

# STRUCTURE OF EARNINGS SURVEY 2002

## Methodology

The Structure of Earnings Survey (SES) for 2002 is the first of a series of four-yearly surveys to be conducted under the Council Regulation 530/1999 and the Commission Regulation 1916/2000.

The objective of this legislation is to provide accurate and harmonized data on earnings in EU Member States and Candidate Countries for policy-making and research purposes.

Bulgaria started its preparations for the Structure of Earnings Survey 2001 following the launching of the Phare'99 pilot project on "Earnings and Labour Costs" by Eurostat. A pilot SES was undertaken as part of this project and was designed to assist several CCs, including Bulgaria, to develop their methodology and to prepare for the main SES for the reference year 2002.

This pilot survey achieved several very important outcomes. The sampling design was developed. The survey questionnaire was constructed. The variables were defined in a way that best suited the national circumstances and, at the same time, complied with EU requirements. The existing national classifications and nomenclatures were tested as well as different methods of data collection. In addition to the SES questionnaire, the relevant employees in the local units were interviewed about: the optimal way to ask for some of the variables; which of the required data are the most burdensome; is electronic data delivery preferable; how do the enterprises save, maintain and manage information about their employees.

### 1. Goal of the survey

The 2002 SES is aimed to give detailed and comparable at European Union level information on distribution and relationships between the level of remuneration, individual characteristics of employees and these of their employer.

### 2. Object, scope and units of the survey

Object of the survey are: characteristics of employer (enterprise, local unit) – number of employees in the local unit, type of ownership, existence and type of collective pay agreement, size of the enterprise; individual characteristics of employees - age, sex, educational level, occupation, length of service, mode of employment (full-time/part-time), working hours per day, working days per week, type of employment contract, annual gross earnings, annual bonuses, annual days of paid holiday leave, monthly gross earnings, earnings related to overtime, earnings related to shift work, employee's compulsory social security contributions and income tax, number of paid monthly hours, number of paid overtime hours.

Statistical units of the survey:

- 1) Local units with 1 or more employees belonging to *enterprises* with 10 or more employees.
- 2) Employees with earnings during October 2002, having at least 1 working day paid by the employer at a full rate.

### Economic activities covered:

Mining and quarrying (C), Manufacturing (D), Electricity, gas and water supply (E), Construction (F), Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods (G), Hotels and restaurants (H), Transport, storage and communications (I), Financial intermediation (J), Real estate, renting and business activities (K), Public administration; compulsory social security (L), Education (M), Health and social work (N) and Other community, social and personal service activities (O).

### 3. Reference periods

The reference year is the calendar 2002. For representative month is approved October as being the month that is least affected by absences owing to annual leave or public holidays.

### 4. Periodicity

The survey is to be carried out once per four years.

### 5. Sampling design and sampling size

The sampling procedure used for the SES contains two stages. In the first stage, a stratified random sample of local units without replacement is drawn. Stratification criteria used by the countries include economic activity (at the 2-digit level of NACE Rev.1), the number of employees at 31.12.2001 in the enterprise to which the local unit belongs. For the second stage, a systematic sample of employees is taken within each of the selected local units.

Sampling fractions for local units and employees are defined as follows:

1) Based on the results from pilot survey the total number of employees to be surveyed is computed so that a predefined accuracy of the final results to be achieved.

$$n = \frac{t^2 (V_x \%)^2}{(V_x \%)^2 + \frac{t^2 (V_x \%)^2}{N}}$$

Where:

$n$  - total number of employees to be sampled

$N$  - total number of employees in the target population

$t = 1.96$  – coefficient for confidence level of 95%

$\bar{x}$  - average gross monthly earnings obtained in the pilot survey

$V_x \%$  - coefficient of variation of the estimate of the standard deviation from the pilot survey

$$(V_x \% = \frac{s_x}{\bar{x}} 100)$$

$$(s_x = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n_0 - 1}})$$

$s_x$  - standard deviation

$V_x \%$  - coefficient of variation of average gross monthly earnings per employee (predefined - 0,55 %);

$n_0$  - number of employees sampled in the pilot survey.

2) The total sampling size is distributed proportionally according to the relative share of the number of employees in each strata of the total population. As the number of employees is distributed unevenly between size classes and enterprises – a large number of employees (25% from the total population) is employed in the very few number of local units (1.5 % from total population) belonging to 4<sup>th</sup> and 5<sup>th</sup> size classes – the square root allocation rule is applied to reallocate the sampling units from bigger to smaller size classes. The following formulae is used:

$$n_h^* = \sqrt{n_h} \left( \frac{\sum_1^h n_h}{\sum_1^h \sqrt{n_h}} \right)$$

$n_h$  - sampling size for employees in strata h before reallocation

$n_h^*$  - sampling size for employees in strata h after reallocation

3) All local units from 4<sup>th</sup> and 5<sup>th</sup> size classes and stratification cells with fewer than 5 local units are included exhaustively in the sample.

