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with the Labour Force Survey

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Measuring labour market flows in Europe with the Labour Force Survey

by

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ABSTRACT

The European Union Labour Force Survey (EU-LFS) is a continuous large sample survey providing quarterly results for the population in private households in the EU. The EU-LFS provides rich and timely data on European and national labour market stocks and is used for the calculation of the so-called structural indicators to monitor the Lisbon Strategy. At the same time, there is an increasing demand from policy makers for data on labour market flows (e.g. transition from one labour market status to another, job-to-job mobility). For that purpose it becomes necessary to measure not only stocks but also flows.

There are two ways to compute labour market flows using the Labour Force Survey: the first way is to cross variables recording the current situation of people in the labour market with the variables recording the situation of people in the labour market one year before ("recall questions"). The second way is to use rotating panel data.

This paper analyses transition probabilities in labour market status and job-to-job mobility rates computed by the method using recall questions for European Union Member States where such information is available. Then it analyses the possibility to use rotating panel data to measure labour market flows. In particular, it compares the transition probabilities in labour market status obtained by the two methods for France and Italy. This paper shows the possibility to compute comparable data on labour market flows for the European Union Member States using EU-LFS while it presents the limitations of such calculations.

INTRODUCTION

The European Labour Force Survey has supplied policy makers and other users with detailed statistics on a variety of labour market indicators for many years. Since 2005, all Member States have been conducting the Labour Force Survey as a continuous survey, enabling the production of accurate and timely data on about 70 variables, comparable across countries. Monthly unemployment rates as well as structural indicators for the monitoring of the European Employment Strategy are key results from the Labour Force Survey published by Eurostat.

All the statistics published so far from the EU-LFS by Eurostat are based on *stocks*, meaning the number of people in a given situation related to the labour market for a given observation period t. But these data give no information on the number of people for which the situation on the labour market has changed since the previous observation period t-1.

In other words, EU-LFS statistics give *static* indicators whereas there is a growing need of measuring the *dynamics* of the labour markets of every country. The increasing geographical mobility of people, alternance of different market situations in people's life (employment/unemployment/inactivity) and job mobility as well as the process of destruction and creation of jobs by firms entail the needs to complement labour market statistics based on *stocks* with labour market statistics based on *flows*.

Many economic and statistical studies have been conducted on labour market flows. These studies analysed the flows in one specific country, or intended to make comparisons between two countries. Some of them, such as *Abowd and al. (1996)* took the point of view of demand-side of work, using business registers and business sample surveys to assess the creation and destruction of jobs. But the main limitation of this approach is that these studies cannot assess the movement of workers. Some others, such as *Amossé (2002)* took the point of view of supply-side of work, using national Labour Force Surveys.

The aim of this paper is to explore to what extent the EU-LFS can be used to derive labour market flow statistics. In a first section the new statistical needs related to the analysis of labour market dynamics at the level of the European Union will be presented. Then we will

show a method of computation of transition probabilities on labour market status using the information of the situation of the year y-1 collected on year y (self-declared working status).

The LFS design permits another approach for the calculation of transition probabilities: the use of LFS rotating panels. The potential of this approach is studied in section 3. For the European Union as a whole, the use of rotating panel data is limited since the sample rotation schemes (number of participations in the quarterly survey for a given sample unit) are different from one country to another. However there is a large interest in using the information contained in these rotating panels and compare the results to those obtained with the first method.

1 – Statistical needs on labour market flows in the European Union

1.1 Lisbon strategy, mobility and flexicurity

The Lisbon Strategy is a European process adopted in 2000 for a ten-year period in Lisbon by the European Council. It broadly aims to "make Europe, by 2010, the most competitive and the most dynamic knowledge-based economy in the world". Recognising the limited progress achieved so far towards these targets, the European Council decided in 2005 to re-launch the Lisbon Strategy without delay and refocus priorities on economic growth and employment.

One of the three broad areas of this process is "the improvement of adaptability of workers and enterprises", which implies a high level of worker's mobility. In this framework, the European Commission has been working with the Member States on the development of "flexicurity" model. First experienced in Nordic countries, "flexicurity" promotes a combination of flexible labour markets and a high level of employment and income security and it is thus seen as the best way to maintain and improve competitiveness whilst preserving the European social model. Greater job mobility can help the European labour force to adapt to changing economic conditions more smoothly and efficiently, in the context of economic

globalization. Moreover, EU provides practical support for the free movement of workers through the EU's Job Mobility Action Plan[1].

