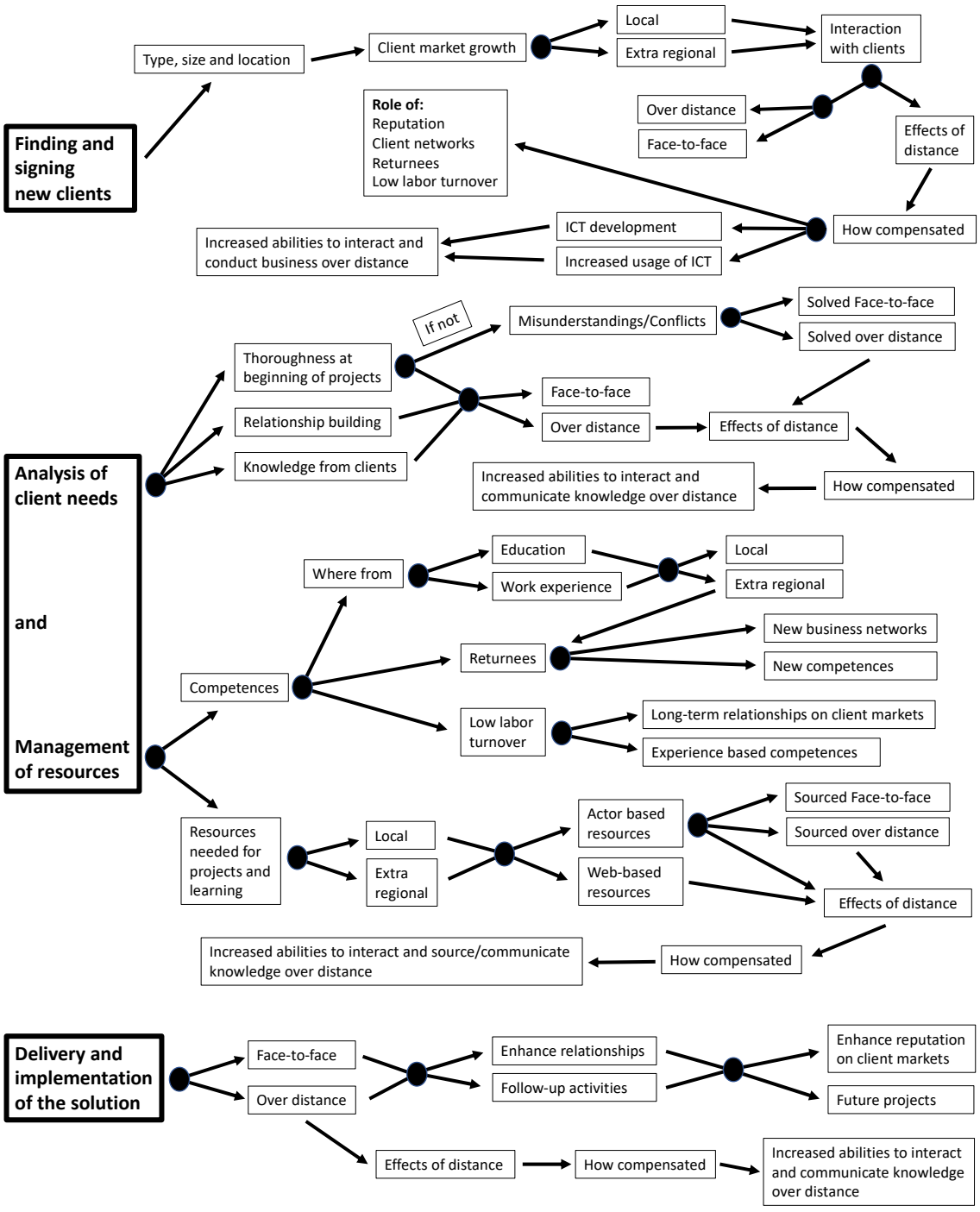

Figure 3. A schematic diagram of the coding process

Case selection

KIBS

It was important that the selected KIBS were fully daily operational in order for there to be something substantial to analyse. Firm, which in spite of being registered as such, that are run by owners as a part-time activity complementing a full-time employment elsewhere, were therefore not of interest to the study. Such part-time activities indicate little and/or sporadic activities to analyse. This was e.g. judged by considering their annual turnover in relation to number of employees. A little or no annual turnover indicated little daily activities. It was also considered if the registered firm had an active and updated webpage or not, e.g. containing list of employees and their roles, illustration of core activities, examples of previous- and/or current projects and clients, to name a few. No webpage or little activities in this sense does not indicate that the firm is daily operational.

Resulting from the search process, KIBS with less than four employees did not seem to have an active daily operation. It was actually rare to find a KIBS with three or less employees that had a webpage. Judging from the very few KIBS with three employees or less that had a webpage, I detected little to no apparent activities or information about their services, employees, clients, and so forth on their webpage. This indicated very little activities to investigate. I therefore did not include such KIBS in my research. In the end, the KIBS identified as actively operational on daily basis had at least 4 employees. The smallest KIBS in Kalmar (Småland) and Norrbotten willing and able to participate in the research had 5 full-time employees, and the largest had 20 full-time employees (see table 8 below). This was used as a reference point in order to identify similar KIBS in Malmö.

The process of identifying KIBS in areas at focus

In order to identify KIBS in the selected study areas, a manual search in firm registration databases was methodically conducted, usually available on municipality homepages. Municipality databases do not always provide information about the number of employees or annual turnover of firm. The identified firm were therefore cross-referenced with national firm registration- and information databases in order to collect additional information when needed (e.g. from www.foretagsfakta.se. www.allabolag.se, www.bolagsverket.se).

Through this method, 19 KIBS were identified in the selected non-core areas, 10 in Kalmar (Småland) and 9 in Norrbotten. The same type of searching process was conducted in order to identify similar KIBS in Malmö. The Malmö KIBS had to belong to the same sectors and employ between 5 and 20 individuals, in order to correspond with the non-core cases. A firm registration database provided by the regional media cluster organisation Media Evolution, was used to identify the Malmö KIBS. In the end, 10 similar KIBS in Malmö were identified through Media Evolution.

All of the identified KIBS were at the beginning contacted through e-mail containing a request for their participation, information about the research, and how the interview material and their identity would be treated. Those who did not respond were sent up to two e-mail reminders and in few cases followed by a phone call. Out of the 19 KIBS identified and contacted in Kalmar (Småland) and Norrbotten, 8 were willing and able to participate in the research. In Kalmar (Småland), 1 KIBS is located in Hultsfred municipality, 2 in Vimmerby municipality, and 1 in Västervik municipality. In Norrbotten, 1 KIBS is located in Piteå municipality, 1 in Boden municipality, and 2 in Kalix municipality. All of these were either software- or advertising KIBS, two of each in Småland, and three software KIBS and one advertising KIBS in Norrbotten[9]. Given the high proportion of participating KIBS compared with how many relevant KIBS were identified in these non-core areas through extensive search, i.e. 8 out of 19 identified KIBS; such a sample may be considered well representative for the non-core areas at focus.

Out of the 10 KIBS identified and contacted in Malmö, 6 were willing and able to participate in the research, 3 software KIBS and 3 advertising KIBS. Due to high levels of coherence in the Malmö interviews, as also discussed in the following section, I considered such a sample size sufficient in order to study if there are any considerable differences between how non-core KIBS and similar KIBS in large urban areas do things.

[9] Unexpectedly, due to recent improvements on the transport system, the travel time between the advertising KIBS in Boden and Luleå was few minutes less than the minimum average commuting criterion (45 min). However, as learned in phase I of interviews; they have no clients or employees in Luleå. I therefore considered it relevant to continue my focus on this KIBS in Boden, which was also important since it was the only advertising KIBS in Norrbotten willing and able to participate in the research.

Fieldwork

In phase one of interviews, 2 software- and 2 advertising KIBS were visited in Kalmar (Småland), and 3 software- and 1 advertising KIBS in Norrbotten. For contrasting purposes, 3 KIBS of each type were visited in Malmö. In phase one of interviews, in-depth, semi-structured interviews were conducted with 5 individuals in Kalmar (Småland), 4 in Norrbotten, and 6 in Malmö, 15 individuals in total.

Given the particular non-core focus of the thesis, only non-core KIBS were revisited in phase two of interviews. As discussed above, a focus on the Malmö KIBS in phase one of interviews was primarily to investigate if any fundamental differences could be detected regarding how KIBS in non-core and large urban areas do things. Apart from differences in their focus on local vs extra regional client markets, the contrasting revealed no noticeable difference in what they do or how they do things. There was also an extremely strong coherence between the interviews in Malmö on the one hand, and in Kalmar (Småland) and Norrbotten on the other hand. It was therefore not necessary to revisit the Malmö KIBS in phase two of interviews.

There was also an extremely strong coherence in all of the interviews in the second phase of interviews. The same sets of answers occurred repeatedly in all of the interviews. Each new interview did not produce new information or alternative answers changing the nature of the findings. After 7 in-depth, semi-structured interviews, 4 in Kalmar (Småland) and 3 in Norrbotten, the findings already strongly verified the conceptual arguments put forward in the developed conceptual- and analytical framework, regarding how non-core KIBS compensate local disadvantages and compete on client markets. It was therefore not necessary to conduct more interviews in phase two of interviews. A lack in coherence between interviews might have called for an additional focus on KIBS in other non-core areas. As an example, a little coherence between the interviews conducted in the two non-core areas at focus on the one hand, and/or between the two non-core areas at focus and Malmö on the other hand, might have called for such an additional focus. This was however not the case as I have illustrated.

This is not considered problematic in critical realism, where intensive research designs are often characterized by a focus on a small sample of cases or even just one case (Sayer, 1992). A single or few case studies are often considered

appropriate for conceptual development due to the in-depth and detailed richness of the empirical material, e.g. exploring causal explanations in the production of certain objects or events. Vast amount of quantifiable data is however typically demanded for theory testing and broad generalizations (see e.g. Eisenhardt & Graebner, 2007). Again, the aim of the thesis is conceptual development and not testing. It was therefore not necessary from a methodological perspective to revisit all of the non-core KIBS in the second phase of interviews or include an additional focus on KIBS in other non-core areas.

However, in order to maintain a balance between the two non-core areas at focus in phase two of interviews, at least one software KIBS and one advertising KIBS were revisited in both Kalmar (Småland) and Norrbotten. Also, in the second phase of interviews two separate individuals at each KIBS were interviewed when possible. This was done for complementing- and validating purposes, i.e. in order to reduce the likelihood of receiving insufficient or skewed information regarding activities at each KIBS. This was possible in 3 of the 4 non-core KIBS revisited in phase two of interviews. In the end, each type of KIBS were revisited in both non-core areas at focus. In-depth, semi-structured interviews were conducted with two individuals in all of the non-core KIBS except one, 7 interviews in all.

The first phase of the fieldwork was conducted in the period between June and December 2014 and the second phase of the fieldwork was conducted during spring months 2016. The main criteria for the selection of interviewees were that they had to know most aspects of the KIBS and be actively engaged in VCPs and client relations. In all three study-areas, these individuals were co-owners that participate actively in daily operation of the KIBS as managers and/or project leaders. In both phases of interviews, 22 in-depth interviews were conducted at 14 KIBS in 6 non-core municipalities and 1 large municipality. The length of interviews varied from one hour to two and a half hours, resulting in around 35 hours of empirical material. All interviews were conducted in Swedish.

6. Findings from case studies

Before the empirical findings are presented and discussed in the context of core analytical aspects, relevant background information about the KIBS at focus is shortly introduced and discussed. This information was gathered in phase one of interviews and is summarized in table 8, which displays their location, type, core activities, number of employees, and the division between local- and extra regional client markets.

The software- and advertising KIBS in the study have between 5 and 22 fulltime employees. Owners and employees are primarily individuals born and raised locally and almost exclusively live close to their place of work. Skills in software writing, system development, and/or graphical design and marketing are considered especially important competences to have and foster. Most to all employees have concluded 3-5 years of higher education, in both social- and technological fields. There were three exceptions from the general rule in this sense. At the software KIBS in Piteå, a third of the employees were university graduates and two thirds high school graduates that have in addition concluded various courses and/or diploma studies in ICT related fields, such as in software writing, digital design, and/or digital marketing[10]. At one of the software KIBS in Kalix, half of the employees were university graduates and half high school graduates that had also concluded similar post-secondary-level studies as their peers in Piteå. At one of the software KIBS in Malmö, the education level of employees ranged from high school to PhD education. More than half of their employees were high school graduates that had also concluded similar post-secondary-level studies as their peers in Kalix and Piteå. As discussed further in relation to resources needed for value creation and learning sub-section below, the business culture at all of the KIBS at focus is characterized by continuous learning

[10] As an example, from Hyper Island, an international educational organization with locations in Stockholm and Karlskrona in Sweden, which offers various university level study programs and courses in relation to digital design and marketing (see: https://www.hyperisland.com/).

and enhancing of organizational competences due to constant sectoral- and demand related developments. This applies to all their employees, regardless of their level of formal education.

The local client market is both thinner and less profitable compared to client markets in large urban areas. Thus, in order to grow they must focus on extra regional client markets. The Stockholm region is the single largest and fastest growing extra regional client market for the non-core KIBS, and the most profitable projects are also found there. The Stockholm region is at minimum three and a half hour in travel time (one-way) away from the KIBS in Kalmar (Småland) and even more travel time away from the KIBS in Norrbotten. Opposite to the non-core KIBS, the Malmö ones primarily focus on the local client market (see table 8). However, different from the non-core KIBS, the Malmö ones do not need to focus much on extra regional client markets in order to grow due to a large local client market. Only one of them, an advertising KIBS, has strategic intentions to grow on extra regional client markets.

While these and other findings from phase one of interviews provided important information and indications on how non-core KIBS create value and compete on client markets, they also brought forward the need for further conceptual development demanding further empirical validation. Therefore, as discussed in the research design section, conceptual reflections with the empirical material collected in phase one of interviews led to a further developed conceptual- and analytical framework, focusing more narrowly on how non-core KIBS compensate local disadvantages and long distances to large client- and knowledge markets during different stages of VCPs.

In the end, the empirical material gathered from both phases of interviews was reflected and interpreted by conceptual contributions forming the final and more developed conceptual- and analytical framework of the research. The results are therefore organized in line with the three main stages of projects from here on, i.e. *finding and signing new clients, analysing client needs and management of resources, and delivery/implementation of the solution*. As highlighted in the discussions on core analytical aspects, the first two of these main stages are divided into several sub-categories representing important focus areas illustrating how non-core KIBS create value and compete on client markets.

Given the core focus and aim of the research, the non-core KIBS lie at the centre of attention in the findings. For contrasting purposes, the cases from Malmö are also discussed when relevant, i.e. if any fundamental differences are in how they do things compared to the non-core ones or not. This is important in order to distinguish between general transformational factors likely to affect all software- and advertising KIBS regardless of location and those that are non-core specific, and if and how such factors have led to unexpected benefits for the non-core KIBS.

Each section and sub-section summarize the common view of all interviewees in relation to what was discussed each time. Given the extremely strong coherence in the interviewees' answers, numerical information about how many said what is not provided. The coherent view is simply discussed. However, although alternative answers were exceptional, they are nevertheless discussed in the findings, e.g. if one of the KIBS did things differently than all the other ones or if any noticeable differences were detected between the non-core KIBS and the Malmö ones.

Each sub-section is structured as follows: Central findings are first presented including discussions on interesting deviations or exceptions if identified. These are substantiated with empirical descriptions. In order to explain the rationale behind the central findings to the reader, a number of subjectively selected quotes from the interviews are included in the text when relevant. For further support for the arguments put forward in the empirical findings, a more comprehensive list of interview quotes is provided in appendix I, organized in the context of the core analytical aspects. This was also important in order to not overcrowd the findings section with numerous interview quotes. At the end of each sub-section, the relation between central findings and previous work is discussed.

Table 8. Location and type of KIBS, their core activities, number of employees, and local vs extra regional client markets

KIBS location	Type of KIBS and core activities	Number of employees	Local vs extra regional client markets
Vimmerby, Småland	Software: Creation of webpages, Web-based solutions and Internet systems. Est. 2000	5 fulltime	<30% local >70% extra regional
Hultsfred, Småland	Software: Creation of webpages, Web-based solutions and Internet systems. Est. 2008	9 fulltime	<30% local >70% extra regional
Vimmerby, Småland	Advertising: Web-based and analogue (signs, catalogs, logos and films) market strategies, and management of expos. Est. 1964	13 fulltime 3-5 part-time	<5% local >95% extra regional
Västervik, Småland	Advertising: Web-based market solutions and and marketing strategies. Est. 2009	6 fulltime 2 trainees	<20% local >80% extra regional
Boden, Norrbotten	Advertising: Web-based market solutions with strong focus on strategy and communication. Est. 2008	7 fulltime Few part-time	<30% local >70% extra regional
Piteå, Norrbotten	Software: Primarily sub-contracts technical parts of webpage development for Stockholm based advertising KIBS. Est. 2002	16 fulltime	100% extra regional >80% Stockholm <20% USA
Kalix, Norrbotten	Software: Creation and development of webpages, market strategies and hosting. Est. 1994	20 fulltime	<25% local >75% extra regional
Kalix, Norrbotten	Software: Create digital solutions for micro-electronic products (mostly software development). Est. 2001	10 fulltime	100% extra regional <40% in Norrbotten >60% rest of Sweden
Malmö, Skåne	Software: Create and develop mobile applications, homepages, and Web-based strategies. Est. 2009	5 fulltime	>90% local <10% extra regional
Malmö, Skåne	Software: Creation of webpages, Web-based applications and Intranet systems. Est. 2009	22 fulltime	>95% local <5% extra regional
Malmö, Skåne	Advertising: Web-based market strategies and graphical design, and consultation in business- and media strategies. Est. 2012.	15 fulltime 2 part-time	>70% local <30% extra regional
Malmö, Skåne	Advertising: Both Web-based and analogue (signs, catalogs, logos and films) market strategies, and management of expos. Est. 1997.	11 fulltime	>90% local <10% extra regional
Malmö, Skåne	Advertising: Web-based advertising, strategies, and communication. Est. 2006.	11 fulltime	100% local.
Malmö, Skåne	Software: Web-based strategies, creation of webpages, mobile applications, graphical design, and catalogues. Est. 1999.	10 fulltime	>80% local <20% extra regional
Own compilation from findings			

6.1 Finding and signing new clients

Type of clients and projects

The interviewees in Kalmar (Småland) and Norrbotten emphasized that neither local scarcities in resources such as clients, competences, and external knowledge resources needed for projects and learning, nor long distances to nearest agglomeration of such factors, limit their range on clients and projects. Discussing if long distance to client markets influenced type of clients and services, one of the interviewees at a software firm in Kalix (Norrbotten) said: "*Distance to clients do not effect this. It is important how the client views this. This is not a problem for us… If this work for the client, it works for us. This is never a problem for us*". It was nevertheless stressed that the combination of organizational competences at any given time may lead to a stronger focus on certain type of clients or projects than others. As an example, software KIBS specialize in certain coding ´languages´ and less in others. The software KIBS in Vimmerby has all sorts of clients and works with variety of software system but nevertheless strategically specializes in specific Microsoft software system platforms. Some KIBS choose to focus more on certain type of client markets and/or size of client firm (see also appendix I). As an example, an advertising KIBS in Vimmerby and Boden have all sorts of clients and broad variety of projects. The former has nevertheless strategically increased their focus on very large firm while the latter has a strategic focus on small firm. Also, an advertising KIBS in Västervik also has a broad variety of clients and projects but have increasingly focused on doing projects for public service organizations.

