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Flow Statistics from the Swedish Labour Force Survey

2005:5

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Preface

Flow statistics from the Swedish Labour Force Survey

Using the panel property of the Swedish Labour Force Survey (LFS) it is possible to estimate quarterly flows showing transitions between different labour market states. Tables with gross flows can consequently be published quarterly, as supplements to present publications.

The possibility to supplement LFS with flow statistics was discussed already in the beginning of the 1980s in one of the working parties which preceded the revision of the LFS in 1987. Work on gross flows based on LFS was initiated by Berndt Öhman and Karl-Erik Kristiansson at the end of the 1980s. After suggestions in a report by Ante Farm in 1997, the work proceeded with the participation of Hassan Mirza until the beginning of 2002.

After a break for two years, the development of flow statistics was resumed in 2004. This report was prepared by Ante Farm (Swedish Institute for Social Research and Statistics Sweden), Monica Rennermalm (Statistics Sweden), and Jan Selén (Statistics Sweden).

Statistics Sweden in November 2005

Anna Wilén

Claes-Håkan Gustafson and Anders Sundström

Contents

Summary

This report presents proposals for the estimation and publication of flow statistics based on the Swedish Labour Force Survey.

Flow tables
Five simple tables are proposed. Two tables report flows between different labour market states, either in thousands per quarter or as transition rates, while three tables report transition rates for particularly interesting sub-groups in the labour market under three different headings, namely *stability rates, unemployment risks, and job chances.* Applications of the tables are illustrated with data for the period 1997–2004.

We find, for instance, that 97 per cent of those in permanent employment at a certain date are also in permanent employment three months later, while the corresponding stability rate for temporarily employed is about 70 per cent per quarter. And about 50 per cent of the unemployed are still unemployed after a quarter.

We also find that the risk of becoming unemployed is less than 1 per cent per quarter for permanently employed, but between 5 and 7 per cent per quarter for temporarily employed. And about a fourth of those who are unemployed at a given point in time have left the labour force a quarter later.

Declining risks of unemployment correspond to increasing job chances. We find, for instance, that the probability to get a permanent job for the unemployed increased from 3 to 6 per cent per quarter between 1997 and 2000, while the probability to get a temporary job increased from 16 to 22 per cent per quarter between 1997 and 2001. And the chance for temporarily employed to get a permanent job during a quarter varied between 9 and 13 per cent.

Flow estimates
A simple method for flow estimation is also proposed. Lessons from other countries are first reviewed, as well as earlier tests by Statistics Sweden. A method adjusted to the new design of the LFS introduced in 2005 is then proposed. It implies, above all, that standard methods can be applied to the estimation of standard errors.

In the US, monthly labour market flows based on the Current Population Survey (CPS) were published already in the 1950s, but the publication was soon discontinued due to measurement problems. After improvements especially during the 1990s, flow tables are now provided upon request, even if they are not part of regular production.

Of course, there are problems of measurement and consistency also in the Swedish LFS. However, they are less than in the CPS, depending on a larger flow sample (7/8 of the regular LFS as against 3/4 of the regular CPS), better identification (personal identification numbers instead of addresses) and fewer indirect interviews. The introduction of dependent interviewing in 1987 has also improved the potential for flow statistics,

since respondents now answer questions about *changes* since the last interview.

The weighting system which has been tested earlier by Statistics Sweden in flow estimation includes *marginal adjustment*, meaning that weights are modified so that status totals in the regular survey are reproduced by flow margins. This method is also presently being contemplated for the CPS.

However, we propose that the Swedish LFS – at least to begin with – use a method *without* marginal adjustment when estimating flows. This is essentially the same method as the method used by CPS so far (although the data used for calibration is richer in the Swedish LFS). Our reasons for this choice – which means that standard methods can be used for estimation of standard errors – are presented in Section 5 below.

Examples of standard errors for flows, transition rates, stability rates, unemployment risks, and job chances conclude this report.

Abbreviations

E = employed
UN = unemployed
NL = not in the labour force
PE = permanent employment
TE = temporary employment
SE = self-employed or family worker

1 Introduction

This report outlines a proposal for the publication of flow tables based on the Swedish Labour Force Survey (LFS). First, in Section 2 five simple tables are proposed[1], and they are illustrated in Section 3 with some applications based on data for the period 1997–2004.

Second, a simple method for flow estimation is proposed. Lessons from other countries are first reviewed in Section 4, as well as earlier tests by Statistics Sweden. A method adjusted to the new design of the LFS introduced in 2005 is then proposed in Section 5. It implies, above all, that standard methods can be applied to the estimation of standard errors.

[1] The proposal is based on Section 2 in Farm (1997), also available in English in Farm (2000).

2 Flow tables

Persons in the LFS samples are interviewed quarterly during a period of two years. Using this panel property, flows between consecutive quarters can be estimated both quarterly and yearly, and published as supplements to present publications.

