Labour Mobility and Plant Performance
The influence of proximity, relatedness and agglomeration

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Acknowledgements

Working with a thesis in economic geography for five years is not only about reading and writing and occasionally teaching classes; it is also a constant process of coping with the issue of floating identities. From being an undergraduate, spending most of the time at the university cafés, to overnight becoming a colleague of your former teachers and starting to teach some of your friends. From being a stranger lost in the landscape of academia to gradually realizing that you are no longer a young student but a newcomer on the ‘other side’ of the academic divide. Still, you may think that nothing has really changed but cannot help asking yourself what actually happened. While a five-year thesis project may seem like a lonely mission, mainly situated in front of a computer, such a project is greatly influenced by people you meet and have the fortune to interact with during the course of those years. And if something has happened during the past five years, it is that a number of persons have come into my life, both in close proximity and at more distant locations, and have influenced me deeply – persons to whom I am grateful and in one way or another could not have done without.

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## APPENDICES


Prologue

The role of geographical proximity in economic relations has begun to be contested, following the recognition of an increasingly globalized economy. Critics argue that globalization processes have contributed to the ‘death of distance’ (Carincross, 2001) and the emergence of a ‘flat world’ (Friedman, 2005), whereby geography and proximity are subordinated to the spaceless flows of information, capital and goods, which creates a playing field with equal possibilities for all individuals everywhere. However seductive such a perspective may appear, it is not possible to ignore the fact that processes of capital accumulation and income distribution work very differently in the space economy. Strong evidence therefore simultaneously points towards a geographical concentration of economic activities into ‘sticky places’ (Markusen, 1996), generating an economic landscape with diverse opportunities for firms and people to cope with the challenges linked to globalization processes (Rodríguez-Pose and Crescenzi, 2008a). Thus, in order to understand the geographical unevenness in wealth distribution it is not adequate to neglect the local variations of capitalist production. Following Massey’s (1984) influential notion of the spatial divisions of labour, it is possible to argue that an increasing dispersion of production simultaneously brings about exploitation and deepening of local variations in the continued search of capital to maximize profit. Massey’s contribution regarding the interplay between local and non-local processes related to capitalism demonstrates that these processes are not likely to even out differences between places. This rather suggests that the classical questions of economic geography still bear relevance to the analysis of today’s space economy: Why is it that particular regions show substantially higher levels of economic growth and innovation ability? What are the mechanisms behind the generation and reproduction of regional specialization?

These questions on the mechanisms behind varying courses of regional development are especially highlighted in the literature related to agglomerations and regional clusters\(^1\). From traditionally having treated the region as an outcome of economic processes by focusing on the monetary benefits derived from the concentration of economic activities (e.g. Weber, 1929; Hoover, 1937), the role of the region was reasserted in the aftermath of the Fordist mass-production regime of the 1980s. Rather than only being per-
ceived as a product of economic activities, the region was increasingly considered the fundamental basis of socio-economic processes, explaining the emergence of new successful modes of production which shape the organization of economic activities. In particular, it is now recognized that the propensity of economic activities to concentrate in certain regions and the explanation behind regional disparities in economic growth are influenced by less tangible aspects, or by the ‘untraded interdependencies’ of the region (Storper, 1997). Similar to Hägerstrand’s (1970) early notion that regions are not just about location but also the social interaction of people living there, these less tangible relations consist of different place-specific social and cultural linkages between workers, firms, industries and institutions. This may, for instance, contribute to the emergence of a pool of specialized workers, the development of supporting local institutions and the establishment of trustful relations between local firms. Consequently, the region is considered to both produce and reproduce certain modes of production through the path-dependent character of economic development, which makes an understanding of the influence of region-specific attributes crucial when addressing the local variations of plant performance in the space economy.

This body of economic geographical literature has been especially successful in finding explanations for how the prosperity of certain global hotspots like the Silicon Valley and the Third Italy can be extracted depending on how the regional industrial setup has underpinned the ability to learn and generate technological and organizational change and to contribute to high levels of local growth (e.g. Asheim 2000; Saxenian, 1994; Piore and Sabel, 1984). By providing a greater understanding of the interplay between the path-dependent character of economic development and how knowledge is acquired and applied by the workforce in the production of consumer goods and services, this literature has recognized the role of the workforce in shaping different regional capabilities. Since information and knowledge are actor-specific and embodied in persons as skills and in firms as routines (e.g. Gertler, 2003), Malmberg (2003) claims that studying the relative fixity and mobility of the labour force is crucial when trying to understand mechanisms of localized learning processes and the subsequent economic development of regions and nations. This is because the relative fixity of the labour force brings about both a production and reproduction of place-specific labour skills and an accumulation of firm-specific routines (Storper and Walker, 1989; Nelson and Winter, 1982), making the mobility of individuals essential in facilitating the transfer of these embodied skills between plants and localities (Saxenian, 1994; Pinch and Henry, 1999; Florida, 2002).

Despite the contribution of scholars addressing the interdependence between regional development and the local reproduction of industries and labour skills, the literature on regional agglomerations and clusters tends to extend the notion of learning from individuals and firms to regions and
thereby assume that the momentum for development is inherent within the region itself (Lovering, 1999). While this reflects the strong link of these notions with regional development policies, it also implies that attempts to verify that geographically clustered firms are more capable of increasing their performance are very inconsistent. Either by being highly anecdotal and based on success stories found in particular places, or by employing different mapping exercises to find important locations of successful industries, they tend to fall short, giving a more general explanation of the interplay between the local context and the ability of plants to acquire and utilize external knowledge (see e.g. Malmberg 1996; Martin and Sunley; 2003; Gordon and McCann, 2000; Mackinnon and Cumbers, 2007, for a more extensive critique). It is therefore questionable whether studies conducted on the global hot-spots are actually viable for explaining local conditions of production outside the high-tech regions and the large, densely populated urban areas, or whether these explanations should only be regarded as geographical anomalies primarily reflecting the logics of production at the higher end of the scale.

This relative lack of consistent findings has led to an emergent need to reconsider why the notions of regional clusters and agglomerations have been so popular in recent years and to present new batteries of questions to address the benefits of co-location; that is, to focus on how the local context of specific plants influences the ability of plants to acquire and utilize new knowledge and thereby achieve higher levels of performance. By reviewing the literature on how attributes in the local economy affect the learning processes of plants, Malmberg and Power (2005) argue that the key mechanism behind learning processes and the subsequent geographical variations of growth is found in the labour market and in the embodied skills of the workforce. Since the mobility of labour within and between localities is likely to facilitate the circulation and recombination of embodied knowledge at the regional level and is an effective medium for plants to acquire and utilize new non-local knowledge, they conclude that successful business systems should be conceived as sites of social interaction and arenas for well functioning labour markets rather than as relative geographical concentrations of economic activities.

**Contribution and aim**

Based on the considerations presented above, this thesis will address the role played by the labour market in analyses of local conditions of production. Embedded in the literature on localized learning processes and the notions of how the workforce and its relative (im-)mobility may affect the performance of certain success industries in certain success regions (e.g. Saxenian, 1994; Pinch and Henry, 1999; Lawson, 1999; Power and Lundmark, 2004),
the thesis will move beyond these contributions by drawing on the labour force and its relative fixity and mobility in space as a key attribute for providing a more generalized understanding of the present localized conditions of production. This is made possible by resetting the focus of study and employing a more extensive research method using quantitative techniques to analyse the performance of plants (i.e. workplaces) throughout the entire national economy. Rather than only analysing the influence of regional aggregates, the firm and its employees are placed at centre stage. This is because it is basically individuals and firms, not regions, that learn. By doing this, the thesis will show that when the relative fixity and mobility of labour are ascribed a central place in contemporary location theory, it is evident that the local context does matter for the understanding of geographical differences in economic growth but that it is not proximate relations in terms of regional specialization or diversification that are important. The interesting story is found rather in the interplay between attributes in the local economy, the specialization of single plants and the mobility of labour within and between local economies. By also considering the impact of non-local flows, the thesis is also embedded in the literature advocating the importance of being well-connected to the outside world (e.g. Bathelt et al., 2004; Scott, 1998).

Thus, the aim of this thesis is to analyse the importance of labour mobility for the performance of plants. By means of a unique micro-database consisting of all firms and individuals in the Swedish economy (see a more detailed description below), this is made possible by analysing how the performance of plants is influenced by the industrial setup where they are located and by the inter-plant linkages derived from workers changing jobs within and between localities. Since this is something that has not been possible to do as readily in previous studies on this topic, the thesis will present an initial systematic conceptualization of co-located economic activities based on the mobility of the workforce. Consequently, this may help identify new directions of research addressing the economic effects of co-location.

Outline of thesis

The thesis consists of an introductory section and four papers. In this introductory section the main concepts studied in the thesis and the limitations related to this kind of analysis are presented. This is followed by a theoretical discussion framing the four papers, together with paper summaries and a final paragraph discussing the findings and possible implications of this study. All four papers include empirical studies, based on longitudinal micro-data, on the interplay between agglomeration economies, labour mobility, knowledge transfer and plant performance in the entire Swedish economy.
Paper I: ‘Agglomeration mobility: Effects of localisation, urbanisation and scale on job changes’. This paper focuses on how agglomerated activities influence the relative fixity and mobility of labour dependent on the regional industrial structure. It thereby addresses whether regional agglomerations promote significant untraded interdependencies in terms of facilitating inter-plant linkages via labour flows.

Paper II: ‘Localized mobility clusters: Impacts of Labour Market Externals on Firm Performance’, addresses the extent to which inter-firm linkages established via labour mobility affect the performance of plants as compared to similar activities not intertwined with labour market linkages.

Paper III: ‘How Does Labour Mobility Affect the Performance of Plants? The Importance of Relatedness and Geographical Proximity’. Here, focus is on how different types of labour flows, in terms of both skills and geographical distance, may have varying outcomes on plant performance depending on the existing composition of labour within the plant.

Paper IV: Localized Spillovers and Knowledge Flows. How Does Proximity Influence the Performance of Plants?’. This paper addresses how the performance of plants is affected by the interplay of attributes in the local economy and of local and non-local labour market linkages.
Setting the scene

Before discussing the empirical findings and the agglomeration literature that embeds the four papers, it is appropriate to consider the underlying structure of the thesis. The analyses of all four empirical papers are conducted on data drawn from ASTRID at the Department of Social and Economic Geography in Umeå. ASTRID is a unique longitudinal micro-database created by matching several administrative registers at Statistics Sweden (SCB) on an annual basis. By connecting attributes of the entire Swedish population (e.g. education and working experience) to features of all plants in the economy (e.g. location and sector) with an extremely high geographical resolution, this data opens up for the possibility to ascribe each plant unique features on attributes both within and near each plant in terms of the employees associated with the plants and the attributes of neighbouring plants. It should be noted, though, that since the data originate from annual registers, it is only possible to extract information on plants and labour mobility at one-year intervals. Additionally, the database also does not reveal the mobility taking part within workplaces by means of persons changing working tasks within an organization. It is only possible to account for mobility that also involves a spatial movement between workplaces. This implies that an unidentified part of mobility is omitted because of the unknown share of employees changing jobs within workplaces or more than once during a measurement period.

By framing the analysis in recent theorizations on the interplay between co-location, labour mobility and plant performance, the quantitative analyses in this thesis can provide answers regarding the relationship between spatial events, which would not be possible using aggregate data with a lower spatial resolution. While this type of analysis can highlight certain regularities in the economy and provide information on areas in need of further analysis on the one hand, it cannot, on the other hand, reveal the casual mechanisms driving different social processes. In such a case, a more in-depth focus by means of interviews or participatory observation, for instance, is needed.

Moreover, labour market processes are not neutral in the sense that they simply take place ‘out there’ in the economy just because it is expected to be beneficial to smoothen transformation processes related to the creative destruction of capitalism or to facilitate the transferring of skills between plants and localities (e.g. Aghion et al., 2006; Saxenian, 1994). Instead, these processes are outcomes of the actions of different agents in the economy which are influenced by wider societal processes, like the business cycle and the local and national institutional framework. For instance, the way labour market relations are institutionalized in Sweden has shifted as a conse-
quence of the crisis in the Fordist production system and the following recession in the early 1990s (see Helldahl, 2008 for an overview). From having been characterized by a negotiation between the two parties on the labour market (employers and employees) based on a mutual understanding that economic growth would benefit both parties equally, increased pressure is being placed on the labour force in line with a neoliberal flexibility discourse characterizing many Western economies. Rather than being offered ‘good jobs’ including long-term employment at a reasonable salary negotiated between the unions and the employers, the workforce is increasingly expected to be more able to quickly change working tasks or employers, and even to accept employment at other locations if needed. Such demands, however, are seldom in line with the need of the individual worker, and not necessarily with the needs of specific employers, which thus contributes to a discrepancy between individual needs and societal demands and also to a contradiction between the relative fixity and mobility of the workforce.

