FINAL REPORT

Contract no:

HPSE-CT2002-50002

Title:

ENMOB - European Network on Human mobility

Project coordinator:

Anders Ekeland, STEP group, Norway

Partners:

List of members of the Network in Annex 1

Project's www:

www.enmob.org

Reference period: from 01.09.2001 **to** 01.09.2003

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Improving the Socio-economic Knowledge Base

FINAL REPORT

Part 1 : Managerial Report

RESTRICTED

Contract no:

HPSE-CT2002-50002

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ENMOB - European Network on Human mobility

Project coordinator:

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Managerial report – September 2001 to September 2003

Introduction

The project proposal was submitted in late June 2000. The evaluation and negotiation process was not completed before the Spring of 2001. Since most members of the network had other obligations to fulfil it was decided that the start of the network would be in the autumn of 2001.

Like in all newly established networks there was in the first phase a need for discussing and clarifying the objectives of ENMOB, both on a more general level concerning overall objectives, and also as regards what should be concretely done by means of a more concrete work plan and specific working methods. The major event in this process was of course the kick-off meeting, held in Leuven, Belgium, on the 25th and 26th of October 2001. This meeting went through the objectives and the work program of ENMOB in order to get a common understanding of the objectives of the network and the most important research and policy issues. This clarifying and harmonising of aims and views on mobility was important, since most of the members of the network were new to each other and were working on specialised sub-topics of mobility. We needed to get a common vision of what the issues were, what kind of data we were looking for, our evaluation of existing data, and what could be done to improve the situation. There were to main areas: domestic and international mobility. These to areas were in turn divided according to the data sources available, register data and/or labour force study (LFS) data in the area of domestic mobility and register data and "other sources", in the area of international mobility.

Setting up an e-mail list

A joint service to maintain e-mail addresses was set up where people could maintain their own address via the web. This was done in order not to be vulnerable to e-mail address changes. To have 17 members keeping their personal address lists updated is an impossible task. It is also important to have a web-accessible archive of all the internal e-mail communication in the network. Such archives are often a valuable source of detailed knowledge.

Buying a domain name for the web-site of ENMOB – www.enmob.org

This was done just to ensure that there was an appropriate domain name, but the network decided to wait until the actual output of the work of the network had been discussed before starting to use and advertise the web site. The web site is up and running although there is some relevant material still missing. This is mostly due to the fact that there is a lack of web design competence in the network, besides the limited skills of the co-ordinator. But the web site will be maintained and developed as a resource for mobility studies in the future.

Organising the kick-off meeting in Leuven, Belgium, October 25th and 26th 2001

The kick-off meeting was held in Leuven on October 25th and 26th 2001 and was a successful one. In addition to the ENMOB issues we also discussed an initiative taken by Mr. Koen Verlaeckt from the Ministry of Flanders, Science and Innovation administration, who invited the ENMOB members to join a proposal for a thematic network on the specific issue of researcher mobility. Several ENMOB members including the coordinator joined this proposal that got a very favourable evaluation, but did not in the final end get funded, which was regrettable, because there were other research milieus involved, and the topic of researcher mobility – although in general being covered by ENMOB, would have benefited from a special network focussing on this particular aspect of mobility.

The main points of the Leuven Agenda:

- Aims, objectives, deliverables, working methods – an introduction, Anders Ekeland
- Networking with other EU projects, report from meeting of co-ordinators in Brussels in September 2001, Ebbe Graversen
- International mobility - report from ongoing research, Wendy Hansen
- International mobility - status quo and prospects - short, critical assessments of national data from participants
- Financial and administrative issues (money, contracts, web-pages)

- LFS[1] and Eurostat - report by Alex Stimpson
- Discussion - the potential of LFS in mobility studies, critical assessments of national data by participants
- TRANSMOB, presentation of project proposal by Koen Verlaeckt
- Comments - discussion of international researcher mobility - national data in this particular field
- Electronic CVs - the internet as a source of human resource data - Anders Ekeland
- Register data – an introduction - Anders Ekeland
- Next and future meetings, dates, venues - any other business

Getting the first drafts of the national reports on data sources

Several of the members of the network even sent their first drafts to the kick-off meeting in Leuven. The others completed their draft in the subsequent months. This was of course first drafts, and there has been continuous work on these drafts, since this is one of the principal vehicles for systematising the collective knowledge of the network. In addition the papers and presentations given at the network meetings are of course an important part of the output of the network. All these contributions have been put on the web site during the autumn of 2004.

Preparing for the 2nd ENMOB meeting in Marseille, France, May 23rd and 24th 2002

This was the first ordinary meeting of the ENMOB network and focused on domestic mobility, but also discussion of some issues related to international mobility, not the least because in April 2002 the co-ordinator was contacted by the commission, by Mr. Marshal Hsia, who wanted the co-operation of the Network in order to organise a workshop on international mobility in late June or early July. The network of course was very positive to this initiative and the Marseille meeting discussed how to utilise this opportunity to disseminate the work of the Network.

[1] LFS = Labour Force Survey

The main points of the Marseille agenda:

Why mobility is important, Richard Pearson

Why mobility is important, Peter Van der Hallen

Mobility as an optimum problem - consequences for research and policy - Anders Ekeland

What do we know - Experiences from trying to collect data - Wendy Hansen, Sveva Avveduto, Annamaria Inzelt

The US situation - data, policy and perspectives, Mark Regets (NSF US)

The international mobility of researchers - why and how, Lars Nerdrum

Towards a set of recommendations in the field of international mobility – general discussion

A small update and summary from a Eurostat point of view, Alex Stimpson

Belgian LFS study, Peter van den Hallen

Czech LFS and work permits, Jaromir Gottvald and Milan Simek

Spanish LFS and other data sources, Carolina Canibano and Monica Martin

The fundamental unit in mobility research - establishment or enterprise? Anders Ekeland

Discussion - towards a set of recommendations on how to harmonise the LFS

Measuring the Mobility of Researchers in Spain, Carolina Cañibano Mónica Martín

Researcher mobility in Norway, Anders Ekeland

Preparing for the June 24th meeting in OECD

Another substantially related event was the workshop held in Paris on June 24th on the international mobility of human resources organised by the OECD in conjunction with the NESTI (National

Experts on Science and Technology Indicators) meeting in Paris. The event was discussed in Marseille. Several ENMOB members participated in the meeting; Recotillet, Avveduto and Inzelt.

Organising and preparing the July 2nd meeting

Since the ENMOB network contains a considerable number of mobility researchers, contributions from ENMOB members were a substantial part of the contributions delivered at this workshop. The ENMOB co-ordinator also did a considerable amount of work of recruiting non-ENMOB contributors to the workshop. This has had the very positive consequence of getting new and/or improved contacts for ENMOB from statistical-demographic oriented milieus (Jerry Sexton, Laudeline Auriol, Enrico Todisco).

There was substantial written input on a range of data source issues from all ENMOB members involved delivered in advance and of course presentations of more specialised nature at the workshop.

Preparing for the 3rd ENMOB meeting in Madrid, October 23rd and 24th 2002

Main points of the Madrid agenda:

Report from the 2. of July workshop (30 min)

Isabelle Recotillet: Some results from a Cereq survey of Ph.D. graduates

Annamaria Inzelt: Report on international mobility of highly skilled

Richard Pearson: Results from the latest survey of UK migrants

Erzsébet Viszt: Hungarian mobility, domestic and international, an overview

Ebbe Graversen: Researcher Mobility in Denmark

Astrid Kunze on international mobility German experiences

Monica Martin and Carolina Canibano: A review of Spanish mobility research and data sources, what improvements can be made?

Lars Nerdrum: "Increased interest in incoming mobility of researchers to Norway: The work of a newly established commission's work" (30 min)

Anders Ekeland: Foreign researchers in Norway, stocks and flows, a first small study

Elisabeth Vist: "Regions and sectors in the mobility game: the case of Hungary"

Barry Zondag: "Labor mobility in the European Union", the Social-economic council (SER) in The Netherlands

Peter van der Hallen: The NIS-EAK long-term data (10 year review) what is the potential of these data?

Anders Ekeland: Electronic CVs a potential data source: status quo and perspectives in Norway

Preparing for the 4th ENMOB meeting in Oslo, September 23rd and 24th 2003

This was the last meeting of ENMOB. It was delayed – the original plan was to have the meeting in late May, but due to other obligations for several of the participants made it impossible to agree on a date in May or June. The meeting was also attended by Paola Dipietrogiacomo from the IPTS, Sevilla and Rolf Lehming, Director, Science & Engineering Indicators, National Science Foundation, US. Mark Regets, also from NSF – who had been involved in the OECD Human Mobility work, also attended this meeting.

The main points of the Oslo agenda:

The involuntary mobility - the competence of refugees (Richard Pearson)

The interplay and interfaces between firms and research organizations (Ebbe Graversen)

The US situation - an update (Mark Regets)

The labour market mobility of PhDs - a policy challenge for the knowledge based society (Isabelle Recotillet)

Mobility; Data, studies and policy in Spain (Carolina Canibano)

Career patterns and learning (Mark Tomlinson)

The mapping of inflows of researchers - data sources and policy (Lars Nerdrum)

The Eurostat view on firm demography - some critical notes (Anders Ekeland)

Comments - discussion

The LFS as an source of mobility data – a comparative study of some European questionnaires (Jaromir Gotvald and Milan Simek)

The emigration flows of qualified scientists, part I (Sveva Avveduto)

The emigration flows of qualified scientists, part II (Wendy Hansen)

Status and perspectives for studies of international mobility (Anders Ekeland)

Status and perspectices for studies of domestic mobility (Anders Ekeland)

The future of the ENMOB group - ESF network

Enmob web site - design and development

The deliverables

Financial and other administrative issues

The organisational results of ENMOB – a short summary

A major objective of the ENMOB Network was to create a real network of researchers, i.e. people who interact, who draw on each other's expertise and networks after the formal closing down of the network. This objective has been achieved. The ENMOB also sent an Expression of Interest, under the acronym LABMOB, knowing that as such the network did not yet have the strength to form a real network of excellence. Labour mobility as such is clearly a too narrow issue to be the sole focus of a network of excellence. As it turned out, ENMOB members did join various other NoE initiatives. The largest group joined the PRIME initiative – which in the end did get funding. This ensures the continued, organised co-operation of a "core" of ENMOB members.

In addition various parts of the commission have used the Network in order to – on short notice – get an up to date status quo on data sources, stylised facts. Already the network/members of the network have been used in connection with the researcher mobility portal. There was another meeting on international researcher mobility in Brussels on October 15th 2003, and there was yet another meeting on researcher and PhD careers mobility in Paris on July 29th 2004. ENMOB partners have been active in STILE (www.stile.be), a 5th Framework Accompanying Measure working on several related issues.

The latest news is that a consortium consisting of mainly – but not only – former ENMOB members got a tender from IPTS in Novermber 2004 for a feasibility study for a Mobility Monitoring System. The project has a budget of 2000 Euro and is focussed on the feasibility and cost of systematic datacollection in this area.

FINAL REPORT

Part 2 : Scientific Report

RESTRICTED

Contract no:

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Title:

ENMOB - European Network on Human mobility

Project coordinator:

Anders Ekeland, STEP group, Norway

Abstract

The main objectives of the European Network on Human Mobility (ENMOB) were to:

- map existing databases for both domestic and international mobility
- critically analyse them and recommend improvements
- to look for new and emerging databases - electronic CVs and emerging register data
- create a network of mobility researchers/institutions.

ENMOB as a thematic network had to build on the research done by its members in other contexts. There have been projects based on register data (Nordic countries and Belgium), on Labour Force Survey data, work/trade permits, and graduate surveys (Czech Republic, France) in the field of domestic mobility. There have been studies on inter-Nordic and international mobility. The latter have used novel methodological approaches in a situation where systematic migration data are not available. ENMOB has created at stable network of researchers that did not exist before.

There is a broad scientific consensus that human mobility is an important mechanism for diffusion of knowledge and that mobility has negative and positive consequences for the receiving and the delivering firm/country. There is a widespread implicit assumption that mobility is too low and should be raised, in general and for specific groups like researchers. That is – one should “maximise” mobility. But human mobility is a problem of finding an optimum. One should avoid very low and very high mobility. Very low (2 - 3 %) means too little diffusion of new ideas, of tacit knowledge etc. Very high mobility (>30 %) disrupts knowledge accumulation and team work, and increases training costs. To quantify the effect of negative and positive effects of human mobility and delineate a more precise optimum range of mobility is a fundamental problem of mobility studies. In order to work on this problem detailed data with full coverage of the economy, i.e. register data is needed.

There are two basic sources of data: public registers and the Labour Force Survey. Only register data can map the mobility in sufficient detail. The Labour Force Survey has inherent limitations due to the small sample size. Mobility rates can be calculated only for economy-wide or for very large sectors and educational groups, but not for subgroups like

researchers or specific educations, like electronic engineers. The LFS cannot be use *at all* for international mobility. As long as there are systematic register data only in the Nordic countries, and partial data in Belgium, France, and the Netherlands - no real progress can be made, neither in domestic and particularly not in the studies of international mobility.

An important “stylised fact” is that the mobility rates calculated on the basis of the Labour Force Survey show clear indication of statistical artifacts. Spain has a much higher mobility (12 - 13 %) than e.g. Italy (3 - 4 %), a difference that is not accepted as reflecting reality. In addition there is a marked difference in 5 - 8 percentage points in the mobility rates calculated with register data versus Labour Force Survey. Before such possible statistical artifacts are weeded out there is no firm empirical basis for policy formulation.

Regarding international mobility there is so far only fragmentary data to map the knowledge flows because education/occupation of immigrants are not registered. In addition there are the well known problems of just counting migrating heads in countries without using administrative registers that record where persons live. Minor reforms in the way migration statistics are collected could change the availability of data dramatically.

Electronic CVs is a potentially very rich data source. The use of CVs is wide spread. More and more CVs are on the internet, on institutional/individual web pages and in large “job-matching” databases. What is needed is standardisation advancing from unstructured Word documents to standards based on XML, advancing from proprietary to compatible CV databases.

Absolutely fundamental is the use of unique identifiers for persons and firms/institutions in all kinds of databases in society. This makes it possible to join data from various sources and create data for policy formation with hitherto unknown cost efficiency. A combination with various surveys to map attitudes and motives to register data is the best research strategy. The Labour Force Survey should in the short run be modified on some points in order to map mobility better until register data become available.