The new labour market policies require a monitoring of the individual changes in the labour market. Usual statistics which break the working age population down by labour market status and job characteristics are not enough. For example, the employment rate of people aged 15 to 64 years for a given year y measures the proportion of employed people in the age class 15-64. The evolution of this rate between two consecutive years gives a global indication on the evolution of the labour market situation of people in this age category. But it says nothing about the people who were not employed in the year y-1 and found a job in year y. There is thus a strong need to complete these statistics with regular measures of inflows and outflows for the different labour market status and job characteristics.

1.2 The need of comparable data across countries, and aggregated data for the whole European Union

As the European Union labour market tends to be more and more integrated, there is a larger need to compute statistics on worker flows using a harmonized survey across EU Member States. *Cohen and Dupas (2002)* compared the mobility of unemployed people in France versus United States, using the French "Enquête emploi" and the US survey PSID. But the comparison here is limited by the fact that these surveys are not conducted in the same framework. In particular the different reference periods may create a bias in the comparison.

The advantage of the European Union Labour Force Survey is that it uses the same set of variables, defined by European regulations. This common framework makes it easier to compute comparable data, and enables the calculation of European aggregates.

EU statistics on transitions are for the moment provided both by the EU-LFS using "recall" questions and the EU Survey on Income and Living Conditions (EU-SILC) using its

[1] See the communication from the Commission (2008) 412 *Renewed social agenda: Opportunities, access and solidarity in 21st century Europe, Communication from the Commission*

rotation panel. The following sections focus on this potential of the EU-LFS since the variables and sample size available would allow the production of accurate results:

- use of recall questions on past events,
- use of rotation panels.

2. Computing flows statistics using recall questions of the European Labour Force Survey

2.1 Flows in labour market status

A direct approach of computing labour market flow statistics is to compare current and past working status as declared in a given week by respondents. The following "recall questions" about the labour market events of the past can be used: starting date in the present job, leaving date in the last job, and situation of people one year before (labour market status, job characteristics, and place of residence).

The European Union Labour Force Survey (EU-LFS) focuses on the situation in a given week (so called reference week). It has been continuous in all Member States since 2005 which means that the sample of interviewed people is uniformly spread over all the weeks of the year. The statistics on annual flows between the year y-1 and y can therefore be calculated using the annual sample (52 weeks) of year y.

As explained above, the method compares the current and past working status but also several other options are available. For the current status, the LFS offers the possibility to define the 'International Labour Organization working status' during the reference week (derivation on the bias of several questions) or to use the self-declared status (main status) as declared by respondents. The former is privileged since it provides the most accurate information for the current status. It is indeed not possible to determine the labour status one year ago following strictly the definition of International Labour Organization since it is impossible to ask whether interviewees were looking for a job or were available to work one year before the survey.

To estimate changes in labour market status, additional information is used, such as:

- time spent since the person started working for the current employer or in his current business activity for employed people
- duration of unemployment and time spent since the person left his/her last job for unemployed people
- time spent since the person left his/her last job for inactive people

In 2007, 16.7 million people were unemployed in the EU-27, a decrease by 2.3 million from 2006. This figure hides the inflows and outflows from the category of unemployed people.

Indeed, in the 24 Member States where flow data can be computed[2], 6.0 million people moved from unemployment to employment whereas 4.0 million people moved from employment to unemployment. The flow between unemployment and inactivity was balanced: 3.6 million moved from unemployment to inactivity status, and 3.0 million from inactivity to unemployment. All in all, at least 29.5 million people[3] have experienced a change in labour market status between 2006 and 2007 (chart 1).