It is also important to stress that it is people who change jobs, and that the motives and consequences of this spatial action vary greatly depending on which sub-markets different individuals and groups sell and deploy their labour power in (Peck, 1996; Storper and Walker, 1989). While densely populated regions are widely acknowledged to be characterized by high levels of job mobility due to a greater diversity of skills and vacancies (Edvardsson et al., 2000), Rosenfeld (1992), for instance, also shows that different socio-economic aspects like age, family status and occupation play a significant role in shaping the prospects for changing jobs. Younger members of the workforce tend to be more mobile than older members, and different sub-groups in the labour market have varying possibilities to find new jobs or to have a career, which thus influences the potential for mobility. It is also possible to theoretically distinguish between voluntary and forced mobility. Whereas voluntary mobility is related to labour market processes by which persons in the labour force search for new working options driven by, for instance, new career opportunities and higher incomes or social reasons, forced mobility is related to restructuring processes within plants by which employees are forced to find employment elsewhere or otherwise risk unemployment. Similarly, it is also important to stress that it is plants that employ these workers, and that the motives and consequences of either employing or laying off vary greatly dependent on specific organizational goals and the perceived costs and benefits this may imply (e.g. Becker, 1962; Carnoy et al., 1997; Lawton Smith and Waters, 2005). While some employers are more interested in high staff turnover than in investing in the present workforce, others are more prone to develop their already existing workforce. And while some are in urgent need to expand their business and retrieve new sets of competence, this also results in other employers possibly facing substantial costs to fill the vacancies created by skilled employees leaving for other jobs.
Thus, the effect of labour mobility is far from only positive for both individuals and employers. This is exemplified in, for instance, Wictorin’s (2007) study on the effects of labour flows within the Swedish ICT sector, where it is shown that only moderate levels of staff turnover had a positive effect on plant performance as compared to very low or very high levels.

Nevertheless, although the mechanisms driving different forms of mobility may both work very differently and be regarded as either negative or positive for individuals and employers, the empirical analyses do not distinguish them from each other. This is because regardless of the underlying mechanisms driving mobility, the outcome of this spatial action brings about a linkage between the old and the new workplace through the social ties of individuals (e.g. Granovetter, 1973). Since there appears to be a gap between the theorization of the potential benefits of labour mobility on learning and firm achievements on the one hand, and empirical evidence on the other hand, this thesis will focus on the economic impact of these linkages and not on the mechanisms driving the actions of individuals and employers.

Despite the potential shortcomings of this type of analysis, the rationale for employing this approach throughout the thesis is threefold: Firstly, to find some general evidence that the theorizations on the economic success in the global hot-spots are also viable for plants outside the often researched high-tech and cultural industries primarily employing expertise knowledge or talents; Secondly, by using plants as the primary analytical unit it is possible to more straightforwardly address how performance is related to the interplay between attributes in the local milieu, labour flows and the specific plant rather than focusing only on the regional conditions of production, which tend to conceal the heterogeneity of economic activities within more or less artificial administrative boundaries and lead to too great a focus on regions as economic actors in themselves; Thirdly, due to the generalizing and selective nature of quantitative analyses it is not possible to identify and verify many different relationships in one single study without providing results that are too generalizing and selective. Several different studies, directed respectively at different societal relationships, are therefore required to actually determine which relationships are consistent and need to be analysed further. Employing such a broad-brushstroke approach naturally only partially succeeds in addressing the different processes at play simultaneously in the space economy, but may help to provide new research questions which more readily address the causal mechanisms behind the findings in this thesis. This being said, the following paragraphs will present some of the considerations framing the empirical analyses before turning to a discussion on the four empirical papers.
Plant performance

As mentioned above, the main research question concerns the performance of plants and how this is affected by the interplay of localized attributes near each plant, the mobility of labour and the potential knowledge transfer this mobility may involve.

The principal question is then how to measure performance in a national economy characterized by a variety of different activities. While the interrelatedness between job mobility, knowledge diffusion and firm competitiveness has been stressed in the literature (e.g. Saxenian, 1994; Power and Lundmark, 2004), there are few studies that have actually tested this relationship empirically. Common proxies for performance used in the literature to reflect knowledge transfer and learning are often related to the study of patent citations (e.g. Almeida and Kogut, 1999; Breschi and Lissoni, 2009; Sonn and Storper, 2008) or the vague concept of ‘cluster advantage’ used mainly within the policy realm (e.g. NUTEK, 2001). Whereas patent citations are a direct measure of how scientific knowledge is transferred between two agents, this is only viable for a minor part of the economy and labour force and does not imply any direct economic value (e.g. a patent may not result in a new product on the market and thus not produce any economic value). The concept of cluster advantages may explain some general benefits of clustering, but is also associated with a plethora of different meanings and may be more a reflection of the anecdotal nature characterizing many studies (Malmberg, 1996). That is, a cluster is successful because someone succeeded in identifying linkages between bundles of successful firms, without actually revealing what it is that makes these firms successful.

Plant performance is measured in two different ways in the empirical analyses. In Paper I, labour mobility is applied as an indicator of performance since previous analyses based on case studies confirm the role played by labour mobility in the competitiveness of regional industrial systems. For example, Pinch and Henry (1999) claim that job mobility is a key localized externality of agglomerations by reporting that the intense flows of skilled personnel within the British motor sport cluster facilitated both knowledge creation and knowledge spillovers between firms and could therefore be regarded an important driver behind the success of the cluster. In addition, since the mobility of labour is considered to create linkages between firms through the social ties of former employees (Granovetter, 1973), the mobility of labour may further strengthen the social cohesion between plants and thereby facilitate knowledge flows between the inter-linked firms (Breschi and Lissoni, 2003). Since labour mobility is mainly a local process, these social networks are primarily formed locally and further enhance regional knowledge accumulation and increase the performance of local agglomerations (Dahl and Pedersen, 2003; Malmberg and Power, 2005). Thus, the
main hypothesis in *Paper I* is that a high level of job mobility is a fairly good proxy for plant performance since mobility may strengthen the local agglomeration, facilitate knowledge spillovers and contribute to performance. It thereby analyses how the mobility of labour within and between regions is influenced by relative regional specialization (localization effects), diversification (urbanization effects) and the dominance of one or a few plants (scale effects). However, labour mobility as such is only an indirect indicator of performance, which can be associated with ‘cluster advantages’, mentioned above, implying that more direct indicators are needed to empirically analyse the effects of labour mobility.

To consider this aspect, performance is defined as labour productivity at the plant level throughout *Papers II-IV*. Since the data do not contain information on productivity, this indicator is calculated as value added per employee. However, in the database value added is reported for organizations and not for their respective plants. For the approximately 15% of all organizations with more than one plant, the value added was distributed to each respective workplace in proportion to its wage distribution. This procedure potentially takes into account both education and experience (Wictorin, 2007). Although traditional agglomeration theory pays attention to relative differences in factor prices, more recent analyses show more interest in how plants increase their performance by being able to absorb and utilize new knowledge. Since productivity mainly reflects the relative efficiency of plants and not the knowledge or innovation output, the use of this indicator can be questioned. However, according to Schumpeter (1939; 1942) the evolution of the capitalist economy consists of a gradual recombination of existing pieces of knowledge. While this can result in both incremental and radical innovations, which, respectively, either result in small alterations of existing products or in a ‘creative destruction’ whereby the existing economic structure is replaced by totally new ways of organizing the economy, it also implies learning processes within plants by making the production of consumer goods and services more efficient. According to this line of thought, innovative and competitive firms can use their resources more efficiently, which also makes them more productive than less innovative firms. With this in mind, labour productivity seems appropriate as an indicator of performance since it proxies both the relative degree of learning and the relative degree of efficiency within plants.

The productivity indicator is not used without some concerns, however. The geographically selective rounds of investments in combination with the ongoing shift from a Fordist single-unit system to more functionally and geographically complex production networks imply that profit achieved at one plant is not necessarily invested in the same profit space where the production unit is located (e.g. Massey, 1984; Dicken, 2007). This manifests itself in the tendency that the economic development of localities is becom-
ing increasingly detached from the profit achieved in single production units. Productivity may therefore reflect the ability to capitalize on place-specific assets, for instance the access to new knowledge and information to produce goods and services more efficiently, without having an explicit focus on how the workforce or the locality may benefit. It may therefore also indicate relative labour exploitation to lower the costs related to production (Storper and Walker, 1989). To consider this aspect, labour income was also used as an indicator of performance in Paper II. Since this performance indicator did not differ substantially from the productivity indicator, productivity was used as main indicator of performance throughout Papers III and IV. Additionally, to not only reflect that successful and growing plants hire new employees, without receiving information on how labour flows affect the future performance of plants, change in productivity between 2001 and 2003 was employed in Papers III and IV.

It could also be argued whether productivity is suitable for all plants in the economy since different plants may compete on different types of markets and differ substantially in terms of labour and capital intensity. Although it is not possible to explicitly account for all these aspects in analyses on the entire economy, the empirical analyses handle these inter-plant variations by also including variables on industrial affiliation, employment size and educational level of the workforce, which to a great deal conceal such variations. Still, productivity more straightforwardly captures the economic effects in a greater share of the national economy as compared to the other proxies of performance used in the literature to reflect the impact of knowledge transfer and learning.

Proximity

Concerning the impact of geographical proximity, the main weakness of this kind of analysis relying on systematic generalization is how to conceptualize and empirically operationalize proximity in an economy where the development in transport and communication technologies has reduced the role of physical proximity on behalf of both more temporal and relational forms (e.g. Bathelt and Glückler, 2003; Torre, 2008), implying that local conditions of production cannot be separated from the interdependent processes occurring at other places in economic space (Bathelt et al., 2004; Scott, 1998). Which relations are proximate, or local, can therefore not be distinguished by drawing lines on a map since the local arena for production, work and reproduction is a socially constructed continuum varying for different firms and different persons in the workforce. Moreover, since the characteristics of places are gradually built up through unique combinations of economic, social, institutional and political factors in relation to the processes at other places in the space economy (Storper, 1997), a snapshot in time indi-
cating the surrounding attributes of plants and the labour flows associated with each plant only partially reflects the patchwork of different localized conditions for production present in a national economy. This is because different historical layers of local accumulation regimes influence the present condition in different places, which is difficult to fully consider in this kind of analysis.

However, while improvements in communication and information technologies imply that aspects in economic space related to production other than those found locally are important, this has not undermined the need for a continued agglomeration of economic activities or implied that local variations are no longer persistent (Scott et al., 2001). Since all economic activities take place somewhere in economic space, both the production and the consumption of consumer goods and services are produced locally and therefore also have local outcomes. This is especially the case when also considering the workforce, which is predominately produced and reproduced on a local scale, underpinned by the local industrial setup (Storper and Walker, 1989; Storper, 1997). Thus, the path-dependent character of regional development is strongly interrelated both with the present conditions for production throughout a national economy and with the local setup of labour skills (Storper and Scott, 2009; Storper, 1997). This also implies that the conditions for plants may differ substantially depending on the other economic activities within a region. For instance, in a region dominated by traditional manufacturing, the local institutional support and labour skills are strongly related to that type of local industrial setup whereas a quite different local setup of labour skills and institutional support is present within a region dominated by a university and R&D activities. Thus, since firms tend to base their investments on already present skills and capabilities, the future of the development of these two types of regions may be quite different, with various opportunities for learning and transformation. It is also likely that the type of labour flows within, and particularly into, these two regions may differ substantially. While the former region is likely to attract skills typically characterized by less formal education, the latter region is more likely to attract labour skills characterized by higher levels of formal education. However, in the case of a temporal crisis in the manufacturing industry, persons employed in the manufacturing region may face unemployment and thus some part of that local labour pool may apply for university courses. While this implies outmigration from the manufacturing region, it also implies that the university region benefits in terms of having more students enrolled in education and that the workplaces in the local economy housing the university may have an even greater pool of skilled labour to employ after these persons have graduated. This, consequently, may also reduce the future need for the relatively knowledge-intensive workplaces in the university region to recruit non-local skills. These arguments lead to the conclusion that regions
are not competitors as advocated by Porter (1998), for instance. Instead, geographical variations in learning capabilities and plant performance are strongly related to development trajectories of certain regions as well as to processes occurring elsewhere in economic space.

