

DIGITAL ECONOMY IN FIGURES

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CZECHIA AND EU

Information technologies

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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 provide 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. **International trade in ICT goods:** this year, for the first time, the publication provides an overview of international trade in ICT goods, when the ownership of goods changes between residents and non-residents, as well as the cross-border movements of ICT goods, which tells about the physical movement of goods, regardless of whether there is direct trade with the goods in question.
- 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 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

In Prague, December 2023

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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, engineers and sales professionals**.*
- 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-Numbers

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 2021 is calculated as an average from the values for 2020, 2021, and 2022).*

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

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-2022>

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		
	2019	2020	2021
Total	209,5	219,8	226,3
Women	19,3	20,8	22,1
Occupation			
ICT managers, engineers and professionals	108,4	119,1	125,0
ICT technicians, installers and servicers	101,1	100,6	101,2
Age group			
Under 25 years	10,1	9,9	10,0
25–34 years	65,2	66,4	66,0
35–44 years	76,9	79,8	79,4
45–54 years	35,6	41,9	47,7
55 + years	21,7	21,8	23,1
Highest level of education attainment			
Tertiary	114,8	123,5	129,2
Secondary with A-level examination	84,3	86,2	87,1
Other (lower)	10,3	10,1	10,0

Figure A1 ICT specialists

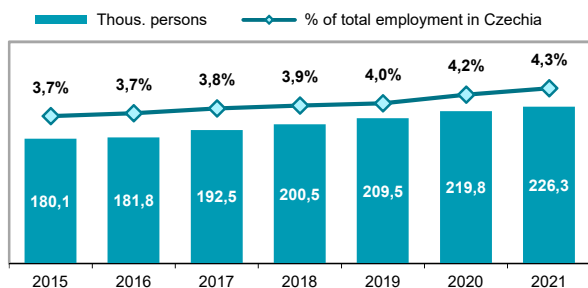
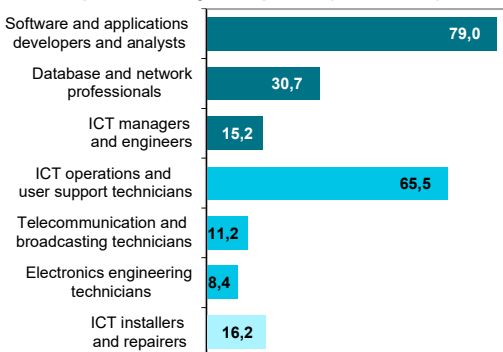


Figure A2 ICT specialists, by occupation (thousands); 2021



Note: The numbers of ICT experts are calculated from three-year moving averages for reasons of higher reliability (e.g. 2021 is the average of data for the years 2020 to 2022).

Source: CZSO, Labour Force Survey

A ICT specialists

Figure A3 ICT specialists; 2022
(% of total employment)

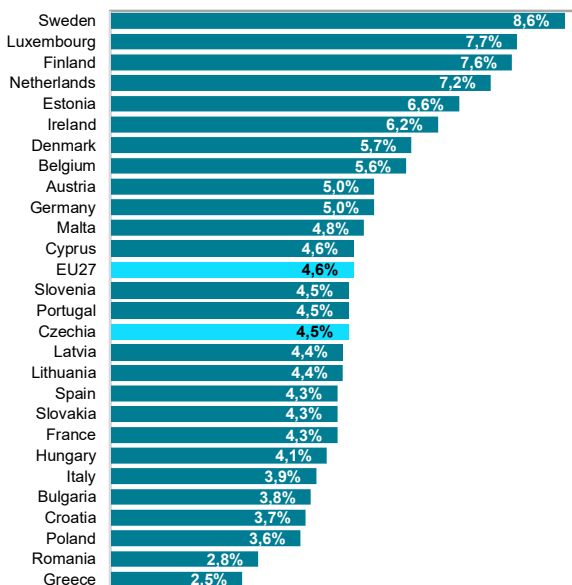
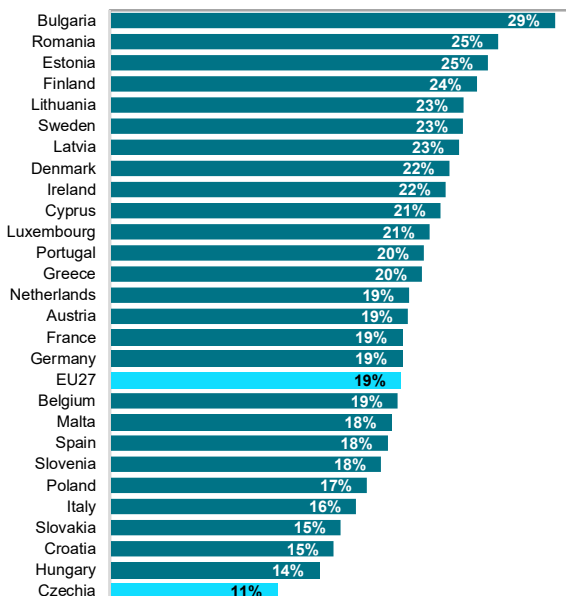


Figure A4 Share of women among ICT specialists; 2022



Source: CZSO calculation based on the Eurostat LFS Database

A ICT specialists

Table A2 ICT managers, engineers and professionals in Czechia

	Thousand persons		
	2019	2020	2021
Total	108,4	119,1	125,0
Women	11,2	13,0	14,6
Occupation			
ICT professionals, total	95,8	106,1	109,8
analysts	67,8	76,2	79,0
Database and network professionals	27,9	29,8	30,7
ICT managers, engineers and sales professionals	12,7	13,0	15,2
Age group			
25–34 years	35,2	38,3	38,6
35–44 years	41,8	44,0	45,1
45–54 years	18,1	23,1	27,4
55 + years	10,4	11,0	11,6
Highest level of education attainment			
Master's and Doctoral	72,0	77,6	82,5
Bachelor's and Higher professional	16,1	19,9	22,0
Other (lower)	20,1	21,4	20,3

Figure A5 ICT professionals

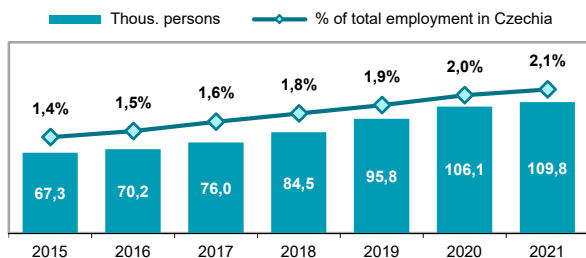


Figure A6 ICT professionals, by gender

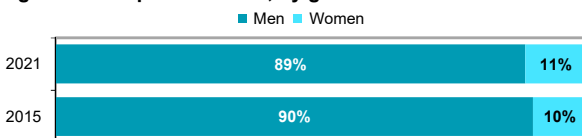
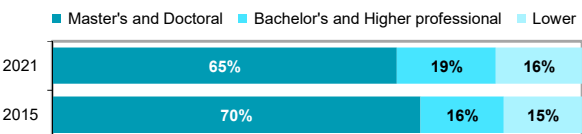


Figure A7 ICT professionals, by level of education



Note: The numbers of ICT experts are calculated from three-year moving averages for reasons of higher reliability (e.g. 2021 is the average of data for the years 2020 to 2022).

Source: CZSO, Labour Force Survey

A ICT specialists

Figure A8 ICT professionals; 2022
(% of total employment)

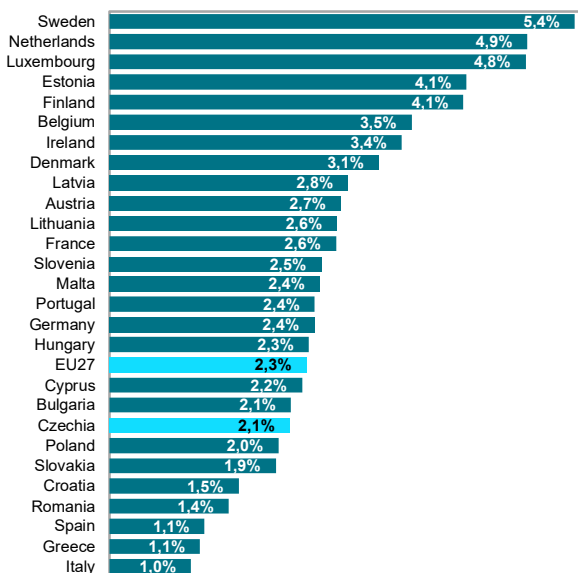
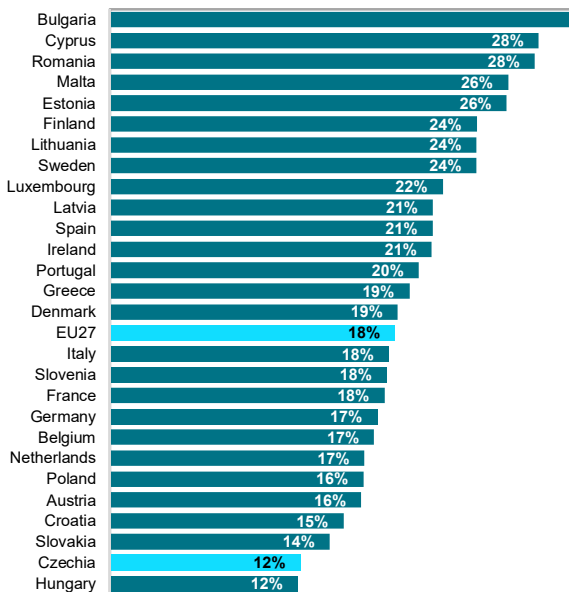


Figure A9 Share of women among ICT professionals; 2022



Source: CZSO calculation based on the Eurostat LFS Database

A ICT specialists

Table A3 ICT technicians, installers and servicers in Czechia

	Thousand persons		
	2019	2020	2021
Total	101,1	100,6	101,2
Women	8,1	7,8	7,5
Occupation			
ICT operations and user support technicians	62,7	63,4	65,5
Telecomm. and broadcasting technicians	12,2	11,5	11,2
Electronics engineering technicians	8,1	8,6	8,4
ICT installers and repairers	18,0	17,1	16,2
Age group			
Under 25 years	7,2	7,2	7,6
25–34 years	30,0	28,1	27,4
35–44 years	35,1	35,8	34,3
45–54 years	17,5	18,8	20,4
55 + years	11,3	10,8	11,5
Highest level of education attainment			
Tertiary	26,7	26,0	24,7
Secondary with A-level examination	64,2	64,8	66,8
Other (lower)	10,1	9,8	9,8

Figure A10 ICT technicians

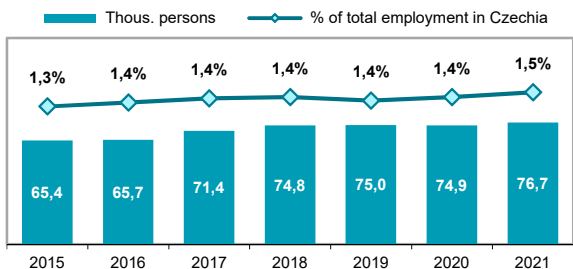


Figure A11 ICT technicians, by gender

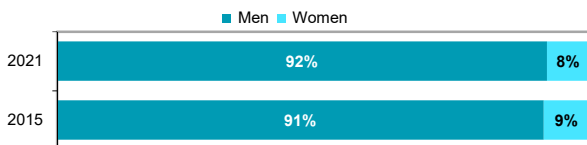
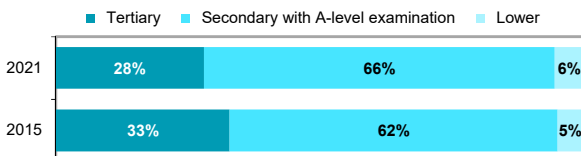


Figure A12 ICT technicians, by level of education



Note: The numbers of ICT experts are calculated from three-year moving averages for reasons of higher reliability (e.g. 2021 is the average of data for the years 2020 to 2022).

