The function of labour market mobility to regional economic growth generally and by new service economy and labour force nationality especially

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Abstract

Efficient matching of local demand and supply of labour at different qualification levels is considered to be an important prerequisite for economic growth in every region. The expectation is that higher mobility of the labour force should increase the general level of employment, e.g. due to a relatively high gross demand of labour and the problems of matching-time to fill in the vacancies. Moreover, increased total labour mobility is thus seen as one tool for reaching the goals of the labour market policy, employing as large as possible part of the labour force into ordinary employment. Use of annual gross-flow labour market statistics may be very relevant in such analyses, allowing multidimensional analysis of labour market mobility, i.e. in geographical terms as well as between sectors and according to the qualifications of the labour force.

Among the sectors, knowledge intensive business services (KIBS) are often seen as an important characteristic of the new, more knowledge based economy. Efficient sharing and transferring of knowledge is central, and KIBS play an important role in the learning and transaction processes. It is thus of importance to analyse KIBS' role as a regional competitive base, e.g. by studying the competitiveness of cities and regions in terms of growth of employment, and particularly focus on the mobility of the individuals who enter and leave the KIBS sectors. Labour mobility in this growing sector may also act as a prerequisite for what may be expected to form the future labour mobility structures of the society, and is thus of particular importance for both the labour market and the regional policy perspectives.

Increased international migration as a result of increased internationalisation gives rise to a more internationally mixed labour force within countries. On the other hand, national labour market policy attempts to use actively immigration as a tool for solving parts of the domestic labour market problems, e.g. shortage of supply of certain kinds of labour in more remote regions. It is thus of particular importance to analyse the function of both initial and succeeding labour mobility among different immigrant groups and how their labour mobility function in relation to the mobility of the employed national majority.

The main purpose of this paper is to present some analyses of the regional labour mobility in terms of growth of employment focusing on the number and quality of the persons that enter and leave the local labour markets. Besides some descriptive analyses, we test the hypothesis if the regional growth of employment is positively or negatively correlated to the level of different segments of gross mobility to and from jobs generally, and more particularly for employment in knowledge intensive service industries and for the employment broken down by different groups of nationality.

Paper presented at the 45th Congress of the European Regional Science Association, 23 - 27. August 2005, Amsterdam, The Netherlands

1. Background and challenges

Efficient matching of local demand and supply of labour at different qualification levels is considered to be an important prerequisite both for economic growth and social cohesion in any region. Hence, more or less explicitly, regional development programmes are designed to improve the performance of functional local labour markets. This is e.g. based on analyses of structural change towards the knowledge society and the mobility of human capital. The levels of education as well as the returns to education vary across different cities and regions. Attractive urban regions are expected to improve its human capital even more through geographical mobility of high-qualified labour. Infrastructure, like location of higher education institutions, business services and transport systems as well as the institutional frameworks are also expected to be of immense importance for urban and regional growth.

The use of annual gross-flow labour market statistics is very relevant in these analyses. Such data may allow multidimensional analysis of labour market mobility, i.e. in geographical terms as well as between sectors and according to the qualifications of the labour force. Theoretical considerations may be taken from e.g. the human capital theory and theories of segmented labour markets and regional division of labour, but also from more modern theories that aim to explain structural change and new forms of transitions in regional labour markets. The labour market mobility is partly considered 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 formations. We expect people to move from low paid to better paid jobs, from unemployment to jobs, from decreasing and stagnating sectors to growing sectors and thus from stagnated and backwards cities and regions to more prosperous, expanding and dynamic cities and regions with a surplus of jobs. According to human capital theory, the most highly educated persons are considered to benefit most from mobility due to an expectation of higher returns to education among the high educated. Inter-sector mobility is also expected to be more frequent among younger people, who do not yet have any sector-specific knowledge through a long professional career.

The main purpose of the paper is thus to analyse the mobility performance and competitiveness of cities and regions in terms of growth of employment and especially focusing on the number and quality of the persons who enter and leave the local labour markets. As a starting point, cities and regions are classified into different urban and regional typologies.

Statistics Norway has, in co-operation with researchers from other Nordic countries, analysed labour market mobility among persons with different qualification levels. In particular, we have established methods for analysing vacancy formations within and between regional labour markets based on the whole population in working age. We have also established indexes which illuminate the gross (and thus also net) demand for labour in regional labour markets and sectors and differences between business cycles, as well as analyses of regional performance of recruitment to jobs within and between local labour markets (see e.g. Edvardsson et al., 2000, 2002, Heikkilä et al.,1999a,b, Heikkilä and Stambøl,1999, Johansson et al.,1997, Persson ed. 2001, Stambøl, 1999, 2000, 2001, 2002, 2003a,b and Stambøl et al. 1996, 1997, 1999, 2003).

By use of gross-flow data and specified mobility concepts the project aims to produce sets of regional, segments and sector-specific mobility performance indexes illustrating how each

city and region perform with regard to recruitment of different kinds of labour in a) within the local labour market and b) through in-migration. An important aspect of different vacancy formation is found in different levels and structures of deactivation, thus including analyses illustrating part of the vacancy chain processes.

 - As an introductory gross mobility between different status groups and regions and abroad is calculated by use of a consistent regional annual vacancy account (See table 1 in section 3).
 - Gross-flows by status groups, education and sectors within and between the urban and regional labour markets are measured by different transition rates (See table 4 in section 3).
 - Finally, we investigate if the growth of employment is positively or negatively correlated to the level of gross labour-mobility.

The analyses use individual register based gross-flow labour market data for total populations in working age 16-74 years by year-to-year transitions through the time period 1994-1999. More specifically we examine some special parts of the economy in addition to a more general overview, representing mobility in all sectors in the urban and regional labour markets. Firstly, we carry out a more detailed analysis of parts of the so-called "new economy", here represented by knowledge intensive business services (KIBS). Secondly, we examine labour mobility among different national groups classified by Norwegian citizens, other Nordic citizens, other Western citizens and finally the remaining part of the labour force aggregated and recognized as non-Western citizens.

2. Theoretical foundation, hypotheses and policy

For several years labour market policies have encouraged the unemployed to look for jobs outside their local labour markets, e.g. by including the whole country as an arena of supply and providing economic support for necessary migration to job. Labour market policies have gently advocated the importance of intersectional mobility. The expectation is that higher mobility of the labour force should increase the general level of employment, e.g. due to relatively high gross demand of labour and the problems of matching-time to fill in the vacancies. Moreover, increased total labour mobility is thus seen as a tool for reaching the goals of the labour market policy, namely employing as large a part of the labour force as possible into ordinary employment. Furthermore, high mobility is expected to satisfy the employers' goal of filling vacancies with suitable employees as quickly as possible in a flexible labour market in continually structural change.

In theory, the bulk of long distance migration is considered to be associated with regional imbalances between supply and demand of labour (see e.g. Greenwood, 1985). Through rational decisions, labour is supposed to move from regions with a limited number of well-paid jobs, high unemployment and an overrepresentation of decreasing industries, to expansive regions with a surplus of jobs. The rate of migration is partly decided by demographic factors: younger persons and especially those with higher education dominate migration (see e.g. Stambøl et al, 1998). These are considered to benefit more from migrating, since their investments in formal education have to pay off. Furthermore, their investments in housing and real estate as well as in social networks in a given locality are generally lower than for older persons. Individuals who have not yet formed a family of their own have fewer ties and are more inclined to move to another region (for an overview of these processes, see e.g. Milne, 1991, Stark, 1991, Champion and Fielding, 1992).

In particular, highly educated people are much more sensitive to environmental factors such as the spatial concentration of high-skilled jobs and career possibilities. As such, in the "knowledge society" factors like amenities, the existence of a good environment and accessibility are also important location factors with respect to highly educated people (Kontuly, 1998, Harris and Becker, 2001).

It is generally accepted that an economic upswing stimulates long-distance migration, while a downturn has the opposite effect (e.g. Pissarides and Wadsworth, 1989, Milne, 1991). The causes for this are mainly found in the increased mobility of the labour force in prosperous periods, when "pull" factors are pronounced. In less favourable economic times people are likely to put more interest into the jobs that are available and are less likely to move or change jobs without fixed plans.

The matching in regional labour markets is also of a different kind compared with the situation some years ago. The problem today is the existence of both shortages and surpluses of labour within the same companies, sectors, and commuting regions. The reason for this is that the labour market has become more segmented regarding competence levels. 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 and unsubstitutable labour force. These sub-markets have their own supply and demand situations, their own wage structures and their own surpluses or shortages of labour. Mobility between segments is low, while it is high within individual segments. Segmentation of the labour force with regard to the supply side corresponds to its segmentation with regard to the demand side. The mismatch on the labour market seems to have been accentuated during the structural transformation in the past decades (for a mismatch overview, see e.g. Padoa Schioppa, 1990).

