STATEC
Luxembourg

Quality Report on the Structure of Earnings Survey 2010 in Luxembourg

This report has been prepared according to the provisions of the Commission Regulation (EC) No 698/2006 of May 5 2006 implementing Council Regulation (EC) No 530/1999 as regards quality evaluation on labour costs and earnings.

1. Relevance

The structure of earnings survey (SES) provides a rather complete picture of wages, hours worked and the personal characteristics of workers. As such, it is a unique source in Luxembourg. Alternative sources are less complete or less reliable. The social security records provide information on wages and hours worked. These records also provide some information on the workers' characteristics, but two crucial items are missing: the level of education and the occupation. There is also information on wages in the Labour Force Surveys (LFS) and in EU-SILC. These surveys provide a wealth of information on the workers' personal backgrounds. Unfortunately, the information on wages is less reliable. Indeed, the wages are self-declared by the workers, and are missing in several cases. Furthermore, there is no precise and reliable information on the amount of hours worked. Another drawback of the two latter sources is that they exclude the workers that work in Luxembourg, but live outside the country. These cross-border workers make up 44% of Luxembourg's total wage employment. The SES covers 87% of Luxembourg's total wage employment, much more than the LFS.

Summary of national core users

The most important national core user is STATEC. The other national core users include ministries, administrations, foreign embassies, researchers, media, employers' federations, trade unions, companies from the private sector, as well as students from high-schools and universities.

Description of their main needs including an assessment of their level of satisfaction with the data offered

The users are mainly interested in breakdowns of wages along several variables. The most popular variables are sector, occupation, and educational level. Whereas most of the users are fine with tabular analyses, the researchers are also interested in a direct access to the microdata.

There is no systematic and formal assessment of the users' satisfaction. Nevertheless, the small size of the national user community enables STATEC to have a direct contact with the users. As a result, STATEC can be very responsive to the users' needs. The informal feedback suggests that the users' needs are generally satisfied.

2. Accuracy

2.1 Sampling Errors

The following tables show the coefficient of variation for the average monthly earnings and average hourly earnings, broken down by the characteristics of the workers and the enterprises they are working in.

	Gross earnings in the reference month (B42)			Average gross hourly earnings in the reference month (B43)		
	MEAN	SE	CV (%)	MEAN	SE	CV (%)
ALL	3 668	49	1,3	23,1	0,3	1,4
Full-Time: Men	4 000	51	1,3	23,6	0,3	1,3
Full-Time: Women	3 637	84	2,3	22,0	0,5	2,3
Part-Time	2 387	42	1,8	23,2	0,4	1,9

Average earnings broken down by major ISCO-08 groups

	Gross earnings in the reference month (B42)			Average gross hourly earnings in the reference month (B43)		
	MEAN	SE	CV (%)	MEAN	SE	CV (%)
1	8 415	153	1,8	50,2	0,9	1,8
2	5 288	94	1,8	33,6	0,7	2,0
3	4 221	43	1,0	27,1	0,3	1,1
4	3 267	32	1,0	21,3	0,2	0,9
5	2 279	37	1,6	15,3	0,2	1,5
7	2 711	27	1,0	16,2	0,1	0,9
8	2 814	29	1,0	16,3	0,1	0,9
9	1 931	32	1,6	13,5	0,2	1,2

Average earnings broken down by ISCED97 categories

	Gross earnings in the reference month (B42)			Average gross hourly earnings in the reference month (B43)		
	MEAN	SE	CV (%)	MEAN	SE	CV (%)
1	2 299	39	1,7	14,7	0,2	1,5
2	2 501	39	1,5	15,9	0,2	1,4
3	3 216	32	1,0	20,4	0,2	1,0
4	4 794	94	2,0	30,1	0,6	2,0
5	5 707	86	1,5	35,5	0,6	1,6
6	7 015	263	3,7	43,8	1,5	3,4

Average earnings broken down by the age of the workers

	Gross earnings in the reference month (B42)			Average gross hourly earnings in the reference month (B43)		
	MEAN	SE	CV (%)	MEAN	SE	CV (%)
< 20	979	52	5,3	8,0	0,3	3,9
20-29	2 630	35	1,3	16,6	0,2	1,4
30-39	3 567	49	1,4	22,5	0,3	1,4
40-49	4 049	50	1,2	25,5	0,3	1,3
50-59	4 413	95	2,2	27,7	0,6	2,2
>= 60	5 516	357	6,5	35,1	2,0	5,7

