

Flows of Human Capital in the Nordic Countries



Paper 2 (STEP Report 14-2003):

Some Methodological Issues Using Labour Force Survey Data for Mobility Research

A project by STEP, The Danish Institute for Studies in Research and
Research Policy, Statistics Finland, Statistics Iceland, and Vinnova

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ABSTRACT

The paper discusses the use of Labour Force Survey (LFS) data in mobility research. Design, conceptual, statistical, and other issues are addressed. Mobility figures emanating from Icelandic LFS and tax register data are then compared.

These aspects of LFS data are of interest because they illuminate the differences between using survey data and register data in estimating mobility rates. The differences in actual numbers produced using the two types of data can be quite substantial.

These methodological considerations are the output of a Nordic project which is dealing with the flow of human capital through job mobility in general, through researcher mobility in particular, and through migration between the Nordic countries. The project is jointly undertaken by STEP, The Danish Institute for Studies in Research and Research Policy, Statistics Finland, Statistics Iceland, and Vinnova.

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	Human capital	Humankapital
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Foreword and reader's guide¹

Competence is a key ingredient for innovation and growth. The prosperity of a nation depends on the knowledge, skills and experience that can be put to work in the operation and development of its economic and social life. Research, education of the young, and lifelong learning are being heralded as crucial mechanisms for supplying businesses and the public sector alike with new and updated competence. A growing body of knowledge about these mechanisms is forming an increasingly strong foundation for public policy and private strategy.

The movement of people involves a mechanism of knowledge transfer that is much less understood. When people move between jobs or between social settings, they carry their skills and experience with them to the new firm or region. When a competence meets with a new situation, innovation can occur, so mobility is not only about moving human capital around but also about creating something new in the process. Competence moves with people in a non-trivial way and mobility may be seriously underestimated as a moving force for social and economic development.

However, research and education take place in purpose-built institutions that are highly visible and relatively easy to study for the purpose of policy improvement. Mobility of human capital, on the other hand, is deeply embedded in social and economic institutions whose primary mission is not the moving of human capital, so it is essentially a by-product of other processes and much less visible to the public eye. Thus the understanding of mobility and its contributions (positive and negative) to a country's competence base is merely in its infancy. Briefly put, the research question is still very open: What is the role of mobility in a National Innovation System?

The project "Flows of human capital in the Nordic countries" ("Kompetansestrømmer i Norden") is a small and exploratory step in the quest for understanding the competence aspect of mobility. The project has set out to illuminate issues of

- human capital flows or circulation through the inter-Nordic labour market
- benchmarks and stylised facts of mobility in the Nordic countries (with a particular emphasis on the significance of the business cycle)
- science – industry mobility

all while identifying and addressing the challenges of opening new, large national register databases to international comparative research.

The project was inspired by the Nordic co-operation in the OECD work on National Innovation Systems in the so-called "Focus Group on Human Mobility" in 1997-1998. Research issues of high policy relevance that were addressed included a better understanding of flows of competence embedded in employees changing jobs. The science-industry relation was a particularly hot topic in this respect. The OECD work was in turn based on the newly available "employment files", i.e. matched employer-employee data produced by combining public register databases. These employment files are constructed in different ways in different countries, but all of them contain a common core of data about all individuals in the population above 16 years, the "active population".

¹ This section is common to the three project reports and the two methodological papers and also appears as the introduction to the summary report.

Until recently it was only the four largest Nordic countries that had such employment files available to researchers and statisticians, but recently Belgium has constructed the first time series of this kind using information from the social security system. In most OECD countries the information exists that would make it possible to construct employment files, but different statistical, legal and political traditions have so far blocked the development of such data sets.

The use of these register data for research purposes is still in an early, explorative phase. Because of this, some caveats are in order for interpreting the results. Firstly, the different mechanisms of knowledge transfer definitely complement each other and they probably also interact. Ideally, mobility rates should be seen in conjunction with measures of research, education and lifelong learning. This has not been possible in the present project.

Secondly, the human capital aspect is not the only aspect of mobility. High mobility increases personnel turnover costs for the firms involved. It disrupts teamwork, makes knowledge accumulation difficult, takes key personnel out of projects that are not finished etc. Low mobility might lead to too little circulation of both experience and new ideas and approaches, incurring high opportunity costs. It is therefore of interest to search for optimal ranges of mobility rates rather than to strive for extreme values. Mobility rates below 5 per cent may indicate stagnation and when they get above 25 per cent, things may seem a bit hectic. Even so, we are not in the position to identify a canonical range.

