

Competitive capitals

**Performance of Local Labour Markets – an International Comparison
Based on Gross-stream Data**

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Stockholm, Sweden
2000

Contents

Preface.....	5
Abstract.....	6
Introduction.....	7
Local Labour Market Performance and the Heterogeneity of Human Capital.....	7
Learning from Better Performing Labour Markets	7
Local Labour Market Processes	9
Modes of Activating Knowledge	9
Explaining Patterns of Labour Mobility.....	10
Labour – Heterogeneous supply, heterogeneous demand.....	11
Segmented Labour Markets – Regional Dualisation.....	11
The Metropolitan Labour Market.....	12
Production Environment in Local Labour Markets.....	13
Towards a Comparative Analysis.....	14
Characteristics of the Capital Regions in Nordic Countries	14
Performance of the Capital Region’s Labour Market in Iceland	15
Differing Arenas for Labour Market Careers.....	17
Analysing Local Labour Market Performance.....	18
Empirical Results: Competitive Capitals.....	20
Adaptability to Structural Change in Nordic Capital Regions.....	20
Activation of Human Capital – Vacancy filling.....	20
Level of Self-sufficiency in Local Labour Markets	21
Adjustment by Inter-Sector Mobility	21
Job Exports and Imports by Labour Migration	22
Differently Performing Capital Regions in National Context.....	22
Concluding remarks	24
References	26

Preface

This working paper on Competitive Capitals is an international comparison of the performance of local labour markets in four Nordic capital regions. The study is based on gross-stream labour market data.

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This working paper is prepared by a Nordic research team, which has been co-operating on labour market analysis since 1996. The team consists of:

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Stockholm, October 2000

Abstract

The purpose of the paper is to contribute to the theoretical discussion on the factors behind the varying performance of local labour markets in a national and international context. Performance here is defined in terms of the rate of activation of different segments of the labour force and focuses on the mobility of human capital. Another aim is to develop a methodology for empirical analysis of the dynamics of differing labour markets, in this case the capital region related to the average local labour market in Finland, Iceland, Norway and Sweden. Annual gross-stream employment statistics are used throughout the analysis. The study is expected to guide regional development strategies, including policy measures for activation of all segments of the labour force.

Introduction

Local Labour Market Performance and the Heterogeneity of Human Capital

Across Europe, regionalized industrial policy, broadly described as better coordinated sector policy actions, is becoming increasingly important in promoting regional competitiveness. In implementing this policy, the efficient matching of local demand and supply of labour at different qualification levels is considered to be one important prerequisite for both economic growth and social cohesion. Hence, more or less explicitly, regional development programmes are designed to improve the performance of functional local labour markets (LLMs). As strategic planning and the implementation of regional policy are gradually decentralised and transferred to the regional level, comparative analysis of regional labour market processes becomes an increasingly important task for regional planners. This includes analyses of structural change towards the knowledge society and of the mobility of human capital. It also includes analysis of the production environment, i.e. the location of higher education institutions, business services and transport systems, as well as the institutional frameworks.

The increasing attention paid to human capital in regional development planning has to do with the fact that, as markets open up and new technology is available more frequently, regions and corporations have to deal with increasing complexity and uncertainty. Business firms try to cope with this by developing an integrated business strategy and recruiting labour with both specialised and general skills. Usually such strategies include increasing the quality of products and developing new products, marketing and various other actions intended to control the uncertainty (Fonda & Hayes, 1988).

Productivity is generally expected to increase as a result of on-the-job training, and through recruitment of labour with fresh education or professional experiences. In all industrial sectors improvement of product and especially service quality can generally only be achieved by the use of qualified labour. A climate for innovations often requires repeated creative meetings of and co-operation by persons with quite different skills. Hence, many comparative analyses of competitiveness between corporations and regions underline the need for heterogeneity of labour. It is not only a matter of human resource management and recruitment strategy at the level of the corporate firms. It is also obvious at the macro level, i.e. concerning strategies for sectors and regions trying to cope with changing markets and technologies (van der Laan & Ruesca, 1998).

Learning from Better Performing Labour Markets

In all Nordic countries, the capital regions are found to be not only the largest labour market areas, but also those having the relatively largest supply of qualified labour (Table 1). In terms of labour market performance, they are generally among the labour markets in respective country showing the lowest rates of unemployment, regardless of the business cycle. Economic performance measured as gross regional product per capita is also relatively high in all Nordic capitals. On the other hand, certain bottleneck problems often appear first in metropolitan regions. A sizeable labour market also generally means a wide variety of industrial sectors, among them a large proportion at the early stages of the product cycle. Finally, the capital regions in the Nordic

countries all have a long record of positive net migration versus the other regions of each country. This last item could be interpreted as a composite advantage over many other regions in terms of the number of attractive forces – related to economic, social and cultural factors.

Table 1. Indicators of economic and labour market performance in capital regions and country averages in Finland, Iceland, Norway and Sweden

Indicator ⁱ	Helsinki - Helsingfors (Finland)	Reykjavík (Iceland)	Oslo (Norway)	Stockholm (Sweden)
Population in LLM Mill ⁱⁱ (Index=average/LLM)	1.14 (0.06)	0.17 (N/A)	0.94 (0.04)	1.83 (0.08)
University degree ⁱⁱⁱ (Index, Country=100) 1996 (Norway 1997)	179 (100)	131 (100)	141 (100)	147 (100)
Unemployment (Index, Country=100) 1998	79 (100)	117 (100)	89 (100)	78 (100)
GRP/capita (Index, Coun- try=100) 1996 (Norway 1995) ^{iv}	137 (100)	105 (100) ^v	142 (100)	122 (100)
Internal net migration in % of total population 1997 (Norway: to job in percent of pop. in working age)	0.9%	0.3%	0.8%	0.8%

Hence, in many respects, the capital regions in Nordic countries display economic competitiveness and labour market excellence in relation to most other regions in respective country. We envisage that, through a comparative analysis with a “leading” region (1) *within the country*, private and public actors in any region can learn about factors can conceivably improve the production environment. We also hypothesise (2) that leading regions of each country can learn about the outcome of differences, particularly in the institutional framework, by analysing and comparing the performance of *corresponding regions in other countries*.

This directs us to a *bench-marking* approach to labour market analysis. In this paper, we will explore a methodology making use of available statistics. Theoretical considerations for the analysis will be derived from human capital and labour market segmentation theory. Against this background, the overall *purpose of this paper* is:

- Firstly, to refer to the theoretical discussion on the factors behind varying performance of LLMs in a national and international context. Here, performance is largely defined in terms of the rate of activation of the different segments of the labour force;
- Secondly, to suggest a methodology for empirical analysis of the dynamics of differing labour markets, in this case the capital region related to the average LLM in each country (Finland, Iceland, Norway and Sweden). In the end, such an analysis is expected to guide regional development strategies including policy measures for activation of all segments of the labour force;

- Thirdly, to make an international comparison of the profile and performance of relatively well performing LLMs, in this case the capital regions of Helsinki, Reykjavik, Oslo and Stockholm. This empirical analysis serves as an introduction to a discussion on the differing institutional settings in terms of industrial, education and labour market policy between the respective countries.