The backbone of all statistics on flows in the labour market is tables showing flows between different states. The traditional states have been employment (E), unemployment (UN) and not in the labour force (NL). Here we also distinguish between three different forms of employment, namely permanent employment" (PE), "temporary employment" (TE), and "self-employment" (SE). Temporary employment is defined as employment of limited duration, that is, a job with a predetermined end, and a permanent job is defined as a job which is *not* temporary. Temporary employment has been identified in the LFS since 1987.

Our proposal is illustrated in Annex 1 with data from the first quarter in 1997. Tables of type 1 and 2 are complete transition matrices giving information on flows between different labour market states, either in thousands per quarter (Table 1.1) or as transition rates (Table 1.2). Here only flows for the whole population (16–64 years) are shown. Tables of types 3, 4, and 5 report transition rates for particularly interesting subgroups in the labour market under three different headings, namely *stability rates, unemployment risks, and job chances.*

3 Some applications

Starting from flow tables as defined in Annex 1 for quarters, flow statistics for the period 1997–2004 can be computed and presented in several different ways. In this section four examples are given. We begin with reporting the development of yearly averages of stability rates, unemployment risks, and job chances. Note that an average for a year is here evaluated as the average of transitions from the first, second, third, and fourth quarter of that year.

3.1 The development of yearly transition rates for the whole population

A *stability rate* is the rate for no transition. For example, a stability rate in permanent employment (PE) of 97 per cent per quarter means that 97 per cent of those who are in state PE at a certain date are still in state PE three months later (even if this employment is not with the same employer).

According to Table 1, the most stable states are "permanent employment" and "self-employment", both with a stability rate of about 97 per cent per quarter, while persons not in the labour force (NL) have a stability rate of about 85 per cent, and temporarily employed a stability rate of about 70 per cent. The stability rate was practically constant for all groups except the unemployed, whose stability rate – the *risk of staying unemployed* – declined from 52 per cent in 1997 to 47 per cent in 2000–2001, and then increased.

Even the *risk of becoming unemployed* first declined, up to 2000–2001, and then increased, according to Table 2, particularly for persons in temporary employment (TE) and persons not in the labour force (NL). Moreover, the last column in Table 2 shows that about a fourth of those who are unemployed at a given point in time have left the labour force a quarter later.[2] (But note the decline to 18 per cent in 2003, which may explain the big increase in the stability rate for the unemployed in 2003.) And the risk of becoming unemployed is (predictably) smallest for permanently employed (about 0.5 per cent), while it is about 5 per cent for temporarily employed.

[2] This transition rate is included in Table 2 because it can sometimes be interpreted as a probability of entering a state of "hidden unemployment".

Table 1
Stability rates. Proportions remaining in given states. Per cent per quarter. Yearly averages 1997–2004. Both sexes, 16–64 years

	PE	TE	SE	UN	NL
1997	97.8	70.6	96.9	52.6	84.9
1998	97.7	70.1	96.6	51.0	84.5
1999	97.6	69.9	96.8	51.2	85.1
2000	97.4	69.2	96.9	47.5	85.0
2001	97.5	69.6	97.0	47.3	86.3
2002	97.5	71.0	96.9	49.2	86.3
2003	97.6	71.7	97.0	56.6	87.0
2004	97.6	72.0	97.1	53.5	86.8

Table 2
Unemployment risks. Transition rates between given states. Per cent per quarter. Yearly averages 1997–2004. Both sexes, 16–64 years

	PE→UN	TE→UN	E→UN	NL→UN	UN→NL
1997	0.5	7.5	1.4	6.9	26.9
1998	0.5	6.2	1.3	6.0	25.5
1999	0.4	5.7	1.2	5.3	22.9
2000	0.4	4.6	1.0	4.3	24.9
2001	0.5	5.3	1.1	3.7	24.0
2002	0.5	5.0	1.1	4.1	22.9
2003	0.6	5.6	1.3	4.2	18.0
2004	0.6	6.0	1.3	4.2	20.2

Declining risks of unemployment correspond to increasing job chances. Table 3 shows, for instance, that the probability to get a permanent job for the unemployed increased from 3.1 to 5.7 per cent per quarter between 1997 and 2000, while the probability to get a temporary job increased from 16.5 to 22.4 per cent between 1997 and 2001. And the chance for temporarily employed to get a permanent job during a quarter varied between 9 and 13 per cent.