Our hope is that the results from this project will contribute to the development of research and policy on issues related to stocks and flows of human capital and related labour market issues.

The project has been carried out by a consortium with the following partners:

The STEP Group², Oslo (lead partner) (Anders Ekeland, Håkon Finne, Svein Olav Nås, Nils Henrik Solum)

The Danish Institute for Studies in Research and Research Policy (AFSK), Århus (Kenny Friis-Jenssen, Ebbe Graversen, Mette Lemming)

Statistics Finland, Helsinki (Mikael Åkerblom, Markku Virtaharju)

Vinnova³, Stockholm (Adrian Ratkic, Christian Svanfeldt, Jonny Ullström)

Statistics Iceland, Reykjavik (Ómar Harðarson).

Beyond the partners, Statistics Norway, Statistics Sweden and Statistics Denmark have provided register data. The Nordic Industrial Fund has been the main financial source for the project. Additional funding has been provided by The Finnish National Technology Agency, the Research Council of Norway and the participating consortium members.

The project has resulted in a summary report, three detailed reports and two methodological papers, all of which are published in STEP's report series.

Paper 1, the **Classification paper** (Virtaharju and Åkerblom (2003): Measuring mobility, some methodological issues. Oslo: SINTEF STEP), is a paper that accounts for the methods and classifications used in the project. The paper focuses on dealing with register data. Its target audience is interested non-specialists and fellow researchers.

² Since 2003-01-01, SINTEF STEP – Centre for Innovation Research.

³ Until Vinnova's establishment in 2001, the participating analysts belonged to NUTEK.

The present paper, Paper 2, the **Data source paper** (Harðarson (2003): *Some methodological issues using labour force survey data for mobility research*. Oslo: SINTEF STEP), discusses the relationships between register data and Labour Force Survey (LFS) data in detail. This discussion is important because while many countries perform LFSs regularly, only Nordic countries have register data available for detailed mobility studies. Iceland is the fifth of the Nordic countries to be constructing a register database for this purpose.

Project report 1, the **Migration report** (Graversen et al. (2003a): *Migration between the Nordic countries: What do register data tell us about the knowledge flows?* Oslo: SINTEF STEP), gives a comprehensive picture of flows of migration of Nordic citizens between the Nordic countries for the period 1988-1998. It studies migration rates, rates for returning to the country of emigration and rates for staying in the country of immigration. It breaks these figures down by a number of demographic and economic indicators. This report is aimed at researchers, statistics officials, policy makers and others interested in the flow of human capital between the Nordic countries.

Project report 2, the **Mobility report** (Graversen et al. (2003b): *Mobility of human capital – the Nordic countries, 1988-1998*. Oslo: SINTEF STEP), compares domestic job-to-job mobility rates in the Nordic countries, broken down over a number of demographic and economic indicators. Particularly important is the verification of procyclical movements in the mobility rates: propensity to change jobs follows the business cycle for most subgroups. The report has produced benchmarks for mobility and stylised facts about influences on mobility rates. This report is aimed at researchers, statistics officials, policy makers and others interested in the flow of human capital between firms.

Project report 3, the **Researcher report** (Ekeland et al. (2003a): *Mobility from the research sector in the Nordic countries*. Oslo: SINTEF STEP), is a specialised study of domestic job-to-job mobility rates for personnel in the research sector for the period 1988-1998. This topic is of particular interest for the discussion of the function of specialised research institutions in the innovation system, an expansion of the classical science – industry theme. The report is aimed at researchers, statistics officials, policy makers and other interested parties, including strategy developers of the institutions in the research sector.

The reports and papers are rather detailed. The **Summary report** (Ekeland et al. (2003b): *Flows of human capital in the Nordic countries 1988-1998*. Oslo: SINTEF STEP) summarises the main findings of the three project reports and the two papers and is recommended as the first intake for all readers. It also contains some material not found in any of the other publications but deemed appropriate for a synthesised formulation.

On behalf of all the partners in the project I would like to thank our sponsors, in particular the Nordic Industrial Fund, for this opportunity to contribute to a literature of growing importance through a stimulating and challenging Nordic co-operative effort.

