



# **DIGITAL ECONOMY IN FIGURES**

**2020**

**CZECH REPUBLIC  
AND EU**

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## Introduction

This publication is devoted to the so-called digital economy, which is based on the rapid acquisition, processing and exchange of information through information and communication technologies (ICT). The effective use of modern ICT and related applications and services has a significant impact on increasing competitiveness and building an innovative and knowledge-based society.

One way to map developments in ICT and its impact on the economy is to compile a set of statistical indicators in this area. The CZSO has been publishing this statistical overview for more than ten years.

This brochure, its twelfth edition, was compiled in order to provide again a comprehensive overview of statistical indicators about the development of the digital economy in the Czech Republic and where possible also in other, mainly EU, countries.

The brochure consists of the following **seven chapters**:

- A. **ICT specialists:** this chapter provides information about **employment** in ICT specialist occupations both for ICT professionals and ICT technicians together with data about their **wages**.
- B. **ICT students:** this chapter contains data on the number and structure of students and graduates of ICT disciplines at universities.
- C. **ICT investments:** this chapter includes detail information about total ICT investment **by asset type** and **industry**. Data on **household expenditures** on ICT equipment and services is also included here.
- D. **ICT research and development:** this chapter provides both data on the total financial resources invested in research and development (R&D) in ICT equipment and software and data about R&D expenditures and personnel in enterprises with the main economic activity that belongs to the ICT sector.
- E. **Cross-border movements of ICT goods:** this chapter informs the reader about the movement of ICT products across borders, both as a whole and broken down into different categories.
- F. **International trade in ICT services:** this chapter informs the reader about the export and import of ICT services, both as a whole and broken down into different categories.
- G. **ICT sector:** this chapter consists of main economic indicators for industries that are primarily engaged in the production of ICT goods and services.

In addition to detailed data for the Czech Republic, each chapter contains a methodological introduction and, for most indicators, an available international comparison. Data for the Czech Republic are in the vast majority of cases on the left (even pages), international comparisons on the right (odd pages).

Data given in this brochure were acquired, in most cases, from regular statistical surveys or databases of the **Czech Statistical Office**. International comparisons were compiled by the Czech Statistical Office based on freely available Eurostat, OECD or UN data sources.

For more information on digital economy statistics, visit our website:

[https://www.czso.cz/csu/czso/vyuzivani\\_informacnich\\_tehnologi](https://www.czso.cz/csu/czso/vyuzivani_informacnich_tehnologi)

In Prague, January 2021

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Czech Statistical Office

Department of Research, Development and Information Society Statistics



## A ICT specialists

ICT specialists are **defined** as persons who have the ability to develop, operate and maintain ICT systems and for whom ICTs constitute the main part of their job. The occupations of ICT specialists are subdivided into **two major groups** and from 2011 are **assigned** to the groups, and subgroups of the **Classification of Occupations (CZ-ISCO)** as follows:

### ICT managers, engineers and professionals

- 1330 Information and communications technology service managers;
- 2152 Electronics engineers;
- 2153 Telecommunications engineers;
- 2434 Information and communications technology sales professionals;
- Note: The 1330, 2152, 2153 and 2434 subgroups are merged into one category called **ICT managers and engineers**.*
- 25 Information and communications technology professionals**
  - 251 Software and applications developers and analysts;
  - 252 Database and network professionals.

### ICT technicians, installers and servicers

- 3114 Electronics engineering technicians;
- 35 Information and communications technicians**
  - 351 ICT operations and user support technicians;
  - 352 Telecommunications and broadcasting technicians;
- 742 Electronics and telecommunications (ICT) installers and repairers.

*Note: Some data for the ICT specialists, such as wages, are available only for the ICT specialists defined **rather narrow**, which includes only two sub-major groups of CZ-ISCO: **25 ICT professionals** and **35 ICT technicians**.*

Detail description of CZ-ISCO occupations is available here (only in Czech): [https://www.czso.cz/csu/czso/klasifikace\\_zamestnani\\_-cz\\_isco-](https://www.czso.cz/csu/czso/klasifikace_zamestnani_-cz_isco-)

### Numbers of ICT specialists

The data on the numbers of ICT specialists are taken from the **Labour Force Survey (LFS)**. *Note: In order to ensure higher reliability and to eliminate considerable year-on-year fluctuations of values for this group of employees, data is here provided as **three-year moving averages** (i.e., for example, the value for 2018 is calculated as an average from the values for 2017, 2018, and 2019).*

For further information on the **Czech LFS** see:

[https://www.czso.cz/csu/czso/employment\\_unemployment\\_ekon](https://www.czso.cz/csu/czso/employment_unemployment_ekon)

The **Eurostat LFS Database** was used for the **international comparison**. *Note: Data for the Czech Republic from Eurostat **differ slightly** from the data published by the Czech Statistical Office. For instance, data from Eurostat are given for the relevant year and not as three-year moving averages.*

### Wages of ICT specialists

Data on wages (average gross monthly wage) of the ICT specialists come from the **Structure of Earnings Survey (SES)** which is generated by merging of databases of the sample survey of the Information System on Average Earnings (ISPV) which covers the **wage sphere**, and from the database of the Salary Information System which covers the **salary sphere**. For more information see: <https://www.ispv.cz/en/homepage.aspx>.

For further information on the **Czech SES** see:

<https://www.czso.cz/csu/czso/structure-of-earnings-survey-2019>

Data about ICT specialists is available by **several breakdowns**: by occupation and industry or by individual characteristics of ICT specialists such as gender, citizenship, age or highest education attainment.

**For further information on ICT specialists see (only in Czech):**

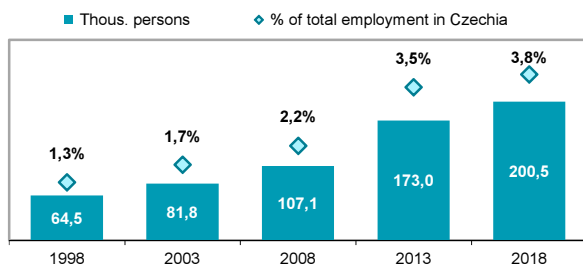
<https://www.czso.cz/csu/czso/ict-odbornici>

## A ICT specialists

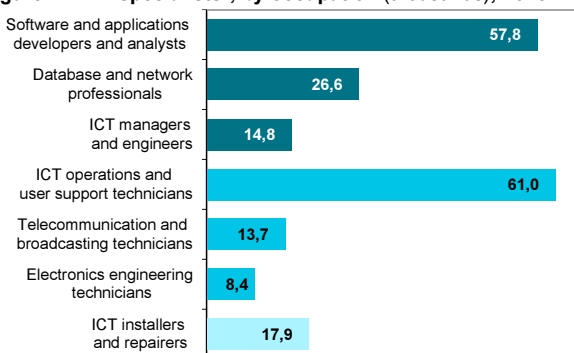
**Table A1 ICT specialists in Czechia**

	Thousand persons*		
	2016	2017	2018
<b>Total</b>	<b>181,8</b>	<b>192,5</b>	<b>200,5</b>
Men	164,4	174,6	181,9
Woman	17,4	18,0	18,7
<b>Occupation</b>			
ICT managers, engineers and professionals	87,8	92,7	99,3
ICT technicians, installers and servicers	94,0	99,9	101,2
<b>Age group</b>			
Under 25 years	9,4	10,1	10,5
25–34 years	63,4	65,2	65,0
35–44 years	59,7	65,0	71,5
45–54 years	32,3	33,3	33,2
55 + years	17,0	18,9	20,3
<b>Highest level of education attainment</b>			
Tertiary	102,6	107,3	109,6
Secondary with A-level examination	69,4	74,4	79,8
Other (lower)	9,8	10,8	11,1

**Figure A1 ICT specialists\***



**Figure A2 ICT specialists\*, by occupation (thousands); 2018**



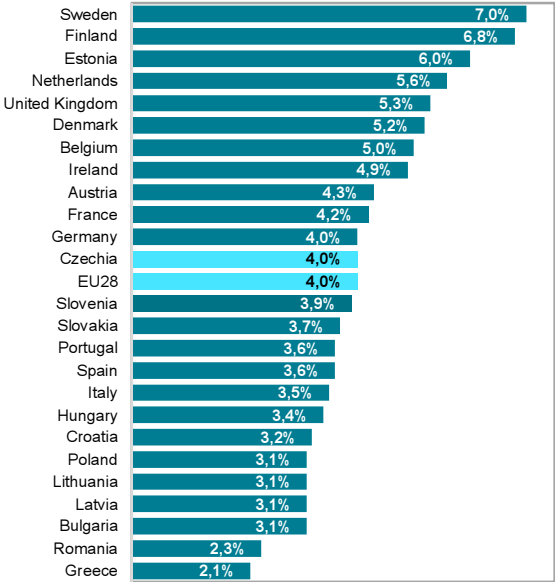
\* Three-year moving averages, see the methodological notes.

Source: CZSO, Labour Force Survey

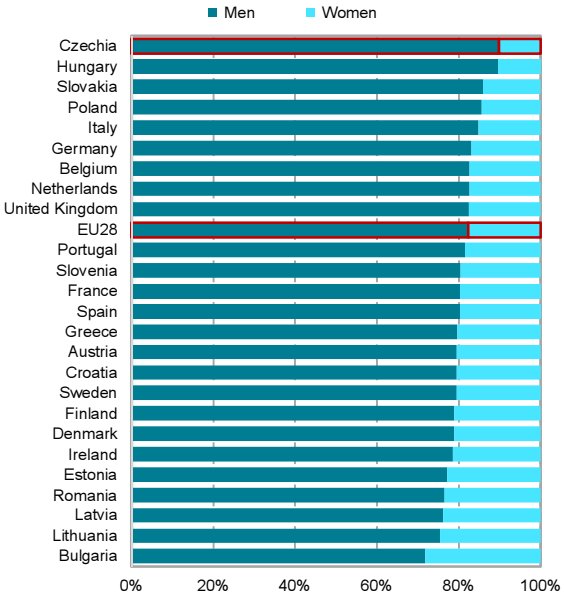


## A ICT specialists

**Figure A3 ICT specialists in EU countries; 2019**  
(% of total employment)



**Figure A4 ICT specialists, by gender; 2019**



Source: CZSO calculation based on the Eurostat LFS Database

## A ICT specialists

Table A2 ICT managers, engineers and professionals in Czechia

	Thousand persons*		
	2016	2017	2018
<b>Total</b>	<b>87,8</b>	<b>92,7</b>	<b>99,3</b>
Men	78,8	83,3	89,2
Women	9,0	9,4	10,1
<b>Occupation</b>			
<b>ICT professionals, total</b>	<b>70,2</b>	<b>76,0</b>	<b>84,5</b>
Software and app. developers and analysts	46,4	50,6	57,8
Database and network professionals	23,5	25,2	26,6
<b>ICT managers and engineers</b>	<b>17,6</b>	<b>16,7</b>	<b>14,8</b>
<b>Age group</b>			
Under 25 years	3,1	3,2	2,8
25–34 years	31,5	32,3	33,6
35–44 years	30,6	34,0	37,8
45–54 years	15,2	14,9	15,7
55 + years	7,5	8,3	9,4
<b>Highest level of education attainment</b>			
Master's and Doctoral	62,4	65,8	68,0
Bachelor's and Higher professional	12,3	12,8	14,5
Other (lower)	11,9	13,1	16,4

Figure A5 ICT professionals\*

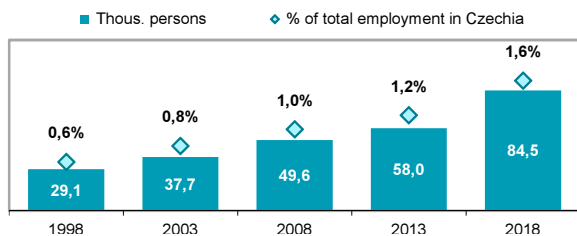


Figure A6 ICT professionals\*, by gender

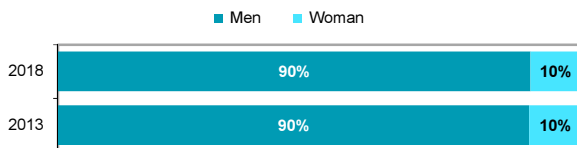
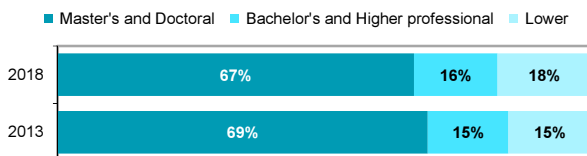


Figure A7 ICT professionals\*, by level of education

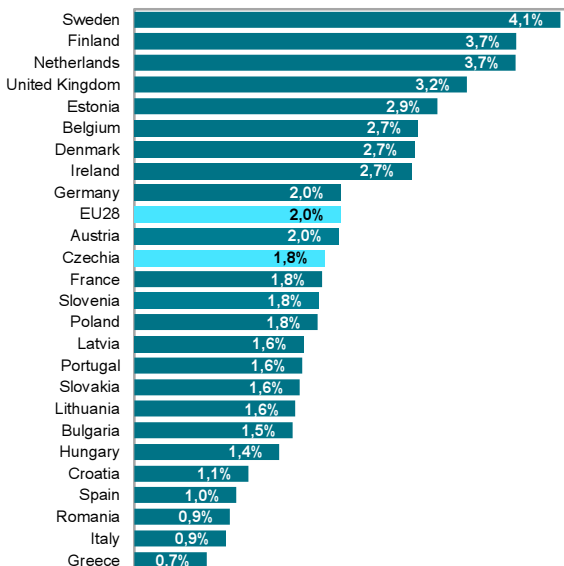


\* Three-year moving averages, see the methodological notes.

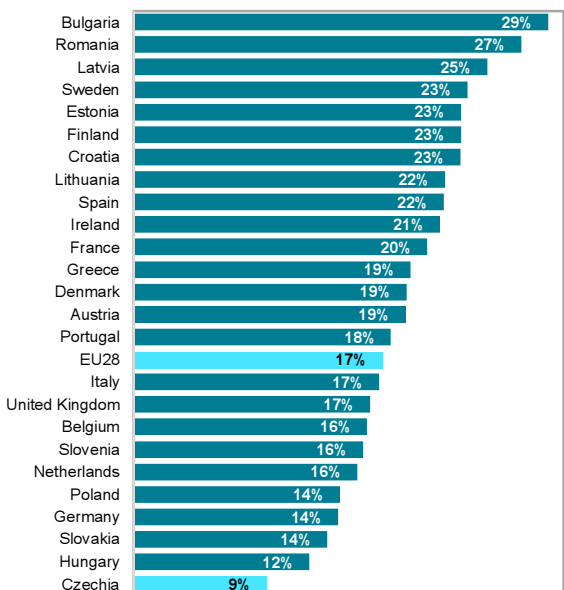
Source: CZSO, Labour Force Survey

## A ICT specialists

**Figure A8 ICT professionals in EU countries; 2019**  
(% of total employment)



**Figure A9 Share of women among ICT professionals; 2019**



Source: CZSO calculation based on Eurostat LFS Database

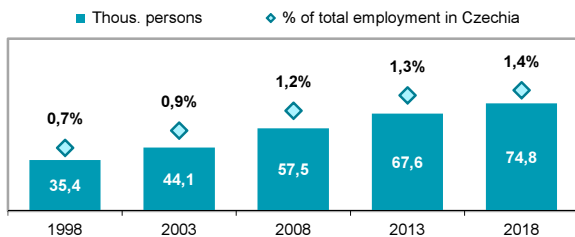
## A ICT specialists

**Table A3 ICT technicians, installers and servicers in Czechia**

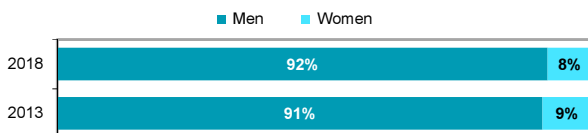
Thousand persons\*

	2016	2017	2018
<b>Total</b>	<b>94,0</b>	<b>99,9</b>	<b>101,2</b>
Men	85,6	91,3	92,7
Woman	8,4	8,6	8,5
<b>Occupation</b>			
<b>ICT technicians, total</b>	<b>65,7</b>	<b>71,4</b>	<b>74,8</b>
ICT operations and user support technicians	52,2	57,3	61,0
Telecomm. and broadcasting technicians	13,6	14,0	13,7
<b>ICT installers and servicers</b>	<b>28,2</b>	<b>28,5</b>	<b>26,3</b>
<b>Age group</b>			
Under 25 years	6,3	7,0	7,7
25–34 years	31,9	32,9	31,4
35–44 years	29,1	31,0	33,7
45–54 years	17,1	18,4	17,5
55 + years	9,5	10,6	10,9
<b>Highest level of education attainment</b>			
Tertiary	27,8	28,7	27,1
Secondary with A-level examination	57,5	61,3	63,4
Other (lower)	8,7	9,8	10,7

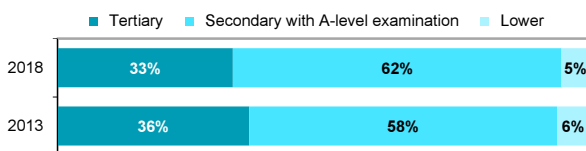
**Figure A10 ICT technicians\***



**Figure A11 ICT technicians\*, by gender**



**Figure A12 ICT technicians\*, by level of education**

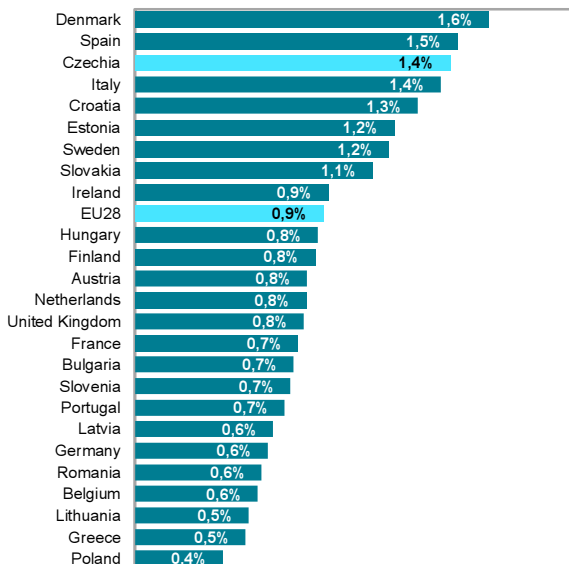


\* Three-year moving averages, see the methodological notes.

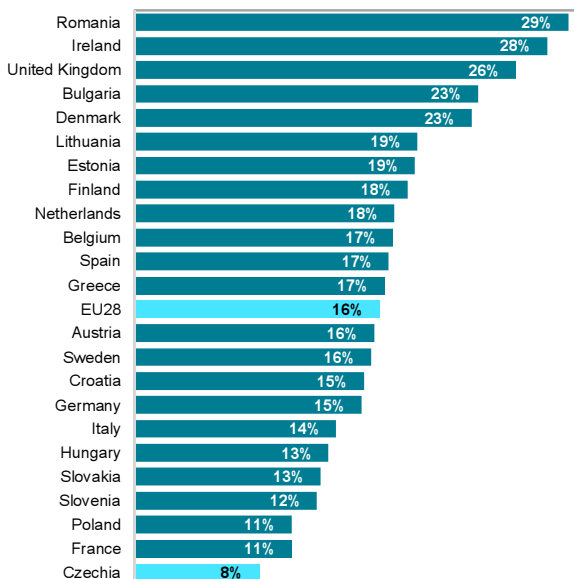
Source: CZSO, Labour Force Survey

## A ICT specialists

**Figure A13 ICT technicians in EU countries; 2019**  
(% of total employment)



**Figure A14 Share of women among ICT technicians; 2019**



Source: CZSO calculation based on Eurostat LFS Database

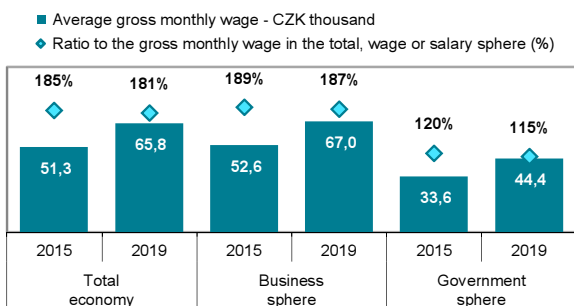
## A ICT specialists

**Table A4 Wages of ICT professionals in Czechia**

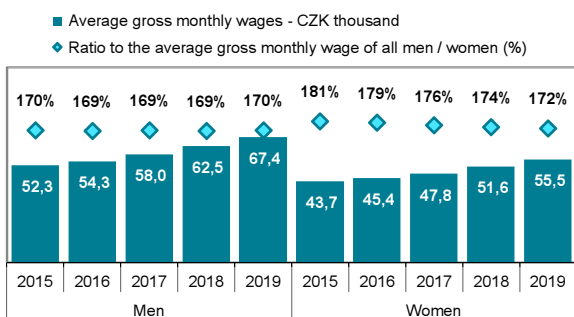
Average gross monthly wage in CZK

	2017	2018	2019
<b>Total</b>	<b>56 747</b>	<b>61 026</b>	<b>65 787</b>
Men	58 025	62 460	67 439
Women	47 765	51 550	55 512
<b>Citizenship</b>			
Czech citizens	54 910	59 103	63 439
Foreigners	70 550	73 574	79 941
<b>Sphere of activity (remuneration)</b>			
Business (wage) sphere	57 810	62 073	66 964
Government (salary) sphere	38 876	42 060	44 351
<b>Age group</b>			
Under 25 years	33 034	34 403	38 149
25–34 years	51 487	55 064	59 311
35–44 years	65 206	69 650	74 702
45–54 years	59 965	65 425	71 122
55 + years	51 652	57 134	58 588
<b>Highest level of education attainment</b>			
Master's and Doctoral	62 809	67 578	72 620
Bachelor's and Higher professional	51 906	56 425	62 025
Secondary with A-level examination	50 723	54 396	58 258