Annual gross-stream labour statistics provide useful tools for this analysis. These data allow for a multidimensional analysis of labour market mobility, i.e. in geographical terms as well as between sectors, and according to the qualification of the labour force. In this approach, labour mobility is described as *aggregates of individual careers* at and between LLMs. Based on this emerging knowledge of the structure and function of labour mobility, we will suggest how human resource management could be integrated in strategic regional planning.

Local Labour Market Processes

Modes of Activating Knowledge

The qualification of the labour force is a complex concept. Economists stress the role of four less tangible factors of labour force qualifications in maintaining business firms' competitive strengths. The first of these factors is management skills, which include consistent incentives within the firm and suitable organisation. The second is knowledge, i. e. in order to ensure innovation and increased productivity and the high quality of products. The third is co-operation, both within the business firm, but also with suppliers and customers. The fourth is flexibility, which represents the ability to adapt rapidly to internal or external changes, particularly concerning markets (OECD, 1996).

These less tangible factors are different from the more tangible resources, such as raw materials, equipment and labour, described as a homogenous category, since most of them only have an effect when embodied in motivated people. Human capital is useful for the firm as a part of its competitive strategy *only as it is activated*, i.e. when the knowledge of the staff prompts economically significant action.

The difference between the concepts of knowledge and human capital is – according to Machlup (1984) - that human capital is active, while knowledge sometimes can be passive. Machlup distinguishes three types of knowledge and, accordingly, three potential categories of human capital:

- a. Knowledge embodied in individual persons, who are trained in specific skills
- b. Knowledge embodied in machines and tools especially developed in research and development
- c. Non-embodied knowledge created and disseminated at a cost but not inseparably embodied in any particular knowledge carriers (of type a) or any particular products (of type b).

All these kinds of knowledge are important in order to improve the competitive strength of a firm, an industrial sector and a region. In this paper, we focus on the importance of activating knowledge of the first category mentioned. As we have an empirical approach to describing and analysing the impact of knowledge and human capital input on a regional economy, we need an *operational definition* of the knowl-

edge embodied in labour. Hence, in the empirical analysis based on official register data, we are left with a definition based on the level of formal education of each individual.

This is justified by the fact that the character of knowledge as a less tangible factor does not mean that assessment and validation of knowledge is not practised. In fact, this is one of the important tasks of universities and professional associations in order to certify certain professions or skills. However, we are also aware that it is no simple task for an employer to determine what skills a person possesses, and in particular what ability he or she has to activate the formally acquired knowledge that is attested to by diplomas.

Explaining Patterns of Labour Mobility

Most mobility in the labour market is a consequence of the fact that people change their working place without changing their geographical location. Only a minor part of the total mobility is connected with migratory movements between different LLMs. All kinds of labour mobility are, however, dependent on the business cycle and the transformation of the economy, as well as on demographic and institutional factors. The supply of labour is dependent upon changes in these variables. This is valid concerning the demand for labour and also for unemployment, as well as labour shortage. The distance between LLMs is an explanatory factor with regard to migratory movements. This can, however, be compensated for by the sizes of the in- and out-migration areas in the sense that a large LLM has a larger inflow of people than a small one. This is valid in terms of the numbers of in-movers, but in relative terms, the evidence indicates that small labour markets have higher intensities of both in- and out-migration than do bigger ones (Johansson & Persson 2000).

In theory, most labour mobility is assumed to be associated with differences in supply and demand of labour both at the local and regional level – differences that create various forms of unemployment and vacancy chains. Through rational decisions, labour is supposed to move from low-paid to well-paid jobs, from unemployment to employment, from declining industrial sectors to expanding ones and, thus, also from stagnating or declining regions to expanding and dynamic ones with a surplus of jobs. The rate of mobility – especially geographical mobility – is moderated by demographic factors: younger persons with higher education dominate in figures of mobility in general and migration in particular. According to the human capital theory, these persons are considered to benefit more from migrating and/or changing their labour market situation, since their investments in education have to be paid off as soon as possible (see e.g. Stark, 1991, Champion and Fielding, 1992). Migration is usually connected with a depreciation of a person's accumulated social capital and then investment in forming new social capital. Also, inter-sector mobility is expected to be more frequent among younger people, who have not yet embedded extensive sector-specific knowledge through a long professional career.

However, the size and diversification of LLMs are complementary in the sense that a diversified labour market, such as the metropolitan one, is more self-sufficient with regard to differing categories of labour than a smaller one. Out- and in-migration intensities are also correlated to each other as a consequence of the greater dependence upon external recruitment by the small LLMs to fill up their vacancies – vacancies

that in many cases are consequences of external departures (see e.g. Johansson & Persson, 2000).

Labour – Heterogeneous supply, heterogeneous demand

The idea that labour mobility is rational from an individual point of view is a central ingredient in human capital-based migration theory. From calculations of expected real income, where mobility or moving costs are included, a decision is made as to whether or not moving or changing jobs is advantageous. This implies that it is the total expected income more than present income differences, which forms the basis of economic migration decisions. These calculations can be extended to include psychological costs (Sjaastad, 1962), and judgements on quality of life and amenities (Liu, 1975). Migration and job mobility within the LLMs, especially with regard to metropolitan areas, seem to be connected with higher incomes. Out-migration from the metropolitan areas usually “results” in lower incomes (Johansson & Persson, 2000).

Income differences are not, however, the only factors figuring in decisions behind labour mobility. The possibility of obtaining employment is also of central importance. This can imply that e.g. a migration decision may be rational despite the fact that immediate employment is not obtainable in the destination region if expected future income still exceeds that obtainable at home. If the potential migrant is unemployed in the home region, the decision to move becomes, of course, simpler. The future benefit of a mobility decision is thus dependent upon future differences in real income in the destination and home regions plus the probability of finding work in the destination area. One prerequisite for this mobility pattern is that the in-migration area be more diversified than the out-migration one. This reasoning is based on Todaro's theory, which is also applicable to mobility and migration in well-developed countries, both concerning rural-urban migration and migration from small or medium-sized towns to metropolitan areas (Todaro, 1980). This will also stimulate the mobility within the metropolitan areas as many of the newcomers have weak connections to the primary labour market with permanent jobs.