Since the secondary data applied in this thesis cannot simultaneously consider all these different aspects of regional conditions for production, the empirical analyses must rely on different indicators symbolizing the local dimension of production. Throughout Papers I-III, functional labour markets are used as a proxy for the local dimension of production. These functional regions are defined based on commuting patterns between the 290 Swedish municipalities and are constantly under revision to reflect the current labour market situation and the composition of local trade and industry in different parts of the country. Although these labour markets fairly well both reflect the geographical differentiation of economic activities throughout the economy and correspond to the maximum functional local hinterland of plants by distinguishing between local and non-local conditions, they are less successful in revealing the constant evolution and interdependence of regional economies. Moreover, the use of functional regions also creates spatial biases by assuming that local attributes are primarily conditioned within administrative borders, which thus ignores the fact that the within-region variation may be far greater than the between-region variation. Markusen (1996), for instance, shows that it is not possible to declare that one region is characterized by one type of agglomeration since several different types of agglomerations overlap and coexist within local economies. To also consider this aspect, the empirical analysis in Paper IV places the unique surrounding attributes of each plant at centre stage by relaxing the influence of regional attributes on behalf of the specific geographical context of each plant. This procedure opens up for the possibility to consider how different plants are affected by their nearby setting depending on the industrial affiliation of each specific plant and the specific sector of all its co-located neighbours, without having to rely on indicators reflecting only one type of regional agglomeration. Although this approach is also an exercise in drawing boundaries around plants, assuming that the economic spaces on either side of a line are significantly different from each other, it opens up for the possibility to address how localized conditions of production are influenced by the distance to, and composition of, surrounding economic activities.

**Knowledge and relatedness**

The next point to discuss is the definition of knowledge (or skills), where in the labour market it is supposed to be found and how it is transferred in space. The literature discussing the relationship between knowledge, local-
ized learning and performance (e.g. Feldmann, 2000) often distinguishes between the tacit and the codified forms of knowledge as first put forward by Polanyi (1966). Codified knowledge is often regarded to be easily articulated and transferred between individuals, whereby it is also regarded as less dependent on proximity. The tacit form of knowledge is less easy to put in words, often exemplified as 'you know more than what you can put in words', thereby making it more reliant on physical proximity and interactive collaboration. However, since all types of knowledge transfer are reliant on the absorptive capacity of the receiving actor (e.g. Cohen and Levintahl, 1990; Nootenboom, 2000), this binary division only partially reveals processes of knowledge diffusion and creation. In line with the discussion on regional capabilities presented above, Asheim and Gertler (2005), for instance, highlight that different sectors are characterized by different knowledge bases, which implies that different regions are characterized by different types of skills depending on the industrial structure. While sectors typically combining already existing sets of knowledge can be characterized by a synthetic knowledge base greatly influenced by social and institutional settings (e.g. traditional manufacturing), sectors reliant on formal models and codified science can be characterized by an analytical knowledge base (e.g. research and development). Asheim and Gertler therefore conclude that knowledge is more easily transferred between economic agents in settings characterized by social networks of scientific knowledge, which are not necessarily dependent on physical proximity (e.g. Agrawal et al., 2006; Ponds et al., 2009). These insights are also reflected in the literature, where the impact of certain expert knowledge embodied in key persons or in talented 'Bohemians' in particular is highlighted (e.g. Almeida and Kogut, 1999; Power and Lundmark, 2004; Florida, 2002).

Nevertheless, such a perspective on knowledge refers mainly to a small stratum of sectors and workers in the economy and therefore does not fit the extensive analytical approach of this thesis or the explicit interest in the effects of labour mobility throughout the whole Swedish economy. It could, for instance, be questioned whether only studying a minority of workers actually reflects how labour mobility may influence localized conditions of production and knowledge circulation since larger groups of persons found in all parts of the economy, from the service sector to R&D activities, are taking part in learning processes by making the production of consumer goods and services more efficient (cf. Engelsof et al., 2005; Glaeser et al., 1992; Maskell et al., 1998). Hence, the potentials for performance could be analysed from a much broader point of view since the embodied knowledge of all individuals may contribute to learning processes.

The empirical analyses therefore consider knowledge from a much broader perspective, related to the human capital approach as developed by Becker (1962). According to this line of thought, knowledge is a combination
of formal training (i.e. education, both level and direction) and on-the-job training (i.e. experience by working with a certain task at a certain workplace for some time) which is transferred from the old to the new workplace in the case of changing jobs. Thus, this division also considers the contradiction between the benefits of mobility on the one hand and the need for relative labour fixity on the other hand. This is because the relative fixity of labour is often associated with the accumulation of less tangible skills, which are difficult to replace if a person leaves for another job. For example, long-term employees may have plant-specific knowledge, which is difficult to instantly transfer to newcomers. Not only do they know their colleagues working within the plant, the routines and the technologies used, they may also have developed social networks with customers and representatives of cooperating companies. As exemplified in Bienkowska’s study on labour mobility in the two Swedish ICT clusters in Kista and Mjärdevi, even if employers were aware that they could acquire new, important knowledge for the organization by recruiting new skills, they were very reluctant regarding high levels of staff turnover because of increasing sunk costs associated with skills leaving the plant and the costs associated with integrating new staff into the organization (Bienkowska, 2007).

However, such insider knowledge is not only related to a specific task or workplace, but could also be specific to a certain sector or location. Simpson (1992) stresses that persons with experience from one sector also acquire sector-specific human capital about technologies, organization forms, norms and routines which is only applicable in particular sectors of the economy. In the same vein, due to the local production and reproduction of labour, the creation of labour skills is related to the local industrial setup and is therefore also greatly place-specific (e.g. Storper, 1997). This place-specific or ‘spatially sticky’ knowledge forms different cognitive capacities for firms and may be difficult to transfer and implement at other locations (Gertler, 2003; Nelson and Winter, 1982). Fischer et al. (1998), for instance, investigate the impact of place-specific insider advantages on migratory decisions and claim that people with a long duration of stay acquire a place-specific human capital that takes time to accumulate, is difficult to transfer to other locations, and may become a sunk cost in the case of outmigration. Since all economic activities are embedded in a social context (Grabher, 1993), it may be essential for plants to maintain the place-specific knowledge of their workforce since the relative fixity of the workforce also includes investments in social networks with customers and representatives of cooperating companies, which in turn may help to reduce social distances between economic agents and to secure trustful relations (Maskell and Malmberg, 1999). This insight implies that relative fixity can also be beneficial for the long-term performance of regions due to the social cohesion long-term relations may bring about. It may therefore also be important for newly recruited employ-
ees to not be too unfamiliar with local technologies, norms and routines since the skills of new employees characterized by very different place-specific knowledge may be costly to implement in an organization.

Accordingly, whether or not it is possible for plants to implement and utilize new skills is related to how well the new knowledge matches the knowledge that is already present. This insight is widely acknowledged within the innovation literature. As pointed out earlier, whether the external knowledge can be integrated into the organization and turned into real learning opportunities is not only a function of co-location, but is also dependent on the absorptive capacity of specific plants and on the degree of affinity between the existing and the new knowledge (e.g. Cohen and Levintahl, 1990; Boschma, 2005; Rallet and Torre, 1999; Torre, 2008; Nooteboom, 2000). This body of literature contends that dimensions other than physical proximity may be essential to interactive learning processes, for example, organizational, institutional, social and cognitive proximity. Whereas organizational, institutional and social proximity refer, respectively, to the plant-specific routines and the place-specific institutional frameworks and social norms shaping economic interactions, the cognitive dimension refers more directly to the learning capacities of single plants and is therefore explicitly in focus in the empirical analyses employing a plant perspective on the economic effects of labour mobility. According to Boschma (2005), sufficient complementarities between economic agents must be present in order to implement external knowledge and secure effective inter-plant communication. The cognitive distance between two agents can therefore not be too small or too great, but should be related (i.e. complementary). This is due to the Schumpeterian notion that new knowledge is primarily produced by combining different pieces of existing knowledge, which means that external knowledge that is very similar to what is present can be absorbed in the new organization but is less likely to create new knowledge, on the one hand. On the other hand, if the two sets of knowledge are too different it is less likely that the external knowledge can be absorbed and transformed into economic value. Boschma (2005) therefore concludes that geographical proximity as such is not a necessary or a sufficient condition to implement external knowledge and secure effective inter-plant communication, but that geographical proximity may influence the impact of the other dimensions. As demonstrated in Grabher’s (1993) study on the fate of industries within the German Rhur area, too much reliance on proximate economic linkages may even be detrimental to firms by causing lock-in effects. It is therefore important to not be too focused on local conditions but to also consider the role of non-local linkages, as such linkages may provide firms and regions with new inputs and other types of place-specific skills (e.g. Bathelt et al., 2004; Scott, 1998)
Whether or not knowledge received via labour mobility can be absorbed and can contribute to performance, and to what extent knowledge can spill over between plants in the local economy, is thus dependent on the extent to which plants share the same work-specific, sector-specific, and place-specific knowledge bases. For example, two firms located in an ICT cluster competing on similar markets with similar products, using similar technologies and routines, may have somewhat similar sets of employees with skills suitable for the local economy. If one of the engineers is offered a similar position with a higher salary and thereby changes workplaces, this engineer is transferring formal and less formal skills from the old workplace to the new one. Since this engineer shares the same sector- and place-specific knowledge with the new co-workers, this knowledge may be easily absorbed into the new organization but is less likely to induce any substantial effects since the cognitive distance between the two pieces of knowledge is too short. However, if the engineer was formerly employed at a similar firm using similar technologies, but in another regional cluster formed by other sets of place-specific norms and skills, the chances that this knowledge can be absorbed are still high due to similarities in sector-specific knowledge. But the chances are also higher that this type of knowledge will induce real learning opportunities due to the relative differences in place-specific skills. Likewise, for an engineer changing jobs between two local workplaces producing totally different products with different technologies, routines and norms, the sector-specific skills may be too different to be easily integrated into the new organization, but the relative dissimilarity of sector-specific knowledge could be compensated for by the sharing of similar place-specific norms and familiarity with local suppliers and customers. However, if this kind of new knowledge were also characterized by another set of place-specific skills, there would be an increased risk that the new skills would be costly to integrate into the new organization due to relative dissimilarities in both sector- and place-specific skills; this is therefore less likely to induce a positive effect on performance.

This implies that the labour force as compared to other means of production has the ability of social learning, whereby the relative fixity of the workforce enables the accumulation of both tangible and less tangible forms of knowledge, and the mobility enables a transfer of these embodied skills between workplaces. Although the empirical analyses cannot reveal how new skills are integrated into an organization or the causal mechanisms behind learning processes, it plausible to expect that a new employee will bring in formal and less formal skills to a workplace when beginning a new job. According to the Schumpeterian notion on innovation, this add-on will either build on the already existing knowledge or bring in new forms of skills. It is therefore also reasonable to expect that labour mobility will have an effect on the competence portfolio of organizations and therefore also on the observ-
able performance of these organizations. The relevance in this relationship is something that the statistical models can account for.

Since all members of the workforce embody skills that can be utilized in the production of consumer goods and services, the empirical analysis takes its starting point in determining how the mobility of all types of persons in the workforce are influenced by the regional industrial setup (Paper I). Due to the widespread notion that labour mobility is mainly a local process and the social linkages and knowledge flows derived from mobility mainly work locally, Paper II analyses the effects of all types of local labour flows on plant performance. While Paper II does not consider the impact on plant performance of different types of inflows, the empirical analysis in Paper III makes an initial attempt to differentiate between the interrelatedness of cognitive and geographical distance by also assessing how well new skills match the existing skills within plants. Since different plants operating in different sectors, producing for different markets, may benefit differently depending on the type of labour skills brought into the plant, the cognitive proximity (degree of complementarities) is proxied by distinguishing the degree of sector-specific proximity between the old and the new workplace. The geographical dimension is assessed by differentiating labour flows within and between regions to determine the effect of place-specific skills. Because of this approach, a more refined selection of flows, consisting only of persons with at least a Bachelor’s degree or receiving the highest 20% of incomes, had to be made. This is motivated by mainly two reasons. First, the higher the degree of formal knowledge, the more easy it is considered to be transferred between organizations (e.g. Becker, 1962; Asheim and Gertler, 2005). Second, the findings in Paper I indicated that the two groups of workers changing jobs either within or between local labour markets differed substantially in terms of education and income. Thus, including the mobility of all types of workers would mean that the effect of long-distance as opposed to short-distance flows could be exaggerated in the models. By only analysing a more refined selection of flows, it is possible to more readily determine the partial economic effects of different types of flows, characterized by either sector-specific or place-specific proximity. Yet another selection refinement is made in Paper IV, where the notion of the combined effects of cognitive and geographical proximity is further elaborated by also distinguishing whether the same interrelatedness between cognitive and geographical proximity is present for inter-plant spillovers; that is, whether the performance of a plant located in a setting which is very similar, complementary or very different to what the plant produces is influenced by the other economic activities within the same geographical context, and whether this effect is altered by extending the geographical reach of the plant-specific neighbourhood and by the local and non-local labour market linkages. Since localized spillovers are regarded most frequently and substantially in knowledge-in-
tensive service sectors (like finance, R&D, creative industries like marketing, etc.) and manufacturing sectors (e.g. Frenken *et al.*, 2007), only plants belonging to these segments of the economy are included in the analysis.