However, in spite of some differences in specialization, the interviewees discussed that even though lack or strength in specific competences may to some extent influence choices on type of clients and projects, they emphasized that all KIBS, regardless of location, specialize more in certain activities than others. This was also the case with the Malmö KIBS. Although they have clients in all sizes and focus on a broad variety of projects, they too specialize more in certain activities than others (see also appendix I). As an example, one of the advertising KIBS in Malmö has variety of clients and projects but has a strategic focus on supermarket chains and the energy sector. One of the software KIBS in Malmö focus also has variety of clients and projects but has increasingly specialized in graphic design for

mobile applications. However, while the Malmö KIBS are more directly able to strategically aim for certain specialization ex-ante due to abundance and broad variety of relevant local competences, the abilities of the non-core ones to do so are more influenced by local scarcities in such sense. Their business strategies on type of clients and projects are therefore more guided by the combination of organizational competences at any given moment compared with the Malmö KIBS. The results are nevertheless the same in spite of this. All software- and advertising KIBS strategically specialize more in certain activities than others, which should therefore be considered a general feature in the sectors regardless of location.

As also discussed in all remaining stages of projects below, an absolute key factor behind why the non-core KIBS are able to focus on broad variety of clients and projects and compete with similar KIBS on extra regional client markets are increased abilities to interact and conduct business over the Internet (see also appendix I). Another key factor in this context, are high qualities of the communication- and transport infrastructure. All of the KIBS that I visited have access to a reliable high-speed Internet- and mobile telecommunication infrastructure, and reliable and well-connected airport-, railway-, and/or highway infrastructures. Such infrastructures not only facilitate their abilities to focus on extra regional client markets, but also their abilities to visit clients if needed during projects without too much effort. Without such well-functioning infrastructures, the non-core KIBS would simply not be able to develop in line with general sectoral trends and compete on extra regional client markets. This is a defining factor for their abilities to do so and focus broadly on type of clients and projects.

While all of the KIBS at focus enjoy a good and dependable transport- and communication infrastructures today, they have improved greatly in recent years in the non-core areas at focus. They are now much better in terms of quality and connectivity to the rest of and beyond Sweden than before. They enjoy fast and dependable broadband connection and are rather effortless able to travel to extra regional client markets when needed. Discussing this, an interviewee at an advertising KIBS in Boden (Norrbotten) said: "*The basic prerequisite for us to be able to work like this is that we have a very good ICT environment (…) Then, as a firm in Boden we have extremely good logistic possibilities, especially to Mälardalen (ins by author: Stockholm area). In three hours, we are in central Stockholm for a meeting. If the request comes in the morning, we can be there in the afternoon... if I*

do not have to go, then we have a Skype meeting (…) Yes, this has been a positive development, yes absolutely, in a wide sense. If you go back to the beginning of the 2000, then we did not have the same possibilities as we do now. That is how it is. Today, we have these possibilities". This development has increasingly enabled them to both interact over distance and travel to extra regional client markets if needed, and hence their abilities to focus on broader variety of clients and projects than before.

However, increased abilities in this sense have primarily been driven forward by a more general transformation pressure in their line of business affecting all KIBS regardless of location. I nevertheless argue that this development has been especially important for non-core ones since they are far from enjoying the same local agglomeration advantages as those in large urban areas do. Although the Malmö KIBS primarily focus on the local client market, it is not because they have problems with focusing on extra regional ones. They do not need to focus so much on extra regional client markets in order to grow and stay competitive because the local client market in Malmö is very large. Only one of the Malmö KIBS, the largest advertising KIBS at focus in the research, had strategic intentions to grow on extra regional client markets in the future. For opposite reasons, i.e. due to a very thin local client market, the non-core KIBS have to focus on extra regional client markets in order to grow. Their extra regional client base has gradually grown over time and has become proportionally larger than the local one. "*They are located further and further away from us nowadays*", as one of my interviewees at an advertising KIBS in Vimmerby said when discussing that almost of their clients are extra regional. This development has therefore facilitated the abilities of non-core KIBS to compensate for local agglomeration disadvantages through drawing on distant ones – which has in return enabled them to focus on broader variety of clients and projects, and hence enhanced their competitiveness.

Another factor brought forward in the context of finding/signing new clients is the role of returnees. Returnees are individuals that have moved from their home region, e.g. from a non-core to a large urban area, in order to educate and work, and at a later point in time decide to move back home. Whether owners or employees hired after the KIBS establishments, returnees not only contribute to organizational competences, as discussed further below in relation to management of resources, they may also provide new business networks (see also appendix I).

All of the non-core KIBS have established new client relations on extra regional client markets through personal networks of returnees. As an example, returnees may exploit some of their previous client relations from their time working in large urban areas. However, when it comes to finding and signing new clients, this was primarily a beneficial factor when they first started their business and had a limited client portfolio to build on. Once their project portfolio grew, which happened very fast in all cases, new clients are primarily brought in through references from current- or previous clients, as discussed further below in relation to reputation.

Also, returnees may combine the benefits of extra regionally acquired networks with the benefits of being locally embedded. As an example of the latter, when the founders of some of the non-core KIBS moved back, they could quickly find relevant housing for themselves and their operation and connect with other possible competences through local personal networks. Through exploiting pre-established networks on both the local- and extra regional level, the non-core KIBS were rather quickly able to establish themselves and grow on both local- and extra regional client markets. This supports previous work highlighting the benefits gained from when individuals return to their home region (see e.g. Solheim & Fitjar, 2018; Martynovich, 2017; Saxenian, 2007). The findings reveal no difference between the non-core and Malmö KIBS regarding such benefits. Although also primarily finding/signing new clients through current or previous clients, they also benefit from personal networks of employees in this sense (see also appendix I). However, although such benefits are general in nature likely to advance all KIBS regardless of location, the findings nevertheless suggest them especially important for non-core ones. Personal networks of returnees facilitate their abilities to compete on extra regional client markets and hence complement a thin local one.

The findings clearly support previous work arguing that recent ICT developments have in general increased considerably the abilities of people and businesses to interact, collaborate, and create value over distance (see e.g. Rodríguez-Pose, 2011; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012). Empirically, they display that these developments are key factors behind increased abilities to focus on broad variety of clients and projects, and to focus more on extra regional client markets than before. Hence, although the findings support previous work that

underline the importance for KIBS to enjoy good access to reliable communication- and transport infrastructures (see e.g. Simmie & Strambach, 2006; Porter, 1990), they also suggest that if non-core KIBS enjoy good access to such infrastructures, absence of local agglomeration advantages and long distances to nearest ones are less likely to limit choices on type of clients and projects than indicated by previous work on KIBS competitiveness (see e.g. Strambach, 2008; 2010; Malmberg & Maskell, 1999; 2002; 2006; Hermelin, 2007; 2009).

In such context, the findings support previous work displaying increased abilities of KIBS to create value and compete on extra regional client markets (see e.g. Shearmur & Doloreaux, 2015; Macpherson, 2008). As highlighted by this work, this has been facilitated by increased abilities to interact and conduct business over the Internet. This does not correspond well with previous work indicating the high importance of physical proximity to large client markets for the competitiveness of KIBS (see e.g. Strambach, 2008; 2010; Simmie & Strambach, 2006). However, they partially agree with this work in the sense that large pool of relevant local competences enables KIBS in large urban areas to have more ex-ante strategic decisions regarding type of clients and projects when compared to the abilities of non-core KIBS to do so. This nevertheless does not change the fact that all of the KIBS specialize more in certain areas than others and this does not limit the ability of non-core ones to compete with similar KIBS in large urban areas on same client markets. Thus, the findings suggest that absence of local agglomeration advantages and long distances to nearest ones are not a defining factor regarding the abilities of non-core KIBS to choose between different types of clients and projects.

The findings suggest that non-core location and long distances to client- and knowledge markets do not limit the abilities of non-core KIBS to focus on broad variety of client and projects. Apart from that the Malmö KIBS are more able to make ex-ante decisions than the non-core ones, there was no difference between the non-core and Malmö ones in this respect. They are all able to specialize in certain activities and compete on same client markets as other similar KIBS. However, while the non-core KIBS are forced to focus on extra regional ones in order to grow further and enhance their competitiveness once the local market is fully explored or saturated, the Malmö ones do not need to do so to the same extent due to large and diversified local client market. Hence, although increased abilities to interact and conduct business over distance is a general factor enabling

all software- and advertising KIBS to focus on broad variety of clients and projects, they should be considered in particular important for non-core KIBS. This development has enabled them to complement a thin and homogenous local client market.

The role of reputation on client markets

The non-core KIBS neither advertise their services in traditional media, nor pro-actively seek and contact potential clients and try to sign them through series of selling pitches. They do not have the resources, time, or manpower to apply such pro-active marketing strategies. Instead, in order to make themselves visible on client markets, they display and illustrate their services on their own webpage and are active on other forms of social media, e.g. Facebook, Twitter, and online discussion forums. Discussing how they market their services, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*We do not market ourselves proactively, we do not have the resources for that. Clients come to us. But we work very actively with our webpage, social media and such*". The interviewees emphasized recent ICT development a key factor behind their abilities to do so. Due to this development, they are much more able to introduce and offer their services on extra regional client markets than previously. Through such digital media they are able to visually highlight core services, competences, as well as previous work including references from clients (see also appendix I).

Good reputation and relationships on client markets were strongly emphasized as key factors for their abilities to find and sign new clients. New clients are almost exclusively found through personal relationships and references from current or previous clients. Discussing how they find new clients, the interviewee at an advertising KIBS in Västervik (Småland) said: "*Just through recommendations, 99 times out of 100 it is through recommendations*". Although a general feature important for all KIBS, good reputation is especially important for non-core ones since it enhances their abilities to complement thin local client market through focusing on extra regional client ones. Discussing this, one the interviewees at an advertising KIBS in Vimmerby (Småland) said: "*Good relations with our clients lead to other relations to other clients, because our clients have their own contact network, and through that we get to meet new potential clients*". The findings do not reveal any difference between the non-core KIBS and the Malmö ones regarding how they advertise their services and find/sign new clients.

New clients almost always make the first contact based on positive references from the KIBS current or previous clients (see also appendix I). Although important for all KIBS, this is highly important for the non-core ones. Since new clients are the ones who make the first contact, it is highly likely that they are already confident in their abilities to interact- and create value over distance, downplaying non-core location and long distances as limiting factors. Otherwise, they would probably not make contact in the first place. Discussing this, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*Reputation is important in this context. If the client believes that this can be done over distance, if he knows that we do a good job, he contacts us. Trust is important*". This suggest that when extra regional clients seek consultations from non-core KIBS, they are already aware of their abilities to interact and create value over distance, hence more likely to initiate new projects and primarily interact over distance.

The findings also suggest that good reputation on client markets facilitates the establishment of good relationships with new clients. As an example of this, a software KIBS in Hultsfred (Småland) made use of a reseller agency located in Stockholm in order to sign new clients in their first years of business. Although the interviewees at this software KIBS highlighted this as a helpful approach in order to complement small local client market and establish a decent project portfolio on extra regional ones when they started their business, they also discussed its downsides. When they received new projects through the reseller agency, they were not in direct contact with the client at the beginning of projects and sometimes rarely during projects. Relationship building, discussions on project goals, and the core analysis on client needs took place between the reseller agency and the client. The software KIBS in Hultsfred (Småland) was then contacted and instructed to conduct the project work accordingly.

Due to this approach, they were not able to establish good relationships with clients at the beginning of projects and gain necessary insights on their activities and needs. Discussing this, one of them said: "*We have had projects through them that ended because we were not able to detect, what can I say, these more sensitive issues which you detect when you meet potential clients by yourself (…) It is very important to have these dialogues in the beginning, they have to take place*". Due to lack of good relationships with these clients they often landed in problems during later stages of projects, often leading to unnecessary high project costs and little if any margins for profit.

Today, however, with an established client- and project portfolio, they no longer depend on this reseller agency. New clients are primarily found through references from current- or previous clients, based on reputation built on previous work. They are now in direct interaction with new clients already from when first contact is made. This is much better for their abilities to establish good relationships with new clients and analyse thoroughly their needs at the beginning of projects as I discuss further in the following section. Hence, good reputation on client markets not only facilitates abilities to find and sign new clients. It also facilitates abilities to build good relationships at the beginning of projects. In return, good relations reduce greatly the likelihood of complications during projects, which increases their potential marginal profits (see also appendix I). There was no difference between the non-core and the Malmö KIBS in this sense.

The establishment of relationships of trust with new clients takes much less time today than before due to increased abilities and willingness to interact and conduct business over distance. The combination of recent ICT development and increased usage of such technologies was emphasized as a key factor in such context. Nowadays, people are in general much more able, willing, and used to communicate, source information, and conduct business over the Internet than previously. Today's younger generations have already for most of their life used Web-based applications on daily basis and are quite used to and comfortable with interacting over distance. Discussing this development, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*It has become less and less important, the need to meet. I think this is a generation thing. The people we work with today are more inserted into this; they do not need to meet. Ten years ago, you had to meet almost all the time. Often, we had to go to Stockholm many days each week in order to attend a two-hour meeting, which was very ineffective (…) The generation question is relevant here, very much (…) So, the need for face-to-face meetings has reduced greatly*". This development has escalated fast since the early 2000s and has enabled them to focus on a broader spectrum of clients and projects than before (see also appendix I).

Abilities of people and businesses to interact and conduct business through the Internet escalated rapidly when usage of smartphones containing all sort of software applications became more frequent among the public and when the mobile- and broadband network expanded considerably. People are today much more willing and used to apply and interact through ICTs than previously. This

general development has further enabled the ability of non-core KIBS to focus on broad variety of clients and projects and compete with similar KIBS on extra regional client markets. "*If not for this development on the Web it would be much more difficult to compete (…) Today we can do this over distance, we can compete on the same terms as them*", as one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said when discussing increased abilities to compete with similar KIBS in large urban areas on same client markets (see also appendix I).

The results complement previous work emphasizing the important role of reputation on client markets (see e.g. Alvesson, 2004; Greenwood & Empson, 2003; Tuli et al., 2007; Åge, 2011), through highlighting that good reputation facilitates the establishment of relationships of trust with new clients, which in return is likely to reduce the need for face-to-face interactions during projects. The findings also complement this work through clearly suggesting that in combination with increased abilities to interact and conduct business over distance, good reputation and relationships also facilitates abilities of non-core KIBS to complement thin local client market and compensate for long distances to larger ones. This supports previous work arguing that recent ICT developments and increased usage have increased considerably general abilities to interact and conduct business over distance (see e.g. Rodríguez-Pose, 2011; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012; The World Bank, 2020).

In light of these findings, although good reputation on client markets is important for all software- and advertising KIBS, I argue that it is especially important for non-core ones for two main reasons. Firstly, it enables them to complement thin local client market and grow on extra regional ones. Secondly, it facilitates the establishment of good relationships of trust with new clients at beginning of projects. This enables abilities to primarily interact and conduct projects over distance, which in return compensates for long distances to large client markets. The findings clearly suggest that opposite to the Malmö KIBS, the non-core ones strongly depend on extra regional client markets in order to grow beyond a small local one once fully explored. Hence, good reputation outweighs the limiting effects of a thin local client market and long distances to larger ones.

6.2 Analysis of client needs and management of resources

Analysis of client needs

Although recent ICT developments and increased usage have enabled KIBS to interact and conduct business over distance more than before, it is still important to meet new clients at the beginning of projects (see also appendix I). This initial meeting is a key factor in order to initiate an active dialogue between participating actors, establish good relationships of trust, agree upon common goals, and properly initiate the analysis of clients' needs and what resources are required for the solution of projects. If this is done aptly at the beginning of projects, their remaining parts are primarily conducted over distance. "*When relationships have been established and the project is initiated, then, distance has really no meaning at all*", as one of the interviewees at an advertising KIBS in Vimmerby (Småland) said when discussing this. If the KIBS are not able to conduct this initial process properly for some reasons, complications may arise during later stages of projects, demanding more interaction, including face-to-face interaction, for their solution. A proper emphasis in this context at the beginning of projects therefore underpins their success. "*For us this is crucial, that is the initial meeting. The whole process (ins by author: projects) depends on this meeting*", as one of the interviewees at a software KIBS in Hultsfred (Småland) said when discussing this.

In order to make the analysis as effective as possible at the beginning of projects, and therefore reduce the likelihood of potential complications during their later stages, the importance of establishing good relationships with the right individual(s) at the very beginning of projects was also emphasized. Individuals able to dedicate time and effort to project work and able to make quick judgements and fast decisions at crucial moments when needed. Such a strategy is highly important since much of interactions during projects are complex or tacit in nature. As an example, in relation to symbolic or value laden factors such as branding and ethical issues, preferences on the visual look or aesthetics in homepages and advertising, and/or what key messages or functions should be and how they should be organized and presented. Once relationships of trust have been established with the right individual(s) at the beginning of projects, such

interactions are primarily conducted over distance during their later stages (see also appendix I).

Recent ICT developments and increased usage have greatly increased their abilities to establish new relationships on client markets and communicate complex knowledge over distance. People are today much more used to and willing to interact and conduct business over distance than before, as also discussed above in relation to finding and signing new clients. As an example, they can share screens and work together on various project tasks in real time through various ICT applications. They can share and work together on documents and discuss ideas through all sorts of video-conference applications. They can also easily review what other firm are doing on similar client markets through browsing the Internet during such common sessions. "*There are so many other tools than just the traditional telephone meeting. Today you can share a screen and you can… via Skype… talk to each other and view what you are working on, and talk, develop a layout or something. You can interact with a client, sit with your computer and see exactly the same thing he does. (…) So, you can interact through technology, through technical help to a much greater extent than before*", as an interviewee at one of the software KIBS in Kalix (Norrbotten) said. In general, more than 95% of interactions during projects are conducted over distance. This also applies to interactions with local clients, i.e. physical proximity to clients does not change the fact that interactions are primarily conducted through ICTs (see also appendix I). There was no difference between the non-core and Malmö KIBS in this sense.

The level of required face-to-face interaction at beginning of projects depends on the nature of relationship between KIBS and their clients. As an example, in case of new projects with previous clients, there is often little need for face-to-face interaction, even no need. In such cases, long-term relations have already been established and the KIBS are familiar with the client´s activities. This, in return, reduces the need for face-to-face interaction and hence that large part of the analysis may be conducted through ICTs (see also appendix I). This may even increase the profitability of new projects with previous clients, as discussed by one of the interviewees at an advertising KIBS in Vimmerby (Småland): "*In our line of business it works like this; the longer… the more you know each other, the shorter this process gets (ins. by author: the process of building relationships of trust and analysing clients´ needs), and the shorter it gets, profitability increases*".

In case of new clients however, more time and face-to-face interaction are usually required in order to establish good relationships, explore and learn about their core activities and markets, and analyse their needs. Similarly, if contact individual(s) at the client firm leave their job for a new one during projects, may in some cases demand additional face-to-face interaction. This may be required in order to build new relationship and start a dialogue with a new contact individual at the client firm. However, if clients are revisited or not because of this, depends on size and budget of projects each time. While additional face-to-face interaction may not be involved in smaller projects in this context, they may be more important in case of large projects and clients. In case of long-term clients, they nevertheless prioritize to visit such clients in order to maintain good relationships (see also appendix I). There was no difference between the non-core and Malmö KIBS in this sense.

Furthermore, in this context, big and therefore often complex projects may require more interaction than smaller ones during the analysis, and even increase the need for face-to-face interaction. Discussing examples of a more complex projects, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*It may apply to system development projects. As an example, when you need to conduct interviews, be in contact with the end users, with those who work for these firm, those who are on the floor there… Then it can be an advantage to be on place. And then we have to travel. And then we hold a rather intense workshop and take in as much as we possibly can about what is needed*". Projects involving many participants or users at the client firm may increase the need for interaction, including face-to-face interaction. As an example, this could apply if clients are changing how they operate on their own client markets, e.g. in relation to new type of services or products. This may in some cases demand a totally new representation of their activities, e.g. new homepage, branding, and/or advertising campaigns. Also, the development of a totally new operational systems demands considerable understanding about clients' operations, routines, and how they perform daily activities. Such projects are likely to involve higher levels of tacit interaction, which may demand more face-to-face interaction during the analysis compared with smaller and less complex projects. However, if complications arise during the analysis due to size and complexities of projects, they are nevertheless primarily solved over distance (see also appendix I).