Average earnings broken down by NACE rev2 sections

	Gross earnings in the reference month (B42)			Average gross hourly earnings in the reference month (B43)		
	MEAN	SE	CV (%)	MEAN	SE	CV (%)
B	3 195	210	6,6	18,2	1,1	6,1
C	3 433	63	1,8	20,4	0,4	1,9
D	5 282	326	6,2	31,6	1,9	5,9
E	3 782	267	7,1	22,5	1,7	7,4
F	2 763	27	1,0	16,2	0,1	0,9
G	2 780	62	2,2	17,1	0,4	2,1
H	3 502	69	2,0	20,8	0,4	1,8
I	2 155	43	2,0	13,6	0,2	1,6
J	4 513	103	2,3	27,6	0,6	2,1
K	5 228	60	1,1	32,1	0,3	1,1
L	3 293	350	10,6	20,6	1,9	9,4
M	4 355	86	2,0	27,1	0,5	2,0
N	1 833	41	2,2	13,8	0,2	1,3
O	5 052	123	2,4	32,6	0,7	2,2
P	5 649	204	3,6	38,4	1,1	2,9
Q	3 481	62	1,8	24,9	0,4	1,6
R	3 657	332	9,1	23,2	1,9	8,3
S	2 942	161	5,5	20,2	1,1	5,5

Average earnings broken down by the size of enterprises

	Gross earnings in the reference month (B42)			Average gross hourly earnings in the reference month (B43)		
	MEAN	SE	CV (%)	MEAN	SE	CV (%)
10-49	3 184	40	1,3	19,8	0,2	1,2
50-249	3 444	44	1,3	21,5	0,3	1,3
250-499	3 455	44	1,3	21,5	0,3	1,2
500-999	3 451	77	2,2	21,7	0,4	2,0
> 1000	4 556	117	2,6	29,4	0,8	2,6

2.2 Non-sampling Errors

2.2.1. Coverage errors

No problem of under-coverage is known. However, there has been some over-coverage, i.e. the sample included units that were out of scope or did not exist in practice. The reasons for this over-coverage stem from a discrepancy between the administrative files used for the sampling and the real world, and can be put into 2 categories:

1. The local unit has less than 10 employees in practice.
2. The local unit does not exist. The reasons for this non-existence can be bankruptcy, merger, liquidation or discontinuance of business.

The table below gives an estimate of the over-coverage rate with respect to the initial sample. Furthermore, the table distinguishes the 2 above mentioned causes for over-coverage.

(1) < 10 employees	1,6%
(2) Unit does not exist	1,2%
TOTAL	2,8%

2.2.2. Measurement and processing errors

A non-negligible amount of measurement errors was noticed for the earnings variables and the working time variables, as shown in the table below:

B32	Number of hours paid during the reference month
B31	Number of weeks to which the gross annual earnings relate
B321	Number of overtime hours paid in the reference month
B42	Gross earnings in reference month
B421	Earnings related to overtime
B423	Compulsory social security contributions paid by the employer

Internal quality and plausibility tests have detected incoherencies between these variables, which are in fact inter-linked. These incoherencies stem from a misunderstanding of the questionnaire and from typos. The errors were corrected via direct follow-up with the local units or automatically. The automatic corrections are based on provisions from the Labour and Social Security acts.

The variable on Annual Holiday Leave (B33) had to be recalculated. Ambiguity in the questionnaire has led to erroneous responses. Values have been imputed, based on legal minima and minima set by (known) collective agreements. As a result, the values of the variable B33 are likely to be underestimated.

2.2.3. Non-response errors

Unit Response Rate

The table below shows the unit response rate. This rate is defined as follows:

$$\frac{\text{Exploitable Units}}{\text{Sampled Units} - \text{Ineligible Units}}$$

The "Ineligible Units" are those mentioned in section 2.2.1. The "Exploitable Units" are those for which there was a response and who have passed the quality and plausibility checks.

	Local Units	Employees
(a) Sampled	2515	21543
(b) Ineligible	71	261
(c) Exploitable	2211	19439
Unit Response Rate: c / (a - b)	90%	91%

Imputation Rates

There has been no imputation of missing values. An extensive follow-up allowed reducing the problems of item non-response and missing values.