Matching problems have always existed in the labour market. In earlier times, these problems were primarily a result of structural change in the economy at the industry or sector level. Some industries declined while others expanded, and this was seen as no great problem but as a natural result of structural change. This process is usually associated with transfers of resources between different companies, industries and sectors. As mentioned before, the Fordist economy required labour with “standardised competence”, that is, labour which could be directly placed in simple, repetitive tasks. The problem was merely to channel the newly unemployed to those industries and sectors that needed workers.

Segmented Labour Markets - Regional Dualisation

A common problem in many LLMs today is the existence of both shortages and surpluses of labour within and between companies, industries and LLMs. One of the reasons for this is the accentuated segmentation both within and between differing LLMs. A *segmented labour market* consists of a number of sub-markets, which are more or less separated from one another by various obstacles, resulting in a heterogeneous labour force characterised by lack of substitutability between different labour force segments. These sub-markets have their own supply and demand situations,

their own wage structures and their own surpluses or shortages of labour. Mobility between the different segments is low, while it is high within the individual segments. This reasoning implies, thus, that the labour force is not homogenous but rather heterogeneous and that the labour force consists of several separate “vintages” or segments on both the supply and demand sides. This also implies that the supply curves for the different segments are not the same and that similar mobility stimuli can have different effects on different groups. This phenomenon has also been a central ingredient in the segmented labour market theory since the early 70s (see e.g. Bluestone, 1970; Doeringer & Piore, 1971; Vietoritz & Harrison, 1973).

Segmentation of the labour force with regard to the supply side corresponds to its segmentation with regard to the demand side. There also seems to be an increased interdependence between the labour force and the structural transformation of the economy – interdependence between the labour force and the development of new products and investments in new production processes, with the labour force being complementary to the new technology. The vacancy chains are expected to vary between labour force segments and correspond only partly to the supply of different kinds of labour. This phenomenon is also valid concerning the relations between different LLMs and regions with different economic structures and development.

The mismatch on the labour market seems, thus, to have been accentuated during the structural transformation of the past decades. Labour markets in different regions have different compositions. The labour required by a metropolitan labour market in the post-Fordist society is also different from that required in big factory towns still in the Fordist phase of development. Especially the metropolitan regions are characterised by a high degree of knowledge-based activities that demand highly educated labour. A social hourglass has increasingly replaced the social pyramid in the metro areas, where the lower portion consists of workers in the lower segments of the private service sector. This type of segmentation and social division is, however, not as accentuated in rural areas or in small and medium-sized towns, where the shares of moderately and low educated people in “traditional” jobs is higher. The division of labour has, thus, increasingly been a regional division of labour, with an accentuated regional polarisation as one result (Massey, 1995; Johansson, 1996; Cars & Johansson, 2000).

The Metropolitan Labour Market

The above discussion indicates that the labour market in metropolitan regions differs from other types of labour markets. Demand for highly educated labour is greater in the metropolitan areas and the supply of qualified labour can increase in three different ways. Firstly, it is a cohort phenomenon. As one cohort leaves the labour force, a new one will enter; this is a slow process of renewal of the labour force. The second way is an up-grading of the qualifications of the labour force in all categories. This is an investment in human capital by the public education authorities or the enterprises. In the latter case, this will restrict mobility, as the firms involved firms will want a return on their investment, which will stimulate labour hoarding. Even for the individual an up-grading of competence level can be seen as an investment. These two ways of satisfying increased demand for highly educated labour are, however, not specific to the metropolitan labour markets but rather a general phenomenon. It is most clearly discernible, however, in metropolitan areas or at least in labour markets that are in a phase of rapid transformation and expansion. The third way of meeting demand for more qualified labour is in-migration of highly educated labour to the

metropolitan areas, which will result in brain drain and an accentuated regional polarisation. The outcome is not only a high share of highly educated labour in the metropolitan regions – the metropolitan LLM is also a region characterised by considerable numbers of young people with or without jobs and a high redistribution of people between various jobs and activities (Johansson & Persson, 2000).

Production Environment in Local Labour Markets

We suggest that strategies developed by corporations and regional partnerships need to be based to a greater extent on objectives and measures to improve activation of knowledge and competence. Less tangible factors are becoming more recognised as important for economic growth. Not only knowledge of the production process, but rather of the entire production system, logistics, markets and the organisation is important. More attention is now given to the *dynamics of the production environment* in

