

Prices and Wages
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27 November 2008

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Structure of Earnings Survey 2006 - Finland Quality evaluation report

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1. Relevance

Structure of Earnings Statistics (SES) are used in Finland among many different kinds of users. Normally SES -data is needed in examinations of levels and differentials of earnings and it is used as a basic data in various studies. Ordinary users need often tabulated earnings information classified by economic activity, occupation, gender, region and age. Academic researchers need also tabulated information, but they need many times longer time series as well. Because of the large scale of variables and long time series available the latest discussions have also related to the versatile use of individual earnings data. International information services, such as the surveys of Eurostat (Gender Pay Gap and Annual earnings), Organisation for Economic Cooperation and Development (OECD) or the International Labour Organization (ILO), also utilise data from the national SES.

Largely users have been satisfied with the form of Finnish SES -data. Most of all discussions have related to some coverage problems and also to the availability of individual earnings data. National SES -data covers enterprises with at least five salaried persons. In addition to small enterprises some minor groups are also missing (Conscripts etc.). Mainly all necessary variables occur, but in some studies it might be useful if we could offer more exact information about employees' duty, task and competence, as well more exact information about the composition of earnings.

2. Accuracy

National SES

National Structure of Earnings data are compiled from detailed information on over 1.30 million employment relationships, which when scaled to the level of the whole population represent approximately 1.64 million employment relationships. The statistics have been published since 1995 and they

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cover normally private sector enterprises with at least 5 employees and all public sector wage and salary earners. The scope of the statistics does not extend to the top management of private sector enterprises nor cover enterprises, whose main activity belongs to the industries of agriculture, forestry and fishery, private households employing domestic staff or extra-territorial organisations and bodies. In addition to previously mentioned groups, wage and salary earners whose gender could not be determined are also excluded from the statistics.

The statistics are based on sector-specific basic earnings data, which in the private sector are collected primarily by Finnish employer organisations (9 430 enterprises). The data collected by employer organisations are supplemented with a sample survey conducted by Statistics Finland among industries in which the rate of unionisation of enterprises remains under 75 per cent (2 412 enterprises). As regards to the public sector, Statistics Finland collects the data from the local government sector and the State Treasury from the central government sector. The Provincial Government of Åland collects data on the autonomous territory of the Åland Islands. Data on different sectors are combined into a single database and common earnings concepts and classifications are defined for all wage and salary earners irrespective of their collective agreement or form of remuneration.

After the database has been formed, the data of the SES are supplemented with the data from other registers. For example, information on a wage or salary earner's education is obtained from Statistics Finland's Register of Completed Education and Degrees, and information on an employee's workplace establishment is updated against basic data in employment statistics. In addition, the extensive study on earnings structure conducted every four years (SES) contains data from registers kept by organisations outside Statistics Finland, such as the Tax Administration and the Social Insurance Institution.

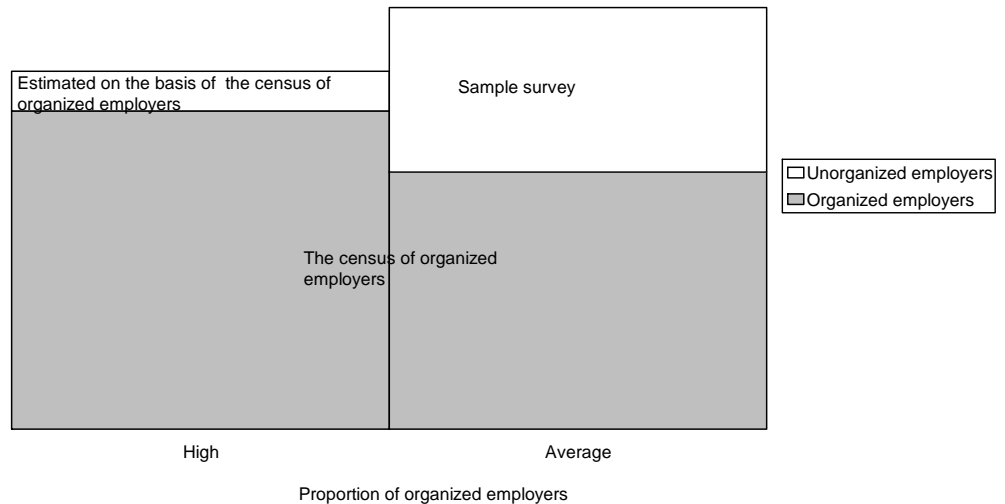
The public sector data are comprehensive census data which do not need to be adjusted for non-response. The private sector data are scaled to the level of the population using a survey frame formed from Statistics Finland's Business Register. The estimator assigns more weight to observations from those enterprises whose stratum had the biggest non-response measured with number of employees.