This being said, the remainder of this thesis contains a discussion on the four empirical papers and the literature on regional agglomerations that the papers are embedded in.
Placing the labour force in agglomerations

The concept of agglomeration economies is at the heart of much of the work in economic geography and related fields trying to explain the benefits of geographical clustering. Despite its seemingly straightforward definition, it is argued that the concept of agglomeration economies is surrounded by a plethora of definitions and meanings (e.g. Gordon and McCann, 2000; Martin & Sunley, 2003; Parr, 2002a; 2002b). Although agglomeration economies are often split into the widely used conceptual trio (Hoover, 1937; Dicken and Lloyd, 1991; Ohlin, 1933) consisting of the internal economies of scale and the external economies of either similar and related industries (localization economies or MAR-externalities) or different industries (urbanization economies or Jacob's externalities), these do not cover all the aspects of the concept. While great interest has been directed at which kind of clustering – urbanization or localization – produces significant externalities (i.e. inter-firm linkages, inducing advantages to firms) and best promotes regional growth (e.g. Glaeser et al., 1992; Henderson, et al., 1995 Malmberg et al., 2000), the disparate empirical findings suggest that other aspects related to the concentration of economic activities need to be considered.

By elaborating on the concept of agglomerations, Parr (2002a; 2002b), for instance, advocates that there may exist other relations that are external as well as internal to the plant depending on the scale, scope and complexity of economic relations, which, to a varying extent, is dependent on geographical proximity. Therefore, following the immense impact of Michael Porter’s (1990; 1998) notion of clusters and the increased attention to localized knowledge and learning (Maskell and Malmberg, 1999), since the 1990s growing interest has been directed at the less pecuniary aspects of co-location. Following the discussion by Wolfe and Gertler (2004), the shift from traditional regional studies to localized aspects of learning has made it possible to identify two opposing perspectives on agglomeration and clusters within economic geography. Whereas the first approach points out the significance of pecuniary benefits gained from agglomeration (i.e. reduced costs or increased revenues) by mainly elaborating on location quotients on aggregate data, the other approach emphasizes the importance of more social and cultural aspects related to geographical clustering by conducting in-depth case studies on issues like knowledge creation, learning and spinoffs. While the former notion focuses on the tradable aspects of agglomerations, the latter highlights the less tangible aspects of co-location by emphasizing that externalities go beyond the traditional input-output transactions (e.g. Maskell and Malmberg, 1999; Storper, 1997; Porter, 1990).
Such ‘untraded interdependencies’ are indeed economic although often have a distinct socio-cultural component as they often spill over to other parts of society as informal rules, norms and routines (Storper, 1997). For instance, the clustering of inter-linked plants and individuals is a traded aspect of co-location, but the socio-cultural processes related to the agglomeration of individuals (like face-to-face contact and the effects of socio-cultural interaction like the resurgence of mutual trust, reduced uncertainty and the establishment of informal norms, rules, and habits) are not economic per se but are regarded as crucial for enabling knowledge creation and innovation and thus have economic implications (Maskell and Malmberg, 1999). Accordingly, an overlap between work cultures (domestic as well as public) will take place, implying that not only the business system but also the locality itself is involved in learning processes due to the local production and reproduction of labour skills (Storper and Walker, 1989). In order to stay in business in a crisis-prone capitalist economy, it is of vital importance for plants to continuously stay informed about changes in demand and production techniques needed for improving their products. From this point of view, the ability to learn becomes a key issue in explaining geographical differences in economic performance (e.g. Maskell et al., 1998; Asheim, 2000).

Using the British motorsport cluster as an example, Pinch and Henry (1999) identify a number of untraded linkages outside the formal transactions, which are also likely to explain the relative competitiveness of the cluster – that is, sharing new ideas via informal collaboration and shared specialized suppliers; imitation and rivalry; spinoffs and plants deaths; industry gossip and high levels of staff turnover. According to this theoretical perspective, the dynamics of agglomerations and clusters can therefore not be fully understood without paying attention to the broader socio-cultural mechanisms behind the long-term competitiveness and innovation ability of plants in certain locations.

The focus on more intangible aspects of co-location is by no means a new topic in the literature on agglomerations. This notion goes back to the early contribution by economist Alfred Marshall (1890), who contended that a trinity of externalities triggers competitiveness among inter-linked similar and related co-located activities. According to this line of thought, plants in the same industry tend to cluster because of the externalities provided by co-location. In these places, there are relatively more employees with specific occupational skills (labour market pooling), relatively lower costs for input and output transactions (specialized input-output transactions), and a relatively higher availability of information about products and innovations, which should induce increased localized learning (technological externalities or ‘the industrial atmosphere’). These characteristics make such places gradually more attractive for new start-ups as well as for established plants considering relocation. While the traded input-output transactions reflect
the pecuniary externalities of co-location, both the emergence of a skilled pool of labour and the industrial atmosphere are less pecuniary and hence bear distinct untraded localized features. Although Marshall emphasized that such localized spillovers operated mainly within industries (i.e. localization), Parr (2002a; 2002b) stresses that geographers, following the early distinction by Hoover (1937), perceive these externalities to also be present in more diversified economies (i.e. urbanization) but in combination with both scale effects and the diversity of scope effects. Hence, plants located in large, diversified clusters may also enjoy these same types of externalities, although not industry-specific but rather collectively shared resources among all co-located activities, due to both the absolute size and the diversity of economic knowledge (Jacobs, 1969). This is reflected in the recent works on the benefits of the technological externality of ‘local buzz’, which is advocated to induce knowledge to spill over and promote learning between geographically concentrated plants due to intense face-to-face interactions of skilled workers within both specialized and large, diversified urban systems (e.g. Bathelt, et al. 2004; Storper and Venables, 2004).

However, while Marshall built his ideas around rather small and isolated ‘industrial districts’ the localized dimension of his notions can be questioned. Due to improvements in transportation and communication technologies, it is argued that the externalities associated with geographical clustering are becoming more mobile, implying that the localized assets are not geographically fixed and may thus have become less significant (Scott, 1982; Glasmeier, 1988). For instance, neither specialized suppliers nor customers must necessarily be located near the producing plant, and neither are the collaborative and social aspects of technological externalities dependent on geographical proximity since it is possible to share experience and exchange knowledge over much greater distances through other modes than were available in the past (e.g. Rallet and Torre, 1999; Torre, 2008; Bathelt and Schuldt, 2008; Ponds et al., 2009). As labour is widely acknowledged as the least mobile factor of production, Phelps (1992; 2004) argues that labour market pooling is the only part of Marshall’s trinity that still produces significant localized externalities and therefore the embodied skills of the labour force produce essential competitive advantages both for plants already within a cluster (Pinch and Henry, 1999) and for plants considering relocation (Florida, 2002).

The notion of the relative importance of the labour force is confirmed by Malmberg and Power (2005), who argue that it is necessary to reconsider the theories on localized systems and begin to analyse what has made studies on regional conditions so popular; that is, in which ways knowledge is created and utilized among co-located activities. While reviewing previous empirical work, they outline three fields of study frequently discussed in the literature which are related to the less tangible aspects of Marshall’s notions: (i) Stud-
ies focusing on the collaborative benefits of co-location; (ii) work on the benefits resulting from local rivalry and, finally; (iii) studies on the local sociability and mobility of individuals. They argue that previous analyses succeed only moderately in providing evidence of the impact of informal collaboration and rivalry and thus that localized business systems should be conceived as arenas for well-functioning labour markets where localized learning is facilitated by the socialization and mobility of skilled workers.

**Do agglomerations facilitate labour mobility?**

Although the early contributions by Marshall (1890) as well as Weber (1929) recognized the role of the labour force in agglomerations, neither approach elaborated on the dynamic aspect of labour mobility for the generation of elevated economic performance. Certainly, these early contributions acknowledged the significance of labour as a production factor by establishing the advantages of having access to a pool of skilled labour and that skilled labour would be attracted to regions suitable to their skills. However, this factor primarily reflects the benefits of 'a constant market for skill', which emphasizes labour as a specialized 'commodity' that can be easily hired and fired, and when entering the agglomeration this 'commodity' would remain within the system. These aspects are summarized in the traded part of the labour pooling externality by relating to the benefits of being able to effortlessly employ needed staff, rather than to the dynamic effects of labour market mobility. However, due to the increased attention to human capital for economic growth (Glaeser, 2000), job mobility is frequently argued to be a crucial factor behind knowledge transfer and the economic development of plants and regions (e.g. Pinch and Henry, 1999; Rodriguez-Pose and Vilalta-Bufi, 2005). This is because human capital, or knowledge, is not only accumulated within the workplace through education, learning-by-doing and learning-by-interacting, but is also acquired externally. Since knowledge ultimately rests within individuals as embodied skills and within firms as routines (e.g. Gertler, 2003; Nelson and Winter, 1982), the mobility of skilled workers is regarded as crucial for acquiring, utilizing and creating new knowledge, and thus constitutes a more intangible aspect of labour pooling. A concentration of skilled workers is likely to facilitate learning-by-interacting through the 'local buzz' derived from face-to-face contacts related to dense concentrations of skilled individuals on the one hand. On the other hand, such concentrations are also likely to increase the incentive to change jobs due to the many potential job openings in both diversified and specialized economies.

How promising the sociability, or 'local buzz', hypothesis put forward in earlier paragraphs may be, it is still difficult to empirically assess which types of sociability promote learning, and how they do it. Is it through frequent
collaboration, random meetings at the pub or by the coffee machine at work, or from a combination of everything? Therefore, the interrelatedness between job mobility, knowledge diffusion and plant competitiveness has frequently been stressed in the literature (e.g. Saxenian, 1994; Pinch and Henry, 1999, Almeida and Kogut, 1999; Breschi and Lissoni, 2003; Power and Lundmark, 2004). This is because the difficulties pinpoint the precise mechanisms behind knowledge creation due to place-, industry-, plant-, and team-specific working modes, which all can be expected to alter the localized outcomes of learning processes. Yet, the mobility of skilled labour is more straightforward. It may not reveal much about the causal mechanisms behind learning processes, but due to the embodied nature of knowledge, skilled workers changing workplaces in one way or the other bring their formal knowledge and previous work-specific experience with them to the new workplace and thereby, more or less, alter the existing knowledge base.

The positive relationship between particularly successful clusters and high levels of job mobility originates from Saxenian’s comprehensive analysis on the factors behind the Silicon Valley’s success story as compared to Route 128. Saxenian (1994) demonstrates that different location-specific institutional arrangements, like flexible labour market relations, are important mechanisms behind the knowledge diffusion and high levels of innovation identified in Silicon Valley. Gilson (1999) similarly shows that local job mobility is affected by the localized institutional arrangements, arguing that an encouraging institutional framework of job mobility in the Silicon Valley has a positive effect on the dynamics of high-tech industries, whereas the legal framework on Route 128 rather discourages job mobility and therefore dampens industrial dynamism. In addition, both Angel (1991) and Almeida and Kogut (1999) also note that employees working in the Silicon Valley semiconductor industry more frequently change jobs within the local economy than to companies located in other regions in the US. This positive relationship between the concentration of high-tech industries and high levels of job mobility also seems to be evident outside the Silicon Valley. Dahl and Pedersen (2003) show that inter-plant mobility of engineers within the two Danish biotech and telecommunication clusters is more frequent than in the rest of the economy. In a Swedish context, using a comprehensive longitudinal data set, Power and Lundmark (2004) empirically support that the internal labour markets of clusters are embedded with high dynamism by studying local job mobility of key personnel within the Stockholm ICT cluster. Their analysis shows that local job mobility within the cluster is significantly higher than in the remaining urban economy.

**Paper I: Agglomeration mobility**

As demonstrated above, the hypothesis that successful clusters facilitate high levels of labour market dynamism is fairly well grounded in previous studies.
However, the work on the relationship between labour market processes and agglomerations tends to be biased towards case studies of certain production-oriented activities and high-tech industries, which are usually isolated from other parts of the regional or national economy (Martin and Sunley, 2003). Major topics have either succeeded in identifying how the levels of job mobility are affected by localized clusters compared to the region as a whole (e.g. Power and Lundmark, 2004) or in studying the mobility of key persons in certain high-tech industries (e.g. Almeida and Kogut, 1999). Apparently, less attention has been paid to actually determining how co-location facilitates the mobility of workers within and between both specialized and diversified agglomerations, or to demonstrating how valid this relationship is in the wider economy and not only for high-tech industries in prospering economies. This implies that the hypothesis on the labour market externalities in agglomeration is only partly proven. The aim of Paper I is therefore to investigate how economies of localization, urbanization and scale influence the propensity of workers to change jobs both within and between local labour markets in the whole Swedish economy during the years 1990 to 2002.