Oslo, June 2003

Anders Ekeland
Project manager

Table of contents

Foreword and reader's guide	i
Table of contents	iv
1 Introduction	1
2 Design problems	2
3 Conceptual concerns.....	3
4 Other issues	5
5 General issues specific to Iceland	7
6 Procedure used in estimating job flows from Icelandic LFS data.....	8
7 External validation: job-to-job inflow rates by sectors.....	9
8 Conclusion	10
9 References	11
Appendix 1	12

1 Introduction

Labour dynamics essentially consist of two distinct events: separation from work and hiring, i.e. inflow and outflow, each of those two events having separate measurable characteristics. I will refer to these events as labour market events. It is however almost impossible to examine directly the universe of labour market events. An indirect approach is needed, taking advantage of the fact that for each such event two aspects are always present, i.e., the individual and the activity, or, to put it simply, the firm and the person hired or fired. The universe of these events can therefore be quantified either at the company level or the person level. Business surveys are examples of the former approach, while household surveys measure labour market events as attributes of the persons in the sample. The Nordic case is special, as the availability of extensive administrative registers enables both approaches.⁴ While labour force surveys (LFSs) are not particularly geared towards measuring flow events, they are in fact the only source for such statistics at the international level.

Traditionally, flow statistics can be produced from LFS data following one of two approaches. The first approach is to use the panel structure inherent in most labour force surveys, linking the records of one survey instance to the records of the same person interviewed in an earlier survey instance. This approach essentially assumes that if the observed status at the two points in time is different, then a labour market event can logically be concluded to have occurred in the intervening period. A variant of this approach is a recall question in the European LFS asking the respondents about their main status one year previously.

The second approach uses data which is available in most LFSs in order directly to estimate labour market events of the past. Such data typically involves the starting date in the present job or the quitting date in the last job. This data cannot, however, be used in order to calculate job-to-job mobility rates, but rather only inflow rates. If LFSs were to ask about recent job history, the data might permit the calculation of inflow and outflow rates, as well as job-to-job mobility rates.

A third approach is now ever more frequently feasible at the international level, as more countries trend towards a continuous labour force survey, especially in Europe. This enables direct examination of the labour market events occurring in each reference week, bypassing many of the problems which hamper the first two approaches. However, as the European LFS set of variables is now defined, the events mentioned are only indirectly measured (appearing as one or two among many reasons for not having worked or having worked less in the reference week than usual), or not at all measured (such as when separation occurs towards the end of the reference week).

The following remarks are divided into five sections. In the first three I will briefly discuss general problems which are common to most of the labour force surveys in OECD countries and have a direct bearing on labour dynamics statistics; they are firstly design problems, secondly conceptual concerns and, thirdly, other statistical and non-statistical errors. In my final three sections I will begin by discussing issues especially related to imputing flow statistics from Icelandic labour force survey data. I will then describe the method for deriving the statistics presented in the Nordic paper "Mobility Rates on Human Capital" (Graversen et al. 2001). In closing I will present some results from comparing flow statistics using two different sources, i.e., the LFS and tax registers for the period of 1998 to 1999.

⁴ This of course assumes the perfect world where all economic activity is duly reported to authorities.

2 Design problems

Under this heading I will mention five design-related problems which are detrimental when producing estimates of labour dynamics from LFSs.

The first problem is of course that even if most if not all labour force surveys in the OECD utilise panel designs, these are not truly longitudinal structures. Panels are applied in LFSs merely in order to reduce variance in the annual, quarterly or even monthly estimators of change, without overly disrupting the annual or quarterly estimates. It is therefore impossible to follow the same individuals through any extended period of time.

The second problem is that the different national statistical institutions (NSI) use different rotational patterns of panel inclusion, depending on which change estimators are deemed of most importance from each nation's perspective. An agency which focuses on accurate tracking of monthly changes in unemployment may thus be unable directly to link the records in order to produce accurate estimates of annual fluctuations. At the international level, these dissimilar rotational patterns may thus prevent having directly comparable estimates of developments.

The third problem is that of panel attrition. Labour force surveys focus on the behaviour or characteristics of individuals. Nevertheless, due to the lack of suitable sample frames in almost all countries, with the notable exception of the Nordic countries, statistical agencies do not sample individuals but residences, that is, all household members inside each residence. When the inhabitants move out, the whole family or individual members, often no attempts are made to trace them. In terms of flow statistics, this may cause biases in job mobility computations, especially assuming correlation between migration and job mobility.

Fourth, individuals in labour force surveys are interviewed at predefined intervals, for example quarterly or even less frequently. Generally only one labour market event can be recorded for the period, even if the person has changed jobs more often. This will of course lead to an underestimation of overall mobility rates during the year.

The final design problem concerns the precision of dates in LFS data. Labour force surveys are in general concerned with status, i.e. whether or not a person is employed. Flow statistics, in contrast, are concerned with events, i.e. when people switch from Status A to Status B. As an overall rule, therefore, flow statistics can only be inferred from labour force surveys, based on the logical assumption that if current labour status is different from the status some given time ago, a labour market event has occurred during the period (see Farm 2000). In most cases LFSs in the OECD provide only rough estimates of when particular events occurred (the year and month), which skews duration estimates and does so proportionally more as time frames narrow.