Source: CZSO, Labour Force Survey

A ICT specialists

Figure A13 ICT technicians; 2022
(% of total employment)

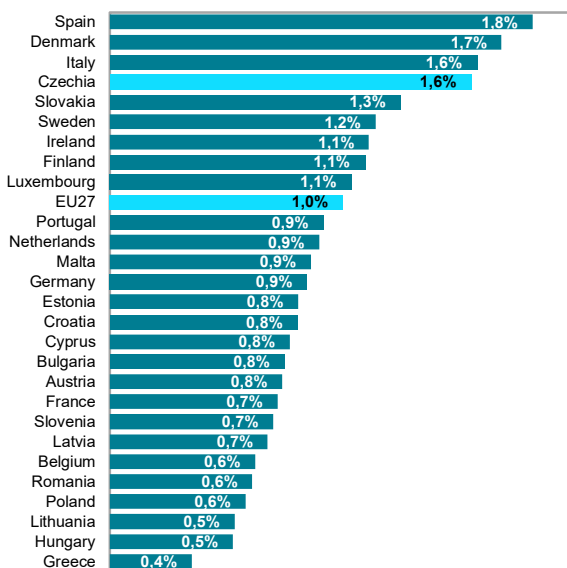
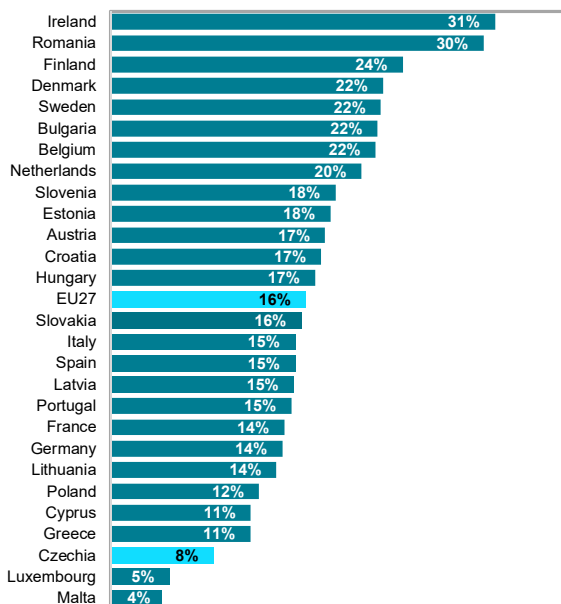


Figure A14 Share of women among ICT technicians; 2022



Source: CZSO calculation based on the Eurostat LFS Database

A ICT specialists

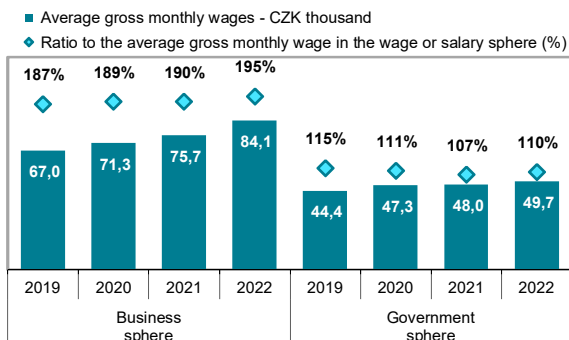
Table A4 Wages of ICT professionals in Czechia

	Average gross monthly wage in CZK		
	2020	2021	2022
Total	70 018	74 357	82 441
Men	71 707	76 360	84 526
Women	59 507	62 499	70 492
Citizenship			
Czech citizens	67 204	70 733	78 013
Foreigners	85 220	92 688	104 184
Sphere of activity (remuneration)			
Business (wage) sphere	71 258	75 718	84 052
Government (salary) sphere	47 347	47 968	49 736
Age group			
25–34 years	64 022	67 447	74 824
35–44 years	78 322	83 448	92 140
45–54 years	75 550	79 959	89 164
55 + years	60 666	64 402	72 319
Highest level of education attainment			
Master's and Doctoral	76 933	81 694	90 757
Bachelor's and Higher professional	66 575	70 524	78 783
Secondary with A-level examination	59 895	62 720	69 472

Figure A15 Wages of ICT professionals



Figure A16 Wages of ICT professionals, by sphere



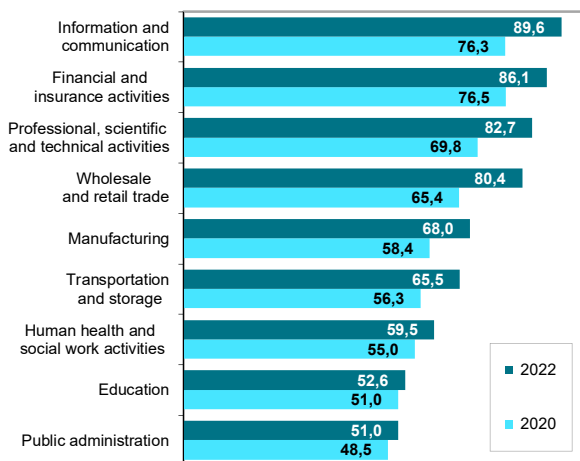
Source: CZSO, Structural Earnings Statistics

A ICT specialists

Table A5 Wages of ICT professionals in Czechia by occupation and industry

	Average gross monthly wage in CZK		
	2020	2021	2022
Total	70 018	74 357	82 441
Occupation			
Software and app. developers & analysts	73 719	78 049	86 473
Systems analysts	73 181	76 980	82 521
Software developers	78 136	84 925	93 017
Web and multimedia developers	68 922	59 692	63 172
Applications programmers	68 899	72 915	81 813
Other software developers and analysts	66 959	71 415	84 542
Database and network professionals	60 715	64 829	72 033
Database designers	69 303	68 113	73 234
Systems administrators	57 329	62 082	68 462
Computer network professionals	69 570	70 574	81 458
Data security professionals	73 289	79 419	83 350
Industry (CZ-NACE Section)			
Manufacturing (C)	58 447	61 486	68 028
Wholesale and retail trade (G)	65 435	72 415	80 375
Transporting and storage (H)	56 268	59 176	65 510
Information and communication (J)	76 344	81 184	89 641
Financial and insurance activities (K)	76 476	77 515	86 134
Professional, scientific and techn. act. (M)	69 778	76 211	82 735
Public administration (O)	48 516	49 029	51 040
Education (P)	50 999	50 788	52 567
Human health and social work act. (Q)	54 968	57 417	59 473
Arts, entertainment and recreation (R)	52 094	56 843	60 769

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		
	2020	2021	2022
Total	48 175	48 322	51 688
Men	48 503	49 046	52 428
Women	45 710	43 312	46 823
Citizenship			
Czech citizens	46 649	47 031	50 296
Foreigners	62 263	59 890	64 620
Sphere of activity (remuneration)			
Business (wage) sphere	48 906	48 923	52 368
Government (salary) sphere	39 692	40 527	42 379
Age group			
25–34 years	45 476	45 525	49 129
35–44 years	52 992	51 697	55 204
45–54 years	52 598	53 203	56 255
55 + years	44 403	45 724	48 372
Highest level of education attainment			
Master's and Doctoral	59 284	57 542	60 426
Bachelor's and Higher professional	51 049	52 228	55 333
Secondary with A-level examination	43 888	43 658	47 467
Other (lower)	37 337	39 776	43 568
Occupation			
ICT operations and user support technicians	49 269	48 979	52 489
Telecomm. and broadcasting technicians	40 889	43 047	45 505

Figure A18 Wages of ICT technicians

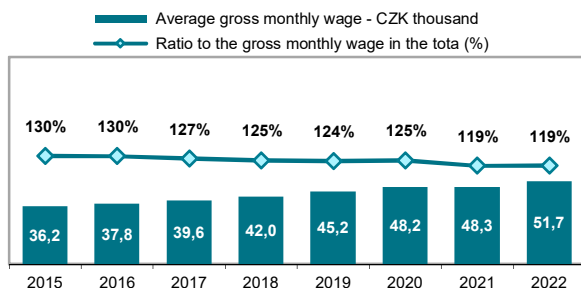
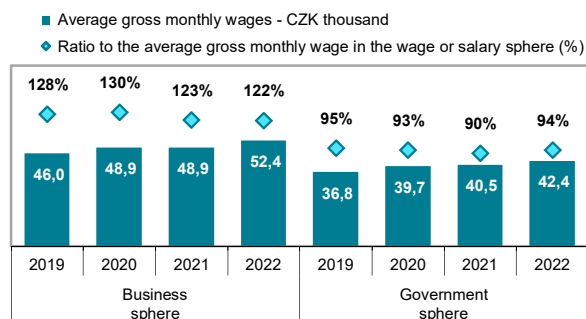


Figure A19 Wages of ICT technicians, by sphere



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).

Note: The 0619 and 0688 fields of education are merged into one category called here ICT n.e.c. and Inter-disciplinary ICT fields. The field of study Computer Use (0611) is not part of the study plan at universities.

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 (MEYS)**, 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 or fields of education 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 or field of education.

Eurostat database was used for **the international comparisons**. Data about number of students of and graduates from ICT fields of education contain information for tertiary level of education, i.e. including, for example, higher vocational schools. For this reason, the data for the Czech Republic from Eurostat differ from the data published by the CZSO available in 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 and graduates

Table B1 University students of ICT fields of education in Czechia by gender, age and citizenship

	Number of students		
	2020	2021	2022
Total	21 647	22 440	23 488
Men	17 941	18 556	19 315
Women	3 706	3 884	4 173
Age			
Under 20 years	2 522	2 710	3 039
20-24 years	14 135	14 606	15 299
25-29 years	3 462	3 437	3 554
30-34 years	802	923	884
35 + years	726	764	712
Citizenship			
Czech citizens	15 361	15 546	15 887
Foreigners, total	6 287	6 894	7 601
Slovakia	3 247	3 163	3 144
Russia	1 080	1 320	1 342
Ukraine	534	660	1 086
other countries	1 426	1 751	2 029

Figure B1 University students of ICT fields of education

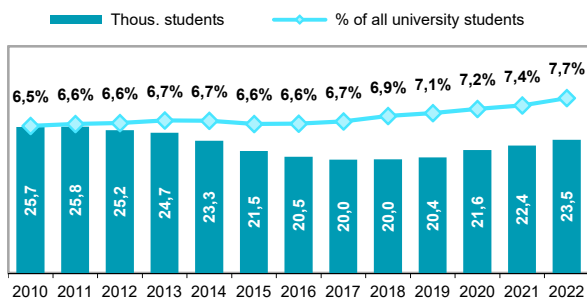


Figure B2 University students of ICT, by gender

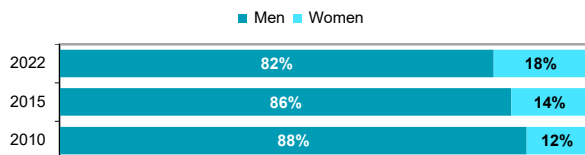
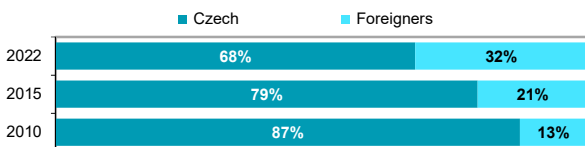


Figure B3 University students of ICT, by citizenship



Source: CZSO calculation based on MEYS database

B ICT students and graduates

Figure B4 Tertiary students of ICT; 2021
(% of all tertiary students)

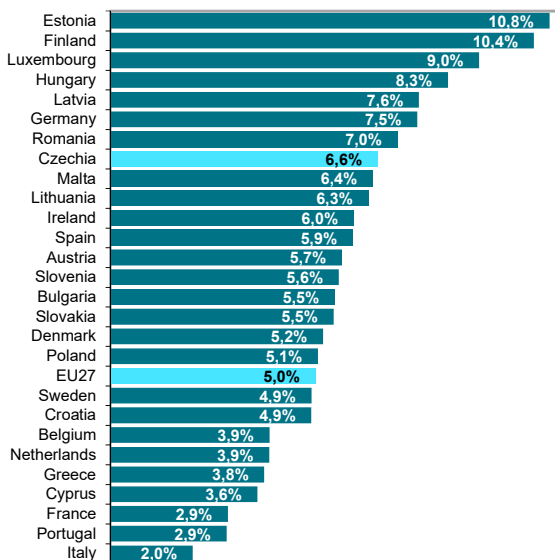
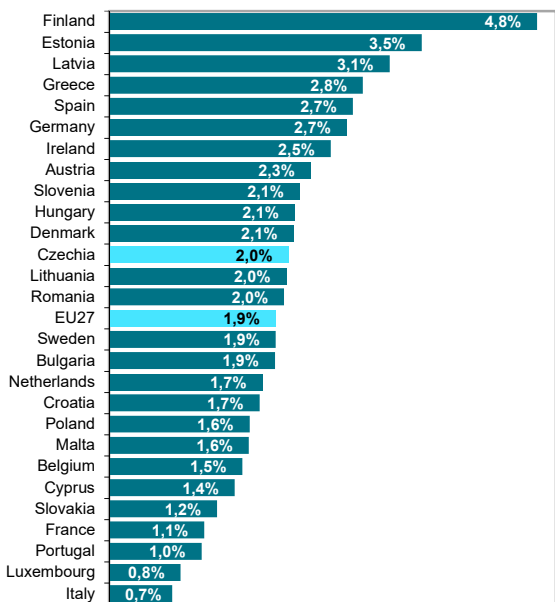