In such context, the proportion of face-to-face interaction in larger projects rarely exceed 5% of sold hours, which is also the case with smaller projects. Hence, this suggest that although big size or complexities of projects may increase the need for interaction during the analysis of client needs, they rarely affect the proportion of face-to-face interaction in projects. As discussed above, good client relationships, recent ICT developments, and increased usage play a key role in this context. In addition, interactions between KIBS and clients during the analysis are not bound to the location of participating firm. Employees on both sides can be located in many different places during projects. They can participate in project work through ICTs regardless of location, i.e. as long as good relationships have been established and they have access to good and dependable Internet connection. They may do so from work, from their own home, while traveling, and so on (see also appendix I).

Clients do not always have clear ideas about what they want or need, or simply lack the abilities to communicate such information. If core needs are not clearly recognized and negotiated by participating actors at the beginning of projects, e.g. regarding the function of new software solutions, branding issues in advertising, or how much time need to be allocated to projects, complications may appear at their later stages. Any mismatch in how KIBS and their clients understand what needs to be done and how it should be done may hamper the success of projects and may even lead to conflicts if not attended to. Solution of conflicts may take much extra time, which in return may reduce potential economic gains of projects. Also, unsolved or poorly solved conflicts are likely to be negative for KIBS reputation on client markets (see also appendix I).

Therefore, in order to avoid potential misunderstanding and mismatch during the analysis, and hence reduce the need for face-to-face interaction as much as possible during projects, they put much time and effort in enhancing analytical competences and emphasize strongly the core importance of building good relationship of trust at the beginning of projects. There was no difference between the Malmö and the non-core KIBS in relation to this and should therefore be understood as a general factor in these sectors regardless of location. However, this should be considered especially important for non-core KIBS. Reducing the likelihood of misunderstandings through conducting a thorough analysis and relationship building at the beginning of projects also reduces the need for face-

to-face interaction for their solution, hence time allocated in travels to distant client markets.

The findings clearly suggest that establishing relationships of trust with relevant individual(s) at the client firm at the beginning of projects is a key strategy for software- and advertising KIBS. This supports previous work highlighting the collaborative- and relational nature of knowledge intensive value creation (see e.g. Strambach, 2010; Simmie & Strambach, 2006; Hermelin, 2009; Pratt, 2006; Bathelt & Glückler, 2005; Bettencourt et al., 2002; Løwendahl et al., 2001; Vargo & Lusch, 2004; 2014). Through establishing relationships of trust at the beginning of projects facilitates the quality of interaction between KIBS and clients, which increases the likelihood of a thorough and proper analysis on what needs to be done. This reduces the likelihood of complications during later stages of projects and therefore the time needed for interaction, including face-to-face interaction, for their solution. In return, this increases both the success and even potential profits of projects. The findings do not reveal any difference between the Malmö and non-core KIBS in this sense.

The results therefore do not relate well with previous work emphasizing the importance of local agglomeration advantages and physical proximity for the success of knowledge intensive value creation due to its complex and tacit nature (see e.g. Strambach, 2010; Simmie & Strambach, 2006; Malmberg & Maskell, 1999; 2002; 2006). They clearly suggest that physical proximity plays a less important role for competitiveness of knowledge intensive firm than previously emphasized, at least for the type of firm that are at focus here. In such context, they support previous work arguing that recent ICT developments and increased usage have increased considerably the abilities of people and firm to interact and conduct business over distance (see e.g. Rodríguez-Pose, 2011; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012; The World Bank, 2020). This also supports previous work highlighting that knowledge intensive value creation and interaction may simultaneously take place over various geographical scales (see e.g. Bunnel & Coe, 2001).

In such context, although the findings partially correspond with previous work highlighting that face-to-face interaction facilitate the establishment of trust (see e.g.; Howells, 2012; Gertler, 2001; Granovetter, 1985; Polanyi, 1958), they nevertheless suggest lesser importance of physical proximity for the maintaining

of trust than indicated by this work. They suggest that once relationship of trust has been established, it actually reduces the need for face-to-face interactions during projects. I therefore propose that it is more accurate to say that tacit- and knowledge intensive value creation and interaction depends on temporary proximity than just to say that it depends on physical proximity. This supports previous work highlighting that good client relationships may be established through temporary proximity (Rallet & Torre, 2000; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007). Once good relationships of trust are established and initial analysis thoroughly conducted when clients are visited at the beginning of projects, interactions, including further analysis on client needs, are primarily conducted over distance.

The results also support previous work in service management studies emphasizing that a thorough analysis at the beginning of projects reduces potential complications during their later stages and therefore their success (see e.g. Nordin & Kowalkowski, 2010; Luthje et al., 2005; Tuli et al., 2007; Lapierre, 2000; Aarikka-Stenroos & Jaakkola, 2012). The findings suggest that this work may be enriched with a geographical component addressing that different stages of projects have different geographical implications, i.e. a thorough analysis at the beginning of projects also reduces the need for face-to-face interaction during their later stages. Although the findings partially correspond with previous work in the sense that interaction may increase in line with size and complexities of projects (Möller & Törrönen, 2003), they do not suggest that proportion of face-to-face interaction increases in such projects. Face-to-face interactions rarely exceed 5% of sold hours.

The findings clearly suggest that strategies focusing on building relationship of trust with clients and conducting a thorough analysis of their needs at the beginning of projects are important for all software- and advertising KIBS, regardless of location. They underpin the success of projects. I nevertheless argue that such strategies are especially important for non-core ones since they enable them to primarily interact and conduct remaining parts of projects over distance. This reduces greatly the need for face-to-face interactions during projects, which in return reduces time and resources needed for travels to distant client markets.

Management of resources

Competences

The KIBS strongly depend on highly skilled competences in order to create value and compete on client markets. As expected, the findings reveal that the single largest disadvantage for non-core KIBS are scarcities in relevant local competences. However, such disadvantages were primarily a marginal challenge when they first started their business. In a rather short time, they were able to build up a strong team of relevant competences. In the very beginning, when the founders started their business, they complemented their own competences by employing those few relevant competences available locally. Then, through constant scanning for potential competences, they identify and employ relevant ones when available (see also appendix I). In such context, discussing that they are constantly scanning for returnees with relevant competences, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*Yes, we have to be able to pick up these local competences when they move back, when they have educated themselves. Those who want to be here*".

Almost all of the owners and employees of the non-core KIBS are returnees. At an earlier stage in their lives, they had moved to larger urban areas in order to study, and often also work, and then moved back home at later stages in their lives. Although many of owners and employees of the Malmö KIBS are also returnees, most of them had previously studied and worked in or close to Malmö. Returnees not only offer new business networks on distant client markets as discussed above. They also contribute to organizational competences. Returnees may also open up networks to other potential extra regional competences. As an example, certain aspects of projects may be subcontracted to such extra regional competences if needed (see also appendix I).

A key factor explaining why the non-core KIBS were rather quickly able to build a strong team of relevant competences is that employees stay very long with the firm, i.e. local labour turnover in non-core areas is very low. Discussing the benefits of this, the interviewee at the software KIBS in Piteå (Norrbotten) said: „*There some benefits in being located here, i.e. it is easier to build skills here, to get in these boys and girls, we can develop them differently. They will not change jobs after two years as they do in Stockholm*". Through continuous processes of individual learning and in-house sharing, e.g. through drawing learning from previous

projects and use in future projects, organizational competences are gradually strengthened. This gradually enhances abilities to take on more demanding projects over time, e.g. in terms of size of clients and complexities of projects. In such context, low labour turnover and a strong culture for continuous learning and sharing processes was emphasized as key compensating factors for scarcities in relevant local competences (see also appendix I).

Low labour turnover is also a key factor when it comes to the abilities of the non-core KIBS to maintain long-term relationships and compete on distant client markets. As an example, the non-core interviewees discussed that clients strongly appreciate being able to communicate with the same individual(s) at the KIBS during long projects or when they return with new projects. Reportedly, this is something they do not experience to the same extent when they seek consultation from similar KIBS in larger urban areas due to rather high labour turnover in such areas. This means that previous clients rarely have to build new relationships with new individuals at the non-core KIBS during long projects or when they reconnect with new projects in mind (see also appendix I). Discussing this, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*What clients appreciate is the continuance in our staff. If our clients return to us after three years, then they can work with the same employees as before, and they think this is unique*".

Low labour turnover therefore facilitates long-term relationships on client markets, which in return strengthens abilities to interact and create value over distance during projects and hence the success of projects. This is an important part of their reputation on client markets, and they view it as a competitive advantage when it comes to compete with similar KIBS in large urban areas on same client markets. Hence, this strongly suggest low labour turnover as one of the key factors facilitating non-core KIBS to maintain and enhance long-term relations on extra regional client markets. This, in return, facilitates their abilities to compete and grow on such markets (see also appendix I).

The positive benefits of low labour turnover were also highlighted by the Malmö interviewees. Such benefits are however often challenged by a high local labour turnover. They nevertheless emphasized that negative effects of a high labour turnover are only marginal and temporary and do not to any great extent reduce their abilities to create value and compete on client markets. If they lost an employee, they are rather quickly able to find a new one due to the thick and

diversified local labour market and therefore great supply of relevant competences. In this context, all interviewees discussed that KIBS in large urban areas more easily find and employ relevant competences when needed compared with non-core KIBS. Hence, low labour turnover should therefore primarily be understood as non-core specific benefits and not a general transformational factor benefiting all KIBS equally regardless of location.

Although the non-core KIBS complement thin local client markets through focusing on distant ones as discussed above, they are to a very little extent able to draw on extra regional labour markets. That is, on full term basis, employ relevant competences willing to commute long distances between home and work on daily basis, e.g. individuals who live in the nearest large urban area (see also appendix I). As an example, for some period in the past, the advertising KIBS in Vimmerby had couple of employees living in adjacent municipalities but still more than one hour in commuting time to their job in Vimmerby. This worked for some time, but in the end, these individuals resigned once they found work closer to their place of living. Similarly, this advertising KIBS has also employed individuals that came from other parts of Sweden. This also worked for some time, but eventually they moved back to their home region. This advertising KIBS therefore prioritize to employ people who live in and are from Vimmerby. Discussing this, one of the interviewees at this KIBS said that their "*employees have to view Vimmerby as the centre of the world*". If they do not, there is a risk that their employment is temporary in nature.

If the KIBS lack certain type of organizational competence(s) needed for certain type of projects or part of projects, they are able to partner up with external competences. However, while the Malmö KIBS are usually able to partner with other local competences when needed, the non-core ones most usually have to partner with extra regional competences. They are usually found through business networks or personal networks of owners and/or employees. As an example, if one of the software KIBS that I visited in Kalix (Norrbotten) need competences in specific graphic design, advertising, and/or branding, they partner up with an advertising KIBS in Kristianstad in S-Sweden (see also appendix I). One of the owners of this software KIBS in Kalix lived in Kristianstad for several years and worked at this advertising KIBS. Although he has now moved back home to Kalix he maintains a strong relationship with his previous co-workers in Kristianstad. Through these relationships, they are able to draw on their specific competences

if needed and distance between participating actors is not a problem. The interviewees emphasized that once good relationships have been established with extra regional competences, they conduct their specific tasks at their own place of work and interactions take place over distance.

However, even though the possibility to draw on extra regional competences when needed is an important attribute for the non-core KIBS to enjoy; it is not often required. The non-core KIBS had already at the time of my visit managed to build and develop a strong level of organizational competences. Again, although abilities to partner up with extra regional competences are likely to apply to all KIBS regardless of location, this should be understood as an especially important complementing strategy for non-core ones due to local scarcities of relevant competences in such areas.

The results support previous work highlighting that KIBS abilities to create value and compete on client markets depends on good access to relevant competences (see e.g. Strambach, 2010; Muller & Doloreaux, 2009; Miles, 2005; Larsen, 2001; Løwendahl et al., 2001). They also support previous work highlighting that the single largest local disadvantages for knowledge intensive firm in non-core areas are local scarcities in relevant competences (see e.g. Fitjar & Rodríguez-Pose, 2011; Anderson et al., 2010; Florida, 2005; Tödtling & Trippl, 2005). In such context, since all employees of both non-core and Malmö KIBS live close to their place of work, the findings support previous work highlighting that most people are not willing to commute long distances between their homes and work on a daily basis (see e.g. Gimenez-Nadal et al., 2020; Haugen et al., 2011; Isacsson & Svärdh, 2009; Gløersen et al., 2006).

However, although the process of finding relevant competences is in general more challenging for non-core KIBS than for those in large urban areas, the findings illustrate how the non-core ones have compensated for such local disadvantages rather quickly over time. In such context, the findings support previous work highlighting the benefits gained from when individuals move back to their home region after spending some time elsewhere (see e.g. Solheim & Fitjar, 2018; Martynovich, 2017; Saxenian, 2007). Whether founders or employees hired after the establishments of the KIBS, returnees gradually enhance and develop organizational competences, which in return enhances their competitiveness. This compensates for local scarcities in relevant competences.

The results also support previous work arguing that experience-based competences derived from low labour turnover in non-core areas benefit firm in such areas (see e.g. Isaksen, 2015; Isaksen & Karlsen, 2016). The findings clearly illustrate that the accumulation of experience-based competences due to low labour turnover gradually enhances non-core KIBS organizational competences, which in return facilitates their abilities to create value and compete on client markets. The results complement this work through illustrating that non-core KIBS also benefit greatly from low labour-turnover in the sense that it strengthens long-term relationships on client markets, which in return facilitates abilities to interact and create value over distance. This suggest that low labour turnover is both an important compensation for local scarcities in relevant competences in non-core areas as well as long distances to extra regional client markets.

Although low labour turnover and employing returnees are likely to benefit all software- and advertising KIBS regardless of location, they should be understood especially important for non-core ones. This may not only lead to new client relationships as discussed above in relation to finding and signing new clients, but also gradually compensate for local scarcities in relevant competences and strengthen long-term relationships on client markets. In return, this gradually enhances their abilities to compete with similar KIBS in large urban areas on same client markets. The Malmö KIBS do not have to depend on neither of these due to local agglomeration advantages in this context.

Resources needed for value creation and learning

A key element behind the success of projects and learning is good access to large and diversified knowledge markets, as well as important knowledge from clients. The KIBS have no problems in sourcing external knowledge needed for value creation and learning (see also appendix I). As an example, this may be knowledge related to latest software- or steering system developments, market trends, developments in sectoral- and or client market characteristics, what and how competitors are doing things, and so on. However, and perhaps surprisingly, apart from knowledge from local clients, external knowledge resources are primarily drawn from extra regional sources. "*The Internet is the basis for finding things you do not know. Today, this is a very general thing*", as an interviewee at an advertising KIBS in Boden (Norrbotten) said in this context. There was no difference between the non-core and the Malmö KIBS in this sense. They all primarily interact, source, and communicate knowledge through the Internet (see also

appendix I). Although Malmö is rich in all sorts of local knowledge resources, e.g. local university, high levels of human capital, strong support structure, industrial diversity, and is also connected to the greater capital area of Copenhagen, external resources needed for value creation and learning are also primarily drawn from extra regional sources.

Recent ICT developments and increased usage have not only enabled the KIBS to primarily interact and create value over distance. They have also forced them to adapt to this development in order to follow sectoral developments and compete on client markets (see also appendix I). "*It forces us, I would like to say (…) Our clients have expectations which means that we have to increase our knowledge. We are therefore forced to evolve, and we constantly have to increase our knowledge (…) This development puts demand on us*" as one of the interviewees at a software KIBS in Hultsfred (Småland) said when discussing this. Not only are interactions and value creation in their line of business primarily conducted through the Internet as discussed above. The display and communication of end results of value creation are also primarily Web-based in nature. Knowledge resources needed for learning and solution of projects, as well as end results of projects, whether related to software development or advertising or the combination of both, are also mostly and increasingly stored on the Internet cloud (see also appendix I). Physical forms of media, such as journals, newspapers, and signs are still around but have greatly reduced in recent years. But also, the creation of such media is primarily digital in nature, increasingly demanding the enhancing of relevant organizational competences in such context. There was no difference between the non-core and Malmö KIBS in this sense.

All interviewees emphasized that if they do not continuously adapt to new sectoral trends or technological developments, they would soon lose their abilities to compete on client markets. In order to follow sectoral developments, they constantly have to develop and enhance organizational competences. This a core factor in the KIBS sector since demand on client markets is constantly developing, which in return demands constant learning (see also appendix I). This should therefore be understood as a general transformation pressure affecting all software- and advertising KIBS, no matter where they are located.

Learning primarily takes place around project work and is guided by what is needed for their solution. KIBS clients are always seeking opportunities to apply latest trends or latest technologies to their activities. Factors such as technology,

hardware, software, Web-based marketing- and design trends, and how things are done evolve incredibly fast in their line of work. "*We evolve, we continuingly evolve, that is our client model, that is what our business model is built on, it evolves all the time*", as one of my interviewees at an advertising firm in Boden (Norrbotten) said when discussing this.

Extra regional knowledge resources needed for learning and projects are much more accessible today than before due to recent ICT developments and increased usage (see also appendix I). Due to this development, they not only easily interact and communicate knowledge with clients over distance; but also, source knowledge needed for learning and solution of projects; follow latest sectoral trends; and monitor what other KIBS are doing on client markets. "*Knowledge resources are not place bound in any ways* (…) *Today you can learn so much through the Internet and that is very much how it is within our sector"* as one of the interviewees at a software KIBS in Hultsfred (Småland) said when discussing this. It was strongly emphasized that long distances to these sources of learning are not problematic. There was no difference between the non-core and Malmö KIBS in this sense.

In order to follow continuous development in their field and learn new things, employees e.g. draw learning from online articles, reports and tutoring videos stored on the Internet cloud. They also participate in online courses and various online discussion forums with peers, where they e.g. discuss new technologies and put forward questions on how to solve various problems. "*We actually pick this up (ins by author: relevant knowledge) from forums most often. Digital forums online, wherever you are (…) They exchange problems and solutions there*", as an interviewee at an advertising KIBS in Västervik (Småland) said when discussing this. Although increased abilities to interact, source, and communicate knowledge primarily over distance is likely to apply to all software- and advertising KIBS regardless of location, this development should be understood in particular important for non-core ones. It not only enables them to compensate for local scarcities in relevant knowledge resources, but also long distances to large client- and knowledge markets (see also appendix I).

The findings support previous work suggesting that continuous development and strengthening of individual- and organizational competences through interacting, should be understood a key strategy for KIBS competitiveness (see e.g. Løwendahl et al., 2001; Vargo & Lusch, 2004). They therefore also support previous work

highlighting that due to constant changes and development on knowledge markets, knowledge intensive firm continuously have to learn and adapt to new things in order to stay competitive (see e.g. Asheim et al., 2011; Strambach, 2010; Dayasindhu, 2002). In such context, the findings support previous work in the sense that success of projects and learning depends on good access to large relevant knowledge markets, including important knowledge from clients (see e.g. Porter, 1990; Løwendahl et al., 2001; Grönroos, 2008; Gruner & Homburg, 2000; Lundkvist & Yakhlef, 2004; Payne et al., 2008).