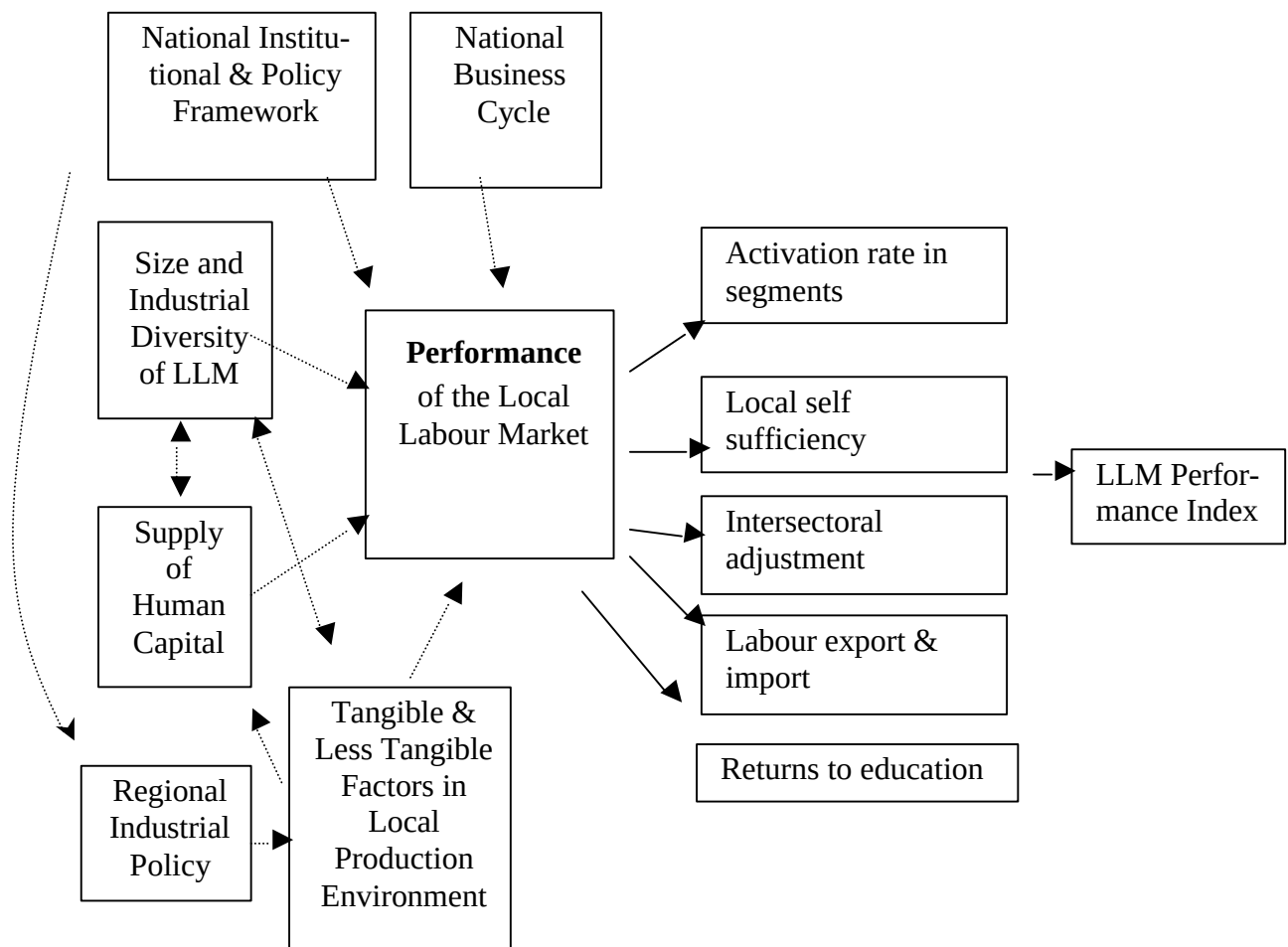


Figure 1. Qualities of the regional and national production environment and labour market performance.

regions. The national and regional institutions facilitating mobility at the LLM, including facilities for education and training, are important elements in this production environment (Figure 1).

The territorially defined production environment is largely synonymous with the functional LLM area. The way countries are split administratively into municipalities and counties, rarely coincides with their functional regions, which are created by the various choices and decisions of individuals and business firms. Functionally coherent LLMs serve as useful divisions. These are the areas within which the businesses concerned have to recruit most of their labour force. The quality of labour force to be found within the functional regions is expected to have a strong influence on both their productivity and prosperity.

The LLM regions, which are based on currently registered commuting connections between municipalities, change according to trends in employment, settlement patterns, the infrastructure and communications, as well as the willingness of the population to commute. For instance, if the same criteria are used to link municipalities together according to dominating commuting flows, the number of “independent” LLM regions in Sweden decreased from 187 in 1970 to 109 in 1997 (Kullenberg & Persson, 1997). By comparison, the country currently has 288 municipalities. Men's labour market regions are larger than women's and people with high educational qualifications travel to work within larger labour market regions than do those with low educational qualifications. It is conceivable that this process of “regional enlargement” will continue with improved road infrastructure and fast regional rail systems, allowing local mobility to eventually replace geographical mobility.

This indicates that the size of the local market will assume an ever-more important role in future developments. This is also evident if the width of the industrial structure is analysed. There is a strong correlation between the number of industries present in and the size of the LLM area. For instance, the Stockholm LLM, which is by far the largest in Sweden, contains almost 600 different industries (5-digit level). A typical regional centre in Sweden with a university will have approx. 250 industries, while each of the numerous small-town-based LLMs typically have less than 100 industries. These figures in themselves indicate that regional enlargement – i.e. more extensive commuting – is more or less the only way to increase the diversity and the dynamics of the many small LLMs in Nordic countries. It should, however, be remembered that also these possibilities are limited for reasons of distance, especially in the sparsely populated parts of the countries.

Production conditions in the regions differ widely within any country and even more so between regions in different countries. What we here refer to as a regional production environment includes, for example, the size of the LLM region, its supply of human capital, the dynamics of its trade and industry, various aspects of accessibility and communications, etc. Other less tangible factors, such as the quality of life, the climate for industry, the spirit of entrepreneurship, culture, etc., may also be included among regional production conditions.

Towards a Comparative Analysis

Characteristics of the Capital Regions in Nordic Countries

Helsinki is the largest city in Finland and the country's capital. Its residents numbered 540 000 at year-end 1997. The city is part of the province of Southern Finland. 15% of the job positions in the whole country are situated in Helsinki (and 27% in the Helsinki district) and most of them (4/5) are in the field of service. The activities most

typically located in the Helsinki district are finance and business services, wholesale trade and, in manufacturing industry, the electronic and graphic industries, and construction. Most of the headquarters of the major domestic enterprises are situated in Helsinki. In addition, the country's largest port and international airport are found here. A wide variety and great quantity of education, at various levels, is offered in addition to diverse cultural services. There are seven higher education institutes in Helsinki and one in the neighbouring municipality of Espoo, plus over 70 vocational institutes and a polytechnic in the capital district. Despite the seemingly abundant educational offerings there are not enough further education study places for youth in Helsinki after completion of secondary school. Helsinki attracts students from elsewhere/all areas of Finland to its seats of learning (Kaupunki-indikaattorit 1998). 19 municipalities are included in the Helsinki LLM.

In the same context, the *region of Oslo* consists of the Norwegian capital, Oslo, and the surrounding county of Akershus, and is further divided into 5 economic regions and 23 municipalities. The Oslo region contains more than 20 percent of Norway's total population and is the most densely populated region in the country. The number of children in the region grew in the 1990s while, like most other regions in Norway, Oslo experienced a decrease in population aged 16-24 years. The main group of working age people has grown rapidly in the region during the last decade. The Oslo region experienced very high net migration in the second half of the 1990s with a somewhat falling tendency towards the end of the period due to high prices and supply problems in the housing market. The region of Oslo reported the lowest percentage of persons with only secondary education in both periods. One important reason is the high percentage of people with higher education, representing almost one-third of the population aged 16-64 years in 1997.

The Oslo region is the centre of Norwegian trade, banking and administration, the main communication junction and the country's leading cultural centre. Its economy is dominated by market and non-market services, while manufacturing is declining. Among industries, printing and publishing are particularly concentrated to the Oslo region. The central location is also the location of the greatest share of services in wholesale merchandising, finance and information technology, while higher education/research and development are, as expected, most important in the largest university regions.

Ca. 1 803 000 people live in the *Stockholm region*, which accounts for one-fifth of the country's employment; more than half of Sweden's major companies have their head offices here. The Stockholm region has the highest concentration of research activity in the country. Arlanda is one of Europe's largest airports and nearby, in northwest Stockholm (Kista and environs), lie three-quarters of the Swedish information and electronics industry. The public sector is the largest single employer in Greater Stockholm, explained by the fact that many state-run activities are situated in the capital. There is also a concentration of private service branches, such as wholesalers and financial companies.

Performance of the Capital Region's Labour Market in Iceland

The Icelandic capital Reykjavík is by far the largest city in the country with its 108 000 inhabitants at year-end 1998. The city is the centre of mass media, government, trade and commerce, culture, as well as higher education. The share of Reyk-

javík in the total population of Iceland was 39.4 percent in 1998 and that is the highest proportion among the capital cities in the Nordic countries. Net migration to the greater Reykjavík area has been as high as 2 percent per annum in the period 1980-1996. People of all age groups and with quite varied skills have migrated to the capital area.