Figure B5 Tertiary students of ICT; 2021
(% of population aged 20 to 29 years)



Source: CZSO calculation based on Eurostat database

B ICT students and graduates

Table B2 University students of ICT fields of education in Czechia by selected characteristics

	Number of students		
	2020	2021	2022
Total	21 647	22 440	23 488
Students of public universities	21 013	21 616	22 645
Students of private universities	644	827	849
Studies			
Full-time studies	18 942	19 651	20 926
Distance and combined studies	2 727	2 803	2 580
Study programme			
Bachelor	15 692	16 329	17 192
Master	5 108	5 187	5 413
Doctoral	857	931	893
Field of study			
Software and applications development and analysis	14 383	16 130	17 460
Database and network design and administration	1 454	1 097	945
Inter-disciplinary and other ICT fields	5 849	5 257	5 116

Figure B6 University students of ICT, by studies

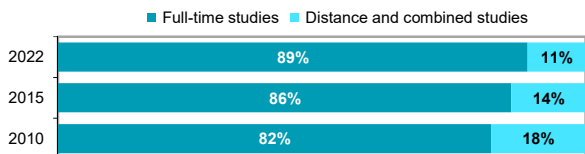


Figure B7 University students of ICT, by study programme

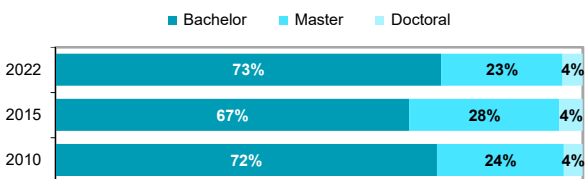
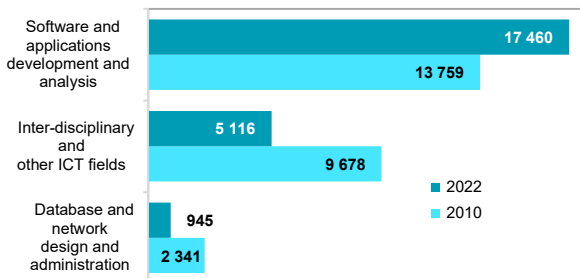


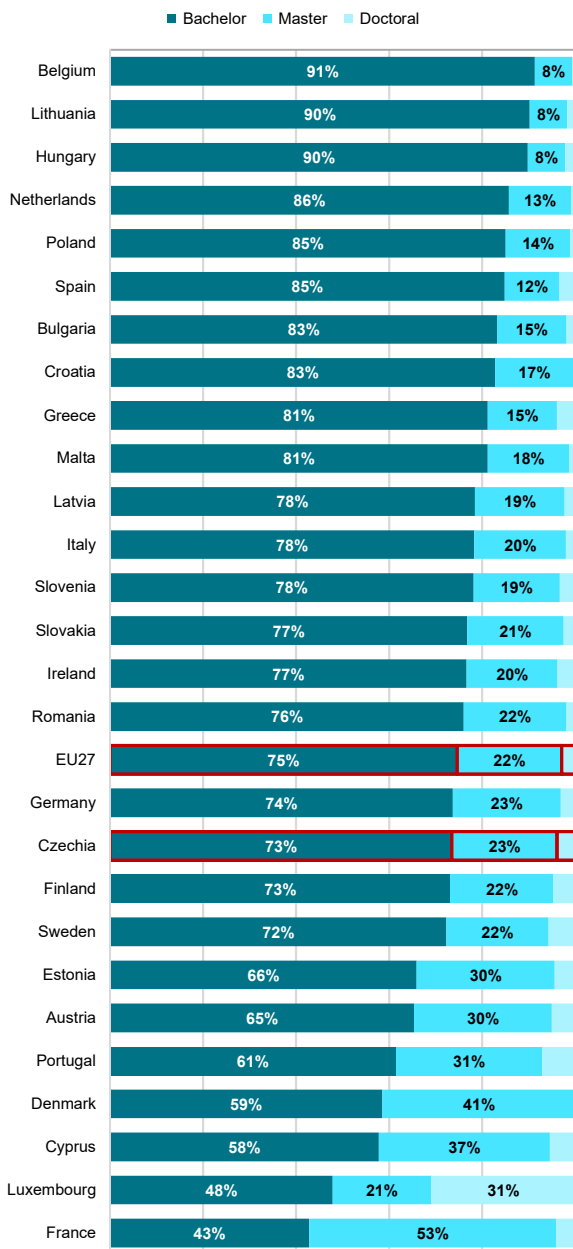
Figure B8 University students of ICT, by field of study



Source: CZSO calculation based on MEYS database

B ICT students and graduates

Figure B9 Tertiary students of ICT field of education by study programme; 2021



Source: CZSO calculation based on Eurostat database

B ICT students and graduates

Table B3 University graduates from ICT fields of education in Czechia by gender, age and citizenship

	Number of graduates		
	2020	2021	2022
Total	3 673	3 801	3 584
Men	2 983	3 091	2 963
Women	690	710	621
Age			
20-24 years	1 864	2 039	1 935
25-29 years	1 567	1 525	1 383
30-34 years	142	135	154
35 + years	100	102	112
Citizenship			
Czech citizens	2 734	2 786	2 578
Foreigners, total	939	1 015	1 006
Slovakia	628	721	683
Russia	97	89	111
Ukraine	66	61	58
other countries	148	144	154

Figure B10 University graduates from ICT fields of education

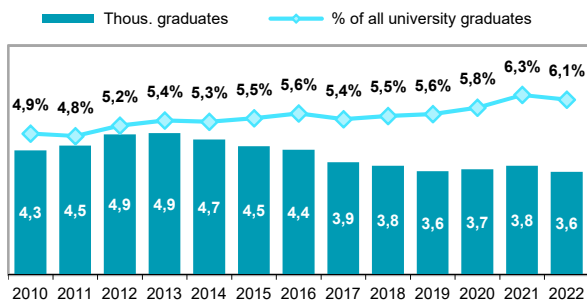


Figure B11 University graduates from ICT, by gender

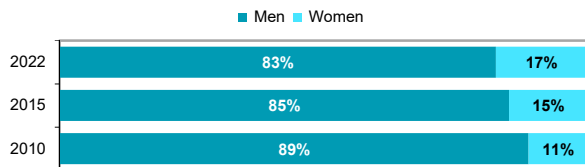
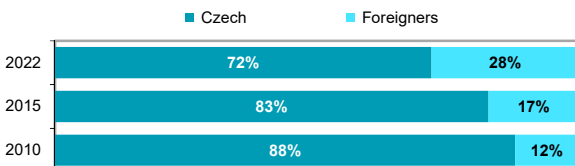


Figure B12 University graduates from ICT, by citizenship



Source: CZSO calculation based on MEYS database

B ICT students and graduates

Figure B13 Tertiary graduates from ICT; 2021
(% of all tertiary graduates)

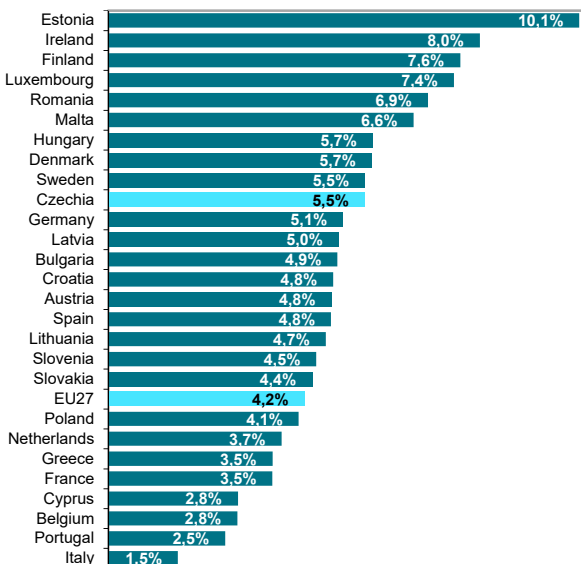
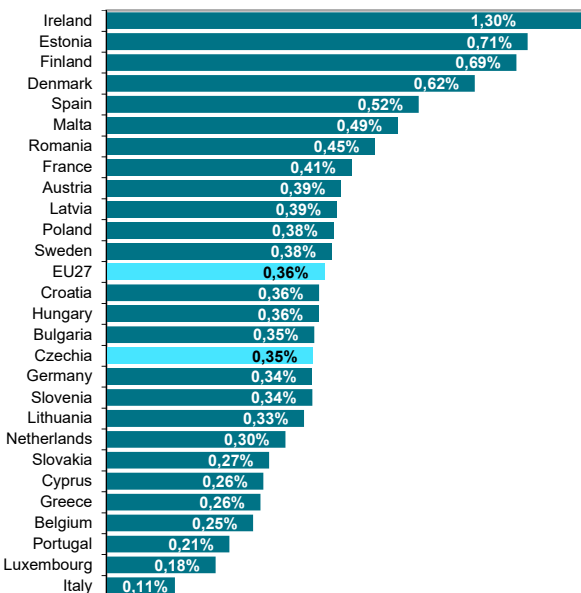


Figure B14 Tertiary graduates from ICT; 2021
(% of population aged 20 to 29 years)



Source: CZSO calculation based on Eurostat database

B ICT students and graduates

Table B4 University graduates from ICT fields of education in Czechia by selected characteristics

	Number of graduates		
	2020	2021	2022
Total	3 673	3 801	3 584
Graduates from public universities	3 633	3 732	3 534
Graduates from private universities	40	69	50
Studies			
Full-time studies	3 337	3 503	3 268
Distance and combined studies	336	298	316
Study programme			
Bachelor	2 081	2 241	2 197
Master	1 543	1 497	1 301
Doctoral	49	63	86
Field of study			
Software and applications development and analysis	1 947	2 011	2 264
Database and network design and administration	456	431	279
Inter-disciplinary and other ICT fields	1 267	1 268	912

Figure B15 University graduates from ICT, by studies

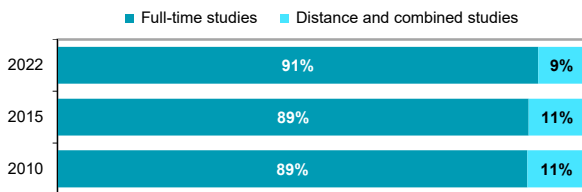
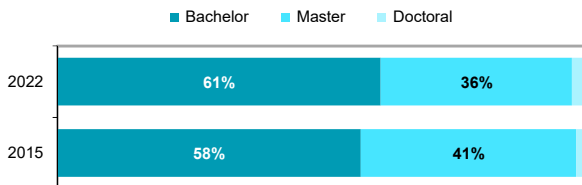
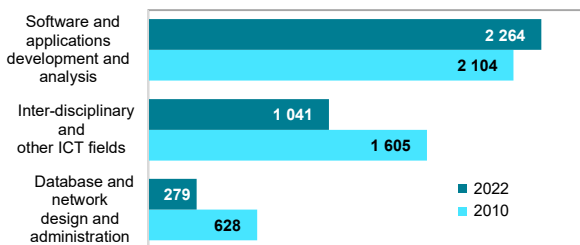


