

# Eurostat/OECD 2018 questionnaire on the methodology underlying labour input data in national accounts

Country: Bulgaria  
Date: March 2018

## *Part I: Methods*

### **1. Employment in persons**

**Question 1.1: Please describe the architecture of your estimation method for employment in persons. Please include details of differences in methods and data sources that may exist at different points in the time series (e.g. a break in the series) or due to the timing of the estimate (e.g. flash estimate, regular estimate or annual data). Please also provide links to articles that may be relevant.**

1.1. The main sources of information for Employment and Hours worked in National accounts are:

#### 1.1.1. Labour force survey

The Labour Force Survey (LFS) is carried out by BNSI. The methodology of the survey has been developed according to the International Labour Organization recommendations and EU legislation. The survey is continuous with a quarterly output and the reference period is one calendar week.

The population coverage:

All persons of 15 years age and over, members of the non-institutional households.

The reporting units:

The reporting units are non-institutional households.

The sampling methodology:

The survey sample is a stratified two-stage cluster sample. The stratification is done by districts (NUTS3) and place of residence (district's center, other town, village), i.e. the sample consists of 83 strata. Clusters on the first stage are enumeration districts (established during Population Census) and clusters on the second stage are households. The clusters on the first stage (2 446 thousand enumeration districts) are selected with probability proportional to the size. Quarterly 19.5 thousand households are selected - by 8 in each enumeration units.

The sample is rotational. A 2-(2)-2 rotation pattern is used. Respondents are interviewed in two consecutive quarters, then are temporarily removed for the next two quarters and entered again for the following two quarters, i.e. each household is interviewed four times. The use of this rotation scheme allows sample overlap (of 50%) between two consecutive quarters as well as between the same quarters of two consecutive years.

The grossing methodology:

The weights are calculated for each quarter in three steps:

- initial weights are obtained as the inverse of the inclusion probabilities of any household within a strata;

- the initial weights are multiplied by correction factor due to households' non-response which is calculated as ratio between the total number of selected households in a stratum and the number of interviewed households from the same stratum;

- in final step the intermediate (corrected for non-response) weights are calibrated<sup>1</sup> to the population data by the following variables: at national level - by age group (0-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75 and over), sex and type of place of residence (urban/rural); at districts level (NUTS3) - by 3 age groups (0-14, 15-64, 65 and over), sex and type of place of residence (urban/rural).

In calculation of quarterly weights the population data (excluding the population, living in institutional households) as of the end of previous quarter are used.

The response rate and imputation methods used for non-response:

The response rate is about 75 % (of eligible households).

The adjustment for unit non-response is inserted in the weighting procedure.

Imputation for item non-response (historical imputation, hot-deck imputation) is doing in rare cases for few variables as economic activity, occupation, professional status and duration of unemployment.

#### 1.1.2. Quarterly Enterprises' Survey on employment, hours worked, wages and salaries, and other labour costs

Survey's purpose is to make a study of the current state and dynamics of some main aspects of labour market.

Important tasks of this survey are to collect, process and analyze statistical data for employees under labour contract in national economy and their average monthly wages and salaries.

The population coverage:

Covered are enterprises from all economic activities irrespective of their type of ownership and source of financing, which have at least one employee working under labour contract.

The reporting units:

The observation units are enterprises' companies, ministries, departments, political, religious, public and other organizations that perform economical activities in Republic of Bulgaria and have at least one employee working under labour contract during the reference period.

The sampling methodology:

Each quarter at about 18 thousand enterprises are surveyed. Up to 2007 the survey is carried out exhaustively for the public sector units and by a sample for the private sector units. Since first quarter of 2008 a sample from the public owned schools and kindergartens is drawn and they are no longer exhaustively covered in the survey. The private sector sample is a stratified random sample without replacement. The stratification criteria used are: size of the enterprise in terms of employees, economic activity (2-digit level of NACE) and NUTS 3 level. The sampling rates for the enterprises according to the number of employees are as follows: up to 49 employees - 5%, from 50 to 99 employees - 40% and 100 and more employees - 100% (census);

The sampling frame from which the survey sample is drawn is taken from the annual exhaustive survey on Number of employees, wages and salaries and other labour costs for the year t-2 (the last

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<sup>2</sup> The calibration is a technique for producing weights, which allows to achieve consistency between survey estimates and corresponding reliable auxiliary data.

available at the moment of sampling). The sampling frame is updated with information from administrative sources.

The grossing methodology:

The grossing up method used is the Horvitz-Thompson estimator.

The response rate and imputation methods used for non-response:

The reasons for non-response are rather due to the use of old sampling frame i.e. inclusion in the sample of dead enterprises, enterprises with frozen activity, without employees, out of date contact information etc. rather than explicit refusals.