2.2.4 Model assumption errors

Does not apply.

3. Punctuality and timeliness

3.1 Punctuality

The table below shows the dates at which the questionnaire and the recalls were dispatched, as well as the deadlines that have been imposed.

	Dispatch	Deadline
Launch	15/05/2011	30/06/2011
1st Recall	07/07/2011	05/08/2011
2nd Recall	12/08/2011	16/09/2011
Last Recall	03/10/2011	21/10/2011

The fieldwork started on the 15th of May 2011. The fieldwork stopped on the 6th of February 2012, the day where the last questionnaire was received and validated.

The data processing started on the 17th of May 2011, the day where the first questionnaires were received. The data processing ended on the 27th of June 2012, by transmitting the final database to Eurostat.

The first results are to be published by STATEC in December 2012.

3.2 Timeliness

The reference month for the Structure of Earnings Survey is October 2010. The final data have been available since the 27th of June 20012. The first results are expected to be published by the end of 2012.

4. Accessibility and clarity

4.1 Accessibility

References for core results publications, including those with commentary in the form of text, graphs, maps, etc.

- A complete set of results is released as a “Bulletin du Statec”.

  http://www.statistiques.public.lu/fr/publications/series/bulletin-statec/index.html

- At the same time, a news release (“Statnews”) will be dispatched.
  http://www.statistiques.public.lu/fr/actualites/index.html

- There will be more shorter and more focused publications in the “Regards” series:

  http://www.statistiques.public.lu/fr/publications/series/regards/index.html

- Several tables will be published on the “Portail des Statistiques du Grand-Duché de Luxembourg”, under the following section:
  http://www.statistiques.public.lu/stat/ReportFolders/ReportFolder.aspx?IF_Language=fra&MainTheme=3&FldrName=1&RFPath=30

- These tables will also be included in Luxembourg’s statistical yearbook (Annuaire statistique du Luxembourg).
  http://www.statistiques.public.lu/fr/publications/series/annuaire-stat-lux/index.html

Information on what results, if any, are sent to reporting units included in the sample.

The reporting units will be informed by mail when the first results will be published

4.2 Clarity

Description of and references for metadata provided

Metadata will be published on the “Portail des statistiques”, together with the tables extracted from the survey.

References for core methodological documents relating to the statistics provided

The “Bulletin du STATEC” to be published on this survey (see above) will contain a methodological section.

Description of main actions carried out by the national statistical services to inform users about links to the data

The public will be informed through different channels:

- A news release (“Statnews”) dedicated to the Structure of Earnings Survey 2010.
- The RSS feeds and electronic newsletters of the “Portail des Statistiques”. http://www.statistiques.public.lu/fr/functions/newsletter/index.php
- Eventually, the subscribers of the “Bulletin du STATEC” will receive the above mentioned publication on the Structure of Earnings Survey 2010

5. Comparability

5.1 Geographical comparability

In Luxembourg, the European concepts on the definition of statistical units, populations, reference times, classifications and definitions of variables have been used.

5.2 Comparability over Time

Coverage

The Structure of Earnings Surveys of 1995, 2002, and 2006 cover the sections C to K of the NACE rev.1 classification. In 2006, the sections M, N and O have been added. In 2010, the NACE rev2 classification is used. The sections B to N and P to S have been covered. In addition, there has been an experimental coverage of ANCE section O (public administration). This test will be evaluated thoroughly. The first results look promising and this section will probably be covered in futures waves.

Survey Design

The Structure of Earnings Surveys of 1995, 2002, and 2006 rely on a two-stage sample design. In a first stage a sample of local units is drawn, and in a second stage, the salaried workers are sampled within these local units. In 1995 and 2002, the local units were asked in the second stage to draw themselves a representative sample of their workers, the size of this sample being fixed by STATEC. In 2006 and 2010, the second-stage sample was directly drawn from social security records, using simple random sampling.

6. Coherence

The following table compares the variable “gross annual earnings in the reference year” from the Structure of Earning Survey to the variable “wages and salaries (D11) per employee” from the national accounts.

The SES 2010 uses the ANCE rev2 classification for activities. However, Luxembourg’s national accounts are still using the NACE rev 1. This makes the comparison a bit more difficult. The table below is restricted to some selected sections for which there is comparability, as well as for the total. It turns out that in total, the wages in the national accounts are on average 5.9% higher than the wages obtained via the SES 2010.