Fig. B16 University graduates from ICT, by study programme



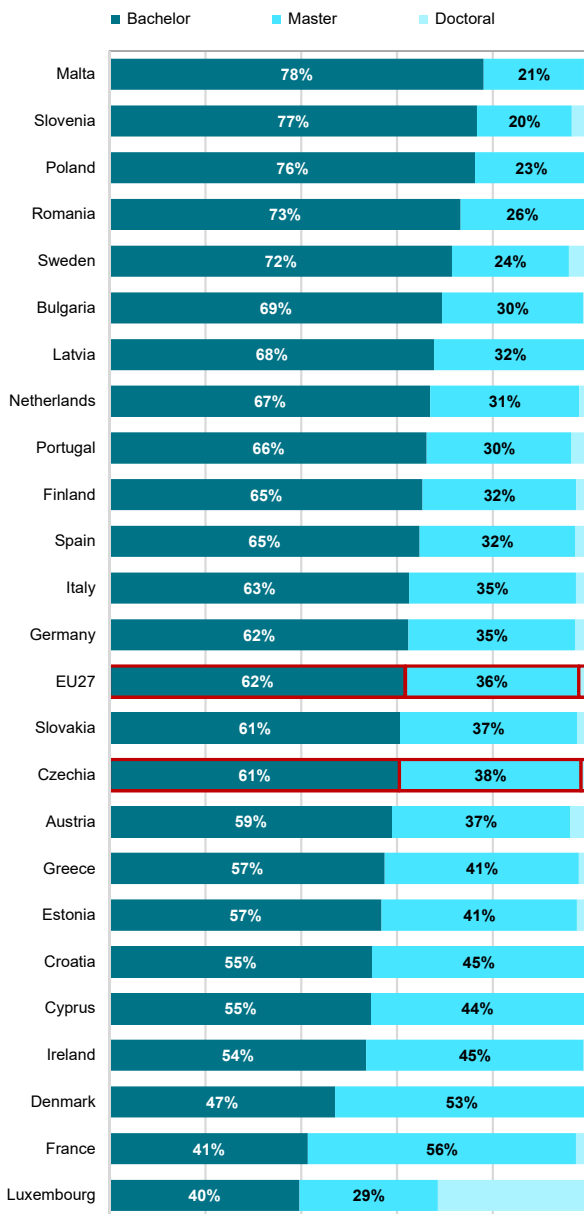
Graf B17 Absolventi ICT oborů na VŠ podle oboru



Source: CZSO calculation based on MEYS database

B ICT students and graduates

Figure B18 University graduates from ICT, by study programme; 2021



Source: CZSO calculation based on Eurostat database

B ICT students and graduates

Figure B19 Share of women among all tertiary students of ICT fields of education; 2021

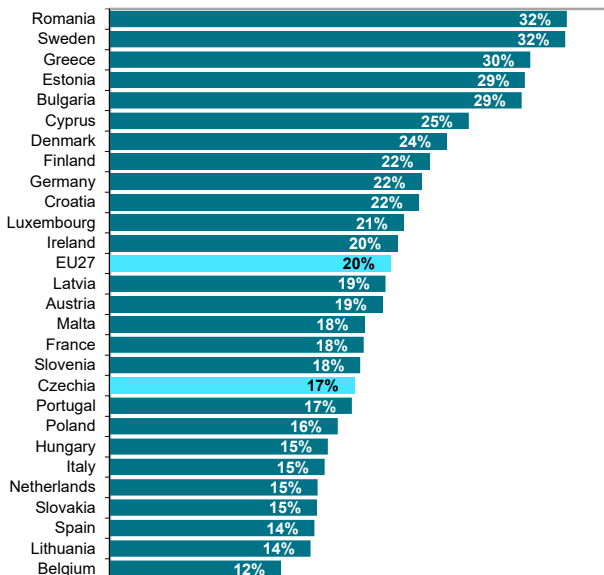
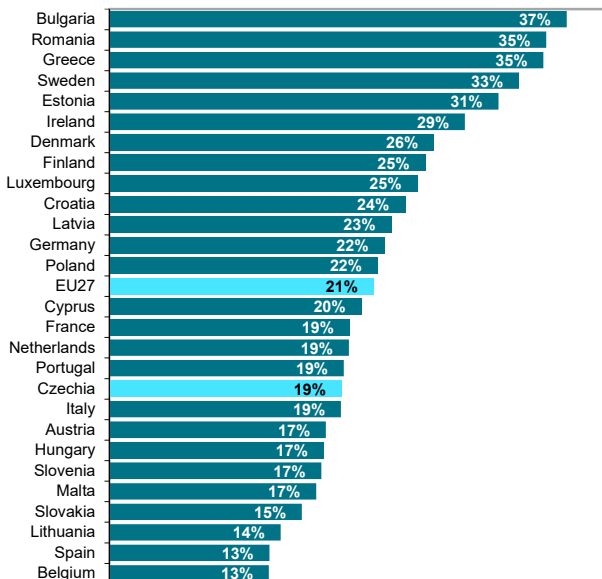


Figure B20 Share of women among all tertiary graduates from ICT fields of education; 2021



Source: CZSO calculation based on Eurostat database

Investments into ICT equipment and software

Investment into ICT equipment and software (hereafter **ICT investment**) is **defined** as the acquisition of equipment and computer software that is used in production for more than one year. ICT has **three components**: information technology equipment (computers and related hardware); communications equipment; and software.

Investment here shall mean the **gross fixed capital formation** (GFCF: P.51), which includes mainly acquisitions of fixed assets (P.511) 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): <http://ec.europa.eu/eurostat/web/esa-2010>

According to **the ESA 2010**, the investments into computer and communication 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 the 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)** that include data files organized so as to enable cost-effective data access and use.

ICT equipment can be also **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.

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 **Sector** (ESA 2010 Institutional Sectors Classification) and **Industry** (CZ NACE classification) of the monitored entities.

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.

Detail description of CZ- COICOP is available here (*only in Czech*):

<https://www.czso.cz/csu/czso/klasifikace-individualni-spotreby-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 2022 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

C ICT investment

Table C1 ICT investment in Czechia

	CZK million		
	2020	2021	2022
Total	287 958	299 037	343 660
ICT equipment	88 434	81 493	69 094
Software	199 524	217 544	274 566
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	3 614	1 677	1 691
Mining and quarrying	628	226	360
Manufacturing	67 656	66 159	68 442
Electricity, gas and water supply	8 809	7 573	10 605
Construction	5 856	6 832	5 196
Wholesale and retail trade	20 227	18 392	23 416
Transportation and storage	8 440	7 964	9 018
Accommodation and food service activities	2 194	2 742	1 488
Information and communication	94 648	106 143	132 061
Financial and insurance activities	32 705	35 033	37 734
Real estate activities	3 448	2 867	4 700
Professional, scientific and technical activ.	15 139	19 092	18 757
Administrative and support service activ.	3 681	3 429	6 185
Public administration and defence	10 801	10 367	12 322
Education	3 129	2 630	2 645
Human health and social work activities	4 365	5 663	6 239
Arts, entertainment and recreation	1 916	1 798	2 165
Other services	702	450	636

Figure C1 ICT investment

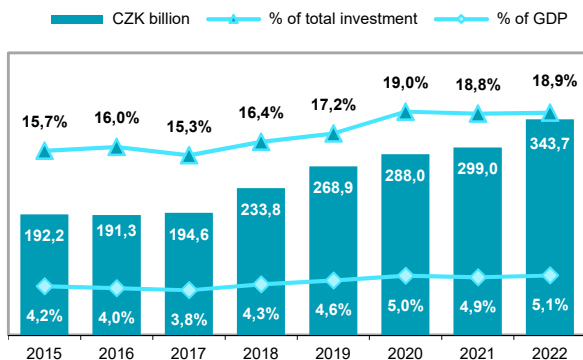
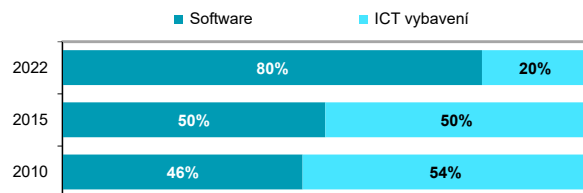


Figure C2 ICT investment, by asset



Source: CZSO, Annual National Accounts Statistics

C ICT investment

Figure C3 ICT investment; 2021* (% of GDP)

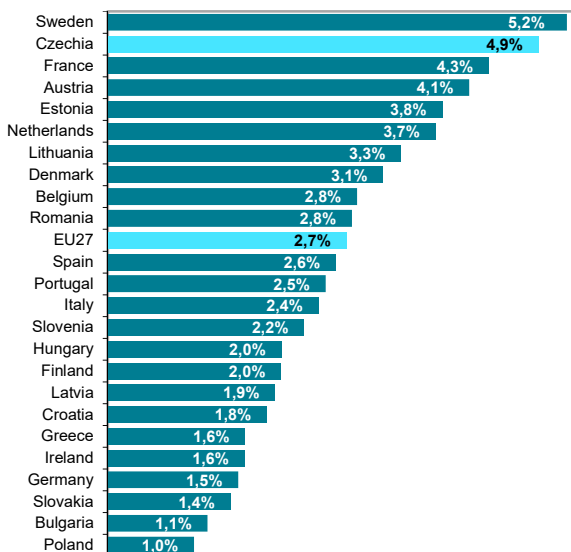
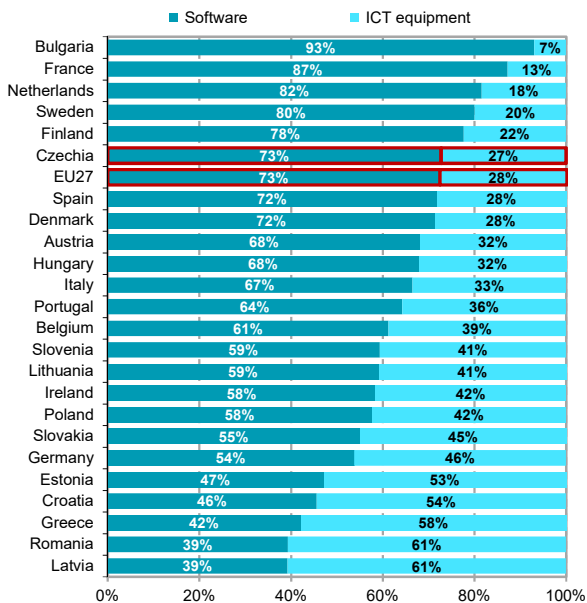


Figure C4 ICT investment, by asset (%); 2021*



* or the nearest available year

Source: CZSO calculations based on Eurostat data

C ICT investment

Table C2 ICT equipment investment in Czechia

CZK million

	2020	2021	2022
Total	88 434	81 493	69 094
in government institutions	7 797	6 188	7 576
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	2 961	907	815
Mining and quarrying	539	131	62
Manufacturing	45 541	41 766	38 415
Electricity, gas and water supply	4 633	2 830	922
Construction	4 131	4 998	2 401
Wholesale and retail trade	4 492	1 554	2 494
Transportation and storage	2 267	1 032	1 366
Accommodation and food service activities	1 553	2 072	587
Information and communication	6 331	5 623	2 837
Financial and insurance activities	3 101	5 195	5 996
Real estate activities	919	193	920
Professional, scientific and technical activ.	3 655	7 167	3 531
Administrative and support service activ.	566	107	482
Public administration and defence	3 101	2 566	3 241
Education	1 911	1 362	1 261
Human health and social work activities	1 788	3 170	2 795
Arts, entertainment and recreation	613	578	529
Other services	332	242	440

Figure C5 ICT equipment investment

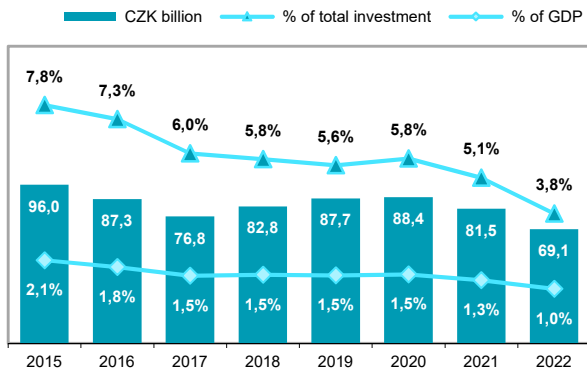
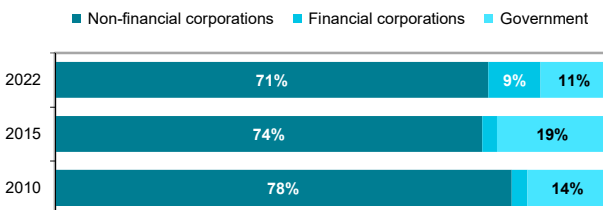


Figure C6 ICT equipment investment, by sector



Source: CZSO, Annual National Accounts Statistics

C ICT investment

Figure C7 ICT equipment investment; 2021* (% GDP)