However, since knowledge resources are primarily extra regional and sourced over distance through ICTs, the findings do not relate well with previous work emphasizing the importance of thick local knowledge market and physical proximity for knowledge intensive value creation (see e.g. Lundvall, 1992; Howells, 2012; Strambach, 2010; Simmie & Strambach, 2006; Malmberg & Maskell, 1999; 2002; 2006; Porter, 1990; 1998; 2002). The results clearly suggest that such local advantages play a less decisive role for competitiveness of knowledge intensive firm in non-core areas than indicated by this work, at least for the type of firms that are at focus here. A thin local knowledge market and long distances to extra regional ones do not limit their abilities to create value and compete on client markets. Apart from knowledge sourced from local clients, the local knowledge market plays almost no role in this context. The findings do not reveal any difference between the non-core and Malmö KIBS in this sense. All of the KIBS primarily source external knowledge needed for learning and solution of projects from extra regional sources through ICTs. In such context, the results support previous work highlighting increased abilities to interact and communicate knowledge over distance (see e.g. see e.g. Rodríguez-Pose, 2011; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012)

Although the findings in this sense partially corresponds with recent work highlighting that successful knowledge productions result from the combination of local- and extra regional knowledge interaction and sharing (see e.g. Meijers & Burger, 2017; Moodysson, 2008; Bathelt et al., 2004), they do not concur with one of the key elements in this work. This work demonstrates their argument empirically through displaying abilities of firm in organizationally thick areas to combine local resources with distant ones and therefore complement local scarcities in specific resources if needed. Thus, this work indicates, at least

indirectly, that firm need to be located in large urban areas in order to be able to draw on extra regional advantages. This line of reasoning is similar to Porter´s (1990) argument on selective factor disadvantages, which is built on the premise that although firm may complement weakness in certain local factors of production, local agglomeration of most others is required. This is rather explicit in Porter's argument. However, such local business conditions do clearly not apply to the non-core KIBS in this study. Not only are the relevant local labour-, client-, and knowledge markets thin, the nearest agglomeration of such factors is also located far away. They are therefore double disadvantaged in such sense when compared with similar KIBS in large urban areas (see also Grillitsch & Nilsson, 2015). The findings however clearly display that abilities to draw on external resources do not necessarily depend on local agglomeration advantages as highlighted or indicated by this work. That is, such abilities may also apply to non-core KIBS. They are, in spite of non-core location, able to compensate local agglomeration disadvantages in all factors of production instead of just adding few extra regional ones to those already locally agglomerated. Hence, in such context, the findings complement this line of work.

The results illustrate that increased abilities to draw on extra regional knowledge resources needed for value creation and learning is a general transformational factor affecting all software- and advertising KIBS. This development has however been especially important for non-core ones. It has enabled them to compensate for thin local knowledge market. The findings clearly suggest that long distances to knowledge resources do not limit their abilities to create value and compete on client markets, i.e. as long as they have access to a good and dependable communication infrastructure.

6.3 Delivery/implementation of the solution

The level of interaction during the delivery/implementation of the solution varies greatly between projects. This usually relates to size and therefore often complexities of projects (see also appendix I). Delivery/implementation of small projects and/or small post-delivery trainings are primarily conducted over distance, e.g. in relation to small adjustments in clients´ homepages or improvements of software applications already used at the client firm. However,

in case of larger and often complex ones, e.g. if many employees at the client firm apply and/or need to further test or develop the end results of projects, someone from the KIBS may need to be on place to train them accordingly. Also, if projects are complex and involving high levels of tacit knowledge interaction, their delivery/implementation may also demand more face-to-face interaction than in simpler and smaller ones. This may apply if the clients are making great changes in what or how they do things, or how they advertise and market their activities, as discussed above in relation to the analysis of client needs. However, although this may demand more face-to-face interaction in some cases, largest parts of interactions during the delivery/implementation of projects are nevertheless most often conducted over distance, Web-based or through telephone. Face-to-face interactions rarely exceed 5% of sold hours during projects, even in case of larger or more complex projects, as discussed previously. The findings did not reveal any difference between the non-core and Malmö KIBS in this sense.

In a technical sense, end results of Web-based marketing- and advertising schemes and/or webpage productions/developments may primarily be delivered and implemented over distance due to their digital- and Web-based character. Abilities to do so have greatly improved from before due to recent ICT developments and increased usage (see also appendix I). As an example, in the beginning of the 2000s one of the software KIBS in Kalix (Norrbotten) most often needed to visit clients at end of projects, e.g. in order to download new software applications or upgrade older ones or to train their employees in basic computer- and software skills. At that time, such services demanded on location deliveries and face-to-face interaction. Today, however, there is almost no need to provide trainings in basic computer- or software skills, and most, if not all downloading and/or upgrading of software, is Web-based in nature. "*It has become much easier for us. Before, that is around 2000, we had to be very much on location, we had to install software in each computer (…) Today, they (ins by author: clients) just turn off the computer and then log in again, and then they have the new… everyone works in the cloud. The cloud is always close by wherever you are located*", as one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said when discussing this development. Although increased abilities in this sense are likely to benefit all KIBS, they are in particular important for non-core ones. They enable them to compensate for long distances to client markets. This possibility has developed very fast in recent years and should be understood a key factor in enabling them to deliver/implement their services over distance (see also appendix I).

However, although delivery/implementation of the solution may primarily be conducted over distance in a technical sense, the non-core KIBS prioritize to visit clients during or soon after the end of projects, whether face-to-face interactions are needed or not. The main reason for this has to do with their strong emphasis on long-term relationship strategies on client markets (see also appendix I). Discussing that they prioritize to visit clients around the end of projects, even when it is not required, one of my interviewees at a software KIBS in Hultsfred (Småland) said: "*We also see this here as an opportunity to sell more to the client in the future. So, if we visit clients, we try to see if we can sell them a little more. It is a sales opportunity to meet with clients*". He said that such visits signals to clients their determination to deliver and implement their services properly, which in return increases the likelihood that they sign them to new projects in the future, as well as recommend them further to new potential clients within their own business networks.

Even though projects are formally finished, some follow up activities, usually small and easily solved, are often required later on. The Malmö KIBS can rather easily drop by at clients and take care of these activities in an ad-hoc manner since most clients are local. This does not take much time or effort. Doing so is not as convenient for the non-core ones since most clients are extra regional (see table 8). However, they usually solve these follow-up activities parallel to new projects with previous clients, and/or combine such activities with visits to other close by clients. As an example, when they need to visit a client in the Stockholm region for some reasons, they prioritize to visit as many clients as possible in one trip. Compared with visiting just one client in each trip, visiting many clients in one trip reduces the overall travel time and costs, and hence increases profit possibilities of projects in the Stockholm region. By doing so, they also enhance long-term relationships with current as well as previous clients, even when they do not need to visit them, e.g. in case of small projects with small budgets (see also appendix I).

Through synchronizing visits in this sense, follow up activities or fine adjustments of previous projects are even in some cases solved without charging clients with full-service rates. This may go on for many years. Such strategies not only increase the likelihood that previous and current clients are more likely to return with new projects in the future. Such clients are also more likely to recommend them to other potential clients within their own business networks (see also appendix I).

This takes us back to the importance of long-term relationships, which links this final stage of projects back to their first stage, i.e. finding and signing new clients. The findings suggest that strategies prioritizing visiting clients during or following the delivery/implementation stage, whether needed or not in a technical sense, in order to maintain long-term relationships, not only facilitate their abilities to complement thin local client markets as discussed above. Such strategies are also an important compensation for long distances to large extra regional client markets since good relationships reduce the total amount of time and costs spent on travels to such areas during projects. "*We who are located in non-core areas we are forced to work on long-term basis, we want clients that stay long with us (…) We build on these relationships, and it is through them that we grow. We want to establish long-term relations and a more genuine relations that withstand distance*", as one of the interviewees at a software KIBS in Hultsfred (Småland) said when discussing the importance of visiting clients during and following delivery of projects. Successful client relationships may last over ten or even fifteen years and yield many different projects. The findings clearly suggest long-term relationship strategies a key factor behind the success of projects, including a successful delivery/implementation of the solution. Such strategies enhance relational proximity between KIBS and their clients over time. Although this should be understood as a general factor in the software- and advertising KIBS sectors regardless of location, this is in particular important for non-core KIBS. Long-term relationship strategies enable them to compensate for long distances to client markets (see also appendix I).

Hence, although face-to-face interaction is not demanded in a technical sense in most cases, I argue that visiting clients during or soon after the delivery/implementation of the solution is an important strategy for non-core KIBS on client markets, especially extra regional ones. Primarily in order to increase the likelihood that previous clients return with new projects and/or recommend them further to new potential clients through their own networks. Again, such an approach not only enhances reputation on extra regional client markets in relation to finding and signing new clients. It also facilitates that interactions are primarily conducted over distance during projects, i.e. Web-based or via telephone (see also appendix I). "*As long as the relationships are in place, this becomes no problem*", as one of my interviewees at a software KIBS in Hultsfred (Småland) said when discussing if long distances are a limiting factor in this context.

The results clearly support previous work highlighting the importance of good relationships between KIBS and their clients and considers them a key factor behind successful knowledge productions (see e.g. Strambach, 2010; Grönroos, 2008; Vargo & Lusch, 2004; 2014; Lusch et al., 2008; Vargo et al., 2010; Gruner & Homburg, 2000; Lundkvist & Yakhlef, 2004; Payne et al., 2008). They complement this work by suggesting that good relationships of trust also reduce the need for face-to-face interaction during projects. Once they have been established, almost always through face-to-face interaction at the beginning of projects, their results may primarily be delivered/implemented over distance. Even though clients are usually visited at the end of or soon after projects, whether it is needed or not, the primary strategy behind such visits is to strengthen client relationships. This links the end of projects to their beginning. The findings suggest that good client relationships of trust may both be established and maintained through temporary proximity. Good relationships not only enable them to primarily interact and conduct projects over distance, as illustrated above in relation to their other stages. This also reduces the need for physical proximity during the delivery/implementation of projects. This therefore strongly supports previous work highlighting that good client relationships may be established and maintained through temporary proximity, which in return reduces the need for physical proximity during projects (see e.g. Torre & Rallet, 2005; Rallet & Torre, 2000; Lagendijk & Lorentzen, 2007).

In such context, the findings clearly illustrate that the competitiveness of non-core KIBS is not limited to the local scale. They suggest that it depends less on physical proximity and face-to-face interaction than indicated by previous work based on the complex and tacit character of KIBS VCPs (see e.g. Strambach, 2008; 2010; Simmie & Strambach, 2006). Projects, even those involving high levels of complex interactions, may primarily be delivered/implemented over distance in a technical sense. As also discussed above in relation to all other stages of projects, increased abilities in this sense have been facilitated by recent ICT development and increased usage of such technologies. The results therefore clearly support previous work in such sense (see e.g. Rodríguez-Pose, 2011; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Jacksi & Abass, 2019; Salmon, 2019; Algosaibi et al., 2017; Berthon et al., 2012; The World Bank, 2020).

Even though the benefits of this development and the importance of good relationships on client markets are general in nature regardless of KIBS location,

they are in particular important for non-core ones. Such benefits enable them to not only to focus on extra regional client markets and primarily conduct most part of projects over distance as discussed above in relation to their other stages. Such benefits also enable them to primarily deliver/implement projects over distance, although they nevertheless usually prioritize to visit clients at the end of projects. In such context, through visiting clients during or soon after the end of projects they maintain and strengthen good relationships on client markets. Hence, linking the end of projects to their other stages, such strategies clearly save the overall time and resources needed for face-to-face interaction during projects, which should therefore be understood as an important complementation for long distances to large client markets.

6.4 Summary of empirical findings

Through focusing on different stages of VCPs, the thesis clearly illustrates that absence of local agglomeration advantages and long distances to nearest ones should not be understood as limiting factors when it comes to the abilities of non-core software- and advertising KIBS to create value and compete on client markets. Such local disadvantages do not affect or limit the type of clients or projects they choose to focus on. Their clients are in all sizes and come from broad variety of sectors and industries. However, they all specialize more in certain activities than others by choice. More than 70% of clients are extra regional, and the single largest client market is the Stockholm region. This clearly suggests that non-core KIBS are able to compete with similar KIBS in large urban areas on same client markets.

Several key compensating factors enabling them to do so were identified. Recent ICT developments and increased usage have greatly strengthened their abilities to interact and communicate knowledge over distance from before. New clients are primarily signed through references from current or previous clients and clients make the first contact, which sustains growth on extra regional client markets over time. Reputation and long-term relation strategies are key factors in this context. Low labour turnover in non-core areas facilitates long-term relationships on client markets and leads to accumulation of experienced based competences over time through constant learning, gradually enhancing their competitiveness and

increasing their range on type and location of clients and projects. Returnees, i.e. locals that move to large urban areas at an early stage of their life in order to study and work and then move back home at a later stage in their life, not only enhance organizational competences but also networks on extra regional client market. Clients are almost always visited at the beginning of projects in order to establish good relationship of trust and conduct a thorough analysis on clients' needs. This enables them to primarily create value and interact with clients over distance during projects. Apart from knowledge from local clients, external knowledge needed for projects and learning is primarily Web-based and almost exclusively extra regional in nature. Clients are usually visited at the end of projects, mainly in order to enhance client relationships and increase the likelihood of future projects.

The findings revealed almost no differences between the non-core and Malmö KIBS in this context. The only differences identified were that non-core KIBS are more dependent on extra regional client markets than the Malmö ones in order to grow, and labour turnover is lower in non-core areas than large urban ones.

Table 9 illustrates how the non-core KIBS compensate for local disadvantages and long distances through different means. It differentiates between if their abilities in this sense result from general transformation pressure in their line of business or from factors that are non-core specific in nature.

Apart from low labour turnover in non-core areas, these compensating factors are general in nature affecting all such KIBS regardless of location. However, as I have argued, their benefits are especially important for non-core ones since they enable them to compensate for local disadvantages and long distances. These have opened a window of opportunity to primarily draw on extra regional agglomeration advantages and compete on same client markets as similar KIBS in large urban areas.

Table 9. A summary of how non-core KIBS compensate for local disadvantages and if the resulting benefits are general or non-core specifics in nature

Traditional factors of KIBS competi-tiveness	Non-core character-istics	Means to compensate	Revealed benefits for non-core KIBS	Benefits rooted in general or non-core specific factors
Thick and diversified local labour market	**Thin local labour market**	Employees stay long. Returnees. Key factor: Low labour turnover in non-core areas - lower than in large urban areas.	Strengthens long-term relationships on client markets. Strengthens experienced based competences over time.	Non-core specifics – less important in large urban areas due to thick local labour market.
Thick and advanced local knowledge market	**Thin local knowledge market**	Sourcing extra regional knowledge resources. Returnees. Key factors: Good access to Web-based knowledge resources, ICT developments and increased usage. Good communication infrastructure.	Enables access to relevant knowledge resources. Facilitates learning and solution of projects. Returnees offer new knowledge.	General – but highly important for non-core KIBS due to local disadvantages.
Thick and diversified local client market	**Thin local client market**	Focus on extra-regional client markets. Long-term relationship strategies on client markets. Increased abilities to interact over distance. Returnees Key factors: Reputation and relationships on client markets. Good transport- and communication infrastructure.	Facilitates access to extra regional client markets. Facilitates reputation and trust on client markets - Clients make first contact. Sustains client growth. Returnees offer new relationships on client markets.	General - but highly important for non-core KIBS due to local disadvantages.
Physical proximity to clients during projects	**Long distances to large client markets**	Finding and signing new clients through est. client relations. Increased abilities to interact and create value over distance. Key factors: Reputation and relationships on client markets, ICT developments and increased usage, Temporary proximity. Est. good relationships and thoroughly analyse client needs at beginning of projects. Enhance and maintain relationships during and after projects. Good transport- and communication infrastructure.	Reduces direct marketing costs - new clients make first contact. Reduces the need for face-to-face interactions. Less than 5% of interactions conducted face-to-face during projects.	General – but highly important for non-core KIBS due to long distances – facilitates their abilities to interact and create value over distance, hence abilities to compete on extra regional client markets.

Own compilation from findings

7. Conclusions

The aim of the thesis is to explain how advanced and knowledge-intensive firm in non-core areas create value and compete on client markets. Such a focus is underrepresented in research and conceptual development. Previous conceptual work, primarily highlighting the core importance of local agglomeration advantages and physical proximity for the competitiveness of knowledge intensive value creation, fails to directly address how such activities are conducted by firm in non-core areas. In order to contribute to this gap, the thesis qualitatively studies if and how non-core software- and advertising KIBS compensate for local disadvantages and long distances, and what factors are at work in such context. Through such an approach, the thesis complements previous work on the competitiveness of knowledge intensive firm.

7.1 The role of general transformation pressure

An important contribution of the thesis is that apart from location specific benefits such as low labour-turnover in non-core areas, increased abilities to interact and conduct business over distance result mainly from general transformation pressure in the economy (see table 9). Recent ICT developments and increased usage play a key role in this context. However, without this general development non-core KIBS would be less able to activate strengths in other important KIBS specific factors such as reputation and relationships on client markets. They would be less able to draw on extra regional client- and knowledge markets, which would limit their abilities to grow and enhance organizational competences. The thesis clearly stresses the importance of such relational factors for knowledge intensive value creation.

In this context, the results complement previous work through illustrating that KIBS specifics such as the importance of good reputation (see e.g. Alvesson, 2004;

Greenwood & Empson, 2003; Tuli et al., 2007; Åge, 2011) and good relationships on client markets (see e.g. Strambach, 2010; Simmie & Strambach, 2006; Hermelin, 2009; Bathelt & Glückler, 2005; Bettencourt et al., 2002; Løwendahl et al., 2001; Vargo & Lusch, 2004; 2014), do not only facilitate client growth and the success of knowledge intensive value creation as suggested by this work. They also enable growth on extra regional client markets and abilities to primarily interact and create value over distance. Thus, although the importance of such relational factors is general in nature regardless of KIBS location, they are in particular important for non-core KIBS. Good relationships and reputation on client markets enable them to compensate for thin local market and long distances to larger ones. This does not suggest that good relationships and reputation were less important before. Rather, the benefits of such KIBS specifics are now less sensitive to distance than before due to increased abilities to interact and conduct business over distance.

7.2 The role of temporary proximity

On similar notes, another contribution of the thesis derives from unpacking different stages of projects in detail. By doing so, the results reveal that knowledge intensive value creation and interaction are primarily conducted over distance through ICTs once good relationships of trust have been established. Since such relationships are almost always established through face-to-face interaction at the beginning of projects, the findings partially coincide with previous work stressing the importance of physical proximity in such context (see e.g. Howells, 2012; Gertler, 2001; Granovetter, 1985; Polanyi, 1958). However, they complement this work by suggesting that once relationships of trust have been established, they actually reduce the need for face-to-face interaction during later stages of projects. Thus, it is more accurate to say that relationships of trust depend on temporary proximity than physical proximity. The findings therefore support previous work highlighting that good relationships may be established and maintained through temporary proximity, which in return facilitates that interaction and value creation may primarily be conducted over distance (Rallet & Torre, 2000; Torre & Rallet, 2005; Lagendijk & Lorentzen, 2007; Lorentzen, 2007). This does not mean that face-to-face interactions do not play a role in knowledge intensive value creation, but certainly suggests less importance than indicated by previous work

in such context (see e.g. Strambach, 2008; 2010; Malmberg & Maskell, 1999; 2002; 2006; Hermelin, 2007; 2009).

7.3 The role of labour turnover

The thesis supports previous work arguing that due to low local labour turnover, non-core firm may enjoy greater benefits from the accumulation of experience-based competences, compared with firm in large urban areas where labour turnover is much higher (see e.g. Isaksen, 2015; Isaksen & Karlsen, 2016). The results complement this work through illustrating that low labour turnover not only enhances organizational competences under the conditions of continuous learning by employees. It also strengthens long-term relationships on client markets, which may render them certain competitive advantage over similar KIBS in large urban areas as I have argued.

Thus, the findings partially contradict recent work emphasizing the importance of co-location and high levels of local inter-sectoral labour mobility for the competitiveness of KIBS (Kekezi & Klaesson, 2020). This work, rooted in Marshallian theory of regional agglomeration, argues that local knowledge spillovers facilitated by high labour turnover in large urban areas renders KIBS in such areas greater competitiveness compared with those in non-core areas where labour turnover and local knowledge spillovers are less evident (Kekezi & Klaesson, 2020). The study partially supports this through illustrating that the Malmö KIBS, opposite to the non-core ones, have no problems in finding relevant local competences when needed due to the large and diversified local labour market in Malmö. This underpins their abilities to compete on client markets.

However, the findings also suggest that low labour turnover in non-core areas may actually have counterweighting effects for the competitiveness of KIBS in such areas. The reason why the findings partially contradict Kekezi and Klaessons (2020) argument may also, to some extent, be explained by that their work is based on statistical data from the period 2000-2009, when abilities to interact and conduct business over distance were not as great as they are today (see also Shearmur & Doloreaux, 2015; 2008). In such context, the thesis clearly suggests that non-core KIBS are much more able to draw on extra regional client- and knowledge markets than they were in the early 2000s. It is therefore likely that

due to recent ICT development and increased usage, knowledge spillovers in large urban areas are less locally confined and more accessible by non-core KIBS than indicated by previous work (see e.g. Strambach, 2008; 2010; Malmberg & Maskell, 1999; 2002; 2006; Hermelin, 2007; 2009; Storper & Venables, 2004).