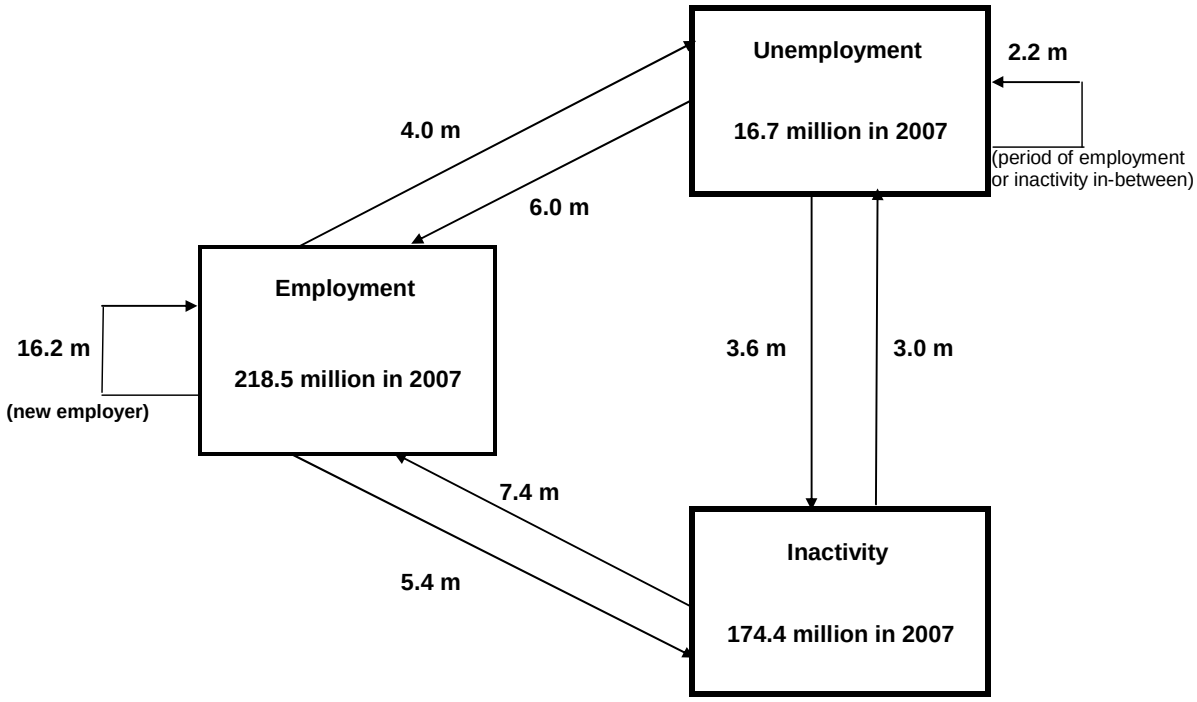
It is also interesting to focus on people who were employed in 2006 as well as 2007, but who changed employer in the meantime using the information on the year and month in which each interviewee starts working for his or her current employer: the number of people who experienced at least one change in employer or business activity was about 16.2 million people between 2006 and 2007.

Among people who were both unemployed at the time of the survey in 2007 and one year before, 2.2 million of them experienced a period of employment or inactivity within the one-year period preceding the 2007 survey.

[2] All member states except Bulgaria, Ireland and the Netherlands. We do not take into account here demographic flows (geographical moves, migrations, entrance in the age of 15 …).

[3] We do not records events occurring within one-year period but only two changes in labour market status between two points in time. Mobility in labour market status is therefore underestimated.

Chart 1. Annual flows of people aged 15 years and more by labour status in the European Union between 2006 and 2007



Source: Eurostat, EU-LFS

2.2 Transition probabilities in labour market status

Transition probabilities in labour market status can be calculated as on the basis of the information presented above. The transition probability from labour market status i in the year t to labour market status j in the year y+1 is equal to the probability for a person aged 15 years and more to have the labour market status *j* in the year y+1 under the condition that he/she had the labour market status *i* one year before.

$$P\,(S(y+1)=j \mid S\,(y)=i)$$

where S(y) is the labour status for the year y

The transition probabilities from 2006 to 2007 based on the EU LFS are presented in table 1 below. The same variables as in the calculations of gross flows (section 2.1) are used. Employment and inactivity are relatively stable: 95.3 % of people who were employed in the EU in 2006 were also employed in 2007, and 93.4 % of inactive people in 2006 where also inactive in 2007.