Unit non-response adjustment is done by re-weighting - sample size is replaced with the number of the responded units in the calculation of weights. Information from administrative Register of Insured Persons is used as well for reduction of unit non-response.

#### 1.1.3. Annual Enterprises' Survey on employment, wages and salaries, and other labour costs

The data are collected from enterprises and organizations that perform economic activity in Republic of Bulgaria. Sources of information are: pay-roll sheets, presence and absence sheets, labour or non-labour contracts, management contracts, letters of appointment or discharge, applications for paid or unpaid leaves etc.

The population coverage:

The annual statistics on employees and labour costs is based on the survey on the employees, wages and salaries and other labour costs, which is an exhaustive for all public and private sector enterprises irrespective of their economic activity and the legislation according to which they are founded.

All persons under labour contract who have been in payroll during the reference year are included. The directors and managers with permanent job in the observed unit are also covered in the survey, working owners. The information for unpaid family workers is obtained from annual report of enterprises with single-entry bookkeeping.

The reporting units:

The observation units are enterprises and local units (division of the enterprise) - companies, ministries, departments, political, religious, public and other organizations, that perform economical activities in Republic of Bulgaria during the reference year.

The sampling methodology:

The annual statistics on employees and labour costs is based on an exhaustive survey. All enterprises, which have been active during the reference year, are obliged to submit annual report on employment, wages and salaries, and other labour costs.

The response rate and imputation methods used for non-response:

Although the survey is exhaustive and legal obligations for providing the data exist, non-response could occur. To minimize non-response the data are checked on the base of reports on National Security Institute, in order to achieve a full coverage.

#### 1.1.4. Farm Structure Survey

Information for Agriculture is derived from Farm Structure Survey, conducted by the Ministry of Agriculture and Forestry. The survey is on annual base.

Two main types of revisions of national accounts data are applied in practice. The regular revisions are related mostly to the different periods when the source data are available for NA purposes and respectively, to the stages of finalisation of the national accounts. Irregular, occasional revisions are

introduced in cases of methodological changes and improvements of the compilation procedures or when new data sources become available.

**Question 1.2: What is the main original source for employment in the national accounts (e.g. administrative source, labour force survey, business survey, other)? Briefly describe this source, its coverage (including over time, range of businesses/households covered, etc.), its availability and whether it is in terms of jobs and/or persons.**

**Please specify the sources used for different parts of employment (in particular if sources differ between employees and self-employed, and/or between industries, firms of different size, etc.). If sources differ, please provide a clear distinction when answering the questions that follow.**

For the National Accounts purposes, the data from Enterprises' survey on labour and LFS are combined in order to get final data.

#### 1.1.5. Persons employed

Enterprises' survey on employment, wages and salaries, and other labour costs provides annual data for employees under labour contract and they are broken down by 2 digit level of NACE.

The annual data for employees under other than labour type of contract or without any contract and self-employed are calculated as average of the fourth quarters of the reference year and they are obtained from LFS. The data from LFS are broken down by 2 digit level of NACE.

All data on employment are prepared on quarterly basis. For data on Employees are used both sources of information Enterprise survey on labour and LFS, and the data on Self-employed are estimating mainly respective LFS data, except some activities (presented in item "Self-employed").

#### 1.1.6. Employees

Data on employees are calculated as sum of two elements: Employees working under labour contract, and Employees working under other than labour type of contract or without any contract. The Quarterly enterprise survey provides data only on employees under labour contract on a monthly basis. Data on employees working by other type of contract are obtained from the LFS. The quarterly enterprise survey is considered the main source for data on employees for the following reasons:

- more reliable NACE breakdown;
- use of domestic concept;
- good coverage;

Adjustments on enterprise data:

- **Calculation of average quarterly data:** average monthly data on employees are calculated as the simple average of number of employees at the beginning and at the end of each month; quarterly average is a simple average of monthly averages in a given quarter.
- **Data on armed forces, security and conscripts** are added to the number of employees. Data are derived from the LFS as average quarterly number of employees by employment contract in NACE activity O.

Adjustments on LFS data on employees by other type of contract or without any contract:

- **The numbers of persons working abroad** are subtracted in order to meet the domestic concept.
- **Persons not declaring the branch of activity** are proportionally distributed across all activities.

#### 1.1.7. Self-employed

Except the activities of Agriculture, the data on the self-employed are estimated using the Labour Force Survey. The data for Agriculture are estimated from Farm Structure Survey. This survey has some

disadvantages – the information is relatively limited, concerning the distinction between main and second job and social variables. Quarterly estimates are prepared on the basis of quarterly distribution of self-employed data in Agriculture, according to LFS.