This does not by any means reject that benefits deriving from co-location and high local inter-sectoral flow of competences may still be a fundamental factor for the competitiveness of KIBS in large urban areas facilitating further growth of the sector in such areas as suggested by Kekezi and Klaesson (2020). However, such local benefits may today render them less competitive advantage over non-core KIBS than before. Not at all because KIBS in large urban areas are today less able to create value and compete on client markets than before. Rather because the abilities of non-core KIBS to do so have increased greatly in recent years. Low local labour turnover and increased abilities to draw learning and foster client relationships over distance play a key role in such context.

7.4 Increased abilities to create and communicate value over distance

The results support work highlighting that trust facilitates the communication of tacit knowledge (see e.g. Gertler, 2001; 2003; 2004; Asheim, 1999; 2000; Echebarria & Barrutia, 2013; Fukuyama, 1995). However, the findings suggest that the communication of tacit knowledge demands less face-to-face interaction than indicated by this work. The results suggest that recent ICT developments and increased usage have to some extent reduced the distance sensitiveness of complex knowledge interactions. As an example, in relation to the communication of symbolic and value-laded factors such as core messages, morals, and branding strategies in homepages and advertising, as well as their ethical and aesthetical presentations, and/or operational styles and functions. Although discussions on such factors are usually initiated when participating actors meet at the beginning of projects, further discussions, developments, and decisions are primarily conducted over distance, i.e. as long as good relationships of trust have been established.

The results also suggest that this development has increased to some extent abilities to codify previously tacit knowledge. As an example, knowledge and information needed for solutions of projects and learning is primarily Web-based in nature and stored in the Internet cloud. This also applies to end results of projects, e.g. new software applications, homepages, advertising campaigns, and/or new operational methods. Hence, although the findings are far from rejecting that KIBS VCPs have a tacit dimension demanding some levels of face-to-face interaction, they nevertheless suggest that they do not depend on constant conditions of physical proximity to large client- and knowledge markets. They rather depend on temporary proximity as discussed above.

In this context, the results partially relate to previous work highlighting the abilities of large international KIBS to create value and communicate tacit knowledge over distance through ICTs, once relationships of trust have been established through face-to-face interaction (see e.g. Faulconbridge, 2006; Amin & Cohendet, 2004; Bunnell & Coe, 2001; Wenger, 1998). Although this work illustrates how different branches of large international KIBS interact and create value across national borders and this thesis how small non-core KIBS do so almost exclusively within national borders, I nevertheless argue that the results complement their findings. They do so by suggesting that abilities to organize knowledge intensive value creation over distance, including tacit knowledge interactions, is not merely an *intrafirm* phenomenon conducted within large international KIBS. Such processes should also be understood as an *interfirm* phenomenon characterized by continuous establishments of new relationships between separate independent firms.

In such context, the findings clearly illustrate that absence of local agglomeration advantages and long distances are today less limiting for non-core KIBS than before. Again, the importance of establishing good relationships of trust at the beginning of projects plays a key role in this sense. Hence, this suggests that instead of limiting our view on knowledge communication as a simple transfer of knowledge produced in one location and then simply applied or replicated in another location (see e.g. Gertler, 2001; 2003; 2004), we should focus on the relational aspect of knowledge production as highlighted by previous work (see e.g. Bathelt & Glückler, 2005). Through such an approach we are better able to unfold the abilities of economic actors to create and communicate knowledge intensive value over distance.

In relation to this, I argue that recent ICT development and increased usage have opened a window of opportunity for non-core KIBS to draw on extra regional client- and knowledge markets and should therefore be understood as an important compensation for local disadvantages and long distances. Paradoxically, at the same time as this development has enabled non-core KIBS to compete on client markets further away than before, although primarily within national borders, it has also reduced the amount of travel needed during projects since value creation and interactions are primarily conducted over distance. This supports previous work highlighting that distances between KIBS and client markets have increased from before due to increased abilities to interact and conduct business over distance (see e.g. Shearmur & Doloreaux, 2015; 2008; Macpherson, 2008; Beyers, 2003; Beugelsdijk & Cornet, 2002).

7.5 The role of extra regional agglomeration advantages

An important contribution in this context lies in the notion that although non-core KIBS do not dependent on local agglomeration advantages, they nevertheless depend on extra regional ones. Client growth primarily takes place in large extra regional client markets, and although knowledge resources needed for projects and learning are primarily Web-based and therefore not place bound per se, they are nevertheless extra regional in nature as well. Such resources are accumulated and stored in the Internet cloud and may therefore be understood as virtual agglomeration advantages that to some extend replace the physical, at least for people and businesses with required skills and good and dependable Internet access.

The findings clearly illustrate that increased abilities to draw on extra regional agglomeration advantages including virtual ones underpins the competitiveness of non-core KIBS. They therefore complement recent work highlighting abilities of firm in large urban areas to complement local resources with extra regional ones (see e.g. Moodysson, 2008; Bathelt et al., 2004; Porter, 1990). They do so through illustrating that such abilities may also apply to non-core firm. However, while firm in large urban areas may only have to *complement* local scarcities in one

or few factors of production, non-core firm have to *compensate* local disadvantages in almost all factors of production.

Thus, the results stress how accessible KIBS specific agglomeration advantages have become regardless of location. This development has not only enabled non-core KIBS to enhance organizational competences through drawing on extra regional knowledge markets. It has also enabled them to compete with similar KIBS in large urban areas on same client markets. Through illustrating how and through what channels non-core KIBS compensate for local disadvantages and long distances during different stages of projects, the research also complements recent work presenting examples of increased abilities of knowledge intensive firm in non-core areas to compete with similar firms in large urban areas (see e.g. Grillitsch & Nilsson, 2015; 2017; Jacobsen & Lorentzen, 2015; Drejer & Vinding, 2007; Huggins & Johnston, 2010; Varis et al., 2014; Fitjar & Rodríguez-Pose, 2011).

In such context, the results partially coincide with previous work highlighting that firm in cities may complement local resources through capitalizing on resources found in other cities, referred to as the ´borrow-size´ concept (Meijers & Burger, 2017; Alonso, 1973). However, the concept of borrow size is formed in the context of large urban areas. Alonso (1973) introduced the concept in the context of small cities within larger metropolitan areas. Mejers and Burger (2017) stretched the concept to wider city networks. They also argue that the concept should not be understood as a one-directional flow of benefits where firm in small cities draw on agglomeration advantages found in larger cities. They highlighted that the opposite also applies, i.e. firm in larger cities also draw on agglomeration benefits found in smaller cities. The thesis partially supports their argument regarding such two-directional flow of agglomeration benefits. However, the results suggest that this may not only apply in situations where firm in large urban areas draw on benefits or value created in other large urban areas. Firm in large urban areas may also draw on value created by non-core KIBS, as the study shows. Although such flow of knowledge between thin and thick areas may only play a small marginal role in how large urban areas develop over time, the findings nevertheless complement this work in this sense. Hence, I suggest that the borrow-size concept could be applied in a new empirical context, including knowledge intensive firm in non-core areas, both as receivers and to some extent contributors in such knowledge flows.

7.6 Policy relevance and further research

Although the thesis considers only a fraction of all possible challenges facing firm in non-core areas, and only studies software- and advertising KIBS in such context, it clearly indicates that non-core location not necessarily means being disadvantaged. The results certainly highlight increased possibilities for knowledge intensive firm in such areas to develop in line with sectoral developments and compete on extra regional client markets. They primarily source and communicate knowledge needed for value creation and learning over distance and their abilities to do so have increased from before. This alone provides a positive message to local- and regional authorities and policy makers regarding economic development potentials in non-core areas. However, not necessarily in terms of great growth and accumulation of specific types of novel economic activities.

As an example, although the thesis suggests increased abilities for non-core KIBS to draw on extra regional benefits, it is not likely that they will grow very fast in number for two main reasons. Firstly, growth of the KIBS sector is typically associated with large urban areas due to the importance of co-location, thick relevant labour market, and local knowledge spillovers deriving from high levels of inter-sectoral labour mobility (see e.g. Kekezi & Klaesson, 2020). Non-core areas however are scarce in relevant competences important for KIBS competitiveness, offering little possibilities for local inter-sectoral flow of knowledge and competences. Although the non-core KIBS at focus were able to draw on few available relevant competences when they were established, and then gradually enhance organizational competences over time, the process of finding new relevant competences is nevertheless challenging in non-core areas. Unless the proportion of individuals with higher education and/or relevant skills, experiences, and competences will increase considerably in non-core areas, the local labour market is not likely to support the establishment and growth of many new KIBS. Secondly, although the non-core KIBS have grown strongly on extra regional client markets, their establishments were nevertheless rooted in the local client market. They were able to draw on a thin local client market and use as a springboard when they started business and then increasingly draw on extra regional ones in order to grow further when the local market was fully explored. Hence, this indicates that new following KIBS are less able than the pioneering

KIBS to draw on the same local client- and labour market and use as a springboard for further growth.

This suggests that even though local disadvantages in this sense may not be or have been an insurmountable obstacle for the few pioneering KIBS already there, they may nevertheless limit the establishment of new ones and therefore great expansion of the KIBS sector in such areas. This indicates that regional development policy initiatives should therefore not focus too strongly on actions fostering local clustering of a selected knowledge intensive sector, e.g. the KIBS sector. They might rather focus on developing further general conditions likely to stimulate entrepreneurship and attract new forms of economic activities. They might also focus actively on encouraging locals that at an earlier stage of their life moved to other areas to study and work to move back home and even establish new firm.

In such context, the results provide clear message to local-, regional-, and national authorities and policy makers on the core importance of continuously strengthening the transport- and communication infrastructures within and beyond non-core areas. Such infrastructures provide a necessary precondition for knowledge production, underpinning the abilities of non-core firm to draw on extra regional client- and knowledge markets. Such an emphasis is therefore likely to further integrate non-core areas in national knowledge production networks and strengthen their regional development potentials. It is relevant to mention in this context that the Swedish government aims for including all homes and businesses to a reliable high-speed broadband with at minimum capacity of 100 Mbit/s by the year 2025 (see e.g. Ministry of Enterprise and Innovation, 2016). Such improvements are therefore likely to enable further people and firm across Sweden to interact, draw learning, and conduct business over distance.

The results beg the question if increased abilities to interact, source knowledge, and conduct business over distance also applies to other types of non-core firm, knowledge intensive and more traditional alike. Although focusing exclusively on software- and advertising KIBS in the study, I find it likely that the results apply, at least to some extent, to other sectors in the economy. I base this on that increased abilities to draw on extra regional client- and knowledge markets have primarily been driven forward by general transformation pressure in the economy, i.e. recent ICT developments and increased usage. Thus, as long as a good and dependable access to the Internet is secured, this is also likely to apply to other

non-core sectors. Increased abilities in this sense might also to some extent halter the downgrading or even shutdown of firm or industries deriving from inabilities to source extra regional knowledge needed for value creation and learning and hence abilities to follow sectoral developments. This may in return reduce to some extent out-migration of valuable competences deriving from such inabilities. This also indicates greater possibilities for individuals that previously moved to larger urban areas in order to educate and work to move back home and find work or even establish new businesses relevant to their competences, experiences, and personal networks.

However, based on its findings, the thesis does not make strong generalizations involving all types of firm in all types of locations. It is characterized by an in-depth qualitative focus on VCPs conducted by several KIBS and not by a broad quantitative focus based on large regional- or national data sets. I nevertheless argue that the main results of the thesis and its conceptual indications are likely to apply to software- and advertising KIBS in other similar non-core areas. At least in areas that are well connected in terms of communication- and transport systems, e.g. within Sweden and countries with similar political-, welfare-, and economic systems, such as the other Nordic countries. A more extensive conceptual- and policy related generalizations require a wider empirical and conceptual focus than provided by this research. Research with a broader focus in this sense would shed further light on what increased abilities to interact and conduct business over distance means for people and firm in general, not least when it comes to economic development potentials in non-core areas.

Further research

The thesis focuses on business related conditions important for KIBS competitiveness and not on other local conditions, such as the quality of life from a broad perspective for local inhabitants. A focus on general living conditions may however play an important role when it comes to improving future development potentials of non-core areas, e.g. in relation to attracting highly skilled and educated people to move to and even establish new businesses in such areas. An interesting and relevant research focus in this context would be to study more closely what drives people to move to non-core areas. As an example, these could be factors related to availability of relevant jobs, closeness to nature, a less stressful lifestyle, housing prices, as well as the level and quality of public- and private

services such as schools, health care, grocery shops, leisure, and so on. Such research would contribute to debates on what it is that actually drives people to move to new places. That is, whether it is the availability of relevant jobs (see e.g. Hansen & Niedomysl, 2009), the quality of general life conditions (see e.g. Florida, 2002; 2005), or the combination of both.

Similarly, it would be relevant to investigate if those who move to non-core areas and establish new businesses are primarily returnees, as was the case in this research, or if they are born and raised elsewhere and then choose to move to a new place later in their life. This would complement recent work highlighting that businesses established by individuals that move from larger to smaller regions are more likely to last longer than businesses established by locals who have not moved between regions (see e.g. Martynovich, 2017). As an example, it would do so through exploring if and then why the combination of pre-established local and extra regional networks outweighs benefits of just extra regional networks imported by newcomers or not.

Also, this study focused exclusively on the national context of KIBS VCPs. It would therefore be relevant to also study if and how increases abilities to interact and conduct business over distance have affected the abilities of small KIBS to focus on international client markets. While a more global market orientation is typically associated with large international KIBS, small KIBS are typically associated with local-, regional-, and/or national markets (see e.g. see e.g. Strambach, 2010; Hermelin, 2009; Faulconbridge, 2006). A specific focus on the abilities of small KIBS to interact, create value, and compete on international markets would therefore contribute to this work. As an example, it would be interesting to investigate if there is a difference between KIBS in non-core and large urban areas in this sense, as well as if and how differences in their location affects abilities to grow fast on international markets.

In such context, it would also be relevant to study if and how external shocks or crisis such as the global spread of the Covid 19 virus, affects general abilities to interact and conduct business over distance. National lockdowns and restrictions due to the virus have decreased physical mobility of people and businesses. Although it is too early to say to what extent, this has forced them to interact and conduct business over distance more than before. In order to do so as well as possible, people have been pressured to learn better how various ICT applications work and what they offer, as well as how to interact more effectively over distance

than before. Thus, although the Covid 19 virus has already had devastating effects on our lives, an unintended side effect might however be an even more increase in abilities to interact and conduct business over distance than before. It would therefore be interesting to focus more closely on how crisis affects abilities of firm in this sense, particularly non-core ones. Especially if and how they open up new opportunities to draw on new client- and knowledge markets.

These lines of research would not only contribute to conceptual development, but also provide valuable information for local authorities and policy makers regarding what factors are important to emphasize in regional development planning strategies.

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Appendix I - Quotes from interviews

Stage 1: Finding/signing clients

Type of clients and projects

Kalmar (Småland) and Norrbotten:

Discussing if distance to client- and knowledge markets affects the type of client or projects they focus on, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*We work very broadly, many industries, so there is no special type due to distance. (…) In what industry does not matter to us. Everyone needs a website*".

Discussing if there were limits on what type of firm and projects they focus on, the interviewee at a software KIBS in Vimmerby (Småland) said: "*No, as long as it is a firm. We have everything from an airplane parts manufacturer, window manufacturer, to an advertising agency. When it comes to taking care of data, it is about performance, performance and so on (…) Firm do not differ very much in this sense, it's pretty much the same*".

Discussing if they focus on any specific type of clients and projects due to non-core location and long distances to client markets, an interviewee at an advertising KIBS in Västervik (Småland) said: "*No, no. They just have to have problems, hehehe*".

Discussing that they have no special type of clients or projects, an interviewee at an advertising KIBS in Boden (Norrbotten) said: "*We work with everything from, we work with municipalities, we work with municipally owned companies, we work with national organizations, we work with firm 100% financed in our healthcare, those who work in home care and the like. We work with manufacturing companies,*

we work with business-to-consumer companies, both those that sell physical products and those that offer services, e.g. municipal services and tourism".

Discussing if they have special type of clients or projects, an interviewee at one of the software KIBS in Kalix (Norrbotten) said: "*No I cannot say that we have any special client focus. Maybe the most common are smaller firms like… firms who sell any product like that and further develops for their clients (ins by author: the interviewee points at a box on his table containing specific software applications). Relatively small. But we also have Bosch as a client, and they are gigantic, big hehehe. And we have large client in Luleå, which is also an international firm. How many are they... 100,000 employees in total. So, these are not small firm. But the other… so, we have customers who are very small, with few employees. It is clear that it is easier to work with the larger client firms, because they have better resources, and you can do better things… you get paid better and such. So... but it is not easy to get into these big firm*".

Discussing that they first started to focus on the local client market before they started to focus on extra regional ones, an interviewee at an advertising KIBS in Västervik (Småland) said: "*We had all focus here (ins author: local client market). We could work quickly, efficiently, short trips, fast meetings, bring up volume, the local, know them, about client firms. We want to be the ones who are of course an alternative here. Only when we got to train, build systems and just live as an organization, then we started to focus more on extra regional markets*".

Discussing if increased abilities to interact and conduct business has enabled them to focus on extra regional markets and on more types of clients and projects than before, one of the interviewees at an advertisement KIBS in Vimmerby (Småland) said: "*Yes, absolutely! We have these video conferences, and we have Skype meetings, as you and I have now (ins by author: this interview was conducted through Skype couple of weeks after I had met this individual shortly in person when I interviewed his colleague at this firm), and email is very good. And we can set up these platforms and view projects, with time plans and such. Certain technical solutions have for sure been of help in this and been an advantage for us at the same time*".

In the context of increased abilities to focus on extra regional client markets, discussing what effects recent ICT development and increased usage distance has had on their abilities to choose different types of clients and projects, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*Positive! Today you*

have online meetings, you share screens, so it is much easier. Today we can do so much over distance. It is a very good thing. So positive".

In the context of the role of returnees in finding/signing new clients, discussing the role of personal networks, an interviewee at one of the software KIBS in Kalix (Norrbotten) said: "*When we find new clients. It is almost always based on that we have some kind of relationship, or that we have a relationship with others who have a relationship with us and so on. It is very much like this in our industry*".

Discussing if long distances to client markets affect their strategies on type of clients and projects and the role of communication- and transport infrastructure in such context, one of the interviewees at an advertising KIBS in Vimmerby (Småland said): "*No, not really. We have clients regionally and nationally. We do not have very many clients locally, perhaps when it comes to little advertising signs and such, but the little more advanced clients, then they will be further away from us, e.g. in Stockholm, where we have many clients today*". Also, in this context, discussing the importance of being able to interact with clients over distance and the importance of good transport infrastructure when they need to visit clients, this same interviewee said: "*We have skype, telephone and such, and you talk on the phone and you send an email, and distance is not really a problem. But since we need to meet occasionally, it is important that there are communications, trains, bus, or good roads so we can drive a car*".

Malmö:

Discussing what type of clients they have, an interviewee at a software KIBS in Malmö said: "*We have all types of firm as clients*".

Discussing if they specialize in certain type of clients more than other, an interviewee at one of the advertising KIBS in Malmö said: "*We are very good in focusing on supermarket chains and the energy sector*".

Discussing increased abilities to focus on broader types of clients and projects due to recent ICT developments, an interviewee at one of the advertising KIBS in Malmö said: "*I have been doing this for a long time, working within advertising and communication since the 1990s. These channels (ins author: marketing channels) have*

increased enormously. The advantage with all these digital channels is that everyone is there, and it is very easy to find things".