Inflows and outflows are more dynamic for the category of unemployed people, as unemployment is a transitory status in the labour market. Less than half of unemployed people in 2006 (48.4%) were also unemployed in 2007, but about one third (32.4%) moved from unemployment to employment.

Table 1: Transition probabilities in labour market status in the EU (2006-2007)

	Employed in 2007	Unemployed in 2007	Inactive in 2007	Total
Employed in 2006	95.3%	2.0%	2.7%	100%
Unemployed in 2006	32.4%	48.4%	19.2%	100%
Inactive in 2006	4.7%	1.9%	93.4%	100%

Source: Eurostat, EU-LFS

Transition probabilities in labour market status can be compared across countries (table 2), especially for transition probabilities from unemployment to another status: the transition probability from unemployment to employment ranged from 18.5% in Belgium to 48.0% in Denmark, whereas the transition probabilities from employment to inactivity ranged from 6.0% in Greece to 38.7% in Belgium.

Mobility from inactivity to employment is particularly high in Nordic countries: more than 10% of people who were inactive in 2006 in Denmark, Finland and Sweden were employed in 2007.

Table 2: Transition probabilities in labour market status by country (2006-2007)

(%)	Emp--->Emp	Emp--->Une	Emp--->Ina	Une--->Emp	Une--->Une	Une--->Ina	Ina--->Emp	Ina--->Une	Ina--->Ina
UE (24 MS)	**95.3**	**2.0**	**2.7**	**32.4**	**48.4**	**19.2**	**4.7**	**1.9**	**93.4**
BE	95.9	1.9	2.2	18.5	42.8	38.7	3.6	1.5	94.9
CZ	96.1	1.6	2.4	30.9	55.7	13.5	4.0	1.1	94.8
DK	95.4	1.5	3.1	48.0	29.4	22.6	18.2	3.3	78.4
DE	95.8	2.2	2.0	26.6	56.5	16.8	5.0	1.5	93.5
EL	96.9	1.5	1.6	23.5	70.5	6.0	1.3	1.0	97.7
ES	93.2	3.2	3.7	45.1	41.4	13.5	5.2	2.9	91.9
FR	93.6	3.0	3.4	33.8	43.1	23.1	5.4	1.8	92.8
IT	96.1	1.2	2.7	33.0	39.9	27.1	2.0	0.9	97.1
HU	94.5	2.2	3.2	29.6	44.7	25.7	2.9	1.2	95.8
AT	94.5	1.9	3.6	42.8	35.5	21.7	6.4	1.4	92.2
PL	95.3	1.9	2.8	29.2	47.7	23.1	3.8	1.6	94.6
PT	95.7	2.6	1.7	41.0	51.2	7.8	3.4	1.7	94.9
RO	97.5	0.8	1.7	24.9	69.6	5.6	3.2	0.9	96.0
FI	93.9	2.1	4.0	29.4	38.8	31.7	13.5	4.4	82.1
SE	97.5	0.9	1.6	50.0	41.7	8.3	16.3	16.0	67.7
UK	95.5	1.6	2.9	43.0	46.3	10.7	6.6	3.6	89.8

Source: Eurostat, EU-LFS

Notes: In the first row, Emp stands for Employment, Une for Unemployment, Ina for Inactive. Emp--->Une stands for transition from employment to unemployment

Figures from Estonia, Latvia, Lithuania Luxembourg, Malta and Slovenia do not appear in this table because of too small sample size. Data are not available for Bulgaria, Ireland and the Netherlands.

2.3 Job-to job mobility

To measure intra-employment flows, an indicator such as the job-to-job mobility rate can be used. It represents the proportion of people who experienced a change in employer or business activity (in case of self-employment) between year n-1 and year n amongst the number of people both employed in year n and n-1.

The job-to-job mobility rate was 8.5 % for people aged 15 year and more in the EU in 2007, ranging from 4.3% in Greece to 14.9% in Denmark (table 3). The mobility rate decreases with the age: 22.4% of young people employed in 2006 and 2007 changed employer, whereas only 11.2 % did so in the age class 25 to 39 years old, only 5.5% in the age class 40-54 years old, and 2.9% for people aged 55 years and more.