**Figure A15 Wages of ICT professionals**



**Figure A16 Wages of ICT professionals, by gender**



Source: CZSO, Structural Earnings Statistics

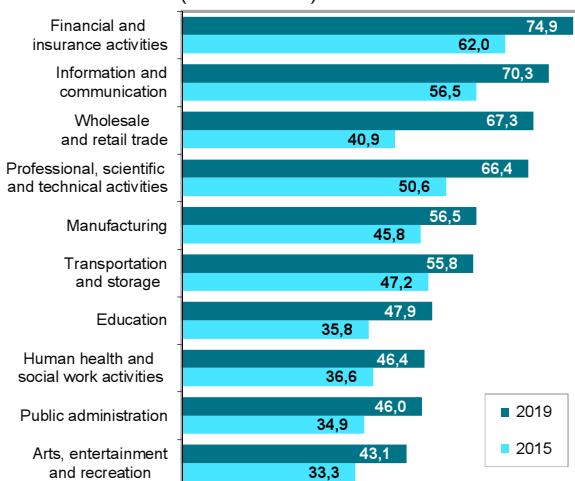
## A ICT specialists

**Table A5 Wages of ICT professionals in Czechia according to their occupation and industry**

Average gross monthly wage in CZK

	2017	2018	2019
<b>Total</b>	<b>56 747</b>	<b>61 026</b>	<b>65 787</b>
<b>Occupation</b>			
<b>Software and app. developers &amp; analysts</b>	<b>59 139</b>	<b>63 530</b>	<b>69 035</b>
Systems analysts	61 883	66 790	72 136
Software developers	61 157	64 173	70 788
Web and multimedia developers			61 266
Applications programmers	54 343	58 386	64 315
Other SW & App. developers and analysts	58 207	63 466	64 788
<b>Database and network professionals</b>	<b>50 884</b>	<b>54 364</b>	<b>57 610</b>
Database designers/admin.	52 646	54 355	64 852
Systems administrators	49 375	52 777	55 160
Computer network professionals	55 742	59 161	62 793
Data security specialists	58 267	66 488	71 428
<b>Industry (CZ-NACE Section)</b>			
Manufacturing (C)	50 159	53 864	56 459
Wholesale and retail trade (G)	48 326	53 925	67 329
Transporting and storage (H)	50 153	52 998	55 837
Information and communication (J)	61 457	65 749	70 290
Financial and insurance activities (K)	65 182	69 909	74 932
Professional, scientific and techn. act. (M)	55 730	60 775	66 387
Public administration (O)	40 278	43 379	46 037
Education (P)	39 543	44 395	47 924
Human health and social work act. (Q)	40 663	43 799	46 445
Arts, entertainment and recreation (R)	39 068	43 540	43 074

**Figure A17 Average gross monthly wage of ICT professionals in selected industries (CZK thousand)**



Source: CZSO, Structural Earnings Statistics

## A ICT specialists

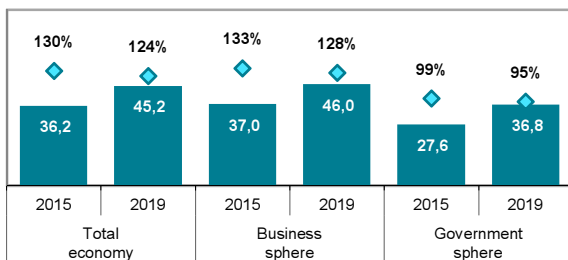
**Table A6 Wages of ICT technicians in Czechia**

Average gross monthly wage in CZK

	2017	2018	2019
<b>Total</b>	<b>39 612</b>	<b>42 016</b>	<b>45 219</b>
Men	40 307	42 616	45 644
Women	35 084	38 269	42 068
<b>Citizenship</b>			
Czech citizens	38 657	41 024	44 170
Foreigners	54 263	55 168	56 840
<b>Sphere of activity (remuneration)</b>			
Business (wage) sphere	40 387	42 726	45 999
Government (salary) sphere	31 200	34 228	36 802
<b>Age group</b>			
Under 25 years	27 143	28 806	31 664
25–34 years	36 329	38 800	42 302
35–44 years	43 666	45 408	49 204
45–54 years	41 235	45 011	49 829
55 + years	39 161	43 452	42 926
<b>Highest level of education attainment</b>			
Master's and Doctoral	48 961	52 020	55 485
Bachelor's and Higher professional	41 245	44 403	45 944
Secondary with A-level examination	36 098	38 449	41 710
Other (lower)	30 926	31 753	36 371

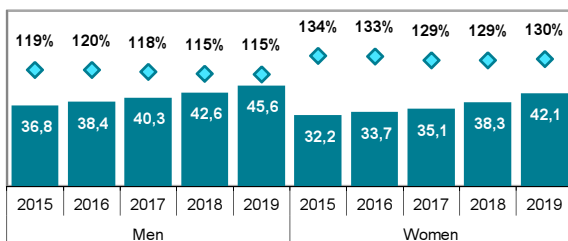
**Figure A18 Wages of ICT technicians**

- Average gross monthly wage - CZK thousand
- ◆ Ratio to the gross monthly wage in the total, wage or salary sphere (%)



**Figure A19 Wages of ICT technicians, by gender**

- Average gross monthly wage - CZK thousand
- ◆ Ratio to the average gross monthly wage of all men / women (%)



Source: CZSO, Structural Earnings Statistics

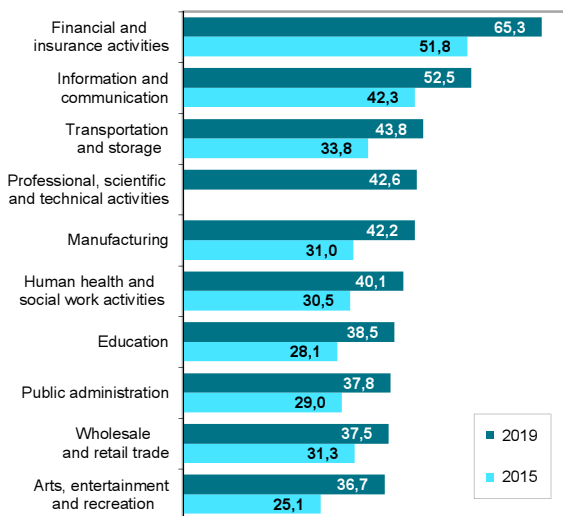


## A ICT specialists

**Table A7 Wages of ICT technicians in Czechia according to their occupation and industry**

	Average gross monthly wage in CZK		
	2017	2018	2019
<b>Total</b>	<b>39 612</b>	<b>42 016</b>	<b>45 219</b>
<b>Occupation</b>			
<b>ICT operations and user support techn.</b>	<b>40 243</b>	<b>42 789</b>	<b>46 134</b>
ICT operations technicians	38 349	40 751	45 950
ICT user support technicians	43 911	46 576	49 438
Computer network and systems technicians	40 562	43 127	43 219
Web technicians			40 840
<b>Telecomm. and broadcasting technicians</b>	<b>36 118</b>	<b>37 922</b>	<b>39 641</b>
Broadcasting and audiovisual technicians	32 511	35 590	36 333
Telecommunications engineering techn.		38 940	40 599
<b>Industry (CZ-NACE Sections)</b>			
Manufacturing (C)	34 427	37 622	42 193
Wholesale and retail trade (G)	34 793	35 874	37 470
Transporting and storage (H)	39 634	43 149	43 789
Information and communication (J)	46 178	49 192	52 488
Financial and insurance activities (K)	57 140	59 403	65 315
Professional, scientific and techn. act. (M)		38 147	42 631
Public administration (O)	32 361	35 140	37 846
Education (P)	31 235	34 438	38 518
Human health and social work act. (Q)	34 215	38 154	40 140
Arts, entertainment and recreation (R)	30 310	33 779	36 718

**Figure A20 Average gross monthly wage of ICT technicians in selected industries (CZK thousand)**



Source: CZSO, Structural Earnings Statistics

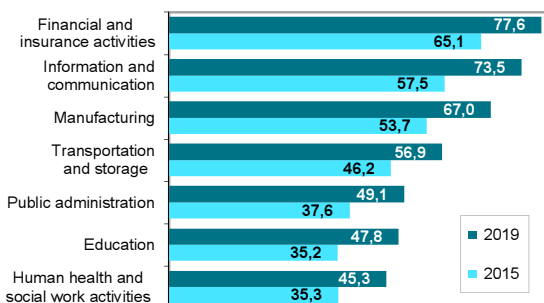
## A ICT specialists

**Table A8 Wages of Software and applications developers and analysts in Czechia**

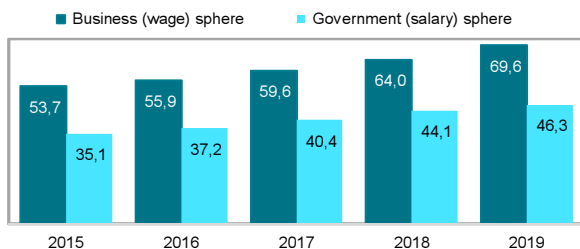
Average gross monthly wages in CZK

	2017	2018	2019
<b>Total</b>	<b>59 139</b>	<b>63 530</b>	<b>69 035</b>
Men	60 429	64 961	70 785
Women	49 971	53 840	58 197
<b>Sphere of activity (remuneration)</b>			
Business (wage) sphere	59 643	63 994	69 577
Government (salary) sphere	40 440	44 068	46 300
<b>Age group</b>			
Under 25 years	33 241	34 834	39 235
25–34 years	53 341	57 078	61 441
35–44 years	69 853	73 966	80 165
45–54 years	62 380	67 764	74 758
55 + years	53 017	59 379	61 346
<b>Highest level of education attainment</b>			
Master's and Doctoral	64 665	69 316	75 268
Bachelor's and Higher professional	53 967	58 580	64 237
Secondary with A-level examination	52 361	56 591	60 990

**Figure A21 Wages of software & applications developers and analysts in selected industries (CZK thousand)**



**Graf A22 Wages of software & applications developers and analysts, by sphere of activity (CZK thousand)**



Source: CZSO, Structural Earnings Statistics

## B ICT students

Students of and graduates from ICT fields of education (in short ICT students and graduates) are **defined** by the International Standard Classification of Education: Fields of Education and Training 2013 used in the Czech Republic (**CZ-ISCED-F 2013**). ICT-related studies correspond to the broad field of education **Information and Communication Technologies (class 06)** of this classification that involves detailed defined fields of education as follows:

Computer use (0611);

Database and network design and administration (0612);

Software and applications development and analysis (0613);

ICT not elsewhere classified (0619) and

Inter-disciplinary programmes and qualifications involving ICT (0688).

Detail description of **CZ-ISCED-F 2013** is available here (*only in Czech*):

<https://www.czso.cz/csu/czso/klasifikace-oboru-vzdelani-cz-isced-f-2013>

Education at universities presented in this chapter for Czechia belongs to the tertiary level of education and **includes bachelor, follow-up master, master and doctoral study programmes**. Master and follow-up master study programmes together are called here master programmes. Studies can be delivered in full-time, distance, or combined type of education.

Data for the Czech Republic were obtained from data sources of the **Ministry of Education, Youth, and Sports**, namely from the **Union Information from Students' Registers (SIMS)**. The source database of SIMS is continually completed and updated, including retrospective corrections. Detailed information about the SIMS database is available here (*only in Czech*): <https://sims.msmt.cz/>

Data on university students are always as at **31 December of the reference year**; data on graduates are **for the entire school year**.

Numbers of students and graduates are given as **headcount**, i.e. each student is included in a particular piece of data only once, including students, who study in more study programmes at the same time. The total numbers of students and graduates thus do not have to be equal to the sums of students and graduates of respective types of study programmes.

*Note: Since a field of education with the same code may have various contents at different universities and thus it is problematic to classify students to relevant groups of fields of education according to the ISCED-F 2013, expert estimates are given for the breakdown by field of education made by experts of the Ministry of Education, Youth, and Sports.*

**Eurostat database** was used for the **international comparisons**. Data about number of students of and graduates from ICT fields of education contain information for following study programmes: Bachelor or equivalent (ISCED 2011 level 6) and Master or equivalent (ISCED 2011 level 7). Doctoral or equivalent study programmes (ISCED 2011 level 8) are not included here.

*Note: Data for the Czech Republic from Eurostat differ slightly from the data published by the Czech Statistical Office using the SIMS database. The main reason is mainly a slightly different definition of levels of tertiary education.*

**For more information on ICT students see** (*only in Czech*):

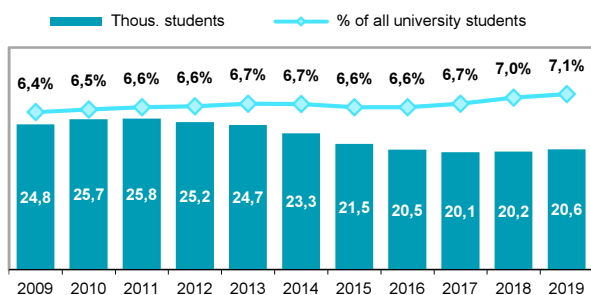
<https://www.czso.cz/csu/czso/studenti-a-absolventi-ict-oboru-vysokoskolskeho-studia>

## B ICT students

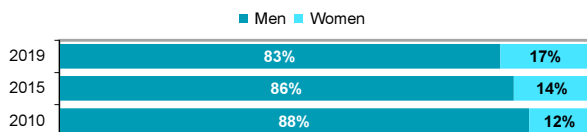
**Table B1 University students of ICT education in Czechia**

	Number of students		
	2017	2018	2019
<b>Total</b>	<b>20 099</b>	<b>20 198</b>	<b>20 552</b>
of which 25 years and older	4 811	4 743	4 670
<b>Gender</b>			
Men	16 887	16 799	17 073
Women	3 212	3 399	3 479
<b>Citizenship</b>			
Czech citizens	15 222	14 967	15 040
Foreigners	4 877	5 231	5 512
<b>Study programme</b>			
Bachelor study programme	13 937	14 306	14 749
Master study programme	5 341	5 152	5 036
Doctoral study programme	830	747	776

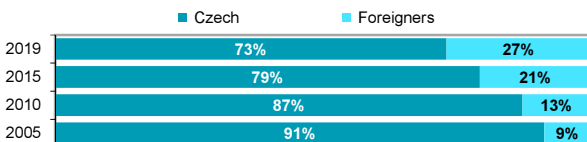
**Figure B1 University students of ICT fields of education**



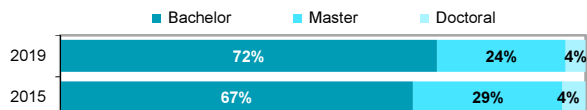
**Figure B2 University students of ICT, by gender**



**Figure B3 University students of ICT, by citizenship**



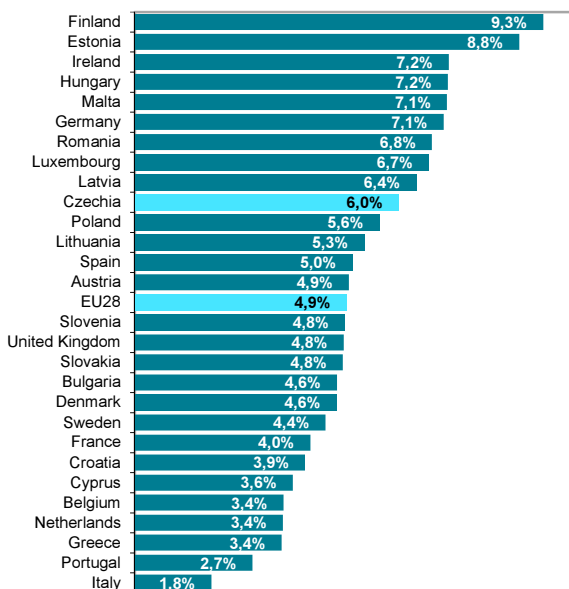
**Figure B4 University students of ICT, by study programme**



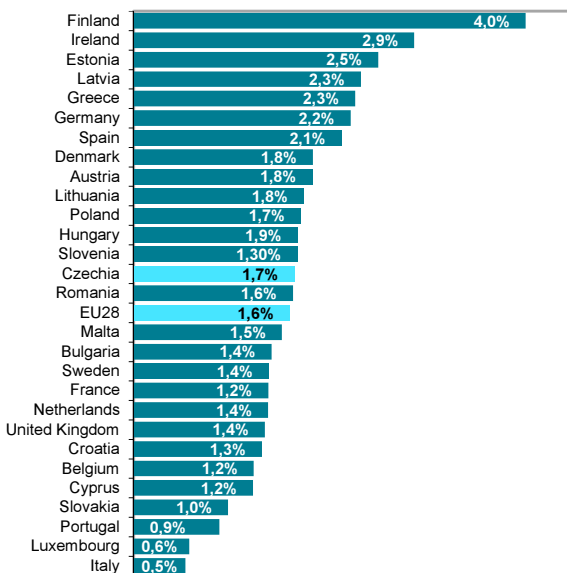
Source: CZSO calculation based on MEYS database

## B ICT students

**Figure B5 University students of ICT education; 2018**  
(% of all university students)



**Figure B6 University students of ICT education; 2018**  
(% of population aged 20 to 29 years)



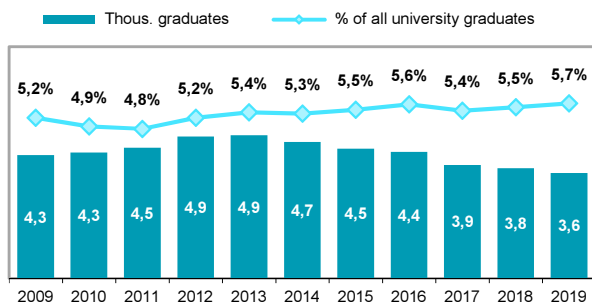
Source: CZSO calculation based on Eurostat database

## B ICT students

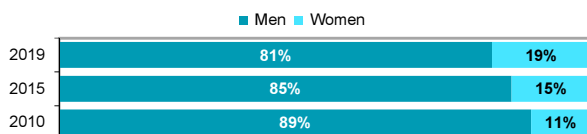
**Table B2 University graduates from ICT education in Czechia**

	Number of graduates		
	2017	2018	2019
<b>Total</b>	<b>3 916</b>	<b>3 802</b>	<b>3 638</b>
Men	3 312	3 181	2 964
Women	604	621	674
<b>Citizenship</b>			
Czech citizens	3 131	2 921	2 668
Foreigners	785	881	970
<b>Study programme</b>			
Bachelor	2 080	2 055	1 989
Master	1 750	1 667	1 580
Doctoral	86	80	69

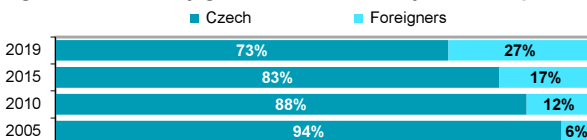
**Figure B7 University graduates from ICT fields of education**



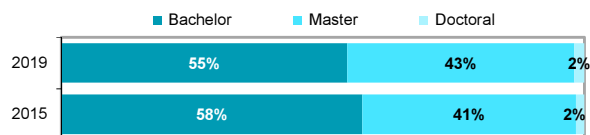
**Figure B8 University graduates from ICT, by gender**



**Figure B9 University graduates from ICT, by citizenship**



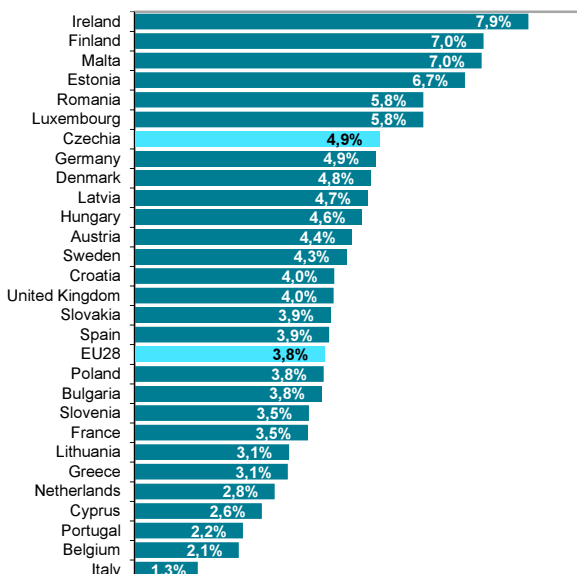
**Fig. B10 University graduates from ICT, by study programme**



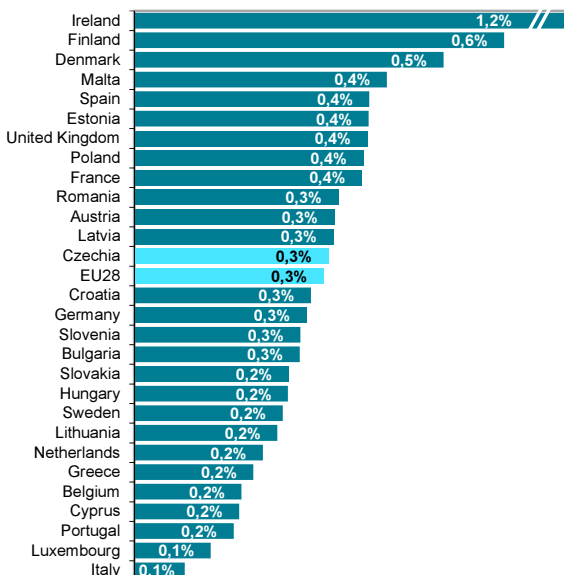
Source: CZSO calculation based on MEYS database

## B ICT students

**Figure B11 University graduates from ICT; 2018**  
(% of all university graduates)



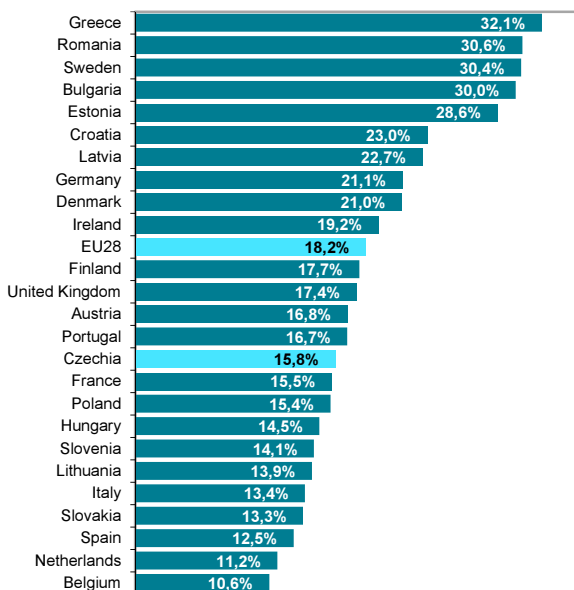
**Figure B12 University graduates from ICT; 2018**  
(% of population aged 20 to 29 years)



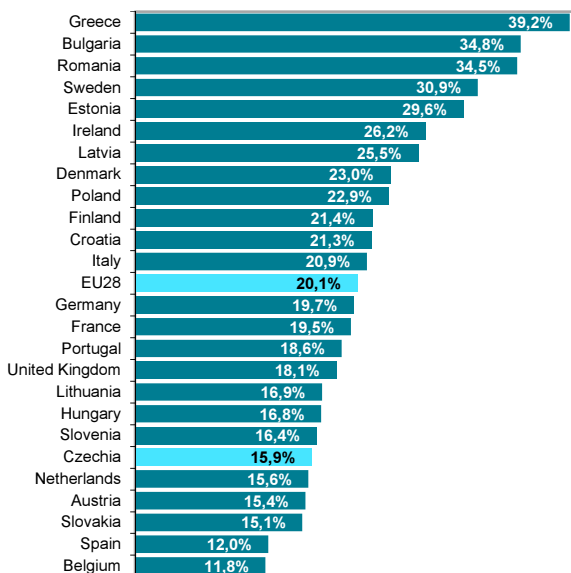
Source: CZSO calculation based on Eurostat database

## B ICT students

**Figure B13 Share of women among all university students of ICT fields of education; 2018**



**Figure B14 Share of women among all university graduates from ICT fields of education; 2018**



Source: CZSO calculation based on Eurostat database



## C ICT investment

### Investments into ICT equipment and software

Investments into ICT equipment and software (hereafter **ICT investment**) in the tables shall mean the **gross fixed capital formation** (GFCF: P.51), which includes mainly acquisitions of fixed assets (P.511) used in the production processes repeatedly or continuously for more than one year and expenses for transition of non-produced assets into ownership (P.512). The definition of GFCF follows **The European System of Regional and National Accounts (ESA 2010)**.