Estimation is performed so that the frame for unionised enterprises and the frame for non-unionised enterprises in the sample industries are estimated separately by stratum. The strata is formed according to the enterprises' size category and industry. As the survey frame is sampled before the statistical reference time, a separate stratum is formed of the new enterprises with at least 5 employees which are added to the frame. The weighting coefficient of increase of this stratum is 1.

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Figure 1. Data source by proportion of organised employers in the private sector



Structure of Earnings Survey 2006 (Eurostat)

Finnish Structure of Earnings Survey for 2006 is based on national Structure of Earnings Statistics. The data file supplied to Eurostat includes a 25% sample (random sample) of employments in national earnings data (308 162 employments and 43 367 local units). The data content of Structure of Earnings Survey is based on Council Regulation no. 530/1999 and the Commission regulation no. 1738/2005. Data includes all mandatory variables.

Data supplied to Eurostat does not cover enterprises under 10 employments and enterprises, whose main activity belongs to the industries of agriculture, forestry and fishery, private households employing domestic staff or extra-territorial organizations and bodies. However optional NACE section L is part of the delivered data. Data for top managers of private sector enterprises, which are not part of the national data, have been formulated from administrative registers.

2.1. Sampling errors

1a. The Relative Standard Error (%) of monthly earnings of full-time and part-time employees by sex

	Relative Standard Error , %			Mean			Standard Error		
	Men+women	Men only	Women only	Men+women	Men only	Women only	Men+women	Men only	Women only
Full-time	0.08	0.12	0.10	2627	2939	2311	2.18	3.60	2.21
Part-time	0.32	0.82	0.32	1255	1326	1234	3.98	10.87	3.99
Total	0.09	0.13	0.10	2475	2849	2139	2.13	3.59	2.18

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1b. The Relative Standard Error (%) of hourly earnings of full-time and part-time employees by sex

	Relative Standard Error , %			Mean			Standard Error		
	Men+women	Men only	Women only	Men+women	Men only	Women only	Men+women	Men only	Women only
Full-time	0.06	0.11	0.07	15.88	17.67	14.06	0.01	0.02	0.01
Part-time	0.30	0.66	0.31	13.30	15.15	12.72	0.04	0.10	0.04
Total	0.06	0.11	0.07	15.59	17.53	13.84	0.01	0.02	0.01

2a. The Relative Standard Error (%) of monthly earnings by NACE section

NACE section	Relative Standard Error , %	Mean	Standard Error
	Men+women	Men+women	Men+women
C	1.28	2797	35.67
D	0.16	2771	4.37
E	0.79	3000	23.55
F	0.37	2604	9.65
G	0.36	2171	7.76
H	0.50	1671	8.30
I	0.32	2425	7.85
J	0.54	3027	16.38
K	0.29	2680	7.87
L	0.23	2580	6.00
M	0.27	2418	6.61
N	0.19	2205	4.19
O	0.41	2203	9.14
Total	0.09	2475	2.13

2b. The Relative Standard Error (%) of hourly earnings by NACE section

NACE section	Relative Standard Error , %	Mean	Standard Error
	Men+women	Men+women	Men+women
C	1.40	16.46	0.23
D	0.18	16.74	0.03
E	0.76	18.35	0.14
F	0.38	15.67	0.06
G	0.27	14.56	0.04
H	0.33	12.09	0.04
I	0.26	15.14	0.04
J	0.52	19.07	0.10
K	0.30	16.91	0.05
L	0.24	16.42	0.04
M	0.25	15.80	0.04
N	0.22	13.92	0.03
O	0.35	14.15	0.05
Total	0.06	15.59	0.01

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3a. The Relative Standard Error (%) of monthly earnings by occupation

Occupation	Relative Standard Error , %		Mean	
	Men+women		Men+women	
0	0.61		3266	20.07
1	0.47		4763	22.36
2	0.17		3257	5.44
3	0.13		2554	3.29
4	0.18		2045	3.74
5	0.15		1725	2.65
6	0.91		1744	15.95
7	0.19		2436	4.63
8	0.17		2426	4.01
9	0.20		1761	3.54
Total	0.09		2475	2.13