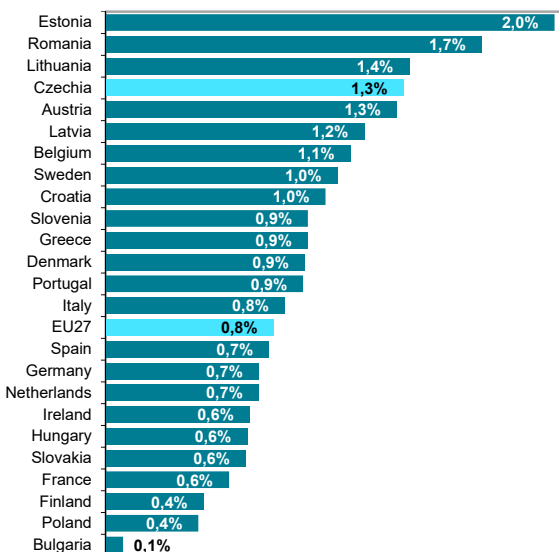
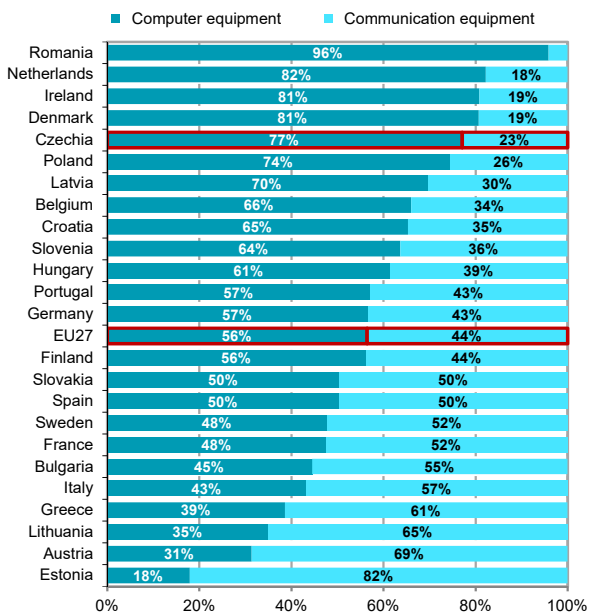


Figure C8 ICT equipment investment, by asset (%); 2021*



* or the nearest available year

Source: CZSO calculations based on Eurostat data

C ICT investment

Table C3 Software investment in Czechia

	CZK million		
	2020	2021	2022
Total	199 524	217 544	274 566
in government institutions	10 016	10 034	11 478
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	653	770	876
Mining and quarrying	89	95	298
Manufacturing	22 115	24 393	30 027
Electricity, gas and water supply	4 176	4 743	9 683
Construction	1 725	1 834	2 795
Wholesale and retail trade	15 735	16 838	20 922
Transportation and storage	6 173	6 932	7 652
Accommodation and food service activities	641	670	901
Information and communication	88 317	100 520	129 224
Financial and insurance activities	29 604	29 838	31 738
Real estate activities	2 529	2 674	3 780
Professional, scientific and technical activ.	11 484	11 925	15 226
Administrative and support service activ.	3 115	3 322	5 703
Public administration and defence	7 700	7 801	9 081
Education	1 218	1 268	1 384
Human health and social work activities	2 577	2 493	3 444
Arts, entertainment and recreation	1 303	1 220	1 636
Other services	370	208	196

Figure C9 Software investment

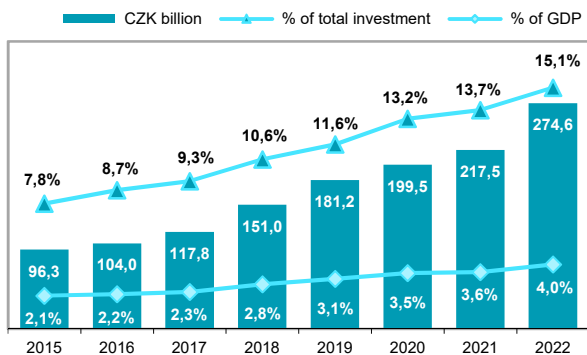
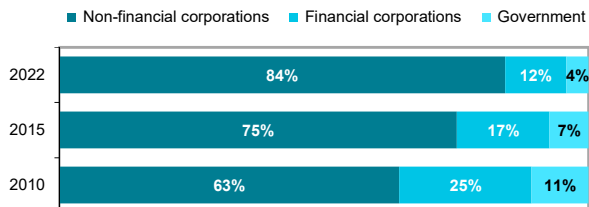


Figure C10 Software investment, by sector



Source: CZSO, Annual National Accounts Statistics

C ICT investment

Figure C11 Software investment; 2021*
(% of total investment)

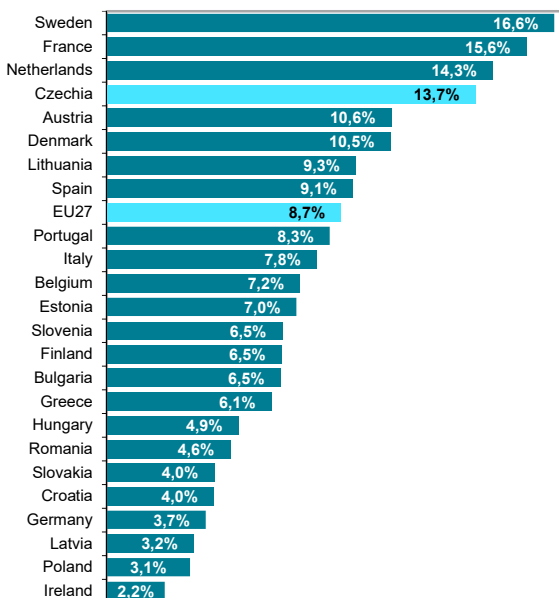
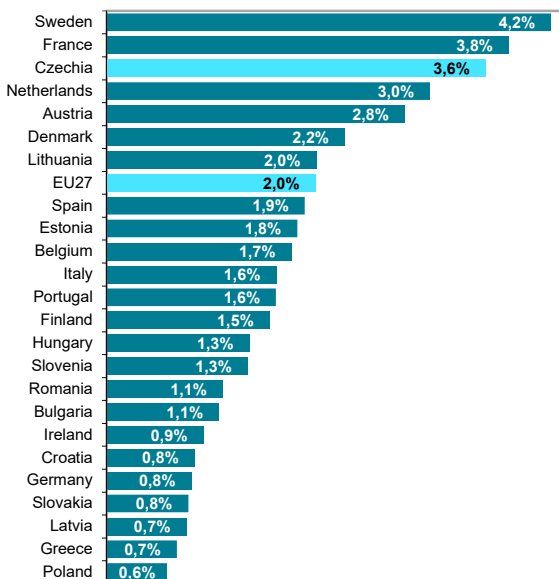


Figure C12 Software investment, 2021* (% of GDP)



* 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		
	2020	2021	2022
Total	111 201	117 293	121 257
ICT equipment	40 085	42 677	45 223
Telephone equipment	9 471	8 999	9 694
Computers and consumer electronics	30 614	33 678	35 529
ICT services	71 116	74 616	76 034

Figure C13 Household consumption expenditures on ICT equipment and services

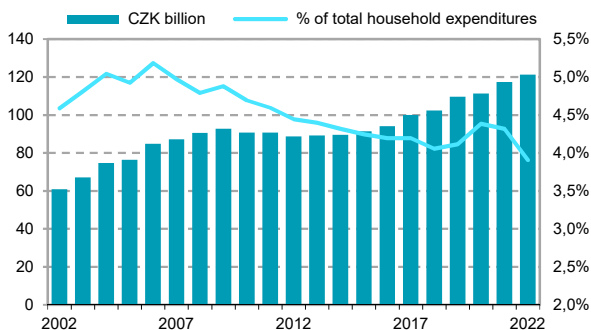


Figure C14 Household expenditures on ICT, by product

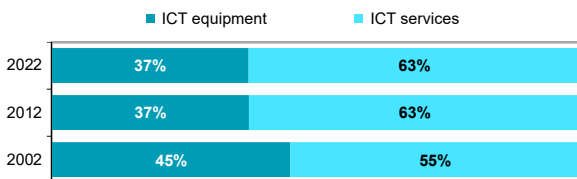
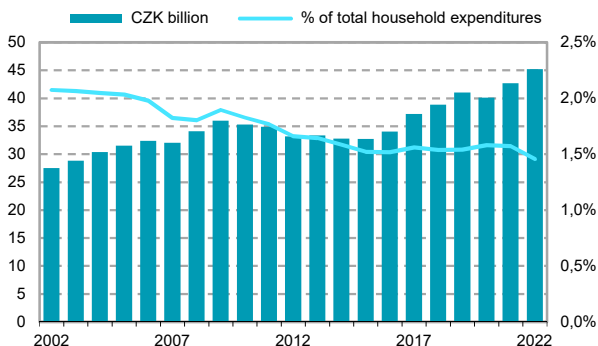


Figure C15 Households expenditures on ICT equipment



Source: CZSO, Annual National Accounts Statistics

C ICT investment

Figure C16 Household expenditures on ICT; 2022
(% of total households consumption expenditures)

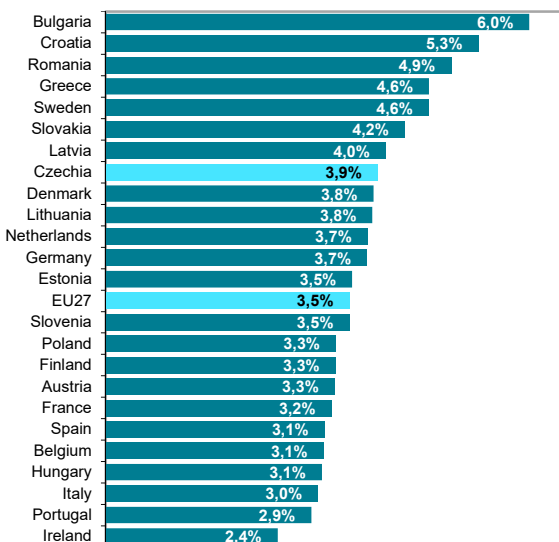
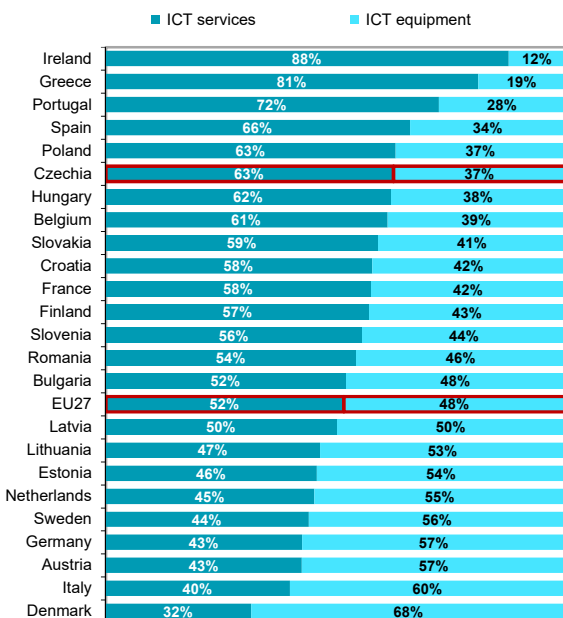


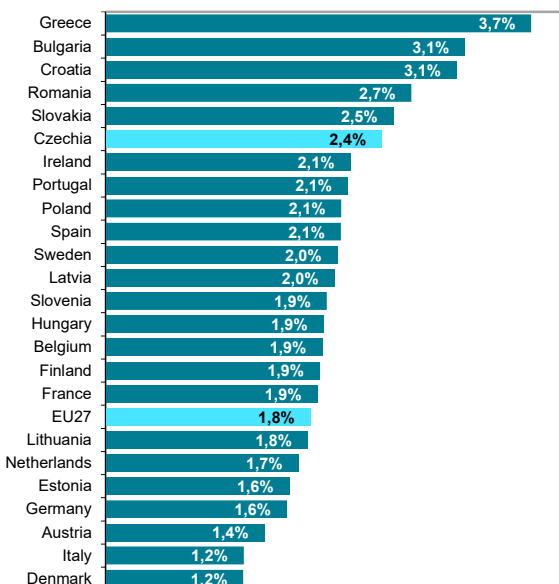
Figure C17 Household expenditures on ICT, by type of product; 2022 (%)