According to the **ESA 2010**, the investments into computer and telecommunication equipment became a part of a newly created item of non-financial assets as **ICT equipment (AN.1132)**.

**Computer software and databases (AN.1173)** involve according to this **ESA 2010** two sub-items as follows: **Computer software (AN.11731)** involves computer programs, program descriptions and supporting materials for both systems & application SW and **Databases (AN.11732)** includes data files organized so as to enable cost-effective data access and use. More about **ESA 2010** at: <http://ec.europa.eu/eurostat/web/esa-2010>

**ICT equipment** is classified to the groups of the **Classification of Products by Activity (CZ-CPA)** as follows: 26.2 Computers and peripheral equipment and 26.3 Communication equipment. **Software** is classified to the groups of the **CZ-CPA** as follows: 62.0 Computer programming, consultancy and related services and 63.1 Data processing, hosting and related services; web portals. Detail description of **CZ-CPA** is available here (only in Czech): <https://www.czso.cz/csu/czso/klasifikace-produkce-cz-cpa->

Data on investments into ICT equipment and software are available by **institutional sectors** and **economic activities** of the monitored entities according to the **CZ NACE** classification.

### Household consumption expenditures on ICT equipment and services

Data on ICT investment in this chapter are supplemented with data on the final consumption of households in the **national concept**, which includes expenditure of residents in Czechia and abroad spent on ICT dedicated to direct satisfaction of personal needs and wishes of individuals.

*ICT is classified here to the International standard of the Classification of Individual Consumption by Purpose (CZ-COICOP) as follows:*

- **ICT equipment:** 08.2 Telephone equipment and 09.1 Audio-visual and information processing equipment (Computers and consumer electronics).
- **ICT services:** 08.3 Telephone services that include primarily payments for calls via landline, mobile phone and payments for Internet connection.

*Note: Item telecommunication includes 08.2 Telephone equipment and 08.3 Telephone (ICT) services.*

Detail description of **CZ- COICOP** is available here (only in Czech): [https://www.czso.cz/csu/czso/klasifikace\\_individualni\\_spo\\_reby\\_-cz\\_coicop-](https://www.czso.cz/csu/czso/klasifikace_individualni_spo_reby_-cz_coicop-)

**The both data**, the total ICT investment and final household consumption expenditure on ICT come from the **Annual National Accounts Statistics**. **Data for the 2019** are preliminary. For more information, see: <http://apl.czso.cz/pll/rocenka/rocenka.indexnu?mylang=EN>

Data for the **international comparisons** come from the **Eurostat database** and refer to the reported or nearest available year.

**For more information on ICT investment** see (only in Czech): [https://www.czso.cz/csu/czso/investice\\_v\\_ict](https://www.czso.cz/csu/czso/investice_v_ict)

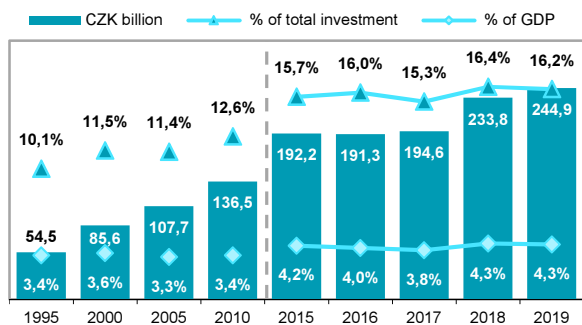
## C ICT investment

**Table C1 ICT investment in Czechia**

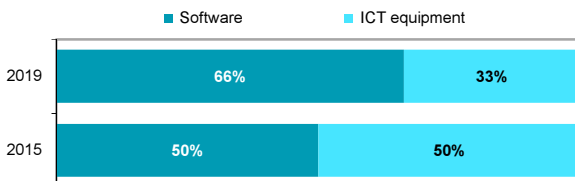
CZK million

	2017	2018	2019
<b>Total</b>	<b>194 625</b>	<b>233 830</b>	<b>244 873</b>
ICT equipment	76 809	82 840	83 780
Software	117 816	150 990	161 093
<b>Industry (CZ-NACE Section)</b>			
Agriculture, forestry and fishing	2 123	2 197	1 149
Mining and quarrying	455	578	230
Manufacturing	54 004	58 101	65 585
Electricity, gas and water supply	6 003	6 035	5 918
Construction	4 193	4 416	4 846
Wholesale and retail trade	13 643	16 895	15 602
Transportation and storage	5 473	7 739	7 901
Accommodation and food service activities	1 530	2 030	1 919
Information and communication	51 594	68 858	70 615
Financial and insurance activities	22 897	27 208	27 629
Real estate activities	1 958	2 466	2 723
Professional, scientific and technical activities	10 820	14 651	18 826
Administrative and support service activities	2 458	2 919	2 508
Public administration and defence	7 863	9 225	9 817
Education	2 906	3 708	3 240
Human health and social work activities	3 327	4 224	3 915
Arts, entertainment and recreation	1 468	1 905	1 985
Other services	1 910	675	465

**Figure C1 ICT investment**



**Figure C2 ICT investment, by asset (%)**



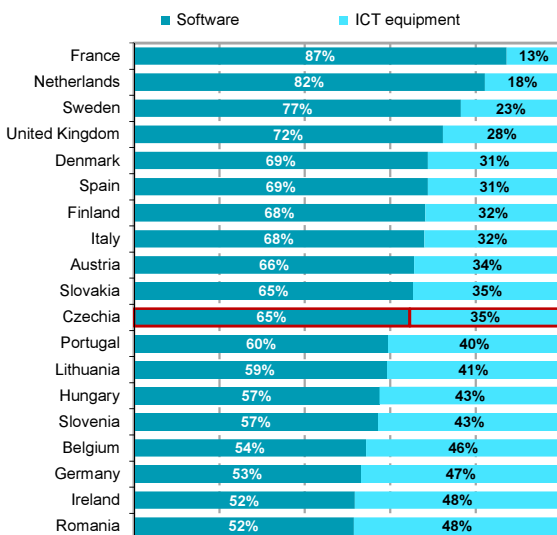
Source: CZSO, Annual National Accounts Statistics

## C ICT investment

Figure C3 ICT investment (% of GDP)



Figure C4 ICT investment, by asset (%); 2018\*



\* or the nearest available year

Source: CZSO calculations based on Eurostat data

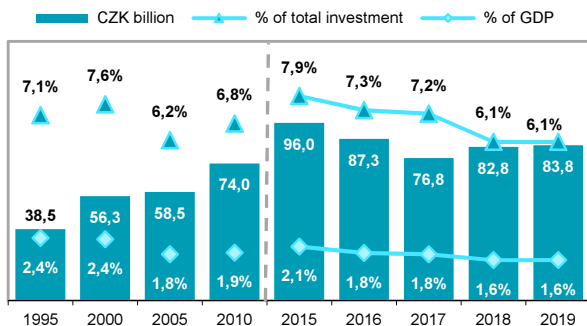
## C ICT investment

**Table C2 ICT equipment investment in Czechia**

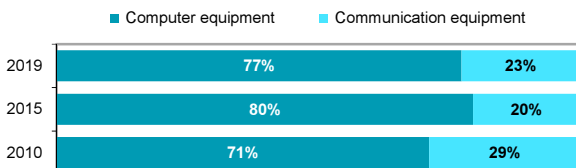
CZK million

	2017	2018	2019
<b>Total</b>	<b>76 809</b>	<b>82 840</b>	<b>83 780</b>
Computer equipment	57 302	63 956	64 845
Communication equipment	19 507	18 884	18 935
<b>Industry (CZ-NACE Section)</b>			
Agriculture, forestry and fishing	1 804	1 726	628
Mining and quarrying	372	483	122
Manufacturing	39 609	40 263	46 257
Electricity, gas and water supply	3 798	3 104	2 802
Construction	2 934	2 947	3 240
Wholesale and retail trade	3 860	3 985	1 072
Transportation and storage	1 477	2 252	2 013
Accommodation and food service activities	1 216	1 615	1 473
Information and communication	7 851	9 549	6 307
Financial and insurance activities	1 082	1 662	2 865
Real estate activities	655	715	872
Professional, scientific and technical activ.	3 506	3 491	6 749
Administrative and support service activ.	623	615	80
Public administration and defence	3 080	3 898	3 786
Education	1 669	2 605	2 208
Human health and social work activities	2 282	3 010	2 393
Arts, entertainment and recreation	646	623	609
Other services	345	297	304

**Figure C5 ICT equipment investment**



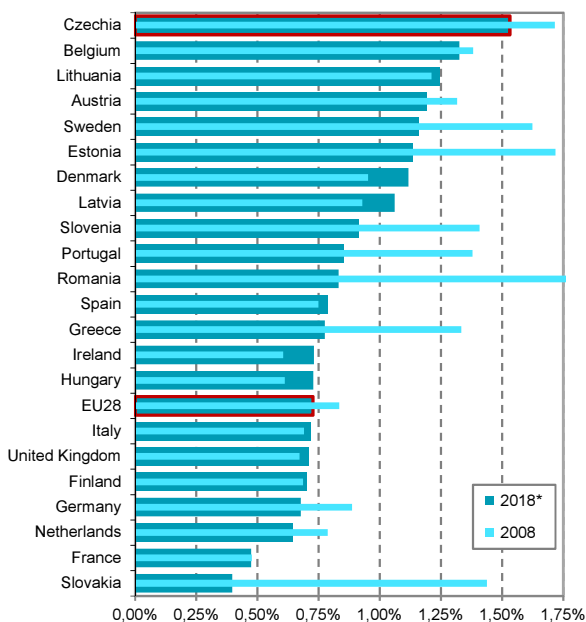
**Figure C6 ICT equipment investment, by asset**



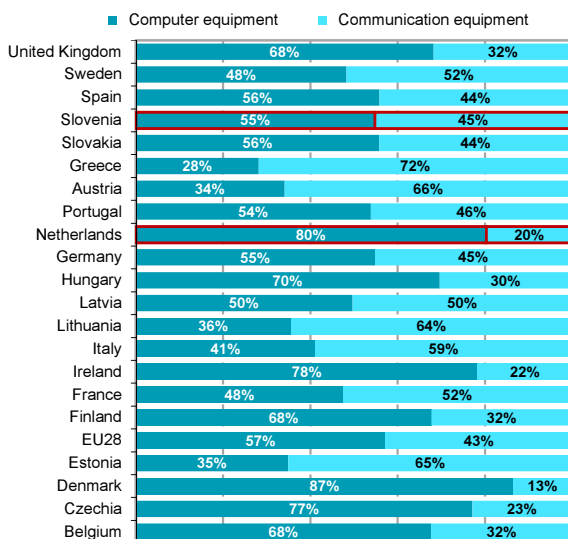
Source: CZSO, Annual National Accounts Statistics

## C ICT investment

**Figure C7 ICT equipment investment (% GDP)**



**Figure C8 ICT equipment investment, by asset (%); 2018\***



\* or the nearest available year

Source: CZSO calculations based on Eurostat data

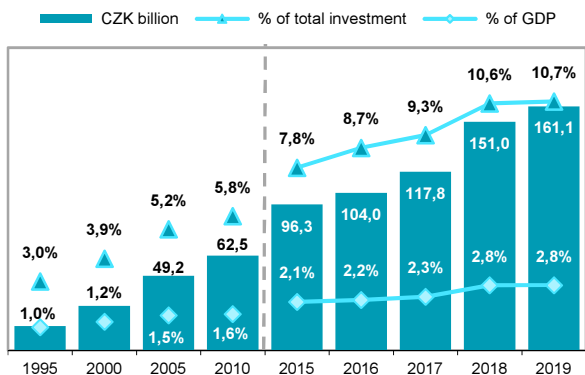
## C ICT investment

**Table C3 Software investment in Czechia**

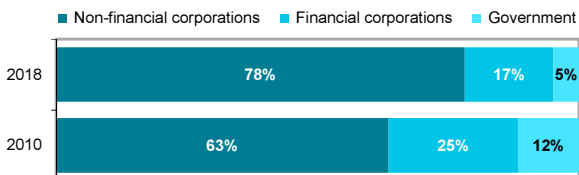
CZK million

	2017	2018	2019
<b>Total</b>	<b>117 816</b>	<b>150 990</b>	<b>161 093</b>
<b>Industry (CZ-NACE Section)</b>			
Agriculture, forestry and fishing	319	471	521
Mining and quarrying	83	95	108
Manufacturing	14 395	17 838	19 328
Electricity, gas and water supply	2 205	2 931	3 116
Construction	1 259	1 469	1 606
Wholesale and retail trade	9 783	12 910	14 530
Transportation and storage	3 996	5 487	5 888
Accommodation and food service activities	314	415	446
Information and communication	43 743	59 309	64 308
Financial and insurance activities	21 815	25 546	24 764
Real estate activities	1 303	1 751	1 851
Professional, scientific and technical activities	7 314	11 160	12 077
Administrative and support service activities	1 835	2 304	2 428
Public administration and defence	4 783	5 327	6 031
Education	1 237	1 103	1 032
Human health and social work activities	1 045	1 214	1 522
Arts, entertainment and recreation	822	1 282	1 376
Other services	1 565	378	161

**Figure C9 Software investment**



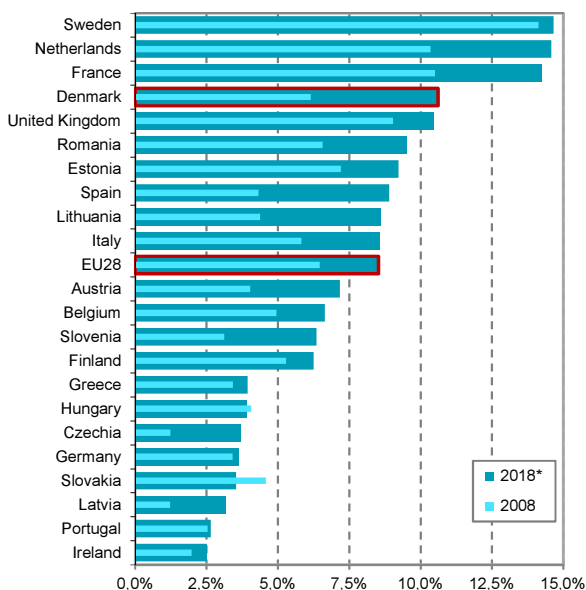
**Figure C10 Software investment, by institutional sectors**



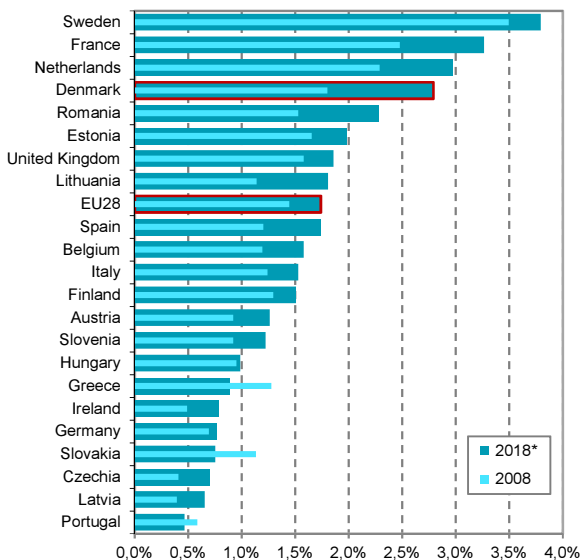
Source: CZSO, Annual National Accounts Statistics

## C ICT investment

**Figure C11 Software investment**  
(% of total investment)



**Figure C12 Software investment (% of GDP)**



\* or the nearest available year

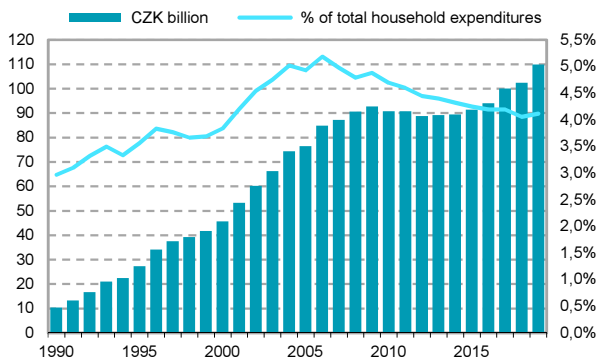
Source: CZSO calculations based on Eurostat data

## C ICT investment

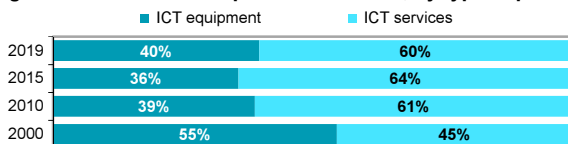
**Table C4 Household consumption expenditures on ICT equipment and services in Czechia**

	CZK million		
	2017	2018	2019
<b>Total</b>	<b>99 995</b>	<b>102 372</b>	<b>109 874</b>
<b>ICT equipment</b>	<b>37 170</b>	<b>38 837</b>	<b>43 734</b>
Telephone equipment	6 587	8 119	9 452
Computers and consumer electronics	30 583	30 718	34 282
<b>ICT (telephone) services</b>	<b>62 825</b>	<b>63 535</b>	<b>66 140</b>

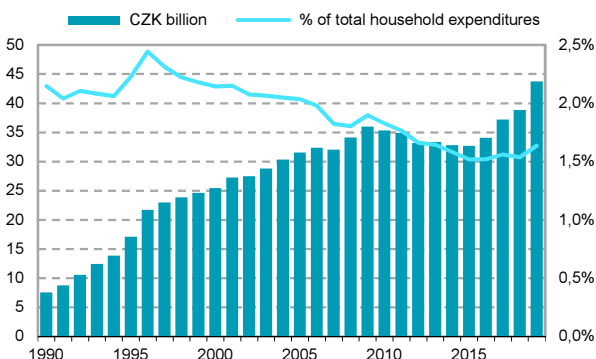
**Figure C13 Household consumption expenditures on ICT**



**Figure C14 Household expenditures on ICT, by type of product**



**Figure C15 Households expenditures on ICT equipment**

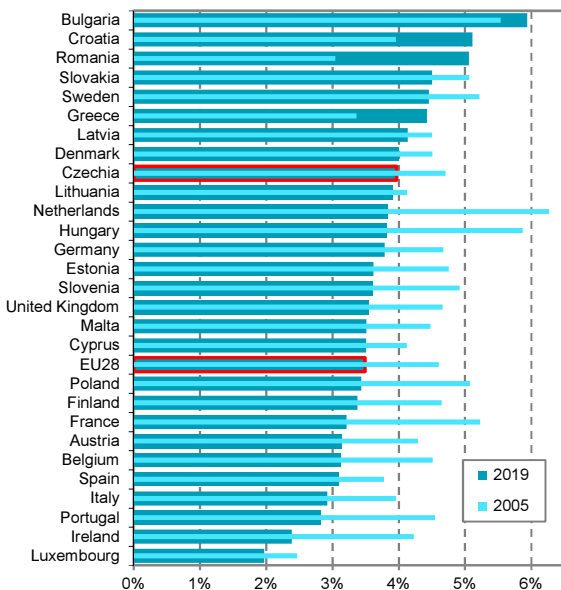


Source: CZSO, Annual National Accounts Statistics

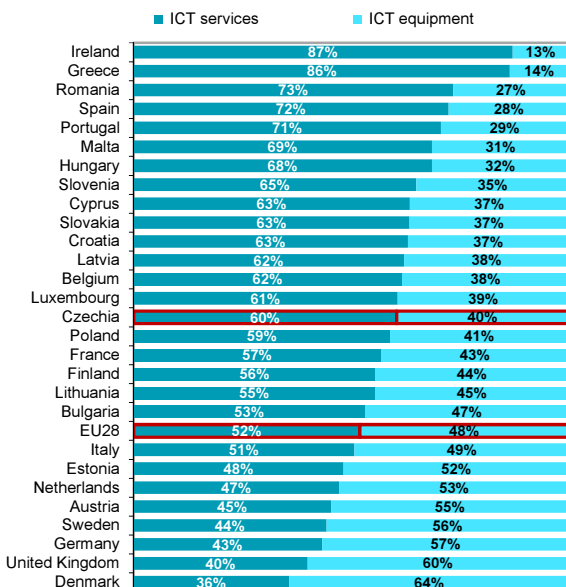


## C ICT investment

**Figure C16 Household consumption expenditures on ICT**  
(% of total households consumption expenditures)



**Figure C17 Household consumption expenditures on ICT, by type of product; 2019 (%)**



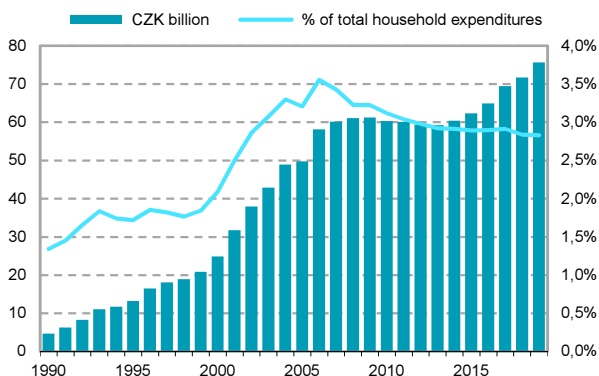
Source: CZSO calculations based on Eurostat data

## C ICT investment

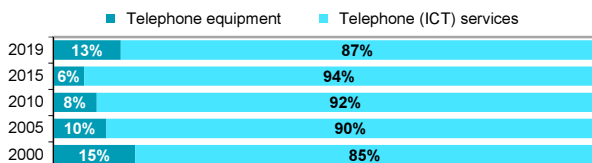
**Table C5 Household consumption expenditures on telecommunication in Czechia**

	CZK million		
	2016	2017	2018
<b>Total</b>	<b>62 573</b>	<b>64 780</b>	<b>68 727</b>
Telephone equipment	4 921	5 355	5 781
Telephone (ICT) services	57 652	59 425	62 946

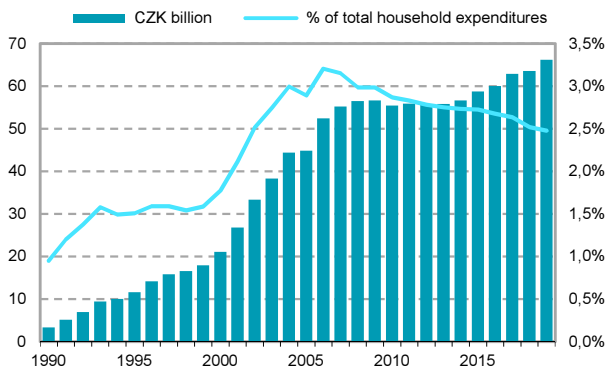
**Figure C18 Household expenditures on telecommunication**