3b. The Relative Standard Error (%) of hourly earnings by occupation

Occupation	Relative Standard Error , %		Mean	
	Men+women		Men+women	
0	0.66		19.78	0.13
1	0.47		29.67	0.14
2	0.15		20.63	0.03
3	0.13		15.97	0.02
4	0.15		13.20	0.02
5	0.09		11.69	0.01
6	0.83		10.82	0.09
7	0.21		14.53	0.03
8	0.14		14.39	0.02
9	0.18		11.33	0.02
Total	0.06		15.59	0.01

4a. The Relative Standard Error (%) of monthly earnings by age band

Age band	Relative Standard Error , %		Mean	
	Men+women		Men+women	
Under 20	1.02		1234	12.58
20-29	0.19		1954	3.68
30-39	0.15		2552	3.95
40-49	0.16		2646	4.17
50-59	0.17		2594	4.31
60 and over	0.50		2445	12.28
Total	0.09		2475	2.13

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4b. The Relative Standard Error (%) of hourly earnings by age band

Age band	Relative Standard Error , %		Mean		Standard Error	
	Men+women		Men+women		Men+women	
Under 20	0.49		10.21		0.05	
20-29	0.16		12.84		0.02	
30-39	0.13		15.86		0.02	
40-49	0.18		16.36		0.03	
50-59	0.19		16.15		0.03	
60 and over	0.47		17.00		0.08	
Total	0.06		15.59		0.01	

5a. The Relative Standard Error (%) of monthly earnings by NUTS level 1

NUTS level	Relative Standard Error , %		Mean		Standard Error	
	Men+women		Men+women		Men+women	
FI1	0.09		2475		2.16	
FI2	0.46		2479		11.52	
Total	0.09		2475		2.13	

5b. The Relative Standard Error (%) of hourly earnings by NUTS level 1

NUTS level	Relative Standard Error , %		Mean		Standard Error	
	Men+women		Men+women		Men+women	
FI1	0.06		15.59		0.01	
FI2	0.44		15.79		0.07	
Total	0.06		15.59		0.01	

6a. The Relative Standard Error (%) of monthly earnings by size band of the enterprise

Size band	Relative Standard Error , %		Mean		Standard Error	
	Men+women		Men+women		Men+women	
E10_49	0.30		2353		7.10	
E50_249	0.20		2567		5.15	
E250_499	0.23		2544		5.83	
E500_999	0.23		2451		5.73	
E1000	0.12		2472		3.07	
Total	0.09		2475		2.13	

6b. The Relative Standard Error (%) of hourly earnings by size band of the enterprise

Size band	Relative Standard Error , %		Mean		Standard Error	
	Men+women		Men+women		Men+women	
E10_49	0.27		14.98		0.04	
E50_249	0.19		15.96		0.03	
E250_499	0.25		15.85		0.04	
E500_999	0.19		15.51		0.03	
E1000	0.13		15.63		0.02	
Total	0.06		15.59		0.01	

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2.2. Non-sampling errors

2.2.1. Coverage errors

The survey frame in national SES -data is built up on national enterprise register data and it refers to the middle of the reference year. In year 2006 the survey frame included 30 838 enterprises. The base data for organised employers (captured by employer organisations) contain also earnings data from some enterprises that were not included or not synchronised in the original survey frame. Most of these respondents were either new or growing enterprises. These enterprises were considered as an under coverage of the frame if the number of employment captured from these employers met the level of the national survey frame, 5 employees. The data were added to the base data without any weighting, by using a coefficient of 1.

In total individual National SES -data the average coefficient was 1.24. In public sector the coverage was 100 percent so there was no need to do any adjustment for non-response. Non-synchronisation between the data and the survey frame may influence the quality of the statistics through data estimation.

The data covers also those local units in activities defined in the regulation that do not belong to enterprises included in the survey frame (activity exclusion).

No specific measures for over coverage were conducted. The over coverage ratio was deemed insignificant.

Finland's Structure of Earnings data (delivered to Eurostat) can fulfil almost all coverage needs, that SES-regulations require. However some minor groups, like Conscripts, are missing.

2.2.2. Measurement and processing errors

The quality of the national base data has been controlled during the whole data processing from the data capturing to publishing by branch-specific checking and validation rules. The validation has been mainly based on imputation of missing or conflicting variables. Observations not accepted by the national or Eurostat -validation process have been usually rejected. In general their share has been insignificant.

Because the basic data for the Structure of Earnings Statistics are obtained from a number of different sources, the statistical reference month varies to some extent. This may influence the numbers of wage and salary earners and thereby also the sizes and types of earnings. Updating the data from various registers may also have some influence on their reliability. As synchronising of the data in the registers is accomplished using enterprise and personal ID keys, some employees may remain unsynchronised due to data and timing differences.