1. Executive summary

Mobility as an optimum phenomenon

One important result of ENMOB is to formulate the study of mobility rates as an optimum problem. The objective cannot be to "maximise" mobility. At present there is a widespread implicit assumption among many policy makers that mobility is too low – despite the fact that we have little no theoretical or empirical foundation for such an assumption. What is clear is that too high mobility disrupts team work and knowledge accumulation and raises training costs. Too low mobility on the other hand might result in too few new ideas, new tacit knowledge, networks etc. The optimal range is where the positive and negative effects of mobility for both the receiving and delivering institution are in a long term sustainable relationship. So while it theoretically is clear that we should "avoid the extremes", that is too low or too high mobility, we are still far from having a real empirical basis for deciding what is "too" high or too low. To be able to be more precise, Europe-wide comparative studies with rich register data are necessary – and these data are not available besides the Nordic countries and to a certain extent in Belgium.

Consequently there is for the time being a tension between the demand for "results" and the willingness to invest in collecting the necessary data or in some countries, making the data available for research. When it comes to "what has to be done", the conventional policy advice is "more labour market flexibility". But again this advice might be more based on economic text-book reasoning than on a real, empirical understanding of labour market dynamics in the short, medium and long term.[2]

In addition there is a lack of realism of how difficult it is to influence mobility rates – up or down. The possibility of unintended negative side effects is not negligible.

The data situation – domestic mobility

The first inventory of databases suitable for mobility studies was made by Mikael Rosengren (1998). When the ENMOB project was conceived we did hope that there should be more data "out

there" and that an updating of the Rosengren inventory would be a major task for ENMOB. But having studied and discussed the available databases it became clear there are basically two types of data sources: surveys and registers, and that the only real comparable economy-wide survey is the Labour Force Survey.

As we will discuss elsewhere, the LFS can never be used as sources for the *detailed* studies needed to answer the policy issues. Detailed analysis of mobility on three digit level NACE – telecommunications for example – is impossible since the LFS is only on two digit level.

On the other hand, when a unique identification number is used, any public or private register database becomes part of register data. Since the possibilities of joining registers are great and constantly increasing a detailed inventory of the existing registers to which researchers have access would also soon become outdated.

A full status inventory of all variables would be very voluminous – disregarding that ENMOB did not have the resources to do that. Better then to start with a set of research questions and then see of there are suitable register data available – and not the least important – that researchers can get access to them.

The bottom line is that we ended up doing less inventory than planned and more time discussing the ways to improve the Labour Force Survey and register data as sources.

Register data

Register data have a long tradition in the Nordic countries[3]. There are partial systems in most countries, mostly on the basis of social security databases. There is work going on in several countries to establish the kind of matched employer-employee databases needed for mobility studies, but both privacy and general standardisation issues makes this a slow process. But there are positive signs, not the least that in the last 12 months a 10 year series of register based data has been made available for research in Belgium. In France the INSEE also has useful register data. There are also partial matched employer-employee datasets in Britain, Germany, Italy and Spain.

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[2] A paper by Anders Ekeland, "Reflections on mobility studies" will be published (Spring 2005) as part of the STILE project and contains a discussion of the policy advice given by OECD.

Some of these matched employer-employee data sets are survey based and based on small statistical samples of the firms in the economy.

The Labour Force Survey

This has a long tradition in all European and OECD countries. As a result of the sustained work of Eurostat the national LFS has become much more standardised since 1992. There is a system of working groups, expert meetings etc. in order to have a constant development and harmonisation effort. The harmonisation achieved since 1992 shows the importance of building stable institutions that can accumulate the necessary detailed knowledge needed for continuously developing the LFS.

Other surveys

There are first of all the censuses, but these are only useful for imputing data on education and/or occupation that are sometimes missing in other data sources, but for this purpose it is of course very useful.

Secondly there are in many countries surveys covering the transition from higher education to work, sampling the graduates at different times - typically one and three years after graduation. The transition from school to work is an important aspect of mobility in itself, and given the panel character of the data, some information on domestic mobility can also be extracted. Since there are so few data sources on *international* mobility, the share of graduates that one finds in other countries can shed some light on this issue.

Recommendations regarding domestic mobility

The recommendations outlined here represent what there is a relatively broad consensus on in the network since this is of course a point where the differences in opinions, in research cultures and strategies for future research manifest themselves. There is less controversy around what to do in order to improve the Labour Force Survey. The proposals are actually “minor” changes and additions to the Labour Force Survey. When it comes to what should be recommended regarding register data this is more controversial since it involves a debate on privacy issues.

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[3]Except Iceland, where a register data system has been established in the last few years.

Labour Force Survey

There are some specific questions that are of importance for domestic mobility. Mobility can be basically measured in two ways in the Labour Force Survey.

a) By the panel character of the Labour Force Survey

b) By the retrospective question, which exists in two variations: "Where did you work one year ago?" and "When did your current job start?"

Since the respondents in the Labour Force Survey are questioned at various times over a two year period the recorded change in workplace could be used as a mobility measure. The major drawback with this measure is that only a fraction, for example a quarter of the population, is asked at the same time, so the sample is reduced and there are some methodological questions that have to be answered related to how one best shall convert this into yearly mobility rates for the whole sample. Of the two retrospective questions the question *"Where did you work one year ago?"* and *"When did your current job start?"* the latter is clearly to be preferred since it gives the precise data of the job change event. This is the only question that does not lead to a loss of information and that makes it possible to use the data for event history analysis.

In addition the Labour Force Survey must be clear about what unit is meant, establishment or enterprise, when asking if one has changed jobs. For a discussion of the importance of "firm demography" see ENMOB deliverable no 8.

Register data

As discussed in more detail in deliverable 2, "Critical analysis of existing data bases for domestic mobility" it is strongly recommendable that register data are in the form of event histories. But first of all there is needed a discussion about register data in themselves in relation to privacy. This is of course not a question where the needs of mobility research - and other labour market research needs – are going to be decisive, by no means. But as researchers with a long experience with register data, with detailed knowledge of the scientific and policy issues some members of the network are of the opinion that we should try to formulate our views so that our knowledge can inform the public debate on these issues.

It is difficult to briefly summarise the debate giving full justice to all the different lines of argument. The short version of the arguments for trying to establish and develop register data is that the current digitalisation of all kind of information in society is in fact a register data building process. And since such systems (banks, insurance, and health) are computer based and computers need unique (numeric) identifiers there is emerging a need for both public and private register databases to use nationally unique identifiers. Social security systems have to be able to identify persons without stable addresses, having identical names, changing their names. The same goes for banks, insurance companies etc. The inner logic of the EU is to have unique identifiers on a European scale, but a discussion of this topic is beyond the scope of the work of ENMOB.

In order to collect taxes one needs to keep track of where people live and who their employers are. Schools and universities build up databases with detailed data about their pupils and students. As long as these databases use one standard identification number for persons and the same for firms there is no need for these different registers to be build according to some overall plan. The data can be merged – using the person ID – many years after this originally decentralised establishment of the database(s). There are also various developments on a national scale pointing in the direction of using unique person and firm (organisation identifiers). The conclusion of this line of argument is that primarily for the reasons of efficient government, especially eGovernment, the use of digital information about citizens and firms should be utilised – also for research. One important objective for social sciences is to contribute to a more informed political debate in a modern democratic society, and it is beyond any doubt that register data are very cost efficient aims compared to different types of surveys[4] when it comes to collect "hard" data.

There are mainly two responses to the arguments in favour of using register data. First of all that - while desirable to use them from a narrow scientific/administrative point of view; register data opens up for a "Big brother watching you" society. The sceptics argue that the possibility for misuse is so great that one should not argue for the establishment and use of such data. Others hold the position that the dangers of misuse is not that great, but that it is not the researcher community's job to argue for the introduction of register data.

[4] Register data and surveys should be used in a complementary manner. The situation today is that surveys still ask a lot of trivial questions like number of employees, total sales etc. etc., information that is already in the registers!

The answer from the "optimists" to the "sceptics" has been to point out that the Nordic countries have a long tradition of using person and firm identifiers – and letting the various public authorities share data collected with such ID numbers as unique key – and letting researchers and statisticians have access to such data – and that there have been no scandals at all. For the optimist this is not surprising since your education, occupation, job career are not sensitive data. People send them to employers and authorities all the time. The "optimists" have also pointed out that the data collected through the use of various types of "bonus-cards" are much more extensive, and have much more potential for revealing sensitive information about consumer habits. That "misuse" from commercial "Big brothers" watching every step you take, that is almost every buy you make, is a much more immediate danger, and still there have been no major scandals – if one does not think that more sophisticated direct marketing is a scandal.

It will not be easy – and probably not be desirable – to reach a consensus on these issues, but a clear statement of the different points of view will in itself be a valuable contribution to the ongoing debate of privacy issues in different parts of the EU commission.

The data situation – international mobility

International mobility as such has of course for a long time been recognised as an important phenomenon, and substantially it is placed as a sub-topic of migration studies which is a well-established academic discipline. The interest of policy makers has increased in the later years, starting with the Lisboa meeting. A good summary of the issues and the progress made so far is found in "The Report on the Implementation of the Commission's Action Plan for Skills and Mobility." COM (2004) 66 final, 6/2/2004.

In contrast to domestic mobility where there are data, the lack of data is the fundamental obstacle for advancing research in this area. The reason for this is that migration registers/statistics do not contain data on education and/or occupation for most immigrants. There are mainly two reasons why this is so. First of all it is often difficult to classify the education of immigrants since this requires a detailed knowledge of the education systems in very many foreign countries. But – and maybe more important is that the authorities have not been focused on collection this kind of information. The authorities have been more interested in other characteristics of the potential

immigrant than educational and/or occupational data, like criminal record, family ties, membership in certain types of political parties etc.

In the Nordic countries the register data can be used to look at the education and work career of the ***e***migrants, and there are data on the destination country. The return rate can also be calculated and this gives a rough picture of the brain circulation/brain. One can use this for calculating the net loss (brain drain) over different time horizons. As in most other European countries, the education and/or occupation of ***im***migrants have not been registered. There has in Denmark and Norway been made large surveys to get this information into the registers, and the situation has improved. But such as hoc surveys cannot be a substitute for continuous registration. The stated objective is to make this a part of routine registration of immigrants. So far there have only been studies of inter-Nordic migration, cf. Graversen, Lemming, Ekeland et al. (2003), Wadensjö (1996).

Recommendations – international mobility

There has been a debate going on in the network on how to improve the situation regarding data. There are two main groups of opinions. The first hold that the only – and fastest – road to real result is to modify migration statistics, and that there is little chance of getting the data needed for real policymaking from surveys. Consequently one should argue rather single-mindedly in order to get this modification process going. The other point of view is that such migration register data will not materialise in the foreseeable future and that consequently researchers should argue for the use of extensive surveys. The obvious problem with surveys is of course that in the population as whole, very few are moving internationally so the numbers of observation will be too low with an ordinary random sample. This is why the Labour Force Survey cannot be used. As soon as you try more targeted sampling, the costs rise, your sample gets biased etc. Electronic CVs could emerge as a alternative data source, especially for studies of researcher mobility and the very high skilled, since they all have a well developed CV and the institutions they belong to could be pilot testers of a standardised electronic CV.

The data situation – other data sources

There are fundamentally two such sources, electronic Curriculum Vitae (eCV) and emerging register data.

Facilitating the use of digitalised information – emerging registers

The total digitalisation of information in society opens up quite new possibilities for the social sciences when it comes to availability of data. Persons and firms leave innumerable electronic traces as a result of their various activities. The key point of this type of data is that the use of unique identifiers, i.e. person and firm ID numbers, makes it possible to join the most different kind of data for various – hitherto unknown analytical purposes. It is a myth that register data requires some kind of central, long term plan. The fact is that every piece of information that is stored with a person ID can be joined and is consequently is part a virtual, distributed database. Such databases are not of the traditional big, public administrative kind. It might be small educational courses - like MSCE (Microsoft Certified Engineer) - very valuable data in a life long learning perspective, but the kind of data that will not be part of public administrative data.

Electronic CVs

One important example of the general digitalisation of information is the emergence of electronic CVs. The eCV clearly opens up new possibilities for labour market research, but of course the most important effect is clearly the improvement of the information in the labour market. Extensive use of eCVs should increase the efficiency of labour market and the rapid growth of "matching" databases since the late nineties shows that this is responding to the needs of the actors of the labour market. That is of course the reason why eCVs are important; their use in research is clearly a secondary issue.

It is important to underscore that a CV stored in a Word file is not an eCV. Without a predefined formal structure makes, it will not be machine-readable, not searchable using database search techniques – only free text search, which is much less efficient. So getting the CV into a word file, with some predefined headings etc. will not do. This is the reason why the he job matching systems require you to enter the data into a structured database, into an eCV, but in addition allows the uploading of Word file CVs. [5]

[5] As it is explained on the Totaljobs web site: "Why is this [filling out an eCV] better than just storing a CV with Totaljobs? Because of the way the information in the profile is structured, recruiters can pick out more easily the candidates with the skills and experience they're looking for. It supplements your CV and highlights why you would be a good candidate match."

The key issue - standardisation

What is needed is of course standardisation and as always when a new potential data source emerges there are several initiatives. Especially the EU and national public agencies have an important role to play in order to make sure that the standardisation process becomes an open, dialog-oriented win-win situation. That is – they have to mediate between conflicting needs. But since a computer has great capabilities – in this context practically unlimited ability to store/retrieve relevant information – there is no reason to believe that a satisfying solution to all parties cannot be found. The key question is to classify and structure the information – and to make the standard expandable – to cater for new and not yet articulated needs.

Electronic CVs – the current situation

The job brokers

The personal computer dates back to the early eighties, it was the spread of the Internet in the mid-nineties that opened up the real possibilities for the use of eCVs. Over the years the labour market has increasingly been going "on-line". Both public and private actors have realised the potential of the Internet. As always happens when a new technology emerges, everyone made their own system. Both on a national and European scale almost all the old manpower agencies went on-line and some new pure on-line actors came into the market – with their own system.

There has been a reduction of the number of actors as a consequence of the dotcom crash. One major job-broker StepStone claims 1 million registered job-seekers, mostly from Europe. It is hard to tell the total number of persons who have entered information in job-seeking databases, since there is considerable overlap between the databases because persons who want to receive job offers tend to register in several systems. There is no use of unique identifiers, so one person might be in the same system with different e-mail addresses.

The individual CVs on the Internet

Another striking phenomenon is the amount of individuals that have put their CV directly on the Internet. It is of course difficult to tell how widespread this practice is, but many research and

academic institutions either oblige or strongly encourage their staff to put their CVs and other information on the Internet. Needless to say – there is a very low level of standardisation.