Discussing if the size of KIBS in Malmö affects type of clients and projects, an interviewee at one of the advertising KIBS in Malmö said: "*In Malmö there are very many small KIBS with 1-5 employees and there are no limits on what they can offer on client markets. Then it is our size, between 5 and 15 employees. We have bit more resources, competences, but we do not really have any competitive advantages over the small KIBS, we do similar things (...) Then we have couple of larger KIBS with between 40-60 employees, and they focus more on large international firm".*

Discussing that although they take on broad variety of jobs, there are nevertheless limits in such respect in relation to their size, an interviewee at one of the advertising KIBS in Malmö said: "*We do one and one project for big international firm, e.g. Tetra Park, but we do not take care of all their market strategies, we are too small for that. As an example, if they want to start a big project over the summer months, we are taking our summer break. So, we do not take on such type of jobs*".

In the context of abilities to focus on broad variety of type of clients/projects, discussing if they have to specialize more in such sense, an interviewee at one of the software KIBS in Malmö said: "*No, we have not niched us with any specific type of clients, but lately we have increased our focus on public organizations and bigger firm (...) Most of our clients have between 10-50 employees*".

In the context of type of clients and projects, discussing that they have a really wide Web-based focus, an interviewee at one of the advertising KIBS in Malmö said: "*We explore everything that has to do with these digital channels (ins by author: Web-based marketing and strategies)*".

Discussing if they focus on specific type of clients/projects, an interviewee at one of the advertising KIBS in Malmö said: "*No, we are not limited in this sense, but we mostly focus on medium to large size firm within Scania. And we do not focus on specific type of projects, we have a very broad focus (...) But we choose clients that have accepted the Internet as an important development factor, and we do not accept clients that have not accepted the Internet as a very important strategy to drive forward their activities*".

In the context of type of clients and projects, discussing the type of clients they prioritize to work with, an interviewee at one of the software KIBS in Malmö said: "*We prioritize to work with serious clients, matured clients that are interested in the*

projects and understand the importance and nature of homepages. We do not want to work with clients that do not understand this". Discussing that they focus on clients in many sizes, he also said: *"Their turnover can be all from 10 million to 500 million. They can have all from 5 employees to 150, 200 employees. The typical client has 30-40 employees and around 80 million in turnover (...) We have worked with over 500 clients through the years*".

Discussing although they have broad variety of clients, they focus mainly on three types of clients and projects, an interviewee at one of the advertising KIBS in Malmö said: "*We focus mainly on three types of clients. We have these e-traders, and then we have these B2C organisations that have much branding awareness, that is they are not selling anything, but they want to be very visible. As an example, Visit Sweden and Finax, they do not sell online but they want to be top of the line when you go to buy Finax muesli in ICA. And then we have the third focus area, which has started to grow and that is the cultural sector. Malmö Symphony, Malmö comedy festival. And Smålands music and theatre, they are not local, they are in Jönköping. So, we are growing in culture... we are very good in destination marketing, i.e. the tourist industry, that is one segment within culture (...) We avoid clients that do not understand the importance of these digital channels. They do not understand what needs to be done in order to have these digital channels*".

Discussing what kind of client firm they focus on, an interviewee at one of the software KIBS in Malmö said: "*Basically all type of firm that need a homepage or intranet*".

Discussing that almost all of their clients are located in Malmö, an interviewee at one of the advertising KIBS in Malmö said: "*I never take a meeting with new client that is further away than 40 minutes... I think it is too far away (...) We consciously choose our clients here in Malmö*".

Discussing that they almost exclusively focus on the local client market, an interviewee at one of the advertising KIBS in Malmö said: "*Our clients are almost 100% local. But we have had one and one client in Stockholm, but this is nothing we prioritize in our strategies (...) We have also had one and one client in Copenhagen, but that is very little part of what we do. Up to 5-10% in a good year, but 0% in a normal year (...) We choose not to prioritize distant client markets. We do not have as good relationships with such clients as we have with local clients. We can travel on bike to all our clients here".* Discussing if they have to have many face-to-face meetings with the Stockholm clients once they have built relationships with them,

this interviewee also said: *"No, not really. We have a skype meeting or… I actually have colleagues, good friends, here in Malmö, that work actively with clients in USA. One of them has all of his clients in USA. So, distance is not a problem. He (ins by author: their colleague) does not provide exactly the same service as we do, but he designs webpages and applications, he develops trademarks and branding profiles*".

In the context of type of clients and projects, discussing how recent ICT developments drastically changed things around and after 2009, an interviewee at one of the software KIBS in Malmö said: "*Around when we started, in 2009, these sectors, advertising, communication, software, they went through great revolution… iPhone had just come out. Internet usage drastically increased, Facebook as well, everything was happening at the same time. All firm were very afraid of being left behind in this development. They were very confused at the time. The big advertising KIBS, they owned the media so to say. They went to the printing house, they managed campaigns. It was like, we want this, and then the printing house printed the material. When the Internet came, only few of the advertising KIBS were born again and said that they can also do this Web thing. Very simple things though, they knew how to deal with the simplest parts. That is when the software KIBS started to grow and they (ins by author: software- and advertising KIBS) were working with very similar things. So, around 2009 you did all of this if you were a software KIBS because the old advertising KIBS did not know so much how to do things (ins by author: web-based market strategies). But we decided 2010, 2011, that these are different things, different firm culture and such. So, we said that we would not focus on advertising, nothing like that. Sure, focus on Internet related strategies, on the Internet, but our clients had to have an already developed trademark and such*".

Discussing if they focus much on extra regional client markets, an interviewee at one of the software KIBS in Malmö said: "*No, as strange as that sounds, we do not focus so much on extra regional client markets. It is like, we market us as a close-by KIBS. That is very usual within our sector. However, if we would be interested in and have the energy to do so, we could focus more actively on, e.g. client markets in Canada, or in Gnosjö where they do not have any local suppliers in our class sort of speak. But the home market, the home market is important, and more important, and feels closer to us*".

Discussing where most of their clients are located, an interviewee at one of the advertising KIBS in Malmö said: "*75% of our clients are local, but those in Stockholm pay more for our services (…) Extra regional clients are usually larger. That*

is why they are in Stockholm... the projects there are much larger, and they pay more... but the projects are larger".

The role of reputation on client markets

Kalmar (Småland) and Norrbotten:

In the context of the importance of good reputation and relationships on client markets, discussing how they market themselves and how they find new clients, an interviewee at a software KIBS in Vimmerby (Småland) said: "*We have some marketing, Facebook and so on, Web-based. But there are a lot of recommendations. We have clients, it has been our strongest… and it is usually that we get new clients through them. And the nice thing about us, that our work is public, it is visible. We can say: this we have done, go in and check for yourself. It is a great advantage*".

Discussing the importance of good reputation and relationships on client markets in order to find/sign new clients, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*Extremely many of our new clients, we get through recommendations from our current clients or industry colleagues. We have much of such relationships. If our clients trust us, they recommend us further*".

Discussing when new clients are primarily found through reputation and references on client markets, an interviewee at an advertising KIBS in Boden (Norrbotten) said: "*This is how it is, when a firm that we have no previous relationship with contacts us, it is because they have seen something we have done, which opens up the reference question*".

In the context of the importance of good reputation and relationships, discussing the benefits of long-term relationships with key persons on client markets, an interviewee at a software KIBS in Vimmerby (Småland) said: "*I can give an example, it is not a local client, it is in Stockholm. A marketing manager who works for a client, which we have had since 2005 and is still a client. She changed work and we now have that firm as a client. The new marketing manager that replaced her at the old client then also changed work. That firm is our client today, and so on and so on. Through such processes we have maybe gained 8 new clients. They know that… our service… it works, has worked well before*".

In the context of the importance of finding new clients through reputation on client markets, discussing the downside of finding new clients through a reseller agency, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*We had a reseller agency before, and they had promised things and said things that we did not know about. So, when we had entered the production phase and realize that there was something wrong, they get angry, and we cannot meet them*" (ins by author: the client).

In the context of the importance of finding new clients through reputation on client markets, discussing the downside of finding new clients through a reseller agency, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*What I can say about these resellers… we have tried this, and it is very clear to us that we have to meet ourselves with clients (…) in order for this to be long-term thing, otherwise there is a risk for short-term relations*".

Discussing the importance of good reputation and relationships on client markets in order to find/sign new clients, one of the interviewees at an advertising KIBS in Vimmerby (Småland) said: "*In fact, it is the case that our whole business, in a big way, is a networking business (…) It is relationships, old relationships, that we have, that lead to new relationships*".

Discussing the importance of reputation on client markets for finding/signing new clients, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*If you have performed well with a client, he simply trusts me, and recommends us further. This is quite common (…) that is, this is a recommendation sector (ins by author: the KIBS sector), in a manner of speaking. It is very important that relationships are working well*".

In the context of the importance of reputation on client markets, discussing how they find new clients, an interviewee at one of the software KIBS in Kalix (Norrbotten) said: "*Almost 100% through our clients. And maybe some through our suppliers. They talk to each other and say: here is this competence. Sometimes, the salespeople that travel around... they visit many firms. Then someone of their clients say to them: by the way, we need help with this here... and then they find out about our competences… and then they come to us as clients*".

In the context of the importance of good reputation on client markets, discussing the importance of fostering good relationships, one of the interviewees at a

software KIBS in Hultsfred (Småland) said: "*We do not want one of our clients to spread the word to other potential clients that they should not sign up with us*".

Malmö:

Discussing how they find new clients, an interviewee at one of the software KIBS in Malmö said: "*Through relationships, personal relationships*".

Discussing that they increasingly find/sign new clients through personal relationships and through digital media, an interviewee at one of the advertising KIBS in Malmö said: "*Through relationships. We still have an employee that actively contacts potential clients, but we also use social media platforms to find new clients and that has been extremely successful in recent years. We will work more with this in the future, i.e. these digital tools. And we will work more with... I and our employees have strong personal networks, and we will be working more with such tools because that they are much more effective and much cheaper. This is very fascinating and has been an eye opener for me recently (...) Clients, or some of their employees see our digital platforms, sees what we do and then book meeting with us. Such digital presence is very important for the identity of our firm*".

Discussing how they find new clients/projects, an interviewee at one of the advertising KIBS in Malmö said: "*This has very much to do with relationships, through personal networks*".

Discussing that although they strategically focus on the local market in Malmö, they now and then sign new clients in Stockholm through personal relationships and reputation, an interviewee at one of the advertising KIBS in Malmö said: "*This is something that is based on relationships or something that is based on our previous work. Through this we get new clients in Stockholm*".

Discussing the core importance of relationships and networks in order to start a business and find new clients, an interviewee at one of the advertising KIBS in Malmö said: "*This is a highly relationship-based market (...) You must have relationships in order to start something (ins by author: a business)*".

Discussing the importance of reputation and relationships on client markets, an interviewee at one of the advertising KIBS in Malmö said: "*If many of our clients*

are happy with what we have done for them, then such reputation spreads. If someone that we have worked with changes jobs, he wants to sign us for new projects for his new employer. Relationships are extremely important, and networks".

In the context of reputation on client markets, discussing the importance of previous work in the context of finding/signing new clients, an interviewee at one of the advertising KBIS in Malmö said: "*Many clients choose suppliers (ins by author: KIBS) based on their previous experience within their own sector. So, it is a little bit like when you are selling yourself with your CV. It is similar when clients seek supplier services*".

In the context of reputation on client markets, discussing the importance of how clients experience working with them in the past, an interviewee at one of the advertising KIBS in Malmö said: "*Principally, there are many KIBS that offer the same service as we do. So, why do clients choose to work us? I think it has very much to do with who you are, how clients experience our professionality, how they experience collaborating with us and such*".

Discussing the role of reputation and relationships on client markets in the context of finding/signing new clients, an interviewee at one of the software KIBS in Malmö said: "*This is very much built on networks and references. We get much of our clients through networks… through previous clients that spread to others what we do and such*".

Discussing the role of reputation and relationships on client markets regarding finding/signing new clients, an interviewee at one of the software KIBS in Malmö said: "*We have had clients in North-Sweden that heard about us from one of our previous clients, and then they come to us*".

Discussing the importance of reputation on client markets for finding/signing new clients, an interviewee at one of the software KIBS in Malmö said: "*When we first started, we systematically chose and contacted clients. But then our reputation spread and most of our clients come now through such channels. But it is a systematic work to be always out there and make us visible out there, to be seen (…) People spread our reputation*".

Discussing the importance of good relationships and reputation on client markets in order to find/sign new clients, an interviewee at one of the advertising KIBS in Malmö said: "*Through personal network, and it grows with every person that comes to works for us. It becomes bigger and bigger. And then, it is from client to client, our*

clients recommend us to other firm within their own networks. This is an extremely big sale channel. And then, we have our own digital channels. We work with digital marketing, hehehe".

Stage 2: Analysis of client needs and management of resources

Analysis of client needs

Kalmar (Småland) and Norrbotten:

Discussing the importance of building good relationships with clients at beginning of projects, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*It is the relationships that hold our business ongoing, the long-term business (…) When you start to develop the client´s homepage, then you are not only creating a homepage, but you are also creating relation with a person, and we create relations with persons all the time*"

Discussing the importance of meeting new clients at the beginning of projects in spite of that it is technically possible to analyse client needs over distance, one of the interviewees at a software firm in Hultsfred (Småland) said: "*The need to meet is really not that great if you think primarily about delivering the service itself, a project. However, in line with our strategies on long-term relations, it is important that we meet in person. But it is not important for the project work itself. But it is important for the trust and this value. So that is why we want to meet in person, in order for relations which are build more on a kind of a feeling and not through this here digital (…) But this has more to do with our strategy. As I say, in non-core areas you have to build more on these long-term relations*".

Discussing that once good relationships have been established and the initial analysis of client needs has been conducted, interactions are primarily conducted over distance, one of the interviewees at an advertisement KIBS in Vimmerby (Småland) said: "*There are telephones, emails and such. You just sent it and there are no problems at all. Then, distance has really no meaning at all. But to establish a relationship, then we need to visit the client and get him to listen to us, to get the client to care*".

In the context of abilities to analyse client needs over distance, discussing that when they have established good relationships with an umbrella organization, they do not have to visit different sub-organizations when they start working for them, one of the interviewees at an advertisement firm in Vimmerby (Småland) said: "*The main organization is located in Sweden and then there are subsidiaries, and they have their own networks and relations. And if they are going to run the same campaign there, we do not go visit them. As I said earlier, if a new project is started, then we have already established a relationship (ins. by author: with the umbrella organization)*".

In the context of analysing client needs, discussing the importance of meeting with clients at the beginning of projects in order to establish good relationships, an interviewee at a software KIBS in Vimmerby said: "*Personal meeting, you can talk over the phone or Skype, but the personal meeting, you need to have at least one personal meeting. Then you can have a telephone conference, Skype and so on. So, after a year you meet again, it's totally OK. We must initially have contact, a little, just talk a little. It like this, warm up like, this is where you go from*".

Discussing the importance of good client relations and that clients have to participate actively in the analysis of their needs, an interviewee at an advertisement KIBS in Boden (Norrbotten) said: "*We build on unbelievably tight and very mindful relationships with our client. I do not see this as we are giving something to the client other than help and support. We help them to find their path. I do not think at all that we just produce services and deliver readymade package that fits all firms, that is not what this is about. The process always starts with a process where we try to map out a mutual plan*".

In the context of the importance of establishing good relationships with clients during the analysis of their needs stage, discussing that good relationships may last for many years and yield many projects for the same clients, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*It is the relationships that hold our business ongoing, the long-term business. (…) When you start to develop the client´s homepage, then you are not only creating a homepage. You are also creating relation with a person, and we create relations with persons all the time. Then we built upon these relationships, and it is through them that we grow*".

Discussing that they try to avoid clients that are not interesting in participating actively in the analysis of their needs, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*For us, relationships are very important, you solve most*

problems. Our line of business is about giving and receiving, and we may sort out those who only want to be at the receiving end, i.e. those who only wants the best prices and not willing to give anything in return. Those who does not understand what this here is about, we try to sort them out".

In the context of a successful analysis of client needs, discussing why it is important to meet clients face-to-face at the beginning of projects in order to build relationships of trust, an interviewee at a software KIBS in Piteå (Norrbotten) said: "*For them to meet us and see our face, to build trust, and for them to understand that we are serious and so on*".

Discussing the importance to analyse client needs thoroughly at the beginning of projects, one of the interviewees at an advertisement KIBS in Vimmerby (Småland) said: "*Our goal is to understand what kind of worries our clients have, we have to find their anxiety … when we gain insights on that than we can find out what we can offer the client, so the initial steps with clients are very much about to understand our client's business*".

Discussing the core importance of a thorough analysis of client needs at the beginning of projects, an interviewee at an advertisement KIBS in Västervik (Småland) said: "*I cannot deliver a good solution if I am not acquainted with all aspects*".

Discussing that the success of the analysis of client needs, as well as remaining part of projects, depend on the mutual understanding that both actors need to dedicate time and resources, one of my interlocutors at a software KIBS in Hultsfred (Småland) said: "*This is all dependent on how we connect in the beginning, that meeting is very important for us*".

Discussing the importance of a thorough analysis at the beginning of projects for their overall success, an interviewee at an advertisement KIBS in Boden (Norrbotten) said: "*It is extremely rare that we have to meet in person, or that these phases (ins. by author: the remaining stages of projects) are location dependent. But this has much to do what we have done in the phases before, if we have managed to be clear in our definitions. Have had the ability to create a mutual map, both the seller and the buyer*".

In the context of the analysis of client needs, discussing if face-to-face meetings are important at beginning of projects in order to build relationships and initiate

the analysis, an interviewee at an advertising KIBS in Boden said: "*Yes, that is how it is. That part we cannot do over, over Skype, it does not work that way*".

In the context of when changes in projects demand new analysis, which may delay projects or increase their costs, discussing the importance of honest discussions with clients in order to avoid misunderstandings and conflicts, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*Then we must explain this for the client (…) when clients change their demands, it may delay things*".

Discussing the importance of an active dialogue with clients during the analysis of their needs in order to avoid or solve conflicts, one of the interviewees at an advertisement KIBS in Vimmerby (Småland) said: "*The key to the question is communication*".

Discussing the core importance of a thorough focus and making clear agreements with clients at the beginning of projects in order to avoid misunderstandings and conflicts during their later stages, one of the interviewees at an advertisement KIBS in Vimerby (Småland) said: "*First, I would like to say that we do not have much conflicts with our clients. Rather, that it works pretty well. When we go into a project, we almost always start out with an offer, a calculator, and then the client knows what this will cost. And then it usually runs without pain. If problem arises during the project, where we are not in agreement with our client (…) it can happen that we are not clear enough and then conflicts can arise off course. But it happens very rarely. If it does, we try to solve it in some way. What is our part in this, and what is the clients' part in this? And then we usually solve this (…) If we are clear towards each other at the beginning of projects we rarely end up having conflicts*".

In the context of good relationships and the importance of making clear agreements with clients at the beginning of projects, discussing the importance of offering fixed price for projects (instead of open-ended price offers based on hours worked), one of the interviewees at a software KIBS in Hulstfred (Småland) said: "*To have fixed prices on what we do, it is also a certain compensation for distance. It is a certain competitive edge that the client knows what it costs, that we take the responsibility, and we may have to spend more time in project from time to time. But we know that we will get the long-term relation with our client instead. We may be in minus to begin with, but we know that the long-term strategy is important, and we compensate for this in the long run because we know that our clients knows that we deliver what we say we will, and we do as we say. And if we do that, we get long-term relations, and then we get projects*".

In the context of avoiding misunderstanding and conflicts during projects, discussing how focusing on building good client relationships at the beginning of projects decrease the likelihood of misunderstandings and conflicts during their later stages, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*You established respect for each other (ins by author: with clients) in some ways, and it is very rare that you are run over (ins by author: by clients) if a relationship has been established*".

In the context of the importance of thoroughness and making clear agreements with clients at the beginning of projects, discussing how it is sometimes challenging to get the necessary information from clients in time and that the timeframe of projects may depend on the time it takes for clients to respond to questions, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*It can be problematic, but it has nothing to do with distance. Our challenge is really to get the client to prioritize the project. Usually, the client asks how long time it takes to create a webpage, when it will be finished. And they usually receive the question back; the answer lies with you, because it is usually the clients that get stuck. If you need to send text or a picture, and you cannot get the response that you need from clients, because they don´t have the time. So usually, it is because of the client that we do not reach the goal in projects. But this is not affected by distance. I do not think so. Even if we had been located close to clients, i.e. in the city, we could not influence this more than we can do from here, sort of speak*".