Based on the literature it could be argued that large diversified regions (urbanization economies) have a good potential for high levels of labour market mobility and that plants located there may enjoy high levels of knowledge externalities, whereas small and less diverse regions with one or a few dominating plants (scale economies) do not have the same potential due to their more limited and less diverse labour pools which make them more reliant upon internal knowledge. However, the limitations of small labour markets could be partly compensated for by a regional concentration of similar or related activities (localization economies) by which plants located in such regions can obtain new knowledge by recruiting from the same specialized labour pool. In such cases, employees can take new jobs and maintain their branch-specific and region-specific knowledge, which enhances the potential for acquiring external knowledge even in small labour markets.

The empirical results, controlling for different co-varying socio-economic aspects on mobility, indicate that the composition of economic activities within local labour markets influences the propensity of people to change jobs both within and between local labour markets. The findings indicate that both urbanization and localization economies have a positive effect on intra-regional job mobility, while scale economies tend to impede job mobility within regions. Regarding inter-regional mobility, all three types of agglomerations have a negative impact, which restricts job changes across local labour-market boundaries. Subsequently, the regional economic composition may facilitate as well as hinder job mobility, and most likely also the prerequisites for local knowledge diffusion and the performance of plants.
The paper concludes by stating that although the empirical evidence of the economic effects of external economies is quite moderate (cf. Malmberg et al., 2000), there is in fact a positive correlation between labour market dynamism and both regional industrial diversity on the one hand and regional specialization on the other. Hence, the empirical findings confirm previous case studies by demonstrating that localized business systems can actually be conceived as arenas for well-functioning labour markets, even outside the identified hot-spots of the national economy.

Does labour mobility influence plant performance?

The findings in Paper I indicated that both specialized and diversified clusters enhance labour mobility, and it is therefore concluded that there is a rather strong relationship between the clustering of activities and the less tangible aspects of labour market dynamism. However, one fundamental question still remains unanswered: If the labour market, as according to Phelps (2004), is the only part of Marshall’s trinity that remains highly localized, does then the mobility of labour produce any significant effects for the plants involved?

The literature is fairly united in the belief that high levels of staff turnover may both benefit plant performance due to the ability to obtain new external knowledge, and help increase the cohesiveness of localized business systems. Apart from the case studies finding a positive relationship between job mobility and clustered activities mentioned in previous paragraphs, the literature also confirms that the mobility of workers itself promotes localized learning and plant performance due to the notion that high levels of job mobility of specialized labour are likely to facilitate the circulation of embodied tacit knowledge and strengthen the social cohesion of the local business system (e.g. Maskell and Malmberg, 1999). This is mainly because embodied knowledge is only available at the workplaces of skilled workers and is costly for other plants to acquire unless the knowledgeable employee changes workplaces (e.g. Zucker and Darby, 1996). In two studies on the semiconductor industry in the Silicon Valley, Angel (1991) and Almeida and Kogut (1999) show that local job mobility enhances knowledge and information circulation between the plants involved and that innovations follow the career paths of key engineers and patent holders within the region. Similarly, Lawson (1999) confirms that a major contributor to regional knowledge creation in the biotech industry in Cambridge is the job mobility between both plants and institutions, which in turn facilitates localized knowledge spillovers. Pinch and Henry (1999) argue that the access to a specialized labour pool within the British motor sport cluster facilitates both knowledge creation and knowledge circulation via the mobility of personnel within the cluster, which thus allows a constant recombination of embodied knowledge.
and is therefore considered vital for the competitiveness of the clustered firms.

Hence, the empirical literature demonstrates quite convincingly that the transmission of knowledge through labour mobility and the performance of the workplaces involved are interrelated. This seems to be the case irrespective of the general dynamism of the remaining local labour market. In addition, persons changing job within a localized cluster may create linkages between plants through social ties between former colleagues (Granovetter, 1973). By arguing that knowledge tends to circulate only within small epistemic communities rather than spilling over to the whole region, Breschi and Lissoni (2003) claim that the social linkages derived from the mobility of employees help both to reduce social distances between plants and to establish local communities of practice, which in turn facilitates further knowledge flows between the associated plants. Since most of the job moves are intra-regional, these social networks are formed locally, and will primarily enhance knowledge accumulation on a local scale (Dahl and Pedersen, 2003), and are occasionally even regarded as the major regulating institution of localized agglomerations (Duranton, 1999).

Despite the potential positive effects of job mobility on regional knowledge circulation, these effects cannot be advocated without some reservation. Apart from the sunk costs many employers associate with skills leaving the plant and the costs associated with integrating new staff in the organization (Almeida and Kogut 1999; Bienkowska, 2007; Becker, 1962), high levels of job mobility may also aggravate local knowledge transfer and performance. For instance, in a study on the effect of local job mobility on the innovative performance of Finnish high-tech plants, McCann and Simonen (2005) report a negative relationship between job mobility and innovative capacity. This relationship is also reported in Wictorin’s (2007) study on the productivity of plants in the Swedish ICT sectors, where it is demonstrated that high levels of staff turnover may also have negative consequences. Thus, different case studies report quite different effects derived from labour mobility, implying that it may be both beneficial and aggravating to performance.

**Paper II: Localized Mobility Clusters**

Nevertheless, there appears to be a gap between the theorization of the potential benefits of knowledge diffusion via job mobility on plant achievements, on the one hand, and empirical evidence, on the other hand. In the literature, the positive influence of mobility is often derived inductively, with scholars mainly finding evidence that employees working within certain success industries located in particular places tend to be highly mobile, without investigating the partial effects of labour flows on plant performance. In addition, the literature focuses mainly on the impact of the spatial movement of star scientists and key persons in certain high-tech industries, ignoring the
fact that knowledge creation and learning form a much broader phenomenon and are equally important for more traditional industries in their efforts to make their daily routines more efficient (cf. Maskell et al., 1998; Engelsoft et al., 2005). Moreover, while both comprehensive case studies (e.g. Power and Lundmark, 2004) and large-scale studies (e.g. Eriksson et al., 2008, this thesis) find evidence indicating a positive relationship between clustered activities and high levels of job mobility, no attempts have been made to systematically define industrial systems based on labour market flows or to determine how labour market-induced externalities influence the performance of plants throughout an entire national economy. Since all plants within a local economy are not by definition inter-linked or affected by each other’s whereabouts (Perroux, 1950), such an approach defining localized business systems based on labour market linkages could bring about further understanding of the potential benefits of co-location given the not so successful approaches of defining and evaluating the benefits of agglomerations, adopting either a top-down perspective (mapping concentrations of industries within regions) or a bottom-up perspective (identifying clusters in pre-specified local areas and industries).

Given that most people change jobs within the same local labour market, Paper II presents a definition of localized business systems based on intra-regional labour flows and then empirically evaluates how local networks of what is defined as ‘localized mobility clusters’ (i.e. a group of workplaces inter-linked by localized networks of job mobility) affect the performance of plants in comparison to traditional top-down perspectives employing location quotients. The initial analysis mapped the presence of localized mobility clusters by connecting all workplaces in the economy to each other in each of Sweden’s 108 local labour markets and then relating the plants via the mobility of their employees. Thereafter, attributes were added for each workplace (sector and both size and composition of employees) and labour market (degree of specialization, diversification and the scale effects related to relative local dominance of one plant) to be able to measure the relative impact on productivity of belonging to a mobility cluster or not.

Results from the analyses indicate that plants related to other plants in the local economy via high levels of both in- and outflows outperformed other similar plants in the region. In comparison to Hoover’s classical agglomeration economies (scale, specialization and diversity), the results also indicate that the external economies of localization and urbanization do not explain any considerable part of the variations in plant performance as compared to the effects produced by linkages established by local flows of labour mobility. However, the results confirm previous findings that absolute and relative size are of importance (Malmberg et al., 2000; Harrison et al., 1996). By also considering the potential negative effects of labour flows, the paper shows that high turnover rates have a short-term negative effect on
performance, implying that sunk costs related to investments in on-the-job training should not be underestimated. In line with Perroux’s (1950) early notions, the overall findings in this paper suggest that spatial proximity and co-location alone do not tell much about geographical differences in plant performance, and neither do the external economies of localization or urbanization. It is rather the untraded inter-plant linkages derived from labour mobility that shape these conditions and make a real difference.

**What is the impact of different skills?**

Based on the discussion in previous sections, it could be argued that the external relations of both localization and urbanization create significant untradeable features in terms of facilitating high levels of local job mobility and that such untradeable linkages are also likely to increase the performance of the plants involved. However, a limitation of the previous analyses on the economic effects of job mobility is that the linkages observed between workplaces via job changes do not distinguish between different types of skills or how these skills match the already existing knowledge base of plants. Hence, the literature almost takes the impact of mobility for granted by assuming that all types of new skills are equally smoothly integrated into the organization, without considering what type of knowledge contributes to increased performance. In addition, previous studies tend to be too focused on the local dimension of labour flows, neglecting the fact that plants and localities are also often inter-related with non-local actors.

Following the literature on spinoffs, it is possible to deduct that the type of mobility occurring when new plants are founded by former employees is also a type of knowledge transfer – from the parent plant to the new start-up – but that the success behind this type of knowledge transfer is dependent on the background of the entrepreneur (e.g. Klepper, 2002; Wenting, 2006). This literature contends that the survival rate of spinoff plants increases when the entrepreneur has a background in either similar or related industries as compared to when an entrepreneur has experience in a very different sector. The notion of the relevance of different types of knowledge is also well understood in the innovation literature, where the importance of absorptive capacity for plants to understand and integrate external knowledge is frequently discussed (Cohen and Levinthal, 1990; Nooteboom, 2000). Nooteboom *et al.* (2007), for instance, empirically demonstrates that there exists an inverted U-shaped function between the cognitive distance with partners in technology-based alliances and their innovative performance. Since new knowledge is produced primarily by combining different pieces of knowledge, no new knowledge is added. On the other hand, if the two partners are too different it is less likely that they share a common language, which will probably cause communication problems and therefore aggravate
interactive learning processes. Therefore, Boschma (2005) stresses that it is essential to recognize that the ability of plants to absorb and utilize external knowledge is not merely a function of geographical proximity. Torre (2008) even contends that physical proximity is only relevant at certain stages of production, in favour of more temporal forms of proximity derived from improved communication and transport technologies.

By applying these insights to the knowledge spillover literature by emphasizing the economic effects of related variety, Frenken et al. (2007) further elaborate on how the industrial setup within regions influences regional growth. According to this literature, it is not sufficient to only distinguish between Hoover’s external economies of localization and urbanization (e.g. Glaeser et al., 1992; Henderson et al., 1995; Malmberg et al., 2000), since diversified regions are likely to produce different types of externalities (e.g. Essletzbichler, 2007; Frenken et al., 2007; Pasinetti, 1993). These are, broadly speaking: (i) spillover effects stemming from inter-plant complementarities; (ii) shock-reducing effects due to the spread of risk between very different industries within a region, and; (iii) variety effects related to how the long-term development of local economies may avoid stagnation by increasing industrial variety. It is therefore essential to make a distinction between related and unrelated variety. Whereas regions characterized by unrelated variety are likely to respond quite well to economic shocks, such regions are less likely to enhance localized learning due to communication problems associated with too much cognitive distance between industries. Regions characterized by high degrees of related (not similar), complementary sectors, on the other hand, are more likely to benefit from knowledge spillovers, spinoffs and inter-plant learning processes due to a greater deal of complementarities, but are consequently more sensitive to sector-specific shocks.

However, as noted in earlier sections, economic geographers tend to emphasize the impact of co-location and geographical proximity on sustaining effective learning processes. While geographical proximity may indeed be beneficial in facilitating the understanding and implementation of new knowledge, Boschma (2005) stresses that proximity can simultaneously be detrimental to continued learning. This is because too much reliance on local knowledge, with only modest impulses from the remaining space economy, can be harmful to the long-term success of plants and regions by causing lock-in effects if no new knowledge is added (Grabher, 1993). To reduce such a risk, more attention is therefore being paid to the impact of non-local linkages (e.g. Bathelt et al., 2004; Scott, 1998). This economic geography literature claims that it is not possible to reveal the causes behind local variations in economic performance unless employing a more relational perspective and also considering the non-local linkages of both plants and regions.
Embedded in the literature on the economic effects of related variety and the importance of non-local linkages, Boschma and Iammarino (2009) proxy international trade linkages as a way for Italian regions to obtain external knowledge and empirically show that the economic performance of Italian export regions was not affected by only having access to extra-regional knowledge unless a certain degree of absorptive capacity was present, making the external knowledge possible to transform to economic value. Their findings indicated that neither linkages similar to what the regions were specialized in nor too-different types of linkages added anything new to the existing knowledge base and therefore did not contribute to further regional growth. However, the regions benefitted from external linkages that were complementary to the existing knowledge base, which made the authors conclude that when the cognitive proximity between the extra-regional knowledge and the knowledge base of the region is neither too small nor too large, external knowledge may contribute to real learning opportunities and regional growth.