The major initiatives

The only initiative that really aims at building a systematic structure of a CV integrated into the job-matching process is the *Human Resources XML consortium*[6]. This seems to be the major initiative, a non-profit consortium made up of job brokers like Manpower, Monster.com, big firms like Oracle, IBM, BP, some public or semi-public labour market agencies like the Swedish Labour Market Board (AMV).

Another important initiative is from The EU organisation CEDEFOP = Centre pour le Development de la Formation Professionelle, which has developed the European curriculum vitae format. But this is a classical example of a Word file with headings – and no real structure when it comes to make the information in the CV machine searchable.

Recommendations – other data sources

The recommendations regarding electronic CVs are:

That the appropriate agencies in the EU and the member states make an action plan for the standardisation of eCVs.

The universities and non-profit research institutions should be the first to test solutions increasing the visibility of scientific human capital on the Internet and consequently in the ERA.

The standard should be structured, flexible and expandable. The techniques used in XML-based semantic systems should be used in such a standard.

The standardisation of eCVs should be integrated with register information, so that all the information in public and private registers can be integrated into the eCV. This will be cost saving and quality enhancing.

[6] www.hr-xml.org

Recommendations regarding emerging data sources:

The central lesson is simple: use unique identifiers for persons and firms in all databases that are created. This will then make possible – with due regard to privacy questions – a very cost efficient use of the data created – both for current and future needs.

2. Background and objectives of the project

Introduction

The ENMOB network has its origins in the OECD work on national innovation systems, more precisely in the "Focus group of human mobility". In the first phase 1997 - 1999 this was a purely Nordic group, since only the Nordic countries had register data. In the last phase of the OECD work, 1999-2000, it was decided to expand the focus group with other countries – and that was a success. Four meetings were held in the focus group and the result was documented in the OECD publication "Innovative People". When the ENMOB was formed this "OECD core" was joined by some institutions that were new to the other participants and started their collaboration for the first time in the ENMOB context.

The state of the art and the objectives of ENMOB

Recent years have seen a rapidly growing interest in the role of knowledge and competence in the economy, especially with regard to the role of knowledge in enhancing the innovative capabilities of firms, sectors, and regions. The demand for indicators and quantitative analysis of competence and human resources has been growing much faster than the ability of researchers and statisticians to respond to such demand.

> **Against this background the main objective of this network is to contribute to the development of indicators and analysis of human mobility. Both domestic and international mobility (brain drain/gain) will be addressed.**

Examples of central issues in the study of human mobility are:

- competence profiles: sectoral, regional, and national
- industry-science relationships
- international mobility (brain drain/gain/circulation)
- human mobility and regional innovation clusters

- recruitment patterns for fast growing industries
- the role of SMEs in employment and competence creation
- research based spin-offs.

These issues can be studied in national contexts, but are very much more meaningful in a comparative framework, through which they can be related to socio-economic performance.

A new field of study

Human mobility is a rather new field of study. The basic reason is on the one hand the recent digitalisation of data relevant for this field, on the other that computers have become so powerful so it is feasible to run analysis of the whole population on an ordinary, well equipped PC.

Since the field is new there is an urgent need for development of analytical tools. There is for example no "standardisation" regarding mobility measures yet – and there is certainly more than one way to calculate mobility rates. To make mobility figures meaningful to "outsiders", and to enhance their relevance as a policy tool, it is important to agree on certain standard measures and methods.

But mobility rates are by no means the only relevant measure. Closely related indicators are duration measures, sometimes called "survival rates"; these can also be constructed in different ways. There are different proportions of "stayers" and "movers", for example, so that average numbers might be quite misleading. To make mobility and other types of rates and intensities meaningful requires considerable analytical work.

No analysis without adequate data

The current state of research in this field is characterised by great variations in data availability and quality. At one extreme, the Nordic countries have registers back to the mid-eighties covering the whole population. Other countries like Belgium, Netherlands and France have partial registers or very large samples based on registers.

Register data can answer a wide range of policy questions because of their complete coverage, detailed information, time-series etc. In short for many purposes they are very cost-efficient compared to traditional surveys.

However in most EU countries and in Central and Eastern Europe a survey measure, using the Labour Force Survey, has for the time being to be the basis for analysis of human mobility. A major objective have been:

> **To use to their full potential the LFS in mobility studies as a source of knowledge about the role of human mobility in the economy and to contribute to the further development of LFS in this respect.**

This is particularly important since the LFS was not designed primarily to answer questions about human mobility as a mechanism of knowledge diffusion.

Combining registers and surveys

Results from the LFS can be studied in the light of the results one gets from the registers – and vice versa. This will benefit the development of both data sources since both sources have their strong and weak sides.

With the rapidly digitalisation of information about employers and employees from a range of institution like tax authorities, social security authorities etc. there emerge large databases that are potential register data. An example is the explosive growth in using the Internet to seek for talent and to offer talent. Personal web pages with CVs can be found. It would be possible to have certain standard elements on such CVs making it feasible to search very rapidly and cost-efficiently for a very well defined set of qualifications. That is – and to an increasing degree will be – the main benefit. But for human resource research of all kinds this would give qualitatively more information on real and tacit competencies than educational and occupational indicators ever can give. Therefore a very important objective for the Network have been:

> **To be a forum for exchange of experiences for the establishment and use of new digital data sources in mobility studies.**

International mobility

One very important aspect of human mobility is international mobility. There are several interesting dimensions of this problem:

- inside the EU
- in relation to the Accession countries
- in relation to Third World countries
- in relation to the US, especially the international mobility of persons working in key sectors like ICT and bio-tech.

The labour force survey and community household survey cannot be used to study international mobility due to the small sample sizes. Regrettably the different sources for migration statistics (work and residence permits etc.) are not well suited to study the international flows of competence. However small changes in the data collection procedures could significantly improve the situation. So an important objective is:

> **By systematic exploration and analysis of existing data and research to point to what kind of analytical models and data that could be developed using existing data.**

3. Scientific description of the project results and methodology

Domestic mobility

The various types of data source for mobility

There are three main types of data sources for the study of domestic mobility:

- The Labour Force Survey (LFS)
- Register data and
- Specialised and ad hoc surveys.

The Labour Force Survey (LFS)

This has a long tradition in all European and OECD countries. As a result of the sustained work of Eurostat the national LFS has become much more standardised since 1992. There is a system of working groups, expert meetings etc. in order to have a constant development and harmonisation of LFS. The results achieved since 1992 shows the importance of building stable institutions that can accumulate the necessary detailed knowledge needed for developing the LFS. Such development work is a slow process of harmonising different statistical traditions, different points of view - consulting various stakeholders etc. In addition two major changes of nomenclature/classifications were implemented in this period. First, in the early nineties there was a change from ISIC rev. 2 to NACE (very similar to ISIC rev. 3). Then there was a change of educational classification from ISCED-76 to ISCED-97. Especially the change of educational classification made it difficult to construct comparable data at a more detailed level in Eurostat, cf. Laafia and Stimpson (2001).

Register data

Register data have a long tradition in the Nordic countries[7]. However, there are also (at least partial) register systems elsewhere, mostly on the basis of social security databases. Moreover,

there is work going on in several countries to establish the kind of matched employer-employee databases needed for mobility studies, but both privacy and general standardisation issues makes this a slow process. However, there is a clear but slow progress allowing us to be optimistic on that issue in the future. Since ENMOB started, Belgium has joined the "register data league", with a labour market database that has quarterly data for 10 years. This shows that "if there is a will, there is a way". In France the INSEE also has useful register data. Research reports show that this is also the case in Italy, Germany, UK and Netherlands[8]. Matched employer-employee data are produced by technical necessity in every modern state. The challenges are: the use of unique identifiers in other public and private databases, access and cost of these data, and as discussed in deliverable number 2, the critical analysis of existing data.

Other surveys

Among the other surveys there are first of all the censuses. The census is useful for imputing data on education and/or occupation that is sometimes missing in other data sources, but for the purpose of measuring mobility it is not adequate, due to the long intervals between the censuses, generally ten years. It might, if the relevant questions were asked, be used as a decadic benchmark, but it is hard to see how a system of monitoring, analysis, policy formulation and implementation in practice could have a ten-year cycle.

Secondly there are in many countries surveys covering the transition from higher education to work, sampling the graduates at different times - typically one and three years after graduation. The transition from school to work is an important aspect of mobility in itself, and given the panel character of the data, some information on domestic mobility can also be extracted. The main strength of the transition surveys is that they are among the few data sources that can shed some light on *international* mobility, the share of graduates that one finds in other countries.

[7] Except Iceland, where a register data system has only been established rather recently.
[8] Cf. the number papers based on matched employer-employee datasets presented at the latest CAED, Comparative Analysis of Enterprise (micro) Data Conference, www.statistics.gov.uk/events/CAED/abstracts.asp

Available data sources

The following table shows the availability of different data sources for domestic mobility in a number of countries.

Country	Labour Force Survey	Register data	Matched employer – employee data
Austria	**X**		**X**
Belgium	**X**	**X**	**X**
Czech Republic	**X**		
Denmark	**X**	**X**	**X**
Estonia	**X**		
Finland	**X**	**X**	**X**
France	**X**	**(in principle)**	**X**
Germany	**X**		**X**
Hungary	**X**		
Iceland	**X**		
Ireland	**X**		
Italy	**X**		**X**
Latvia	**X**		
Lithuania	**X**		
Luxembourg	**X**		
Malta	**X**		
Netherlands	**X**	**(in principle)**	**X**
Norway	**X**	**X**	**X**
Poland	**X**		
Portugal	**X**		
Romania	**X**		
Slovak Republic	**X**		
Slovenia	**X**		
Spain	**X**		
Sweden	**X**	**X**	**X**
Switzerland	**X**		
UK	**X**		**X**

Table 1: Data sources available for mobility studies, per country.

Critical analysis of existing data bases

One major objective of the ENMOB network has been to evaluate the existing data sources in order to create a better knowledge base for policy formation related to domestic mobility issues.

The critical analysis has two aspects. On the one hand a discussion of more technical aspects of the data bases, like lack of standardisation, low quality of data etc. – and on the other hand clarifying of what type of data, what variables should or can be used to answer the analytical questions. The objective of such a critical analysis is of course to tell whether we have a sufficiently firm basis for policy formulation.

Strengths and weaknesses of data from Labour Force Surveys

The fundamental weakness of LFS data is that it is sample data. The number of interviewed persons is typically somewhere between 0.5 and 1 percent of the so called “active”, in practice from population between 16 to 65 - 70 years old. Based on the respondents, and assuming representativity, the population is inferred from these small samples. That means that on the basis of answers from 23,000 Norwegians – the total number of employed persons in Norway are calculated – around 2 millions. This estimate has a confidence interval of plus/minus 5 %. The LFS was constructed to give information on three main groups – the employed, the unemployed and the inactive – and the estimates produced for these aggregate groups are reliable. The problem comes when we want to look at sub-groups, by sex, by age, by sector, by education, by occupation etc. The number of interviewed persons that are, say, female, between 25 – 35, work in research, have a PhD and work as a researcher – is low. In that sub-group only a minority, a quarter at the maximum have changed job. In reality, we know from registers that between 20 to 40 (out of around 200 researchers) are mobile. Because of selection randomness, and because sample size and population are too small to allow the "law of big numbers" to work, reliability problems are very important.

As a consequence Eurostat publishes guidelines that must be obeyed for how many respondents there have to be in a group to calculate reliable estimates. There is a minimum threshold for numbers to be published at all. Then there is a reliability threshold. Numbers, i.e. estimates between the minimum and the reliability threshold must be published with a warning, that is a footnote that these numbers are not reliable.

To illustrate this phenomenon we present the following table from a study of human resources and mobility using the Dutch LFS taken from the Eurostat LFS database covering the years 1993 – 1999.

Sector	ISCED -high	ISCED - low	ISCO-low	ISCO-high
Oil and Gas	Not at all	Not at all	Some	Not at all
Chemicals&Pharmaceuticals	A few	Not at all	Some	Not at all
Office/comp equipt	Not at all	Not at all	Not at all	Not at all
Radio/tv/comms	Not at all	Not at all	Not at all	Not at all
Aerospace&Other Transport	Not at all	Not at all	Not at all	Not at all
Telecom and Post	Yes	Some	Yes	Yes
Computer services	Some	A few	Most	Some
Research	Not at all	Not at all	Not at all	Not at all
Other Manufact.	Yes	Yes	Yes	Yes
Other sectors	Yes	Yes	Yes	Yes

Table 2: Overview of the "cell size" problem, selected sectors, Dutch LFS 1993-1999.

Source: Ekeland, A and Tomlinson M. (2001), The supply and demand of high technology skills in United Kingdom, Norway and Netherlands a report from the European Science and Technology Observatory (ESTO) http://www.jrc.es/projects/gateway/Estofinalreport.pdf

This breakdown was made to look at some high-tech sectors, putting the rest of the economy into two broad categories, "Other manufacturing" and "Other sectors". We then look at four subgroups, first high and low educated, then high and low occupational groups. We see that for the research sector (NACE 73), one of the smaller sectors of the economy, that not even the size of these groups can be estimated with sufficient precision. That means that one does not get above the minimum number of respondents. A medium size sector like Telecom and Post, is problematic in some years. But this is stock figures and, as mentioned already, the mobile are not more than 25% Consequently, it is only in the biggest sectors we could reliably measure mobility. Since we miss several smaller industries and field, we cannot infer mobility on the total economy with desirable precision.

This is even more dramatic for international mobility, since less than one percent of the population migrate each year, one cannot use the LFS to calculate the total international mobility – not to speak of any subgroup like females, fields of research, highly skilled etc.

Another problem is that the Eurostat LFS only have NACE data on two-digit level. In practical terms this means that if you want to study the ICT sector you cannot use the OECD definition of ICT sectors since that definition includes telecom but not postal services. Since the Eurostat LFS is on a two digit level, you cannot separate 64.1 Postal services from 64.2 Telecom, you only get numbers for 64. Since the development of many indicators (employment, sales, level of education

etc.) might be different between Postal services and Telecom it is nearly impossible to make analysis of these as two different sectors since we only have data on an aggregated level.

The response to the problem of analysing sub-groups could be to increase the sample size, but this not economically feasible. Today tens of thousand persons are interviewed in the small European countries, a very labour intensive and costly operation. With the growth of public and private registers, it would not be cost efficient to double, triple or quadruple the sample – and the demand for detailed analysis would probably not be satisfied any how. The sample could never be big enough to study the female PhDs in natural sciences over a ten year period.