The validity of the production process and the representativeness of the reference period have been ensured by comparing the SES -data (the gross

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monthly earnings for the reference month plus periodic bonuses for the year) to annual taxable gross earnings for the same persons in administrative data. For example the annual taxable gross earnings for those in the same full-time employment for the full year were 1.2 per cent lower compared to the calculated gross annual earnings based on SES. The reason for this is a consequence of reference period. Usually earnings in October are a bit higher compared to earlier calendar months.

The survey frame was formed from national enterprise register. The frame was updated to take into account the changes in enterprise structure by the middle of the reference year.

Some bias may also occur in the published average earnings, because small enterprises and their top management in the private sector are excluded from the national statistics.

2.2.3. Non-response errors

Data captured by Finnish employer organisations covered about 83 percent of all organised enterprises with over 100 employment relationships. For small enterprises the coverage was smaller than that. For unorganised enterprises (data collected by Statistics Finland) the coverage was about 80 percent of all enterprises in the survey (2 412 enterprises).

The estimation weights have been calculated as an inverse of the realised sampling probability. The influence of unit non-response errors is being reduced by using itemised sampling strata by 42 activities and 5 classes by the number of employees. In year 2006 the average coefficient for non-response in private sector was 1.42 and in total data 1.24 (individual data).

Because the production process of national Structure of Earnings data has many processing steps and the base data has been captured mainly by Finnish employer organisations the imputation rates for certain variables cannot be calculated. However we may say that the rates would be small-sized, because the quality of the base data has been controlled faithfully during the data capturing and the whole production process.

2.2.4. Model assumption errors

Modelling is not used in SES 2006.

3. Punctuality and timeliness

The data refer to the last quarter of 2006. Yet the reference period may slightly differ by sector and branch. For example in most of the service sector the data refer to October. Data for manual workers in manufacturing depict the situation in the whole last quarter and in the local government sector the data refer to October. Data for non-manual workers in manufacturing have been collected from December instead.

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3.1. Punctuality

The crucial data processing dates were:

- The national survey frame for private sector enterprises was created by September 2006 and after that the data capturing started for unorganised enterprises. Enquiry for local government sector began in October 2006.
- The branch-specific data based on enterprise surveys was captured and controlled by August 2007. Public sector data (local government sector and central government sector) was final by June 2007.
- National Structure of Earnings data had been completed in April 2008, i.e. branch-specific survey data had been processed and harmonised into one single database.
- The data for top managers of private sector enterprises were created from administrative registers by end of May 2008.
- National Structure of Earnings data had been completed by data from administrative registers (annual earnings, months employed, unpaid absence etc.) by the middle of June 2008.
- The first data for a sub-sample of 308 162 employment was delivered to Eurostat in the end of June.
- The last revised version of the data was supplied to Eurostat at the beginning of September.
- The quality evaluation report was supplied to Eurostat in the end of November 2008.
- The first results of national Structure of Earnings statistics were published nationally by release in November 2007 and second results in April 2008.
- The national Structure of Earnings publication for year 2006 was complete in July 2008.

3.2. Timeliness

The Structure of Earnings statistics are annual statistics and they describe the situation in the last quarter of the statistical year concerned. In this case the data depict the last quarter of the year 2006. The data on annual earnings depict the total earnings for a whole year 2006 from a certain employment relationship.

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The data of the structural statistics derive from final data on wages and salaries by employer sector and from many type of registers. The released data is final. The Structure of Earnings Statistics are published twice a year on Statistics Finland's Internet pages. In addition, a printed publication is produced once a year. The first results of national Structure of Earnings Statistics were published by internet release in November 2007 (11 months after targeted date) and second results in April 2008. First results dealt with earnings classified by occupation and gender and second results with earnings classified by economic activity and region.

4. Accessibility and clarity

4.1. Accessibility

The data of the Structure of Earnings Statistics are published as a statistical release twice a year on Statistics Finland's Internet pages and once a year as a printed publication in the Wages, Salaries and Labour Costs publication series, e.g. Structure of Earnings 2006. In addition, tables for the StatFin online service are published from these statistics.

A copy of the national publication (unfortunately mainly in Finnish) was supplied in July 2008. The Structure of Earnings publication can be ordered from the Statistics Finland's Sales Service. Appendix tables of the publication are also available in electronic format.

Micro data are not available for ordinary users at the moment. In any case use of micro data presumes accurate research plan and also license.