**Figure C19 Household expenditures on telecommunication, by type of product**



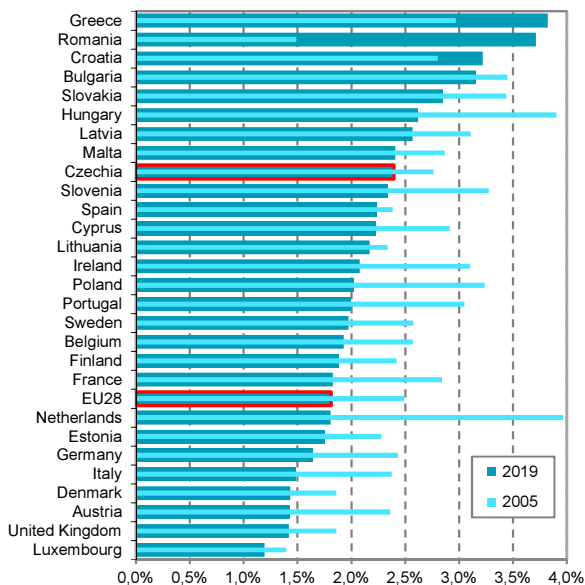
**Figure C20 Household expenditures on ICT services**



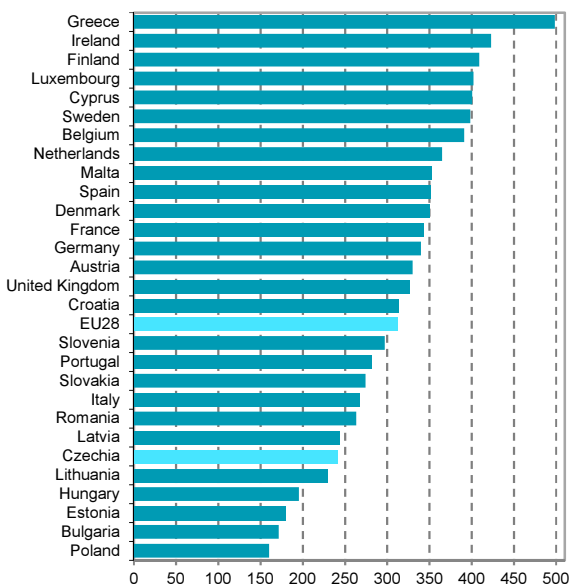
Source: CZSO, Annual National Accounts Statistics

## C ICT investment

**Figure C21 Household consumption expenditures on ICT services (% of total households consumption expenditures)**



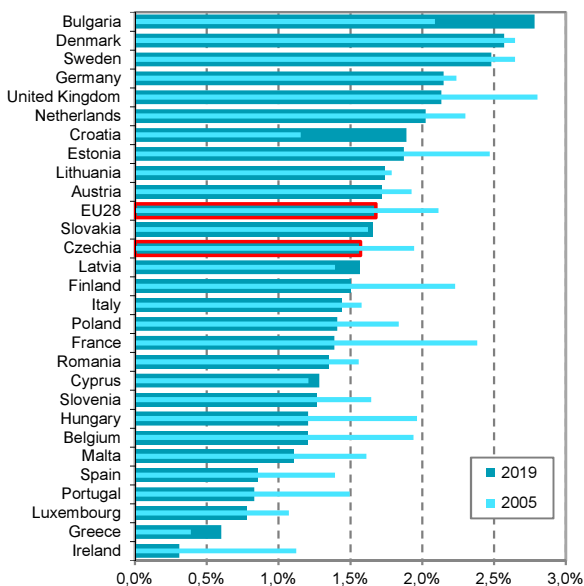
**Figure C22 Household consumption expenditures on ICT services; 2019 (EUR per capita)**



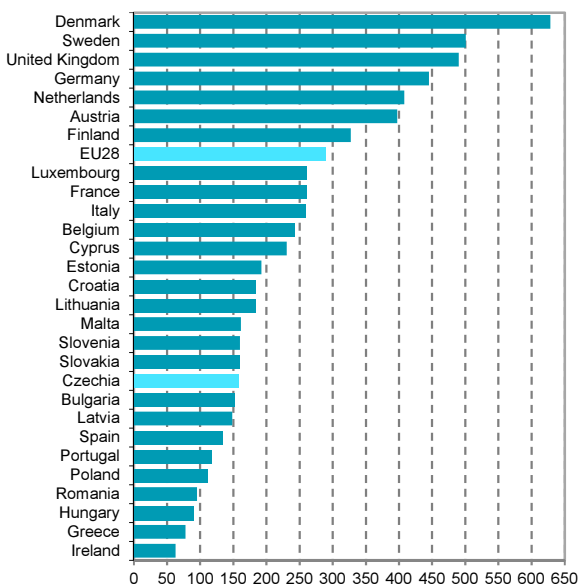
Source: CZSO calculations based on Eurostat data

## C ICT investment

**Figure C23 Household consumption expenditures on ICT equipment** (% of total households consumption expenditures)



**Figure C24 Household consumption expenditures on ICT equipment; 2019 (EUR per capita)**



Source: CZSO calculations based on Eurostat data

## D ICT research and development

### ICT R&D expenditure

This sub-chapter presents data on financial resources devoted in research and development of ICT equipment and software (hereafter **ICT R&D expenditure**) regardless of the main economic activity and sector of R&D performers. ICT is **classified** here into two main categories according to the groups of the **Classification of Products by Activity (CZ-CPA)** as follows:

- **ICT equipment includes:** 26.1 Electronic components and boards; 26.2 Computers and peripheral equipment; 26.3 Communication equipment; 26.4 Consumer electronics and 26.8 Magnetic and optical media.
- **Software includes:** 58.2 Software publishing; 61 Telecommunications services; 62 Computer programming, consultancy & related services and 63.1 Data processing, hosting & related services; web portals.

Detail description of **CZ-CPA** is available here (*only in Czech*): <https://www.czso.cz/csu/czso/klasifikace-produkce-cz-cpa->

**Research and experimental development (R&D)** comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.

*Note: Software-related activities of a routine nature which do not involve scientific and/or technological advances or resolution of technological uncertainties are not to be considered R&D. For more information see Frascati Manual (OECD, Paris 2015) at: <http://oe.cd/frascati>*

Data in this sub-chapter are based on the results of the **special module** on R&D expenditures in selected **technological areas** that is included in the Czech annual questionnaire on R&D. ICT R&D expenditure figures are **available** by sectors of R&D performance and industry (CZ-NACE) classification. **International comparison is not available** for this data set.

### R&D expenditures and personnel in the ICT sector industries

This sub-chapter focuses on R&D expenditures and R&D personnel in enterprises with the main economic activity that belongs to the **ICT sector**. In general, the term ICT sector includes both: **ICT manufacturing** and **ICT services** which are associated with the production and/or distribution of information and communication technologies (ICT) and a provision of related services.

Industries of ICT sector includes all enterprises with the prevailing economic activity according to the codes of the Classification of Economic Activities (**CZ-NACE**) that fulfill the OECD official definition of ICT sector. For more information, see **Chapter G** or **dedicated website** to the measurement of **information economy industries** (*only in Czech*): <https://www.czso.cz/csu/czso/odvetvi-informacni-ekonomiky>

Data for the **international comparisons** come from the **Eurostat database** and refer to the reported or nearest available year.

*Note: Data on R&D expenditures in the ICT sector has less predictive value than the figures for the total ICT R&D expenditures included in first sub-chapter. Enterprises within the ICT sector can perform their R&D activities in areas other than ICT and vice versa enterprises outside the ICT sector can exercise their R&D activities in the ICT field.*

The both data sets on ICT R&D expenditures come from the results of the **Annual questionnaire on R&D**. For more information, see (*only in Czech*): [https://www.czso.cz/csu/czso/vysledky\\_vyzkumu\\_a\\_vyvoje](https://www.czso.cz/csu/czso/vysledky_vyzkumu_a_vyvoje)

## D ICT research and development

Table D1 ICT R&D expenditures in Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>15 448</b>	<b>18 720</b>	<b>20 474</b>
financed from government funds	1 452	1 924	1 920
<b>Type of ICT product</b>			
ICT equipment	5 024	5 594	5 791
Software	10 424	13 125	14 683
<b>Type of R&amp;D performer</b>			
<b>Enterprises, total</b>	<b>14 330</b>	<b>17 101</b>	<b>18 830</b>
National enterprises	4 510	5 203	5 915
Foreign-controlled enterprises	9 820	11 898	12 914
<b>Public universities</b>	<b>1 060</b>	<b>1 535</b>	<b>1 577</b>
<b>Other R&amp;D performers</b>	<b>58</b>	<b>84</b>	<b>68</b>

Figure D1 ICT R&D expenditures

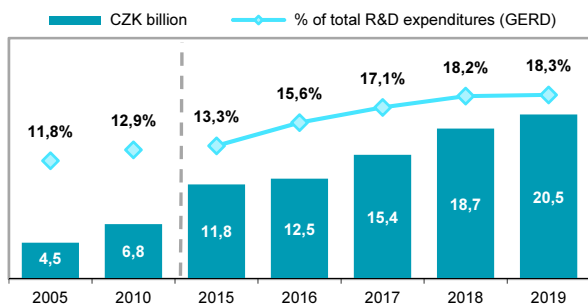


Figure D2 ICT R&D expenditures, by type of product

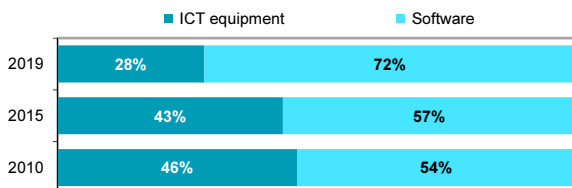
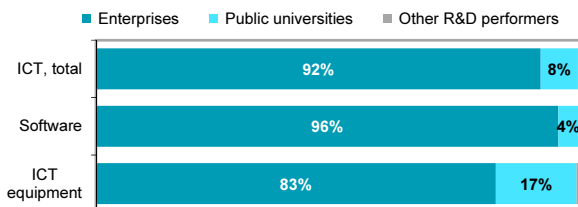


Figure D3 ICT R&D expenditures, by type of performer; 2019



Source: CZSO, Annual R&D survey

## D ICT research and development

Table D2 Software R&D expenditures in Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>10 424</b>	<b>13 125</b>	<b>14 683</b>
financed from government funds	489	751	652
<b>Type of R&amp;D performer</b>			
<b>Enterprises, total</b>	<b>10 029</b>	<b>12 464</b>	<b>14 041</b>
National enterprises	2 899	3 597	4 302
Foreign-controlled enterprises	7 130	8 867	9 739
<b>Public universities</b>	<b>367</b>	<b>630</b>	<b>609</b>
<b>Other R&amp;D performers</b>	<b>27</b>	<b>32</b>	<b>33</b>

Figure D4 Software R&D expenditures

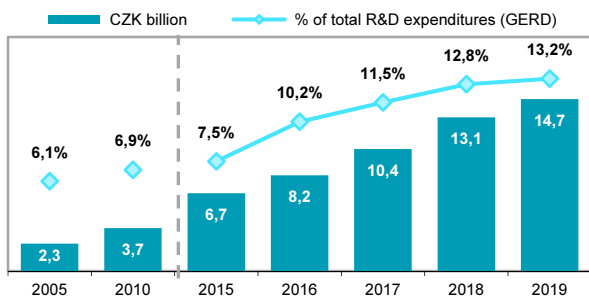


Figure D5 Software R&D expenditures, by performer; 2019

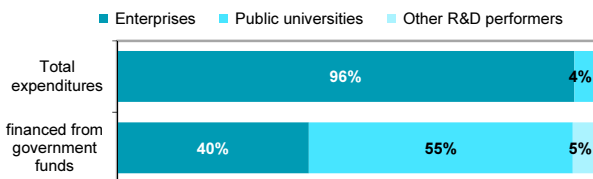
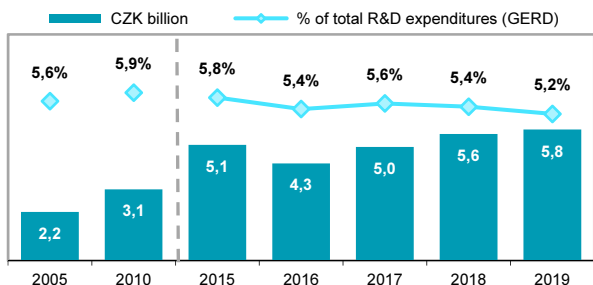


Figure D6 ICT equipment R&D expenditures



Source: CZSO, Annual R&D survey

## D ICT research and development

Table D3 Business ICT R&D expenditures in Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>14 330</b>	<b>17 101</b>	<b>18 830</b>
financed from government funds	646	861	784
<b>Type of ICT product</b>			
ICT equipment	4 301	4 637	4 789
Software	10 029	12 464	14 041
<b>Enterprise size group</b>			
Small (0-49 employees)	1 480	1 674	1 968
Medium (50-249 employees)	3 899	3 677	3 845
Large (250+ employees)	8 952	11 749	13 017
<b>Ownership of enterprises</b>			
National enterprises	4 510	5 203	5 915
Foreign-controlled enterprises	9 820	11 898	12 914
<b>Industry of enterprises (CZ-NACE)</b>			
<b>ICT sector industries, total</b>	<b>10 035</b>	<b>12 644</b>	<b>13 286</b>
ICT manufacturing	245	295	335
Telecommunications	724	794	366
IT services	9 066	11 555	12 585
<b>Other industries</b>	<b>4 296</b>	<b>4 457</b>	<b>5 544</b>

Figure D7 Business ICT R&D expenditures

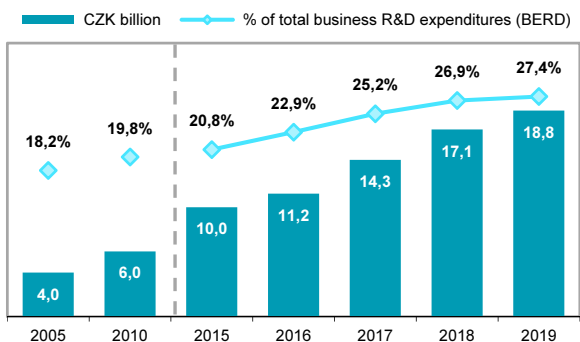
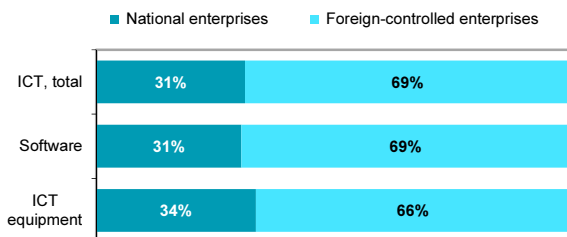


Figure D8 Business ICT R&D expenditures, by ownership; 2019



Source: CZSO, Annual R&D survey



## D ICT research and development

Table D4 Business ICT R&D expenditures in Czechia; 2019

CZK million

	Total	ICT equipment	Software
<b>Total</b>	<b>18 830</b>	<b>4 789</b>	<b>14 041</b>
financed from government funds	784	522	262
<b>Enterprise size group</b>			
Small (0-49 employees)	1 968	430	1 538
Medium (50-249 employees)	3 845	856	2 989
Large (250+ employees)	13 017	3 504	9 513
<b>Ownership of enterprises</b>			
National enterprises	5 915	1 614	4 302
Foreign-controlled enterprises	12 914	3 176	9 739
<b>Industry of enterprises (CZ-NACE)</b>		0	
<b>ICT sector industries, total</b>	<b>13 286</b>	<b>1 417</b>	<b>11 869</b>
ICT manufacturing	335	215	120
Telecommunications	366	7	359
IT services	12 585	1 195	11 390
<b>Other industries</b>	<b>5 544</b>	<b>3 372</b>	<b>2 171</b>

Figure D9 Business ICT R&D expenditures, by type of product

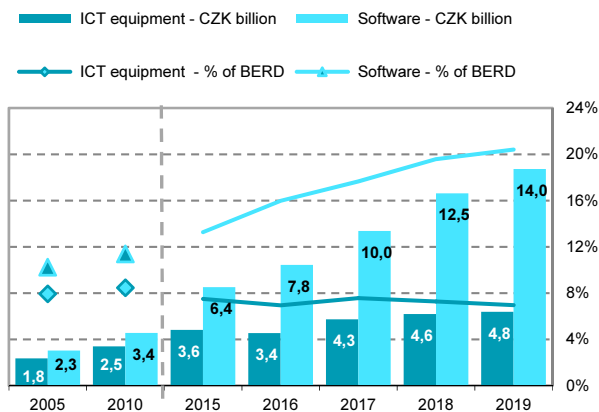
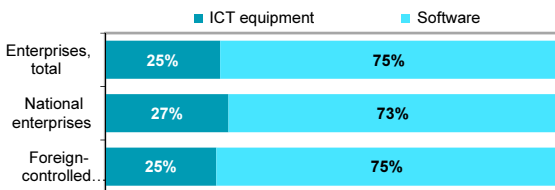


Figure D10 Business ICT R&D expenditures, by ownership of R&D performers and type of product; 2019



Source: CZSO, Annual R&D survey

## D ICT research and development

Table D5 R&D expenditures in the ICT sector in Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>11 190</b>	<b>13 495</b>	<b>14 600</b>
financed from government funds	889	1 067	983
<b>Type of product</b>			
ICT equipment	1 712	1 802	1 417
Software	8 322	10 842	11 869
Other non ICT related products	1 155	851	1 313
<b>Enterprise size group</b>			
Small (0-49 employees)	1 439	1 568	1 933
Medium (50-249 employees)	3 768	3 187	3 441
Large (250+ employees)	5 982	8 740	9 225
<b>Ownership of enterprises</b>			
National enterprises	3 800	4 306	4 830
Foreign-controlled enterprises	7 390	9 189	9 770
<b>Industry of enterprises (ICT sub-sectors)</b>			
ICT manufacturing	512	591	902
<b>ICT services, total</b>	<b>10 677</b>	<b>12 903</b>	<b>13 698</b>
Telecommunications	727	801	377
Computer programming	8 017	10 052	10 378
Data processing and hosting	1 252	1 101	1 066
Other IT services	682	949	1 877

Figure D11 R&D expenditures in the ICT sector

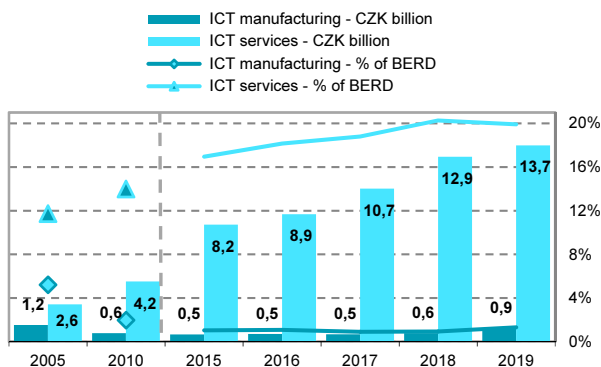
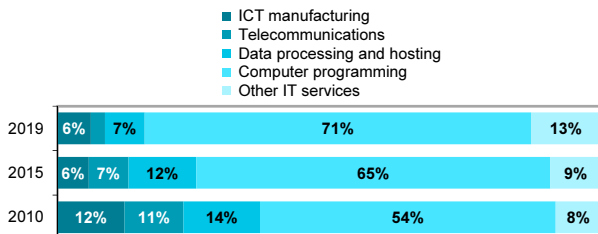


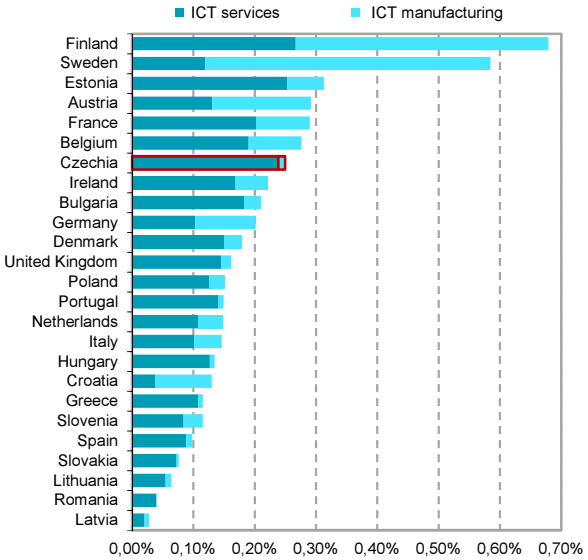
Figure D12 R&D expenditures in the ICT sector, by industry



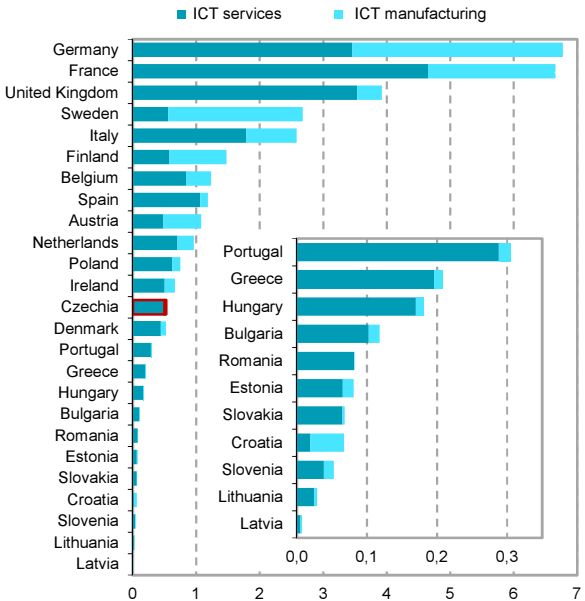
Source: CZSO, Annual R&D survey

## D ICT research and development

**Figure D13 R&D expenditures in the ICT sector; 2018**  
(% of GDP)



**Figure D14 R&D expenditures in the ICT sector; 2018**  
(EUR billion)



Source: CZSO calculations based on Eurostat data

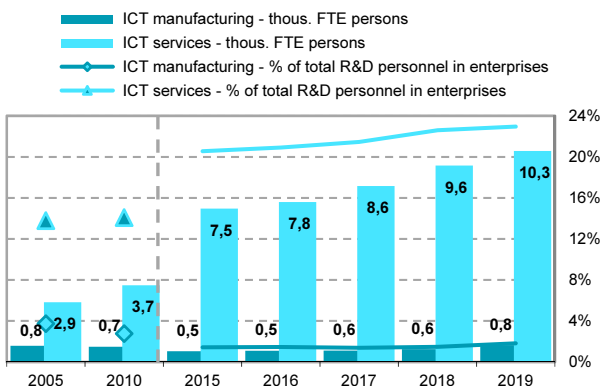
## D ICT research and development

**Table D6 R&D personnel in the ICT sector in Czechia**

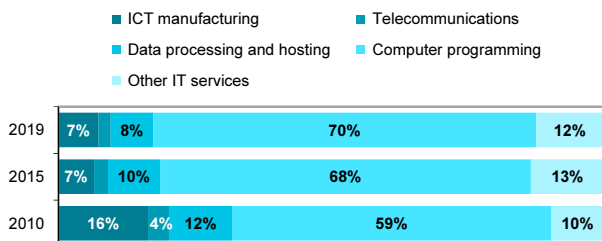
R&D personnel (Full Time Equivalent Numbers - FTE)

	2017	2018	2019
<b>Total</b>	<b>9 130</b>	<b>10 196</b>	<b>11 102</b>
Man	1 084	1 141	1 363
Woman	8 046	9 055	9 739
<b>Enterprise size group</b>			
Small (0-49 employees)	1 709	1 857	2 078
Medium (50-249 employees)	3 214	2 891	2 998
Large (250+ employees)	4 207	5 449	6 026
<b>Ownership of enterprises</b>			
National enterprises	4 094	4 428	4 815
Foreign-controlled enterprises	5 037	5 768	6 287
<b>Industry of enterprises (ICT sub-sectors)</b>			
ICT manufacturing	553	623	818
<b>ICT services, total</b>	<b>8 578</b>	<b>9 573</b>	<b>10 284</b>
Telecommunications	234	352	248
Computer programming	6 629	7 489	7 788
Data processing and hosting	967	852	866
Other IT services	746	880	1 382

**Figure D15 R&D personnel in the ICT sector**



**Figure D16 R&D personnel in the ICT sector, by industry**



Source: CZSO, Annual R&D survey

## E International trade in ICT goods

Goods in the field of information and communication technologies (hereinafter referred to as ICT goods) are defined as goods whose main function is to carry out or enable communication or processing of information, including their recording, transmission and display by electronic means (OECD 2009).