The Reykjavík labour market area includes a total of six municipalities. In addition, Akranes, a town on the west coast of Iceland became a part of the Reykjavík labour market with the opening of a tunnel in 1998, making it possible to drive to Reykjavík by car in about 40 minutes. In November 1998 there were 95 800 individuals active on the capital labour market, which means that 62 percent of the country's labour force is located in the capital area. The majority of these people are employed in the service sector, which comprises 73 percent of total economic activities.

The performance of the national labour market is relatively good in Iceland, as is, for instance, manifest in very high participation rates in most age groups, and low unemployment rates. The Icelandic economy was beset by a recession in the 1990-95 period, followed by an upswing 1996-2000. In the period 1990-1996 net changes on the Icelandic labour market showed a marked decrease in employment in other sectors than private and public services.

Table 2. Some characteristics of the Icelandic labour market in November 1998

	Total	Males	Females
Labour force participation			
16-74 year (%)	83.3	87.7	78.9
Capital area	82.4		
Outside capital area	84.8		
Unemployment (%)	2.4	2.1	2.7
Working hours per week			
Total	42.8	49.7	34.5
First-job	41.0	47.9	32.6
Second-job	1.8	1.8	1.9

Source: Statistics Iceland 1999.

The capital area is the centre of education and research with five institutions of higher education and 12 secondary and vocational institutions. In the Reykjavík area 41 percent of the population aged 18-80 years had either secondary or university education in 1996-98. By comparison, in the Akureyri region, with only a small university and limited vocational educational opportunities, 29 percent of the population had the same level of education. The comparable figure is less than 20 percent in many other LLMs in Iceland.

There is a clear pattern of upgrading present on the Icelandic labour market in the 1990s. The number of the population with only primary education decreased in more or less all the LLMs, while the proportion with secondary education grew, as well as did the group with university-level education. Most regions had a rise in total employment between 1990 and 1997. The Reykjavík area had the greatest growth rate, 7.4 percent.

The structure of production in 1997 shows regional differences. The greatest share of employment in transport, finance, information technology, culture and sport, as well as higher education and research, is in Reykjavik. In 1990 the unemployment rate in the Reykjavík area was under the national average but in 1997 its unemployment rate was the highest in the country. Average income in 1990 and 1997 was comparatively high in Reykjavik. The index for 1997 was 105 in Reykjavik, compared to 100 for the national average.

The highest income sectors in 1997 were fishing, information technology, finance and insurance, public administration, transportation, and higher education and research. The income level was lowest in agriculture, hotel and restaurants, and retail trade. Regional differences can be explained to a considerable extent by the higher level of university education in the Reykjavík area than in the provinces.

Differing Arenas for Labour Market Careers

In the segmented labour market of the emerging knowledge economy, there is a need to develop methods for both describing and monitoring the stocks and flows of human capital. We use the annual statistics available (in all Nordic countries except Iceland) for describing the careers in terms of labour market status for each individual.

Labour market mobility is defined as a change of status: to and from employment; remaining employed but moving between twenty-one economic sectors and one unspecified sector; and/or migration between regions. Job-to-job mobility (inter-industry exchange) is defined as movement of employed workers between twenty-one economic sectors and one unspecified sector and/or migration of employed workers between regions. The definition also takes into consideration, to some extent, international migration, ageing and death. Limiting the divisions to twenty-one economic sectors certainly underestimates job-to-job mobility. On the other hand, a more disaggregated division would, however, be more vulnerable to statistical misplacements of employed between sectors.

Traditional labour market statistics operate with the number of employed, unemployed and individuals outside the labour force, where the annual differences express the net change of all gross streams in the labour market. One basic aspect of this analysis is then to establish a regional labour market indicator indicating the gross annual flows between these different statuses. Figure 2 illustrates how this regional labour market indicator is measured in a so-called *vacancy account*. We deal with filled vacancies in the regional labour markets, which means that the average stock of unfilled vacancies is not taken into consideration at this stage of the analysis.

A. Initial stock: The number of employed in sector <i>s</i> in region <i>r</i> in year <i>t</i>	
Employment leavings:	
- To other employment	
- To unemployment	(1) Out-migrated from the region
- Out of the labour force	
<i>(Education)</i>	(2) Did not migrate from the region
<i>(Retirement - Age)</i>	
<i>(Other insurance)</i>	
<i>(Emigration)</i>	
<i>(Dead)</i>	
= Total employment leavings	
Employment recruitment:	
- From other employment	(1) In-migrated to the region
- From unemployment	
- From education	(2) Living in the region
- From outside the labour force	
= Total employment recruitment (represents the filled vacancies from year <i>t</i> to year <i>t</i> +1)	
B. Final stock: The number of employed in sector <i>s</i> in region <i>r</i> in year <i>t</i> +1	

Figure 2. A vacancy account for gross-stream analyses in regional labour markets

Analysing Local Labour Market Performance

In order to illustrate the regional adaptability to structural change and to enable comparisons between regions, the recruitment (and leaving) processes in different regions are examined in terms of the following set of measures:

Activation rate is measured as vacancy filling rate: the number of entries (gross recruitment in the LLMs plus in-migration to jobs) per total exits from employment (employment leaving in the LLM plus out-migration from jobs). *Local labour market self-sufficiency* is measured by local vacancy filling rate: entries from local recruitment in relation to total entries in the LLM. Local adjustment to structural change is measured by the *inter-industry exchange rate*: the number of employed within the LLM who changed their industrial sector (21 different classifications) from year *t* to year *t* + 1 within the LLM per all employed in the LLM in year *t*. *Net employment change by internal migration*: In-migrants to jobs in the LLM in year *t*+1 in relation to all employed within the LLM in year *t*. Employed out-migrating from the LLM from year *t* to year *t*+1 in relation to all employed within the LLM in year *t*.

Finally, the analysis includes a Local labour market performance index, which measures the relative performance in each region. The total performance index is composed of a set of different mobility rates derived from internal gross streams within the LLMs. In the national context all LLM mobility measures are compared with the corresponding national average rate. Labour market performance is defined as a dynamic concept: the ability of the LLM both to adapt to and facilitate structural change in the local economy by activating all segments of labour, and to increase the input of as well as returns on human capital investments. The segmented structure of the labour markets according to formal qualifications will be inherent in the analysis. Each individual (aged 16–64 years) is classified according to his or her highest level of

formal education: primary; secondary and post secondary. Each individual is also classified in terms of careers to employment status year t+1 from either of the following registered status year t: employed, unemployed and student (Table 3).