The variation of job-to-job mobility rate by age is different from one country to another: Spain has the highest mobility rate for young people aged 15 to 24 (34.5%) , but Denmark maintains high mobility rate for older people (21.0% for the age class 25-39, 12.7% for people aged 40 to 54 and 6.7% for people aged 55 and more).

Table 3: Job-to job mobility rate in the European Union, by age class

(%)	15-24 y.o.	25-39 y.o	40-54 y.o.	55 y.o. and more	15 y.o. and more
EU (24 MS)	**22.4**	**11.2**	**5.5**	**2.9**	**8.5**
BE	25.3	11.0	4.5	1.7	7.8
CZ	17.2	7.1	4.8	3.6	6.1
DK	23.3	21.0	12.7	6.7	14.9
DE	17.8	10.0	4.7	2.1	7.2
EL	9.3	6.0	3.1	2.2	4.3
ES	34.5	17.5	7.9	3.6	13.5
FR	29.6	12.3	5.2	2.5	9.2
IT	17.0	8.6	4.0	1.9	6.1
HU	16.7	7.8	4.3	3.1	6.2
NL	18.8	13.3	6.1	2.1	8.8
AT	20.6	12.0	5.5	2.6	9.0
PL	21.1	10.4	4.7	2.4	7.9
PT	18.4	9.6	4.1	1.5	6.4
RO	14.7	6.6	4.8	2.1	5.9
FI	32.0	15.0	7.9	4.3	10.5
SE	21.0	8.7	4.6	2.4	5.9
UK	25.1	12.6	7.6	4.6	10.6

Source: Eurostat, EU-LFS

Figures from Estonia, Latvia, Lithuania Luxembourg, Malta, Slovenia and Slovakia do not appear in this table because of too small sample size. Data are not available for Bulgaria and Ireland.

2.4 Main limitation of the use of LFS recall questions

Indicators computed using the answers to recall questions may be subject to some bias. First of all, as we reported in subsection 2.1, the method relies on the comparison of changes in labour market status using information collected in a single point in time but on both current and past status, which is highly dependent on the memory of the interviewed people. Information on year y-1 collected on year y is then subject to non-negligible memory errors. For example, a respondent can forget a seasonal job he was performing one year ago.

Moreover, a high discrepancy between the spontaneous answer given by the respondent and the status determined by a precise set of questions following the standards of International Labour Organization may entail errors in establishing whether there has been a change in the labour status of the individual or not.

Another limitation is due to the characteristics of the recall questions: they cannot measure all events related to labour market occurred for an individual within a year. In the case when several changes occur within one year for an individual, only one change can be observed. Thus infra-annual flows cannot be measured.

3. Computing flows statistics using panel data of the European Labour Force Survey

In all EU Member States the Labour Force Survey consists of a rotating panel: each sample unit (dwelling, household or person) is surveyed several times, so that it is possible to follow the job situation of people over time (see appendix 1). However, the sample designs do not yet allow a follow-up of respondent from one year to another in all Member States. The French and Italian LFS however do allow such analysis.

3.1 Examples of France and Italy

In the French Labour Force Survey, households are interviewed in six consecutive quarters, while in the Italian survey households are interviewed in two consecutive quarters of the year y and interviewed in the same quarters of the year y+1. For both countries, it is therefore possible to compute year-to-year flow statistics[4].

Transition probabilities can be calculated in the same manner as presented in section 2.2. Compared to the "recall" method, the results show significant differences (see table 4), particularly for transition probability from unemployment to another labour status (employment or inactivity).

[4] It would even be possible to compute quarter-to-quarter flow statistics. We limit this study to the analysis of annual flows.

Table 4. Transition probabilities in labour market status calculated by two approaches

	(%)	Emp--->Emp	Emp--->Une	Emp--->Ina	Une--->Emp	Une--->Une	Une--->Ina	Ina--->Emp	Ina--->Une	Ina--->Ina
France	Using recall questions	93.6	3.0	3.4	33.0	40.6	26.4	5.4	1.8	92.8
	Using panel data	93.1	2.2	4.6	40.2	41.6	18.2	5.2	2.5	92.3
Italy	Using recall questions	96.1	1.2	2.7	33.0	39.9	27.1	2.0	0.9	97.1
	Using panel data	92.8	1.3	5.9	31.8	27.5	40.7	4.5	2.1	93.4

Source: Eurostat, EU-LFS

When using panel calculations for France, the flows "Employment to Unemployment" and "Unemployment to Inactivity" are lower and the flows "Unemployment to Employment" and "Inactivity to Unemployment" are higher than those computed by the recall questions. For Italy, the panel data provide larger flows between labour force (employment and unemployment) and inactivity status.