Different regions have differently composed labour markets. Today, the labour required by the urban labour market is different from the last decades. The regional division of labour has been more important, with an accentuated regional polarisation and specialisation as one result (Massey, 1995, Johansson, 1996). "Rural push" has declined as an activating force, and it seems that "urban pull" has come to dominate migration from old factory towns or rural areas to metropolitan areas and regional service centres. There is thus expected to be a certain interdependence between the labour force and the structural transformation of the economy with the labour force being complementary to the new technology. This interdependence also seems to have been accentuated during the transfer from the industrial to the post-industrial society. This implies a decreasing substitutability between different kinds of labour and that the structure of the economy regulates the kinds of labour demanded in a given sector or region. This phenomenon is also valid with regard to the relationships between different regions (Massey, 1995, Johansson, 1996, Johansson and Persson, 1999).

Mobility is, however, not only associated with migratory movements. Instead most of the mobility in the labour market is a consequence of the fact that people change jobs without any geographical mobility. Here, we usually distinguish between labour mobility – i.e. the same as moving in or out or between jobs - and different kinds of job mobility. In this analysis the focus is primarily put on the labour mobility, thus making theories dealing with flows of labour somewhat more relevant compared with job mobility theories dealing with loss of old jobs and creation of new jobs. Flows of jobs are, however, closely related to flows of labour, e.g. that both closures of working places and the creation of new jobs necessarily generate flows of labour. Closures of complete firms or divisions within firms and companies give rise

to involuntary flows of labour. Labour mobility is, however, much more comprehensive than the job mobility suggests. All kinds of mobility, however, depend of the labour market situation and the transformation of this (see e.g. Burda and Wyplosz, 1994, Burgess, Lane and Stevens, 1996, Davis and Haltiwanger, 1998).

At the demand side the more modern industries require local supply of a committed labour force, at the same time as new generations of ICT (Information and Communication Technology) and global "high-tech" industrial networks diffuse the physical concept of a work-place and require highly specialized labour with up-to-date training. As van der Laan (2001) points out, there are conflicting and complementary theories explaining the location in space of workplaces in the new economy, from traditional agglomeration and more recent and fashionable cluster theories, to theories of indifference, the latter meaning that new economic activities are increasingly independent of any place-specific characteristics and that regional growth is, to a large extent, a matter of coincidence (Curran and Blackburn, 1994). Accordingly, different strategies are stressed in territorial industrial and innovation policy.

Knowledge intensive business services (KIBS), are often seen as an important characteristic of the new, more knowledge based economy, since they are concerned with the supply and management of new knowledge and intangible assets (so called 'knowledge-about-knowledge'). The new economy is used as a term to understand the current global social and economic changes, linked to the increased use of information and communication technologies and to the growth of new ways of organising industrial activity (post-fordist principles). These trends seem to appear early on in KIBS in city areas, as postulated by Storper and Scott (1990) more than a decade ago. Efficient sharing and transferring of knowledge is central, and KIBS play an important role in these learning and transaction processes. It is thus of importance to analyse KIBS' role as a competitive base of larger cities in Norway, e.g. by studying the competitiveness of cities and regions in terms of growth of employment, and particularly focus on the mobility of the persons that enter and leave the KIBS sectors. Mobility is important for the knowledge transaction process of an economy, and KIBS employees are said to have an important role as knowledge diffusers in the economy since the sector is characterised by modern education, intra and interregional as well as international networking, dynamism and flexibility. Labour mobility within this sector may also act as a prerequisite for what may be expected to form the future labour mobility structures of society, in line with the argument by Storper and Scott (1990).

In more general terms, other hypotheses put forward that functional labour markets can only be understood within the context of a systematic framework. Employment systems are defined as the set of policies and institutions that influence the interaction between the production systems and the labour market systems (Schmid, 1994). Another hypothesis is the emergence of the transitional labour market. It is based on the observations that the border between the labour market and other social systems, e.g. the educational system, the private household economy etc. are becoming increasingly blurred, and thus increase transitions between formal employment and productive non-market activities. Each transition, such as those from school to job and vice versa, from parental or sick leave to job, from unemployment to job etc. can be temporary and repetitive. Transition itself is also enforced by policy intervention to encourage temporary leave for life-long learning periods and parental leave. This transition can be viewed as a supplementary dimension to that usually described as labour mobility, i.e. qualification or de-qualification careers, inter-sector mobility and

inter-regional or international migration (for more discussions: see e.g. Schmid and Gazier, 2002).

3. Urban and regional classifications, data, definitions and methods

An important aspect in this analysis of regional labour market mobility and migration is the classification of individuals according to their labour market status; e.g. employed, unemployed, in education and the remaining population outside the labour force. In this analysis one aim is to analyse the change of labour market status, sector and segment connected to the domestic and international migrants and the migration processes as well as investigating how these transitions are operating within different local labour markets. In such cases, it is important to compare changes in labour market statuses among migrants and non-migrants, investigating the local labour market's inter and intra-regional as well as international transition rates. Necessary gross-flow data for all individuals of working age are therefore established. The data cover whole populations, collected from individual register-based data sources at Statistics Norway. In the analysis, the comparison of the inter- and intra-regional labour market transition is based on changes in two-year periods (following each individual from year t to another year t+1) during the time period 1994-1999.

Urban and regional classifications
One important prerequisite for the analyses is a proper classification of cities and regions into different categories of local labour markets. This will further represent one of the independent variables in the analysis. Earlier investigations of geographical mobility have shown that the labour market and the level of education have a tendency to become increasingly important factors in explaining migration at a higher geographical level (see e.g. Stambøl, 1991, Stambøl et al., 1998). In this analysis, however, we use somewhat more disaggregated regional levels classified on the basis of what may be identified as functional regions. The analysis is based on 86 local labour markets in Norway, which mainly correspond to a classification of economic regions used by Statistics Norway (see Hustoft et al., 1999). The regions are basically classified by commuting figures, and should thus represent functional local labour markets. The regions are, however, classified so that they do not cross any county borders, thus making a few neighbouring regions part of the same functional labour market. Most obviously this is the case in the Oslo region, which consists of the capital region of Oslo and four economic regions in the surrounding county of Akershus. In this analysis these five regions are aggregated to one region: Oslo and Akershus.

Table 1. Classification by 7 typologies of regions.

1. The capital region
2. Regional metropolises
3. Regional centres with a university
4. Other regional centres
5. Medium-sized towns and regions
6. Small labour areas
7. Micro labour areas

In part of the analysis we have included a somewhat more aggregated classification by seven typologies of regions (see e.g. Persson et al. (2004)). The seven main typologies of regions are shown in table 1.

Furthermore, we do operate with the four main urban regions of Norway, which consists of the capital region of Oslo/Akershus and the regional metropolises regions of Bergen, Trondheim and Stavanger/Sandnes.

An annual vacancy accounting
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 at the labour market. Full knowledge of the gross-streams will also give full knowledge of the net change, while the opposite is obviously not the case. One basic aspect of this analysis is then to establish a regional labour market indicator illustrating the annual gross-flows between the statuses. Table 2 illustrates how this regional labour market indicator is measured in a so-called "annual vacancy account". With regard to the "vacancy accounting", we basically deal with the filled in vacancies in the regional labour markets, which means that the average stock of not filled in vacancies is not taken into consideration.

Table 2. An "annual vacancy account" for gross-flow analyses in regional labour markets

(A). Entering stock: The number of employed in sector s in region r in year t including individual characteristics by age, gender and education

(EX): Employment exits:
- To other employment in year t+1
- To unemployment in year t+1   (1) Out-migrated from the region from year t to t+1
- Out of the labour force in year t+1
 Due to: (Further education)   (2) Not migrated from the region from year t to t+1
        (Retirement - Age)
        (Other insurance)
        (Emigration)
        (Death)

= Total employment leave from year t to year t+1

(EN): Employment entries:
- From other employment in year t   (1) In-migrated to the region from year t to t+1
- From unemployment in year t
- From education in year t   (2) Settled in the region in year t and t+1
- From others outside the labour force in year t

= Total employment recruitment (represents the filled in vacancies from year t to year t+1)

(B). Outgoing stock: The number of employed in sector s in region r in year t+1 including individual characteristics by age, gender and education

The number of <u>filled in vacancies (EN)</u> in each region, sector and segment appears as follows:

EN = B - A + EX

B   = is the number of employed in year t+1
A   = is the number of employed in year t
EX = is the number of employed in year t that left a job from year t to year t+1.