Country	**Number of respondents**	**% of population**	**Rotation of panel each quarter in %**	**No. of quarters**
Netherlands *	47000households (92000 respondents)	0.6	20	5
UK	60000 households		20	5
Denmark*	15600 respondents	0.3	33.3	1 year
Germany	370000 households			
Spain	65000 households	0.4	16.7	6
Czech Republic	70000 respondents	0.7	20	5
Norway*	33000 respondents	0.79	Continuous method	

Source: LFS questionnaires.
* Register data are also available.
Table 3: LFS processing examples.

The collection of data is a costly operation for the national statistical institutions. Since surveys are labour intensive, to double the sample would roughly double the costs. And even when doubling the sample, the sample problem would only be reduced, the detailed data required for detailed analyses of for example women in science would still be impossible. The alternative use of the resources would be to establish a register based system, using data that in most countries already is produced – and that contains all the desired richness of detailed information.

LFS as a source of mobility data

Like any other survey the LFS suffers by problems of how questions are formulated as well as respondents' short or inexact memory. In addition the LFS allows for so called proxy respondents, i.e. someone else is answering on your behalf, in the overwhelming majority of cases it is family members. For example for young persons in Belgium six out of ten answers come from proxy respondents. This does probably not introduce a major bias for the core variables of the LFS – employment status, but for variables regarding search behaviour in the labour market this might lead to less accurate – or biased – information than if it was first-hand information.

For mobility studies there are particular questions where these communication and recollection problems are important. There are two ways of calculating mobility in the LFS. First of all one can consider the changes from the previous interview (each person is interviewed several times). These changes might be in employment status or in NACE sector, giving estimates for mobility in and out of the labour market and intersectoral mobility. Secondly one can use the so-called retrospective questions regarding the duration of the current job. These questions are not yet harmonised in the national LFS surveys. Typical examples are:

- When did you start working for your current employer?
- Have you had this job for more than 12 months?
- When did your last job end?

In an appendix to deliverable 3 there is a full overview of the questions as they are formulated in a large group of European countries.

There are of course problems connected with how the concepts of job and employer are formulated or understood. The best would be to have the whole working career of the respondent, as precisely as possible (e.g. by month and year). Questions of that type are used in some national graduate surveys and although the graduates are only sampled with an interval of several years, a complete event history can be created. But the second best – and putting fewer burdens on the respondent – is to get the precise duration of the last job. Job is here defined as being in the same workplace (establishment). That means that change of workplace inside the same enterprise (legal unit) would

count as mobility. But a change of job meaning a change of function at the same workplace would not count as mobility.

The lack of harmonisation of the retrospective questions is not surprising, since mobility was never a major focus of the LFS. But this would only require minor changes in the national LFS questionnaires, and as far as we know these variables have not been the basis of much research so a break in the series would not have significant negative consequences for major stakeholders.

Strengths and weaknesses of register data

The basis of register data is the electronic recording of events in public and private administrative registers. But if one has not used unique identifiers, that are common in at least some of them, the mere electronic registration is of little use. When the use of standard unique identifiers like personal ID number or social security number is widespread then it is possible to have a register data system, i.e. with the possibility of merging information from various sources.

Besides questions of data quality on the level of each individual variable, it is the transformation of the register data from “panel data” to ”event history data” that is the major issue here. One aim of the ENMOB is to promote the use of the statistical technique called “Event History Analysis” (EHA). The use of EHA is optimal when the data collection is based on precisely dated events. Examples of “events” are typically job change, change in marital status, graduating, taking a course at the university. Or to put it another way – that time is treated as a continuous variable as it is in real life. Today most of the data – in the form that it is accessible for research – are in yearly time series. The loss of information about exactly when an event happened makes it difficult to analyse the causal chains. Did she get a new job because she had taken a university course in programming in her spare time? Or did she need to take that course because she had got a new job? Only when events are dated with sufficient degree of detail can one study the causal chain.

This means that one must always look for the data source that has the most fine-grained recording of events. A typical example is which administrative event is used to create the crucial connection between employer and employee. In some countries it is the social security agency that makes this connection. The event is then the payment of benefits, which requires data on current employer and current wage. But this means that it is for those who become unemployed or ill that data is quality

controlled, not those who are steadily employed and have no long term illness or other social problems. This means that there are relatively less real-life quality checks of the highly skilled and healthy since no monetary transaction is directly connected with the updating of the registers. The payment of wages and taxes on the other hand is a much more continuous and controlled event. Generally it is best to use wage/tax payments as the basis for making the nexus between employee and employer since wages are paid frequently, mostly on a monthly basis and controlled both by employers and employees. So far the matching employer-employee data in some register countries like Norway are only reliable on a yearly basis, since the most consistent updating of the matched employer-employee register is done by the social security agency on a yearly basis. In Belgium there are quarterly data available based on social security agency data. This is still not event history data, but the sampling interval is so short, so for the highly skilled that this is of minor importance, but for studying those with higher labour market vulnerability, even a quarterly collection of data might be too seldom. Hence, the fundamental attitude should always be to get events dated as precisely as possible. There will of course be a lot of detailed statistical problems, like people getting paid after they physically have quit the workplace, but such statistical challenges do not invalidate the general principle that the timing of events should be as fine-grained as possible in order to be able to analyse the causal mechanisms.

The fundamental weakness of register data is that they do not record people's opinions, a person's subjective assessment of an event or a phenomenon. This has to be collected by surveys. But in reality we often use "objective" data to get a grip of why people behave like they do, differences in incomes between jobs etc. Critics claim that register data are made for administrative purposes and not research purposes, but our experience is that these are, in most cases, not conflicting aims. Both administration and research are dependent on high quality data – research is actually less dependent on "zero-tolerance" since from a research point of view it is the trends, the causal mechanisms on an aggregate level that are important. A little noise in the data does not matter that much. From an administrative point of view,however, individual rights and benefits are at stake, so a zero tolerance attitude must apply.

The strong sides of the register data are of course:

- Full coverage – no response problems.

- Their richness and detail due to all the electronic traces that persons and firms leaves in our age of digital information.

- Expandability – every kind of information that uses the same unique identifiers can be merged into one data set.

- Cost-efficiency, once established their ability to answer detailed policy questions on short notice is remarkable.

The weak sides of register data are:

- Do not record peoples motives, their judgement etc.

- Considerable investment to establish registers, to establish routines for electronic data collection.

- Costs pertaining to modify existing registers (both for administrative and research purposes) due to interoperability: change in one register has consequences for other registers since there is in many cases an interchange of information between registers.

- Vulnerability to changes in administrative routines.

- Changes in the legal unit (enterprise) have hitherto too often induced a change in the ID number of the establishment (workplace). This is not a correct statistical treatment.

The factual basis for policy formation

The question of data quality is of course not an abstract one, but raised in order to say if the data are sufficiently reliable to be a basis for policy formulation. In the following paragraphs the focus will be on some aspects of the data that should be seriously considered to be resolved before one starts formulating and implementing various mobility related policies. The need for data of course depends on what kind of policy measure we consider to implement. We will argue that the data still are to contradictory to merit formulation of mobility policies, due to the fact that in most countries that have both registers and LFS numbers for mobility – these are wide apart. The case of Finland illustrates this – we do not know if we have to lower/raise mobility from a level of 8 or 22 per cent.

Not to mention that we do not have a solid empirical basis for saying whether it should be raised or lowered.[9]

If we want to implement policy on the basis of factual knowledge – then we need reliable data. In mobility studies comparisons are fundamental because we have not reached a level of knowledge in the field enabling us to know optimal levels of mobility without reference to and knowledge about the same phenomena in other countries. A mobility rate for one sector is just a number, without much interest in itself. It is only when relating this rate to the rate in other sectors – and not the least to the same sectors in other countries – that these numbers can be analysed. Using the EU-LFS we get the for example the following table, just recently published by Eurostat[10]:

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Austria	:	5.59	5.49	: u	:	:	:	:	:	5.53
Belgium	4.9	4.76	5.82	5.77	6.8	6.49 b	7.43	6.45	7.57	5.45
Cyprus	:	:	:	:	:	6.25	8.01	6.64	6.26	8.16
Czech Rep.	:	:	:	:	6.6	4.62	:	:	5.13	4.64
Denmark	8.37	10.6	10.85	9.04	11.15	10.99	11.33	12.7	12.15	11.17
Estonia	:	:	:	:	13.04	9.91	11.00 u	: u	11.27 u	: u
Finland	:	:	:	:	9.81	10.25	9.99	11.49	9.78 b	9.02
France	:	5.92	5.88	6.35	6.66	7.15	7.67	8.41	8.32	:
Germany	6.8	6.91	5.84	5.87	:	6.91	6.84	7.62	6.72	5.63
Hungary	:	:	:	5.58	6.19	5.35	4.56	4.9	3.79	4.7
Iceland	:	:	:	:	:	:	12.7	16.28	13.5	:
Ireland	6.79	6.93	8.13	8.14	:	:	:	:	:	:
Italy	:	:	:	:	4.02 b	4.35	4.35	5.22 p	:	3.92
Latvia	:	:	:	:	:	:	:	: u	8.14	11.42
Lithuania	:	:	:	:	:	:	:	9.33 b	8.9	5.24
Luxemb.	4.72 u	3.54 u	4.00 u	3.46 u	:	5.76	5.48	7.06	5.01	3.66 u
Malta	:	:	:	:	:	:	:	:	: u	: u
Netherlands	:	:	5.21	5.88	8.71	7.82	:	:	:	:
Norway	:	:	:	8.95	12.27	7.01	7.98	8.11 p	6.36 p	6.11
Poland	:	:	:	:	:	:	:	6.8	6.04	6.53
Portugal	:	:	:	:	6.91	7.16	6.99	5.75	5.97	5.78
Romania	:	:	:	:	:	:	:	:	5.16	3.49 p
Slovak Rep.	:	:	:	:	:	:	:	2.59	2.54	:
Slovenia	:	:	:	:	:	:	7.24 u	5.26 u	4.20 u	5.52 u
Spain	:	:	:	:	:	5.13	5.16	6.38	5.21	5.72
Sweden	:	:	:	6.63	9.83 p	:	:	5.78 bp	4.55 p	3.55
Switzerland	:	:	8.53	8.47	10.14	9.85	10.31	:	9.12	7.71
UK	8.15	8.74	9.42	10.39	:	11.06	11.49	12.50 b	11.25	10.21

Notes:
b: Break in series

[9] See, Virtaharju M. , Åkerblom M. and Roessingh M. (2003): NESIS Deliverable D5.6.3: "The Measurement of Knowledge Stocks and Knowledge Flows In the New Economy".
[10] Thanks to Håkan Wilén and colleagues at Eurostat for providing this table.

u: Unreliable or uncertain data
p: Provisional value

Table 4: Job-to-job mobility, HRST, males. Source: Eurostat.

There are several striking features of this table, first of all the lack of data for many countries. This undermines the major asset of the Labour Force Survey – that it should be a basis of comparative studies. Without data for at least ten years, serious comparative studies of mobility cannot be done. The lack of data is a bit surprising for even on this *very aggregate* level - the Labour Force Survey should be able to give reliable data. Looking at this table the conclusion that mobility is "too low" in many countries seems to be empirically confirmed. In the Slovak Republic it is only 2.6 – close to the rate induced by retirement alone. But there is reason to be sceptical. First of all – is this mobility between enterprises (legal units) or establishments (workplaces)? The intention is that this is enterprises, and since there are multi-establishment enterprises, the enterprise rate can be expected to be two-three percentage points lower than the establishment rate. We should calculate all the three possible units – establishment, enterprise and enterprise group – but we will argue that the establishment rate is the most important rate. The mobility between workplaces, the change of competence milieu, is the real, physical mobility. That's how human mobility mediated knowledge diffusion takes place. If we only use the rates based on the legal units, i.e. the enterprise and enterprise group, the same mobility between establishments could be lowered just because of changing ownership structures. In periods of mergers, buy-ups, i.e. the creation of (even bigger) multi-plant firms this could mean significant downward bias. Is the low rate in the Slovak Republic a result of the heritage from the command-economy with its big integrated units? Is it just a statistical artifact? Or will these numbers be corrected in the coming years?

One reason for asking these questions is that Eurostat published a similar table some years ago, Laafia and Stimpson (2001) - and there are some marked differences between the 2001 table and the 2004 table. In the 2001 table the rate for Italy (I) was very low – on the Slovak level and the rates for Spain (E) was very high – among the highest in Europe as can be seen from the table below.

Mobility rates of employed HRST (%)												
	Males						Females					
	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
B	5.5	5.8	6.3	6.4	8.1	7.4	6.1	6.8	7.1	7.0	9.3	7.8
DK	9.4	11.2	11.2	8.9	10.9	11.8	13.0	11.4	11.3	9.9	11.8	12.6
D	6.5	5.5	6.0	6.1		7.2	6.9	6.5	6.9	6.0		7.8
EL	4.3	3.6	3.9	3.2	4.9		4.4	4.6	4.1	4.4	5.6	
E	11.6	12.6	12.0	12.0	12.0	6.1	16.6	16.2	16.1	17.2	17.2	8.4
F	5.9	6.5	6.5	7.0	7.3	8.0	7.0	6.5	6.5	6.7	7.8	9.1
IRL	7.9	8.1	9.5	9.8			8.9	11.0	11.7	11.8		
I	2.5	2.4	2.7	2.8	4.1	4.4	3.5	3.4	3.5	3.6	5.3	5.4
L	4.8	3.7	4.7	3.8		5.9	5.4	6.3	4.9	5.1		6.5
NL	6.6	6.5	5.8	7.1	9.9	8.8	7.4	7.8	6.8	7.0	11.0	9.6
A		5.6	5.9					5.9	6.3			
P					7.3	7.9					8.8	7.6
FIN					10.4	11.9					12.3	12.3
S				7.0	8.9	10.2				7.2	7.8	8.0
UK	8.9	9.5	10.3	11.7		11.9	10.0	10.6	11.2	11.8		12.2
IS		13.8	10.4	11.9	12.6			10.9	12.1	12.4	15.8	
NO			10.4	9.3	13.3	7.6			11.2	8.2	12.7	8.1
CH			9.3	8.4	10.5	10.6			11.5	10.2	11.2	10.3
CZ					6.6	4.6					5.2	3.7
EE				12.5	13.5	11.8				9.3	8.6	10.3
HU				6.4	6.9	5.7				5.0	5.2	4.7
PL				5.1	5.6	3.5				4.1	3.2	2.5
RO					0.0						0.0	
SI			6.5	6.5					4.7	4.2		
EU-15	**6.7**	**6.7**	**7.0**	**7.5**	**7.9**	**8.1**	**7.8**	**7.7**	**8.0**	**8.0**	**9.3**	**8.9**

Table 5: Mobility rates of employed. HRST (per cent).

