

## 19. SCIENCE AND RESEARCH

The terms **research and development (R&D)** in the Czech Republic are defined in the Act on R&D Support from Public Funds. **R&D** is defined as systematic creative work conducted for the purpose of broadening of existing knowledge (including knowledge of humans, culture, and society), obtaining new pieces of knowledge or application of pieces of knowledge in practice using methods allowing their confirmation, addition, or refutation.

**Reporting units** in the R&D statistical survey are all legal and natural persons conducting R&D on the territory of the Czech Republic as their principal (CZ-NACE 72) or secondary economic activity, irrespective of the number of their personnel, sector, or CZ-NACE activity they are active in. The **breakdown of data by region** has been available since 2001 and is processed by the location of the R&D workplace of respective reporting unit. In the case of the higher education sector it applies mainly to respective faculties of public universities. Estimates of data for districts were made according to locations of registered offices of businesses and addresses of R&D workplaces. The registered office (seat) of a business may not be identical with the workplace where R&D is performed.

**R&D personnel** by occupation are:

- **researchers**: professionals engaged in or managing projects that include the concept or generation of new pieces of knowledge, products, processes, methods, and systems;
- **technicians and equivalent staff** (hereinafter as "technicians") who participate in R&D activities by performing scientific and technical tasks, applying concepts and operating methods (usually under the supervision of researchers);
- **other research and development personnel** participating or involved in R&D activities (as craftsmen, secretaries, and clerks).

The **registered number of employees (headcount) as at 31 December** refers to registered number of active R&D personnel employed (full or part-time) at the end of the reference year irrespective of time devoted to research and development activities. Mainly in the high education and partially also in government sector, big amount of persons working in R&D, especially researchers, works for more entities and therefore in these sectors the indicator is overestimated and does not show the real number of persons working in R&D. The **average registered number of employees adjusted as full-time equivalent (FTE) devoted to research and development activities** brings information about real time devoted to research and development activities. One FTE is equal to one year of full-time work of an employee fully dedicated to R&D activities.

**R&D expenditure** represents total expenditure (current and capital expenditure) designated to own research and development carried out within the reporting unit or the economic sector irrespective of the source of funds. Expenditure incurred outside the reporting unit (external expenditure on R&D) is included in the total expenditure only on condition that it directly serves to support own R&D (e.g., purchase of supplies for R&D).

In 2013, an occasional data revision took place for the area of research and development. It applied mainly to backward control of correct methodological differentiation between costs for performed R&D and costs for R&D services (expenditure on R&D made by another entity for a surveyed unit) in the business enterprise sector. Thus, some data for the period 2008–2011 may differ in these yearbooks from the data published in the previous yearbooks. It applies mainly to data for the Středočeský and, to a lesser extent, for the Pardubický Regions.

Data on the **state support of research and development** result from information contained in the R&D Information System (secretariat of the Research and Development Council) and in the closing account of the State Budget of the CR for the area of the R&D (Ministry of Finance of the CR).

Data on **patents and utility models** were processed on the basis of data sources of the Industrial Property Office of the Czech Republic (IPO CR), which is responsible for the patent protection in the Czech Republic. Tables contain only data on patent activity of entities doing their business on the territory of the Czech Republic.

The data source for **persons employed in science and technology occupations** is the Labour Force Sample Survey (LFSS), in which basic reporting units are individuals and households. Data in tables are annual averages. If the figure is smaller than 3 000 persons, data are considered to be of low reliability. In 2010, there was a change in the methodology and therefore data for 2010 are not fully comparable with those of previous years. Since 2011, persons employed in science and technology occupations are defined based on the new CZ-ISCO-08 classification (CZ-ISCO major groups 2 and 3). Among persons employed in science and technology occupations there is a very narrow group of persons called **Professionals** (CZ-ISCO major group 2). From that category of persons, the following three groups of occupations called previously scientists and engineers are further specified in details:

- science and engineering professionals (CZ-ISCO sub-major group 21);
- health professionals (CZ-ISCO sub-major group 22);
- ICT professionals (CZ-ISCO sub-major group 25).

Data on **wages of professionals** are from results of the structural statistics on wages of employees published by the Czech Statistical Office in cooperation with the Ministry of Labour and Social Affairs of the CR. Up to 2010, the amount of average monthly gross wage of professionals given here relates to the survey sample (approx. 1.7 million employed persons) that means the data are not grossed up.

**Higher education students** (ISCED levels 5A and 6) in the fields of **science** (life sciences, physical sciences, mathematics and statistics, computing) and **engineering, manufacturing and construction** (engineering and engineering trades, manufacturing and processing, architecture and building) are defined in the International Standard Classification of Education – ISCED 97 (ISCED broad groups 4 and 5). Data are always as at 31 December and were

obtained from data sources of the Ministry of Education, Youth and Sports of the CR, namely from the "SIMS" database (i.e. Union Information from Students' Registers).

**High-tech goods** are for the needs of external trade statistics defined by the Standard International Trade Classification (SITC); they are broken down by nine groups (electronics - telecommunications, electrical machinery, pharmacy, chemistry, aerospace, non-electrical machinery, scientific instruments, computers - office machines, and armament). Since 2011, external trade with goods is not measured by seat of the exporter any more.

Data on **technology balance of payments** (exports of technology) come from a survey on exports and imports of services "ZO 1-04". Respective items of these services (payment items) are defined based on the EBOPS (the Extended Balance of Payments Services Classification).