The vacancy account represents a new and consistent way of measuring vacancies in the labour markets. The total vacancy account is defined so that all transitions from jobs have to be replaced if the total entering stock and outgoing stock of employed is equal. If entering stock of employed (A) is higher than the outgoing stock of employed (B), not all employment exits will be replaced, and vice-versa, if (B) is higher than (A), the total employment recruitment will exceeds the employment exits. The total employment recruitment in this case

thus represents the filled in vacancies from year t to year t+1. A measure of structural change in the various local labour markets appears by breaking down the total figures by different sectors and segments. This is of great importance, because we expect that there will be clear differences in the leaving and recruitment processes due to different development by sectors and segments in the local labour markets.

In the project we measure the mobility into, out of and between altogether 28 industrial sectors and one unspecified sector. The sector classification is found in table 3. Sectors marked with an asterisk* represent the knowledge intensive business services (KIBS-sectors).

Table 3. Basic sector classification used in the analysis.

1. Primary/mining	17. Telecommunication *
2. Manufacturing, Raw material	18. Activities auxiliary to financial intermediation *
3. Manufacturing, Labour intensive	19. Finance (bank, insurance, real estate and renting of machinery)
4. Machine/Transport production	
5. ICT-Manufacturing	20. Renting of office machinery and equipment inclusive computers
6. Electro	
7. Printing and Publishing	21. Information technology *
8. Energy	22. Research and development *
9. Pharmaceutical production	23. Other business activities *
10. Construction	24. Activities of membership organisations and other service activities
11. Retail, recreation, culture and sport	
12. Hotel and restaurant	25. Education: Basic education
13. ICT-wholesale	26. Education: Higher education
14. Other Wholesale	27. Health and social work
15. Transport	28. Public administration
16. Post and courier activities	29. Unspecified sectors

Composition of a total local labour market mobility performance index
The analysis finally includes a total local labour market mobility performance rate, which measures the relative mobility performance of each region. The total mobility performance rate is composed of a set of different transition rates derived from both internal gross flows to and from jobs within the local labour markets as well as interregional and international labour market mobility to and from jobs. In the national context all local labour market mobility measures are described in relation to the national average measure correspondingly. The purpose of this total index is to illuminate how each region, and type of region, performs with respect to total gross labour mobility, while the underlying structure of this total mobility is found in each specific transition segment.

Local labour market mobility performance indexes
Each individual in the local labour force (16 – 74 years) is classified according to the highest formal education: Primary, secondary and post secondary. Each individual in the local labour markets is also classified in terms of careers to employment status year t+1 from either of the following status year t: Employed, unemployed, in education and others outside the labour force. Hence, the total local labour market mobility performance index (TLLMMP) is partly a description of the *rate of activation of twelve pools* of labour force <u>within</u> the local labour market (LLM) compared with the corresponding transition rate in the nation as a whole (table 4). With local activation rate we thus mean different types of transition rate to job within the local labour markets. In addition in-migration careers leading to employment as well as immigration leading to a job is related to the size of the regional employment. As the figure shows the activation rates to job are thus measured for six main groups (A-F) broken down by

three education levels. The activation rate of each group is measured separately, but obviously the rate of each element may be closely related. In a well functioning and strongly growing regional labour market there may be room for a high score in many of the separate indexes. In reality the situation may be different, where several of the included activation rates are correlated. In many regions high in-migration to jobs may function as an obstacle to high activation from local unemployment to job or from local education to job, while in other regions the situation may be the opposite. The decomposition of all these activation rates by education levels gives the possibility to investigate how the segmentation processes operates in the regional labour markets.

On the other hand, the total local labour market mobility performance index is also taking into consideration the deactivation rate from job (transitions from job), measured by gross out-migration from job as well as by gross emigration/death from job (notice G and H in table 4). The deactivation within the local labour markets is, however, expressed by the activation rate A, showing how many employed persons are still employed in the same local labour market the following year. In most cases the activation rates measured by B-F are dependent on the size of the deactivation rate of employed out-migrants and emigrants (G and H) in addition to the activation rate A. In regions with stable or growing employment, the deactivation rate will establish vacancy chains in the local labour markets, demanding a replacement of former employees. In regions with decreasing employment this dependency may be less visible, due to an excess of losses of jobs compared with creations of new jobs. However, by taking into consideration the regional deactivation rate, the analyses of the activation rates will be controlled for uneven regional deactivation. A region with a high total activation rate in spite of a low deactivation rate will be far better off with respect to employment growth than a region with a similar activation rate, but due to a high deactivation rate.

Table 4. Composition of a total local labour market mobility performance index (LLMMPI). Rates of activation and deactivation in twenty-four pools of labour force.

Status year t:	Status year t+1: Employed /or out-migrated,emigrated/dead		
	Primary education	Secondary education	Post secondary education
A.Employed in region r	A1.Still in job in region r	A2.Still in job in region r	A3. Still in job in region r
B.Unemployed in region r	B1. Unemployed to job in region r	B2. Unemployed to job in region r	B3. Unemployed to job in region r
C.In education in region r	C1. From education to job in region r	C2. From education to job in region r	C3. From education to job in region r
D.Others statuses in region r	D1. From others to job in region r	D2. From others to job in region r	D3. From others to job in region r
E.Any status in other regions. In-migrants	E1. In-migrants to job in region r	E2. In-migrants to job in region r	E3. In-migrants to job in region r
F.Any status in other countries. Immi-grants/New recruits	F1. Immigrants/New recruits to job in region r	F2. Immigrants/New recruits to job in region r	F3. Immigrants/New recruits to job in region r
G.Employed in region r	G1. Out-migrants from job in region r	G2. Out-migrants from job in region r	G3. Out-migrants from job in region r
H.Employed in region r	H1. Emigrated/dead from job in region r	H2. Emigrated/dead from job in region r	H3. Emigrated/dead from job in region r

Each of the elements in the total local labour market performance index is calculated as follows:

Local activation rates:
A1-A3. Still in job: Employed persons in region r in year t still employed in the same region in year t+1/All employed in the same region in year t) - (the same relationship for the nation as a whole).

B1-B3 Unemployed to job: Unemployed in region r in year t that became employed in the same region in year t+1/All unemployed in the same region in year t - (the same relationship for the nation as a whole).

C1-C3 Education to job: Persons in education in region r in year t that became employed in the same region in year t+1/All persons in education in the same region in year t - (the same relationship for the nation as a whole).

D1-D3 Others to job: Other persons in working age in region r in year t that became employed in the same region in year t+1/Persons outside the labour force and studies in the same region in year t - (the same relationship for the nation as a whole).

E1-E3 In-migrants to job: Internal in migrants that became employed in region r in year t+1/All employed in region r in year t - (the same relationship for the nation as a whole).

F1-F3 Immigrants/New recruits to job: Immigrants/new recruits that became employed in region r in year t+1/All employed in region r in year t - (the same relationship for the nation as a whole).

Local deactivation rates:
G1-G3 Out-migrants from job: Persons that were employed in region r in year t but had out-migrated from a job in region r in year t+1/All employed in region r in year t - (the same relationship for the nation as a whole)

H1-H3 Emigrants/dead from job: Persons that were employed in region r in year t but had emigrated (or died) from a job in region r in year t+1/All employed in region r in year t - (the same relationship for the nation as a whole).

The total local labour market mobility performance index (TLLMMPI):
In the total index for each region - i. e. the sum of the activation rate for eighteen groups minus the deactivation rate for six groups - each rate is given a weight based on the number of persons within each segment in relation to the total number of labour market mobile by adding up all 24 segments of mobile labour. The total mobility performance index of each local labour market is thus expressed as follows:

TLLMMPI= [(A1*x1/z) + (A2*x2/z) + (A3*x3/z) + (B1*x4/z) + (B2*x5/z) + (B3*x6/z) + (C1*x7/z) + (C2*x8/z) + (C3*x9/z) + (D1*x10/z) + (D2*x11/z) + (D3*x12/z) + (E1*x13/z) + (E2*x14/z) + (E3*x15/z) + (F1*x16/z) + (F2*x17/z) + (F3*x18/z) - (G1*x19/z) - (G2*x20/z) - (G3*x21/z) - (H1*x22/z) - (H2*x23/z) - (H3*x24/z)] / 24;

where A1-H3 = rates within each mobility segment according to table 5
x1 - x24 = the weights expressed as the number of persons within each segment of mobility and
z = the sum of all persons within each segment of mobility.