More detailed data for ICT goods are available only according to **statistics on the Cross-border movements of goods**, which refers exclusively to the physical movement of goods across borders. Data on the physical movement of goods inside and outside the territory of the Czech Republic are obtained in accordance with the requirements and needs of Eurostat.

Data on the movement of goods across borders are more detailed and better internationally comparable, but they do not indicate the trade in these goods, ie the change of ownership between residents and non-residents. On the contrary, this is taken into account by external trade statistics, which monitor the external trade in goods between Czech and foreign entities. More details on this issue of the dual concept of foreign trade can be found here: [International trade in goods \(change of ownership\) - methodology | CZSO](#) and here: [Cross border movements of goods | CZSO](#).

The **list of ICT goods** was first defined in 2003 by the OECD according to the International Customs Nomenclature of the **Harmonized Commodity Description** and Coding System of the World Customs Organization of 2002. At present, the list of ICT goods from the HS is based on 2017. More here: <https://bit.ly/3smUqu2>

The Czech Statistical Office has grouped individual items of ICT goods defined according to the HS 2017 nomenclature and the **Combined Nomenclature (CN)** of the European Union into the following five main categories:

- **Computer equipment and peripherals,**
- **Communication equipment,**
- **Consumer electronics,**
- **Electronic components,**
- **ICT parts n.e.s.**

Detailed information to Combined Nomenclature are here (*only in Czech*): <https://www.celnisprava.cz/cz/clo/sazebni-zarazeni-zbozi/spolecny-celni-sazebnik-es/Stranky/default.aspx>

Data for the Czech Republic comes from the Cross-border movements of goods database, for more see [Cross-border movements of goods \(CBmG\) \(CZSO.CZ\)](#).

Data for **international comparisons** come from **Eurostat** data sources.

Data for international comparisons refer to the reported or nearest available year. More information at: [Database - International trade in goods - Eurostat \(europa.eu\)](#)

For further information on ICT external trade see (*only in Czech*): [https://www.czso.cz/csu/czso/zahranicni\\_obchod\\_s\\_ict\\_zbozím](https://www.czso.cz/csu/czso/zahranicni_obchod_s_ict_zbozím)

## E International trade in ICT goods

Table E1 ICT goods exports from Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>564 760</b>	<b>667 983</b>	<b>740 780</b>
Computer equipment and peripherals	283 506	324 867	335 466
Communication equipment	138 167	196 020	242 408
Consumer electronics	74 650	78 676	71 661
Electronic components	33 101	34 371	38 808
ICT parts n.e.s.	35 335	34 049	52 438

Figure E1 ICT goods exports

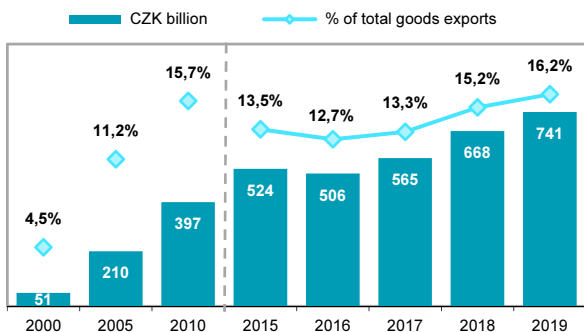


Figure E2 ICT goods exports, by commodities

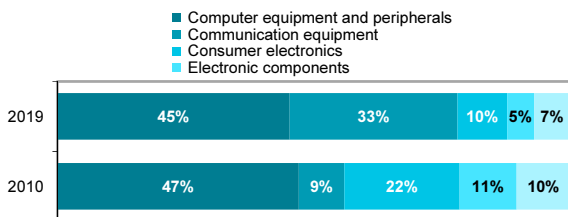
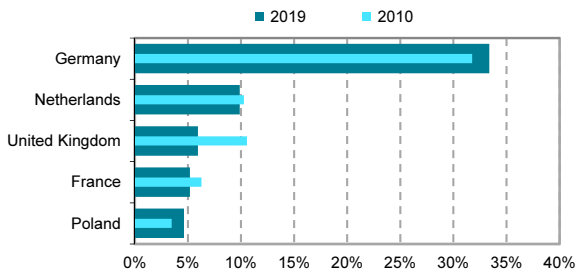


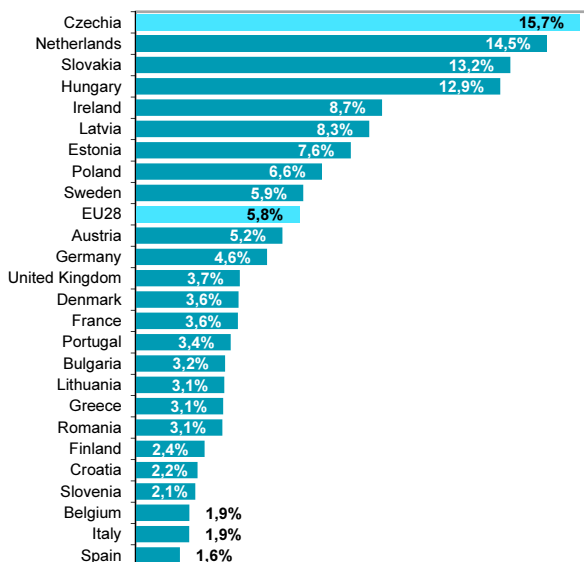
Figure E3 ICT goods exports, by countries



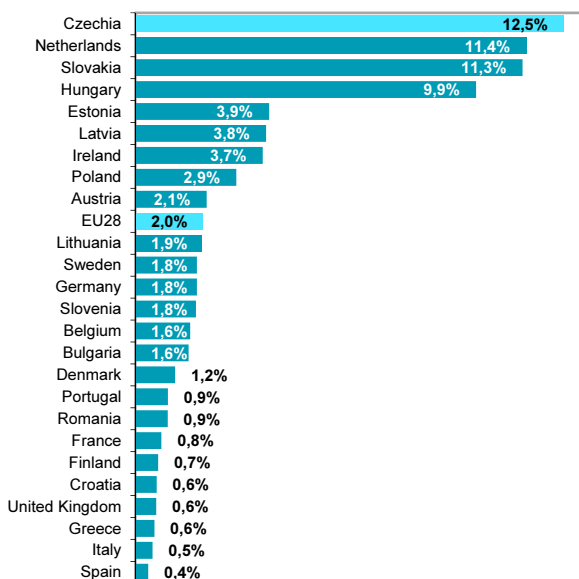
Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

**Figure E4 ICT goods exports; 2019**  
(% of total goods exports)



**Figure E5 ICT goods exports; 2019 (% of GDP)**



Source: CZSO calculations based on Eurostat

## E International trade in ICT goods

Table E2 ICT goods imports to Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>578 493</b>	<b>657 289</b>	<b>715 750</b>
Computer equipment and peripherals	196 963	206 974	224 436
Communication equipment	141 049	209 053	255 061
Consumer electronics	43 031	45 400	51 065
Electronic components	101 739	105 611	93 257
ICT parts n.e.s.	95 711	90 251	91 931

Figure E6 ICT goods imports

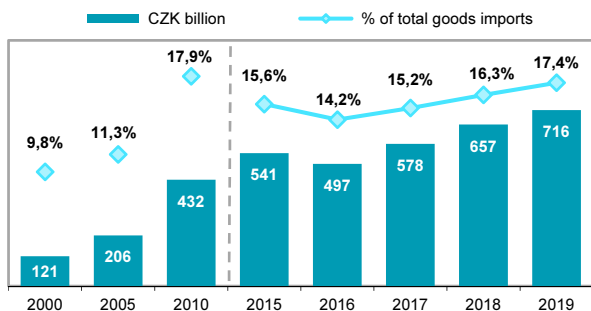


Figure E7 ICT goods imports, by commodities

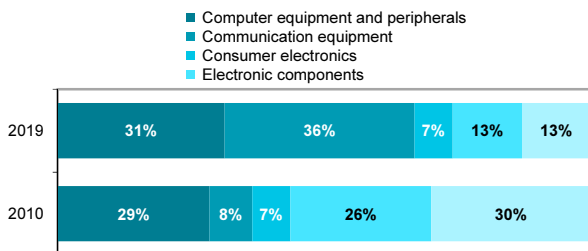
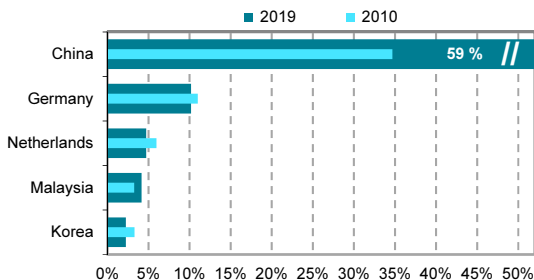


Figure E8 ICT goods imports, by countries

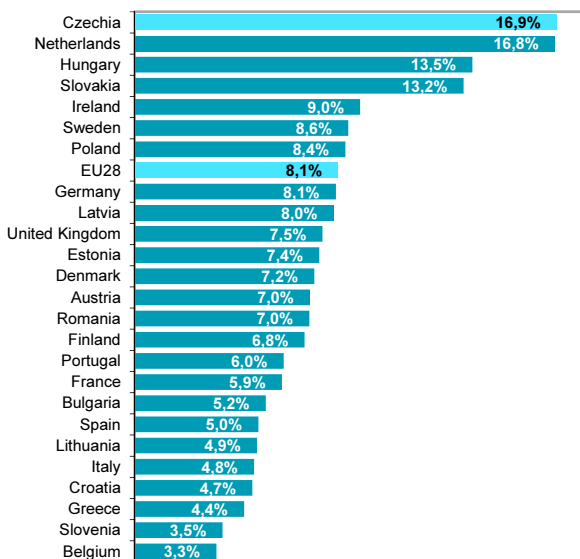


Source: CZSO, Cross-border movements of goods database

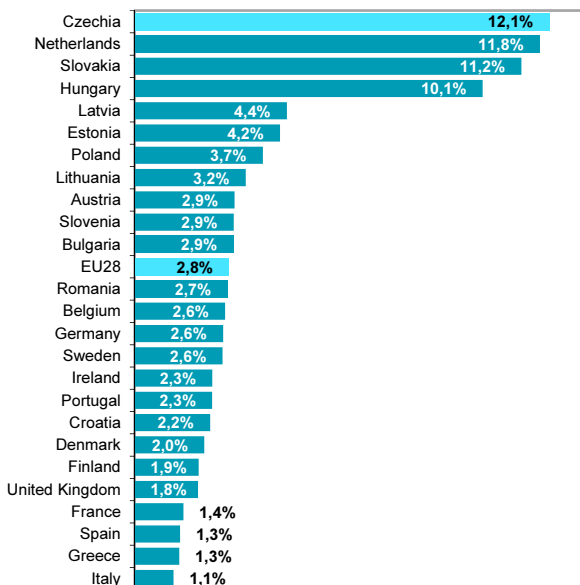


## E International trade in ICT goods

**Figure E9 ICT goods imports; 2019**  
(% of total goods imports)



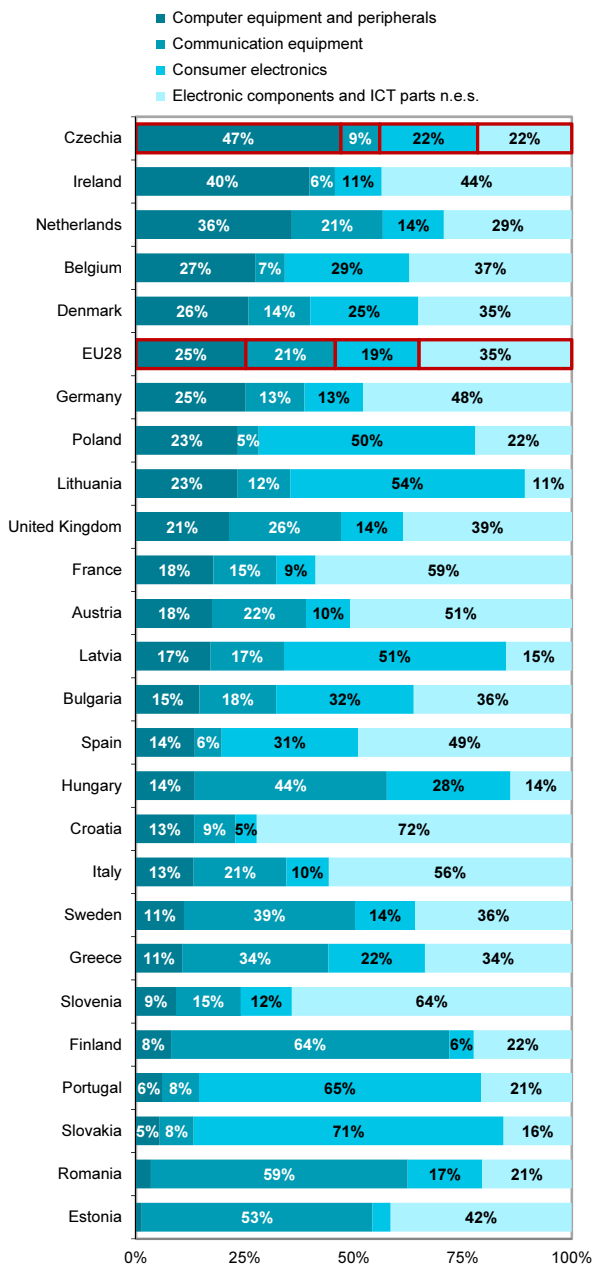
**Figure E10 ICT goods imports; 2019** (% of GDP)



Source: CZSO calculations based on Eurostat

## E International trade in ICT goods

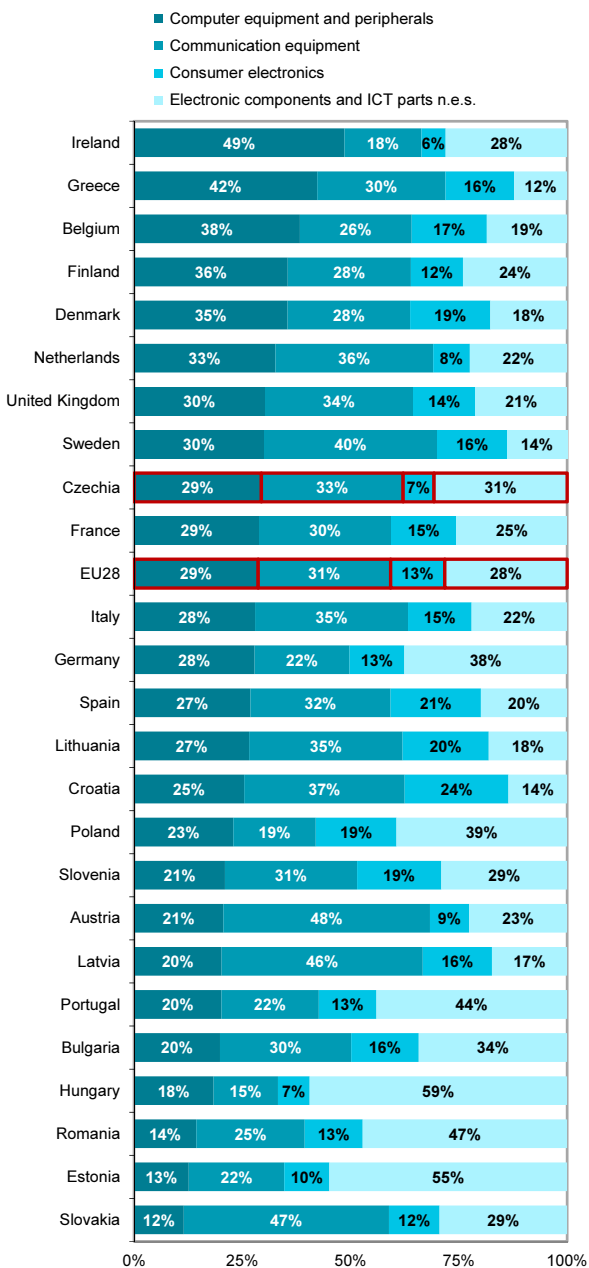
Figure E11 ICT goods exports, by commodities; 2019



Source: CZSO calculations based on Eurostat

## E International trade in ICT goods

Figure E12 ICT goods imports, by commodities; 2019



Source: CZSO calculations based on Eurostat

## E International trade in ICT goods

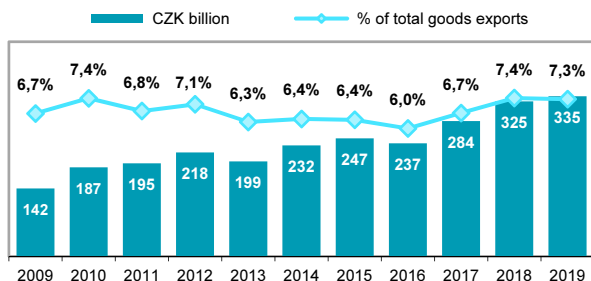
**Table E3 Computer equipment exports from Czechia**

CZK million

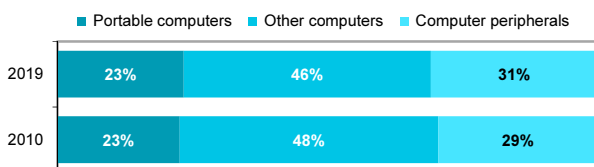
	2017	2018	2019
<b>Total</b>	<b>283 506</b>	<b>324 867</b>	<b>335 466</b>
Portable computers	64 699	66 589	78 471
Other computers	120 643	162 401	153 517
Computer peripherals, total	98 164	95 877	103 478
Storage units	49 816	48 255	44 588
Sound, video, network and similar cards	12 097	13 751	20 388
Monitors used with computers	19 748	19 324	22 392
Printers, copying or faxing machines	6 388	5 589	5 251
Other input or output peripherals*	10 114	8 957	10 859

\* Keyboards; joysticks, computer mice, scanners or optical readers

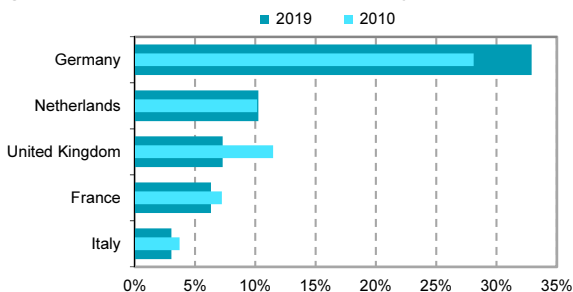
**Figure E3 Computer equipment exports**



**Figure E14 Computer equipment exports, by commodities**



**Figure E15 Computer equipment exports, by countries**



Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

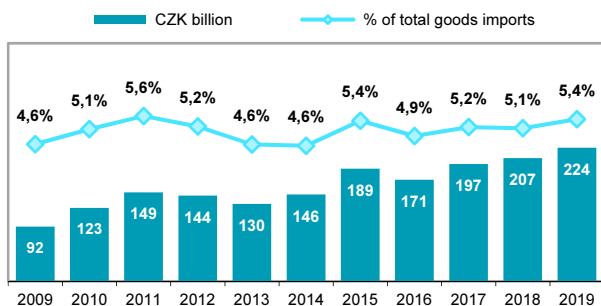
**Table E4 Computer equipment imports to Czechia**

CZK million

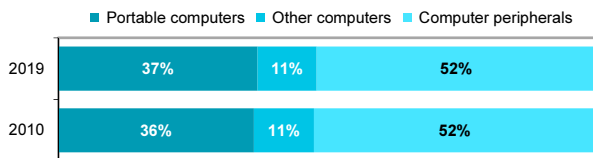
	2017	2018	2019
<b>Total</b>	<b>196 963</b>	<b>206 974</b>	<b>224 436</b>
Portable computers	71 830	76 491	83 235
Other computers	19 125	21 843	24 700
Computer peripherals, total	106 008	108 640	116 501
Storage units	57 324	58 638	51 090
Sound, video, network and similar cards	11 529	12 933	23 000
Monitors used with computers	19 875	19 511	22 034
Printers, copying or faxing machines	7 150	6 798	7 387
Other input or output peripherals*	10 130	10 760	12 990

\* Keyboards; joysticks, computer mice, scanners or optical readers

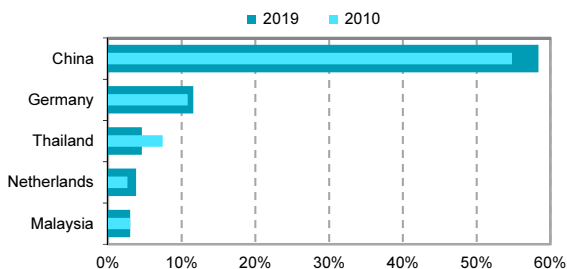
**Figure E16 Computer equipment imports**



**Figure E17 Computer equipment imports, by commodities**



**Figure E18 Computer equipment imports, by countries**



Source: CZSO, Cross-border movements of goods database

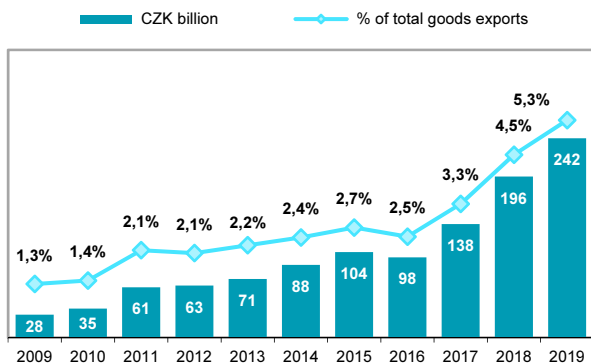
## E International trade in ICT goods

**Table E5 Communication equipment exports from Czechia**

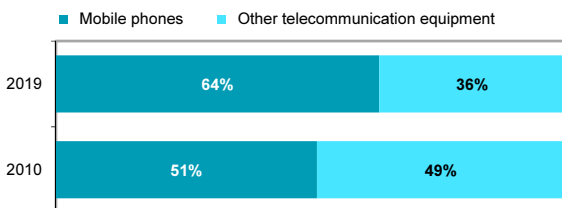
CZK million

	2017	2018	2019
<b>Total</b>	<b>138 167</b>	<b>196 020</b>	<b>242 408</b>
Mobile phones	87 374	141 592	153 944
Other communication equipment	50 794	54 428	88 463