Table 3
Job chances. Transition rates between given states. Per cent per quarter. Yearly averages 1997–2004. Both sexes, 16–64 years

	UN→PE	UN→TE	NL→PE	NL→TE	TE→PE
1997	3.1	16.5	1.1	6.7	8.6
1998	3.8	18.8	1.4	7.8	10.2
1999	4.4	20.5	1.5	7.8	11.3
2000	5.7	21.2	1.8	8.4	12.9
2001	5.4	22.4	1.8	7.8	11.7
2002	5.2	21.6	1.4	7.8	10.3
2003	4.5	20.0	1.2	7.3	9.1
2004	4.3	20.6	1.2	7.4	9.1

3.2 Differences within the population

Tables 4 – 6 illustrate some differences between subgroups. We can see, for instance, that youth (16–24 years) had lower stability rates than others in all states; that the risk of staying unemployed increased with age; that both the risk of staying unemployed and the risk of becoming unemployed were somewhat higher for men than for women; that the risk of becoming unemployed decreased with age for permanently employed but increased with age for temporarily employed; that job chances were decreasing with age for both unemployed and persons not in the labour force; and that the chance for temporarily employed to get a permanent job was somewhat larger for men than for women. And these differences apply not only to 2003 (as shown in Tables 4 – 6) but to all years during the period 1997–2004.

Table 4
Stability rates. Proportions remaining in given states. Per cent per quarter. Yearly averages 2003

	PE	TE	SE	UN	NL
Men	97.5	69.0	97.1	59.2	86.4
Women	97.7	73.6	96.5	53.2	87.5
16–24 years	90.5	65.8	83.0	41.3	81.4
25–54	98.1	75.0	97.2	58.1	85.8
55–64	97.8	78.9	97.8	73.1	96.7
Total	97.6	71.7	97.0	56.6	87.0

Table 5
Unemployment risks. Transition rates between given states. Per cent per quarter. Yearly averages 2003

	PE→UN	TE→UN	E→UN	NL→UN	UN→NL
Men	0.8	7.0	1.4	4.6	17.0
Women	0.4	4.7	1.1	3.8	19.3
16–24 years	1.7	4.1	2.9	4.2	26.0
25–54	0.5	6.6	1.2	5.7	15.7
55–64	0.4	6.9	0.8	1.9	15.3
Total	0.6	5.6	1.3	4.2	18.0

Table 6
Job chances. Transition rates between given states. Per cent per quarter. Yearly averages 2003

	UN→PE	UN→TE	NL→PE	NL→TE	TE→PE
Men	4.9	17.8	1.5	7.1	10.2
Women	3.9	22.8	1.1	7.5	8.4
16–24 years	5.5	27.0	1.7	12.5	7.4
25–54	4.8	20.0	1.6	6.5	10.7
55–64	1.7	9.9	0.1	1.1	6.4
Total	4.5	20.0	1.2	7.3	9.1

3.3 Seasonal patterns

Seasonal patterns for job chances and unemployment risks are shown in Figure 1 and Figure 2. Note that seasonal variation is particularly large for transitions from UN to TE and from NL to TE (according to Figure 1), and for transitions from TE to UN and from NL to UN (according to Figure 2). For instance, the chance for unemployed to get a temporary job always increases during the spring (with more than 5 percentage points), while the risk for temporarily employed to become unemployed always decreases during the spring.

Figure 1
Job chances 1997 Q1 – 2005 Q1. Per cent per quarter

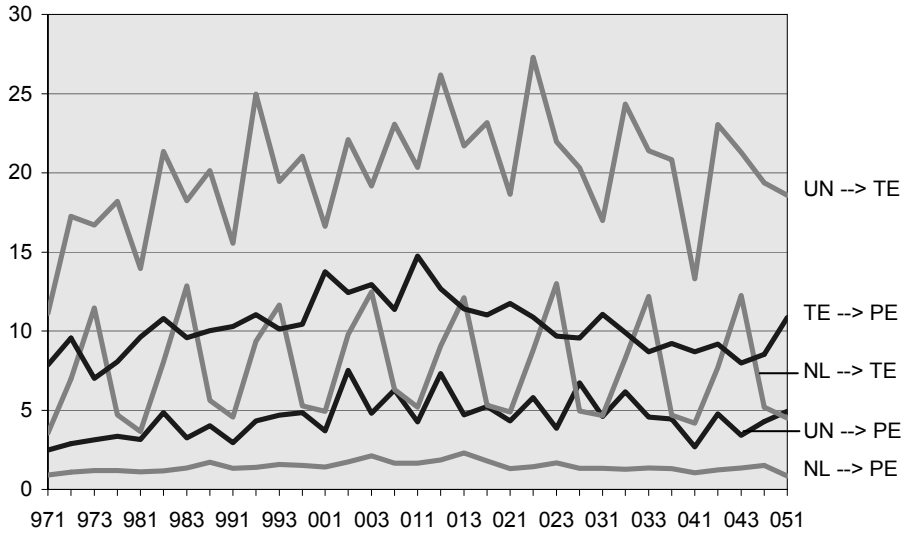
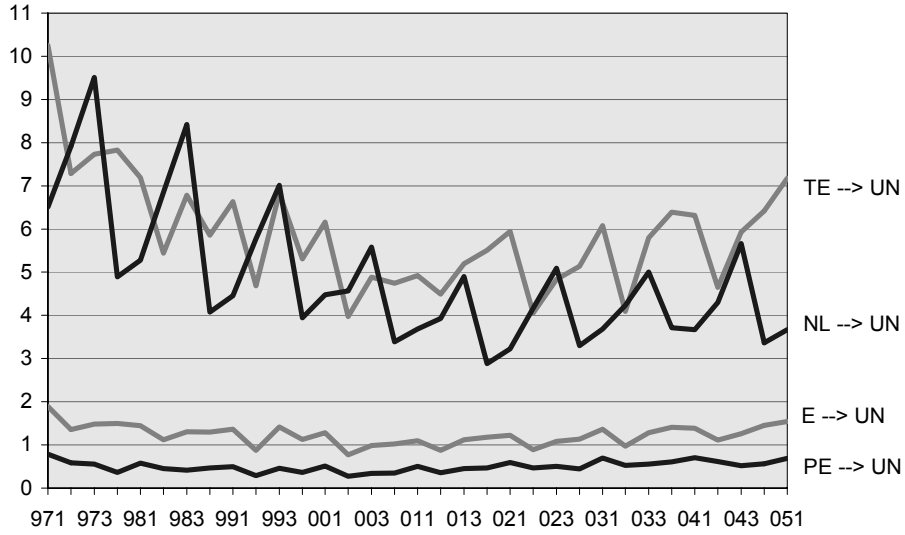