This expression secures that positive indexes (higher than the national average) for the segments A-F gives positive contributions to the total mobility performance index, while the opposite is the case for negative values for each segment. On the other hand positive indexes for the segments G and H give negative values to the total mobility performance index, while negative indexes here give positive values.

Policy implications
The total mobility performance index thus gives an illustration how each regional labour market performs in the national context. Each transition rate should, however, give some incentives to different policy areas, what may be successful or not successful performance. The total index illustrates how the regional labour market functions as a whole, while each element shows which transition contributes mostly to a total high performance, or vice versa to a less successful performance. The ability to stay in job or the job-to-job elements (A1-A3) and not at least the unemployment-to-job elements (B1-B3) represent important areas for both

regional and national labour market policies. In the same manner we may consider that the elements (C1-C3), from education to job, reflect the success of the educational policy, measuring to what extent the local labour markets are able to absorb new graduates, but also to what extent the local labour markets need to cover their demand by recruiting persons with a modern education. The elements (D1-D3) reflect in many ways the pressure in the local labour markets, measuring to what extent it is necessary to activate the so-called "reserve-army" of the labour market to increase the labour market participation rate, but also to what extent the local labour markets are able to employ as large a part of their inhabitants in ordinary jobs as possible. All these elements are however important for the regional policies. The elements representing the geographical labour market mobility should be of immense importance for all regions and many policy areas.

4. Empirical results

4.1 Labour mobility in the economy generally

Transition rates by mobility segments, education and regional typologies:
Table 5 below shows mobility rates for 24 segments of transitions in the regional labour markets in Norway. All transition rates are defined as described in table 4 in section 3. There are strong variations across the regional typologies. The best total mobility performance is found in the capital region for all education levels, whilst the weakest total mobility performance was observed in the micro labour areas. It is worth noting that other regional centres, which include more than 1/4 of the total national employment, show a total mobility performance below the national average for all education levels. The successful mobility performance in the capital region has a strong contribution from the education to job mobility, which means that this region has a very strong ability to employ new graduates. The opposite trend is found in the small and micro labour areas, where the transition rates from education to job are far below the national average for all education levels. Measured by number of persons, the cells showing the still in job rates are of immense importance for the total mobility score. Here the capital region shows, however, a weaker performance than the national average, with high exit from jobs in the local labour market for all educational groups. Regional metropolises, medium-sized towns and regions and small labour areas all show a lower than average transition from jobs in the local labour markets for all levels of education. The capital region also shows lower than average transitions with respect to unemployment to job. Here regional metropolises, small labour areas and micro labour areas all show higher than average transition rates. One important reason for this regional difference is found by the fact that the capital region had a much lower unemployment rate, making it more than average difficult to employ the small remaining group of unemployed into ordinary jobs. On the other hand the capital region shows a high ability to employ other persons from outside the labour force with respect to all education levels. Concerning geographical mobility the capital region shows higher than average in-migration rates to job for low and middle educated persons, but lower than average in-migration rates for persons with higher education. The regional metropolises show lower than average in-migration rates to job for all education levels. On the other hand regional centres with universities, medium-sized towns and regions, small labour areas and micro labour areas all show higher than average in-migration rates to job, especially for persons with higher education. One important reason for this regional difference is found by the fact that more central regions have a much higher percentage of employed with higher education. This regional difference is even more pronounced in the internal out-migration rates, where employed in the most central regions

show a much lower ability to out-migrate from jobs compared with other types of regions, and especially in relation to regional centres with a university and micro labour areas. Considering international migrations to and from jobs there are rather small differences across the regional typologies.

Table 5. Transition rates by 24 mobility groups in each typology of region in 1997-1998:
The Norwegian national average in each mobility group is set at 0. *)

Mobility group and level of education:	Capital region	Metropol ises	Regional centres with a uni-versity	Other regional centres	Medium sized towns and regions	Small labour areas	Micro labour areas
Still in job locally (Low)	-0.4	0.3	0.6	0.0	0.4	0.4	-0.4
Still in job locally (Middle)	-0.5	0.3	-0.3	0.0	0.7	0.5	-0.3
Still in job locally (High	-0.5	0.3	-0.2	0.2	0.6	0.2	0.2
From education to job locally (Low)	8.0	-0.7	0.9	-1.1	-2.3	-1.6	-3.4
From education to job locally (Middle)	6.6	0.2	-0.6	-0.5	-0.5	-2.3	-3.7
From education to job locally (High)	4.0	-0.5	-2.8	-0.8	-0.6	-2.4	-3.2
From unemployed to job locally (Low)	-0.1	0.0	0.9	-0.8	-1.0	0.5	1.2
From unemployed to job locally (Middle	-1.1	1.1	-0.6	-0.2	-0.2	0.7	0.1
From unemployed to job locally (High)	-0.3	0.7	-2.8	-0.7	-0.9	0.8	0.6
From others to job locally (Low)	1.6	0.0	1.5	-0.4	-0.6	-0.7	-0.2
From others to job locally (Middle)	1.2	-0.1	3.1	-1.2	-0.2	0.5	0.6
From others to job locally (High)	1.8	0.1	-0.2	-1.8	-2.3	-1.0	0.1
In-migration to job (Low)	0.1	-0.4	0.1	0.0	0.4	0.3	-0.1
In-migration to job (Middle)	0.3	-0.4	0.6	-0.1	0.1	0.1	0.1
In-migration to job (High)	-0.3	-0.4	1.1	0.0	0.4	0.3	0.8
Immigration to job (Low)	1.0	0.2	-1.0	0.0	-0.9	0.3	-0.6
Immigration to job (Middle)	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Immigration to job (High)	0.2	0.0	0.0	-0.1	-0.1	-0.1	-0.2
Out-migration from job (Low)	0.4	-0.4	0.0	-0.1	0.0	0.0	0.1
Out-migration from job (Middle)	-0.1	-0.7	0.8	-0.2	0.2	0.3	0.9
Out-migration from job (High)	-1.4	-0.5	2.6	0.2	1.0	1.1	3.0
Emigration from job (Low)	0.1	-0.1	0.0	-0.1	-0.1	0.0	0.1
Emigration from job (Middle)	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
Emigration from job (High)	0.2	0.1	0.0	-0.1	-0.2	-0.2	-0.3
Average (Low)	1.2	0.0	1.1	-0.3	-0.5	-0.1	-0.5
Average (Middle)	0.8	0.2	0.1	-0.2	0.0	-0.1	-0.5
Average (High)	0.7	0.1	-0.2	-0.4	-0.5	-0.4	-0.5

*) The definition of all mobility rates is found in table 4 in section 3 above

The relationship between net employment growth and specific and total labour mobility performance in Norway
It is expected that increased labour mobility will be important for reaching the targets of employing as large a part of the work force as possible into ordinary employment. Furthermore, high labour mobility in regions is thus expected to increase the employment

growth generally and especially in relation to regions experiencing low mobility rates. Put into the context of this analysis, we should expect that regions showing the highest labour mobility also experience the highest net growth of employment. Thus we have made an analysis, showing the relationship between the net change of employment and the level of gross mobility to and from jobs by using an ordinary least square regression model.

Table 6. The relationship between net employment growth and gross labour mobility expressed as specific and total index of mobility performance. By type of mobility and education 1997-1998. Basis: 86 Norwegian regions

Type of mobility:	Low education	Middle education	High education
Still in job locally	**0.462*****	0.159	**0.706*****
	(3.48)	(1.23)	**(4.30)**
To job from education locally	-0.014	0.027	**0.133*****
	(-0.27)	(0.76)	**(4.53)**
To job from unemployment locally	0.041	**0. 077****	0.006
	(1.17)	**(2.41)**	(0.61)
To job from others outside the labour force locally	**0. 656*****	0.070	**0. 121*****
	(3.79)	(1.24)	**(3.77)**
To job from internal in-migration	**1. 388*****	**0. 959*****	**0. 846*****
	(4.29)	**(4.67)**	**(6.81)**
To job from immigration	**0. 316***	4.073	0.548
	(1.70)	(1.14)	(0.56)
From job to internal out-migration	**-0.717****	**-1.051*****	**-0. 843*****
	(-2.13)	**(-5.06)**	**(-9.29)**
From job to emigration	**-2.142****	-0.745	**-1.332***
	(-2.52)	(-0.60)	**(-1.90)**
Weighted average	**6.33*****	**1.139*****	**5.242*****
	(5.85)	**(6.34)**	**(6.70)**
Adjusted R^2	0.88	0.93	0.79

Level of significance: 99%***, 95%**, 90%*. (t-values in brackets). Number of observations=86)