### Sample size for local units

Number of employees	1_49	50_249	250_499	500_999	1000+	Total
Size classes of local units	1	2	3	4	5	
Sampling percentage: local units	8%	12.60%	41%	100%	100%	11.50%
Number of sampled local units	1 401	727	285	284	110	2 807

### Sample size for employees by size classes of local units

Number of employees	1_49	50_249	250_499	500_999	1000+	Total
Size classes of local units	1	2	3	4	5	
Sampling percentage for employees within the local units	100%	50%	25%	20%	10%	
Planned total number of employees in the sample	29 477	38 599	24 201	38 453	20 521	151 251
Planned total sampling percentage for employees	8%	7%	10%	20%	10%	10%
Actually obtained total number of employees in the sample	26 970	39 883	27 222	38 396	21 760	154 231

## 6. Method of data collection

Survey tools used for purposes of data collection are as follows:

1. Dispatch note to the each respondent about the purposes of the survey
2. Statistical questionnaire: part A collecting information for sampled local units and part B collecting information for each sampled employee.
3. Explanatory notes for sampling of employees within the local units and instructions on information required. Annex with the National Classification of Occupations (4-digit level).

The SES questionnaire and the other accompanying documents are delivered to the respondents either personally by a representative of regional statistical offices of NSI or were sent by post.

The local units itself sampled a certain number of their employees from a given starting number and with a step (from one to the next selected person) following the instructions of NSI and provided individual data for each employee.

Part A was required only on paper. For part B was developed an option for electronic data delivery. At about 10% from the sampled local units used this possibility.

## 7. Timetable of the survey

**October 2002** – Preparation of the survey organization and training of the staff of regional offices of NSI

**November 2002** – Set up of target population from local units and employees

**December 2002 – March 2003** – Development of the survey tools and computer programming. Printing of the questionnaires explanatory notes, annexes.

**April 2003** – Start of the survey at regional level: distribution of questionnaires to the respondents by the 28 regional statistical offices (RSOs) of NSI.

**April – June 2003** – Data collection from the respondents.

**July – September 2003** – Data processing and data validation at RSOs.

**October 2003 – April 2004** – Processing, validation and analysis of the data in the Head office of NSI.

**May 2004** – Producing of output tables with final results.

**June – July 2004** – Data release on Internet. Preparation and issue of a printed publication with the survey results.

## 8. Main definitions

Employees are all persons who have a direct employment contract with their employer and receive remuneration in cash or in kind for certain quality and quantity of work done, irrespective of the type of work performed, the number of working hours (full or part-time) and the duration of the employment contract (fixed or indefinite). Other categories of workers included:

- apprentices and trainees with an employment contract with the reporting unit.
- seasonal or occasional workers who are working pre-defined hours on a contractual basis with the local unit or the enterprise.
- outworkers, but only if there is an explicit agreement that they are remunerated on the basis of the amount of hours worked.
- employees on maternity leave as long as they receive remuneration from the employer.

### Categories of workers, which are excluded:

- employees without an employment contract with the enterprise/local unit.
- apprentices and trainees without an employment contract with the reporting unit (and who are considered to be government employees).
- seasonal or occasional workers which are employed without pre-defined working hours.
- persons wholly remunerated by way of fees, or commission.
- members of the board of directors of the enterprise.
- unpaid owners or directors or managers (who are paid by way of profit share or fee).
- employees of the observation unit who have been permanently working abroad (i.e. for more than one year) in an affiliated company.
- the self-employed.
- family workers.
- voluntary workers.

**Gross earnings** are the remuneration in cash paid to the employee directly and regularly by the employer at the time of each pay period, before deductions of any tax and social security contributions payable by employee and withheld by the employer.

The gross monthly earnings of employees **include**:

- basic wage or salary for work done or time worked in the reference month;

- earnings related to annual paid holiday leave and other periods of absences paid for entirely by the employer at a full rate;
- payment for overtime work;
- special payment for shift work – night shifts, week-end or public-holiday shifts;
- payments for seniority, harmful and other specific working conditions, high personal qualification or other collectively or individually agreed additional payments;
- bonuses and gratuities paid regularly in each pay period, even if the amount varies from month to month,

The following are **not included**:

- payments paid in this period but relating to other periods, such as advances, or pay for holiday or sickness absence outside reference period,
- periodic bonuses and gratuities not paid regularly at each pay date,
- payments for periods of absence paid by the employer at a reduced rate,
- statutory family allowances,
- the value of benefits in kind,
- allowances for work clothes or tools,
- reimbursements or payments for traveling, subsistence etc. expenses incurred in carrying out the employer's business.

**The annual gross earnings** are the total amount of the regular payments in cash received by the employee for the work performed during the reference year and all irregular payments as quarterly bonuses, 13<sup>th</sup> or 14<sup>th</sup> salaries and other gratuities not received at each pay period.

**Net earnings are** the amount received by the employee after deduction of the tax and compulsory social security contributions levied on the total gross earning in the reference period.

**Employee social security contributions** refer to the total amount of compulsory social security contributions payable by the employee and withheld by the employer from the total gross earnings in the reference month, including: health care, old-age pension, sickness, maternity and unemployment.

**Excluded are:** social contributions paid by the employee for his/her family members; social contributions for additional pension insurance paid voluntarily by the employee in a private insurance fund.