Figure 2
Unemployment risks 1997 Q1 – 2005 Q1. Per cent per quarter



3.4 Inflows

The inflow of persons to state X (X = PE, TE, SE, UN, NL) can be calculated from column X in Table 1.1 (see Appendix 1) as the sum of all off-diagonal terms in the flow matrix.

Table 7 reports yearly averages of quarterly inflows to different states. We can see, for instance, that the inflow to unemployment during the period 1997–2004 first decreased from 145 000 to 92 000 persons per quarter in 2001 and then increased. And the inflow to permanent employment first increased from 72 000 to 111 000 persons per quarter in 2000 and then decreased.

Table 7
Inflows. Transitions to given states. Thousands per quarter. Yearly averages 1997–2004. Both sexes, 16–64 years

	PE	TE	SE	UN	NL
1997	72	161	16	145	194
1998	89	178	14	129	180
1999	99	178	14	116	166
2000	111	181	17	94	162
2001	101	166	13	92	155
2002	88	167	13	98	155
2003	79	161	15	105	150
2004	81	170	15	111	160

4 Flow estimation: problems and experimentation

Every month the Swedish Labour Force Survey (LFS) collects data from eight groups of individuals. The groups are called rotation groups and differ with respect to the number of times they have been included in the survey. The individuals participate every third month for eight times. Every month one rotation group is new, meaning that individual changes from the last quarter are observable for about seven eights of the total sample. By merging observations from the three months of a quarter we can estimate average flows between quarters. Temporary changes for shorter periods are not observed.

Flow data will consequently be based on a sub-sample of the regular LFS sample used for estimation of labour stocks. Estimates of flow table margins will therefore normally differ from the corresponding estimates in the regular survey. For example, an estimate of the number of unemployed in the population based on the flow panel will differ from the number of unemployed according to the larger regular sample. Such differences between two different samples are to be expected and should be possible to explain in a publication.

There are problems of measurement and of non-response in all surveys. These problems are more serious for flow estimation than for stock estimation. For flows based on observations at different points in time for the same individuals, a missing observation at one occasion means that stability or transition is unknown. Therefore non-response is usually larger for the measurement of flows as compared to the measurement of stocks.

An important measurement error in labour force surveys is classification of an individual to an incorrect labour market status. Such errors of classification are often more difficult to handle than other measurement errors. Furthermore, their effects on flow estimation are usually larger than their effects on stock estimation. In stock estimation there may well be a small net effect, since random errors tend to cancel out in this case. When estimating flows, however, such random errors usually have systematic effects.

It is consequently difficult to get the same quality for flow estimates as for stock estimates. On the other hand, non-response and measurement bias remain in most surveys even after laborious efforts to deal with those difficulties. In many instances the results are nevertheless useful. Moreover, changes over time can often be estimated without too large a bias. This holds for repeated surveys where the setup is constant and non-response and measurement effects are similar over time. And it applies not only to changes in stocks but also to changes in flows.

In the next section we propose a simple procedure for the estimation of gross flows in the Swedish LFS. But first we summarize efforts from other countries as well as previous methods used by Statistics Sweden.

4.1 The United States

As early as around 1950, monthly labour market flows based on the Current Population Survey (CPS) were published; see Flaim and Hogue (1985) and Frazis at al. (2005). However, it was not long before problems appeared. Thus, stock changes according to the regular CPS were different from flow changes when flows in to and out of labour market states were combined to net flows. Flow estimates tended to overstate flows out of the labour force as compared to stock estimates. There were even examples where net flows were positive according to one procedure but negative according to the other. Flows accumulated over a couple of months could differ substantially from differences in stocks. As a result, the publication of flow statistics was discontinued for three decades. Presentation of flow statistics was resumed in 1982, but then only for years (Flaim and Hogue 1985). Flow statistics is still not part of regular production, even if simple flow calculations are generated and provided upon request.