Table 6 shows the correlation results of the relationship between net employment growth and different types of gross mobility to and from jobs in altogether 86 Norwegian local labour markets in the strong upswing period of 1997-1998. There was observed a strong, positive and highly significant relationship between the ability to stay in job in the regions and employment growth for employed with low and high education. This relationship is positive but not significant for employed with middle education. The relationship between employment growth and mobility from the educational system is rather weak for low and middle educated persons, but positive and highly significant for persons with higher education. The relationship between net growth and recruitment from the unemployed shows some significance only for middle educated persons. The ability to increase the transitions from other persons outside the labour force in an upswing period is definitely stronger for low and high-educated persons compared with middle educated persons. Recruitment to job from internal in-migration is highly significant for all educational groups, but strongest for high educated employed. Net job growth and immigration show a rather weak correlation with a certain exception of low educated persons. Out-migration from job seems to be very sensitive to job growth, and have a high but negative correlation for all educational groups, and especially for high educated employed, which here shows the highest estimated value of all mobility groups. The highly significant and negative estimates for out-migration and job-growth can be understood in light of the expectation that employed persons have better information of the situation in their own local labour market compared with all other local labour markets, thus regulating the out-migration processes closer to the regional business

cycles than the corresponding in-migration processes. Job leaving through emigration shows a certain significance although negative correlation with the employment growth for employees with low and high education. When all the mobility measures are weighted together by the number of persons within each mobility group, the relationship between net employment growth and total mobility is strong, positive and significant for all educational groups with the strongest effects for high educated employed.

**4.2 Labour mobility in knowledge intensive business services (KIBS-sectors)**
In table 3 in section 3 above, we defined the knowledge intensive business services (KIBS-sectors) as the sum of the sectors: Telecommunication, financial intermediation, information technology, research and development and other business services. In the "new-economy" information and knowledge-based service sectors are recognized to be the driving forces in the economic development. Much of the development in these sectors are based on processes of information and knowledge flows that have to be absorbed and prepared for application in the Norwegian society. The expectation is that these processes mainly take place in the largest cities and regions, where the universities and most qualified labour force are found. In close connection to higher educational institutions, we find different types of research institutes, which develop new and distribute established knowledge, often in close connection to central administrations both within the market as well as non-market sectors.

During the last couple of decades there has, however, been an increasing externalisation of knowledge based service functions. Due to increased specialisation a large number of service functions that previously were produced within larger companies both in secondary and tertiary sectors have been outsourced. This in turn has definitely increased the number of employed within separate knowledge intensive firms in the tertiary sectors. Due to these outsourcing processes an ever-increasing part of the job tasks within the KIBS-sectors have been directed towards other parts of the economy more than towards households. In other words the KIBS-sectors are more producer-oriented than consumer-oriented. The producer-oriented structure indicates that employed persons in the KIBS-sectors have a well-developed network with a lot of other sectors, companies and firms. On the other hand these other sectors have close contact with the KIBS-sectors due to the close co-operation that is necessary according to the type of services being demanded. Such complementary relationships between the KIBS-sectors and other sectors give rise to a set of hypotheses. Firstly, there is reason to believe that the development of the KIBS-sectors is strongly correlated to the growth of all other sectors served by the KIBS-sector. Secondly, there is reason to expect that the close network with other sectors will increase the potential job-to-job mobility between the KIBS-sectors and other sectors of the economy, and thus generate a flow of knowledge between these sectors. Due to the expectation of a relatively centralized localisation pattern of the KIBS-sectors there is reason to believe that the geographical mobility mainly will go in central directions towards the major city regions. Due to the expectation that the KIBS-sectors are very innovation intensive there is also reason to expect that the demand for persons with modern and up-to-date education is higher than in most other sectors of the economy. Recruiting persons directly from the educational system may thus solve part of this demand.

As shown in figure 1 the four main city regions include approximately 60 per cent of the total national employment in the KIBS-sectors. During the 1990s there has been a tendency towards increased concentration due to the fact that all remaining regions' share of the employment decreased from about 40 per cent in 1994 to approximately 38.5 per cent in

1999. The concentration is further illustrated by an increase in the share of employment in the capital region of Oslo from around 39 per cent up to almost 43 per cent during this period. The other three main urban labour markets show, however, a slight decrease in their share of the nation's total KIBS-employment during this period. Bergen goes from slightly above to slightly below 8 per cent of the national employment, while the regions of Trondheim and Stavanger/Sandnes reduce their share by approximately 1 per cent point from 6.5 to 5.5 per cent of the national KIBS employment.

Figure 1. Percentage of Norway's total employment in the KIBS-sectors 1994-1999 distributed by the four main urban regions and all other regions. Per cent
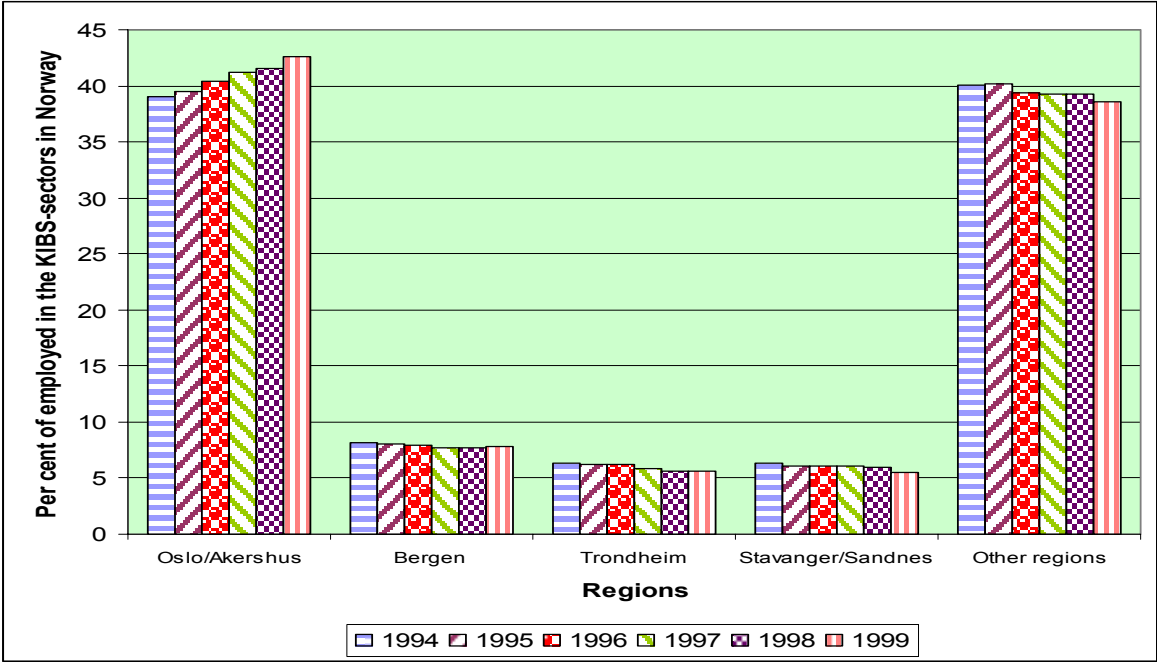
In figure 2 the gross entries to job in the KIBS-sectors are compared with the total gross mobility to job in all sectors of the economy. The figures represent the national average in the time period 1994-1999. There are very clear differences with an overall higher gross mobility in the KIBS-sectors compared with the total economy. The size of the differences seems to be positively correlated to the business cycle, with the highest gaps of mobility in the strongest growth years 1997 and 1998. Furthermore, status groups break down the total gross entries. The figure definitely shows the importance of recruitment through job-to-job mobility. Transitions directly to job from the educational system are definitely of importance, but in the KIBS-sectors the recruitment from in-migration to job is generally of even higher importance. The recruitment from persons outside the labour force is also of importance, while the transition to job from unemployment and immigration is of minor importance. There is a very clear tendency to higher recruitment from other sectors and from in-migration to the KIBS-sectors compare with the economy generally, while there are small deviations in the structure of recruitment from all other status groups.