**Paper III: The importance of relatedness**

Previous research indicates strong empirical evidence pointing towards the possibility that the ability of regions and plants to benefit from external knowledge is greatly dependent on the cognitive distance between co-located plants as well as between the existing knowledge base and the external knowledge. These insights imply that it is not sufficient to consider the impact of local labour flows on plant performance unless also taking into account how well the external knowledge matches the existing knowledge base of plants and whether the external knowledge is obtained locally or from other regions, bringing in similar or different place-specific skills, respectively.

**Paper III** therefore hypothesizes that when the newly acquired skills are similar to the existing knowledge base, it is possible for the plant to absorb the new knowledge, but that such external knowledge will not add to the already existing knowledge base and will therefore not contribute to plant performance. When the new skills originate from very different (unrelated) sectors, on the other hand, the cognitive distance between the existing and the new knowledge is likely to be too great, implying that the plant cannot easily absorb them and is therefore unlikely to learn and benefit from it. However, for inflows of new skills that are related (complementary) to the existing knowledge base, real learning opportunities are present and such flows should therefore have an economic impact. In addition, the paper expects that inflows of skills already present in the plant may be more beneficial if originating from other regions, since these persons will also bring other types of place-specific skills (re-)produced in other place-specific industrial structures, while inflows of very different skills might contribute to
plant performance if such skills originate from the same region, because such skills are formed by the same local industrial structure as the absorbing plant.

While Paper II focused mainly on the effects of local gross flows on the productivity levels of all plants in the economy, Paper III applies the above notions by investigating the impact of different types of skill inflows on the productivity change between 2001 and 2003 only on those plants with registered inflows of labour. This is because the findings in Paper II suggested that the economic effect of labour flows is not instantaneous. Only modelling the performance of plants with inflows opens up for the possibility to address the partial effects of different types of inflows, not only of inflows as such. Employing entropy measurements to differentiate between similar, related and unrelated competence portfolios (see e.g. Frenken et al., 2007; Boschma and Iammarino, 2009), the initial analyses assess the impact of intra-plant learning and absorptive capacity on plant performance. Next, by comparing the sector of the old workplace with the new one, the paper investigates whether high degrees of similar, related or unrelated inflows are the most beneficial for plant performance and whether or not the impact of the different skills is affected if they originate from the same local labour market or from another labour market with other place-specific settings.

The empirical analyses indicate that a portfolio of related competences significantly increases the performance of plants, in contrast to plant portfolios consisting of either similar or unrelated competences. Moreover, the analyses show that it is not inflows of skills as such that contribute to plant performance, but that it depends on both the type of skill and whether or not the new skills are characterized by different sets of place-specific knowledge. This is because inflows of skills that are related to the existing knowledge base of the plant show a positive effect on plant performance, while inflows of skills that are similar or very different to those already present in the plant did not contribute positively. The results also indicate that geographical proximity influences the effect of different types of skill inflows. Inflows of unrelated skills actually have a positive effect when originating from the same region and therefore also may share a greater deal of place-specific skills, while labour mobility across regions only positively affects productivity growth if the inflows are related to the existing knowledge base.

The paper concludes by stressing the importance of differentiating between different types of external knowledge, since inflows of new knowledge cannot be too similar or too different. Only when externally retrieved knowledge is complementary to the existing knowledge base will real learning opportunities be present. Additionally, the paper also shows that geographical proximity is not a necessary condition for external skills acquired via labour flows to be transformed into economic knowledge, but that geographical
proximity is likely to influence how easily a plant can absorb and utilize different types of skills.

**Does proximity influence the effects of spillovers and knowledge flows?**

While previous sections primarily theorized the relationship between clustered activities and labour mobility by highlighting that both localization and urbanization economies produce significant labour market externalities (*Paper I*) and that such externalities positively affect the performance of plants as compared to plants not intertwined by local labour flows (*Paper II*), it is also shown that it is necessary to differentiate how well the new skills match the existing knowledge base and to consider the geographical dimension of such flows to understand the relative effect of labour market-induced externalities (*Paper III*). However, less attention has been directed at how the interplay between attributes in the local milieu and local and non-local linkages produce geographical variations in economic performance. In particular, the effect of geographical proximity is only indirectly assessed using the spatial range of local labour markets to proxy how the local milieu may facilitate localized knowledge spillovers. However, to more readily addressing the local conditions for production seems to be of particular importance in trying to understand why plants continue to agglomerate despite improvements in transport and communication technologies and the continued separation of activities characterizing the economy.

The literature on agglomerations has focused mainly on trying to find evidence of whether localized externalities derived within (MAR-externalities) or between industries (Jacob’s externalities) best facilitate knowledge spillovers and promote regional growth (e.g. Glaeser *et al*., 1992; Henderson *et al*., 1995; Frenken *et al*., 2007). It is, however, difficult to draw any consistent conclusions regarding which type of external economy is most beneficial, or regarding the spatial range in which such externalities work (Rosenthal and Strange, 2004). For instance, scholars often use predefined spatial units – ranging from zip codes up to national boundaries – to define the spatial range of spillovers (e.g. Dekle and Eaton, 1999; Van Soest *et al*., 2006) and thereby overlook the fact that agglomerations are unlikely to be geographically fixed and externalities are more likely to work across or only partly within conventional administrative borders (Scott, 1982; Anselin *et al*., 1997). Since the geographical dimension of agglomerations is often treated as a fixed definition and not as a specific characteristic of agglomerations in many conventional approaches (see some more statistically advanced approaches below), this implies that analyses relying on administrative borders are spatially biased with only moderate (or no) real connection to the actual spatial range of externalities, or with no explicit focus on the
local dimension of such industrial systems (Martin and Sunley, 2003; Phelps, 2004; Oerlemans and Meeus, 2005).

The need to overcome this conceptual bias and not rely on aggregates bounded within administrative borders is crucial in trying to achieve a greater understanding of the benefits of clustered activities due to a number of reasons. First, as mentioned in previous paragraphs, the knowledge spillover literature recognizes that knowledge is primarily transferred and utilized within a very close distance from where it was created, may be costly for plants at other locations to acquire, and, in addition, often requires face-to-face interaction to be effectively transferred (e.g. Jaffe et al. 1993; Zucker and Darby, 1996; Storper and Venables, 2004; Gertler, 2003). Second, relying on regional aggregates is likely to conceal the fact that different types of agglomerations (i.e. ‘sticky places’) may be located within a regional economy; therefore, a region should be conceived as an amalgam of ‘sticky mixes’ containing different agglomerations, competing at different markets (Markusen, 1996). Third, following the studies by Essletzbichler and Rigby (2005) and Rigby and Essletzbichler (2006) indicating that routines and technologies of plants within a sector tend to be more similar within a region than between regions, it is possible to conclude that increased geographical distance also involves other sets of place-specific routines which may influence the degree of industry-specific affinity. Fourth, and finally, recent studies applying spatial econometric approaches (e.g. Rodríguez-Pose and Crescenzi, 2008b; Sonn and Storper, 2008) find that proximity is crucial for transmitting economic knowledge and that the influence of proximity tends to be manifested over the years, despite improvements in communication and information technologies. However, the findings by Ponds et al. (2009) demonstrate that although the underlying mechanisms shaping the ability to absorb and utilize knowledge are indeed highly localized, collaborative relations may extend over much greater spatial distances, which makes it essential to also consider the non-local relations (Bathelt et al., 2004).

Thus, by taking these notions into consideration it is possible to deduct that in order to address how geographical proximity influences the economic impact of agglomerations, it is necessary to address both the local context of plants and the local and non-local linkages of each plant. By employing a plant perspective and ascribing each plant unique contextual attributes, such a procedure will open up for the possibility to consider within-region variations and more readily address how the dissemination and implementation of sector-specific knowledge is influenced by other sets of place-specific knowledge.

**Paper IV: Localized spillovers and knowledge flows**

The aim of *Paper IV* is to explicitly address how geographical proximity affects inter-plant spillovers and plant performance. By also being embedded
in the economic geographic literature emphasizing the economic impact of related variety and non-local linkages, this is made possible by both considering attributes in the local economy and investigating whether local and non-local linkages via labour mobility may bring in new sets of place-specific knowledge to the plant.

This was conducted by using the spatial coordinates related to each plant in the database, which allows the creation of three different plant-specific neighbourhoods ranging from 500 metres to 50 kilometres. Within each neighbourhood, departing from the methodology presented in Frenken et al. (2007), modified entropy measurements were used to measure how similar, related and unrelated the local industrial setting surrounding each plant is as compared to the industry the plant belongs to. Analogous to Paper III, the number of similar, related and unrelated inflows of skilled labour from both within and outside each neighbourhood was measured to also assess the impact of proximity on labour flows without having to rely on predefined labour market boundaries. Departing from the notions asserted by Boschma (2005), for instance, the paper anticipates that co-location as such will not induce substantial localized spillovers and promote plant performance. Instead, it is expected that effective spillovers that can be turned into economic knowledge and have a substantial economic effect on plants are present when a plant is located in a setting that is complementary to what the plant is specialized in. In addition, it is also reasonable to assume that geographical proximity will influence the extent to which a local setting consisting of very similar or very different industries influence plant performance. A high degree of similar activities within close distance to a given plant is not expected to have a positive impact on performance, since any potential knowledge spillovers in such settings are less likely to facilitate a recombination of different pieces of knowledge. Conversely, since increased geographical distance may enhance the possibility to also acquire other pieces of place-specific knowledge it is expected that high degrees of similar activities may be beneficial at greater distances. For plants located in areas characterized by very different activities, on the other hand, geographical proximity may reduce potential problems associated with implementing very different pieces of knowledge since close neighbours are likely to share the same place-specific corporate culture and routines.

By estimating the productivity growth of all plants within the manufacturing and knowledge-intensive service sectors between 2001 and 2003, the empirical findings confirm that not too much or too little proximity is beneficial for plants. Intra-industry spillovers, typically characterized by high degrees of cognitive proximity, only have positive effects on performance in combination with geographical distance, whereby the possibilities of also acquiring other types of place-specific skills are greater. Geographical distance, on the other hand, tends to worsen the communication problems as-
associated with being located in a very different local setting and thereby does not contribute to increased performance. However, the effects induced by high degrees of complementarities (relatedness) are less influenced by geographical distance. Such local settings produce significant positive effects on plant performance within all distances except within very close distance from the plant. In these vicinities the industrial composition is subordinated to the relative density of economic activities. The empirical findings also show that labour flows from outside the maximum functional hinterland of plants do not contribute to performance or alter the influence of the local industrial composition. Thus, relaxing the influence of administrative borders indicates that the benefits of labour market linkages are primarily a local phenomenon found within 50 kilometres of plants. Only relatively geographically proximate inflows contribute to performance if they are complementary to the existing knowledge base, while geographical distance tends to worsen the negative effect of both similar and unrelated skills.

The paper concludes by stressing that it is not possible to confirm that either specialized or diversified local economies are the most beneficial for the performance of plants. The potential impact of spillovers is rather highly dependent on the distance between plants. Within close distance, the effect of urbanization (density) is most prevalent whereas the composition of economic activities has a greater influence further away from the plant. Regarding the influence of industrial composition, proximity increases the need to be located near different, but related, industries whereas increased distance implies a greater effect of intra-industry spillovers. The paper also shows that labour market externalities are mainly a phenomenon characterized by geographical proximity, implying that other types of non-local relations are more important for acquiring non-local knowledge.
Epilogue

The purpose of this thesis was to shed new light on the theorizations discussing the economic benefits of geographical clustering in a space economy increasingly characterized by globalization processes. This was made possible through the employment of a plant-perspective and a focus on how the relative fixity and mobility of labour influence plant performance throughout the entire Swedish economy. The empirical findings have shown that the circulation of labour skills, produced and reproduced through the place-specific industrial setup, is crucial for understanding the mechanisms creating geographical variations in plant performance as compared to other regional conditions often proxied as relative specialization or diversification. This is because the relative fixity of labour tends to create place- and sector-specific skills which by means of their mobility in space are likely to facilitate the recombination of local skills, make the acquirement of non-local skills possible and secure sufficient affinity between economic actors by strengthening other dimensions of proximity – all aspects regarded as crucial to facilitate interactive learning processes and contribute to sustained regional growth. In short, the empirical findings indicate that both localization and urbanization economies produce significant labour market externalities and that such inter-plant linkages positively affect plant performance as compared to the partial effects of relative regional specialization and diversification. Moreover, it is also demonstrated that it is necessary both to distinguish how well the external skills retrieved via labour mobility match the existing knowledge base of plants and to determine the geographical dimension of such flows to verify the relative effect of labour market-induced externalities. Finally, whereas general urbanization is shown to be beneficial within close distance to the plant, the composition of economic activities is more influential at greater distances. In such cases the geographical dimension influences whether plants benefit from being located in similar or different local settings.