**Question 1.3: Please describe how estimates of annual figures based on higher frequency data (e.g. weekly, monthly, quarterly) are derived. Please also specify, if relevant, how annual figures are derived if survey information is less periodic (e.g. every 5 years)?**

Enterprises' survey on employment, wages and salaries, and other labour costs and LFS provide quarterly and annual data for employment and they are broken down by 2 digit level of NACE.

**Question 1.4: Please describe the adjustments made to pass from jobs to the concept of persons (if the original source is in terms of jobs).**

For National accounts purposes, Enterprises' survey on employment, wages and salaries, and other labour costs and LFS provide data in persons.

**Question 1.5: Please describe the adjustments made to correct for coverage of the economic territory (see ESA §11.17-11.19)? This refers specifically to residents working for non-resident units abroad non-residents working in resident units. If relevant, please also describe adjustments for military (including conscripts, where applicable) and other collective households not covered by your main source.**

For National accounts purposes, Enterprises' survey on employment, wages and salaries, and other labour costs and LFS provide data in terms of definition of resident units.

**Question 1.6: Which adjustments are made for the unobserved economy (e.g. producers that deliberately do not register, individuals providing their labour that are not required to register, illegal workers, etc.)?**

LFS provides data for employees working without any contract.

**Question 1.7: Which, if any, other adjustments are made (e.g. inclusion of resident workers below the age threshold, prisoners, adjustments made to account for statistical deficiencies in the source data, etc.)?**

**Question 1.8: In cases where Labour Force Survey data have not been used as the main source (even if only for some activities or groups of workers), please explain why. Are LFS data used for adjustments or cross-checking? Are differences monitored?**

See answer on Question 1.2.

## **2. Hours worked**

**Question 2.1: Please describe the architecture of your estimation method for hours worked. Please include details of differences in methods and data sources that may exist at different points in the time series (e.g. a break in the series). Please also provide links to articles that may be relevant.**

Enterprises' survey on employment, hours worked, wages and salaries, and other labour costs provides data for hours worked for employees under labour contract.

The data for hours worked for employees under other than labour type of contract or without any contract and self-employed are calculated as average of the fourth quarters of the reference year and they are obtained from LFS.

All data on hours worked are prepared on a quarterly basis and the data are broken down by 2 digit level of NACE.

Generally, data from Quarterly enterprise survey on labour and LFS are combined for the preparation of final data, with exception on hours worked for agriculture.

Data are prepared separately for employees and self-employed.

**Question 2.2: What is the main original source for hours worked in the national accounts (e.g. administrative source, Labour Force Survey, Business survey)? Briefly describe this source, its coverage and its ability to reflect the definition of hours worked (see ESA §11.27-11.31). In particular, does it capture a 'usual' hours, 'actual' hours, or some other concept?**

**Please specify the sources used for different parts of the employed population (in particular if sources differ between employees and self-employed, and/or between industries, firms of different size, etc.). If sources differ, please provide a clear distinction when answering the questions that follow.**

#### **Hours worked by employees**

Data on hours worked by employees are calculated as sum of two elements: Hours worked by employees under labour contract, and hours worked by employees working by other than labour type of contract or without any contract. The situation is the same like in employed persons, i.e. the quarterly enterprise survey provides data only on hours worked by employees under labour contract on a monthly basis, and the LFS provides information for other type of contract or without contract.

The quarterly enterprise survey is chosen as main source for data on hours worked by employees under labour contract (although such kind of data are available in the LFS also) for the same reason, as for employment data.

The data from Quarterly enterprise survey as well as data from LFS are adjusted according to the general concepts.

Adjustment on enterprise data:

- **Calculation of quarterly data:** quarterly data are the sum of monthly hours worked by employees, provided by Quarterly enterprise survey.
- Data on **armed forces, security and conscripts** are added to the hours worked by employees in the corresponding activity. Data in this branch are derived from LFS as number of actually worked by employees' number of hours worked by conscripts. As no authentic data are available for working time of conscripts, this is estimated assuming 40 hours per week as standard. Data on hours worked by this group are converted to quarterly figures.

Adjustment on LFS data on hours worked by employees with non-labour contract or without any contract:

- The hours worked by **persons working abroad** are subtracted in order to meet the domestic concept.

- Average weekly hours worked in the same category are applied for each person worked in the reference period, but *not declaring the number of hours*.
- Number of hours worked on *second job* is added to the number of hours worked in relative activities.

#### **Hours worked by self-employed**

Data on hours worked by self-employed are estimated using mainly the LFS data hours actually worked by self-employed in the reference period, adjusted in the same way, presented for employees without labour contract.

Data on hours worked in Agriculture are based on the Farm Structure Survey. Specifically for Agriculture quarterly distribution of hours worked by self-employed is made according to the estimated quarterly distribution of number of self-employed and average hours worked by self-employed, provided by LFS.