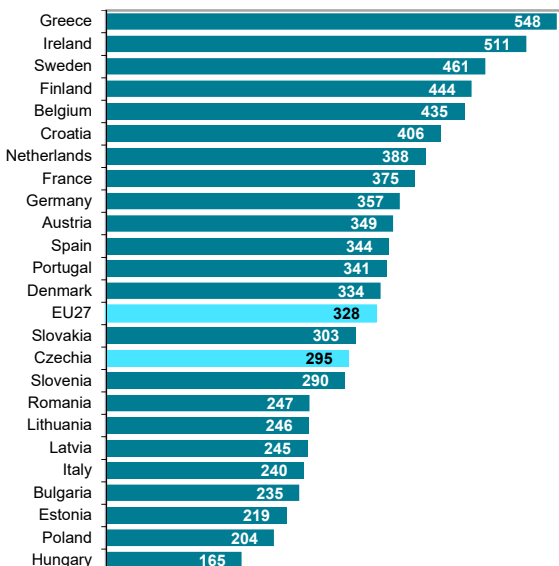
Source: CZSO calculations based on Eurostat data

C ICT investment

Graf C18 Household expenditures on ICT services; 2022
(% of total households expenditures)



Graf C19 Household expenditures on ICT services; 2022
(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>

D ICT research and development

Table D1 Total ICT R&D expenditures in Czechia

	CZK million		
	2020	2021	2022
Total	22 975	27 450	31 643
financed from government funds	1 828	1 979	1 668
Type of ICT product			
ICT equipment	6 691	7 372	8 164
Software	16 284	20 078	23 479
Type of R&D performer			
Enterprises, total	21 517	26 096	30 469
National enterprises	6 799	8 607	9 822
Foreign-controlled enterprises	14 718	17 489	20 647
Public universities	1 355	1 267	1 049
Other R&D performers	103	86	126

Figure D1 Total ICT R&D expenditures

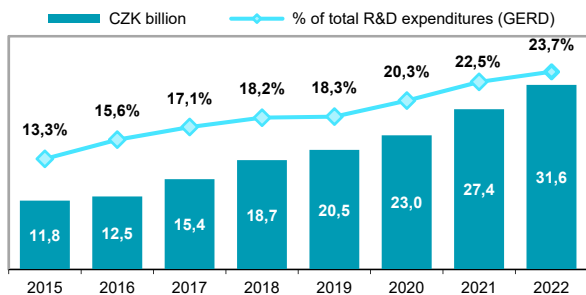


Figure D2 ICT R&D expenditures, by type of product

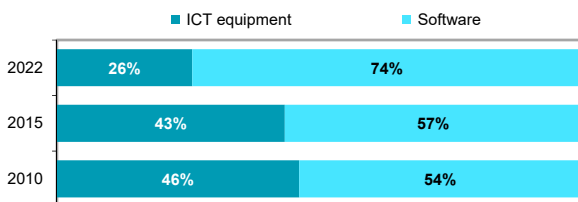
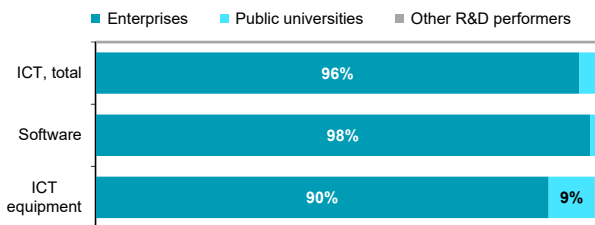


Figure D3 ICT R&D expenditures, by type of performer; 2021



Source: CZSO, Annual R&D survey

D ICT research and development

Table D2 Software R&D expenditures in Czechia

	CZK million		
	2020	2021	2022
Total	16 284	20 078	23 479
financed from government funds	573	611	581
Type of R&D performer			
Enterprises, total	15 792	19 699	23 108
National enterprises	4 679	6 246	7 331
Foreign-controlled enterprises	11 112	13 453	15 777
Public universities	452	342	298
Other R&D performers	40	37	73

Figure D4 Software R&D expenditures

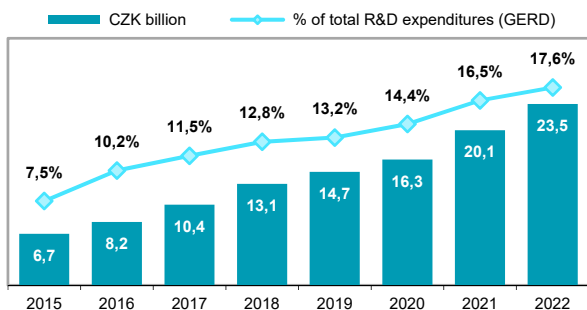


Figure D5 Software R&D expenditures, by performer; 2021

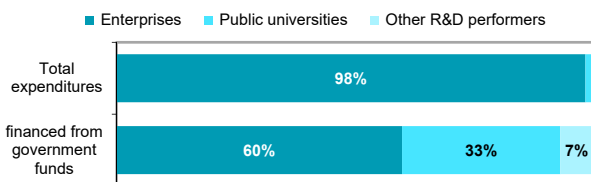
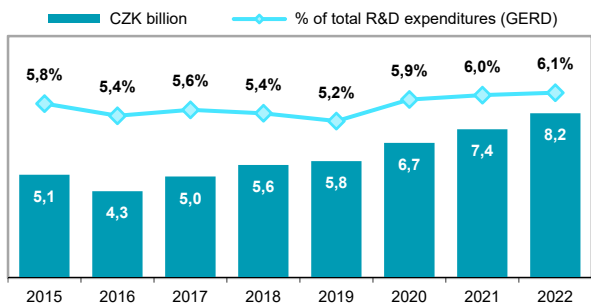


Figure D6 ICT equipment R&D expenditures



Source: CZSO, Annual R&D survey

D ICT research and development

Table D3 ICT R&D expenditures in enterprises in Czechia

	CZK million		
	2020	2021	2022
Total	21 517	26 096	30 469
financed from government funds	900	945	849
Type of ICT product			
ICT equipment	5 725	6 397	7 361
Software	15 792	19 699	23 108
Size group (employees)			
Small enterprises (0-49)	2 154	2 582	3 436
Medium enterprises (50-249)	3 957	4 938	4 819
Large enterprises (250+)	15 406	18 576	22 214
Ownership			
National enterprises	6 799	8 607	9 822
Foreign-controlled enterprises	14 718	17 489	20 647
Industry (CZ-NACE)			
ICT sector industries, total	15 262	18 906	21 895
ICT manufacturing	323	374	484
ICT services	14 939	18 533	21 412
Other industries	6 255	7 190	8 574

Figure D7 ICT R&D expenditures in enterprises

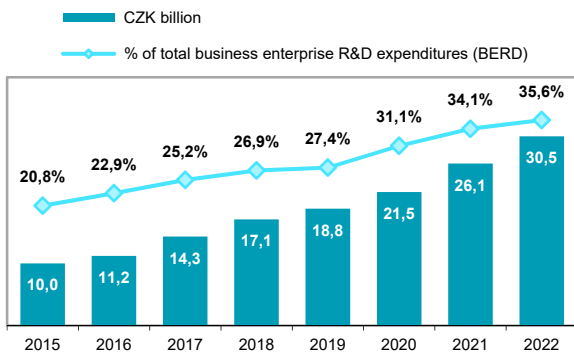
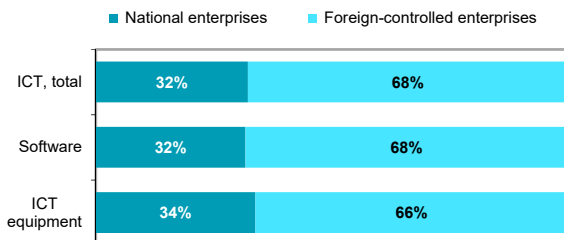


Figure D8 ICT R&D expenditures in enterprises, by ownership; 2022



Source: CZSO, Annual R&D survey

D ICT research and development

Table D4 ICT R&D expenditures in enterprises in Czechia by type of product; 2022

CZK million

	Total	ICT equipment	Software
Total	30 469	7 361	23 108
financed from government funds	945	600	345
Size group (employees)			
Small enterprises (0-49)	3 436	806	2 630
Medium enterprises (50-249)	4 819	1 344	3 475
Large enterprises (250+)	22 214	5 212	17 002
Ownership			
National enterprises	9 822	2 491	7 331
Foreign-controlled enterprises	20 647	4 871	15 777
Industry (CZ-NACE)			
ICT sector industries, total	21 895	1 789	20 107
ICT manufacturing	484	289	195
ICT services	21 412	1 500	19 912
Other industries	8 574	5 573	3 001

Figure D9 ICT R&D expenditures in enterprises, by product

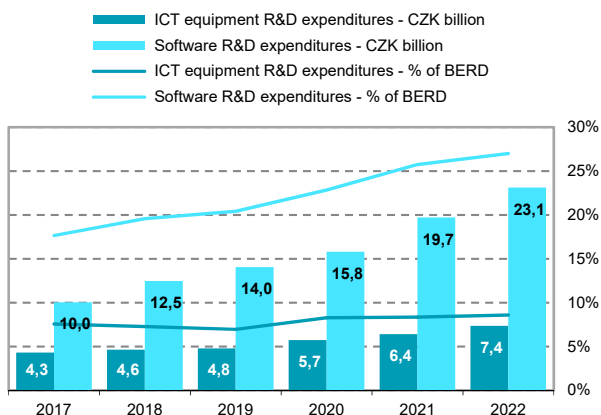
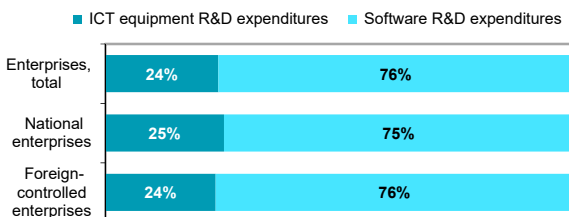


Figure D10 ICT R&D expenditures in enterprises, by ownership of R&D performers; 2022



Source: CZSO, Annual R&D survey

D ICT research and development

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

	CZK million		
	2020	2021	2022
Total	16 739	20 190	23 035
financed from government funds	1 071	1 715	1 777
Type of product			
ICT equipment	1 652	1 837	1 789
Software	13 610	17 069	20 107
Other non ICT related products	1 477	1 284	1 140
Size group (employees)			
Small enterprises (0-49)	2 031	2 332	2 918
Medium enterprises (50-249)	3 329	4 230	3 959
Large enterprises (250+)	11 379	13 628	16 159
Ownership			
National enterprises	5 454	6 851	8 134
Foreign-controlled enterprises	11 285	13 339	14 901
ICT sub-sectors			
ICT manufacturing	999	727	1 054
ICT services, total	15 740	19 463	21 982
Computer programming	11 867	15 005	17 056
Data processing and Other IT services	3 874	4 458	4 926

Figure D11 R&D expenditures in the ICT sector

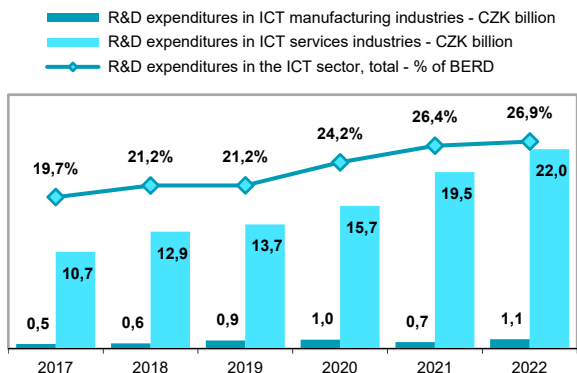
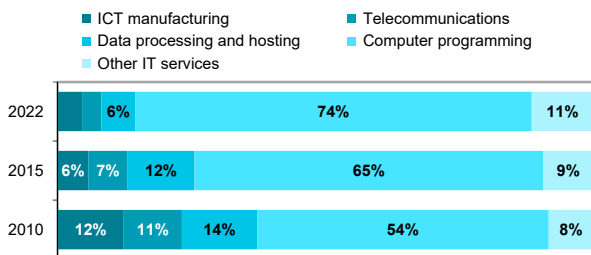


Figure D12 R&D expenditures in the ICT sector, by industry



Source: CZSO, Annual R&D survey

D ICT research and development

Figure D13 R&D expenditures in the ICT sector; 2021
(% of GDP)