Hence, the Labour Market Performance Index is a description of the *rate of activation of nine supply pools* of labour force within the LLM in comparison to the corresponding activation rate in the country as a whole. In the aggregate index - the sum of the activation rate for nine careers/9 - each element is given the same weight, in accordance with a definition of labour market performance stressing the *equal importance* of activating all segments of the labour force.

Table 3. Composition of Local Labour Market Performance Index. Rate of activation of nine pools of local labour force

Status year t	Status year t+1: Employed		
	Education: Primary	Secondary	Postsecondary
Employed in same LLM	Job-JobPRIM	Job-JobSEC	Job-JobPOSTSEC
Unemployed in same LLM	Unempl-JobPRIM	Unempl-JobSEC	Unempl-JobPOSTSEC
Student in same LLM	Stud-JobPRIM	Stud-JobSEC	Stud-JobPOSTSEC

An illustration of the composition of the index is shown in Figure 3, which concerns the performance of the labour market in the Stockholm region in 1992 (recession year) and 1996 (economic upswing).

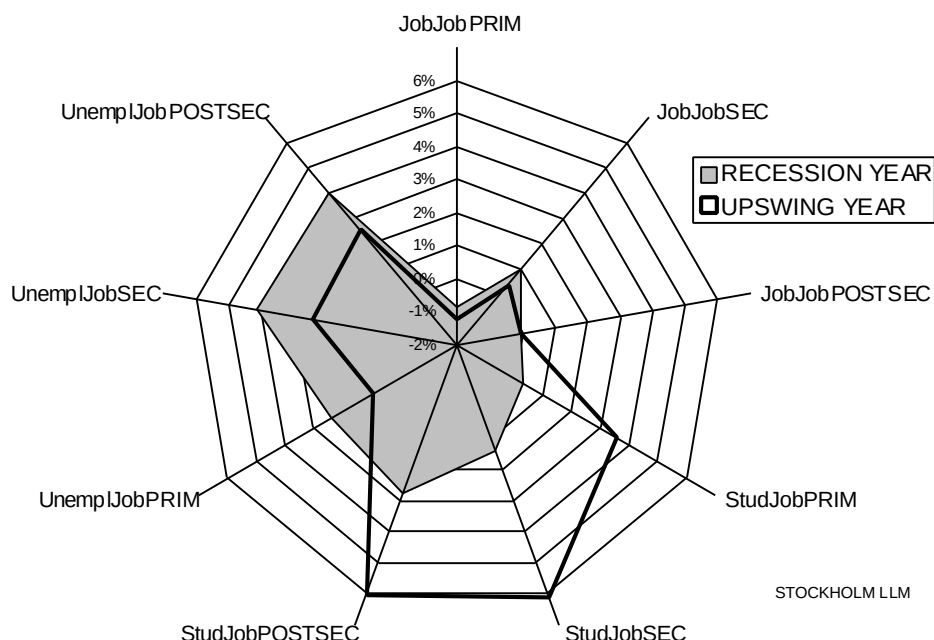


Figure 3. Stockholm region. Composition of Local Labour Market Performance Index. Deviance in rate of activation (% units) of nine pools of labour force (Sweden average = 0%)

Empirical Results: Competitive Capitals

Adaptability to Structural Change in Nordic Capital Regions

In all Nordic countries, increased labour mobility is seen as a significant tool for achieving the goals of the labour market policy, employing as large as possible part of the labour force in ordinary employment. Furthermore high mobility is expected to satisfy the employers' demands for filling in the vacancies with suitable labour as quickly as possible in a flexible labour market undergoing continual structural change. On the other hand, regional policy states that these processes should be governed in a way that will ensure the regional balance is not disturbed. In the subsequent sections we illustrate the performance of three Nordic capital regions using a selection of mobility concepts.

According to the general hypotheses the capitals are expected to show a higher rate of activation of labour, especially labour with higher education, than the average LLM in the respective country. However, we do expect variation between the three capital regions due to differences in general economic structure, institutional contexts and the behaviour of different segments of the domestic labour force. At this stage of the exploratory analysis, however, we have not formulated specific hypotheses on the nature of this international variation. Since we expect labour market performance to depend heavily on the business cycle *in the respective country*, we have selected two time periods, one of recession and another of economic upswing, for each country:

	Recession year	Economic upswing year
Finland	1990-91	1996-97
Norway	1990-91	1996-97
Sweden	1990-93 (average)	1994-97 (average)

Activation of Human Capital - Vacancy filling

As documented by e.g. Stambøl et al. (1999), the necessary recruitment to jobs is to a certain extent a function of the leaving processes in the regional labour markets. The main part of the recruitment is thus a replacement of employed leaving a job, mostly due to transitions to another job in the same LLMs, but also because of out-migration from jobs. In addition the recruitment should fill in the vacancies emerging when employed persons change their status in the labour market, e.g. to unemployment, further education, retirement or leaving the work force in some other way. As previously demonstrated in the vacancy account, these replacement processes are corrected for the annual growth or decline of employment in each LLM.

In Table 4 the relation between total exits and entries in each of capital region's labour markets is shown for the respective time periods of recession and economic upswing. The results confirm the hypothesis that a higher activation rate is to be expected in an economic upswing as compared with a period of recession. The expectation of a higher total activation rate in the Nordic metropolitan regions is also confirmed, particularly for Stockholm. There is one exception: during the deep recession in Finland, the capital region did not perform better than the average Finnish labour market. The Stockholm LLM also performs in accordance with the hypothesis that there should be a higher rate of vacancy filling for higher educated persons than for the lower educated. This is to some extent the case also for Helsinki, while Oslo shows the opposite pattern, at least for the year chosen.

Table 4. Indicators of economic and labour market performance in the capital region and country average in Finland, Norway and Sweden: Vacancy filling rate for labour with different levels of education. Index (in brackets) country average = 100

	Helsinki (Finland)	Oslo (Norway)	Stockholm (Sweden)
Upswing year:			
Primary education	1.44 (103)	1.23 (102)	0.84 (107)
Secondary	1.63 (104)	1.11 (101)	1.17 (105)
Post-secondary	1.57 (103)	1.11 (105)	1.45 (116)
Total	1.54 (103)	1.14 (102)	1.15 (109)
Recession year: total	0.52 (95)	1.01 (100)	0.62 (110)

Level of Self-sufficiency in Local Labour Markets

A well functioning regional labour market is in many ways dependent on a sufficient *local* labour force to fill in the continually emerging vacancies. On the other hand, a well functioning LLM is also attractive to potential in-migrants, in addition to functioning as a buffer against potential out-migration. Table 5 shows the levels of self-sufficiency in the recession period as well as in the period of economic upswing respectively. Particularly in Stockholm, but to some extent also in Oslo, there is a higher level of self-sufficiency in a boom period as compared with a recession year. Migrants generally show a certain competitiveness in the labour markets. This effect is expected to be even stronger in a recession period, when the competition for jobs among suppliers is increasing. Although geographical labour market mobility does increase as we move from a recession to a boom period, competition in the labour market is gradually shifting from the supply side to the demand side, raising the possibility and also the necessity for other parts of the labour force to become employed. Both the Helsinki and Stockholm LLMs depending somewhat more on local supplies of labour than does the average LLM in each country. Oslo, again, shows the opposite picture.