3 Conceptual concerns

Under this heading I will discuss two problems. Firstly, the job concept in LFSs and secondly, though also related to the former concern, the problem of people involved in more than one job or employment.

When using labour force surveys to estimate labour dynamics, particular attention should be paid to the idea of what constitutes a job. Labour force surveys do not measure “jobs” per se. On the contrary, LFSs measure employment as a characteristic (status) of the sampled individuals by asking them to divide the past 168 hours into either gainful or not so gainful use of time. If none of the past 168 hours were gainfully utilised, the sampled individual might still be considered employed, would he or she have been working except for some predetermined set of barriers.⁵ Also, an employed person may have more than one job or be engaged during the reference week in gainful activity that may or may not be formally defined as a “job”. This is in contrast to data at the enterprise level, where a single “job” can be executed by more than one person and the least formal relationships do not enter the statistics at all (such as work at building one’s private house).⁶

Generally, for the purposes of flow statistics, labour force surveys contain usable data only for the main job or primary employment. This may not be an issue in most European countries, where the percentage of persons having more than one job is negligible. In the case of Iceland, however, this percentage has remained constant at around 17%. Moreover, there is evidence of considerable marginal flows; judging by paired records, approximately 40% of the people employed in consecutive years who report more than one job in year t report only one job in the year $t+1$. The higher the prevalence of multiple jobs, the less likely labour force surveys are to depict overall mobility rates correctly. As seen in Table 1, an LFS tends to underestimate structurally the number of labour market events, while nevertheless falsely tabulating such events when switches occur among main and second jobs between measurement points.

⁵ I heard this view of LFSs as specialised time-use surveys from Ian Macredie (Statistics Canada) at the 16th ICLS in Geneva, October 1998.

⁶ In register data a “job” may however be defined as the wage relationship between a firm and an individual, so that two persons sharing one job would count as two jobs, as well as one person employed by two enterprises.

Table 1: Representation of labour market events and the corresponding estimates by LFSs using data solely from main job

Number of jobs			"Reality"				LFS estimate	
			Inflows		Outflows		Inflows	Outflows
Year t	Year t+1	Description	1 st job	2 nd job	1 st job	2 nd job		
1	1	Job _{t+1} = Job _t	0	-	0	-	0	0
		Job _{t+1} ≠ Job _t	1	-	1	-	1	1
	2	Main _{t+1} = Job _t & Second _{t+1} = New	0	1	0	-	0	0
		Main _{t+1} = New & Second _{t+1} = Job _t	1	0	0	-	1	1
		Main _{t+1} = New & Second _{t+1} = New	1	1	1	-	1	1
2	1	Job _{t+1} = Main _t	0	-	0	1	0	0
		Job _{t+1} = Second _t	0	-	1	0	1	1
		Job _{t+1} = New	1	-	1	1	1	1
	2	Main _{t+1} = Main _t & Second _{t+1} = Second _t	0	0	0	0	0	0
		Main _{t+1} = Main _t & Second _{t+1} = New	0	1	0	1	0	0
		Main _{t+1} = Second _t & Second _{t+1} = Main _t	0	0	0	0	1	1
		Main _{t+1} = Second _t & Second _{t+1} = New	0	1	1	0	1	1
		Main _{t+1} = New & Second _{t+1} = Main _t	1	0	0	1	1	1
		Main _{t+1} = New & Second _{t+1} = Second _t	1	0	1	0	1	1
		Main _{t+1} = New & Second _{t+1} = New	1	1	1	1	1	1

- NA
0 No inflow or outflow
1 Inflow or outflow
t Base year
t+1 Subsequent year

4 Other issues

Under this heading I will mention two statistical problems⁷ and two non-statistical problems contributing to errors and possible bias in flow statistics derived from LFS data.

The first statistical problem is that mobility rates calculated from LFS data suffer from the nominator and denominator both being variates. This reduces the efficiency of estimates, since the variance and therefore the confidence interval increase.

Secondly, the linked records approach to flow statistics hardly ever produces the same point estimates for each period as a full sample, as the estimates are subject to sample variations. Before flow estimates can be produced, the sub-sample containing the linked records must thus be realigned to two estimates distinct from those for the full samples. In lieu of external estimators, this is most easily done by raking weights to the estimated marginals (see for example OECD 2001, Alvarez 2001). The results of these estimators may be subject to the rotation group bias discussed by Kristiansen (2001), although the evidence of this bias, also referred to as panel conditioning, has been questioned (Holt 1989, US Census Bureau 2002). In general, however, raking weights to the marginals may result in a subtle, nearly incalculable decrease in efficiency (Elliot 1991).