What are the reasons for these problems and what is their relevance for the Swedish LFS? One reason is that flow observations exist only for a sub-sample of individuals who have been interviewed twice: two consecutive months in CPS and two consecutive quarters in LFS. In CPS this panel is about 75 per cent of the regular survey, while in LFS the panel is larger: about 87.5 per cent of the regular survey.

A second reason is non-response, which – as emphasized above – often has more serious effects in flow estimation than in stock estimation. Thirdly, the CPS sample is based on addresses, where those moving out are excluded from the sample for future months and replaced by those moving in, with unknown labour market history. A fourth reason is response variation, which is relatively large since different individuals may provide the answers for different waves. Any individual over 14 years is counted as a responsible individual in the household and may provide answers. Again the situation is more favourable in Sweden, where a sample of individuals based on unique personal identification numbers is used. Individuals are easily traced when they have moved. Proxy interviews are allowed, but in 2004 they amounted to only 2.4 percent of the interviews.

Rotation group bias is a further problem. Thus, those participating for the first time in the CPS report a higher unemployment rate than those participating a second or third time (Bailar 1975, compare also Frazis et al. 2005). Here the original interview was a face-to-face interview, while the following waves were conducted by telephone. In the Swedish LFS there is no difficulty linking the different interviews to the correct individual, and the interview setting is basically the same with telephone interviews all times. Rotation group bias is limited, also for flows (Kristiansson 1997). A procedure with questions about changes from the previous interview is since long implemented. This is favourable for flow data, although incorrect measurements may be preserved from a previous occasion.

An additional source of inconsistency is failure to account for population growth or, more broadly, flows in and out of scope of the survey, for example outflows from the labour force by death and emigration. This source is of minor importance, however, Frazis et al. (2005).

At a conference in 1984 different approaches to deal with flow estimation problems in the CPS were presented (see Flaim and Hogue 1985). A simple method is to adjust the estimates so that the margins in the flow tables conform to the stock estimates from the regular survey. By such calibration stock and flow tables become consistent, but it is not clear that other properties of flow estimates are improved. This adjustment of margins is similar to the by now standard method of calibration against known totals. The difference is that calibration here is against *estimated* totals, which means, for example, that estimation of standard errors becomes a non-standard exercise.

A couple of more complicated estimation procedures were also suggested at the 1984 conference, but none of these seem to be in regular use today. Changes in the survey process were also suggested, such as improvement of non-response follow-up as well as better identification of individuals and references to answers at previous occasions for non-first waves of the panels. The importance of measurement analysis based on re-interviews was also stressed.

Since 1994 the CPS has been redesigned in order to improve longitudinal data (Monthly Labor Review, September 1993). For the estimation of flows a simple ratio adjustment is made, resulting in agreement between certain totals for men and women in the monthly panel and the corresponding known totals in the population.

However, margins in the flow tables do not match the stock estimates in the regular survey for the current (destination) month. They do not match the stock estimates in the regular survey for the previous (origin) month either, and the deviations here are often larger than for the current month depending on the choice of weights from the latter. Frazis et al. (2005) examine a procedure based on raking, that is adjustment of interior cells in a flow table by a fitting algorithm, in order to get estimates reproducing regular stock estimates for both months (origin and destination), but this method is not (yet) in regular use.

4.2 The United Kingdom

The British Labour Force Survey is since 1992 basically a quarterly survey with a rotating sample design where a fifth of the sample is substituted each quarter. The survey is based on a sample of addresses, and for the corresponding households information about all members are collected. Individuals are substituted whenever the household moves or the household composition changes.

In an analysis of flow problems Clark and Tate (2000) discuss weighting to adjust for non-response. The ambition is to use known totals (gender, age, region) as well as housing tenure where known totals do not exist. For longitudinal two-wave data a weighting procedure is suggested where totals, known and estimated, become the same in the panel and in the ordinary cross-section. But the estimation of standard errors is not discussed.

An analysis of flows and measurement errors in the British LFS is made by Bell and Smith (2002). They utilise the questions on present labour market

status, including duration. Using panel data certain errors are possible to estimate.

A new estimation alternative is suggested by Tzavidis (2004).

4.3 Sweden

Kristiansson (1997, 1999) summarises analyses relevant for flow measurement based on the Swedish LFS. Results from a number of re-interview studies, 1978, 1989–1990 and 1994–1995 are discussed. The Swedish LFS was based on independent interviewing up to 1987, that is, no references were made to answers at the previous occasions the individual had participated in the survey. The change to dependent interviewing resulted in decreased status mobility and fewer misclassifications. As a consequence, measurements of change become more reliable. The observed effect of non-response is understated mobility. According to results from 1978 about seven per cent were classified to an incorrect labour market status. Those changing status are more often misclassified than those not changing status, with changes relatively common for those difficult to classify.