Figure 2. Total gross entries to all sectors and to the KIBS-sectors 1994-1999 broken down by status groups. Norway. Per cent of stock of employed.
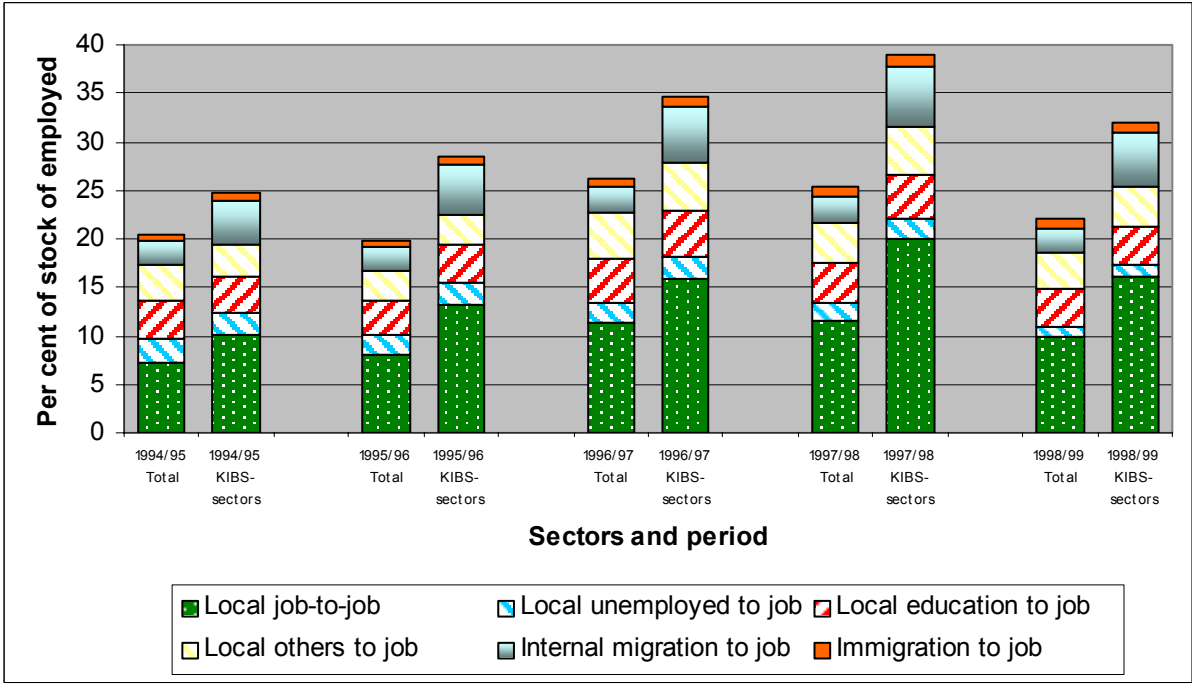
In table 7 we investigate in more detail how each of the four main urban regions perform according to different mobility types and education. The calculation is done so that each of the transitions from and to job in the KIBS-sectors is measured in relation to the national average for each education level. The national average is thus set at zero for each transition. Most of the rates are measured in relation to the total stock of employed by education apart from the rates to job from education, unemployment and others, which are measured in relation to the number of persons in education, the number of unemployed and the number of persons outside the labour force respectively (see definitions in table 4 in section 3 above).

In total, the capital region of Oslo/Akershus shows the best performance of mobility in the KIBS-sectors both for middle and especially for high-educated labour. For low educated labour it is only the region of Stavanger/Sandnes that shows a total index above the national average. The region of Trondheim shows lower than average total indexes for all three education levels. Transitions in each specific mobility group shows that Oslo/Akershus and Stavanger/Sandnes have the highest turnover of labour within the local labour markets, while Bergen and Trondheim have more stable labour. Especially Oslo/Akershus but also Stavanger/Sandnes show a high score on the transitions from the educational system to jobs in the KIBS-sectors. The same goes for unemployment to job. The recruitment among persons outside the labour force is also higher in the capital region, and particularly for high-educated persons. In-migration to KIBS-jobs is above the national average for middle educated labour in Oslo/Akershus and in Trondheim, and for low- and high-educated labour in Stavanger/Sandnes. For all other groups the indexes are negative in relation to the national average. This is somewhat surprising according to high-educated persons in Oslo/Akershus, but this becomes much more than balanced by very low out-migration of higher educated employed from the KIBS-sectors in the capital region. Immigration to job shows positive indexes for Oslo/Akershus and Stavanger/Sandnes both for middle- and high-educated labour, but especially strong and positive is the index of immigration to the KIBS-sectors for low

educated labour in Stavanger/Sandnes. The emigration from job is also most visible in the capital region, which means that the international flows of labour to and from the capital region is of importance in both directions.

Table 7. Mobility performance of the KIBS-sectors 1997-1998 by status group and education. The main urban regions of Oslo/Akershus, Bergen, Trondheim and Stavanger/Sandnes. The corresponding levels of mobility in the whole nation = 0. Deviation from the nation in per cent point.

Mobility group		Oslo/Akershus	Bergen	Trondheim	Stavanger/Sandnes
From job locally	(L)	-1,0	-4,6	-8,4	-3,0
From job locally	(M)	0,9	-3,7	-2,9	1,0
From job locally	(H)	0,3	-0,9	-3,5	4,6
To job from job locally	(L)	-2,4	-8,6	-12,3	-1,0
To job from job locally	(M)	0,2	-3,0	-5,1	-2,0
To job from job locally	(H)	0,6	-0,4	-4,7	-0,1
From education to job locally	(L)	0,8	-0,1	-0,2	0,2
From education to job locally	(M)	2,3	-0,4	-0,5	0,7
From education to job locally	(H)	1,8	0,2	0,3	0,3
From unemployed to job locally	(L)	1,0	0,1	-0,2	1,4
From unemployed to job locally	(M)	1,6	0,6	-0,2	1,6
From unemployed to job locally	(H)	1,2	0,5	-0,7	1,5
From others to job locally	(L)	0,2	0,0	0,0	0,2
From others to job locally	(M)	0,8	-0,1	-0,1	0,6
From others to job locally	(H)	1,5	-0,4	0,2	0,4
In-migration to job	(L)	-0,1	-0,4	-0,5	0,1
In-migration to job	(M)	0,3	-1,3	0,5	-0,6
In-migration to job	(H)	-0,3	-0,7	-0,7	0,8
Immigration to job	(L)	-1,0	-2,2	-0,4	1,4
Immigration to job	(M)	0,1	0,0	-0,2	0,0
Immigration to job	(H)	0,2	-0,2	-0,2	0,2
Out-migration from job	(L)	0,3	-1,4	-0,5	0,0
Out-migration from job	(M)	-0,6	-1,2	-0,2	-0,6
Out-migration from job	(H)	-1,8	-0,5	0,4	0,2
Emigrated from job	(L)	0,3	0,0	0,2	0,2
Emigrated from job	(M)	0,1	-0,1	-0,2	-0,1
Emigrated from job	(H)	0,3	-0,2	-0,1	-0,1
Average	(L)	-0,1	-0,6	-0,6	0,6
Average	(M)	0,5	0,1	-0,3	0,0
Average	(H)	0,7	0,1	-0,3	-0,2

(L): Low education (compulsory school), (M): Middle education (secondary school) (H): High education

Finally, we have analysed the impact of different types of mobility on the regional employment net growth in the KIBS-sectors in Norway. As a basis we have used 86 regions in Norway, and the net change of employment by education in the KIBS-sectors are used as a dependent variable, whilst the specific labour mobility transitions are used as explanation variables. The analysis is put forward by help of regression analysis by ordinary least square methods, and the results are found in table 8.

The figures show that there is a strong but negative correlation between the net change of employment and the ability to leave a job in the KIBS-sectors in the regional labour markets. The job-to-job mobility is strong but positively correlated to the net change of employment. When we include all regions in Norway, the effects of transition from the educational system are somewhat weaker correlated to the net job growth in the KIBS-sectors than expected. The correlation results are, however, positive for all educational groups, but only middle educated persons show estimates with certain significance. The relationship between transitions from unemployment to job and net employment growth is positive and significant only for persons with low education. On the other hand, the relationship between net employment growth and internal migration to job are significant for all educational groups, and strongest for persons with high education. For international migration to job the correlation to net job growth is generally positive, but clearly most positive for persons with middle education. The parameters for internal out-migration from the KIBS-sectors are all negative, and the effects for middle- and high-educated labour are particularly strong. For emigration from job the relationship is only significant for employed with middle education, but then as expected in a negative direction. A weighted average of all types of mobility by education in the KIBS-sectors shows positive and significant correlations, but strongest for persons with middle education.