Nonetheless, the non-statistical problems are of greater concern, because these may introduce serious biases. The first bias is connected with classification errors, the second with recall problems. These two types of error relate to the two main approaches, mentioned above, to producing flow statistics from labour force surveys.

Use of the linking method can create a considerable bias in the event of classification errors.⁸ Classification errors arise either from mistakes in the coding process or from the relevant information being insufficient for accurate coding. In both cases these errors may lead to a significant overestimation of flows, since errors will wrongly be interpreted as modifications of status (except of course in those few instances where the errors happen to be the same). With the introduction of computer-assisted interviews, now prevalent in most OECD countries, these errors may be significantly reduced, since the follow-up interview need not be an independent measurement, but rather a mere verification of identical status to the previous occasion. The technique of dependent interviewing advocated by Lemaître (1994) is however no panacea. Much depends in that case on the accuracy of the first interview; few LFSs are designed so that errors detected during the follow-up interview can be retroactively corrected. The dependent interview technique is also more suitable for certain discrete characteristics, such as keeping the same job, while labour force status (employed, unemployed, inactive) is a far more complicated concept to reduce to a simple question.

The second approach, using direct measurement of labour market events, gives rise to another type of problem, that of recall. This type of error generally arises when the respondent cannot correctly remember his or her activity immediately prior to the last labour market event or the exact timing of that event. I am not aware of any research indicating the effect of such shortcomings on flow statistics. I can nonetheless reveal one discovery. The Icelandic labour force survey uses a dependent interview technique for, among other things, the activity of the

⁷ A further statistical problem could be discussed, i.e. the American method of linking records by statistical matches (see e.g. Jones and Riddell, 2000). I refrain from such a discussion due to lack of familiarity with the method.

⁸ Lemaître (1994) gives an excellent overview of problems related to the linked record approach, also indicating how they can be reduced.

employing establishment. If a respondent indicates that he or she is presently not employed at the firm/establishment previously recorded, the new firm and activity is recorded, along with the starting month and year. The date is not immediately verified against the one mentioned in the previous interview. In 1994 to 2000 a sizeable portion of the persons answering that they were working at a firm other than the one recorded at the last interview actually recalled their starting date there as prior to the date of the last interview. The number answering in this manner averaged 21%.⁹ Even if these figures are high, they may not solely indicate recall problems, but could result from faults in the first interview or simply indicate summer jobs and second jobs becoming main jobs or the fluid interpretation of what constitutes employment, when employment starts etc.

⁹ This requires further investigation, because there is a pronounced seasonal variation in the data which demands explanation - both a variation in the proportion of persons giving contradictory responses of this sort and the number of persons actually indicating that they have changed jobs since the last interview. Preliminary analysis indicates that the people committing these errors (if they are indeed errors) are more likely to have held a second job on the previous occasion, had a temporary work contract or been self-employed, or to have been occupied as students or in residence outside the capital city region. Why all this is so needs to be theorised.

5 General issues specific to Iceland

The Icelandic labour force survey (ILFS) questionnaire has four aspects bearing on the question of labour flows.¹⁰ These aspects are as follows:

- a) the rotation plan allows for linking approximately 50% of the records to results one year earlier;
- b) each employed person participating in previous survey rounds is asked if their present employer is the same as previously recorded;
- c) the starting month and year of the present employment are recorded for each employed person;
- d) everyone is asked about their employment status one year previously.

The greatest impediment to using the ILFS for examining employment mobility is of course the size of the sample. Sample surveys in general awaken uncertainty due to sample variance. The ILFS has on the average around 3.600 usable responses in each survey wave. The linked records approach allows less than 1.800 cases to be examined, which is in general unsatisfactory for the purposes of official statistics. Nevertheless, from the point of view of research and theoretical validation, the size of the sub-sample probably suffices.

Another deterrent is the paucity of observation points in the ILFS. The ILFS is only conducted in April and November of each year. This of course increases the problem of recall as well as perhaps detracting from the portrayal of labour market events occurring during the year.

One advantage of the ILFS, on the other hand, is that the sample is drawn from the National Register of Persons (NRP) by a simple random sampling procedure. This reduces variance in comparison to sampling procedures used in other OECD countries outside the Nordic nations, and furthermore allows for utilising registry information by linking personal identification numbers to administrative databases. At the moment, however, the Icelandic LFS only incorporates external data directly available from the NRP, such as age, sex, marital status and residence.