There has been a dialog between Eurostat and experts on the Spanish Labour market and the explanation for the high Spanish mobility was most probably that temporary contracts were used as a proxy for job shift. The sharp drop in the Spanish rate from 1998 to 1999 is explained by a change in statistical routines. There is still no good explanation why Italy (I) had such a low mobility in the table produced for 2001. Probably the numbers were not reliable enough since Eurostat has taken out of the table the numbers previously given for Spain and Italy.

The point here is not to discuss whether that was a correct decision, but that it clearly indicates that LFS does not constitute a solid empirical basis for analysis and policy formulation. The gaps in the table must be filled, the numbers must be confirmed by common sense, by statistical research projects and other sources (primarily register data). This brings us to the next point, the relationship between the LFS and register data. Given the strengths and weaknesses of both sources it is useful to look at the differences in the mobility rates.

The complementary use of register and survey data

From the above discussion it follows that one should combine the register data and the LFS, that is, use the strong sides of both sources. In practical terms this means that all objective information, the "hard facts" like age, gender, sector, income, education, and employment should be taken from register data. That will give full coverage, and no troubles with the response rate. This leads to reduced need to ask for such questions in surveys and consequently a better opportunity to ask more questions about opinions, motivations and the like. That is either reduce the overall response burden, or ask new questions. Still the problem of sample size leads to questions of how small subgroups one can get reliable estimates from. It can also be argued that the reliability and representativity issue is above all a serious problem as far as the extent of moves and the composition of the mobile work force are concerned. When it comes to motivations, experiences etc., smaller samples do not pose statistical problems of the same magnitude.

Register mobility rates versus Labour Force Survey rates

Several reports have searched into whether there is a difference between mobility rates in Labour Force Surveys and register data. In the Vanderbrande (2001) and in the STILE project, Stimpson and Tielens (2004), the difference between the Belgian Labour Force Survey and the register data is not striking. In Graversen, Ekeland et al. (2003), as in the tables reproduced above, there is however a manifest difference between the two methods. The definitions, break-down in age and education groups differ, making the rates only roughly comparable, but still it is clear that there is a stable difference of 5 – 10 percentage points.

The NESIS project (Virtaharju, Åkerblom and Roessingh, 2003) has investigated the details of this issue for Finland for the year 2000. They conclude that there still is an unexplained difference. It is more than 10 percentage points in the year studied. The Labour Force Survey mobility is 8.6, the register data mobility 21.9. This is on the establishment level, which should be the unit in both sources. But even if we take the enterprise level in the register data the total register based job-to-job mobility rate is 16.9 – still the double of the Labour Force Survey rate. This striking difference is illustrated in the following figure.

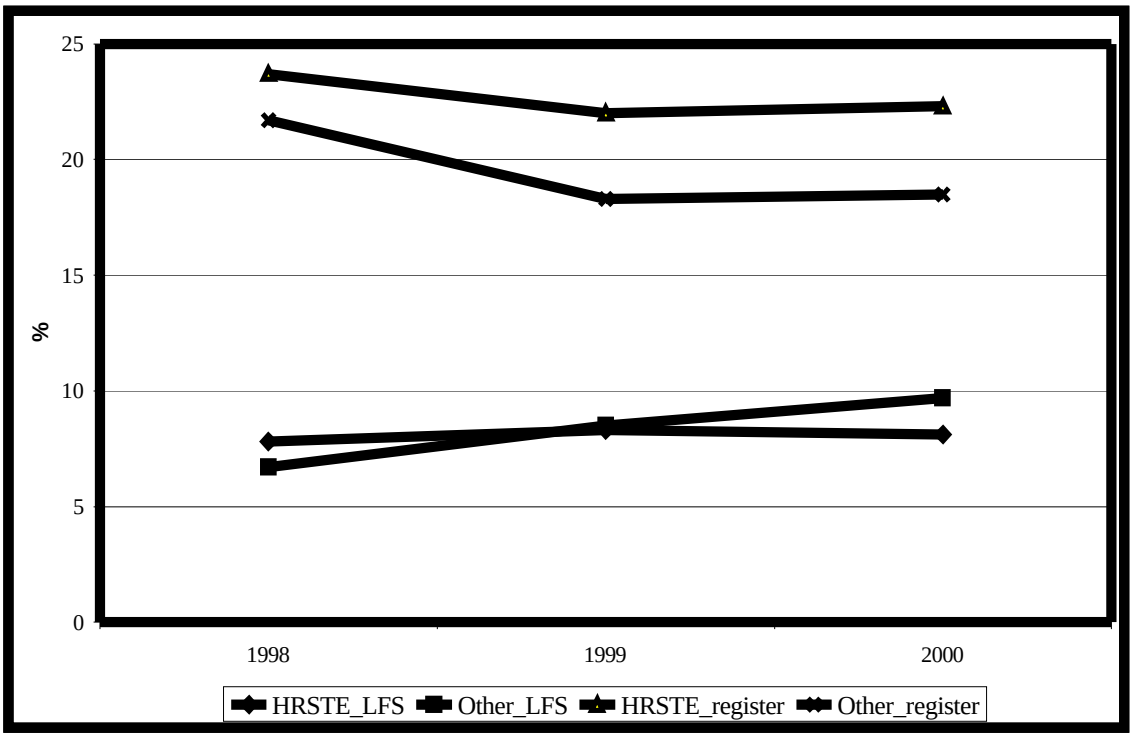

Figure 1: Finnish mobility rates according to different data sources. Source: Virtaharju, Åkerblom and Roessingh (2003, p. 25)

The Finnish authors also compare data from the Labour Force Survey and register data on an individual basis, but no obvious explanation of the discrepancy is found.

Sooner or later we will find the reasons for this striking difference. What is clear is that one cannot make mobility policy in Finland with two high quality data sources disagreeing to such an extent. Since the mobility rates in one country only have meaning in a comparative analysis with several other countries in order to correlate the effect of mobility to other economic and social indicators, it is first when we have weeded out all paradoxes and major statistical artifacts for several countries that the numbers from one country becomes politically useful.

Recommendation for improvement of existing databases for the study of domestic mobility

The recommendations outlined here represent a relatively broad consensus in the network. However there are still many points where the differences in opinions, often based on national conditions such as existence and access to different data sources manifest themselves. There is consensus around what to do in order to improve the Labour Force Survey. The proposals imply "minor" changes and additions to the Labour Force Survey. When it comes to what should be recommended regarding register data, opinions diverge more. In addition to implying substantial changes in the national statistical structures, the use of such data for research purposes implies difficult legal issues related to privacy and individual rights that are handled differently in different countries. This problem should be addressed on a high political level to give it a political leverage necessary to induce change and harmonisation.

Recommendations for the Labour Force Survey

There are some specific questions that are of importance for domestic mobility. Mobility can basically be measured in two ways in the Labour Force Survey:

- By the panel character of the Labour Force Survey
- By the retrospective question, which exists in two variants: "Where did you work one year ago?" and "When did your current job start?"

Since the respondents in the Labour Force Survey are asked at various times over a two year period the recorded change in workplace could be used as a mobility measure. The major drawback with this measure is that only a fraction, for example a quarter of the population is asked at the same time, so the sample is reduced and there are some methodological questions that have to be answered related to how to convert this into yearly mobility rates for the whole sample. Of the two retrospective questions the question *"Where did you work one year ago?"* and *"When did your current job start?"* the latter is clearly to be preferred since it gives the precise data of the job change event. This is the only question that does not lead to a loss of information and that makes it possible to use the data for event history analysis.

In addition the Labour Force Survey must be clear about what unit, establishment or enterprise, is meant when asking if one has changed job. For a discussion of the importance of "firm demography" see ENMOB deliverable no 8.

Register data

As discussed in deliverable no 4 on methodological issues it is highly recommended that register data are in the form of event histories and – as in the case of the LFS – that the issues of firm demography are taken seriously. Different administrative and statistical treatment of the change of ID numbers will introduce bias in the mobility rates. But first of all a discussion about register data in themselves in relation to privacy protection is needed. Our view is that such practical barriers seriously impede research on the topic in some countries, and comparative knowledge in all countries, and it is seen as important that the possibility to exploit register data to mobility studies can be made largely comparable among comparable EEA (European Economic Area) countries.

In any case, attention should be given to registers. One should try to establish and develop register data. The current digitalisation of all kind of information in society is in fact a register data building process. And since such systems (banks, insurance, and health) are computer based and computers need unique (numeric) identifiers there is an emergent need for both public and private register databases to use such nationally unique identifies. Social security systems have to be able to identify persons without stable addresses, having identical names, changing their names and the step forward will in many cases be relatively modest, albeit "cultural" opposition to accessing person data must not be under-estimated.

In order to pay taxes one needs to keep track of where people live and who their employers are. Schools and universities build up databases with detailed data about their pupils and students. As long as these databases use one standard identification number for persons and the same for firms there is no need for these different registers to be built according to some overall plan. The data can be merged – using the person ID – years after this originally decentralised establishment of the registers. There are also various developments on a national scale pointing in the direction of using unique person and firm codes (establishment and enterprise identifiers). The conclusion of this line of argument is that primarily for the reasons of efficient government, especially eGovernment, the use of digital information about citizens and firms should be utilised – also for research. One

important objective for social sciences is to contribute to a more informed political debate in a modern democratic society, and it is beyond any doubt that register data are very cost efficient aims compared to different types of surveys[11] when it comes to collect "hard" data.

There are mainly two types of critical issues to the use of register data in social sciences. First of all, register data opens up for a "Big-brother-watching-you" society through which ordinary people can be scrutinised and monitored unduly. Another critical argument is that is not the researcher community's job to argue for the introduction of such data.

The answer to the first type of criticism is to point out that the Nordic countries have a long tradition of using person and firm identifiers. Various public authorities share data collected with ID numbers as unique key and they make data available to researchers and statisticians. There has been no misuse of data from this practice. This is no real surprise since education, occupation, job career etc. are not sensitive data. The potential for misuse is much bigger in registers held by credit card and purchasing "bonus card" companies and even from those we are not aware of any privacy violating scandals that can justify a tightening of privacy rights in society.

There were various opinions within the ENMOB network regarding the threat to privacy that wide use of register data implies. But there was a consensus that the EU needs to make an informed decision on this issue based on the real experiences in countries with register data and the undisputed benefits of register data for both administrative and various research purposes.

Recommendations – brief summary

Regarding LFS:

To harmonise the retrospective question to: "When did your current job start" or "When did your last job start and stop", so that the precise duration of the current or last job is registered making the data suitable for event history analysis.

To use establishment as the basic unit for the retrospective question.

[11] Register data and surveys should be used in a complementary manner. The situation today is that surveys still ask a lot of trivial questions like number of employees, total sales etc. etc. Information that is already in many registers!

To have NACE (industrial classification) on three and four digit level in the Eurostat LFS.

Regarding register data:

To discuss the introduction of matched employer-employee data as the core of register data suitable for mobility studies. Register data is the only data source that answers the policy questions raised in relation to the mobility of human resources in the economy, like the mobility of researchers.

That register data have a precise dating of events to enable event history analysis.

That the establishment is made the basic unit in business registers.

That creation and deletion of establishment ID numbers must relate to real events, and not be influenced by changes of ownership (legal unit).

Regarding both LFS and register data:

That the division of labour between register data and LFS is focussed so that each source is used for the type of data, objective/subjective, that is the most efficient.

International mobility – data, models and perspectives

The issues – an introduction[12]

Mobility of persons across national borders has for long been a high priority research area[13]. A long discussion of the net value of migration has dominated the agenda, very often when a fear of a possible brain drain was explicitly or implicitly the starting point. Economic theory does not give any direct guidance on what would be the optimal amount of migration. Several studies have tried empirically to validate or calculate the effects of knowledge mobility and knowledge diffusion. The

[12] The information here is a modified version of the introductory chapter of Graversen, Lemming, Ekeland (2003).

[13] The main political documents from the EU can be found at http://europa.eu.int/comm/employment_social/skills_mobility/index_en.htm. A good overview is given in "The Report on the Implementation of the Commission's Action Plan for Skills and Mobility." COM (2004) 66 final, 6/2/2004.

dominating conclusions are that circulation of knowledge embedded in people increases the economic performance, nationally and internally in firms. However, only a few of these studies concern the movements of individuals between countries. Naturally, a continuous net outflow of highly educated innovative individuals reduces a country's long run innovative capabilities. Beside the immediate costs of educating the persons there is also the future social cost of not having the individuals' contribution to GDP. Similarly, an opposite flow may benefit a country in the long run. These situations can be characterised as lose-win and win-lose situations, where one country gains and another loses. There are also well known cases of lose-lose situation from a competence point of view, typically when poor countries loose part of their highly educated people who end up doing unskilled or low-skilled work in rich countries.

But, just as in the case of national mobility where individuals may move forth and back increasing the knowledge base both places, the international mobility of individuals may also be a win-win situation. This happens if an individual emigrates and later returns with a greater knowledge stock, experience stock or contact network that can increase the national innovation ability and economic performance. At the same time, the receiving country may get a benefit in the period before the individual returns or moves to a third country. The benefit may for example be the knowledge, network contacts, or other kinds of expertise brought along by the individual. Hence, also the receiving country gains knowledge. It would probably be fruitful to use the insights from modern trade theory, where "intra industry trade" is one of the major issues[14]. That is, we will se exchange of f.ex. researchers in very narrowly defined fields of scienc, making any theory of "comparative scientific advantage" as the cause of flows to simplistic.

The general difference between the win-lose (brain gain), lose-win (brain drain)[15] and the win-win situations seems to lie in the distinction between knowledge flows and knowledge circulation. The flow is primarily a one-way movement, as opposed to circulation. This also means that a snapshot of individuals moving across borders is a static picture that has limited information value. Instead,

[14] See for example, Paul Krugman, "Rethinking international trade", MIT Press, 1990

[15] What is here called lose-win is often in the public debate about emigration called "brain drain". The brain drain first appeared in a report by the Royal Society of London published in the early 1960s (Royal Society, 1963).

data on returning rates, increase in knowledge, job experience, formal education, family restrictions etc. all would contribute to a clearer picture of what the win-win situation actually consists of.