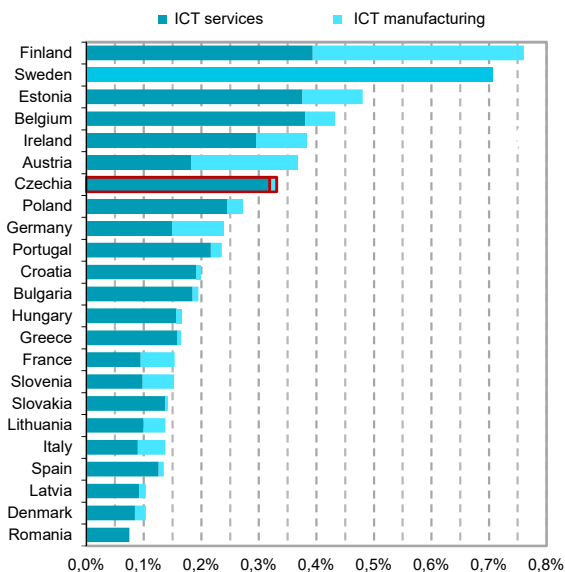
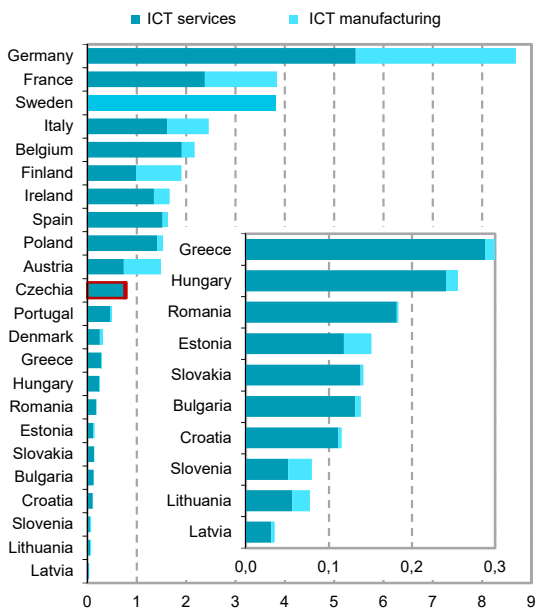


Figure D14 R&D expenditures in the ICT sector; 2021
(EUR billion)



Source: CZSO calculations based on Eurostat data

D ICT research and development

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

	Full Time Equivalent Numbers		
	2020	2021	2022
Total	11 593	12 971	14 132
Men	10 130	11 106	11 911
Women	1 462	1 866	2 221
Size group (employees)			
Small enterprises (0-49)	2 021	2 225	2 588
Medium enterprises (50-249)	2 838	3 093	2 779
Large enterprises (250+)	6 734	7 653	8 765
Ownership			
National enterprises	6 656	7 591	8 062
Foreign-controlled enterprises	4 937	5 380	6 070
ICT sub-sectors			
ICT manufacturing	832	761	857
ICT services, total	10 760	12 210	13 276
Computer programming	8 493	9 858	10 879
Data processing and Other IT services	2 268	2 352	2 397

Figure D15 R&D personnel in the ICT sector

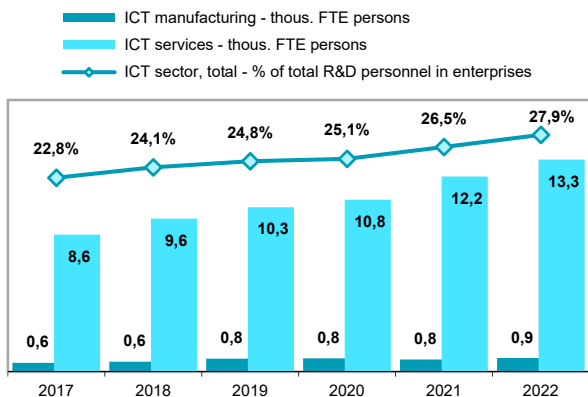
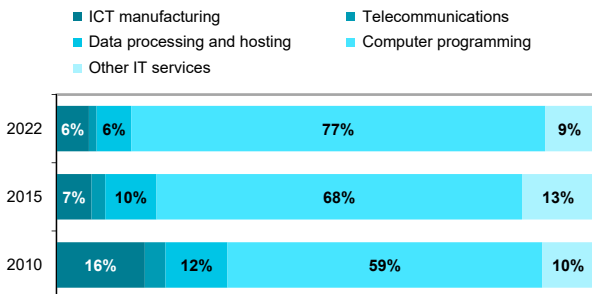


Figure D16 R&D personnel in the ICT sector, by industry



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).

Statistics on international trade in goods track actual trade in goods between Czech and foreign entities, i.e. trade where there is a change of ownership between residents and non-residents. Internationally comparable data for foreign trade with goods respecting change of ownership are currently only available for the total export/import of goods.

Statistics on Cross-border movements of goods tell exclusively about the physical movement of goods across the borders of the Czech Republic, regardless of whether there is trade between Czech and foreign entities. These data are available for international comparison and in a more detailed breakdown, however, they do not indicate the actual trade in these goods.

More detailed information on the issue of the dual concept of international trade can be found on the links: https://www.czso.cz/csu/czso/2-vzonu_m ; https://www.czso.cz/csu/czso/external_trade_in_goods_according_to_the_movement_cross_border_concept- .

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/3smUgu2> .

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 External Trade Statistics Database (https://apl.czso.cz/pll/stazo/STAZO_ZO.STAZO) and the Cross-border movements of goods database (<http://apl.czso.cz/pll/stazo/STAZO.STAZO>).

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

Data for international comparisons refer to the reported or nearest available year. More information at.:

<https://ec.europa.eu/eurostat/web/international-trade-in-goods/data/database>

For further information on ICT external trade see (*only in Czech*): https://www.czso.cz/csu/czso/zahranicni_obchod_s_ict_zbozim

E International trade in ICT goods

Table E1 International trade in ICT goods in Czechia

CZK million

	2020	2021	2022
Export, total	327 355	339 541	333 182
Computers and peripheral equipment	152 880	157 467	147 037
Communication equipment	63 750	58 785	58 437
Consumer electronics	54 415	57 698	47 621
Electronic components	26 011	29 425	31 060
ICT parts n.e.s.	30 298	36 165	49 028
% of total goods exports from Czechia	9,5%	8,7%	7,6%
Import, total	388 031	395 524	403 689
Computers and peripheral equipment	101 829	114 513	124 702
Communication equipment	89 253	86 227	86 352
Consumer electronics	40 767	45 003	43 417
Electronic components	77 285	81 866	97 826
ICT parts n.e.s.	78 898	67 915	51 392
% of total goods imports to Czechia	11,9%	10,2%	8,8%

Figure E1 International trade in ICT goods in Czechia by commodities, 2022

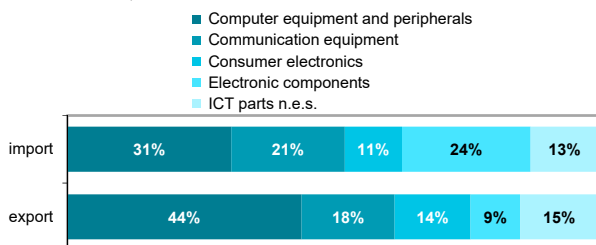


Figure E2 ICT goods exports from Czechia, by countries

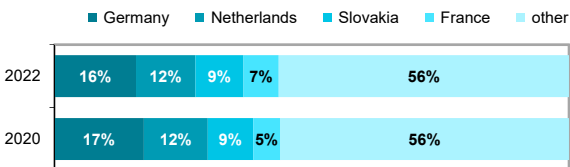
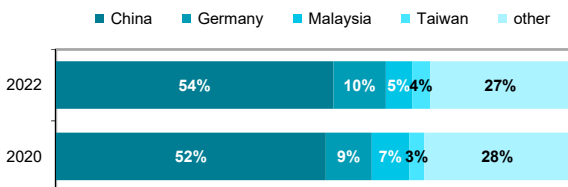


Figure E3 ICT goods imports to Czechia, by countries



Source: CZSO, External Trade Statistics Database

E International trade in ICT goods

Table E2 International trade in Computers and peripheral equipment in Czechia

CZK million

	2020	2021	2022
Export, total	152 880	157 467	147 037
Portable computers	10 913	13 935	10 764
Other computers	93 635	85 120	76 917
Computer peripherals, total	48 332	58 412	59 356
Storage units	30 218	36 280	32 461
Sound, video, network and similar cards	10 240	12 251	13 922
Monitors used with computers	2 073	2 528	3 983
Printers, copying or faxing machines	1 661	1 549	3 703
Other input or output peripherals*	4 139	5 805	5 286
% of total goods exports from Czechia	4,5%	4,1%	3,3%
Import, total	101 829	114 513	124 702
Portable computers	28 299	33 372	33 080
Other computers	15 200	17 874	32 780
Computer peripherals, total	58 330	63 268	58 841
Storage units	23 741	29 215	21 655
Sound, video, network and similar cards	15 402	16 154	18 301
Monitors used with computers	5 861	4 908	5 473
Printers, copying or faxing machines	3 904	3 651	5 754
Other input or output peripherals*	9 421	9 340	7 658
% of total goods imports to Czechia	3,1%	2,9%	2,7%

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

Figure E4 International trade in Computers and peripheral equipment in Czechia by commodities, 2022

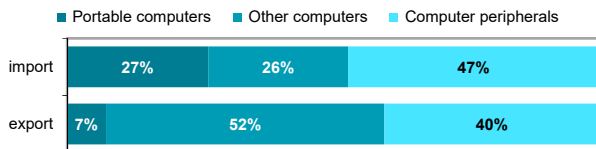


Figure E5 Computers and peripheral equipment exports from Czechia, by countries

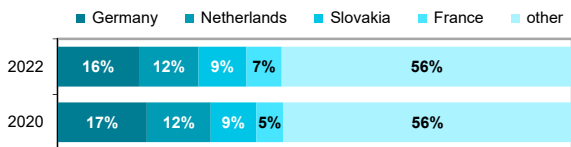
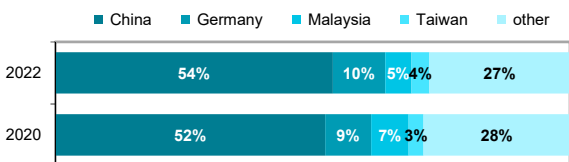


Figure E6 Computers and peripheral equipment imports to Czechia, by countries



Source: CZSO, External Trade Statistics Database

E International trade in ICT goods

Table E3 International trade in Communication equipment in Czechia

CZK million

	2020	2021	2022
Export, total	63 750	58 785	58 437
Mobile phones	34 543	28 544	24 568
Other communication equipment	29 207	30 241	33 869
% of total goods exports from Czechia	1,9%	1,5%	1,3%
Import, total	89 253	86 227	86 352
Mobile phones	53 475	47 611	48 942
Other communication equipment	35 778	38 616	37 410
% of total goods imports to Czechia	2,7%	2,2%	1,9%

Figure E7 International trade in Communication equipment in Czechia by commodities, 2022

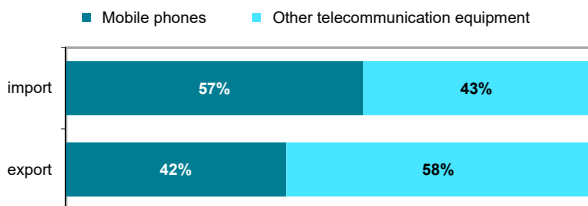


Figure E8 Communication equipment exports from Czechia, by countries

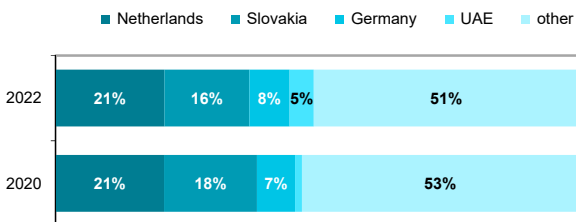
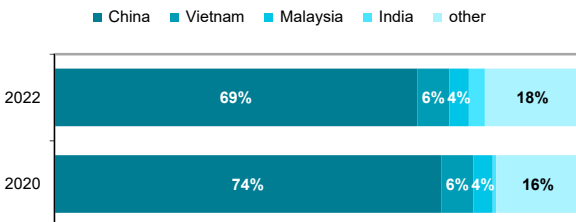


Figure E9 Communication equipment imports to Czechia, by countries



Source: CZSO, External Trade Statistics Database

E International trade in ICT goods

Table E4 International trade in Consumer electronics in Czechia

CZK million

	2020	2021	2022
Export, total	54 415	57 698	47 621
Radio and TV receivers	24 342	20 669	9 646
Sound and image recording and reproducing apparatuses	10 289	11 253	10 295
Consumer electronics accessories*	19 785	25 775	27 679
% of total goods exports from Czechia	1,6%	1,5%	1,1%
Import, total	40 767	45 003	43 417
Radio and TV receivers	16 397	14 882	11 073
Sound and image recording and reproducing apparatuses	12 865	15 699	16 111
Consumer electronics accessories*	11 505	14 422	16 234
% of total goods imports to Czechia	1,3%	1,2%	0,9%