The ILFS applies to some degree the dependent interview technique advocated by Lemaître (1994). In particular, occupation, industrial activity, last labour market participation (occupation, activity) and education utilise previously recorded answers, even if modifications of these statuses are not logically verified against other evidence, as previously mentioned.

Otherwise, the ILFS suffers from most of the problems associated with the use of labour force surveys for flow statistics.

¹⁰ In addition, separations and hirings that occur in the reference week are recorded if they result in a shorter working week than on average. However, this is not presently a useful measurement for inflows and outflows of employment, partly because not all separations and hirings are noted and partly because there are only two reference weeks per year in the ILFS.

6 Procedure used in estimating job flows from Icelandic LFS data

At the outset, I had to make two fundamental decisions about preparing the data. The first decision was to count only flows where the recalled date of starting (or quitting) a job was less than 13 months previously. The second decision was to use both of the year's surveys in order to calculate the "average" mobility. This may alleviate problems associated with the smallness of the sample, but at the same time the disadvantage enters in of covariance increasing the variance, since one third of the cases are common to both measurements.¹¹

Subsequently, I followed an iterative procedure in adjusting the weights of the common sample to the marginals estimated for each two years, determined by sex, adjusted employment status (students forming a special category, unlike the international ILO recommendation), residence (capital city region and other regions) and broad educational groups.¹² While pursuing that procedure I had to be cautious of the fact that the labour force survey is but a window fixed on the population 16-74 years of age which was living in the country at the time of the interview. Thus, the iterative process had to leave out persons who were outside this frame in the preceding or the subsequent year, assigning those people the weights originally assigned to them.

The resulting basic flow matrices, using the adjusted employment status for year t and $t+1$, can be seen in Appendix 1.¹³

¹¹ Averaging a period of one or two years is in fact a common procedure in Icelandic official statistics, due to the smallness of the population. Calculation of such factors as fertility rate, mortality rate etc. is only performed as two-year averages.

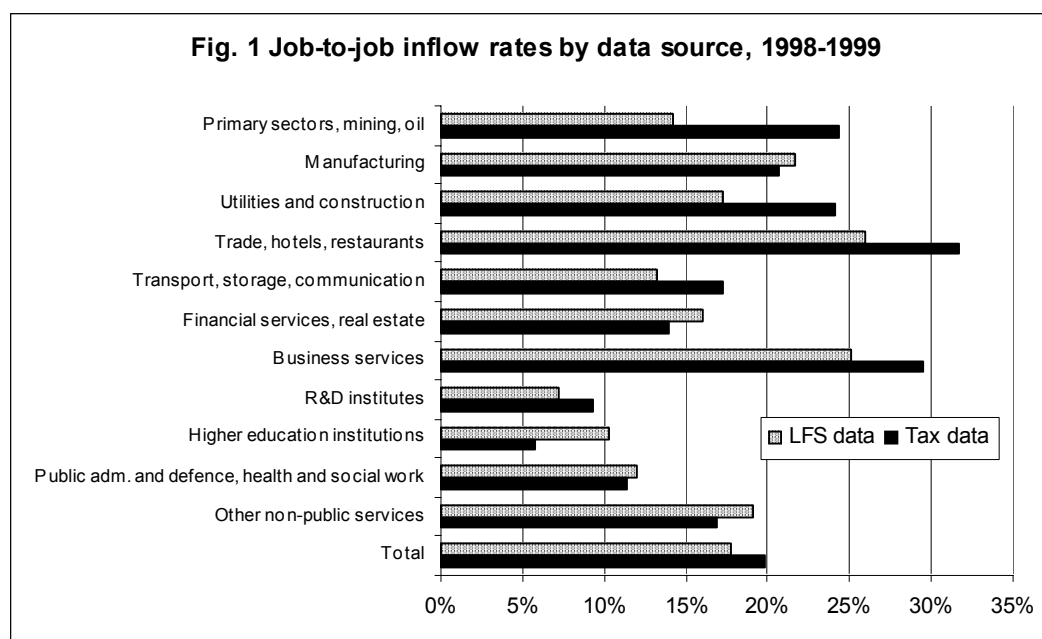
¹² Age would have been a desirable category in the iterative process. However, due to the paramount constraint that no cell have fewer than ten observations in the raking procedure, age had to be discarded.

¹³ As a final note, the sampling frame for the first three-and-a-half years was the population aged 16-74 at the end of the year. From November 1994, the sampling frame was redefined in relation to the actual reference week. As the iterative process does not take age into account, the matrices underestimate the number of persons who were out of scope during the first year.