In contrast to domestic mobility where there are some data, the lack of data is the fundamental obstacle for advancing research in this area. The reason for this is that migration registers are incomplete, and when complete, they do not contain data on education and/or occupation for most immigrants. There are mainly two reasons why this is so. First of all it is often difficult to classify the education of immigrants since this requires a detailed knowledge of the education systems in many foreign countries. But – and maybe more important is that the authorities have not been focused on the collection this kind of information. The authorities have been more interested in other characteristics of the potential immigrant than educational and/or occupational data, ability to make a living, previous criminal record, family ties, membership in certain types of political parties etc. The solution to the lack of data lies principally – as with domestic mobility in modifying existing migration statistics, and using to the full the electronic traces that administrative events – public, but also private - create.

Definition of international mobility

First of all it is necessary to define international mobility. The underlying intuition is persons moving on a more permanent basis, settling in another country for a couple of years – often without no clearly defined date when they are going to move back home – or to yet another country. There also have to be a professional purpose for the migration. Highly skilled persons going to another country for purely touristic reasons are not interesting for the question of brain drain.

From a statistical point of view one has to draw a line between the short stay, from a couple of weeks to deliver a set of lectures, a crash-course lasting a month, studying abroad a semester or two and the more permanent, indefinite stay. The UN has chosen a stay of at least twelve months as the definition of international mobility. In Denmark and Norway six months have been used as a unit when publishing statistics. In our opinion at least 12 months is a minimum requirement if one is to speak about international migration. If possible one should try to get information on the purpose of the stay – and the probability for returning after one year. The basic approach here should be to record all such events, short and long stays, as accurately as possible because even if they will not be counted as international mobility by the UN definition, these data can be the basis for other

indicators of knowledge flows. As always – the more detail we have the more analytical purposes can be served. And as we have pointed out repeatedly – there will almost without exception be some kind of administrative event, i.e. some electronic "trace" so that the information is out there. What is needed is a system for the systematic collection and classification of such events. Because if one should choose to change the definition, let's say use six months instead of twelve, or two years, this would not be a major change, since this would only imply a new grouping based on the precise dates. Various classifications could be used to analyse the same data. Data on the short stays- although not counted as migration, might be very important as an explanatory variable.

Overview of existing data bases – international mobility

It might be is useful for the discussion of data sources, first of all to ask what kind of data do we need. There are three categories:

- Fundamental data
- Necessary data
- Rich data

Fundamental data

That means the ability to count the persons moving across borders. Ideally one should be able to register all movements, also short stays because it might be of importance as an explanatory variable. Typically the short visits by academics, by experts, by managers – a week, a month, a couple of months, half a year. In the information society this is not impossible. But this is still far into the future. If we could register all stays abroad of one year or more – the UN definition of emigration – that would have been a great leap forward. That would give us a sampling frame for collecting the necessary data. Despite work done by UN and OECD we do still not have a comprehensive view of the migratory flows. But things are moving forward. In July 2003 the OECD launched a data collection in collaboration with national statistical offices of OECD countries, to obtain statistics on the foreign-born population for each OECD country by country of birth and educational attainment. The data were obtained in most cases from the 2000 round decennial population censuses. All but one OECD country participated in the project. The database

should in principle make it possible to provide, for the first time, a comprehensive picture of migration to each OECD country over recent decades as well as a picture of brain drain / brain exchange both within OECD countries and from non-OECD countries to the OECD area[16].

But the database will be made with ten year intervals. And that is probably too seldom for being able to monitor migration, analyse, formulate policies and evaluate effect of policies. Especially since economic conjunctures, political events like wars, abrupt change of political and/or religious regimes might create huge flows. For practical policy purposes we would need a continuous monitoring system. Migration statistics based on visas and/or work permits, "green cards" etc. are one important source. In single markets like the Nordic countries and the EU, where no work-permission is (or will be) needed, matched employer employee files and registers over persons residing on a states territory can also be the bases for such fundamental data. Migration data have the advantage that they report on what country the person came from. But often the fact that an immigrant turns up in matched employer-employee data or in the population register is enough to get a correct sampling frame – although we do not know where the person came from. But often the citizenship, ethnicity will be good enough as proxy for statistical purposes. Illegal immigration will of course always be a great challenge, but in the case of the highly skilled this is less of a problem.

The question of registering the return of emigrants is also a part of fundamental data. To sum up: Fundamental data is the pure, but complete head count of legal migration over time – on an individual basis so that return rates can be calculated.

Necessary data

The concept of brain drain implies a calculation of costs and benefits, from the point of view of the sending or receiving country – and from a global perspective. One can make a cost-benefit analysis from all three perspectives. In order to do that the educational level and field of the migrants is a minimum requirement. The social status of the immigrant, employed/unemployed/student in the receiving country should also probably be considered necessary data. But within an order of magnitude we know the level of unemployment – and type of employment of a certain educational

[16] http://www.oecd.org/findDocument/0,2350,en_2649_201185_1_119684_1_1_1,00.html

group of immigrants. If academics from a certain country really are in jobs were they are grossly over-qualified, this is often well-known from anecdotal sources. The data sources for necessary data are typically public registers and on a very aggregate level the Labour Force Survey.

Rich data

Rich data are those that allow a precise analysis of not only the migrants' economic contribution in a brain drain perspective, but also enable us to analyse the push and pull factors behind emigration. Income and kind of work in both country of origin and destination are important. Not the least as background information to questions in surveys about economic motives for migrating, because one might suspect that there is a downward bias regarding the importance of economic factors. But not the least questions about what the immigrants thing about:

- Administrative barriers
- Importance of language
- Working conditions
- Information channels.

These are but a few examples of questions that are relevant for the formulation and implementation of pro-mobility, pro-immigration policies[17]. Rich data are essential for the "filters" that sort out the type of migrant that is the object of the analysis.

Data types and sources

Parallell to the ENMOB work, there was a major EU project on international mobility called "The Brain Drain -- Emigration Flows for Qualified Scientists". The project was directed by a team consisting of coordinator Wendy Hansen, MERIT- The Netherlands, Sveva Avveduto, CNR – Italiy and Annamaria Inzelt, IKU Hungary. All three members of ENMOB. The results of the project has recently (autumn 2004) been made publicly available, regrettably after the end of the

ENMOB project[18]. This project is – besides part of work of the SOPEMI/OECD[19] – the most up to date effort to map and analyse international mobility of the highly skilled. It consists three parts:

1. A discussion of the concept of mobility, consisting of two major papers. The first is by S. Avvveduto and M. Carolina Brandi titled "Evolution of Theories of Brain Drain and Migration of Skilled Personnel". The second by Enirco Todisco, "Human, Brain and Knowledge Mobility"

2. An an impressing number of country studies. Not covering all European countries, the Nordic, Netherlands and UK are missing, but they are covered relatively well in other work, for example in SOPEMI country reports[20]. Central and Eastern Europe is very well covered with studies on Ukraine, Estonia, Lithuania, Poland, Hungary, Bulgaria, Romania. There are also reports on Canada and Australia.

3. The third part consists of three pilot studies. One by Annamari Inzelt, "*A pilot survey: Foreign Direct Investment and Migration of Foreign-citizen Scientists and Engineers in Hungary*", another by Sveva Avveduto, "*A Pilot Survev of Foreign Researchers in Public Research Bodies in Italy - Characteristics of Recent Migrants*" and the third by Wendy Hansen, "*A web-based survey on the international mobility of scientists and engineers*".

The totality of the BDEF project illustrates well the status quo of international mobility studies. There is no common basis of fundamental data, i.e. a consistent head count, including return rates for a larger group of countries over time. The introduction part of the country studies often contain phrases like:

- Given the lack of hard data, this paper has been written with the support of a number of existing research activities...(Germany).

- A very large part of the resource material comes from journalistic articles. (France)

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[17] An excellent example of a study with rich data on push and pull-factors is Sveva Avveduto, "A Pilot Survey of Foreign Researchers in Public Research Bodies in Italy. Characteristics of Recent Migrants ". A report in the BDEF-project.

[18] At the time of writing the results are not yet available on the Internet, but will be so soon.

[19] SOPEMI (System d'observation permanente pour les migrations), for latest report see http://www.oecd.org/document/37/0,2340,fr_2649_33931_29054949_1_1_1_1,00.html

[20] In the executive summary there are small country "vignettes" covering most of the "missing" European countries.

The BDEF project did not attempt to make an inventory of all the data sources and their characteristics. They come in three main groups:

- Census-like registers measuring – in principle continuously – in practice on a yearly basis the appearance and disappearance of persons
- Partial, complete population of small, well defined groups, like the public research labs, the Academy of Science, the institutes of the national research council.
- Partial, incomplete populations, like the persons registering by the diplomatic/consular services of their country of origin abroad.

The labour force survey (LFS) could have been a common data base, but due to the problems of very few observations of migrating people it just cannot be used for measuring flows. LFS is used only as the main source of data in the Austrian country study. But as the study of Austria shows, even to measure stocks are difficult, and the internationally mobile are very few in relation to the stocks. Even in the stocks there are "implausible swings" and data imputation is necessary. In short, the problem of using LFS for domestic mobility is increased by an order of magnitude.

There is then often a division of labour between the various sources that are used. If you got fundamental data – you do not have the necessary data, i.e. you can make a head count, but do not have information on education and/or occupation. If you have rich data, mostly coming from surveys, very often the full population is not known, so the statistical significance cannot be calculated, control cannot be made of the many possible biases etc. This means that although there is a lot of tables that give a lot of insight in various quantitative and qualitative aspects of mobility it does not add up to even a shaky foundation for making the kind of cost-benefit analysis that is the ultimate goal of the exercise.

The Inter-Nordic Migration

In the period 1999 – 2002 there was a project sponsored by the Nordic Innovation Center[21] in order to increase the understanding of the characteristics of Nordic migration, i.e. whether the

[21] At that time it was called the Nordic Industrial Fund.

migration between the Nordic countries is a win-win situation and what the characteristics of the migrants are. Through a comparison of the information collected in national register databases available in several Nordic countries a more detailed empirical picture was drawn. An attempt was made to give a picture of the knowledge drain, knowledge gain and knowledge circulation. This was done through a description of what individuals are doing before emigration according to the sending country's register data and what individuals are doing after immigration according to the receiving country's register data. Although it is technically quite easy to follow the single individuals across borders, this inter-linkage has not yet been done with the register data in the Nordic countries. Given the richness of characteristics that are common in the registers in both the sending and receiving country, one can compare small groups, sub-cohorts that most probably contain that same persons, so that the average characteristics can be compared. Swedish registers could tell something of the pre-emigration history of those leaving to Denmark, Danish registers tell their post-migration history. But this is an exercise that is on the future research agenda.

In the Nordic countries there are several structural similarities making it possible to have a greater degree of integration in various areas than normally found between neighbouring countries. The Nordic countries have had a common labour market with free mobility of labour for several decades, cf. Pedersen and Straubhaar (1996). Historically, the countries have in past centuries been ruled by each other, with Denmark as the largest conqueror. Today, the Nordic Council - in close co-operation with the national governments - co-ordinate co-operation between the Nordic countries. Finland has only recently joined the practical co-operation of the free labour mobility some decades ago. The countries also have languages that are understandable across borders (except Finnish)[22] similar to the German speaking area of Germany, Switzerland and Austria.

The similarities and the ease of mobility between the Nordic countries make them an economically integrated region. The economic development has been highly correlated in the Nordic countries, so differences in business cycles have been present but small in size. Migration between the Nordic countries may, therefore, not be directly comparable with migration in general between developed and less developed regions like between EU and Africa among others.

[22] A very large fraction of the Finns speak and write Swedish.

Usually, register data can give a full and detailed description of the emigrants with a national citizenship when they leave the country. However, emigrants with any other citizenship usually do not have a full track record in the registers if they for example immigrated to the country a few years earlier. In such a case, the registers would only contain information on these few years and not items as for example educational levels, skills, and work careers prior to immigration. In general the registers will not contain this information for immigrants.[23] Similarly, for national citizens returning to a country, only the information at the time when they emigrated is available. This information might be outdated, i.e. biased downward if they have increased their educational level, but this is not possible to detect in the register databases. However, the use of information from the register databases in all the Nordic countries can give an aggregated answer to the non-available information mentioned above.[24]

With these warnings in mind, the registers can give information on the persons leaving a country and their status at the time of emigration. Combining the information from the register data in two countries, information can be retrieved on the knowledge stock and previous career for immigrants from one country as well as the added knowledge stock and career track for the persons returning to that country. In particular, the combination of information from register data in two countries can determine the added knowledge obtained by returning persons, i.e. the knowledge obtained abroad. But let us first take a look at the return rates for Denmark, Finland, Norway and Sweden.

[23] The data collected among immigrants only covers information such as age, gender and family status.
[24] It is theoretically possible to merge the registers across countries but data confidentiality rules in the countries prohibit this at the moment. Personal identification numbers in the Nordic countries are not systematically matched. Hence, the story has to be put together as one story told by pieces from two sides, the sending and the receiving country.

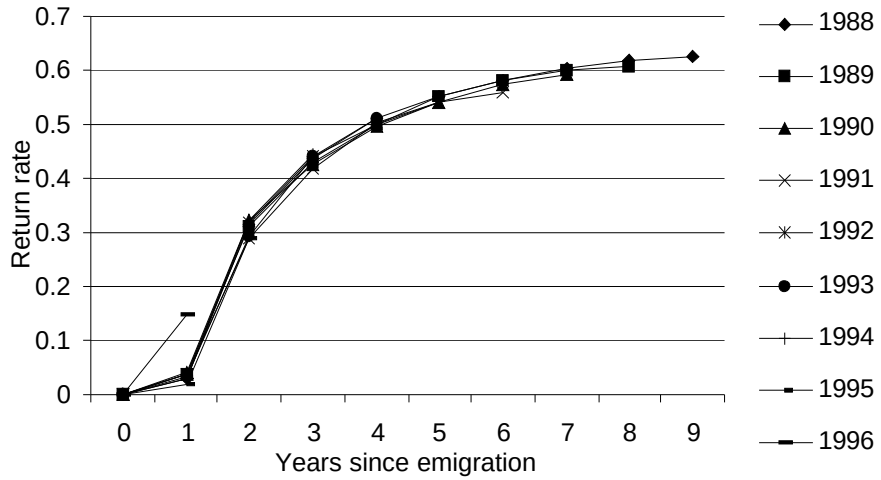

Figure 2: Return rates to Denmark over time for Danish citizens emigrating 1988-96 from Denmark to all other Nordic countries. Each line is one cohort.