Table 5. Local vacancy filling rate in capital regions and country average in Finland, Norway and Sweden. Index (in brackets) country average = 100

Indicator	Helsinki (Finland)	Oslo (Norway)	Stockholm (Sweden)
Upswing year: total	0.92 (103)	0.90 (96)	0.89 (101)
Recession year: total	0.92 (102)	0.89 (96)	0.82 (100)

Adjustment by Inter-sector Mobility

As mentioned in the former section inter-industry exchange, or in other words local job-to-job mobility between sectors, is expected to comprise a large part of the total labour mobility. Here, as is the case for total mobility, the hypotheses call for an increase in inter-industry exchange when moving from periods of economic recession to periods with economic growth. Compared with the total labour market mobility, the local inter-industry exchange typically comprises approximately half of total mobility in and out of employment. Table 6 indicates a general increase in the local inter-industry exchange only for Oslo LLM when moving from economic recession to periods with economic upswings. Also the general level of inter-sector mobility is *considerably* higher in Oslo than in Helsinki and Stockholm. On the other hand, inter-industry mobility is much higher in the capitals than in other LLMs in Finland and Sweden, while the differences in this sense are small between Oslo LLM and other Norwegian LLMs. According to our expectations this type of mobility should corre-

late positively with the level of education of the labour force; such is in fact the case in Helsinki and Stockholm, but not so in Oslo. The reasons for these important differences, particularly between Norway and the other two countries, need to be analysed in further research.

Table 6. Inter-industry exchange rate in capital regions and country average in Finland, Norway and Sweden. Index (in brackets) country average = 100

	Helsinki (Finland)	Oslo (Norway)	Stockholm (Sweden)
Upswing year:			
Primary	8.4 (117)	16.3 (95)	8.6 (136)
Secondary	9.7 (120)	17.6 (96)	10.5 (124)
Postsecondary	10.2 (112)	16.7 (101)	11.5 (126)
Total	9.5 (117)	17.1 (96)	10.5 (127)
Recession year: total	9.9 (119)	13.2 (102)	10.8 (123)

Job Exports and Imports by Labour Migration

An important indicator of regional competitiveness is to be found in the net streams in and out of the LLMs due to geographical mobility. A well-functioning labour market will attract in-migrants as well as reduce out-migration tendencies. According to our expectations, both Stockholm and Oslo, in particular, display a considerably higher net migration to employment for labour with secondary and post-secondary education than for labour with lower education. Both regions depend on annual net import of human capital, i. e. labour with higher education to meet demand from the growing knowledge-intensive industries.

Table 7. Net employment change by internal migration in capital regions in Finland, Norway and Sweden. Recession year.

	Helsinki (Finland)	Oslo (Norway)	Stockholm (Sweden)
Recession year:			
Primary	- 0.32	0.27	0.35
Secondary	0.31	0.80	0.50
Post-secondary	0.66	0.75	0.50
Total	0.21	0.69	0.47

Differently Performing Capital Regions in National Context

If assessed by the suggested aggregate index of labour market performance, Stockholm LLM appears to perform far better than the average LLM in Sweden, both in periods of economic recession, such as the early 1990s, and in a period of recovery such as 1994-97. Helsinki LLM also activates different segments of the labour force at a higher rate than the average labour market in Finland. Oslo LLM performed only somewhat better than the average in the period of economic upswing, and somewhat worse during the recession year.

Table 8. LLM performance index in capital regions in Finland, Norway and Sweden

	Helsinki	Oslo	Stockholm
Upswing year	+ 0.75	+ 0.44	+ 1.04
Recession year	+ 0.37	- 0.39	+ 2.31

The quite different regional patterns of activation of nine segments of the labour force in Stockholm and Oslo LLMs are illustrated in Figure 4. It is striking that while activation of unemployed was much more efficient in Stockholm than in the rest of the country this particular year, the very opposite occurred in Oslo. The Oslo LLM was, on the other hand, more successful – as compared to other LLMs in Norway – in employing former students with only primary or secondary education. Helsinki LLM shows a pattern of activation of different pools of local labour similar to that of Stockholm, but with a few exceptions. These results suggest there are underlying differences, both in the regional industrial structure and in labour market and regional policy implementation, between the countries, which will be analysed in our further research.