7 External validation: job-to-job inflow rates by sectors

Statistics Iceland has received monthly data from the tax authorities since 1998, i.e. reports on the PAYE (pay-as-you-earn) tax. These records still require extensive corrections and editing, especially with regard to the NACE codes, rendering them difficult to use in validating the mobility rates calculated from LFSs. In addition, Statistics Iceland presently has the explicit policy of precluding links between the tax register and the LFS database, so that even if I supervise both activities I am not allowed any peek at the tax data when working with LFSs or vice versa. The tax data are also limited concerning the definition of firms. A tax reporting firm is the entity that pays out wages, not necessarily the local unit or even the legal entity. For example, all wages paid out by the Icelandic state are lumped together under a single reporting entity. Similarly, much effort is still required to analyse companies changing identity codes for legal reasons.

Nevertheless, when examining people receiving taxable wages in one year and connected with records in the following year, we obtain an indication of mobility rates by sectors and can compare the rates to those calculated from LFS data.¹⁴ Fig. 1 shows the job-to-job inflow rates by this method from the tax records of October 1998 and 1999, along with those from LFS data. I carried out the same comparison for the 1999-2000 rates with comparable results. Overall the two data sources show the same patterns for the various sectors. Notable exceptions are sectors having a high prevalence of the self-employed, since they are poorly represented in the monthly register.



¹⁴ The underlying data for Fig. 1 were defined as follows: persons 16-74 years of age who reported earnings in October 1998 and in October 1999 were considered employed in both years. If a person received wages from at least one employer common to both periods, this person was considered not to have changed jobs, regardless of extra jobs he or she held at either time, and the NACE code for the main job (yielding highest wages) in October 1998 was then assigned to both reference points. Other people employed in both years were assumed to have switched jobs, with the NACE codes for each of the two reference points being assigned according to the main job criterion.

8 Conclusion

In the preceding remarks I have focused on problems relating to the production of flow statistics from labour force surveys. Some of these problems are statistical in nature, others related to design, and some connected with non-statistical aspects, such as codification errors and recall problems. Nevertheless, there are indications that the LFS data is sufficient for examining causal relationships, enabling researchers and theorists to draw valid conclusions as to the relations and antecedents governing the behaviour of individuals in the labour market. This can be seen both in the results presented by Graversen et al. (2001) and also in the preliminary comparison of flow rates from Icelandic LFSs and tax registers by sectors. However, we have yet to see how LFS data can be used to calculate flow data for official statistics, where the emphasis is generally greater than in research on the accuracy of levels and on consistency in time-series.

Some of the disadvantages of labour force surveys in producing flow data can be circumvented by more concise questioning. Such is the case when trying to establish the exact date of a labour market event in the not so recent past. Similarly, questions on recent job history may prove effective. Adjusting labour force surveys within OECD countries to achieve better estimates of labour dynamics may, however, not serve the main objective of these surveys, as the amended questions may turn out detrimental to estimating the current labour force status of the populace (Lemaître 1994). I would in any event urge national statistical institutions - Statistics Iceland in particular - to consider a compromise overhaul of national questionnaires in order to improve flow statistics. After all, estimates of flows in recent history are always the best indicator of how a populace will behave in the future. That, after all, is the main task of official statistics, i.e., helping policy makers and the public to formulate policy and to plan for coming times.

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Appendix 1

Table 2: Basic flow matrices produced iteratively from Icelandic LFSs, weighted by the second year.

1991–1992 ×1000		1992								
1991	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years		
Total	177,0	132,9	5,7	17,9	18,0	1,1	0,4	1,0		
Employed	133,7	120,9	3,0	4,1	4,3	1,0	0,2	0,1		
Unemployed	3,2	1,8	0,8	0,2	0,3					
Students	17,2	5,5	0,4	10,7	0,4	0,1				
Not in LF	18,8	3,5	1,2	0,2	12,8	0,0	0,2			0,9
Abroad	1,0	0,8	0,1	0,1	0,1					
< 16 years	3,2	0,5	0,1	2,5						

1992–1993 ×1000		1993								
1992	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years		
Total	180,4	133,1	6,9	18,2	19,7	0,9	0,3	1,3		
Employed	133,4	120,6	4,2	3,6	4,0	0,6	0,2	0,2		
Unemployed	5,8	3,1	1,7	0,2	0,6	0,0	0,0			
Students	18,1	6,2	0,2	11,2	0,3	0,2				
Not in LF	18,6	2,0	0,6	0,2	14,5	0,0	0,1			1,1
Abroad	1,1	0,7	0,1	0,2	0,2					
< 16 years	3,5	0,5	0,1	2,8						