Table 8. The relationship between net employment growth in the KIBS-sectors and gross labour mobility measured as specific mobility performance of the KIBS-sectors. By segments of mobility and education 1997-1998. Basis: 86 regions in Norway.

| Type of mobility	Low education	Middle education	High education
From job locally	**-0. 963***** **(-5.79)**	**-0. 983***** **(-13.77)**	**-0.907***** **(-7. 98)**
To job from job locally	**1. 036***** **(22. 84)**	**1. 183***** **(25. 26)**	**1. 141***** **(10. 91)**
To job from education locally	0. 724 (0.05)	**1.702*** **(1. 64)**	0.690 (1.48)
To job from unemployment locally	**11. 579**** **(2. 43)**	-0.089 (-0.14)	0. 251 (1.62)
To job from others outside the labour force locally	10. 090 (0.22)	2.265 (1.04)	0. 985 (1.64)
To job from internal in-migration	**1. 323**** **(2. 14)**	**1. 098***** **(3.93)**	**0. 875***** **(4.78)**
To job from immigration	**0. 839*** **(1. 95)**	**5. 368***** **(3.75)**	0.993 (0.78)
From job to internal out-migration	**-1. 153*** **(-1.79)**	**-0.668***** **(-3.00)**	**-0.833***** **(-6. 66)**
From job to emigration	-1.986 (0.86)	**-2. 30**** **(-2. 58)**	2.029 (1.49)
Weighted average	**7.43***** **(15.40)**	**4.21***** **(20.57)**	**7.70***** **(13.84)**
Adjusted R^2	0.88	0.93	0.79

Level of significance: 99%***, 95%**, 90%*. (t-values in brackets). Number of observations=86)

4.3 Labour mobility among different groups by citizenship
Investigations of differences and similarities in the labour mobility structure among different citizen groups represent another important approach of the analysis. We operate here with altogether 4 main groups defined by each person's citizenship. The main groups include a) Norwegian citizens, b) other Nordic citizens, c) citizens from Western European countries and the USA/Canada (Western), whilst the fourth group consists of all remaining citizens (non-Western).

Figure 3 shows that the level of gross mobility to job is generally lower among Norwegian citizens compared with all other main citizen groups. The highest gross mobility is generally found among non-Western citizens reflecting a strong flexibility but also a more marginal and thus less stable position in the labour markets. All citizen-groups show, however, a gross mobility that is highly correlated to the business cycle with highest mobility in the strongest growth years 1997 and 1998. It is interesting to note that other Nordic citizens generally show higher gross mobility compared to other Western citizens. A part of this explanation reflects the neighbourhood effect of higher mobility between Norway and other Nordic countries compared with all other international migration.

Figure 3. Gross mobility to job 1994-1999 broken down by Norwegian, other Nordic, Western and non-Western citizens. Norway. Per cent of stock of employed.
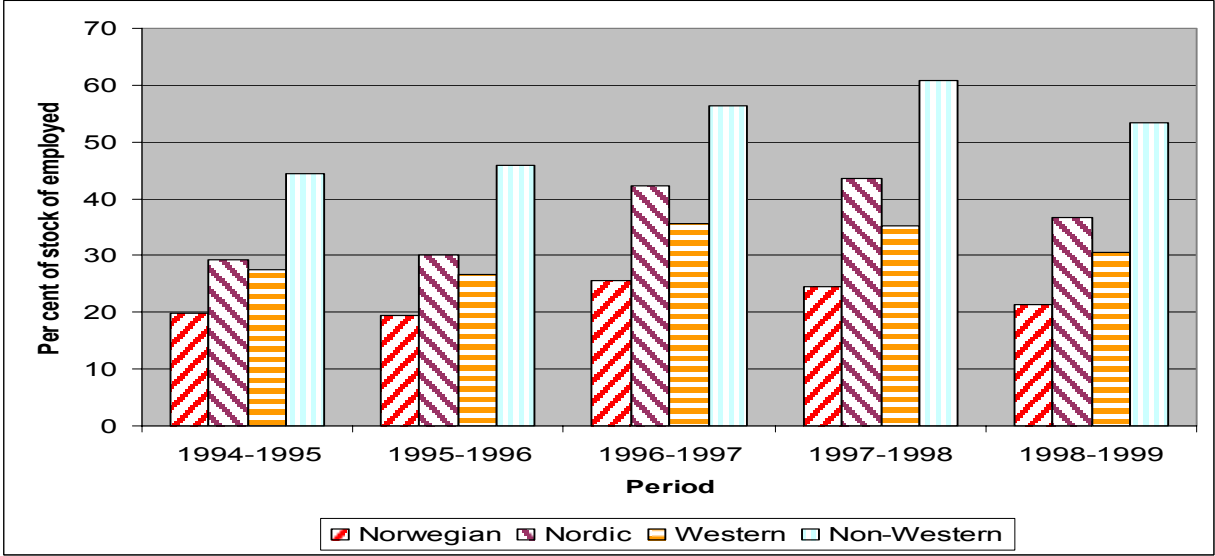
We have examined in more detail how each citizen group behave with respect to different mobility segments. The results are found in figure 4, which shows the mobility rates in 8 different mobility segments for the whole nation in the economic growth period of 1997-1998. The rates are mostly measured in relation to the stock of employed except for the rates for education, unemployment and others outside the labour force which are measured in relation to the number of persons in education, the number of unemployed and the number of persons outside the labour force (see definitions in table 4 in section 3 above).

Strong behaviour deviations across the citizen groups have been observed. The probability of leaving a job within the local labour markets is much higher among non-Western citizens compared with all other citizen groups. The lowest turnover from jobs within the local labour markets is found among other Nordic and Norwegian citizens. On the other hand, Norwegian citizens show a much higher ability to turn from the educational system into an ordinary job compared with all other groups. The lowest ability to find a job after education is observed among non-Western citizens. This group also shows the lowest transition from unemployment to job within the local labour markets. The highest turnover rate from unemployment to job is found among other Western citizens. Other Nordic persons show a much higher ability to find a job among persons outside the labour force than all other citizen groups. Also here the ability to find a job is lowest among non-Western citizens.

Figure 4. Mobility rates in 8 mobility segments broken down by Norwegian, other Nordic, Western and non-Western citizens 1997-1998. Norway. Per cent
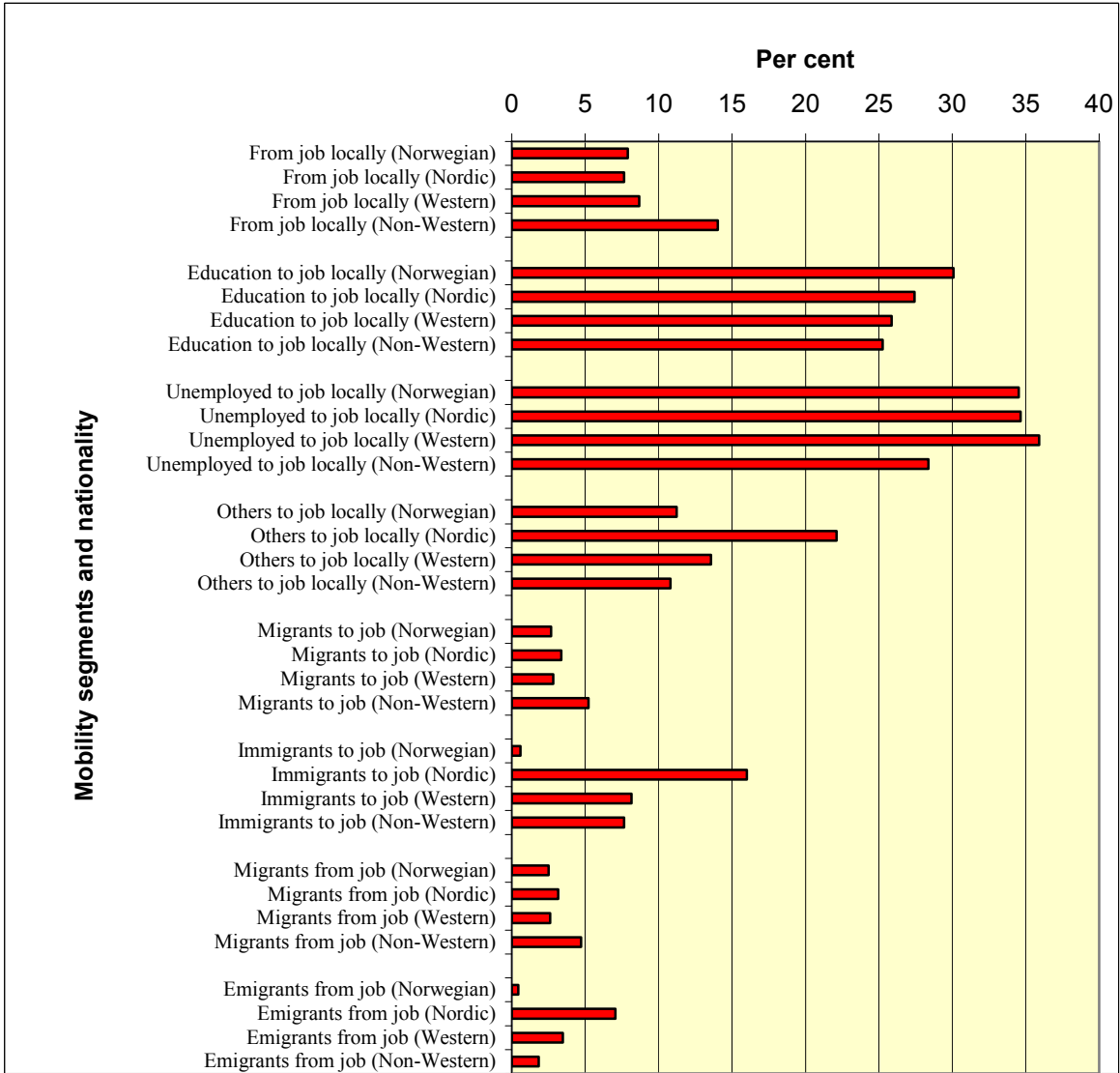
When we turn to geographical mobility the highest mobility rates of internal migration are definitely found among non-Western citizens. This goes for both migration to job and migration from job with a certain positive net effect. Norwegian citizens are more geographically stable than all other national groups. Looking at international migration, other Nordic citizens show much higher rates concerning immigration to job and emigration from job compared with all other groups. In particular, high immigration rates to job also secured high net immigration rates to job from other Nordic citizens in this period. This is in accordance with our findings above, expecting the neighbourhood effect to be of strong importance for the total gross labour mobility of other Nordic citizens. As we could expect, the immigration/emigration rates are lowest among Norwegian citizens while both Western and non-Western citizens show a relatively high gross and net immigration rates to job.