		National Accounts	Structure of Earnings Survey 2010
Nace rev.2	Nace rev.1	Wages and Salaries (D11)	Gross Annual Earnings in the Reference Year (B41)
C	D	43 303	42 020
F	F	32 305	32 109
G	G	35 089	32 877
I	H	24 329	23 103
K	J	80 533	73 794
O	L	64 214	63 601
P	M	71 225	70 092
Q	N	46 256	43 209
B-S	C-O	48 416	45 710

The following table compares some results from the Structure of Earnings Survey 2010 (SES 2010) to those of the Labour Force Survey of the same year (LFS 2010). There is a big difference between these two surveys regarding their coverage. The LFS only covers workers living in Luxembourg. The SES covers persons working in Luxembourg, regardless if they are living in Luxembourg or not. Persons not living but working in Luxembourg make up 44% of the total wage employment. Moreover, the profiles of these workers are different from those of the resident workers. Hence, the following table presents the results for the SES in three columns. The first column labeled “Total” shows the results for all the workers. The second columns labeled “Residents” shows the results for the workers living in Luxembourg. These are the results that are comparable to those of the LFS. The third column, labeled “Commuters” shows the results for the persons working in Lu8xembourg and living abroad.

However, there are further divergences regarding the coverage of the SES and the LFS. The SES is restricted to enterprises with 10 employees or more, active in the NACE rev.2 sections B to S, i.e. the total economy with exception of Agriculture, Forestry and Fishing (section A), as well as the activities ho households as employers (section T). Moreover, the LFS includes persons

working for extraterritorial organizations (NACE section U). This group makes up roughly 5% of Luxembourg's domestic employment. The LFS contains a variable on the activity of the employers and the size of the companies where the persons are working. However, this information is plagued by measurement error and non-response. Indeed, the information is self-declared by the workers. Hence, it was decided not to use this information for filtering purposes. More generally, non-response and measurement errors are an issue in the LFS, much more than they are in the SES.

Characteristics of the Workers according to the Labour Force Survey 2010 and the Structure of Earnings Survey 2010 (in % with respect to all the workers).

	LFS 2010	SES 2010		
		Total	Residents	Commuters
Women	44	36	40	31
15-24 years old	6	7	8	6
25-34 years old	28	29	28	30
35-44 years old	31	33	30	35
45-54 years old	26	24	26	23
55-64 years old	9	7	8	6
ISCO 1	3	5	6	5
ISCO 2	28	18	20	15
ISCO 3	23	15	14	17
ISCO 4	12	13	14	12
ISCO 5	9	11	11	12
ISCO 7	9	16	14	18
ISCO 8	5	10	8	13
ISCO 9	9	11	13	8
Other	2	1	0	0
ISCED 0-2	19	23	29	16
ISCED 3-4	42	47	42	52
ISCED 5-6	39	30	29	32
Part-time workers	17	15	17	13
Temporary contracts	7	8,9	9	9
Nationals	52	29	52	2

Regarding gender, age and citizenship, the SES and the LFS give highly consistent results. Moreover, the shares of part-time workers are identical in both surveys and the shares of temporary workers are similar.

There is a divergence regarding the occupations. According to the LFS, 51% of the workers are in the ISCO-08 categories 2 (“Professionals”) and 3 (“Technicians and associate professionals”). However, these two groups only make up 34% in the SES. The difference might be explained by selective non-response measurement problems in the LFS.

There is also a divergence regarding the highest attained level of education. Persons with at most ISCED0 to ISCED2 are, with a share of 29%, overrepresented in the SES, as compared to the LFS. On the other hand, the ISCED5 and ISCED6 categories tend underrepresented by the same amount, i.e. 29% in the SES as compared to 29% in the LFS. Besides the non-response and measurement issues already mentioned, an additional problem can arise with the level of education. In the LFS the level of education is reported by the workers whereas it is reported by the employers in the SES. This might give rise to a so-called social desirability bias, a tendency that the workers declare higher levels of education than they really have. Furthermore, it is not sure whether the employers dispose of the most accurate information regarding their employees’ education. In some cases, they may have only encoded the level of education required for the job rather than the diploma a person disposes of. In other cases, employees may have followed since their hire some extra courses which can lead to a higher level of education.