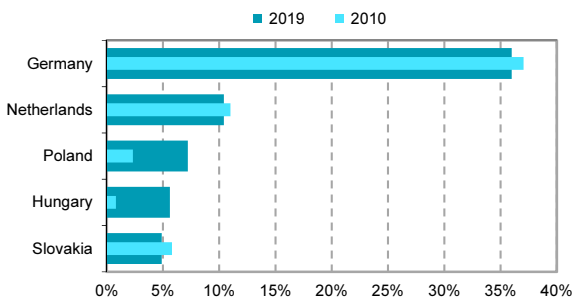
**Figure E19 Communication equipment exports**



**Figure E20 Communication equipment exports by commodities**



**Figure E21 Communication equipment exports, by countries**



Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

Table E6 Communication equipment imports to Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>141 049</b>	<b>209 053</b>	<b>255 061</b>
Mobile phones	98 042	156 153	165 170
Other communication equipment	43 006	52 900	89 891

Figure E22 Communication equipment imports

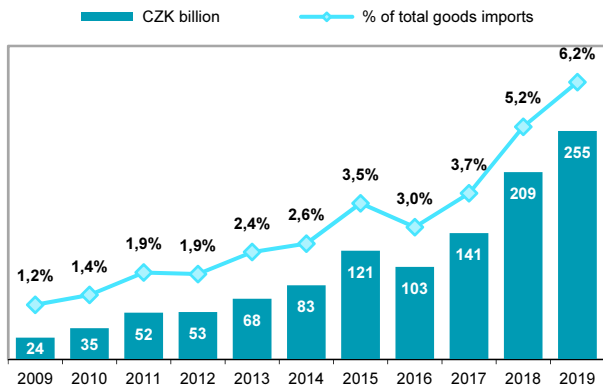
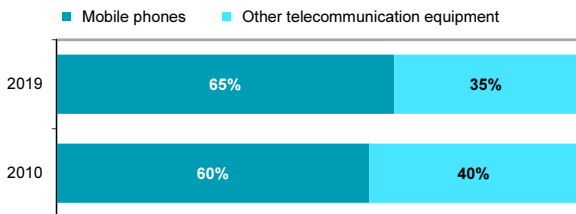
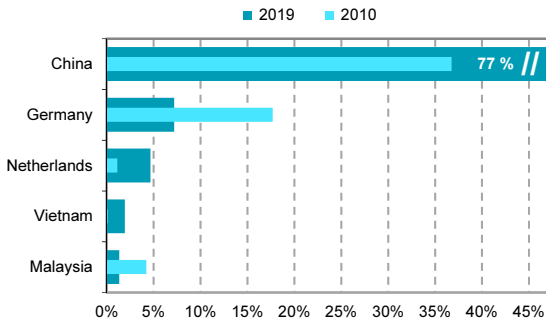


Figure E24 Communication equipment imports by countries



Graf E24 Evoz komunikačního zařízení do ČR podle zemí



Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

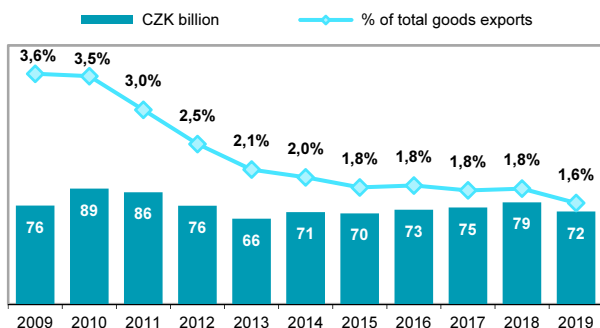
**Table E7 Consumer electronics exports from Czechia**

CZK million

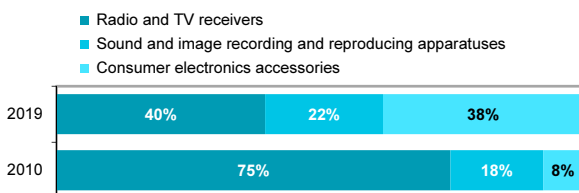
	2017	2018	2019
<b>Total</b>	<b>74 650</b>	<b>78 676</b>	<b>71 661</b>
Radio and TV receivers	34 821	35 627	28 407
Sound and image recording and reproducing apparatuses	15 264	15 935	16 038
Consumer electronics accessories*	24 565	27 114	27 215

\* Monitors and projectors; Microphones and stands there for; Loudspeakers; Headphones, earphones and combined microphone/speaker sets; Audio-frequency electric amplifiers; Electric sound amplifier sets; Non-recorded media

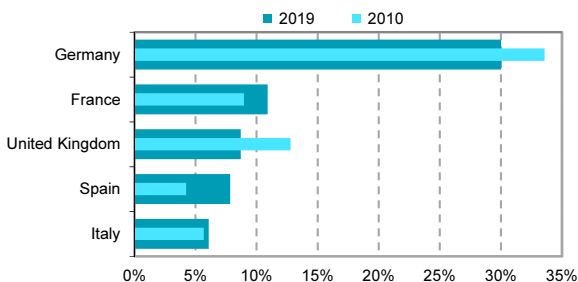
**Figure E25 Consumer electronics exports**



**Figure E26 Consumer electronics exports, by commodities**



**Figure E27 Consumer electronics exports, by countries**



Source: CZSO, Cross-border movements of goods database



## E International trade in ICT goods

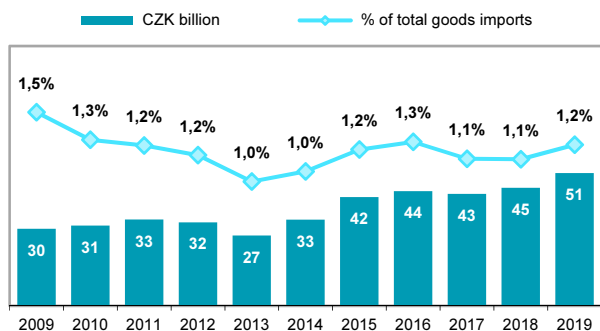
**Table E8 Consumer electronics imports to Czechia**

CZK million

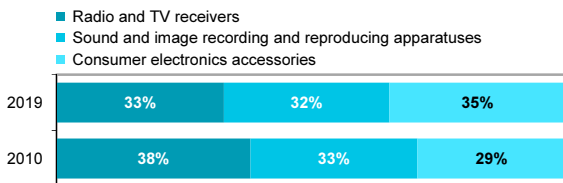
	2017	2018	2019
<b>Total</b>	<b>43 031</b>	<b>45 400</b>	<b>51 065</b>
Radio and TV receivers	15 213	14 914	16 784
Sound and image recording and reproducing apparatuses	14 457	15 564	16 590
Consumer electronics accessories*	13 362	14 922	17 691

\* Monitors and projectors; Microphones and stands there for; Loudspeakers; Headphones, earphones and combined microphone/speaker sets; Audio-frequency electric amplifiers; Electric sound amplifier sets; Non-recorded media

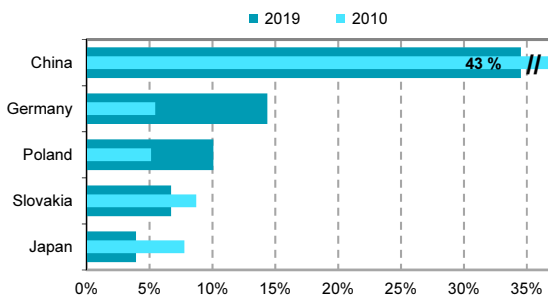
**Figure E28 Consumer electronics imports**



**Figure E29 Consumer electronics imports, by commodities**



**Figure E30 Consumer electronics imports, by countries**



Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

Table E9 Electronic components exports from Czechia

	CZK million		
	2017	2018	2019
<b>Total</b>	<b>33 101</b>	<b>34 371</b>	<b>38 808</b>
Electronic integrated circuits	21 422	21 718	27 067
Printed circuits	4 555	4 782	4 668
Other electronic components	7 124	7 870	7 072

Figure E31 Electronic components exports

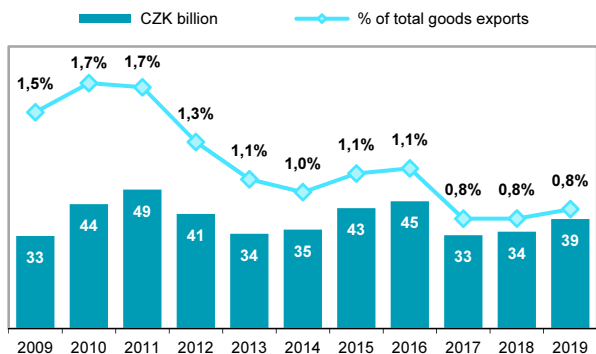


Figure E32 Electronic components exports, by commodities

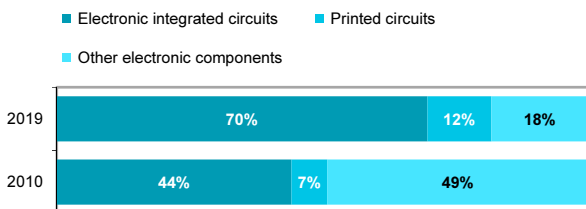
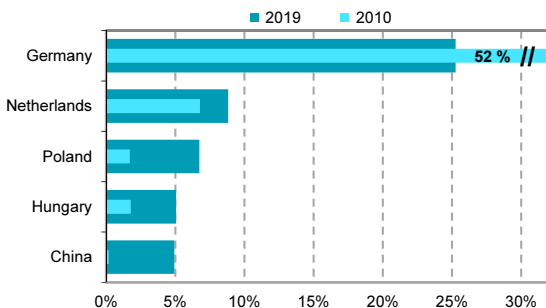


Figure E33 Electronic components exports, by countries



Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

Table E10 Electronic components imports to the Czechia

	CZK million		
	2017	2018	2019
<b>Total</b>	<b>101 739</b>	<b>105 611</b>	<b>93 257</b>
Electronic integrated circuits	77 417	81 468	71 185
Printed circuits	13 352	12 460	11 333
Other electronic components	10 969	11 683	10 738

Figure E34 Electronic components imports

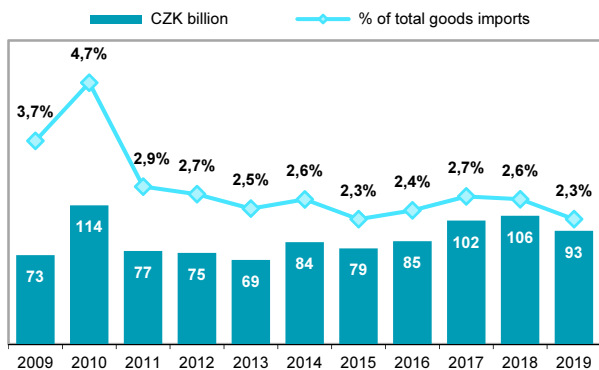


Figure E35 Electronic components imports, by commodities

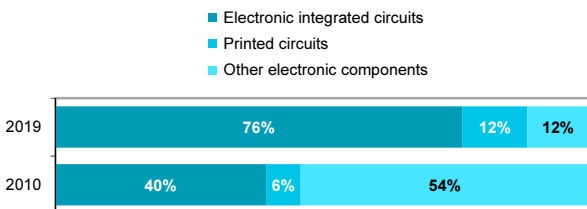
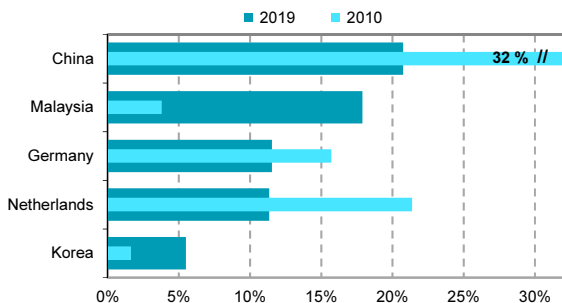


Figure E36 Electronic components imports, by countries



Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

Table E11 Exports of ICT parts n.e.s. from Czechia

	CZK million		
	2017	2018	2019
<b>Total</b>	<b>35 335</b>	<b>34 049</b>	<b>52 438</b>
Parts and accessories n.e.s. of			
computers	17 647	16 629	29 897
telecommunication equipment	11 638	10 752	12 979
consumer electronics	6 050	6 668	9 561

Figure E37 Exports of ICT parts and accessories n.e.s.

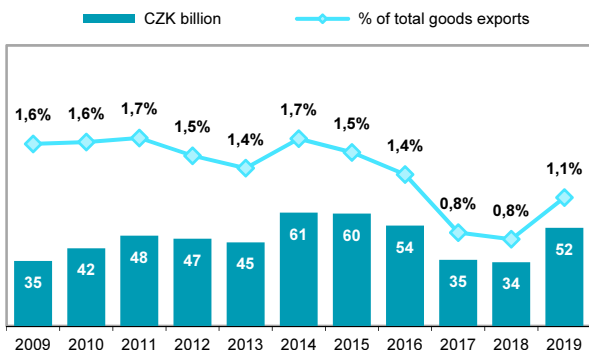


Figure E38 Exports of ICT parts n.e.s., by commodities

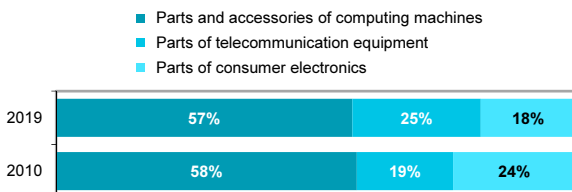
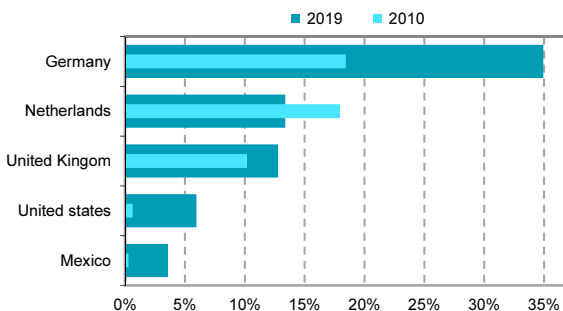


Figure E39 Exports of ICT parts n.e.s., by countries



Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

Table E12 Imports of ICT parts n.e.s. to Czechia

	CZK million		
	2017	2018	2019
<b>Total</b>	<b>95 711</b>	<b>90 251</b>	<b>91 931</b>
Parts and accessories n.e.s. of			
computers	59 430	55 786	57 829
telecommunication equipment	7 792	7 295	8 923
consumer electronics	28 489	27 170	25 179

Figure E40 Imports of ICT parts and accessories n.e.s.

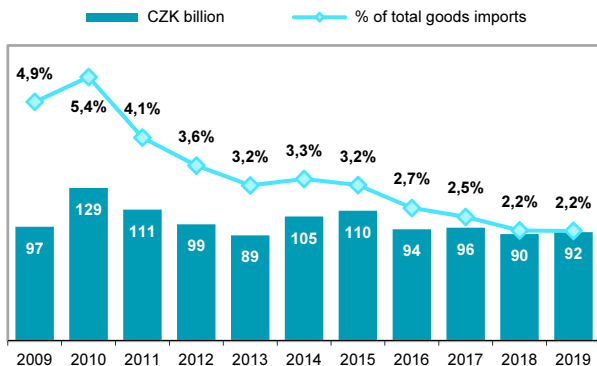


Figure E41 Imports of ICT parts n.e.s., by commodities

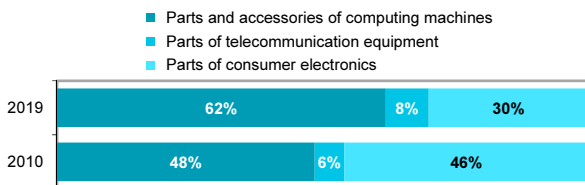
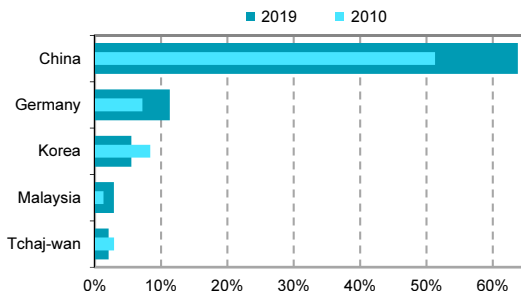


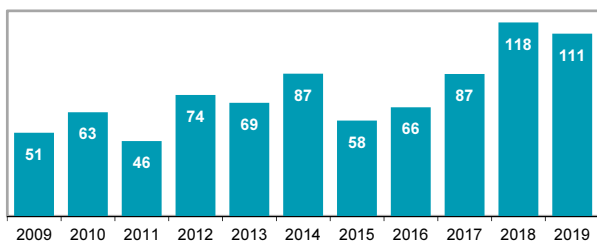
Figure E42 Imports of ICT parts n.e.s., by countries



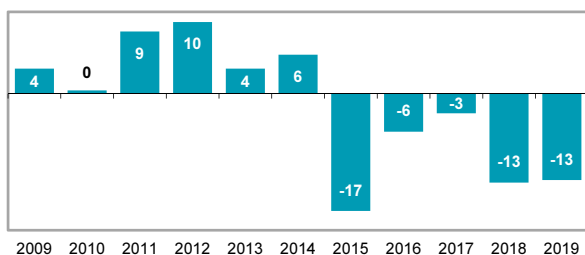
Source: CZSO, Cross-border movements of goods database

## E International trade in ICT goods

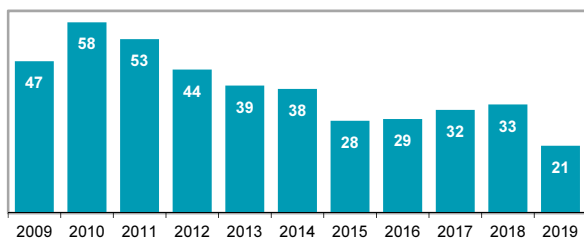
**Figure E43 Balance of cross-border movement of Computer equipment and peripherals (CZK billion)**



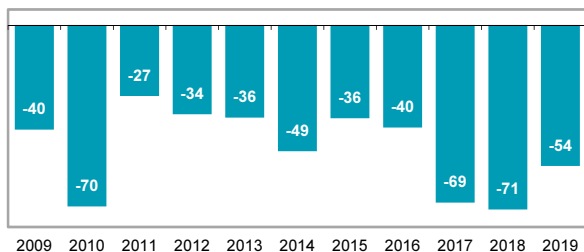
**Figure E44 Balance of cross-border movement of Communication equipment (CZK billion)**



**Figure E45 Balance of cross-border movement of Consumer electronics (CZK billion)**



**Figure E46 Balance of cross-border movement of Electronic components (CZK billion)**



Source: CZSO, Cross-border movements of goods database

## F International trade in ICT services

Services in the field of information and communication technologies (hereinafter as the **ICT services**) are defined as services that must primarily be intended to fulfil or enable the function of information processing and communication **by electronic means**, including their record, transmission, and display (OECD, 2009).

Respective items of the ICT services are defined based on the **Extended Balance of Payment Services Classification (EBOPS 2010)** and subdivided into **two main categories** as follows:

- **Telecommunication services (code SI1/9.1)** include, first of all, transactions of Czech and foreign telecommunication operators for implemented international calls by means of fixed or mobile telephone networks. Other telecommunication services involve payments for the access to the Internet, cable television, and to other computer networks, including providing of services as e-mail, video conferences, or transmitting of audio-visual signal over the Internet, cable networks or satellites.
- **Computer services (code SI1/9.2):**
  - **Computer software (code SI21/9.2.1)** involves purchase and sale of tailor-made software and application (original computer software), including purchase and sale of ownership rights to such software or licence fees for the software use. Furthermore, it is also purchase and sale of standard software and applications supplied over the Internet, including purchase and sale of ownership rights to such software or licence fees for the software use. *Note 1: Computer services does not include purchase and sale of standard software packages supplied on physical media carriers (CD-ROMs, flash disks, etc.), or as a part of hardware (as Microsoft products, for instance), which are considered to be goods and are reported within the statistics on international trade in goods. Note 2: The computer software category includes here also licences to reproduce and/or distribute computer software (code SH3).*
  - **Other computer services (code SI22/9.2.2)** consist mainly of consultancy services in the fields of hardware and software of computers, including maintenance and repairs of both hardware and software and services related to data processing.