Compared to the US and the UK, flow estimation is easier in the Swedish survey, because of the survey and sampling design with more rotation groups, a better sampling frame through the population register, and a sample of individuals instead of addresses.

The weighting system so far employed by Statistics Sweden for ad hoc flow tables comprises marginal adjustment, meaning that weights are modified so that stock totals in the regular survey are reproduced by flow margins. To do this three different weights for different labour market statuses are used, as a consequence of the LFS using dissimilar weights up to 2004.

5 A simple method for flow estimation

In the newly designed LFS launched in 2005, a single weighting system is used for all regular estimation. The earlier dissimilar weights were a consequence of different calibration information in the form of different variable totals, a choice motivated by consistency in time series. The advantage with a common set of calibration data and one weighting system is consistency between estimates in the sense that – for example – totals for population subgroups directly sum to the total population.

Using this common set of calibration data also for the smaller panel, one set of weights is obtained for flow estimation as well. These weights are, of course, not identical to those of the regular survey, but estimates for the panel can be made in the same way as for the full sample.

Calibration data can be chosen for different months: the month of origin or the month of destination. It seems natural to choose the month of origin, which is closer to sample selection, and this is also the choice we make here. On the other hand, months of destination are often used, presumably to obtain estimates for the later composition of the population. But the difference is small, since population change is slow, possibly with the exception of changes in the number of individuals registered at the employment offices.

Moreover, we propose a weighting system with no marginal adjustments, meaning that no calibration against stocks in the regular survey is carried out. This makes it possible to use standard estimation of standard errors.[3]

Note also that marginal adjustment can only be carried out for some columns or rows in a limited number of tables, at the risk of deterioration for other estimates or other groups of individuals. There are also other problems with marginal adjustment, for example that estimates for calibrated margins should have the same precision as those of the regular survey despite the smaller sample.

In Annex 2, flow estimates from the second to the third quarter 2003 are given according to our proposal. The tables include standard errors. Calibration data refers to the months of origin.

However, the use of calibration data in this example differs somewhat from the presumed procedure in regular production. Instead of using different calibration data for different months, and then averaging estimates over three months, the same quarterly averages of calibration data are used for the whole sample. This does not affect estimation principles and the effects on the results are probably small.

[3] For adjustments to sample totals see for example Lundström and Särndal (1999) and Särndal and Lundström (2005). There is also an undocumented add-on module TOPECA for the computer program CLAN, Andersson and Nordberg (1998).

In Tables 2.1 and 2.2 in Annex 2, results for flows from the second to the third quarter 2003 are shown for our proposal as well as for a method with marginal adjustment and three weights (see Section 4.3). Comparisons with marginal estimates for the regular survey are also given. These regular estimates are in two columns, one labelled 'new weights' with a common set of known totals similar to that used since 2005 in regular production, and one labelled 'old weights', which accords with the procedure before 2005 (with a somewhat different set of totals for those unemployed). The utilised calibration data is population size by age, gender, sector of economic activity, region and registration at employment offices.

The standard errors indicate a lower precision for flow margins as compared to stock margins; see the three leftmost columns. This difference follows from the smaller flow sample. Examples of standard errors for stability ratios, unemployment risks and job chances are found in Tables 2.3.1–2.3.3.

The method proposed here, without marginal adjustments to the regular survey, is similar to the present approach in the CPS, although the data used for calibration is richer. The procedure used so far by Statistics Sweden on a non-regular basis is, however, more similar to the suggestion in Frazis et al. (2005) to use marginal adjustments. It may appear as a paradox to suggest a method others possibly are abandoning, but we have two reasons for this choice.

Firstly, calibration against stocks in the regular survey would probably mean only a marginal reduction of non-response bias and of variance. Non-response bias would decrease notably if the estimates in the regular survey were considerably less non-response biased than the flow estimates, but this seems unlikely. The regular estimates are based on a sample with less non-response, but both kinds of estimates utilise rich calibration data. The effect on the variance of the estimates is probably even smaller, since it is difficult to achieve further reduction when so rich calibration data is used both for the stratified sampling design and in the estimation.[4]

Secondly, consistency of flow margins to the regular survey is achievable only for a limited number of estimates. Time will show whether such consistency has an advantage matching the increased complexity implied by marginal adjustment in flow estimation.

[4] Thanks to Sixten Lundström, Statistics Sweden, for advice used in this paragraph.