**Paid hours** cover the total number of normal and overtime hours to which the gross monthly earnings in the reference month relate. The number of paid hours includes: actually worked normal hours, worked and paid overtime hours, hours not worked but nevertheless paid by the employer at a full rate (annual leave, work stoppages and other hours paid such as for medical examinations). Hours not worked and paid at a reduced rate are excluded.

*Normal working hours* are the number of hours, which the employee is obliged to work in the reference month under the terms of the employment contract, regulation or rules in force in the local unit.

## 9. Classifications and nomenclatures

- National Classification of Economic Activities 2001 – fully compliant with the European classification NACE Rev. 1.
- National Classification of Occupations – consistent with the International Standard Classification of Occupations ISCO-88 (COM)
- Nomenclature of Educational Levels – in compliance with the International Standard Classification of Education ISCED'97

## 10. Main statistical indicators

The following weighted averages are calculated:

- Average gross monthly earnings in October 2002
- Average amount of earnings related to overtime and average amount of earnings related to shift work in October 2002 – spread over the total number of employees
- Average net monthly earnings in October 2002
- Average number of paid hours in October 2002
- Average number of overtime paid hours in October 2002
- Average gross hourly earnings in October 2002
- Average gross hourly earnings related to overtime in October 2002
- Average annual gross earnings in 2002
- Average amount of earnings for annual paid holiday leave and average amount of irregular bonuses in 2002- spread over the total number of employees
- Average number of days of paid holiday leave

**Median** of gross (monthly, hourly, annual) earnings – takes the value of the gross earnings of the 50th percentile and is the value below which 50% of all employees fall.

### 11. Accuracy

For each table with survey results are calculated coefficients of variation (relative standard errors) concerning total gross earnings as required in the Commission Regulation N 72/2002 concerning quality evaluation of structural statistics on earnings.

Coefficients of variation are calculated by use of the following formulae:

$$CV_{x'_h} = \left( \sqrt{\frac{\left( \sum_{i=1}^{n_h} f_i * x_i^2 \right) * \left( \sum_{i=1}^{n_h} f_i \right)}{\left( \sum_{i=1}^{n_h} f_i * x_i \right)^2} - 1} \right) * 100 * \left( \frac{\sum_{i=1}^{n_h} f_i - \sum_{i=1}^{n_h} f_i^2}{\sum_{i=1}^{n_h} f_i * \sum_{i=1}^{n_h} f_i} \right)$$

$x'_h$  - estimate of the total gross earnings

$$x'_h = \sum_{i=1}^{n_h} f_i * x_i$$

$x_i$  - individual gross earnings of each sampled employee in strata h

$n_i$  - number of sampled employees in strata h

$f_i$  - individual grossing-up factor of each sampled employee in strata h,

$$f_i = \frac{M_h}{m_h} * \frac{N_{kh}}{n_{kh}}$$

$M_h$  - total number of local units in the population in strata h

$m_h$  - number of sampled local units in strata h

$N_{kh}$  - total number of employees in the k-th sampled local unit in strata h

$n_{kh}$  - number of sampled employees in the k-th local unit

### 12. Comparability with other surveys

The results from the 2002 Structure of Earnings Survey are not comparable with the average gross earnings data and data on number of employees from the other surveys carried out by NSI with the same indicators:

1. Quarterly Survey on Number of Employees, Time Worked, Wages and Salaries and Other Labour Costs
2. Annual Survey on Employed Persons, Wages and Salaries and Other Labour Costs
3. Labour Force Survey

Basic conceptual differences of SES from the above-sited surveys:

*Target population from enterprises:* enterprises with 10 and more employees

*Coverage by economic activities:* Agricultural sector is excluded (sections A and B)

*Target population from employees:* employees with earnings during October 2002, having at least 1 working day paid by the employer at a full rate. Excluded are all persons without earnings in the reference month but are nevertheless in labour relationship with their employer.

*Sample design:* two-stage stratified random sample

*Other methodological characteristics:*

- individual monthly earnings of employees which have been influenced by periods of unpaid absence (due to sick, maternity, unpaid leave etc.) or because the employee joined or left the firm during the month, are grossed-up onto a full-month level. Total gross earnings in the representative month for a 'full month' is estimated by a coefficient obtained from the ratio between the normal monthly working hours and the total number of hours actually paid reduced with the number of overtime hours paid in October 2002.
- from the gross monthly earnings are excluded irregular bonuses and gratuities not paid regularly at each pay period;
- individual annual earnings of employees which have been influenced by periods of unpaid absence (due to sick, maternity, unpaid leave etc.) or because the employee joined or left the firm during the year, are grossed-up onto a full-year level. Total gross earnings in the representative year for a 'full year' is estimated by a coefficient obtained from the ratio between the total number of working weeks (52.2) in the calendar 2002 and the actual number of weeks to which the annual remuneration relates. In the calculation of average gross earnings are included only these employees who have received earnings from the sampled local unit at least for 8 months (36 weeks) in the reference year. In this way the number of employees to which the calculations of average annual gross earnings relates is reduced with 16%.