4.2. Clarity

Most of the metadata used in the production of Structure of Earnings Statistics are available from Statistics Finland's internet pages and publication. Users can ask for the metadata also directly from responsible unit Wages, salaries and labour costs. Certain metadata concerning employees are also available from employment statistics, the Register of Completed Education and Degrees and the Business Register. The data concerning annual earnings and employees' employment relationships may be obtained i.a. from registers of the Tax Administration and the Social Insurance Institution.

Statistics Finland has done regularly many marketing operations to make Structure of Earnings Statistics better known. We have also written a brochure about the statistics and kept education about salaries and labour costs.

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5. Comparability

5.1. Geographical comparability

The definitions applied follow the European practise as closely as possible and the geographical comparability is in order.

5.2. Comparability over time

National SES

National Structure of Earnings Statistics has been annually compiled since 1995. During years 1995–2000 the concepts and definitions were practically kept unchanged. Data for years 2001–2005 make another comparable time series.

Most important revisions from 2000 to 2001:

- a) The new Classification of Occupations 2001
- b) Method to classify part-time and full-time employees
- c) The definition of the local unit
- d) Periodic payments by results
- e) Working time
- f) The formula for calculating the gross monthly earnings

In the 2006 Structure of Earnings Statistics hourly earnings have been calculated for the first time for teachers in the local government sector and the calculations have included also the local government sector wage and salary earners with reduced wages. In addition to these revisions we have also made some minor updates to our production processes, for example to the method of calculating special payments of shift work and adjustment for non-response.

Due to the above-mentioned revisions the data for 2006 are not entirely comparable with data for earlier years. Revisions are made to maintain and improve the comparability – both internationally and between employee groups.

Structure of Earnings Survey 2006 (Eurostat)

Finnish Structure of Earnings Survey 2006 differ from SES 2002 at least by the scope and coverage of employees. In SES06 there are also activities from public sector included and data for top managers of private sector enterprises, which are not part of the national data, have been formulated for the first time. Added to this, some smaller improvements have also been made. In SES 2006 the information about employees nationality is available and creation of register data (annual earnings, months employed, unpaid absence etc.) is more accurate than earlier.

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6. Coherence

Because the data of the Structure of Earnings Statistics derive from the data on wages and salaries, they can be best compared with Statistics Finland's employer sector-specific statistics on wages and salaries. In certain circumstances the comparison between SES and the Index of wage and salary earnings, income distribution statistics and National Accounts gives also useful information. However, there are both conceptual and methodological differences between these statistics. The Index of wage and salary earnings describes earnings for regular working hours, while the Structure of Earnings Statistics depict total earnings. In addition, the delimitations and definitions of wage and salary earners differ when comparing different statistics.

As regards to the number of wage and salary earners, the data of the Structure of Earnings statistics can best be compared with the employer sector-specific statistics on wages and salaries, income distribution statistics and the Labour Force Survey (LFS). The numbers of wage and salary earners are nearly identical when compared with employer sector-specific statistics on wages and salaries, but a certain degree of disparity in coverage becomes evident in comparisons between the Labour Force Survey and the Structure of Earnings Statistics. The coverage of the basic data of the Structure of Earnings Statistics may be lessened by the timing of the inquiry, concepts and definitions used, and the fact that the data on wages and salaries may not cover all employees of a certain employer.

7. The quantity comparison between Structure of Earnings Statistics and LFS in 2006

		Number of employees, 1 000		
		LFS	SES	Coverage, %
Industry	Full-time	512	416	81
	Part-time	29	11	38
Services in private sector	Full-time	714	512	72
	Part-time	190	110	58
Local government sector	Full-time	432	374	87
	Part-time	65	61	94
Central government sector	Full-time	132	113	86
	Part-time	15	10	67
Total		2 130	1 643	77

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However, with respect to changes in the proportions of different wage and salary earner groups, such as full-time and part-time employees, successful comparisons between the structure of earnings statistics and the Labour Force Survey can be made and they offer quite useful information on the numbers of wage and salary earners.

8. The gross annual earning comparison between Structure of Earnings Statistics and NA by NACE section in 2006

NACE section	SES	NA	SES/NA, %
C	34474	29074	118.57
D	34351	35290	97.34
E	40417	37862	106.75
F	29101	32586	89.30
G	27256	25602	106.46
H	19598	20870	93.91
I	29593	30432	97.24
J	38692	41013	94.34
K	32384	35239	91.90
L	30689	28265	108.58
M	28308	30775	91.98
N	25574	25990	98.40
O	25778	25735	100.17
Total	29847	30283	98.56