***Question 2.3: Please describe the adjustments made to transform the original source to adapt it to the concept of working hours as defined in national accounts? Please, describe each adjustment separately. These adjustments might include:***

- Accounting for holidays and annual leave
- Accounting for sickness leave
- Accounting for strikes and temporary lay-offs
- Accounting for paid but unreported overtime
- Accounting for unpaid overtime

In the original data provided to National accounts, all those adjustments have been made.

***Question 2.4: Is a specific adjustment made to account for under- or over-reporting in the source data? Please specify if these adjustments are made for employees and/or self-employed workers.***

A specific adjustment is made in order to get exhaustive data for National accounts purposes based on the comparison of annual and quarterly data for reporting units.

***Question 2.5: If an adjustment is made for the number of persons employed in relation to the unobserved economy, what assumption is made regarding the hours worked by these persons?***

***Question 2.6: Which other adjustments, if any, are made?***

***Question 2.7: If necessary, please describe any additional calculations needed to derive total hours worked and average hours worked from the sources and adjustments specified above. This includes, but is not limited to, adjustments made to align the coverage of hours worked with that of employment in persons (i.e. the coverage produced by the process followed in section 1).***

## *Part II: Other work in this area*

### **3. Differences between national accounts and Labour Force Survey estimates**

**Question 3.1:** To what extent do you consider your Labour Force Survey an accurate tool for the measurement of employment and hours worked? Please describe any issues or shortcomings of which you may be aware.

**Question 3.2:** If the Labour Force Survey is not the primary source of data used to derive your estimates of employment in persons hours worked: Are you able to quantify, even approximately, what the difference would be between your current national accounts estimates and those you would obtain if you did use the Labour Force Survey data as your primary source?

**Question 3.2.1:** Where differences between these estimates exist, can you provide a brief assessment of the source of these differences?

National Accounts use different data sources which are combined to obtain the best comprehensive and consistent estimate. In results National Accounts data could differ from the results of each source. For Bulgaria the main difference between LFS and NA refers to Agricultural employment. In the estimation of self-employment in agriculture NA use data based on Agricultural Census and sample surveys, carried out by Ministry of Agriculture and Food.

NA employment data are based on domestic concept (employment in resident production units irrespective of the place of residence of the employee) while LFS gives information on the national concept.

LFS does not cover persons living in collective households, who are included in NA employment estimates.

In contrast to National Accounts persons on leave for taking care of a child until 2 years of age are not considered employed according to LFS.

### **4. Flash estimates of employment in persons**

**Question 4.1:** Are you currently producing flash estimates of employment (t+30 or t+45)? If so, please describe briefly the methodology, coverage and sources. If you are not producing a flash estimate, do you have plans to start doing so in the future?

We compile employment data at T+42-45 days and T+60 days (both employment and hours worked) after the reference period. The employment, hours worked and labour productivity are published at the same day as GDP data T+62. We do not publish employment data at T+42-45 days. They are compiled only for internal use for national accounts purposes.

For the first time the flash estimates for GDP in Bulgaria were elaborated for Q3 2008. It was also the time when we started with producing flash employment estimates.

The main sources of information for employment data (T+42 and T+60 days) are:

- LFS – employees under other than labour type of contract or without any contract and self-employed and they are broken down by 2 digit level of NACE (T+60) and 21 activity groupings by NACE (T+42-45)



- Enterprises' Survey on employment, hours worked, wages and salaries, and other labour costs – employees under labour contract and they are broken down by 2 digit level of NACE (T+60) and 21 activity groupings by NACE (T+42-45)
- Farm Structure Survey – self-employed in Agriculture activities.

**Question 4.2: Please provide information on the quality of the estimates (e.g. revision analysis).**

## **5. Other data produced (Optional)**

**Question 5.1: Do you have plans in the near future to improve or expand the content of national accounts labour input data (e.g. improved alignment with national accounts concepts, extension of the time series, increased industry detail, etc.)?**

In future, we will concentrate our work on changing our main source of information for armed forces. At present, we use LFS data.

**Question 5.2: Do you produce labour input data other than that already discussed, for example quality adjusted labour input or labour input in terms of full-time equivalents? If so, please provide details and/or links to these data.**

No

**Question 5.3: Do you produce productivity statistics (e.g. labour productivity for the total economy, further breakdowns of labour productivity, capital productivity, multi-factor productivity, etc.)? If so, please provide details and/or links with regards to these data.**

We calculate and publish data for labour productivity - <http://www.nsi.bg/en/content/13220/employment-and-hours-worked-total-economy>

**Question 5.4: If there is any other work that you produce currently, or are looking to produce in the future, in the areas of labour input or productivity, please use the space below to inform us about this work.**