Concluding remarks

The above findings can be summarized under three general headings, which also may help pinpoint directions for future research on this topic. First, the empirical papers in this thesis support the notion put forward by Boschma (2005) that proximity and co-location as such are neither a sufficient nor necessary condition for explaining variances in plant performance, since other dimensions of proximity are also important. It is evident, however, that geographical proximity influences the impact of the cognitive dimension of proximity. The findings in Paper II and IV, respectively employing tradi-
tional location quotients and measuring the sector-specific relatedness of co-located activities, indicate that both relative specialization and diversification contribute to plant performance. However, in line with other findings (e.g. Malmberg et al., 2000), these effects are only moderate as compared to more traditional agglomerative effects internal to the workplaces. Thus, the findings indicate that the performance of plants is not influenced so much by the regional industrial structure as such. Instead, the regional industrial structure indirectly influences performance by conditioning the access to local labour skills.

Still, the thesis has shown that the geographical dimension may influence the impact of external economies. When the cognitive distance between plants is elaborated on, proxied as sector-specific distance, geographical proximity tends to strengthen the impact of inter-industry spillovers on the one hand, but reduce the positive effect of intra-industry spillovers on the other hand. This implies that it is not sufficient to only distinguish whether it is regional specialization or diversification that best promotes localized advantages of plants. The empirical findings rather suggest that the advantages related to the industrial composition are also influenced by the geographical distance between plants. To fully understand the impact of external economies, it is therefore not only essential to recognize that different agglomerations may produce different types of effects (Frenken et al., 2007). It is also crucial to consider that the distance between plants strongly shapes the impact of these linkages. Thus, while the positive impact of being located in a complementary setting has been proven in empirical work advocating the benefits of related variety (e.g. Frenken et al., 2007; Boschma and Iammarino, 2008; Essletzbichler, 2007), the empirical papers in this thesis have demonstrated an initial attempt to more explicitly add a geographical dimension to this body of empirical literature. As exemplified in Figure 1, it is not context or distance that is important; what seems to be of greater importance is the combination of the two.

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<th>Close proximity</th>
<th>Long distance</th>
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<td>Similar knowledge</td>
<td>Ineffective</td>
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<td>Dissimilar</td>
<td>Useful</td>
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Figure 1: Spatial dimensions on the economic impact of external knowledge (source: Eriksson, 2009 in this thesis)
Nevertheless, the ability to absorb and generate new local and non-local knowledge is strongly related to the knowledge bases of specific plants and business systems (e.g. Asheim and Gertler, 2005). Future studies could therefore address how the path-dependent development of plant- and region-specific knowledge bases shape the ability of plants to absorb and utilize new knowledge by employing a more evolutionary approach. Such an approach could provide further understanding of the processes shaping localized conditions in different regions and for plants in different segments of the economy, and bring further focus on the interplay between local and non-local processes.

Second, although concentrations of either similar and related or different industries do not explain much of the observable differences in plant performance, Paper I shows that such concentrations of economic activities produce significant untraded linkages in terms of increased labour market mobility. Both localization and urbanization economies contribute positively to higher levels of regional job mobility. Thus, it is, on the one hand, apparent that a greater share of production is becoming increasingly less dependent on geographical proximity because other types of institutional arrangements, not only relying on physical proximity, can secure both sufficient social and cognitive affinity on the one hand (Bathelt and Schultd, 2008; Torre, 2008; Ponds et al., 2009). On the other hand, it is also evident that both specialized and more diversified agglomerations produce significant localized untraded externalities in terms of increased labour market mobility.

Consequently, this type of untraded externality might be regarded one of the most significant contemporary localized assets (e.g. Phelps, 2004; Power and Lundmark, 2004; Saxenian, 1994), explaining both the continued agglomeration of economic activities and the continued localized production and reproduction of place-specific labour skills that are mutually shaping present local conditions for production. This is not only because the mobility of workers is regarded as crucial for transferring embodied skills between plants. Co-located activities intertwined by labour market linkages are, additionally, likely to be characterized by social proximity, which may strengthen the degree of trust, enable the enhancement of social networks and contribute to institutional embeddedness. Recent theorizations (e.g. Breschi and Lissoni, 2003; Giuliani and Bell, 2005; Hakansson, 2005) contend that in order for co-located activities to be successful, a combination of geographical relations (i.e. co-location) and interaction of skilled workers (i.e. social networks or local epistemic communities) is essential. This is because co-located activities embedded in social networks both help develop and maintain institutional frameworks supporting the local business system, and allow workers in the local labour pool to form local communities of practice. In
such communities, workers are likely to both share common language and technical backgrounds, which increases the sense of similarity and therefore further (re-)produces the place-specific skills of the agglomeration. Local mobility flows therefore not only mediate knowledge circulation within a localized business system; labour mobility also likely promotes social proximity and thereby helps strengthen the local agglomeration.

Accordingly, future studies could also consider how different economic actors, not only plants, are influenced by the mobility of labour. It could be rewarding to more straightforwardly address the social dimension of labour mobility by determining how the degree of social and geographical proximity may influence plant performance. Given the tendency of capital to invest its profits very selectively and the continued ambition of capitalist enterprises to maximize their profits by finding new locations to minimize costs related to wages, being closely interlinked with the local supporting institutions may influence whether or not the local economy will benefit. Torre (2007), for instance, claims that plants both characterized by geographical proximity (co-location) and belonging to a network of similar practices (established by labour flows) are more reliant on their local networks. Since these are costly to replace and re-establish at other locations, a geographical restructuring seems less favourable for plants tightly intertwined with other local actors. Thus, more reproductive dimensions of labour could also be considered in future studies to acknowledge whether or not this may have implications on the future economic development of different regions. For instance, rather than only studying how the conditions of capital are shaped by the relative fixity and mobility of labour, the influence of the intertwinenment of local economic agents by labour flows on the effects on local income levels, levels of employment and which types of jobs are destroyed and created could be addressed.

The third, and final, conclusion to draw from this thesis concerns the relative importance of the labour market in general and the mobility of labour in particular. *Paper II* indicates that the performance of agglomerated plants is not affected much by relative concentrations as such. It is rather the linkages between workplaces established by the social bridging of workers changing jobs within the local labour pool that have a much greater influence on plant performance. Local plants intertwined by mobility flows show significantly higher productivity levels than do similar local plants not connected by labour flows. Thus, similar to what is advocated by Breschi and Lissoni (2003; 2009), the interaction and social networking within epistemic communities formed by workers changing jobs within the local economy seems to be of much more importance.

As demonstrated in *Papers III* and *IV*, however, it is not sufficient to separate the impact of geographical proximity from more organized forms of proximity since they alone may not create adequate logics of both belonging
and similarity to guarantee effective inter-plant learning. Instead, the results confirm the notion that it is the combination of several dimensions of proximity that must be taken into account (e.g. Boschma, 2005; Rodríguez-Pose and Crescenzi, 2008a). For instance, the degree of sector-specific difference established between plants via labour mobility cannot be too small or too great. Similar to the impact of localized spillovers, it is only when sufficient complementarities between the new skills and the existing knowledge base are present that the skills acquired via labour mobility induce substantial effects on performance. This is because inter-plant linkages established via job mobility that are very similar or very different cannot be as readily absorbed and transformed into economic knowledge in the new organization. Contrasting the effects of geographical proximity on intra-industry spillovers, new skills which are very similar to what the plant is already specialized in do not seem to be beneficial at all – not even if these skills are also shaped by other types of place-specific industrial structures. The findings in both Papers III and IV suggest that workers originating from exactly the same sector have either no effect or a negative effect on plant performance. In this respect, it seems that the influence of acquiring other place-specific skills is subordinated to the impact of sector-specific skills characterized by high degrees of industrial affinity. The distance between the existing knowledge base and the new knowledge is thus not great enough to promote interactive learning processes. It is also evident that sharing similar region-specific norms and skills may reduce the communication problems associated with being familiar with very different types of sector-specific technologies. As exemplified in Paper III, unrelated inflows have a positive impact on performance as long as they originate from the same region.

Thus, when studying local conditions for production it is not sufficient to only consider the composition of economic activities in terms of relative specialization or diversification. Since the inter-firm linkages derived by flows of labour to a much greater extent explain the relative variations of plant performance, future studies on local conditions for production should also consider attributes related to the local labour market. However, this is mainly a local effect. The effects of non-local flows are only moderate and, as demonstrated in Paper I, agglomerations tend to restrict mobility out from the system, which implies that potential knowledge transfer via mobility is primarily a result of the production and reproduction of labour skills within the agglomeration. To consider the interrelation between local and non-local linkages, more temporal forms of proximity must be accounted for (Torre, 2008; Bathelt and Schuldt, 2008; Ponds et al., 2009), and a distinction must be made between analytical and synthetic types of knowledge to more properly address the interplay between local and non-local processes in different parts of the economy (cf. Moodysson et al., 2008). Future studies would therefore benefit from employing a more evolutionary approach to address
possible variations for different sectors over the product lifecycle. For instance, as demonstrated by both Henderson et al. (1995) and Neffke et al. (2008), young industries are in greater need of relative diversification whereas mature industries benefit more from the standardized knowledge found in specialized regions. Considering this aspect as well would allow an analysis of which types of geographical settings and labour skills new industries need as they emerge and develop, as well as the retrieval of information about the stages at which geographical proximity is more relevant as compared to other more temporal forms of proximity. Since the positive impact of related variety is very consistent throughout the papers, it could also be gainful to refine the measurement and obtain a measure of revealed relatedness (e.g. Neffke and Svensson Hennig, 2008) to determine which combinations of skills occur most frequently in people and plants. Considering the evolution of skills within single plants would also make it possible to account for the mobility of persons within and not only between plants.

Discussion

It is evident that the economic performance of plants is strongly influenced by attributes in the local economy, despite the seductive notion that globalization processes have evened out geographical variations and created a level playing field with equal opportunities everywhere. The thesis has demonstrated that an explanation behind the continued clustering of economic activities and why particular regions may demonstrate higher levels of economic growth can be found in the labour market and in the embodied skills applied by the workforce in the production of consumer goods and services. This has to do with the local dimension of labour production and reproduction which contributes to the formation of various place-specific skills and learning capabilities related to the region-specific development trajectories. Since the mobility of labour predominantly is a local process, this further shapes different local conditions of production. Nevertheless, the contradiction between increased fluidity of materials and information, on the one hand, and the continued importance of place-specific skills on the other hand is an indication of how capital and labour are simultaneously reproduced at different localities. When analysing the benefits of co-location, it is therefore not possible to separate the agglomeration of firms from the agglomeration of people. The interdependence between regions and people, on the one hand, and between capital and the workforce on the other hand has long been acknowledged by geographers (e.g. Hägerstrand, 1970; Massey, 1984), and will continue to be a focal point due to the escalating geographical separation of production and the tendency that profits achieved in certain production units are becoming increasingly detached from the economic development in the production spaces where they are located.
Following these findings, it could be tempting to advocate policies aiming at increased labour market flexibility to raise the level of labour mobility and thereby strengthen the competitiveness of firms and regions. However, as the empirical findings demonstrate, labour mobility may indeed be beneficial for shaping advantageous conditions for production, but mainly in terms of local mobility, which not is associated with residential mobility. The reliance of capital on the embodied assets of the workforce is still highly profound, despite a continued geographical separation of production. This is related to the fact that all forms of production are socially embedded in a local context, which also signifies the importance of local skills. Since labour mobility may both remove the incentive for firms to invest in their workforce and also bring about increased pressure and social costs for the individual worker, especially if long distances are involved, including a separation from close friends and relatives, the societal gains of a more mobile labour force may not exceed the societal costs. As exemplified in this thesis, this is especially evident on a short-term basis as high levels of staff turnover only produce significant positive effects for plants after a number of years. Thus, it would be more beneficial, from both a societal and a strict economic point of view, to take advantage of the already existing local skills rather than lay off what, at the moment, seems like redundant parts of the workforce and thereby force through a reallocation of persons between regions in the national economy. Since both layoffs and recruiting are costly processes for both individuals and employers, particularly if they also include migration for the individual worker, it would be more beneficial to build on the already present place-specific skills and focus on training programs to re-educate the existing labour pool.