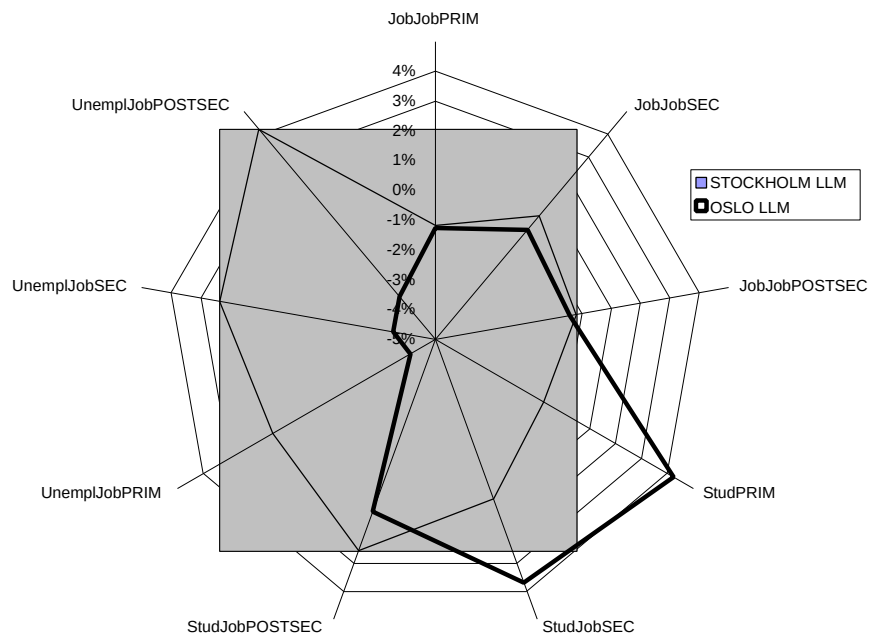


Figure 4. Local Labour Market Performance in Stockholm LLM and Oslo LLM 1991

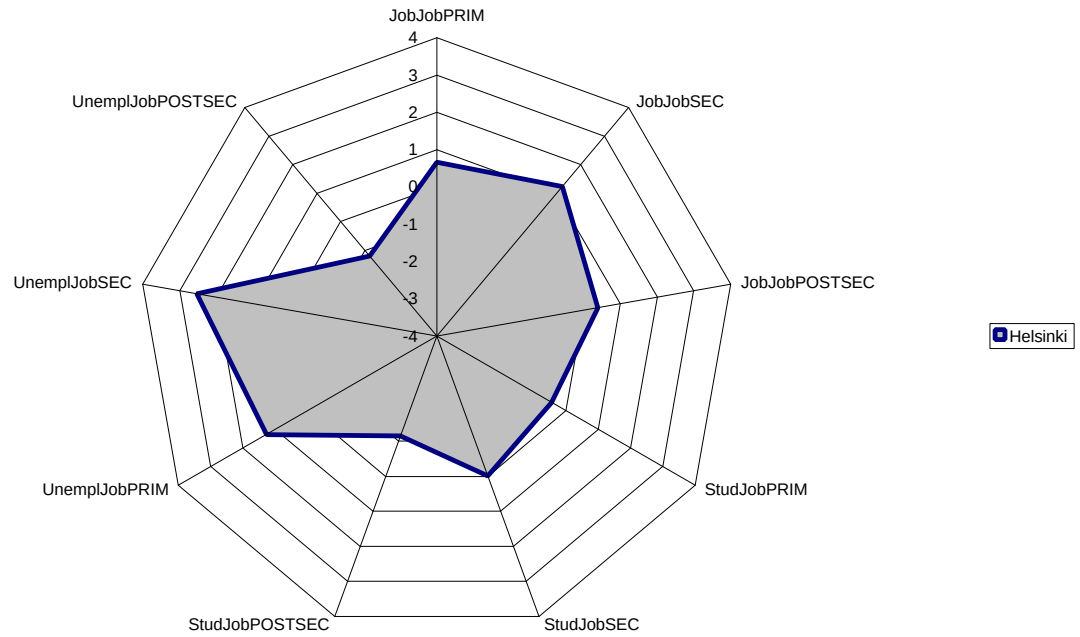


Figure 5. Local Labour Market Performance in Helsinki LLM 1991.

Concluding Remarks

In the knowledge economy, efficient and rapid, if not instantaneous, matching of the demand and supply of competent labour is one of the most important elements in territorial competitiveness. In this paper, we analyse structural change and the differing performance of LLMs in a national and international context. Performance is defined in terms of the annual rate of activation of the different segments of the labour force. The focus is on rates and directions of human capital mobility. We suggest a methodology for comparative analysis of the dynamics of labour markets, in this case the capital region as compared to the average LLM in each of the Nordic countries Finland, Norway and Sweden. Such a bench-marking analysis is expected to serve as a useful guide for regional development strategies, including policy measures for activation of all segments of the labour force. Due to the lack of compatible statistics, Iceland is included only in parts of this analysis.

The annual gross-stream labour statistics available in Finland, Sweden and Norway provide useful analytical tools. These data allow for a multidimensional analysis of labour market mobility, i.e. in geographical terms as well as between industries and according to the qualification of the labour force. Labour mobility is described as aggregates of individual careers at and between LLMs. Based on this emerging knowledge of the structure and function of labour mobility, we suggest that human resource management be integrated in strategic regional planning.

The vacancy account analysis confirms the hypothesis of a higher activation rate in total in the Nordic metropolitan regions as compared to the rest of the country, particularly for Stockholm. The Stockholm LLM is also performing as expected, with a higher rate of vacancy filling for the higher educated than for the lower educated. This

is to some extent the case also for Helsinki, while the Oslo LLM shows a contrasting pattern, at least for the year chosen.

A well functioning regional labour market is dependent on a sufficient local labour force to fill in the continually emerging vacancies. Both the Helsinki and Stockholm LLMs are somewhat more dependent upon local supplies of labour than the average LLM in each country. Oslo, again, shows the opposite picture.

Local job-to-job mobility between sectors is expected to comprise a large part of the total labour mobility. Our preliminary analysis indicates a general increase in the local inter-industry exchange for Oslo LLM when moving from economic recession to a period with economic upswing. The general level of inter-sector mobility is considerably higher in Oslo than in Stockholm and Helsinki. Inter-industry mobility is much higher in Stockholm than in other LLMs in Sweden, while the differences in this sense are small between Oslo LLM and other Norwegian LLMs. In accordance with our expectations, this type of mobility correlates positively with the level of education of the labour force in Stockholm, although it does not do so in Oslo.

An important indicator of regional competitiveness is to be found in the net streams in and out of LLMs due to geographical mobility. In line with our expectations, both Stockholm and Oslo, the latter in particular, display a considerably higher net migration to employment for labour with secondary and post-secondary education than for labour with lower education. Both regions depend on annual net import of human capital to meet demand from the growing knowledge-intensive industries. This suggest that the productive capacity of higher education facilities in these capital regions is too low for their needs.

Using an aggregate index of labour market performance, the Stockholm and Helsinki LLMs tend to perform better than the average LLM in the respective countries. The Oslo LLM, on the other hand, performed somewhat better than the average for Norway in a period of economic upswing, but weaker during a recession year.

Already these preliminary results suggest interesting differences between countries, not only in regional industrial dynamics, but also in labour market and regional policy effects, that need to be explored in further research. Eventually it is hoped that the cross-national analysis of the performance of labour markets, using gross-stream statistics, will guide strategies for regional competitiveness, including development of policy measures for the activation of all segments of the labour force.

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ⁱ Finland:	Seutukunta - Ekonomisk region Partly functional, partly administrative delimitation. Uses municipalities as the smallest building block. A total of 85 regions in Finland.
Iceland:	Reykjavík and its surrounding municipalities.
Norway:	Handelsdistrikt Based on domestic (retail) trade, transports and settlement structure. Uses municipalities as the smallest building block. Constructed in 1966 and thereafter only adjusted for changes in the municipal structure. A total of 104 regions in Norway.
Sweden:	Lokal arbetsmarknadsregion Functional delimitation based on trans-municipal commuting. Uses municipalities as the smallest building block. Latest revision dates from 1996. A total of 109 regions in Sweden.

ⁱⁱ 1 January 1998 or 31 December 1997.

ⁱⁱⁱ Finland: kandidaattiaste (alempi & ylempi), tutkijakoulutus. Denominator pop. 16+.

Norway: universitets- og høgskolenivå II & III, forskernivå. Denominator pop. 16+.

Sweden: eftergymnasial utbildning 3 år eller mer, forskarutbildning. Denominator pop. 16-74 years.

^{iv} Finland: Uusimaa maakunta; Norway: Oslo and Akershus fylke; Sweden: Stockholms län.

^v Average income 1997. Source: Regional Development Institute Iceland 2000.