More detailed information about the **EBOPS 2010 classification** can be found at: <https://unstats.un.org/unsd/classifications/Family/Detail/101>

Data on exports and imports of the ICT services come from the **Sample survey on exports and imports of services (ZO 1-04)** carried by the Czech Statistical Office (CZSO) quarterly. For more information about international trade in services statistics in the CZSO, see: <https://www.czso.cz/csu/czso/international-trade-in-services>

*Note: The international trade in ICT services in the Czech Republic is dominated by transactions of foreign-controlled enterprises, units of multinationals enterprise groups.*

The **Eurostat Balance of Payments Database** was used as a data source for the **international comparison**. Data for international comparisons refer to the **reported or nearest available year**. More information about this data source can be found at: [https://ec.europa.eu/eurostat/cache/metadata/en/bop\\_its6\\_esms.htm](https://ec.europa.eu/eurostat/cache/metadata/en/bop_its6_esms.htm)

*Note: In the international comparison data for computer software do not include data for Licenses for the distribution or distribution of computer software (EBOPS 2010 code SH3) as for most countries these data are not available separately in the Eurostat database.*

**For further information on trade in ICT services, see (only in Czech):**  
[https://www.czso.cz/csu/czso/zahranicni\\_obchod\\_s\\_ict\\_sluzbami](https://www.czso.cz/csu/czso/zahranicni_obchod_s_ict_sluzbami)

## F International trade in ICT services

Table F1 ICT services exports from Czechia

	CZK million		
	2017	2018	2019
<b>Total</b>	<b>87 808</b>	<b>91 441</b>	<b>105 286</b>
Telecommunication services	18 290	17 077	14 286
<b>Computer services, total</b>	<b>69 518</b>	<b>74 364</b>	<b>91 000</b>
Computer software	21 953	28 217	36 739
Other computer services	47 565	46 146	54 261
<b>by selected countries</b>			
EU28, total	53 823	55 309	61 132
of which to Germany	16 830	15 445	16 432
Other countries, total	34 247	36 371	44 151
of which to the United States	15 628	17 688	23 027

Figure F1 ICT services exports

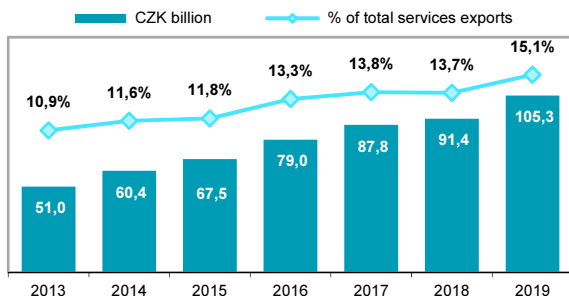


Figure F2 ICT services exports, by type of ICT services

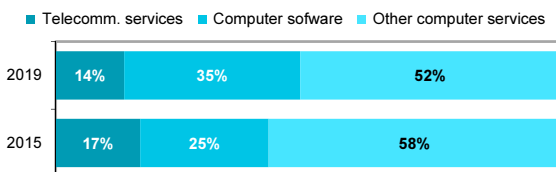
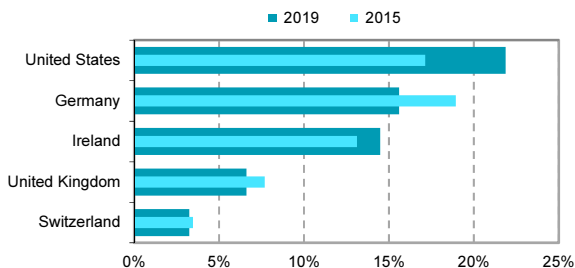


Figure F3 ICT services exports, by countries

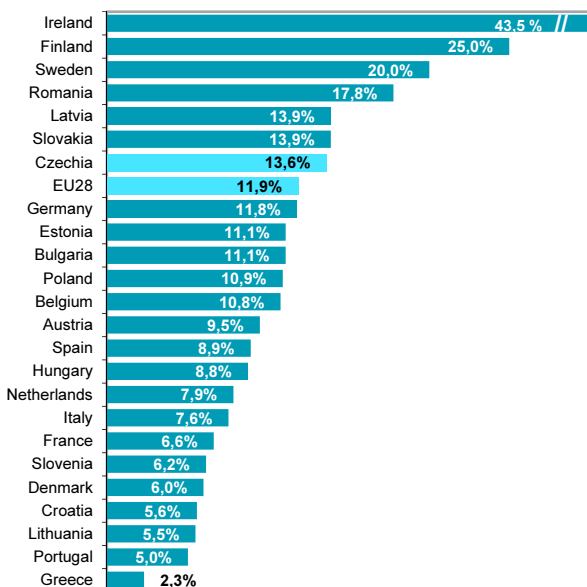


Source: CZSO, Survey on exports and imports of services

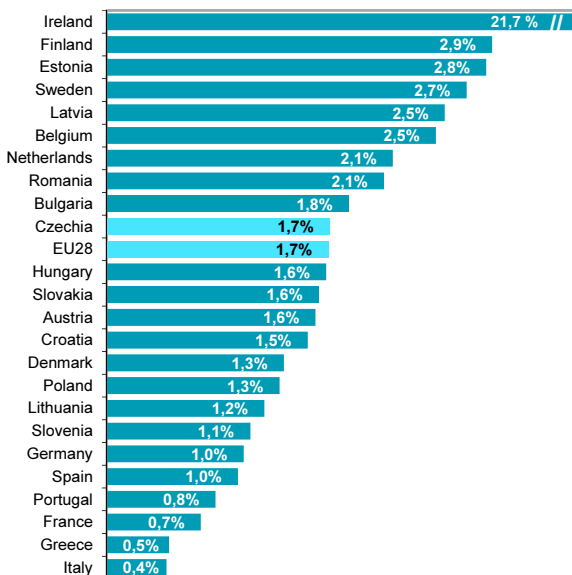


## F International trade in ICT services

**Figure F4 ICT services exports; 2018**  
(% of total services exports)



**Figure F5 ICT services exports; 2018** (% of GDP)



Source: CZSO calculations based on Eurostat

## F International trade in ICT services

Table F2 ICT services imports to Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>50 389</b>	<b>52 446</b>	<b>53 040</b>
Telecommunication services	16 433	15 558	11 535
<b>Computer services, total</b>	<b>33 956</b>	<b>36 888</b>	<b>41 504</b>
Computer software	9 052	10 498	11 790
Other computer services	24 904	26 390	29 715
<b>by selected countries</b>			
EU28, total	33 507	37 175	35 807
of which from Germany	12 837	11 300	11 875
Other countries, total	16 882	15 271	17 232
of which from the United States	3 138	3 104	3 277

Figure F6 ICT services imports

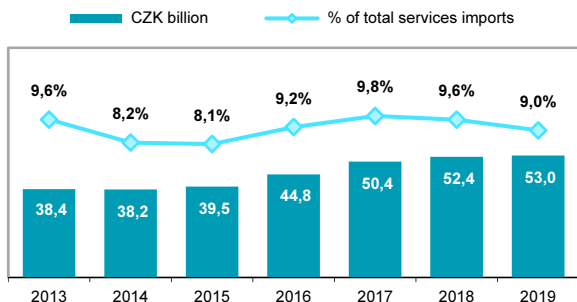


Figure F7 ICT services imports, by type of ICT services

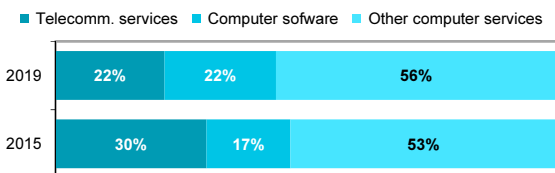
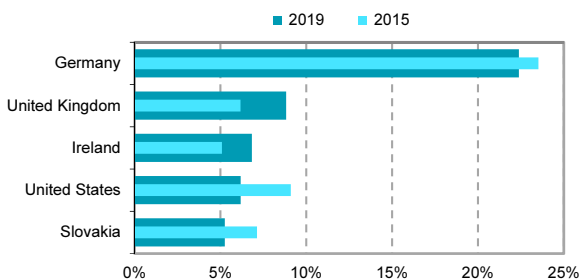


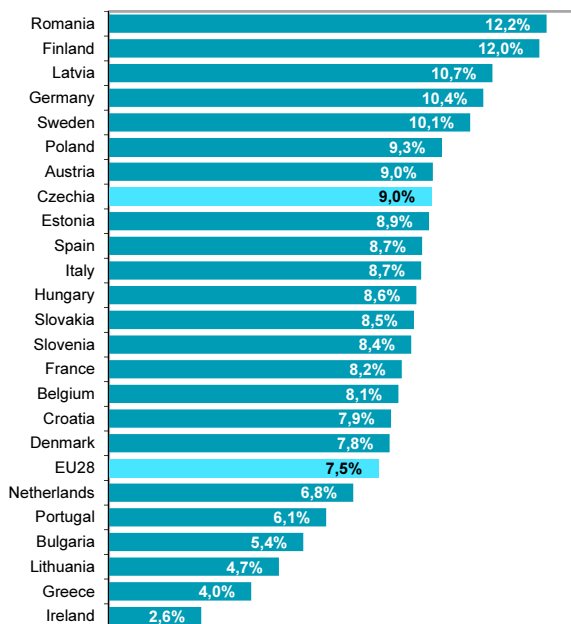
Figure F8 ICT services imports, by countries



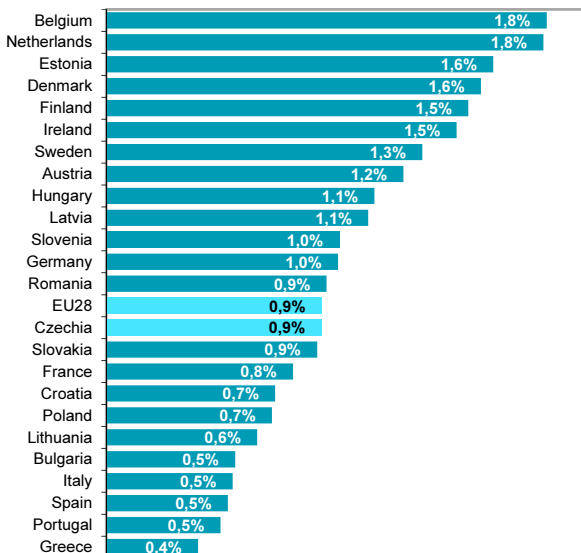
Source: CZSO, Survey on exports and imports of services

## F International trade in ICT services

**Figure F9 ICT services imports, 2018**  
(% of total services imports)



**Figure F10 ICT services imports, 2018 (% of GDP)**



Source: CZSO calculations based on Eurostat

## F International trade in ICT services

Tab F3 Computer services exports from Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>69 518</b>	<b>74 364</b>	<b>91 000</b>
Computer software	21 953	28 217	36 739
Other computer services	47 565	46 146	54 261
<b>by selected countries</b>			
EU28, total	44 044	46 297	54 603
of which to Germany	13 246	13 370	15 128
Other countries, total	25 474	28 067	36 397
of which to the United States	14 911	16 099	21 625

Figure F11 Computer services exports

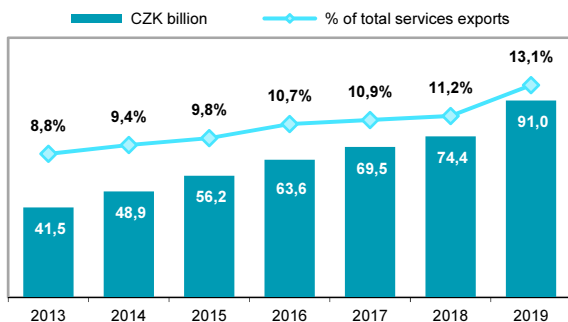


Figure F12 Computer services exports, by type of services

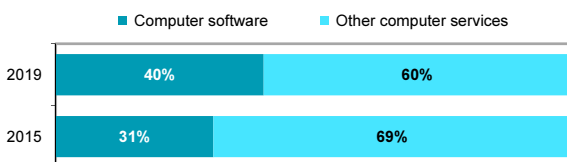
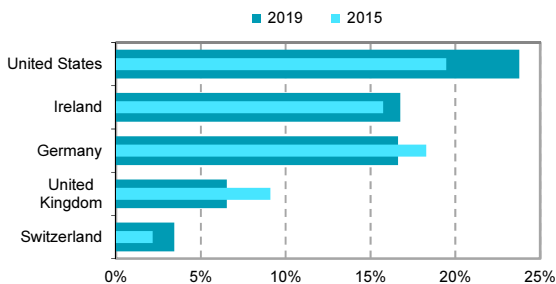


Figure F13 Computer services exports, by countries



Source: CZSO, Survey on exports and imports of services

## F International trade in ICT services

Tab F4 Computer services imports to Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>33 956</b>	<b>36 888</b>	<b>41 504</b>
Computer software	9 052	10 498	11 790
Other computer services	24 904	26 390	29 715
<b>by selected countries</b>			
EU28, total	24 334	26 909	29 696
of which from Germany	8 706	9 832	10 761
Other countries, total	9 622	9 978	11 808
of which from the United States	2 838	2 875	3 097

Figure F14 Computer services imports

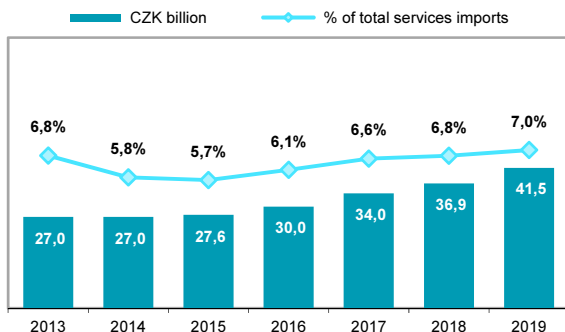


Figure F15 Computer services imports, by type of services

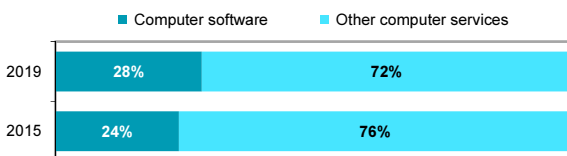
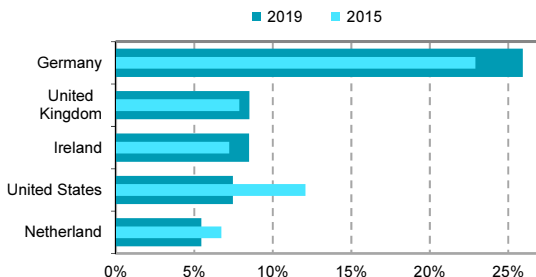


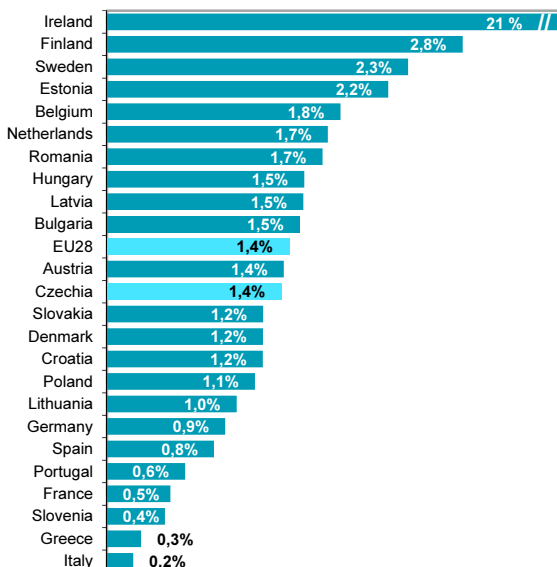
Figure F16 Computer services imports, by countries



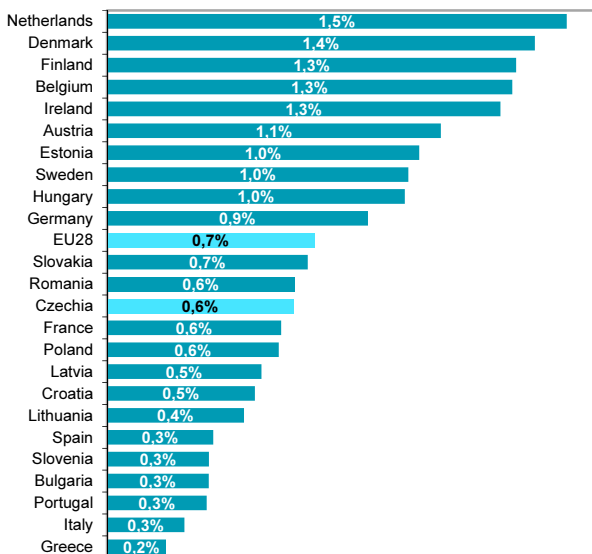
Source: CZSO, Survey on exports and imports of services

## F International trade in ICT services

**Figure F17 Computer services exports; 2018**  
(% of GDP)



**Figure F18 Computer services imports; 2018**  
(% of GDP)



Source: CZSO calculations based on Eurostat

## G ICT sector

Information and Communication Technology Sector (hereafter **ICT sector**) is **defined** as a combination of **economic activities of manufacturing products and providing services** primarily dedicated to processing, communication, and distribution of information **electronically**, including information capture, storage, transmission, and display (OECD, 2006). For more details see: „**OECD Guide to Measuring the Information Society 2011**” at: [www.oecd.org/sti/measuring-infoeconomy/guide](http://www.oecd.org/sti/measuring-infoeconomy/guide)

ICT sector together with Content and media sector was in 2007 recognized by the **United Nation Statistics Division** as a new alternative grouping of economic activities called **information economy** following the International Standard Industrial Classification of All Economic Activities (**ISIC Revision 4**). For more information see following web page: <https://unstats.un.org/unsd/EconStatKB/KnowledgebaseArticle10286.aspx>

ICT sector includes a combination of **ICT manufacturing** and **ICT services** industries. ICT sector involves all enterprises with the prevailing economic activity according to the divisions, groups and classes of the **Classification of Economic Activities (CZ-NACE)** as follows:

### ICT manufacturing:

- Manufacture of electronic components and boards (26.1)
- Manufacture of computers and peripheral equipment (26.2)
- Manufacture of communication equipment (26.3)
- Manufacture of consumer electronics and media (26.4 and 26.8)

### ICT services:

#### ICT wholesale:

- Wholesale of information and communication equipment (46.5)

#### Telecommunications:

- Wired telecommunications activities (61.1)
- Wireless telecommunications activities (61.2)
- Satellite and other telecommunications activities. (61.3 and 61.9)

#### IT services:

- Software publishing (58.2) and Computer programming, consultancy and related activities (62.0)
- Data processing, hosting and related activities; web portals (63.1)
- Repair of computers and communication equipment (95.1)

More detailed information of the **CZ-NACE** can be found at: (*only in Czech*): [https://www.czso.cz/csu/czso/klasifikace\\_ekonomickyh\\_cinnosti\\_cz\\_nace](https://www.czso.cz/csu/czso/klasifikace_ekonomickyh_cinnosti_cz_nace)

Data for this chapter, except for R&D expenditures (source: **R&D annual survey – see chapter D**), were obtained from the Annual structural survey of business entities from selected production industries (**SBS – Structural Business Statistics**). For more information about Czech SBS, see: <https://www.czso.cz/csu/czso/annual-structural-business-statistics-methodology>

Data **prior to the year 2005** are estimates based on the **Annual National Accounts Statistics**. More information about this data source is available at: [http://apl.czso.cz/pll/rocenka/rocenka.indexnu\\_en](http://apl.czso.cz/pll/rocenka/rocenka.indexnu_en)

All 2019 data are preliminary.

The **Eurostat Structural Business Statistics Database** was used as a data source for the **international comparison** (except for R&D expenditure). More information about this data source can be found at: <http://ec.europa.eu/eurostat/web/structural-business-statistics/overview>

Data for international comparisons refer to the **reported or nearest available year**.

**Further information on ICT sector can be found at** (*only in Czech*): <https://www.czso.cz/csu/czso/odvetvi-informacni-ekonomiky>

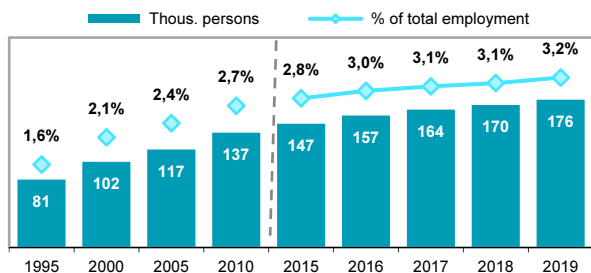
## G ICT sector

**Table G1 Employment in the ICT sector in Czechia**

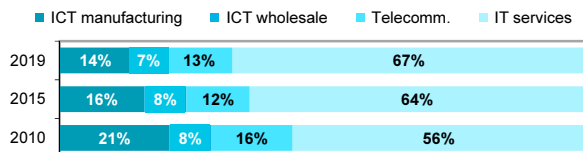
Number of persons employed - headcount persons

	2017	2018	2019
<b>Total</b>	<b>164 209</b>	<b>169 722</b>	<b>175 919</b>
<b>ICT manufacturing, total</b>	<b>25 298</b>	<b>24 253</b>	<b>24 054</b>
Manufacture of electronic components	8 065	8 410	8 691
Manufacture of computers and peripheral equipment	6 742	5 873	5 874
Manuf. of communication equipment	6 527	6 129	5 903
Manufacture of consumer electronics	3 965	3 842	3 587
<b>ICT services, total</b>	<b>138 911</b>	<b>145 469</b>	<b>151 865</b>
ICT wholesale	11 127	11 601	11 505
Telecommunications	20 459	22 009	22 383
IT services	107 325	111 859	117 977

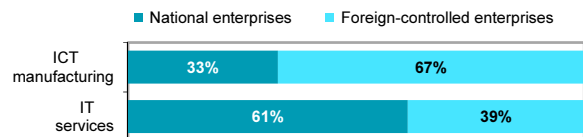
**Figure G1 Employment in the ICT sector**



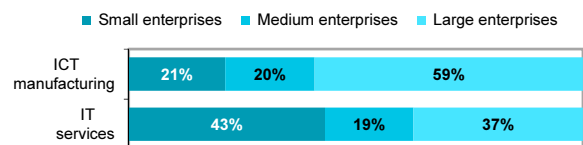
**Figure G2 Employment in the ICT sector, by industry**



**Figure G3 Employment in the ICT sector, by ownership; 2019**



**Figure G4 Employment in the ICT sector, by size; 2019**

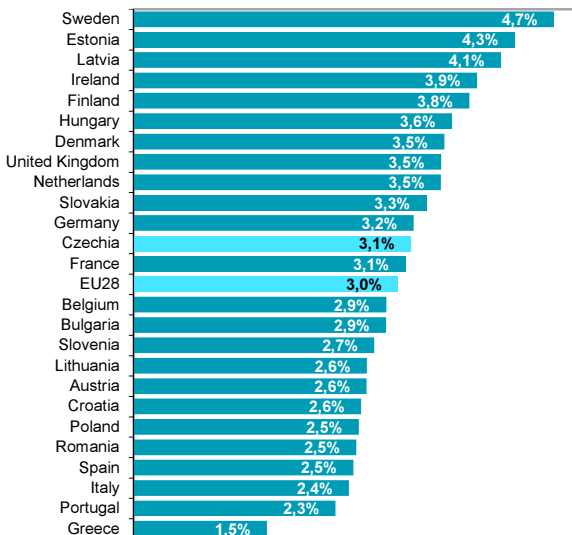


Source: CZSO, Structural Business Statistics

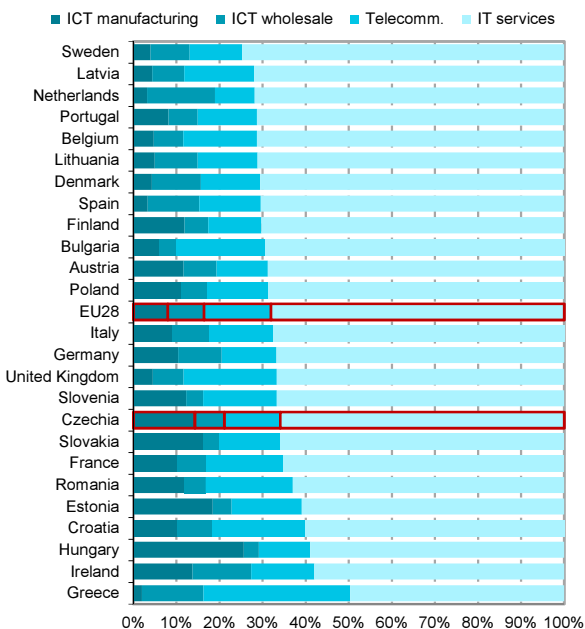


## G ICT sector

**Figure G5 Employment in the ICT sector; 2018**  
(% of total employment)



**Figure G6 Employment in the ICT sector, by industry; 2018**



Source: CZSO calculations based on the Eurostat SBS database

## G ICT sector

Figure G7 Employment in ICT manufacturing in Czechia

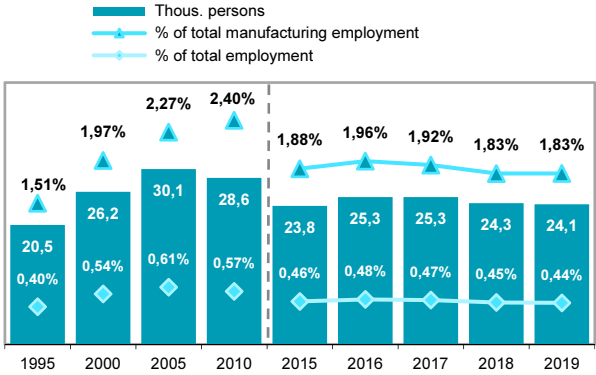


Figure G8 Employment in Telecommunications in Czechia

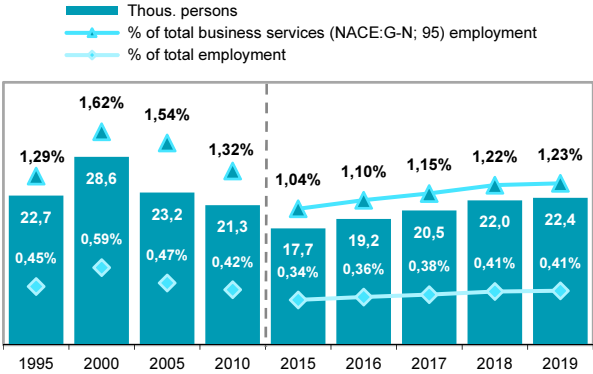
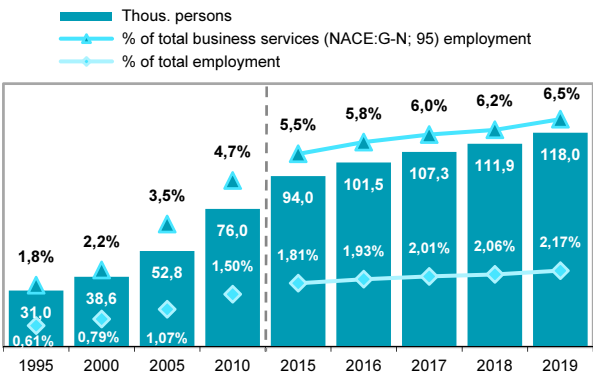