As demonstrated in this Swedish example, a key aspect for understanding present geographical patterns of location and growth is related to how well the local composition of economic activities and labour skills match the specialization of specific plants. While the findings do indicate that urbanization as such is important for creating relative advantages for plants, this is mainly relevant within very close distance (500 metres) from a certain plant. This implies that beneficial place-specific conditions for economic growth cannot only be ascribed the attributes of the large, densely populated metropolitan areas or regional centres in Sweden, since the beneficial conditions explicitly related to urbanization are associated with attributes found on a much more local scale than the region. Thus, the potential for beneficial localized conditions for plants may also be present in smaller urban areas where the spatial concentrations of economic activities can facilitate linkages and interaction with other firms and labour and with supporting local institutions. The relative moderate impact of urbanization is especially evident when analysing the attributes at higher spatial scales and focusing on how the performance of plants is influenced by the region-specific attributes. As indicated by the
empirical findings, the most beneficial attributes for economic location are ascribed regions characterized by complementary activities whereby the ability of plants to recombine different pieces of knowledge is facilitated. Not from the relative density of economic activities as such. In particular, the possibilities for plants to absorb and utilize the complementary skills embodied in the local labour pool are likely to be facilitated by the location in a complementary setting. Thus, although recent theorizations advocate the importance of densely populated large urban areas for promoting growth by providing high amenity values and thereby attracting talented individuals (e.g. Florida, 2002; Glaeser, 2005), this may be crucial for understanding the emergence and competitiveness of new industries associated with creative or talented workers, on the one hand. On the other hand, when trying to achieve a more general understanding of place-specific variations in economic growth, including many different sorts of sectors and workers, it is possible to draw the conclusion that this is not necessarily the case for all types of economic activities. For a great share of activities in the economy, it is more relevant to have access to appropriate skills than to the vibrant buzz of large metropolitan regions. This is reflected in the empirical results, which indicate that the most successful plants are those that can utilize and capitalize upon the local skills and receive non-local knowledge via other, more temporal, forms of relations.

However, a question arising from this insight is of course whether the future performance of plants is in the hands of their personnel manager and recruiters or whether it is more related to the development and setup of industries within local economies. If it is a matter of achieving just the right mix of skills, then these findings may be relevant for organizations in recruiting new skills or investing in training programs for their present workforce, whereas if it is related to the place-specific setup of industries it may be more difficult for single organizations to achieve. In such a case, policies aiming to strengthen the learning capabilities of regions should try to build upon the regional-specific assets and the non-local linkages that have obtained a critical mass in a region to sustain a local industrial setup characterized by related variety (Boschma, 2009). The possibility for plants to acquire complementary skills could then be created by broadening and diversifying the regional economic base and aim bringing together activities with possible complementary pieces of knowledge to support new variety in the local economy.

Nevertheless, in spite of policies trying to even out regional disparities within nations, the exploitation of place-specific attributes on the one hand and the selective rounds of investments on the other are likely to further widen already existing regional disparities. This implies that regional development policies will continue to be an important medium of smoothening processes of creative destruction. However, how such policies are shaped,
which actors they aim to support and who is implementing them, are of course crucial for whether or not they will succeed. A recent trend in most Western countries is to decentralize development policies and promote particular sectors (e.g. biotech, gaming, etc.), which are assumed to be the future drivers of the economy, and actively try to attract creative people (or talents) by offering high amenity values. Whereas this may be successful for growing sectors and already prospering regions which can build on their past success, it is not guaranteed to be the best solution for lagging economies dominated by mature industries. This can be related to mainly two reasons. First, decentralization processes tend to imply greater administrative costs for regions with limited adjustment capacities and thereby manifest rather than reduce disparities (Rodríguez-Pose and Gill, 2004). Second, regions differ in terms of location, knowledge base and institutional structure, and the path-dependent character of economic development entails that localities cannot be turned overnight into innovative, fancy sites attracting the most creative and talented individuals (Scott, 2006; Storper and Scott, 2009). As demonstrated in the thesis, it is not even guaranteed that attracting certain skills from other regions will induce any substantial economic effect for the workplaces involved. But if this were the case, it would be at the expense of those regions deprived of these skills, thus further manifesting already existing regional disparities. Rather than being perceived as a regional development agenda aiming to reduce regional disparities and increase national welfare, this may be more a reflection of a shift in society in which it is more interesting to reinforce competitiveness among already competitive actors and focus on regional success stories and talented individuals rather than on the silent majority constituting the fundamental base of national and regional economies.

This thesis has made an initial attempt to more systematically focus on the workforce in the analysis of geographical variations in plant performance, but there are more challenges ahead. In demonstrating that the agglomeration, and spatial actions, of the persons within the workforce are influential in shaping beneficial conditions for production also outside the often-studied global and national hot-spots, it is important to note that the fortune of prospering firms and industries is often related to the relative misfortune of others. This entails various opportunities and constraints for different people employed in different types of industries and regions throughout the national economy. Thus, the almost 40-year-old question posed by Torsten Hägerstrand, ‘What about people in regional science?’ is as important today as it was then. Perhaps the time has come to leave the high-tech regions and ‘talented’ people behind, as they are most likely succeeding anyway, and rather turn our focus to the processes shaping the economic activities in lagging regions and the everyday life of all those on the socio-spatial margins. Being more sensitive to the different socio-spatial arrangements af-
fecting people both within and temporarily outside the workforce could further contribute to our understanding of the underlying mechanisms and consequences of industrial decline and renewal. This would subsequently help shed light on why some localities in the space economy prosper while others do not, as well as help us understand the different possibilities and constraints for people in coping with the challenges associated with the continuous gales of creative destruction characterizing the contemporary space economy.
Svensk sammanfattning

Vilka faktorer i närmiljön som bidrar till företags konkurrenskraft har under lång tid intresserat ekonomgeografer och forskare i angränsande discipliner. Från att främst ha studerat de kostnadsreduceringar företag kunnat erhålla genom samlokalisering i specialiserade eller diversifierade miljöer (lokaliserings- eller urbaniseringsfördelar), har under senare år allt större intresse riktats mot hur närmiljön påverkar företagens innovationsförmåga och möjligheter till lärande och förnyelse. Detta gäller inte bara högteknologiska verksamheter utan också mer traditionella sektorer i ekonomin där innovationer och lärande kan effektivisera hanteringen av produktion och service. Eftersom kunskap är bunden till individer samtidigt som arbetskraften är den mest platsbundna produktionsfaktorn i en allt mer globaliserad ekonomi, är avhandlingens utgångspunkt att den lokala arbetskraftssammansättningen och den lokala arbetsmarknadens funktionssätt spelar en avgörande roll för att förklara geografiska skillnader i företagens förnyelseprocesser och konkurrenskraftsutveckling.

Syftet med avhandlingen att belysa hur samspelet mellan arbetskraftsrörlighet och egenskaper i den lokala ekonomin påverkar företags förmåga att absorbera och generera ny kunskap som kan bidra till ökad konkurrenskraft. Avhandlingen består av en kappa och fyra artiklar. Studierna baseras på svenska registerdata som omfattar alla företag och all arbetskraft i Sverige.

Artikel 1 utgår från grundhypotesen att rörlighet antas vara gynnsamt för företag men att företag lokaliserade i olika typer av agglomerationer (geografiska koncentrationer av liknande och relaterade verksamheter, eller koncentrationer av olika typer av verksamheter) antas ha olika möjligheter att dra nytta av arbetskraftens rörlighet. Genom att kontrollera för en rad faktorer på individnivå som tidigare litteratur visat påverka rörlighet inom och mellan lokala arbetsmarknader, visar analysen att arbetskraftsrörligheten är högre i diversifierade arbetsmarknader i förhållande till arbetsmarknader som domineras av en eller ett par stora arbetsplatser. Det är dock inte bara stora och diversifierade arbetsmarknader som uppvisar högre dynamik. Även i små arbetsmarknader, som vanligtvis brukar förknippas med relativt låg rörlighet på grund av ett begränsat antal potentiella arbetsgivare, kan dynamiken på arbetsmarknaden vara väldigt hög. Det rör sig främst om specialiserade arbetsmarknader med relativt höga koncentrationer av liknande och relaterade företag. I sådana mindre arbetsmarknader tenderar också jobbeyten ut från regionen vara mindre vanligt förekommande. Slutsatsen i artikeln är att den lokala sammansättningen av ekonomiska aktiviteter spelar en betydande roll för att förklara relativa skillnader i lokal rörlighet. För företag lokaliserade i stora, diversifierade arbetsmarknader samt i små men specialiserade arbetsmarknader är möjligheten större att erhålla ny kunskap.
Artikel 2 fokuserar på rörlighetens effekter på företags konkurrenskraft. Tidigare studier har lyckats identifiera ett positivt samband mellan, å ena sidan, koncentrationer av liknande företag (inom kluster, agglomerationer etc.) och arbetskraftsrörlighet och, å andra sidan, kunskapsspridning och arbetskraftsrörlighet. Dessa studier har dock varit väldigt fokuserade på arbetskraftsrörlighetens positiva effekter inom högteknologiska sektorer och regioner (exempelvis Silicon Valley). I artikeln söks därför efter ett mer generellt svar på rörlighetens effekter genom att här studera hur alla typer av verksamheter i den svenska ekonomin påverkas av rörlighet inom lokala arbetsmarknader. Detta möjliggörts genom att sammanlänka alla företag inom lokala arbetsmarknader i nätverk av jobbrörlighet för att analysera effekten av att tillhöra de mer dynamiska delarna av arbetsmarknaden i förhållande till de potentiella agglomerationsfördelar företag kan åtnjuta. Resultaten visar att företag som är länkade med varandra inom den lokala arbetsmarknaden presterar förhållandevis bättre än liknande företag som inte har samma grad av konnektivitet. Även om rörligheten i sig har starkare effekt än mätten på regional specialisering/diversifiering är det dock interna faktorer (bransch, storlek, utbildningsnivå etc.) som påverkar konkurrenskraften mest. Studien visar även att på kort sikt verkar en hög grad av arbetskraftsomfördelning ha negativa effekter på företagens prestationsförmåga men att rörligheten påverkar företagens prestationsförmåga i positiv riktning på lite längre sikt.

I artikel 3 förfinas analysen i föregående artikel genom att studera effekterna av inflöden av olika typer av kompetens i förhållande till den kompetens som redan finns inom företaget. Det finns exempelvis anledning att anta att all typ av kunskap inte lika lätt kan absorberas och implementeras i en ny organisation om den nya kunskapen är allt för olik den redan befintliga. På samma sätt är det inte heller troligt att ny kunskap som är alldeles för närbeslättd med den redan befintliga kommer att kunna bidra till ökad prestationseffektivitet eftersom ny kunskap i huvudsak bildas genom att kombinera olika typer av redan existerande kunskap. Istället är det rimligt att anta att ny kunskap via arbetskraftsrörlighet behöver skilja sig från företagets redan befintliga kompetens. Den får dock inte vara för olik utan bör vara komplementärt (relaterat). Först då kan ny kunskap absorberas, implementeras och bidra till ökad konkurrenskraft. Analyserna visar att en kunskapsbas bestående av komplementära kompetenser är mest gynnsam för företags produktivitetsutveckling i förhållande till kunskapsbaser som är väldigt homogena eller heterogena. Analyserna visar också att bilden av arbetsmarknadsrörlighetens ekonomiska effekter inte blir fullständig genom att endast studera nettoflöden av arbetskraft. Istället är det av yttersta vikt att skilja på vilka

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sektorer den nya arbetskraften har erfarenhet från och om arbetskraften rekryteras inom samma arbetsmarknad eller från andra arbetsmarknader. I förhållande till inflöden av arbetskraft som antingen kommer från exakt samma eller från en helt annan sektor som det rekryterande företaget, är det inflöden från komplementära (relaterade) sektorer som är mest gynnsamma. Det finns även en tydlig geografisk dimension i detta. Relativa skillnader i teknologianvändning, rutiner etc. mellan sektorer som gör att vissa typer av kompetens kan vara svårt att implementera i andra verksamheter, kan faktiskt bidra till företagens förenelsekraft om kompetensen rekryteras lokalt jämfört med om den nyanställd kommer från en annan lokal arbetsmarknad.


Det är relativt tydligt att de ekonomiska effekterna av företagsagglomerationer inte kan studeras utan att ta hänsyn till agglomerationer av arbetskraft. På senare tid har stadsstorlekens betydelse för lokala variationer i tillväxt betonats i litteraturen. Analyserna i denna avhandling kan dock inte finna några entydiga bevis för att företagslokalisering i stora tätbefolkade
områden är mer gynnsam för företag jämfört med lokaliserings i mindre orter. Istället verkar en viktig aspekt för att förklara närmiljöns betydelse i en allt mer globaliserad ekonomi vara relaterad till arbetsmarknaden och till utbudet av lokal arbetskraft. Det är dock inte arbetskraftsutbudet i största allmänhet som är av betydelse utan tillgången till komplementär kunskap. Eftersom arbetskraften produceras och reproduceras genom de olika typer av verksamheter som finns på olika platser är därför behovet att vara lokaliserad nära komplementära verksamheter särskilt viktigt. I sådana miljöer finns det både möjlighet att erhålla viktig ekonomisk information genom att ’bara vara där’ samt att öka möjligheten att kunna rekrytera arbetskraft med komplementär kunskap.