3.2 Main limitations: attrition bias and effects of moves

The first problem of producing estimates of labour dynamics using panel data is the attrition bias. Some people answering for the first interview refuse to answer to the consecutive interviews, or are impossible to reach again. 17% of the people interviewed in Italy and 16% in France cannot be reached or refuse to answer one year after. A special weighting factor can be used to correct for this bias by treating the specific non-responses following the first interview. A logistic regression can be processed to determine the factors of this specific non-response, provided that this specific non-response is correlated to some variables available in the survey.

A second problem concerns the definition of the LFS samples since in household panels such as those of the Italian and the French LFS the households, and thus the individuals, are not followed when they move. However, *Breuil-Genier and Valdelièvre (2001)* showed that the effects of moves on labour market flows are not significative.

A third problem concerns the panel design: in the LFS, panels are designed to maximise the accuracy of the quarterly (or monthly) estimate of the unemployment rate and to minimise the survey costs. They are not designed with the objective to implement longitudinal studies and calculate flows. Such a design would imply an oversampling of people for whom

the probability of labour market status changes is higher, for example young people, or people working under specific contracts (short-term contracts, seasonal contracts, free-lancers,…).

A fourth issue relates to the data comparability across countries: the different national statistics institutes (NSI) use different rotational patterns, depending on which change estimators are considered of most importance for each NSI's perspective. The objective of proper comparable estimates of labour market flows in the EU would imply the application of additional rules in the definition of the rotation patterns, or ideally that Member States agreed on implementing a harmonized approach of panel design.

CONCLUSION

In this paper we illustrated the possibility to assess labour market flow statistics using the European Union Labour Force Survey, to meet the increasing policymaker needs for such data.

Recall questions give comparable results on transition probabilities and job-to-job mobility rates although they do not record all possible changes within a year and rely on questions on past events and a self-assessment of the working status in the previous year by respondents which can differ from the derived ILO working status.

This bias could be avoided using EU Labour Force Survey panel data. To compute accurate and comparable flow statistics using the longidutinal structure of European labour force surveys, some conditions would be required:

- Household and individual panels should be designed with the objective to compute flow data in each country, ideally using similar rotation schemes in all EU Member States.

- A specific weighting procedure for the calculation of flow data should be implemented, in particular to correct attrition bias.

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Appendix 1: Sample size and rotation scheme of LFS by country

Country	Overall sampling rate (pr. quarter)	Sample size per quarter	Rotation scheme (quarters)
BE	1.20%	11 960 households	2-
BG	0.60%	18 000 households	2-(2)-2
CZ	0.60%	33 900 dwellings	5-
DK	0.40%	16 665 persons	2-(2)-1
DE	0.25%		4-(annual)
EE	0.50%	2 500 households	2-(2)-2
IE	3.30%	39 000 households	5-
GR	0.86%	36 000 households	6-
ES	0.50%	62 700 dwellings	6-
FR	0.17%	54 000 dwellings	6-
IT	0.30%	76 872 households	2-(2)-2
CY	1.54%	4 500 dwellings	6-
LV	0.30%	2 574 households	1-(1)-1-(1)-1
LT	0.40%	4 000 households	2-(1)-2
LU	2.61%	5 866 households	2*-
HU	0.92%	36 700 households	6-
MT	2.00%	2 500 households	2*-
NL	0.71%	50 000 households	5-
AT	0.60%	22 700 households	5-
PL	0.14%	24 700 dwellings	2-(2)-2
PT	0.60%	22 554 dwellings	6-
RO	0.38%	28 080 dwellings	2-(2)-2
SI	1.00%	7 300 households	3-(1)-2
SK	0.60%	10 250 dwellings	5-
FI	0.90%	36 000 persons	3-(1)-2
SE	1.00%	60 000 persons	8-
UK	0.30%	69 600 households	5-