Table 9 shows correlation results for the relationship between net employment growth and different types of gross mobility to and from job in altogether 86 Norwegian local labour markets in the strong upswing period of 1997-1998. A positive correlation has been observed between the ability to stay in job in the local labour markets and employment growth for all

groups except for Western citizens. However, only Norwegian citizens show certain significance in the ability to stay employed locally. Also for the transitions from education to job there are positive parameters for all groups except for Western citizens. None of the estimates are, however, significant, but there are indications that this type of mobility functions somewhat better for Norwegian citizens compared to the other national groups. Transition from unemployment to job in the local labour markets is only positive and significant for Norwegian citizens. For other Nordic and Non-Western citizens this relationship is even negative, although not significant. To job from others outside the labour force shows rather weak correlation with the employment growth with mostly negative parameters, but only with certain significance for Western citizens. To job from internal in-migration generally shows positive correlations, but is clearly most significant for Norwegian citizens. To job from immigration is only positively correlated for Norwegians but most significant although negatively correlated for Western citizens. Transition from job due to internal out-migration is generally negatively correlated with job growth, and most strongly so for non-Western citizens and Norwegians. Emigration from job is, as expected, mostly negatively correlated with employment growth except from among non-Western citizens, but none of the groups show significant correlations here. Looking at a weighted average for all types of mobility the correlation is only strong and positive for Norwegian citizens. This means that in total the labour mobility has the highest functionality among Norwegians with respect to transitions in direction towards jobs in the strongest growing regions. However, this result does not necessarily indicate a negative conclusion according to the labour market policy. In a period with a very tight labour market in quite many regions, there were lacks of supply of qualified labour in many regions outside the main and strongest growing local labour markets of the nation, thus making it beneficial that not all foreign citizens follow the main stream of labour market mobility among Norwegian citizens. It is, however, important to note that negative correlation between employment growth and immigration to job among foreigners is followed by a more evenly behaviour among Norwegian and foreign citizens when it comes to internal in- and out-migration.

Table 9. The relationship between net employment growth and gross labour mobility measured as specific mobility performance by groups of citizenship 1997-1998. Basis: 86 regions in Norway.

Type of mobility	Norwegian citizens	Other Nordic citizens	Other Western citizens	Non-Western citizens
Still in job locally	**0.250*** **(1. 83)**	0.035 (0.76)	-0.004 (-0.10)	0.041 (1.56)
To job from education locally	0. 043 (0. 97)	0.004 (0.30)	-0.007 (-0.79)	0. 002 (0.14)
To job from unemployment locally	**0.060**** **(2. 09)**	-0. 002 (-0. 23)	0. 006 (0.94)	-0.014 (-1.55)
To job from others outside the labour force locally	-0.038 (-0.56)	0.001 (0. 03)	**-0.031*** **(-1. 66)**	-0.025 (-1.61)
To job from internal in-migration	**1. 044**** **(5.27)**	**0. 092*** **(1.66)**	0. 027 (0.66)	**0. 075**** **(2.51)**
To job from immigration	**1. 498*** **(1. 84)**	-0.008 (-0.46)	**-0. 048**** **(-3.67)**	-0.025 (-0.63)
From job to internal out-migration	**-0. 960**** **(-5. 61)**	**-0. 101**** **(-2.19)**	**-0. 084**** **(-2.59)**	**-0. 094**** **(-6. 12)**
From job to emigration	-0.867 (-0. 68)	-0.025 (-0.64)	-0. 015 (-0.24)	0. 052 (0.95)
Weighted average	**0.866**** **(6.70)**	-0.001 (-0.00)	-0.006 (-1.42)	0.008 (1.49)
Adjusted R^2	0.88	0.93	0.79	0.31

Level of significance: 99%***, 95%**, 90%*. (t-values in brackets). Number of observations=86

5. Main findings

Transitions in regional labour market show strong variations across regional typologies. The best total mobility performance is found in the capital region for all education levels, whilst the weakest total mobility performance was observed in the more remote micro labour areas. The successful mobility performance in the capital region has a strong contribution from the education to job mobility, which means that this region has a very strong ability to employ new graduates. The opposite trend is found in the small and micro labour areas. Due to much lower than average unemployment, the capital region shows much lower than average transition from unemployment to job compared to many other regional typologies. On the other hand the capital region shows a high ability to employ persons from outside the labour force. High positive net migration to job in the capital region is first of all connected to low out-migration from job, while negative net migration from job in more remote areas is more connected to high out-migration than to low in-migration.

We expected that regions showing the highest labour mobility also experience the highest net growth of employment. The results showed higher correlation between employment growth and gross labour mobility for high-educated labour compared with middle and low educated labour. Furthermore, there is high and positive correlation between employment growth and in-migration to job, and even higher, but negative, correlation for gross out-migration from job. The highly significant and negative estimates for out-migration and job-growth may support the hypothesis that employed persons have more information of the situation at their own local labour market compared with all other local labour markets, thus regulating the out-migration processes closer to the regional business cycles than the corresponding in-migration processes.

The four main city regions in Norway include approximately 60 per cent of the total national employment in the knowledge intensive business service sectors (KIBS-sectors). During the 1990s there have been a tendency towards increased concentration. There is an overall higher gross mobility in the KIBS-sectors compared with the total economy. Furthermore, there is a very clear tendency to higher recruitment from other sectors and from in-migration to the KIBS-sectors compared with the economy generally, while there are small deviations in the structure of recruitment from all other status groups.

There is a strong but negative correlation between the net change of employment and the ability to leave a job in the KIBS-sectors, while the job-to-job mobility is strong but positively correlated to the net change of employment. The transition from the educational system are somewhat weaker correlated to the net job growth in the KIBS-sectors than expected. The relationship between net employment growth and internal migration to job is significant for all educational levels, while the parameters for internal out-migration from the KIBS-sectors are all negative, and the effects for middle- and high-educated labour are particularly strong.

The level of gross mobility to job is generally lower among Norwegian citizens compared with all other main citizen groups. The highest gross mobility is generally found among non-Western citizens reflecting a strong flexibility but also a more marginal and thus less stable position in the labour markets.

Strong mobility behaviour deviations have been observed across the citizen groups. The probability of leaving a job within the local labour market is much higher among non-Western

citizens compared with all other citizen groups. Norwegian citizens show a much higher ability to go from the education system into an ordinary job compared with all other groups. The highest turnover rate from unemployment to job is found among other Western citizens. Other Nordic persons show a much higher ability to find a job among persons outside the labour force than all other citizen groups. The highest mobility rates of internal migration are definitely found among non-Western citizens both concerning in-migration to job as well as out-migration from job. Norwegian citizens are more geographically stable than all other national groups.

In total, the labour mobility shows higher functionality among Norwegians with respect to transitions in direction towards jobs in the strongest growing regions. However, this result does not necessarily indicate a negative conclusion according to the labour market policy, trying to fill in vacancies in more remote regions through immigration to job. It is, however, important to note that negative correlation between employment growth and immigration to job among foreigners is followed by a more evenly behaviour among Norwegian and foreign citizens when it comes to internal in- and out-migration.

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