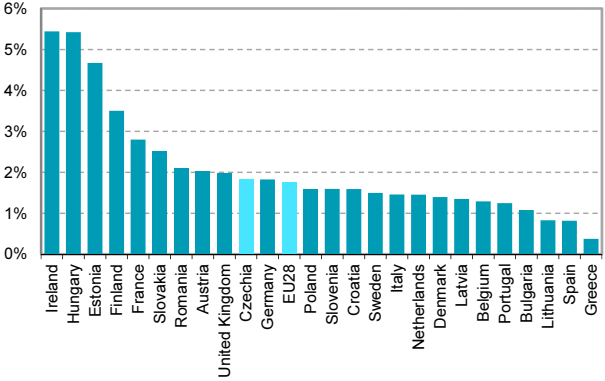
Figure G9 Employment in IT services in Czechia



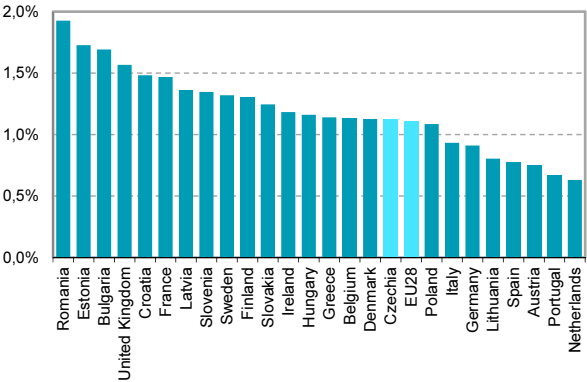
Source: CZSO, Structural Business Statistics

## G ICT sector

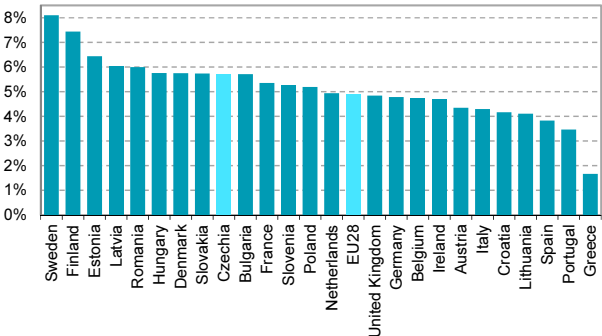
**Figure G10 Employment in ICT manufacturing; 2018**  
(% of total manufacturing employment)



**Figure G11 Employment in Telecommunications; 2018**  
(% of total business enterprise sector employment)



**Figure G12 Employment in IT services; 2018**  
(% of total business enterprise sector employment)



Source: CZSO calculations based on the Eurostat SBS database

## G ICT sector

Table G2 Turnover in the ICT sector in Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>789 990</b>	<b>847 611</b>	<b>903 369</b>
<b>ICT manufacturing, total</b>	<b>233 272</b>	<b>260 301</b>	<b>256 181</b>
Manufacture of electronic components	15 626	16 002	19 785
Manufacture of computers and peripheral equipment	163 746	191 655	184 951
Manuf. of communication equipment	17 272	17 416	18 294
Manufacture of consumer electronics	36 628	35 229	33 151
<b>ICT services, total</b>	<b>556 718</b>	<b>587 310</b>	<b>647 188</b>
ICT wholesale	167 844	162 408	169 702
Telecommunications	125 872	127 568	133 968
IT services	263 002	297 334	343 519

Figure G13 Turnover in the ICT sector

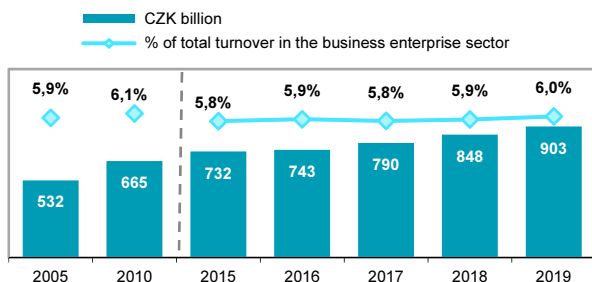


Figure G14 Turnover in the ICT sector, by industry

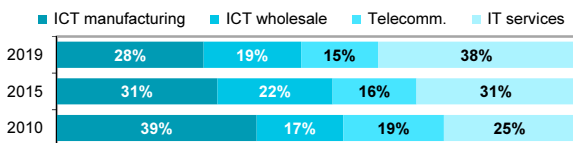


Figure G15 Turnover in the ICT sector, by ownership; 2019

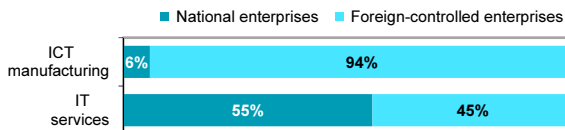
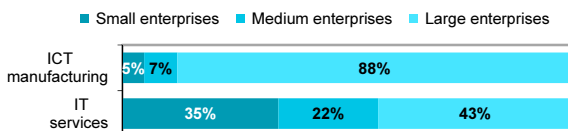
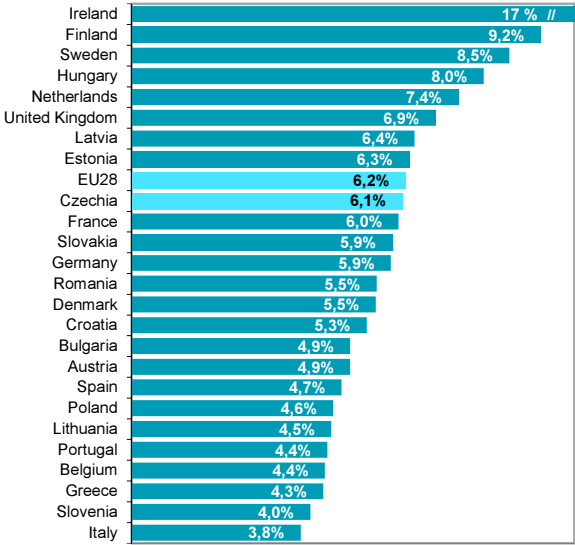


Figure G16 Turnover in the ICT sector, by size; 2019

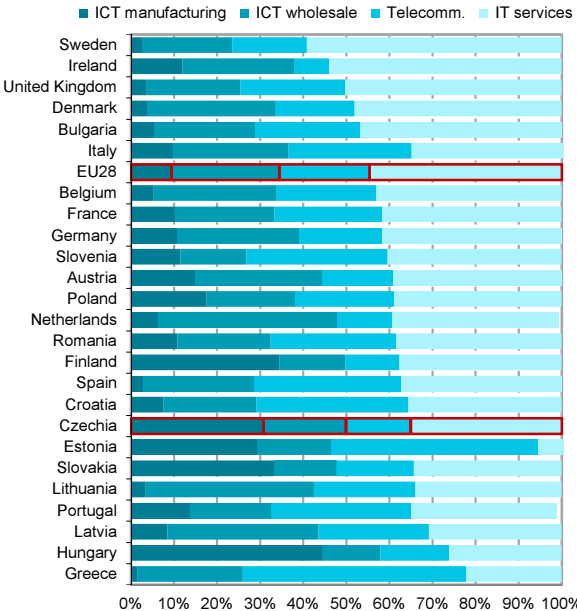


Source: CZSO, Structural Business Statistics

**Figure E17 Turnover in the ICT sector; 2018**  
(% of total turnover in the business enterprise sector)



**Figure E18 Turnover in the ICT sector, by industry; 2018 (%)**



Source: CZSO calculations based on the Eurostat SBS database

## G ICT sector

Figure G19 Turnover in ICT manufacturing in Czechia

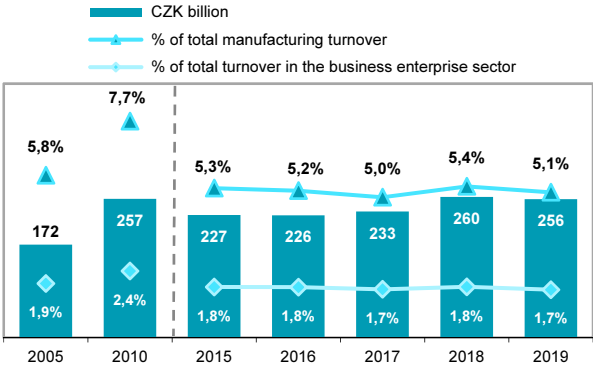


Figure G20 Turnover in Telecommunications in Czechia

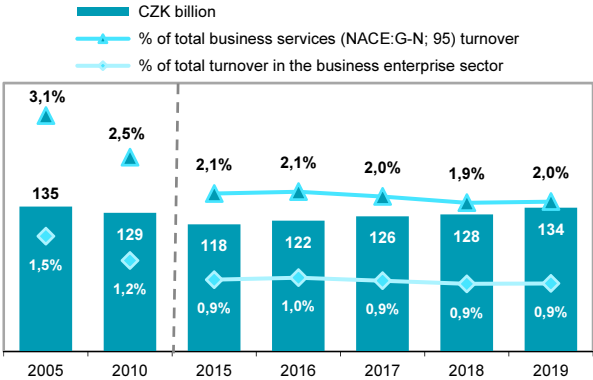
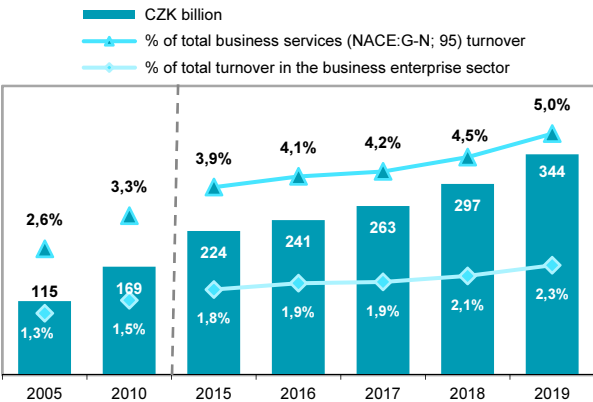


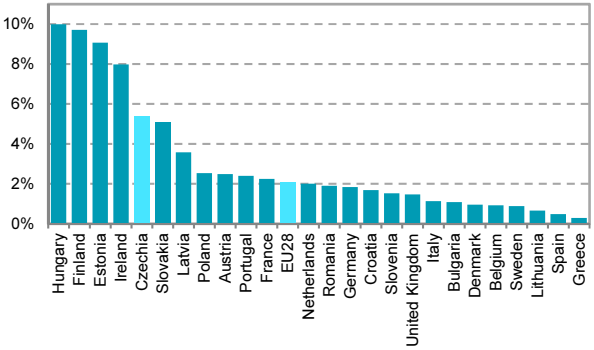
Figure G21 Turnover in IT services in Czechia



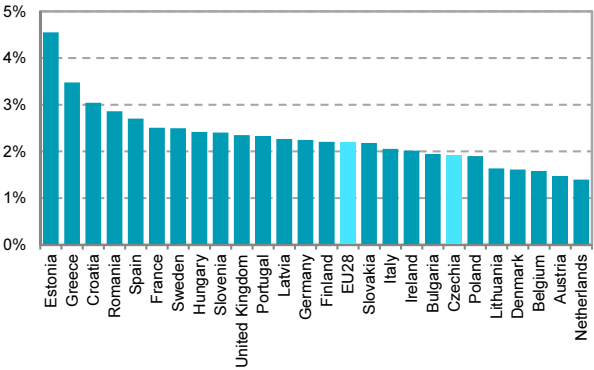
Source: CZSO, Structural Business Statistics

## G ICT sector

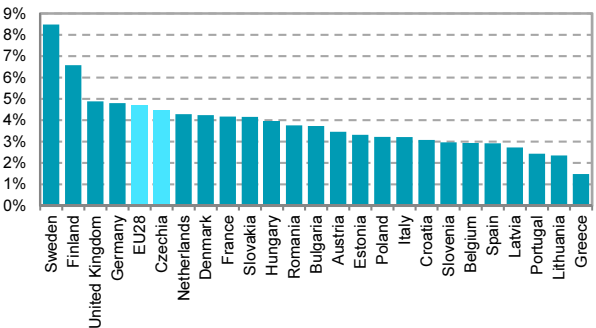
**Figure G22 Turnover in ICT manufacturing; 2018**  
(% of total manufacturing turnover)



**Figure G23 Turnover in Telecommunications; 2018**  
(% of total turnover in the business enterprise sector)



**Figure G24 Turnover in IT services; 2018**  
(% of total turnover in the business enterprise sector)



Source: CZSO calculations based on the Eurostat SBS database

## G ICT sector

Table G3 R&D expenditure in the ICT sector in Czechia

CZK million

	2017	2018	2019
<b>Total</b>	<b>11 190</b>	<b>13 495</b>	<b>14 600</b>
<b>ICT manufacturing, total</b>	<b>512</b>	<b>591</b>	<b>902</b>
Manufacture of electronic components	185	241	497
Manufacture of computers and peripheral equipment	17	14	14
Manuf. of communication equipment	287	299	337
Manufacture of consumer electronics	23	38	53
<b>ICT services, total</b>	<b>10 201</b>	<b>12 473</b>	<b>13 343</b>
ICT wholesale	87	86	234
Telecommunications	727	801	377
IT services	9 863	12 017	13 087

Figure G25 R&D expenditure in the ICT sector

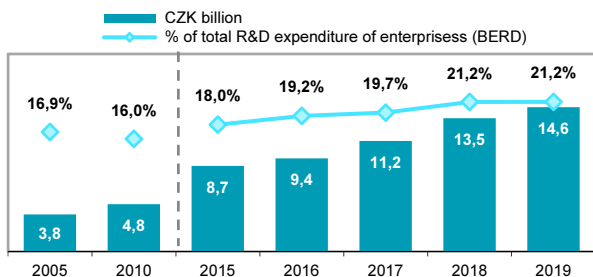


Figure G26 R&D expenditure in the ICT sector, by industry

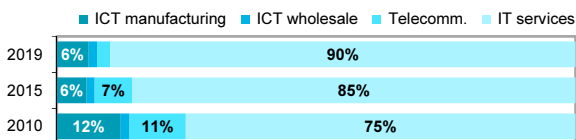


Fig.G27 R&D expenditure in the ICT sector, by ownership; 2019

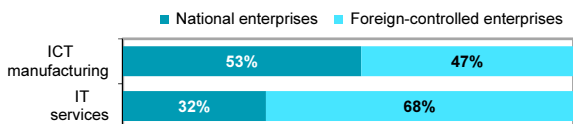
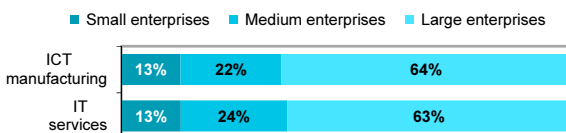


Figure G28 R&D expenditure in the ICT sector, by size; 2019

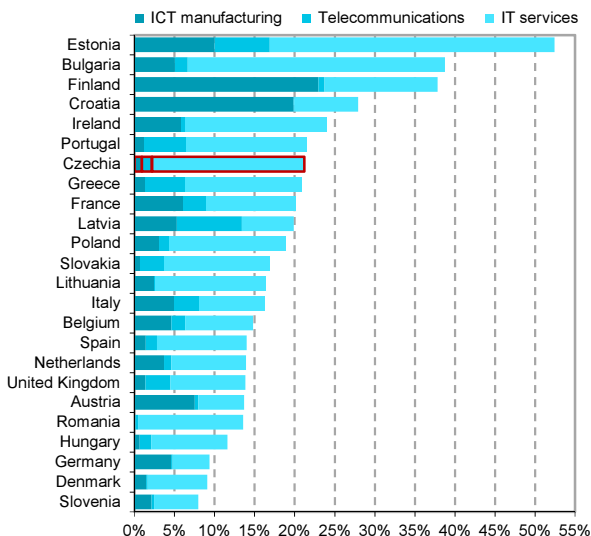


Source: CZSO, Annual R&D survey

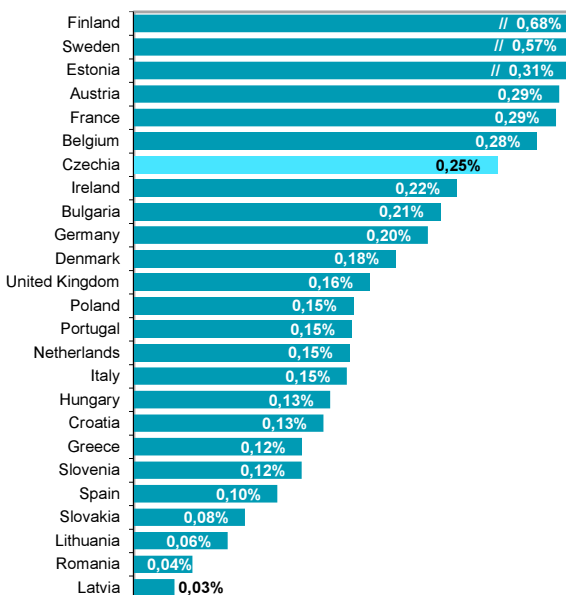


## G ICT sector

**Figure G29 R&D expenditure in the ICT sector; 2018**  
(% of total R&D expenditure of enterprises)



**Figure G30 R&D expenditure in the ICT sector; 2018**  
(% of GDP)



Source: CZSO calculations based on the Eurostat STI Database

## G ICT sector

Figure G31 R&D expenditure in ICT manufacturing in Czechia

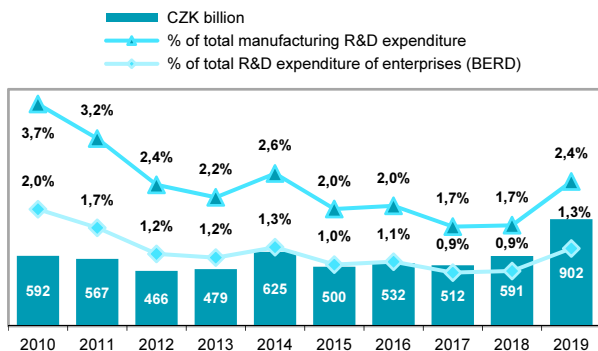


Figure G32 R&D expenditure in Telecommunications in Czechia

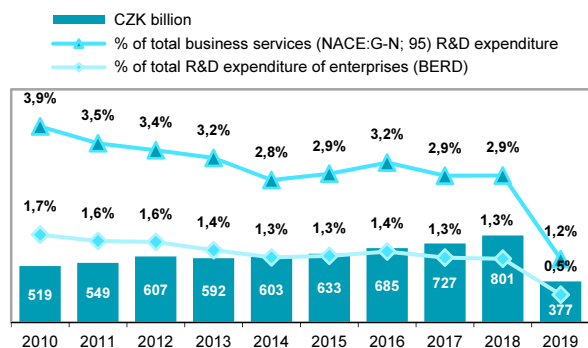
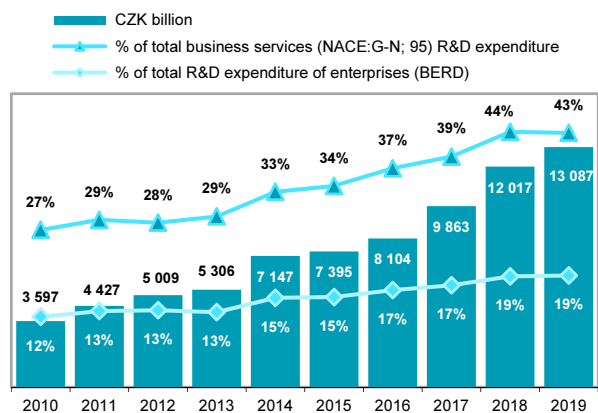


Figure G33 R&D expenditure in IT services in Czechia

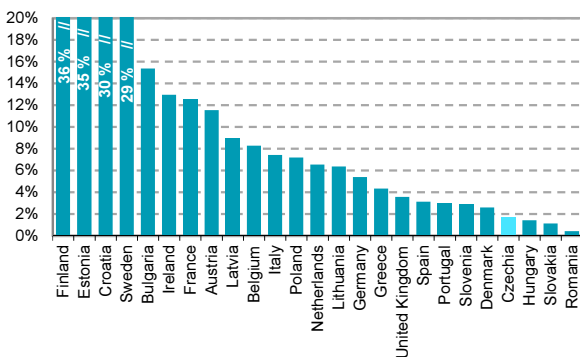


R&D - Research and development

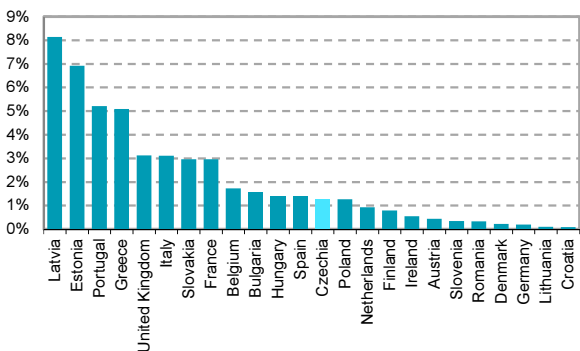
Source: CZSO, Annual R&D survey

## G ICT sector

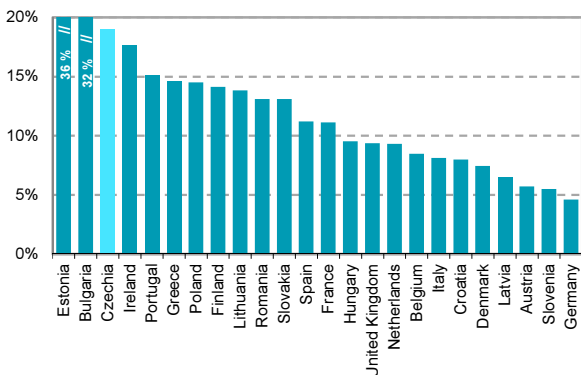
**Figure G34 R&D expenditure in ICT manufacturing; 2018**  
(% of total manufacturing R&D expenditure)



**Figure G35 R&D expenditure in Telecommun.; 2018**  
(% of total R&D expenditure of enterprises)



**Figure G36 R&D expenditure in IT services; 2018**  
(% of total R&D expenditure of enterprises)



Source: CZSO calculations based on the Eurostat STI Database