Discussing what is the most steering factor regarding the need for face-to-face interaction with clients during the analysis of their needs, one of the interviewees at a software KIBS in Kalix (Norrbotten) said: "*I would say the complexity, and maybe also how old our client's system is when we start working with them. If they have a very old system, it can be good to be on place. They may use white board as a part of their system, and it can be very good for us to realize this on place, something you can miss out in a telephone meeting, e.g. when they say that they do it like this, but forget that they also do it like this. (…) As an example, we have worked on a 35-year-old system with one of our clients. Then it was easier to be on place to start with, in order to experience what they do in a certain way*".

In the context of analysing client needs, discussing if they see it as a problem to have to travel long distances to meet with clients at the beginning of projects, one of the interviewees at an advertisement KIBS in Vimmerby (Småland) said: "*This is just something that is needed when you are running a firm in non-core areas*".

Discussing if face-to-face interactions are important in order to build relationships and conduct a thorough analysis on client needs, an interviewee at an advertising KIBS in Västervik said: "*Yes, it is important to meet, and I think it can be done in very many different ways. We have chosen the have an intensive meeting with our clients (…) It is like a conference in fact, because there are so many things you have to find out by talking to each other (...) In practice, we meet with our clients once a quarter, or after six months. A one-day or two-day meeting. We go through everything, feel, meet department heads, look at new parts of the business. You create basic information. I cannot deliver a good solution if I do not know all the factors. What about this machine? I did not know this one. Then I can ask relevant questions (…) So many times, it is so important to see that activity on the inside because you can find things that they themselves do not see (...) So, it is very important to meet in a real meeting*".

Discussing the benefits of being able to interact and conduct much of the analysis of client needs over distance, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*It takes much less time for the client, whether it is local or not to have these on-line meetings. It may actually be much better for everyone and does also not demand that everyone is located at the same place at the same time, i.e. everyone co-located at the client firm or at our side. People can participate in on-line meetings when they are travelling, sitting in different offices in different locations and so on*".

Discussing increased abilities to interact and analyse client needs over distance, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*Personal meetings are important, yes, but they do not need to be on place with clients. We have conducted whole projects where we have never met with clients on place. Today we are able to use Web-based technologies to communicate with clients over distance. Clients can show us on their computer what they need and such*".

Discussing increased abilities to interact and analyse client needs over distance, an interviewee at an advertising KIBS in Västervik said: "*Phone, email, skype, those things work really well. You have to want to communicate first and foremost, otherwise it does not work. And those who are here, we all force to communicate because it is so… to have relationships with clients. Whether it is local or external. I will say, we have a better, we have better control of those customers who are not here*".

In the context of importance of face-to-face interaction during the analysis of client needs, discussing when they visit clients during projects, an interviewee at

a software KIBS in Piteå said: "*Usually it is in the beginning and then maybe after the project is completed that you… when you take care of some small tasks, check out the situation and so on*".

Malmö:

Discussing the importance of building good relationships with the right person at the client firm for the success of the analysis of their needs, an interviewee at a software KIBS in Malmö said: "*You need to be able to have a good communication with someone that is directly active in the project. The tighter the relationship is, the better, for project work... this is very important within our line of business. You must have a thorough understanding on what needs to be done*".

Discussing the importance of a thorough analysis of client needs at the beginning of projects, an interviewee at one of the software KIBS in Malmö said: "*It is extremely important to analyse properly what needs to be done at the beginning of projects*".

Discussing that they are able to conduct most parts of projects over distance, an interviewee at one of the software KIBS in Malmö said: "*We have had clients in New York and Stockholm that we have never met in person, where we interacted through skype, that is skype with video, and through telephone*".

Discussing what they do when they analyse client needs and conduct projects, an interviewee at one of the software KIBS in Malmö said: "*We have a meeting with clients, on place, or over skype if he is not located here, and we discuss what needs to be done. We provide the client with an access to the code we will work with or access to a drop-box, if there are some specific design related tasks. Then, we deliver it through this (ins by author: over Drop-box/Internet)*".

Discussing the difference between clients that know exactly what they want and those who do not, an interviewee at one of the software KIBS in Malmö said: "*The better structured the clients are in relation to what they want, there is a less need for face-to-face meetings*".

Discussing the importance of establishing good relationships of trust through face-to-face interaction with clients at the beginning of projects, an interviewee at

one of the advertising KIBS in Malmö said: "*It is very important. When I have presented what we want to do for the client, I tell him that a hundred other advertising KIBS could have said exactly the same as I just did. But that is not why I am here; I am here to sell you a relationship. That is extremely important. They have to believe that what I say I will deliver is true… and that they can trust me. When I say that, I establish trust. This is extremely important. If I am not with the client, I do not get the project. So face-to-face interaction with clients at this stage is extremely important*".

Discussing the importance of a thorough analysis at the beginning of projects for their success, an interviewee at one of the advertising KIBS in Malmö said: "*The first meeting is extremely important. We must know the why question before we start to work on a project"*.

Discussing if the need for face-to-face meetings is different between new and previous clients, an interviewee at one of the advertising KIBS in Malmö said: "*In case of older clients, I know very much about them. I have the know-how and know-why. But in case of new clients, I have to spend more time in getting to know their activities. I have to sit down with them*".

Discussing the need to build good relationships of trust with key person(s) at the client side through face-to-face interaction, an interviewee at one of the advertising KIBS in Malmö said: "*If a key person at our client leaves their job, we have to build relationships with the new employee that takes over his role. Then we have a meeting with this person*".

Discussing the key importance of establishing and fostering good relationships of trust with clients, an interviewee at one of the Malmö KIBS said: "*We build everything we do on good relationships and trust*".

Discussing that they meet clients at beginning of projects in order to analyse their needs but then primarily interact over distance during projects, an interviewee at one of the advertising KIBS in Malmö said: "*We meet clients at beginning of projects, sometimes when projects are halved, and during the implementation. But we interact very much with our clients during projects via telephone or Internet or such tools. If we need to solve something or discuss something, the project is visible up there (ins by author: on the Internet) … should this work like this, or work like this, and so on? For such purposes, we do not need face-to-face meeting with clients*".

Discussing the importance of active interaction and collaboration with clients during the analysis of their needs, an interviewee at one of the advertising KIBS

in Malmö said: "*The exact solution is something that we find very much with clients. We work very much through collaboration. We are not the type who says to clients: We hear what you say, we will return back next week with the solution. We find out what needs to be done through discussions with our clients. Do we understand this correctly? Can we do this and this better? This is how we work forward with projects, and sometimes few steps back as well*".

Discussing the importance of receiving knowledge from clients during the analysis, an interviewee at one of the advertising KIBS in Malmö said: "*They (ins by author: the client) provide important knowledge about their own activities and on their own client markets*".

Discussing the importance of face-to-face meetings when relationships are built and clients' needs are analysed at the beginning of projects, an interviewee at one of the advertising KIBS in Malmö said: "*We should not underestimate face-to-face meetings. Skype, Facetime, and such, they bring us closer, but we should not underestimate the personal meeting, in order to really understand each other and such. There are so many nuances that you may miss if you do not meet with clients. To establish trust and security are important parts in this context (...) I do not know if we do this because of tradition or not, that I cannot answer. Perhaps if we all had to work over distance, then maybe this would also work perfectly*".

Discussing if they have face-to-face meetings with clients at the beginning of projects, an interviewee at one of the software KIBS in Malmö said: "*With some clients we have not done that. We have done it over skype and such... But that is the exception. We usually say to clients that we want to have face-to-face meetings with them. Then, the client can explain what he wants and wants to do, and we can give response to that (...) We come with an open mind to that meeting and the client presents his case*".

In the context of the importance of a thorough analysis at the beginning of projects, discussing that clients not always know what they need or want, an interviewee at one of the software KIBS in Malmö said: "*I would say that in more than 95% cases, the client has not defined well what it is that he wants and then we have to focus thoroughly on that*".

Discussing that they do not have much face-to-face interaction in case of small projects but more in more complex ones, an interviewee at one of the software KIBS in Malmö said: "*If clients just want us to polish their homepage, change text,*

make it a bit nicer and such, we do not have to meet them so much. If we have clients where we have to work more with their concept or what they do and such, we meet with them (…) Then, we have these workshops and go through these things with them".

Discussing the importance of face-to-face meetings with clients in order to build good relationships of trust and clear understandings between participating actors on what needs to be done, an interviewee at one of the software KIBS in Malmö said: "*The client does not always understand what this is all about, and then we want to meet him and get him to understand so he can stay onboard with the project to the end. To understand the system, and the database, how they work. If they do not understand, it can be problematic*".

Discussing the importance of establishing good relationships of trust at the beginning of projects, an interviewee at one of the software KIBS in Malmö said: "*We do not meet our clients in Malmö or in Helsingborg more than the extra regional ones. Once we have established good relationships and trust we can pretty much interact via mail or telephone. This has very much to do with trust*".

Discussing if they have to have face-to-face meetings with clients at the beginning of projects, an interviewee at one of the software KIBS in Malmö said: "*No, we principally do not have to do that. We have had clients in Canada that we have never met (…) But we always visit local clients at the beginning of projects. This is important in order to build relationships and trust… but then we mostly interact through skype, even when we are so close to each other (…) The more insecure the client is, the less he knows what he wants or needs… than they want to have a face-to-face meeting… or if the client has little experience and such. But normally we can analyse most parts of what needs to be done without many face-to-face meetings (…) As long as all goes well in projects, we do not have to meet so much with clients, but if the client gets uncertain about things, it is helpful to meet them. When people sit beside each other, that often becomes easier (…) In such context, when clients are so close, when you have a big local client market as we do, it is easy to visit clients, and then this is what we do*".

Discussing that although they most often visit clients at the beginning of projects, they could conduct the analysis of their needs over distance, an interviewee at one of the software KIBS in Malmö said: "*Principally, we can conduct this over distance, that as long as clients are comfortable and used to Web-based interactions, we can do it over distance*".

Discussing that they meet with clients at the beginning of projects in order to make clear agreements, an interviewee at one of the advertising KIBS in Malmö said: "*We start by have a meeting with them and create a digital marketing plan (…) This is a whole day workshop with the client and then we take 10 days to develop a more detailed plan (…) Then we have another meeting where we present for the client our suggestions. Then, if they agree with what we suggest, we meet with them once a month in order to report and fine tune things. This is in general like this*".

Discussing the importance of a thorough analyse at the beginning of projects, an interviewee at one of the advertising KIBS in Malmö said: "*In the beginning, it has very much to do about understanding their business. Then, they have to be very transparent with us, about their budget, how they conduct their work, their business goals, all such things*".

In the context of the importance of building good client relations, discussing the importance of having face-to-face meetings at the beginning of projects, an interviewee at one of the advertising KIBS in Malmö said: "*It is extremely important. As an example, they (ins by author: clients) are not always sure about what they want, they do not really know what it is that we do. We cost much money, but they do not really know what it is that we do. The more they know about what we do, the better they understand how much work lies behind what we do… in relation to these digital channels (ins by author: Web-based marketing strategies)*".

Management of resources

- ***Competences***

Kalmar (Småland) and Norrbotten:

Discussing scarcities in relevant local competences and if they draw on extra regional competences that live outside the zone of daily commuting between home and work, an interviewee at a software KIBS in Vimmerby (Småland) said: "*No it is not possible. Not to commute on daily basis (…) We had a person from Kalmar two years ago… To be on place almost daily became difficult for him… and it did not work more than half a year. Then we went separate ways*".

In the context of returnees, discussing how they are constantly on the lookout for potential competences, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*Recruitments are a challenge. So, we use quite a lot of time and energy to find potential competences. We campaign, and we work, we try to meet with individuals that are still at the high school level, i.e. before they move away to study at the university level. We tell them about us and what we do, and that they have the opportunity to move back home and work for us. Then we stay in contact with some of them during their university education. We also offer some of them work besides their education and so on. We know them" (…) So when they are almost finished with their studies, we have sometimes already hired them. It's almost like sports, heheheh. These are important competences, and they are also from Kalix! We once had an employee that lived in Luleå. It is a greater risk of losing such competences, because they get tired of commuting after a while*".

In the context of returnees, discussing the importance of being constantly open for new potential competences when located in non-core areas, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*We take what we get and see what we can make of it. What I mean is that when you are located in a big city region you can take on whatever you want, and you have access to the relevant skill. Here we cannot do that, we do not have that possibility (...) We build from the competences we get, and that is how the firm develops*".

In the context of returnees, discussing the organic nature of how organizational competences develop, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*Maybe people will come (ins by author: returnees), move from Stockholm and so on. And then we see what kind of competence they have… We may not be looking for any specific competences, but we try to see how we can shape them into our business, be pieces of the puzzle (…) We may also develop the business towards this competence... instead of deciding what competences we want in advance and then try to employ such competence*s".

Discussing the benefits of low labour turnover in non-core areas, an interviewee at a software KIBS in Piteå (Norrbotten) said: "*What is of advantage by locating here is that we have very stable employees, employment turnover is low and often we have a better continuity with our clients than they have with other firms in Stockholm which frequently get new employees, while we still have ours*".

Discussing benefits on client markets when they have employees on long-term basis, one of the interviewees at a software KIBS in Hultsfred (Småland) said, "*In*

some cases, our client's employees have changed job between projects, and then they think it is very valuable that we know how their system works".

Discussing that clients appreciate the fact that they can interact with the same individual from the KIBS side, one of interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*This is something that our clients say, i.e. regarding this continuity, that you can keep working with the same person and not just the same firm, i.e. the same person who can continue to help you. Our clients say that this is security and competence, i.e. you do not have to start all over again each time (ins by author: build new relationships with new individuals when new project starts)*".

Discussing that organizational competences gradually grow over time through constant learning since employees stay long with the firm, an interviewee at one of the software KIBS in Kalix (Norrbotten) said: "*We value the continuity, i.e. the employment turnover is not that great that we get continuity with the employees, and the knowledge stays within the house*".

Discussing benefits of low labour turnover in non-core areas and the importance of maintaining good relationships with employees, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*We must think very carefully about the employees that we have because it is not easy to replace them, but at the same time we do not have the same local competition in this sense as they have in larger cities, we have our employees for long time*".

Discussing the benefits of low labour turnover in non-core areas compared with similar KIBS in Stockholm, an interviewee at one of the software KIBS in Kalix (Norrbotten) said: "*The advantage of being here is that... employees... that you have very strong or stable staff. Labour turnover is very little (...) It is often the case that we have better continuity than our clients have with suppliers located in Stockholm. Often, they have high labour turnover. We hold on to our employees*".

Discussing if scarcities in relevant local competences are a limiting factor for their abilities to compete on client markets, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*Very seldom I would say, because we can usually bring in external competences when needed (…) that is for certain parts of a project, that is possible*".

In the context of building long-term relationships with extra regional competences, discussing if it is a challenging process to involve extra regional competences in projects if needed, one of the interviewees at one of the software

KIBS in Kalix (Norrbotten) said: "*It is not problematic at all to be honest. We have partnered up with an advertisement firm in Kristianstad which has worked very well (…) When we consider partnering up with external competences, we do not only familiarize us with the partnering firm. We want to meet the employee that will work in the project in order to build trust*".

Discussing the importance of being able to build relationships and communicate with clients, an interviewee at an advertising KIBS in Västervik said: "*Everyone who works here is communicative. These are basic requirements; you are not allowed to work here if you cannot communicate. You must be able to have a conversation with a customer, listen, take in information, come back. You need to be able to talk, this is how we do it. You have to be nice. You have to be nice, and communicative*".

Discussing what core competences employees need to have and foster, an interviewee at a software KIBS in Piteå (Norrbotten) said: "*They must have programmed a little before, have some math skills, and a little logical thinking. And above all they must be good in absorbing information. In any case, they have to have a reading-head (swe: läshuvud), because they have to be able to take in all the new things that are out there and turn it into projects*".

Malmö:

Discussing access to local relevant competences when needed, an interviewee at one of the software KIBS in Malmö said: "*It is extremely good. People email us all the time and ask if they can do internship or work for us (...) Today, Web-based competences are strong among young people, I feel like that is a general factor*".

Discussing if there are any problems in finding relevant local competences, an interviewee at one of the advertising KIBS in Malmö said: "*No problem. I have never had to find competences through a recruiting firm. As an example, last fall we got around two job applications per day from well-educated and experienced people. We have good access to relevant competences when we need them*".

Discussing local availability of relevant competences, an interviewee at a software KIBS in Malmö said: "*There are plenty of relevant local competences that fit very well with our activities*".

Discussing local availability of relevant resources, an interviewee at a software KIBS in Malmö said: "*There are plenty of competences because of them (ins by author: Sony and Ericsson in Lund). They have trained and educated plenty of resources*".

Discussing access to relevant local competences, an interviewee at one of the advertising KIBS in Malmö said: "*It is in general very easy to find relevant local competences. But it can be a challenge to find those who have great expertise and experience in dealing with how we can really use these digital channels in order to accomplish specific business goals. They are not that many. Such competences, the perfect person, have worked for an advertising KIBS, most likely at a Web-based advertising KIBS, surely at a software KIBS or something like that, and they have worked with these digital channels there. Then, they have worked at the client side within marketing*".

Discussing inhouse learning processes and how they help each other to solve different projects, an interviewee at one of the software KIBS in Malmö said: "*We have a meeting once a week and go over what we are doing. We discuss all the time with each other ongoing projects and share what we have learned with each other. Help each other to find different solutions for projects. Everything we design is tested by our developers all the time... we can develop and design at the same time. We exchange knowledge all the time*".

Discussing if it is problematic to find local relevant competences when needed, an interviewee at one of the advertising KIBS in Malmö said: "*No, it is not a problem, but it may take some time, but it is not a problem. Very many individuals are now being educated within the digital media branch. We have good supply and diversity of competences here in Malmö and in Scania in general. But there is also a great competition for the best talents, and they often move to bigger cities, Stockholm, London, and start to work for KIBS there. But if we need to find relevant competences, we find them here, they are available*".

Discussing the educational level of employees, an interviewee at one of the software KIBS in Malmö said: "*All of our employees have at least four years university education*".

Discussing the educational level of employees, an interviewee at one of the advertising KIBS in Malmö said: "*All of our employees, except one, have university education. If we look at those that we are hiring today, they all have 3-5 years of university education*".

Discussing why they do not want to grow much more in terms of employees, an interviewee at one of the advertising KIBS in Malmö said: "*We do not want to be much bigger, because then we lose the inhouse family spirit that we have*".

In the context of the importance of constant learning in their line of business, discussing how they constantly share knowledge with colleagues and collaborate on solution of projects, an interviewee at an advertising KIBS in Malmö said: "*We have strong cross-fertilization between different inhouse working groups. We have a meeting every Monday where we go over things and share knowledge. We have a short meeting every morning where we go over what we have to do and if we need to share the working load in different projects (...) Once a month we have these meetings where our employees have 15 minutes introduction on what they have learned, what they have learned about this here. This knowledge exists in the firm. So, we very much share our knowledge with each other*".

Discussing that younger generations are more used to use and work with ICTs, an interviewee at one of the advertising KIBS in Malmö said: "*The younger employees have been educated in schools and used to work within these digital channels their whole life. Those who are 35 and older, they have more had to learn this later in their lives*".

Discussing the educational level of employees, an interviewee at one of the advertising KIBS in Malmö said: "*Most of our employees have an academic background, and some have some form of post high school education... education from some form of vocational related schools, e.g. on Hyper Island, which is also an university, I think. But most of us have some form of higher education behind us*".

Discussing that younger employees have applied and worked with ICTs all their lives, an interviewee at one of the software KIBS in Malmö said: "*We have had a generation change in our firm. We have been hiring young competences which bring in new ways of thinking. They come in with totally new attitude to the Web, to social media, to the whole. That is, when you bring in young people. They are already used to apply these digital platforms all of their lives (...) If I take my own children as an example. They have these ICT tools. It is like, they cannot imagine their life without the Internet. This is deeply rooted in them*".