1993–1994 ×1000		1994								
1993	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years		
Total	181,4	134,0	6,8	18,3	19,8	1,2	0,4	0,8		
Employed	132,6	120,7	3,2	2,8	4,8	0,8	0,2	0,1		
Unemployed	6,9	3,5	1,9	0,3	1,1	0,1				
Students	18,2	5,4	0,4	11,8	0,5	0,2	0,0			
Not in LF	19,5	3,4	1,2	0,6	13,3	0,1	0,2			0,7
Abroad	1,1	0,8	0,1	0,1	0,1					
< 16 years	3,2	0,3	0,1	2,8						

1994–1995 ×1000		1995								
1994	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years		
Total	183,4	137,7	6,2	17,1	18,8	1,7	0,5	1,4		
Employed	133,7	123,0	2,7	2,5	3,8	1,2	0,3	0,2		
Unemployed	6,8	3,6	1,8	0,3	0,9	0,1				
Students	18,3	6,0	0,7	10,7	0,6	0,3				
Not in LF	19,8	3,6	0,9	0,5	13,4	0,0	0,2			1,1
Abroad	1,2	0,9	0,0	0,2	0,1					
< 16 years	3,6	0,6	0,1	2,8						

1995–1996 ×1000		1996								
1995	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years		
Total	184,7	138,2	4,6	17,9	20,0	2,2	0,6	1,2		
Employed	137,2	124,8	2,4	3,9	4,1	1,6	0,3	0,2		
Unemployed	6,2	3,3	1,5	0,4	0,9	0,0				
Students	17,1	6,0	0,2	9,9	0,4	0,4	0,0			
Not in LF	18,7	2,3	0,3	0,1	14,5	0,1	0,3			1,0
Abroad	1,3	1,0	0,0	0,1	0,1					
< 16 years	4,3	0,8	0,1	3,4	0,0					

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1996–1997

×1000

1996	1997								
	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years	
Total	186,3	137,0	4,7	19,6	21,1	1,6	0,6	1,6	
Employed	137,8	124,5	2,3	4,6	4,9	1,2	0,3	0,1	
Unemployed	4,7	2,7	1,1	0,2	0,6	0,1	0,0		
Students	18,1	6,3	0,5	10,7	0,4	0,2			
Not in LF	20,2	2,0	0,8	0,2	15,2	0,2	0,3	1,5	
Abroad	1,1	0,8	0,1	0,2	0,1				
< 16 years	4,4	0,6	0,1	3,7					

1997–1998

×1000

1997	1998								
	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years	
Total	188,4	141,8	3,4	19,3	20,4	1,7	0,4	1,5	
Employed	137,2	127,2	1,6	3,5	3,4	1,1	0,3	0,2	
Unemployed	4,8	2,8	0,6	0,0	1,2	0,1			
Students	19,7	7,1	0,4	11,6	0,3	0,3			
Not in LF	21,1	2,9	0,7	0,5	15,3	0,2	0,2	1,3	
Abroad	1,4	1,1	0,1	0,2	0,1				
< 16 years	4,3	0,8	0,1	3,4					

1998–1999

×1000

1998	1999								
	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years	
Total	191,1	148,8	2,5	16,1	20,6	1,4	0,5	1,2	
Employed	142,3	132,4	1,2	2,9	4,4	0,9	0,3	0,3	
Unemployed	3,4	2,1	0,4	0,1	0,7		0,0		
Students	19,3	9,0	0,3	9,2	0,4	0,4			
Not in LF	20,2	3,0	0,5	0,5	15,0	0,1	0,2	0,9	
Abroad	1,6	1,2	0,1	0,3	0,1				
< 16 years	4,3	1,2	0,0	3,1	0,0				

1999–2000

×1000

1999	2000								
	Total	Employed	Unemployed	Students	Not in LF	Abroad	Deceased	> 74 years	
Total	190,7	148,7	2,8	15,8	20,5	1,3	0,4	1,3	
Employed	145,8	134,5	1,2	4,4	4,4	0,8	0,1	0,3	
Unemployed	2,5	1,6	0,4		0,5	0,0			
Students	15,9	7,1	0,2	8,2	0,1	0,3	0,0		
Not in LF	20,3	2,6	0,9	0,2	15,2	0,1	0,2	1,1	
Abroad	2,1	1,6	0,1	0,2	0,2				
< 16 years	4,1	1,3	0,1	2,7					

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