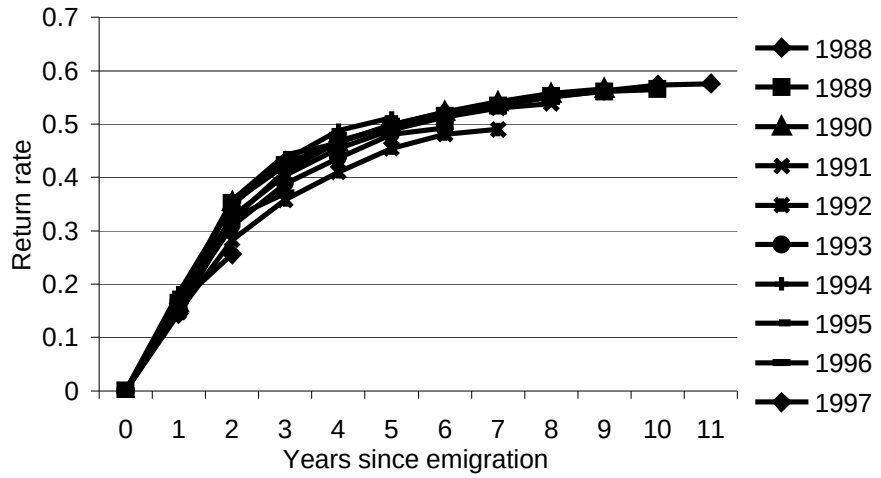

Figure 3: Return rates to Finland over time for Finnish citizens emigrating 1988-97 from Finland to all other Nordic countries. Each line is one cohort.

Denmark and Finland seem to have a rather similar return pattern. The first year they are a bit different, but otherwise the various cohorts behave in a very similar way taking into consideration for example the business cycle. The Danish 1996 cohort might signal a new pattern, but having only one year it is too early to say. The rate of return is slightly lower back to Finland than to Denmark.

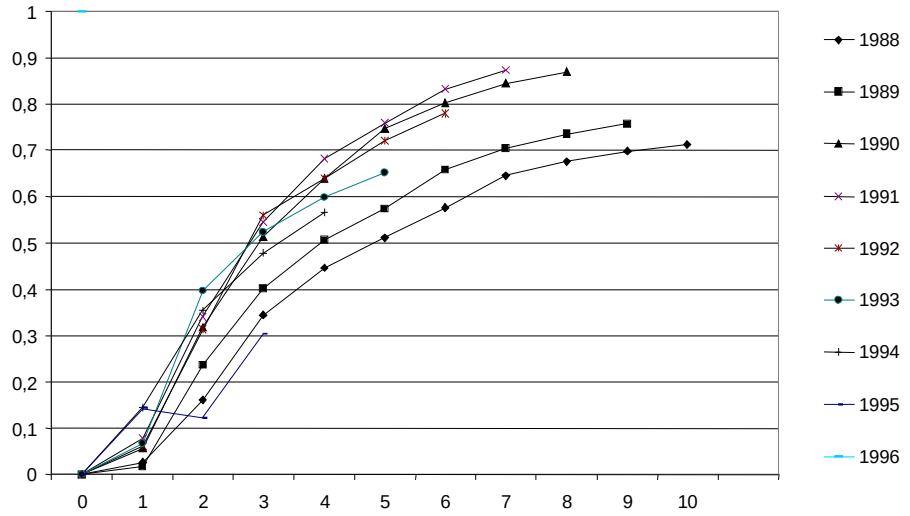

Figure 4: Returning rates to Norway over time for Norwegian citizens emigrating 1988-96 from Norway to all other Nordic countries.

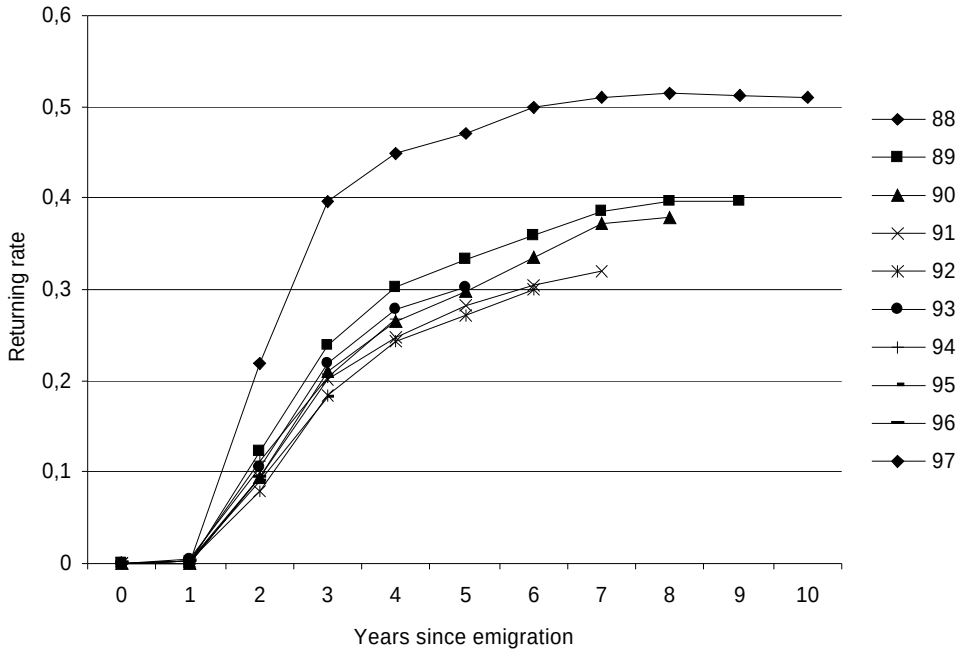

Figure 5: Returning rates to Sweden over time for Swedish citizens emigrating 1988-97 from Sweden to all other Nordic countries.

Compared to the other three Nordic countries, Norway has a high rate of return, and the cohorts have different return rates. The earliest cohorts (88, 89) have lower return rates than 90, 91, 92 cohorts. That might be explained by relative worse labour market conditions in the other Nordic countries in these "slump" years. The Swedes have the lowest return rates, even the 88 cohort is just above 50% after ten years. This could be explained by the – for Sweden – deep slump of the early nineties. But it is not easy task to explain the patterns of inter-Nordic migration[25]. One should keep in mind that these figures are for both high skilled and less skilled migrants, and there is reason to believe that these two groups might behave differently. The empirical studies gives an impression that the highly skilled move more independent of business cycles and the less skilled respond more – and with a certain delay – to labour market conditions in the Nordic area.

Brain drain or brain circulation in the Nordic countries?

There is a spontaneous tendency to think in terms of brain drain, but we do not know to which extent there is brain circulation, both on the macro level and especially important – on a more detailed sectoral/educational level. There might be brain drain of a certain group of highly skilled between to states/areas, but brain circulation and/or brain interchange in other fields. As always there is clearly a danger of missing important nuances when looking only at net effects without studying the interplay of the different forces/factors that lie behind the net effect. The same goes for relying too much on averages without controlling the distribution of events are such that the average is a good indicator.

In event history analysis terms brain drain equals a move from one state (country/area of origin) into an absorbing state - the destination country/area. We have brain circulation when a person stays for a limited period. There is no need to define any particular length. The survival rate will give a precise picture of the rate of return. There will of course always be "right censoring", since people are "at risk" of returning until they die. For practical analytical purposes – looking at people below fifty over a period of ten to twenty years will give a clear picture of the return rate. If a person aged 20 – 30 years when entering the country has not returned after twenty years then the possibility that he stays will be high and probably increasing.

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[25] For more detail, see Eskil Wadensjö (ed.): *The Nordic Labour Markets in the 1990's, Part 2*. Amsterdam:

The results from the studies of inter-Nordic mobility show that there is a high degree of circulation. Around 60 % of those that emigrated returned within ten years, but that means that 40 % where "drained" into another Nordic country. Since the percentages of emigrants are roughly equal for example between Denmark and Sweden there is in the end a net drain from Sweden in absolute numbers. But the numbers are small, so this has a marginal effect. In the case of the Nordic countries there are two types of mobility. One is a small "stochastic" current, i.e. people moving as part of their careers, love affairs etc. The other is economically motivated migration caused by differences in unemployment and business cycle. This emigration is typical for some low pay manual and service professions and involves more people. But these also go quickly back when the business cycle changes. The highly skilled – being less hit by conjunctural unemployment – and often with more "country specific" skills are relatively less mobile. But job-to-job mobility is not very common even inside a country, so the difference between long distance domestic mobility and inter-Nordic mobility is not that great. That is to say that the extra transaction costs by moving to another – rather similar country – are not that great. It is of course a methodological challenge to separate this more stochastic migration from the one induced by differences in the business cycle.

Recommendations for improvements in the statistical treatment of international mobility

One major objective of the ENMOB network has been to evaluate the existing data sources in order to create a better knowledge base for policy formation related to international mobility issues.

As made abundantly clear in Deliverable 5 it is the change of statistical routines which is the key to get the kind of data needed to map and analyse the flows of skills and competences across borders.

The source of such data has to be administrative acts/events of different types. In some countries like the Nordic, citizens have the obligation to inform the authorities when they are leaving the country for a period of more than six months. The citizens have incentives to do this since the payment of social benefits; social insurance etc. is tied up with the correct registration of temporary address. Tax collection systems, payroll systems very often have current and permanent address as

mandatory data. Voting systems are as a rule based on that the authorities know where you live. In short it is the need of the modern state to keep track of where the citizens are living. Some of the traditional sources of information on migration, work permits, are disappearing due to the creation of common markets with free flow of capital and labour. But on the other hand this integration, transferability of pensions and other social benefits creates the need for integrated databases that will allow the authorities to exchange the necessary data for an efficient servicing of the citizens.

Surveys and partial, ad hoc databases

As the work of Hansen, Avveduto and Inzelt show, the Brain Drain Emigration Flows project, it is possible to get some qualitative insight into the push and pull factors of international mobility. But as always with surveys there are methodological challenges. These challenges fall into two categories, the statistical/technical issues and the interpretation of the results. The first type of problem is very often related to the representativity of the sample. The second type of problem relates the interpretation of the answers. If there are cultural norms saying that one should not be "be in it for the money" – as is likely among top researchers, then "higher wages" will not come out as the most important factor – even though that might be the case.

The perspectives for studies of international mobility

There has been a debate going on in the network on how to improve the situation regarding data. There are two main views on how to make progress in this field.

Some are of the opinion that the only – and fastest – road to real result is to modify migration statistics, i.e. to start collecting information about education and occupation routinely, from registers. This will give us both the "fundamental" and the "necessary" data, and even some of the "rich" data. The advocates of this view argue that there is little chance of getting the data fundamental (head count, return rates data) needed for real policymaking from surveys. Clearly the "rich" data, people's motives, subjective evaluation of obstacles etc. will come from survey data. But without register data you do not even have a good sampling frame, which makes it impossible to know if the no-response is random or has a systematic bias. According to this view the efforts of the researcher community should be concentrated on changing the way migration statistics are collected.

The other point of view is that such migration register data will not materialise in the foreseeable future and that consequently researchers should argue for the use of extensive surveys. The obvious problem with surveys is of course that in the population as whole, very few are moving so the number of observations will be too low with an ordinary random sample. This is why the Labour Force Survey cannot be used. As soon as you try more targeted sampling, the costs rise, your have a hard time controlling sampling errors etc.

These two views are of course not mutually exclusive, on the contrary. Both should be pursued, depending and depending on the international/national context.

4. Conclusions and policy implications

Mobility as an optimum problem

As stated at length above, mobility is a question of balancing the negative and positive aspects of mobility between firms and between sectors in order to maximise the net gain from mobility. That is to avoid too low or too high mobility, to be in the optimum range. Theoretically on might find an optimum, but given the measurement problems, realistically such an optimum value would have a large confidence interval. At one extreme there is no job-to-job mobility at all, only a replacement of those that go into retirement. Given 35 years of working life, 2.86 % "gross" mobility would be the result. If working life was 50 years on average – from 15 to 65 years of age, we would have 2 % mobility caused by retirement. A "gross" mobility rate of 2 – 3 % , and zero job-to-job mobility means that the new entrants to the labour market enter into the firms where people retire – and stay in the same firm for the rest of their working life. If we assume that there is partially a chain reaction, i.e. that the seniors retiring are replaced by the next generation of seniors from other firms, we will have some job-to-job mobility. From this it is clear that retirement alone will not induce much mobility. But a market economy is a fairly dynamic system. A significant share of firms goes out of business each year, and this in itself creates a certain amount of job-to-job mobility. There are also declining/growing sectors, and declining/growing firms within each sector. So even if firms survive, they will change their number of employees. Even if firms did not go out of business – or change their overall number of employees – people would change jobs for various reasons. Especially the youth are searching and learning, while constantly trying to improve the match between their interests, career prospects, the remuneration, content of the job etc. Since changing job sometimes also means moving geographically, a change of employer might also induce spouse and family members to move and change jobs. All together this means that a job-to-job mobility rate of 3 - 5 % might be considered low. Not necessarily *too* low, but a mobility rate in this range can be used as a first rough indicator for which sectors of the economy that could merit further detailed analysis.

An example - academic mobility

An example of a sector where mobility rates close to the "retirement rate" is to be expected is academic mobility, i.e. job-to-job mobility of tenured staff at a university. First of all there is a very long selection/recruitment period, trying to assure that the most able person gets the privilege to do research in a fairly secure position[26]. For centuries the expectation was that you were going to stay in that position, some moving up in the internal hierarchy, a few moving to other universities, but not moving to another sector of the economy. With 40 years of working life – from 30 – 70 years of age, a "gross" mobility rate of 2.5 % to 3 %, and close to zero "out of university-sector" - job-to-job mobility rate should be expected. Of course – depending on the academic field. In philosophy and linguistics there are very few opportunities for similar work outside the university sector. In informatics, a lot of leading edge development takes place in the private sector, and remuneration has in periods been considerably higher. Also in law and business administration there are more extramural possibilities with significantly higher remuneration. Seen from the university point of view, from the point of view of society – a high rate of mobility out of ICT and law fields might be negative. The most able academics are drawn away from the universities, resulting in unwanted vacancies, disruption of team work, lack of real seniors to train the young researchers undermining the ability to keep up leading edge research etc. The private sector will probably benefit in the short and medium term – the question is of course the long term balance of positive and negative effects. If the quality is undermined, private sector will suffer from this in the long run. The lesson to draw is that in the case of academic mobility one should not expect (or want) very much mobility. Instead one should take a closer look at all the other mechanisms of knowledge diffusions from/to the university sector. Relevance of research for private sector, joint projects, co-authorship, arenas like conferences, learned societies etc.