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Annex 1

Basic flow tables from the Swedish LFS with an example from 1997

Table 1.1
Flows between different labour market states. Both sexes, 16–64 years. Thousands per quarter. From the fourth quarter 1996 to the first quarter 1997

Origin	Destination					
	PE	TE	SE	UN	NL	Total
PE	2 957	17	6	24	30	3 034
TE	37	335	3	48	46	469
SE	3	1	415	2	5	427
UN	9	39	2	218	79	347
NL	12	45	5	82	1 122	1 266
Total	3 017	436	432	375	1 283	5 542

Table 1.2
Flows between different labour market states. Both sexes, 16–64 years. Per cent per quarter. From the fourth quarter 1996 to the first quarter 1997

Origin	Destination					
	PE	TE	SE	UN	NL	Total
PE	97.5	0.5	0.2	0.8	1.0	100
TE	7.9	71.4	0.6	10.3	9.9	100
SE	0.7	0.3	97.3	0.5	1.2	100
UN	2.5	11.1	0.6	62.9	22.9	100
NL	0.9	3.6	0.4	6.5	88.6	100

Notes

1) PE = permanent employment, TE = temporary employment, SE = self-employed or family worker, UN = unemployed, NL = not in the labour force.
2) The last column in Table 1.1 presents the same numbers as the regular LFS for the fourth quarter 1996.
3) Quarterly flow statistics from the Swedish LFS is based on comparisons of states referring to two different weeks a quarter apart. But the weeks are not the same for all individuals in the sample, since the LFS sample is distributed between all weeks in a year. Thus, for some individuals in the sample, flows refer to transitions between the first week of the first quarter and the first week of the second quarter, while for some other individuals flows refer to transitions between the second week of the first quarter and the second week of the second quarter, etc.

Table 1.3
Stability rates. Proportions remaining in given states. Per cent per quarter. From the fourth quarter 1996 to the first quarter 1997

	PE	TE	SE	UN	NL
Men	97.2	64.2	97.9	65.8	88.2
Women	97.8	76.3	95.8	59.3	88.9
16–24 years	91.8	65.9	80.5	49.0	90.3
25–54	98.2	74.2	97.9	63.3	81.8
55–64	96.1	72.8	97.9	83.1	96.9
Total	97.5	71.4	97.3	62.9	88.6

Table 1.4
Unemployment risks. Transition rates between given states. Per cent per quarter. From the fourth quarter 1996 to the first quarter 1997

	PE→UN	TE→UN	E→UN	NL→UN	UN→NL
Men	1.1	14.6	2.3	7.1	20.2
Women	0.5	7.3	1.5	6.0	26.3
16–24 years	2.5	7.0	4.4	4.1	32.1
25–54	0.6	11.9	1.7	11.7	22.4
55–64	0.8	11.4	1.1	2.6	10.8
Total	0.8	10.3	1.9	6.5	22.9

Table 1.5
Job chances. Transition rates between given states. Per cent per quarter. From the fourth quarter 1996 to the first quarter 1997

	UN→PE	UN→TE	NL→PE	NL→TE	TE→PE
Men	3.3	10.1	1.0	3.2	9.4
Women	1.5	12.4	0.9	3.9	6.9
16–24 years	3.2	15.3	1.1	4.3	9.2
25–54	2.6	10.9	1.2	4.6	7.4
55–64	0.5	5.6	0.1	0.4	5.5
Total	2.5	11.1	0.9	3.6	7.9

Notes
PE = permanent employment, TE = temporary employment, SE = self-employed or family worker, UN = unemployed, NL = not in the labour force, E = employment (PE + TE + SE).

Annex 2

Flow tables with standard errors

Table 2.1
Flows between different labour market states according to proposed estimation method. Both sexes, 16–64 years. From the second to the third quarter 2003

Estimates, thousands per quarter

Origin	Destination						Regular LFS	
	PE	TE	SE	UN	EA	Total	New weights	Old weights
PE	3 200	23	5	15	31	3 274	3 260	3 265
TE	52	414	4	34	90	593	585	594
SE	4	3	375	3	4	389	407	409
UN	11	43	2	119	42	217	212	205
EA	16	144	5	57	1 001	1 223	1 233	1 225
Total	3 284	627	392	229	1 164	5 697	5 697	5 697

Estimates, per cent per quarter

Origin	Destination					
	PE	TE	SE	UN	EA	Total
PE	97.7	0.7	0.2	0.5	0.9	100
TE	8.8	69.8	0.6	5.7	15.0	100
SE	1.0	0.7	96.5	0.7	1.1	100
UN	5.2	19.9	0.8	55.5	18.6	100
EA	1.4	11.8	0.4	4.7	81.8	100
Total	57.6	11.0	6.9	4.0	20.4	100

Standard errors, thousands per quarter

Origin	Destination						Regular LFS	
	PE	TE	SE	UN	EA	Total	New weights	Old weights
PE	12.0	2.0	1.0	1.7	2.3	11.9	9.5	9.6
TE	3.3	8.6	1.1	2.5	4.1	9.9	7.7	7.1
SE	0.9	0.7	7.9	0.9	0.9	8.0	6.5	6.9
UN	1.6	2.9	0.6	4.6	2.8	5.7	4.2	3.8
EA	1.7	4.8	1.0	3.3	10.2	10.6	8.2	8.4
Total	12.2	9.9	8.1	6.2	10.8	0	0	0