Discussing the level of education level of employees, an interviewee at one of the software KIBS in Malmö said: "*All our employees have from high school to PhD education. Most have post high school ICT related education... e.g. Hyper Island and*

KE. We can take in people directly from them as interns for six months and then hire them. But we are also hiring system developers from Lund (ins by author: Lund University)".

Discussing that their employees continuously learn new things and share with each other, an interviewee at one of the software KIBS in Malmö said: "*Our employees help each other all the time, ask each other questions and such. They are very good in that (…) A key strategy at our firm is that we educate each other…we help each other*".

Discussing that employees live close to their place of work, an interviewee at one of the software KIBS in Malmö said: "*Most of our employees walk or ride bike to work*".

Discussing where from employees come from and where they live, an interviewee at one of the advertising KIBS in Malmö said: "*Our employees are primarily locals, we all live here*".

Discussing the educational level of employees and what competences they need to have/acquire, an interviewee at one of the advertising KIBS in Malmö said: "*Almost all of our employees have some form of a university education, 3-5 years (…) But although they have an university education, which means that they can take in and organize knowledge, they are very much self-thought when it comes to what we actually do, i.e. Web-based marketing (…) All of our employees must have some sort of a certification in online marketing, they have to be able to speak about online marketing in social gatherings*".

In the context of if location of external competences plays a role when they need to use them, an interviewee at one of the advertising KIBS in Malmö said: "*We have many different sub-contractors. We have few sub-contractors in Malmö, in Gothenburg, we have a copy writer in Bangkok, and we have something that is called Odesk where you can go in (ins by author: online) and order simple tasks. So no, that is very accessible to us*".

Discussing the importance of being able to sub-contract tasks to external competences when needed, an interviewee at one of the advertising KIBS in Malmö said: "*To have all competences in-house. I do not believe in that. I rather believe that it is important to have super good competences inhouse, but then they can sub-contract tasks to external competences when needed. It is good to have external*

competences and we can choose others if they are not delivering what we need, that is simple".

- ***Resources needed for value creation and learning***

Kalmar (Småland) and Norrbotten:

Discussing how most knowledge needed for projects and learning is sourced through the Internet and then shared inhouse, an interviewee at a software KIBS in Piteå (Norrbotten) said: "*Yes exactly. Usually it starts, we have a basic knowledge in-house and then we have a little different expertise, a little better at some type of programming for phones and some better at other things, and they are a little different. Then sometimes comes a request from a client in areas that we are not good in. Then we say, yes, but we know how to solve it. And then we must quickly educate ourselves in this area. There are online tutors who provide knowledge on this area, i.e. videos that can be watched online (…) There are various forums where you can post questions and issues to other programmers who can help solve problems and tasks. So, usually it is like this, OK now we have to know things in this area. How can we source external information? And then just go online and check all the channels and so on. This is how we solve it. And new questions always pop up along the road. The we go online, check out new stuff and keep going. It is very much like that*".

Discussing how they source knowledge needed for projects and learning, an interviewee at a software KIBS in Piteå said: „*The internet… it is our daily tool. It is our natural way of sourcing knowledge*".

Discussing how they source knowledge needed for projects and learning, an interviewee at one of the software KIBS in Kalix (Norrbotten) said: „*Mainly from the Internet. But sometimes when it comes to hardware issues... we read trade magazines and we have salespersons that visit us and present what is new and what is going on in these technology areas. We draw some learning from that. Then maybe on the software development side, it is more through the Internet. What is going on ... what is up…. within our field so to speak*".

Discussing how and where from they source knowledge needed for projects and learning, an interviewee at a software KIBS in Vimmerby (Småland) said:

"*Knowledge resources are not place bound in any ways, because today this happens very much through the Internet*".

Discussing that employees primarily and continuously source new knowledge and draw learning over the Internet, one of the interviewees at a software KIBS in Hultfred (Småland) said: "*Today you can learn so much through the Internet and that is very much how it is within our sector, i.e that you educate yourself*".

Discussing the importance of continuous learning and how employees share new knowledge with each other, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*We learn very much from each other. When someone has worked on a project with new interesting technology or tried new technology as they call it… then we simply share that with each other. We have lunch or something together and someone prepares a lecture for those who are interested. Everyone is invited and those who are interested in this new technology will come and listen and participate" (…) "Another method is that we… two times each year. We lay client work to the side. We invent our own projects, with new technology. We form groups, try new things, work on small projects. Yes, almost continuously for two days in a row. And then after these two days we share what we have learned with each other. We then finish with a little dinner party and celebrate. This is also something that is very much appreciated*".

Discussing that employees often participate in online forums in order to source knowledge and learn new things, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*There are many different forums where you can put out questions and problem issues to other programmers who can help with solving these problems and tasks. (…) The internet is our daily tool*".

Discussing the importance of being open to continuously draw learning from all possible sources, one of the interviewees at an advertisement KIBS in Vimmerby (Småland) said: "*We are constantly seeking new knowledge in all sorts of ways. You meet people. You talk to clients. You talk to suppliers. And then we try to collect this new knowledge systematically and try to find ways to develop it further and see what we can do with it*".

In the context of abilities to source important knowledge, discussing the importance of adapting to new technologies and sectoral- and market trends in order to be able to compete on client markets, one of the interviewees at an advertisement KIBS in Vimmerby (Småland) said: "*And it was then we started to*

discuss what our role was on this market, what do we have to offer (…) who are we, what is it that we can do in here. We, the medium sized office, will there be any use for us at all. It was then we realized that we needed to develop our knowledge. It is not enough to be able to know how to do the original (ins. by author: printings and signs for clients), you must be able to develop the knowledge based on what clients really needs".

In the context of the core importance of continuously following technological and sectoral trends, one of the interviewees at an advertising KIBS in Vimmerby (Småland) said that learning processes take place "*through reflections on what we have done in the past we are able to bring forward new types of offers for our clients (…) this is very much build on our ability to look back and realize new ideas. To evolve the whole organization in this sense is absolutely crucial*".

In the context of abilities to source important knowledge, discussing the importance of continuous learning in order to follow sectoral developments, an interviewee at a software KIBS in Vimmerby (Småland) said: "*We continuously try to keep us up to date with what is going on out there (…) If we can do something better, we go on and do it better and when there is new technique, we learn this new technique, software, hardware*".

In the context of abilities to source important knowledge, discussing the constant development in their line of work, one of the interviewees at a software KIBS in Hultsfred (Småland) said that it "*demands a strong awareness from their part (ins by author: the employees) that they constantly have to be aware of technological aspects and adapt their competences and services to new technologies*".

In the context of abilities to source important knowledge, discussing the importance of constant learning in order to follow technological and sectoral trends, an interviewee at an advertising KIBS in Boden (Norrbotten) said: "*This is how we work all the time, to evolve and learn new things, that´s what it´s about. I built on my experience; on what I have done in the past. That is how we evolve. We sometime take on complex projects in order to challenge ourselves, in order to evolve. The solutions in such projects are useful in future projects. And such an approach makes a huge different for us, you have to dare to take on complex projects. You have to evolve all the time, that is how it is in our line of business, and it is our clients that put this demand on us*".

Discussing wherefrom they mostly source knowledge needed for learning and solution of projects, an interviewee at an advertising KIBS in Boden (Norrbotten) said: "*First and foremost through client work, I would like to say. Every day, we work very much project-wise, and we engage our customers quite a lot in the work with them. And every day we make a lot of mistakes, and every day we learn a lot. And this adds to the knowledge that we have every day. And we of course offer all our knowledge the next day. And I would say that we do this across industry. So, with our group, our creativity, we often realize things when working with one client and transfer it to another client, who is in a completely different industry. That is one side. If you consider knowledge that, for example, are needed to technically develop a web, then I would say that on the technology side, probably 90% of it is sourced digitally through the Internet*".

In the context of the importance of constantly learning new things in order to follow sectoral changes, discussing why they do not send their employees to conferences or courses, an interviewee at a software KIBS in Piteå (Norrbotten) said: "*No, we are pretty bad in doing that, because they are usually... the information must be so incredibly fresh. There are not many good seminars in our line of work. And also, because there are constant developments. When someone has become good at lecturing something, a new version has already been released in the US. So, you have to… everything goes so fast that it is difficult to buy relevant courses for the employees. They constantly have to be online, finding new information, and learning new things*".

Discussing the importance that employees continuously learn new things in order to follow sectoral developments, an interviewee at one of the software KIBS in Kalix (Norrbotten) said: "*But a lot of this, i.e. program development and such, it is based a lot on the interests of employees to educate themselves over time. The interests to create, the urge to take in, to educate oneself. We always try to bring in new technology, which is interesting for our employees, and in the end our clients benefit from it as well*".

Malmö:

Discussing how they source knowledge needed for projects and learning and the need to constantly learn new things in their line of work, an interviewee at one of

the software KIBS in Malmö said: "*From the Internet... in principle, it has to do with being interested in what you are doing. In our firm, we are interested in trying new things and you must be interested in doing that (ins by author: constantly want to learn new things). Check out different podcasts, check out different lectures, check out what is going on, and we do this all through the Internet*".

Discussing examples of how they draw learning through the Internet and that they rarely attend on-place lectures, an interviewee at one of the software KIBS in Malmö: "*We check out Pinterest (ins by author: an application exploring various designs), different applications, we check out new homepages. If we attend extern lectures (ins by author: on place lectures), we are often disappointed, and we feel that we could have found this information ourselves through the Internet. So, we do not attend much of these (...) There is no reason to pay for that. We can sit at the office and do online courses for an hour without having to go somewhere*".

Discussing that their employees primarily source external knowledge through the Internet, an interviewee at one of the advertising KIBS in Malmö said: "*We want our employees to be active on social media, not only social media, but there are also other online communities, freelance communities, and they are very important, and they are international. Our employees therefore have to be very active during the workday on social media (...) We encourage them to do so, and our firm is actually quite active on Facebook and such (...) The Internet is very important. If we can call it as such in this context, then it is very, very important*".

Discussing if long distances to knowledge sources are problematic, an interviewee at one of the advertising KIBS in Malmö said: "*No, it is not problematic. It is in English, that is a global thing. As long as it is Web based, it is global (...) Sometimes we visit these Web based communities and ask if anyone know how to solve this and if their solution works for us. But where it is created does not play a role. I cannot see that it does. Often when I check out what other firm are doing, I often do not even know where they are located. I cannot see that this is a geographical thing. No, I cannot say that (...) We are very Web-based, we are very active in such channels*".

Discussing that although they sometimes send employees to conferences, they primarily source knowledge needed for learning and solution of projects over the Internet, an interviewee at one of the advertising KIBS in Malmö said: "*The Internet, primarily through the Internet (...) We can find out what competitors are doing, explore good marketing campaigns out there, visit homepages and such (...) We could very well exclusively source all knowledge through the Internet*".

Discussing if long distances to knowledge sources are problematic, an interviewee at one of the advertising KIBS in Malmö said: "*No, distance does not exist in such context... it is very easy to follow different sides or bloggers every day and seek inspiration from these*".

Discussing organizational learning processes, an interviewee at one of the advertising KIBS in Malmö said: "*Every month we have a staff meeting that we all attend, something we call Indian and Inspiration, or Open Mike. And there we share what we have learned, seen, heard, or been inspired with (...) These meetings are wide open, everyone can share what they want to and are interested in*".

Discussing how they source knowledge needed for learning and solution of projects and how it is shared among colleagues, an interviewee at one of the software KIBS in Malmö said: "*Everything like this takes place through the Internet (...) New things are sourced through the Internet. You can find everything on the Internet (...) We have to do this quickly; we cannot spend much time on this. We do this very much as a team. We take in new trends; we explore new homepages. The client has some problems, and we have to seek solutions on the Internet... e.g. from blog pages that we can follow and such. We have these meetings where employees can share new cool things and such with each other*".

Discussing how they source knowledge needed for learning and solution of projects, an interviewee at one of the software KIBS in Malmö said: "*We do so, principally, through the Internet. Coding academy, smashing blog, from such sides. But we also have Foo café where people present things to each other and Media Evolution (ins by author: local organizations in Malmö) ... some of our employees have attended seminars there, e.g. on trend related issues. But technical related issues we principally source through the Internet. But what they get from this (ins by author: attend on-place seminars), is that they get confirmation that they are part of this business, things like that. But what is interesting with this, is that although our employees say that these events are nice, they prefer to have inhouse development days and primarily educate themselves. Basically, all knowledge that we need, technical or this (ins by author: the interviewee points at the more artistic part of a sketch that he had drawn to divide between the more technical and more artistic aspects of what they do), we can learn by ourselves through different online courses and such (...) Through reading blogs and just browse and have in-house learning processes*".

Discussing if long distances to extra regional knowledge sources are problematic, an interviewee at one of the software KIBS in Malmö said: "*We have, basically, no problem in absorbing knowledge from distant locations through the Internet*".

In the context of the importance of continuously draw in new learning in order to follow sectoral developments, discussing inhouse learning processes, an interviewee at one of the software KIBS in Malmö said: "*We have these development days, last Friday each month. Where we explore, everyone can explore their interests' areas, e.g. java script or a new coding language, and experiments within new areas, like Internet of things that has started to emerge, and some of us have started to explore and experiment with... and then they share what they learn with each other. And we also write this on our blog, what we have learned and such. And then we sometimes have lunch lectures about this here, something new that is coming (...) Our employees are to a high degree responsible to educate themselves, but also all the time share what they have learned with each other, through lunch lectures and such*".

Discussing the importance of continuously learn new things in order to follow sectoral developments, an interviewee at one of the advertising KIBS in Malmö said: "*The development in our field goes so incredibly fast and we have to stand on our toes all the time (...) It is important that have such a mentality, to never stop learning new things*".

Discussing how they source knowledge needed for learning and solution of projects, an interviewee at one of the advertising KIBS in Malmö said: "*The whole world is our playground sort of speak... we source all the knowledge we need through the Internet (...) We give all our employees 2000 SEK each month for education... online education*".

In the context of if knowledge gained from on-place conferences play an important role for learning and solution of projects, an interviewee at one of the advertising KIBS in Malmö said: "*No,this almost exclusively takes place through the Internet... Conferences, they are kind of a spice*".

Discussing the importance of continuous organizational learning processes, an interviewee at one of the advertising KIBS in Malmö said: "*Our employees talk together all the time and help each other with how to solve client related problems, share knowledge and such. We have Friday inspiration lunches, every Friday, where we discuss chosen issues. Sometimes we get external competences to talk and sometimes our employees give lectures (...) One of our employees has the responsibility to organize*

these Friday lunch seminars, whether it is to ask someone inhouse to introduce some new things or to book external experts to come and talk".

Stage 3: Delivery/implementation of the solution

Kalmar (Småland) and Norrbotten:

In the context of delivery/implementation of the solution, discussing increased abilities to interact and conduct business over distance, one of the interviewees at one of the software KIBS in Kalix (Norrbotten) said: "*Before, you needed to be on location with the client in order to install things on his computer. This was a big con for us since some clients were located long from us. So, we adapted quite soon to these web-strategies, to use the software that is found in the cloud and is easily accessible. And it was not a bad idea that we had to adapt to this. Now, the future is here, and everyone works like this (…) It has become much easier for us. Before, that is before 2000, we had to be very much on location, we had to install software in each computer. If a new version was needed, it had to be sent there and distributed in this way. Today they (ins. by author: the client) just turn off the computer and then log in again and then they have the new… Everyone works in the cloud. The cloud is always close by wherever you are located*".

Discussing the nature of interaction with clients during and after the delivery/implementation stage, one the interviewees at a software KIBS in Hultsfred (Småland) said: "*Often, after we deliver the solution, we have to educate our client about the system, and it can be conducted through telephone and it can also be on place with the client sort of speech*".

Discussing when it may be important to visit clients during the delivery/implementation stage, one the interviewees at a software KIBS in Hultsfred (Småland) said: "*It can be when there are many individuals that have to work with the tool, sort of speech. Then we may drive this forward in the manner that we go see the client in person. We go there and show them the tool. That is perhaps not something we really need to do, but we do that in case of many individual users*".

Discussing the digital- and Web-based character of their services and increased abilities to interact and deliver/implement solution of projects over distance, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*Here, distance has no effect since, when we publish a homepage for our client. The client is never conscious about where the homepage is located physically. We have it located here. There is no problem because of distance, because it is fully digital. The client needs to be able to see his new homepage and it would not have any meaning if we would sit beside our client, or if we would sit in China*".

Discussing that they prioritize to visit as many clients as possible in one trip to the Stockholm client markets if and when they have to meet clients during the delivery/implementation of the solution, an interviewee at an advertising KIBS in Västervik (Småland) said: "*It is also the trend in our organization that we try to avoid using a whole day visiting one client in Stockholm. How many clients do we need to visit in Stockholm in order for this to work properly? Four, yes, then we can have four meetings in one day, and then it's worth it*".

In the context of delivery/implementation of the solution, discussing the importance of visiting clients at end of projects in order to enhance relationships on client markets, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*We want clients to be satisfied with our work. If he is unhappy, we want to discuss and solve the problem. It is important for small firms to provide clients with high levels of service. We are working with trust issues. We want to hold on to the clients we already have, we want our clients to trust us, and we would very much like them to tell others about us in their network*".

Discussing that they often prioritize to visit clients at the end of projects, even when it is not required for the delivery/implementation of the solution in a technical sense, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*We also see this here as an opportunity to sell more to the client in the future. So, if we go on place we try to see if we can sell them a little more. It is a sales opportunity to meet with clients*".

Discussing if long distances to clients can be problematic during the delivery/implementation process, one of the interviewees at a software KIBS in Hultsfred (Småland) said: "*As long as the relationships are in place, then this becomes no problem*".

In the context of the importance to enhance client relationships during or after the delivery/implementation of the solution, one of the interviewees at an advertisement KIBS in Vimmerby (Småland) said: "*In our line of business it works like this; the longer… the more you know each other, the shorter this process gets (ins. by author: the process of building trust and relations), and the shorter it gets, profitability increases*".

Malmö:

Discussing that they primarily deliver projects over distance, an interviewee at one of the software KIBS in Malmö said: "*We deliver it through this (ins by author: over the Internet), and then we simply send a bill, how much time we have worked*".

Discussing interaction with clients at end of projects, an interviewee at one of the advertising KIBS in Malmö said: "*We are in much contact with clients at the end of projects, e.g. when we have to test and go over what we have done in collaboration with clients*".

Discussing the importance of maintaining good client relationships even when projects are delivered, an interviewee at one of the advertising KIBS in Malmö said: "*The more trust our clients have in us, if they have worked for long time with us, or if we have been good in building trust, we need to be in less contact with him (…) We often drop by at clients in order to fix small things. And this is how we build trust, and this is how we get clients to stay with us*".

Discussing the importance of meeting clients at the end of projects, an interviewee at one of the advertising KIBS in Malmö said: "*We usually meet with clients at the end of projects. As an example, to test and fine tune things and see if there is something new that needs to be done in the future*".

Discussing when they need to visit clients in relation to the delivery/implementation of their services, an interviewee at one of the advertising KIBS in Malmö said: "*We meet with clients if we have to train them in certain aspects of what we have been doing for them*".

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Knowledge intensive business services in non-core areas

Knowledge intensive business services (KIBS) play a key role in economic development. Due to the complex and collaborative nature of their value creation processes, it is conventionally argued that they depend strongly on physical proximity to large client-, and labour-markets, as well as on closeness to advanced knowledge infrastructures. This thesis partially questions such conventional assumptions and investigates how KIBS manage to stay competitive in relatively peripheral locations, aided my modern communication technologies. The thesis accounts for the results from in-depth qualitative case studies of KIBS in two Swedish non-core areas. How they compensate for local disadvantages, such as the absence of local agglomeration advantages and long distances to client- and knowledge markets, is the main focus of the cases studies.

Hjalti Nielsen is affiliated with the Department of Human Geography, Lund University. Knowledge intensive business services in non-core areas - Preconditions and strategies for value creation and competitiveness is his doctoral thesis.

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