High mobility

On the other end of the scale, there are unskilled jobs, demanding mostly labour power with little or no need for tacit, work/firm specific training. In such jobs there might be a very high turnover of persons, no person staying for a year. Or more realistically – some key persons being fairly stable –

[26] Although teaching is a part of the job, the selection for tenured jobs is made almost exclusively based on academic research merits.

and otherwise very high turnover. The turnover might be so high that to compute yearly mobility rates would give no meaning. But such jobs are marginal due to various factors. Very simple operations tend to be mechanised, there are tacit components of all jobs. The quality of the job, your attitude to the quality of service will change (less shirking) if there is more stable employment, there are always some transaction/and training costs. These factors will make it rational to reduce the mobility. In most workplaces a mobility rate over 50% is not sustainable, even if there are two distinct categories of stayers (leading personnel) and movers doing unskilled work. Even 30 – 50 % means fairly high training costs, constant disruption of team-work etc. As a rule of thumb, job-to-job mobility over 30% might merit a more detailed analysis. Since the fact that mobility declines monotonically with age is close to a universal phenomenon as described in chapter 3, one must of course control for the age composition. But with a not very skewed age distribution of the employees, 30 % is to bee considered so high mobility as to merit the (consideration of) further detailed analysis.

The research challenge for future mobility studies is to be more precise and specific on the negative and positive effects of mobility. That is to develop models and guidelines for saying more about what is the optimum range of mobility in different contexts.

Data and the state of the art of mobility studies

Mobility studies are fundamentally characterised by the lack of adequate data both for domestic and international mobility. As described in detail in chapter 3, besides the Nordic countries where register data are an integrated part of the statistical system, there is only the Labour Force Survey as a common data source. The small sample size of the Labour Force Survey makes it only possible to calculate mobility rates for large segments of the population of the economy. There is no possibility to get the level of detail necessary for real policy formulation. Researchers are a small group – and consequently no reliable estimates can be made regarding their mobility.

Fortunately the data needed are emerging as an effect of the digitalisation of information in society. Generally it is social security and/or tax authorities that have registers that contain the crucial

connection between person and workplace. Examples of such datasets are the Belgian Datawarehouse containing 10 years of quarterly matched employer-employee data. Other examples are the French register based data used among other by Francois Kramarz and colleagues. Or the Austrian dataset used by Gruetter and Lalive (2003). Other matched employer-employee data are based on surveys. The variables included might vary, crucial for mobility studies is indicators of skills and competence like education and/or occupation – and time series data. Matched employer-employee data that are register based are potentially available in most countries. But for the time being the fact is that we are still only able to calculate detailed mobility rates in the Nordic countries. Before such data are available mobility studies can make only limited progress. The policy implication of ENMOB is consequently fundamentally implications for data collection policies.

Short term and long term data collection policies – domestic mobility

To get real register data in most European countries will take several years – even if the political will was there and privacy issues could be solved overnight. In the mean time it will be worthwhile to make some improvements in the Labour Force Survey, to get the synergies out of the joining of Labour Force Survey and register data whenever possible. In the long run, register data should be used for collection of much of the basic data now collected by the Labour Force Survey and the Labour Force Survey should be focussed on "subjective data" like the subjective motivation for changing job etc.

The ENMOB network did not discuss concrete data collection plan, neither on a country nor on a EU basis. But in the network there was considerable agreement of what was needed, what should in principle be done. Of course there were different opinions of how to concretely implement new data collection systems, possible obstacles of legal and practical nature etc. etc. Below are sketched the main recommendations:

Labour Force Survey:

- Standardise the question(s) in the Labour Force Survey regarding previous and current job in order to get information on when the job started.

- Standardise the question(s) regarding the unit of mobility to establishment, with enterprise and enterprise group as supplementary information.

- To analyse the relation between Labour Force Survey and register data in those countries having both.

Electronic CVs

- To start the work regarding making electronic CVs structured in such a way that they are machine searchable and readable. A Word-template is not a sufficient level of standardisation, XML or similar structured systems/languages must be used.

- Use researchers and other CV "power-users" in the development phase of an European eCV.

- The eCV has a richer description of experience and skill than both Labour Force Survey and register data and is a very promising data source for mobility studies.

Register data

- Start a discussion on register data as a fundamental part of the ESS (European Statistical System).

- Make the use of unique person and firm identifiers an "industry standard" in all public, semi-public and private databases as soon as possible. This is the cornerstone of a register based statistical system. Universities and schools should be pioneering institutions in building up the education register. Tax and social security agencies have pivotal role in connecting employee to the establishments.

Methodologically – the importance of Event History Analysis

A statistical methodology which is very well suited for mobility studies is "event history analysis"[27]. Some of the major advantages of event history analysis are:

- Makes use of the full information on the duration of a state (being employees). There is no truncation of the interval in different states
- State changes are registered sequentially and this is crucial for causal analysis.
- The survival rates are easy to interpret and give a graphical representation of the time-profile of the transitions (like share of researchers moving to private sectors)
- The need for consistent histories of persons and firms "life" is a stimulus for "zero" tolerance, i.e. a continuous process of improvement of the data collection process.
- The event histories can be used for many administrative and research purposes, can be extended in a consistent way.

International mobility

- Registration of migration must include the education and occupation(s) of the migrant. In a free labour market in Europe without the necessity of visas and work permits other administrative events (like change of residence) must be used to follow and measure regional and cross-border geographical migration.
- International mobility can also be studied using a properly standardised and machine readable eCV. Academic and public research institutions should be the first to try out how to record international contacts of different sorts (short stays, guest lecturing, long term stays etc.).

A more detailed discussion is found in the deliverables. But what is important here is that policy makers must realise that there cannot made any real headway in mobility studies. It is of course not

[27] The analytical technique has emerged in different fields where "survival" or more generally state changes are important. The life time of persons, electric bulbs, failure times of machines, survival of patients etc. The method has been called "survival analysis,", "duration analysis" etc.

a question of mobility studies alone. Better data – and that is fundamentally register data – will not only be a sine qua non for eGovernment, but will open up a new phase in the social sciences generally. Systematic use of the electronic traces we leave behind will give the more and richer data for social science research by order of magnitude. This will give a much better and more cost efficient knowledge base for policy formation.

5. Dissemination and/or exploitation of results

Being a thematic network ENMOB did not produce research results as such. The main result was the establishment of a network of researchers in this field, and as described in Part 1, the managerial part of this report, ENMOB has been used on several occasions as a resource for the EU-commission, DG Research, in its work with mobility issues, including the researcher mobility portal. The main vehicle of diffusion has been the influence that the network has had in stimulating the members' research projects in this field. One member of the network has written her PhD. thesis in parallel with the work of the Network. (Ref. to Carolina Canibanos thesis, defence to be finished 20th). The work of the network has inspired both project proposals like Transmob, that did not get funding, and STILE, that did get funding. There has been a close link to the National Science Foundation in the US, contributing to a mutual exchange of information and analysis, especially in the field of international mobility.

The mobility portal already contains a lot of the material (articles, reports, presentations) that have been the input to the work of the ENMOB network.

Below is given a schematic overview of the dissemination activities:

Event	Date	Diffusion of results to:	Venue
1st (kick-off meeting)	Oct. 2001	Transmob/High Level Steering Group on Researcher Mobility	Leuven Belgium
2nd meeting	May 2002.	National Science Foundation, US	Marseille, France
The HRST statistics meeting	June2002	OECD	Paris, France
International mobility experts meeting	July 2002	DG research	Brussels, Belgium
Researcher Mobility WEB-Portal meeting	March 2003	DG - research	Brussels, Belgium
4th ENMOB meeting	Sept. 2003	National Science Foundation, US and IPTS/Sevilla	Oslo, Norway
Researcher mobility meeting	Nov. 2003	DG - research	Brussels, Belgium
OECD conference on mobility	June 2004	OECD, Candice Stevens	Bro, Stockholm area, Sweden
Researcher mobility meeting – follow up	June 2004	JCR/IPTS Sevilla	Paris, France

Table 6: Dissemination activities.

For obvious reasons not all 17 members have been present at the various expert meetings, but 5-6-7 ENMOB members were taking part, except the mobility portal meeting where only the co-ordinator participated.

6. Acknowledgements and References

Harðarson, Ómar (2003), Some Methodological Issues Using Labour Force Survey Data for Mobility Research, STEP Report 14-2003

Graversen, E, Lemming M, Ekeland, A et al. (2003), Migration between the Nordic countries: What do register data tell us about the knowledge flows? STEP report 10/2003.

Mikael Rosengren (1998), An Inventory of National Priorities and availability of data in OECD Countries to Quantify Science and Technology, Personnel Mobility Patterns, Room Document No.2, Joint Nesti/Tip/Gss Workshop 17 June 1998.

Lalive, Rafael and Gruetter, Max, (*2003*), "*Job Mobility and Industry Wage Differentials Evidence from Matched Employer Employee Data"*, New Economic Papers, http://d.repec.org/n?u=RePEc:ecj:ac2004:140&r=ltv.

7. Annexes

Annex 1 – List of ENMOB members

The original members of the network:

Partner no	Role	Scientific responsible	Institution	Country
1	CO	Anders Ekeland	STEP group	NO
2	MB	Christian Svanfeltd => Axel Neckham	NUTEK	SE
3	MB	Carolina Cañibano	URJC	E
4	MB	Wendy Hansen	MERIT	NL
5	MB	Maarten Botterman => Barry Zondag	Rand Europe	NL
6	MB	Richard Pearson	IES	UK
7	MB	Mark Tomlinson	CRIC	UK
8	MB	Elisabeth Viszt	GKI	HU
9	MB	Daniel Martinelli =>Isabelle Recotillet	CEREQ	F
10	MB	Ebbe Graversen	AFSK	DK
11	MB	Jaromir Gottvald, Milan Simek	VBS	CZ
12	MB	Sveva Avveduto	ISRDS	I
13	MB	Peter v.d. Hallen, Marten Tielens	SWAV	B
14	MB	Rainer Winkelmann => Astrid Kunze	IZA	D
15	MB	Annamarie Inzelt	IKU	HU
16	MB	Alex Stimpson	Camire	LU
17	MB	Sami Mahroum (joined Rand Europe)	TNO	NL
18	MB	Olaf Tvede => Lars Nerdrum	NIFU	NO

There have only been minor changes of participating institutions and persons:

Christian Svanfeldt was replaced by Alex Neckham, and their part of NUTEK was reorganised into VINNOVA.

Sami Marhoum left TNO for Rand Europe and TNO left ENMOB, when Marhoum left TNO, Barry Zondag represented Rand in ENMOB.

Daniel Martinelli was replaced by Isabelle Recotillet, partly Cereq, partly LEST, Aix en Provence.

Rainer Winkelmann was replaced by Astrid Kunze, also IZA.

Olaf Tvede was replaced by Lars Nerdrum, also NIFU.

Annex 2 – Presentations at the ENMOB meetings

Title of presentation	**Author**
International mobility – report from ongoing research	Wendy Hansen
LFS and Eurostat - report by	Alex Stimpson
Register data – an introduction	Anders Ekeland
Why mobility is important	Richard Pearson
Why mobility is important	Peter van der Hallen
Mobility as an optimum problem - consequneces for research and policy formulation	Anders Ekeland
What do we know - Experiences from trying to collect data	Wendy Hansen
The US situation – data, policy and perspectives	Mark Regets, NSF US
The international mobility of researchers - why and how	Lars Nerdrum NIFU
Belgian LFS study	Peter van den Hallen
Czech LFS and work permits	Jaromir Gottvald and Milan Simek
Spanish LFS and other data sources	Carolina Cañibano and Mónica Martin
The fundamental unit in mobility research - establishment or enterprise?	Anders Ekeland
Measuring the Mobility of Researchers in Spain	Carolina Cañibano and Mónica Martín
Researcher mobility in Norway	Anders Ekeland

Some results from a Cereq survey of Ph.D graduates	Isabelle Recotillet
Report on international mobility of highly skilled	Annamaria Inzelt
Results from the latest survey of UK migrants	Richard Pearson
Hungarian mobility, domestic and international, an overview	Erzsébet Viszt
Researcher Mobility in Denmark	Ebbe Graversen:
On international mobility German experiences	Astrid Kunze
A review of Spanish mobility research and data sources, what improvements can be made?	Monica Martin and Carolina Cañibano
Increased interest in incoming mobility of researchers to Norway: The work of a newly established commission's work	Lars Nerdrum
Foreign researchers in Norway stocks and flows a first small study	Anders Ekeland
Regions and sectors in the mobility game: the case of Hungary	Elisabeth Vist
Labor mobility in the European Union", the Social-economic council (SER) in The Netherlands	Barry Zondag
The NIS-EAK long-term data (10 year review) what is the potential of these data?	Peter van der Hallen:
Electronic CVs a potential data source: status quo and perspectives in Norway	Anders Ekeland
The involuntary mobility – the competence of refugees	Richard Pearson
The interplay and interfaces between firms and research organizations	Ebbe Graversen
The US situation - an update	Mark Regets
The labour marked mobility of PhDs - a policy challenge for the knowledge based society	Isabelle Recotillet
Mobility; Data, studies and policy in Spain	Carolina Canibano
Career patterns and learning	Mark Tomlinson
The mapping of inflows of researchers - data sources and policy	Lars Nerdrum
The Eurostat view on firm demography - some critical notes	Anders Ekeland

The LFS as an source of mobility data – a comparative study of some European questionnaires	Jaromir Gotvald and Milan Simek
The emigration flows of qualified scientists, part I	Sveva Avveduto
The emigration flows of qualified scientists, part II	Wendy Hansen

The presentations given at the various expert meetings are shortened/modified versions of presentations held in the ENMOB framework.

Annex 3 – List of ENMOB deliverables

Deliverable No	**Deliverable title**	**Status by Dec 20th 2004**	**Date due**
D1	Inventory of existing databases, domestic mobility	Finished	
D2	Critical analysis of existing databases	Finished	
D3	Proposals for improvement	Finished	
D4	Overview over methodological approaches domestic mobility	Finished	
D5	Overview over databases for international mobility	Draft	1st Jan-05
D6	Recommendations for improvements in the statistical treatment of international mobility	Draft	1st Jan-05
D7	Methodological issues in international mobility	Draft	1st Jan-05
D8	The problems of firm demoghraphy	Finished	
D9	Potential and emerging datasources owned by public and private institutions and firms	Finished	
D10	Human resource information on the Internet	Finished	

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