Standard errors, per cent per quarter

Origin	Destination					
	PE	TE	SE	UN	EA	Total
PE	0.1	0.1	<0.05	0.1	0.1	0
TE	0.5	0.8	0.2	0.4	0.7	0
SE	0.2	0.2	0.4	0.2	0.2	0
UN	0.7	1.2	0.3	1.6	1.2	0
EA	0.1	0.4	0.1	0.3	0.5	0
Total	0.2	0.2	0.1	0.1	0.2	0

Table 2.2
Flows between different labour market states according to earlier estimation method. Both sexes, 16–64 years. From the second to the third quarter 2003

Estimates, thousands per quarter

Origin	Destination						Regular LFS
	PE	TE	SE	UN	EA	Total	Total
PE	3 184	23	5	18	35	3 265	3 265
TE	52	410	4	34	94	594	594
SE	3	3	396	2	5	409	409
UN	9	44	2	112	38	205	205
EA	17	149	5	61	992	1 225	1 225
Total	3 265	629	411	228	1 164	5 697	5 697

Estimates, per cent per quarter

Origin	Destination					
	PE	TE	SE	UN	EA	Total
PE	97.5	0.7	0.2	0.6	1.1	100
TE	8.7	69.1	0.6	5.8	15.8	100
SE	0.8	0.8	96.8	0.5	1.2	100
UN	4.6	21.4	0.9	54.5	18.7	100
EA	1.4	12.2	0.4	5.0	81.0	100
Total	57.3	11.1	7.2	4.0	20.4	100

Notes
PE = permanent employment, TE = temporary employment, SE = self-employed or family worker, UN = unemployed, NL = not in the labour force.

Table 2.3.1
Stability rates according to proposed estimation method. Proportions remaining in given states. Per cent per quarter. From the second to the third quarter 2003

	Estimates					Standard errors				
	PE	TE	SE	UN	NL	PE	TE	SE	UN	NL
Men	97.4	61.9	96.2	54.9	85.9	0.2	1.3	0.6	2.0	0.7
Women	97.5	69.3	95.3	49.1	85.8	0.2	1.0	0.9	2.2	0.6
16–24 years	85.5	53.8	70.3	33.8	77.8	1.1	1.3	5.7	2.8	0.9
25–54	98.0	74.8	96.3	54.1	86.6	0.1	1.1	0.6	1.9	0.7
55–64	99.2	80.5	98.1	74.4	94.5	0.1	2.9	0.6	3.2	0.5
Total	97.4	66.1	96.0	52.3	85.9	0.1	0.8	0.5	1.5	0.4

Table 2.3.2
Unemployment risks according to proposed estimation method. Transition rates between given states. Per cent per quarter. From the second to the third quarter 2003

	Estimates					Standard errors				
	PE→ UN	TE→ UN	E→ UN	NL→ UN	UN→ NL	PE→ UN	TE→ UN	E→ UN	NL→ UN	UN→ NL
Men	0.4	8.0	1.5	4.6	22.4	0.1	0.7	0.1	0.4	1.7
Women	0.3	5.9	1.3	2.5	28.3	0.1	0.6	0.1	0.3	1.9
16-24 years	1.8	5.3	0.9	3.8	41.9	0.5	0.6	0.1	0.4	2.9
25-54	0.3	7.9	1.7	4.4	21.3	0*	0.7	0.1	0.4	1.6
55-64	0.1	8.5	0.2	1.7	13.9	0*	2.1	0.0	0.3	2.4
Total	0.3	6.8	2.8	3.4	25.0	0*	0.4	0.2	0.2	1.3

* <0.05

Table 2.3.3
Job chances according to proposed estimation method. Transition rates between given states. Per cent per quarter. From the second to the third quarter 2003

	Estimates					Standard errors				
	UN→ PE	UN→ TE	NL→ PE	NL→ TE	TE→ PE	UN→ PE	UN→ TE	NL→ PE	NL→ TE	TE→ PE
Men	8.3	12.6	2.4	6.5	3.6	1.1	1.2	0.3	0.5	0.5
Women	4.9	17.4	2.9	8.6	3.7	0.9	1.7	0.3	0.5	0.4
16-24 years	5.0	19.3	2.4	15.7	2.5	1.5	2.3	0.3	0.8	0.4
25-54	7.8	15.5	2.8	5.6	4.7	0.9	1.3	0.3	0.5	0.5
55-64	5.3	4.1	2.7	0.7	3.2	1.7	1.3	0.4	0.2	1.4
Total	6.8	14.7	2.6	7.7	3.7	0.7	1.0	0.2	0.3	0.3

Notes
PE = permanent employment, TE = temporary employment, SE = self-employed or family worker, UN = unemployed, NL = not in the labour force, E = Employment (PE+TE+SE).

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