* 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 E10 International trade in Consumer electronics in Czechia by commodities, 2022

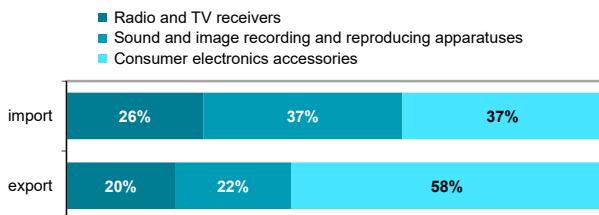


Figure E11 Consumer electronics exports from Czechia, by countries

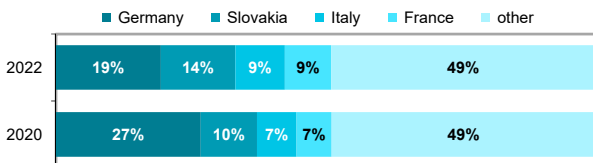
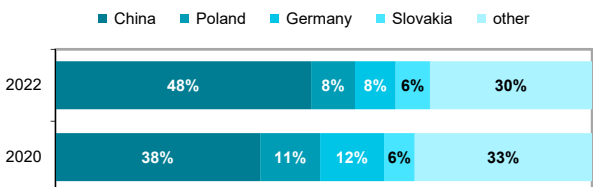


Figure E12 Consumer electronics imports to Czechia, by countries



Source: CZSO, External Trade Statistics Database

E International trade in ICT goods

Table E5 International trade in Electronic components in Czechia

CZK million

	2020	2021	2022
Export, total	26 011	29 425	31 060
Electronic integrated circuits	19 485	20 819	18 556
Printed circuits	3 270	4 219	4 042
Other electronic components	3 256	4 387	8 462
% of total goods exports from Czechia	0,8%	0,8%	0,7%
Import, total	77 285	81 866	97 826
Electronic integrated circuits	60 310	57 896	58 314
Printed circuits	8 461	11 584	13 307
Other electronic components	8 514	12 386	26 205
% of total goods imports to Czechia	2,4%	2,1%	2,1%

Figure E13 International trade in Electronic components in Czechia by commodities, 2022

■ Electronic integrated circuits ■ Printed circuits ■ Other electronic components

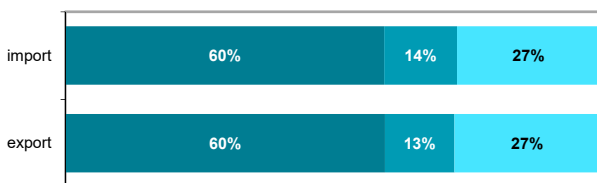


Figure E14 Electronic components exports from Czechia, by countries

■ Germany ■ Slovakia ■ Netherland ■ France ■ other

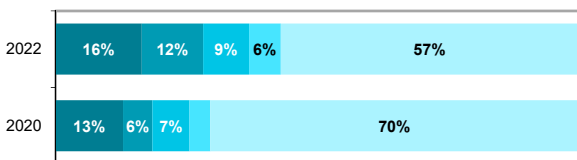
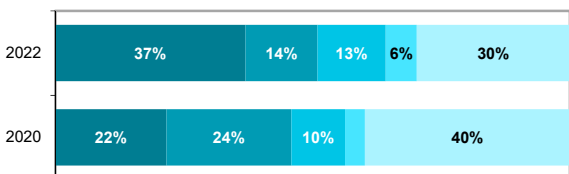


Figure E15 Electronic components imports to Czechia, by countries

■ China ■ Malaysia ■ Germany ■ Taiwan ■ other



Source: CZSO, External Trade Statistics Database

E International trade in ICT goods

Table E6 International trade in ICT parts n.e.s. in Czechia

CZK million

	2020	2021	2022
Export, total	30 298	36 165	49 028
Parts and accessories n.e.s. of			
computers	21 064	26 603	41 925
telecommunication equipment	1 520	1 701	1 611
consumer electronics	7 714	7 860	5 492
% of total goods exports from Czechia	0,9%	0,9%	1,1%
Import, total	78 898	67 915	51 392
Parts and accessories n.e.s. of			
computers	49 018	37 305	25 891
telecommunication equipment	9 082	8 321	8 541
consumer electronics	20 799	22 288	16 960
% of total goods imports to Czechia	2,4%	1,7%	1,1%

Figure E16 International trade in ICT parts n.e.s. in Czechia by commodities, 2022

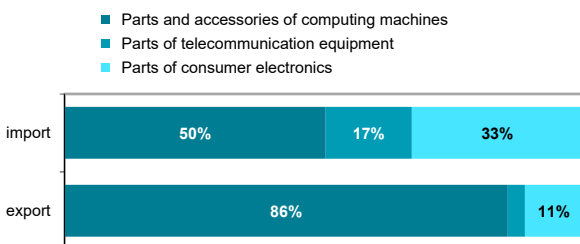


Figure E17 ICT parts n.e.s. exports from Czechia, by countries

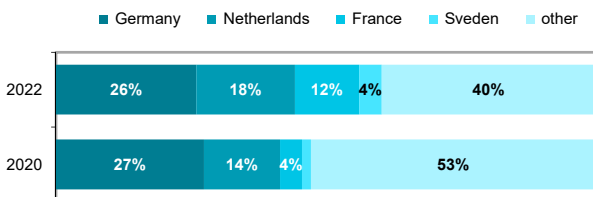
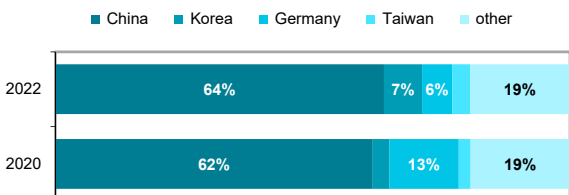


Figure E18 ICT parts n.e.s. imports to Czechia, by countries



Source: CZSO, External Trade Statistics Database

E International trade in ICT goods

Table E7 Cross-border movements of ICT goods from Czechia

CZK million

	2020	2021	2022
Total	798 057	766 230	918 558
Computers and peripheral equipment	364 383	356 328	370 289
Communication equipment	259 421	235 585	366 595
Consumer electronics	70 864	73 694	66 180
Electronic components	45 845	47 816	50 330
ICT parts n.e.s.	57 544	52 806	65 164

Figure E19 Cross-border movements of ICT goods from Czechia

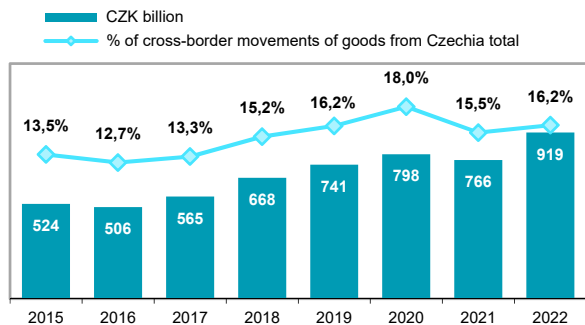


Figure E20 Cross-border movements of ICT goods from Czechia, by commodities

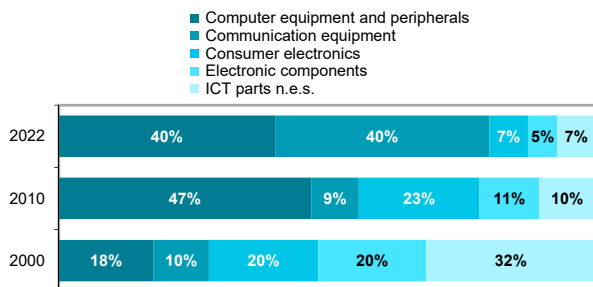
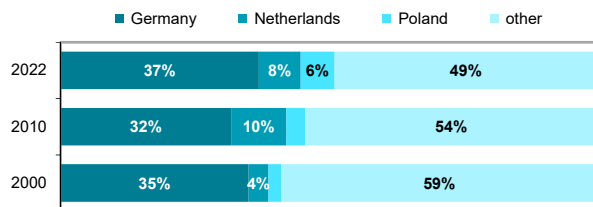


Figure E21 Cross-border movements of ICT goods from Czechia, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Figure E22 Cross-border movements of ICT goods from countries; 2022

(% of total movements of goods from the given countries)

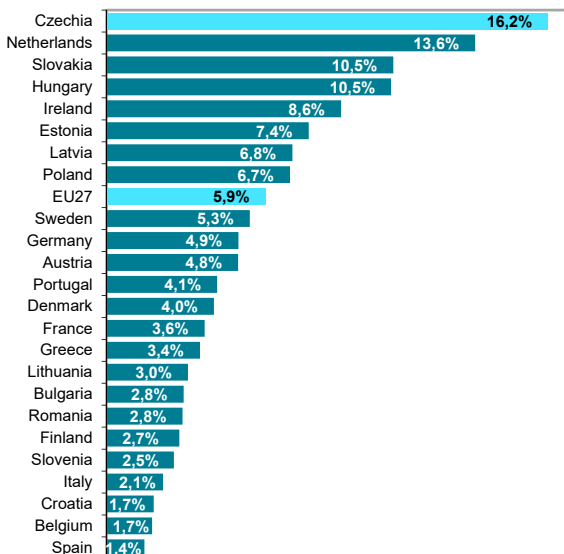
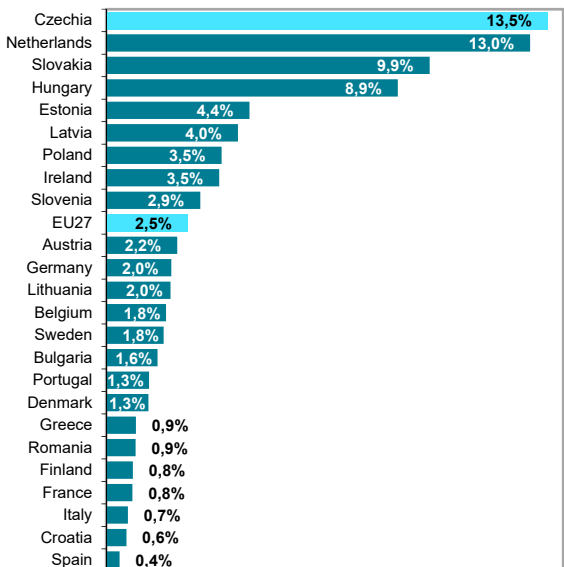


Figure E23 Cross-border movements of ICT goods from countries; 2022 (% GDP)



Source: CZSO calculations based on Eurostat

E International trade in ICT goods

Table E8 Cross-border movements of ICT goods to Czechia

CZK million

	2020	2021	2022
Total	796 391	780 412	934 907
Computers and peripheral equipment	253 026	275 788	288 174
Communication equipment	264 728	223 242	369 518
Consumer electronics	52 205	56 583	56 465
Electronic components	106 347	105 822	128 965
ICT parts n.e.s.	120 086	118 976	91 785

Figure E24 Cross-border movements of ICT goods to Czechia

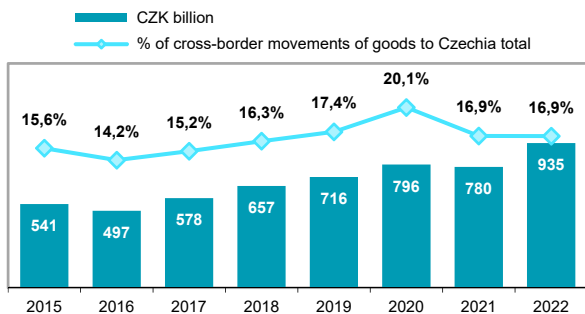


Figure E25 Cross-border movements of ICT goods to Czechia, by commodities

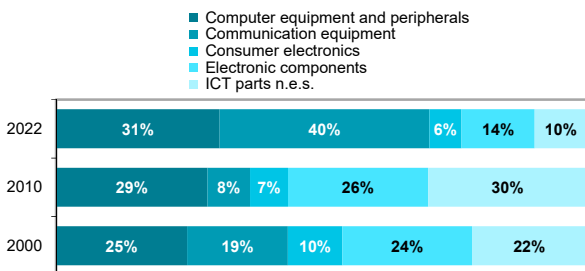
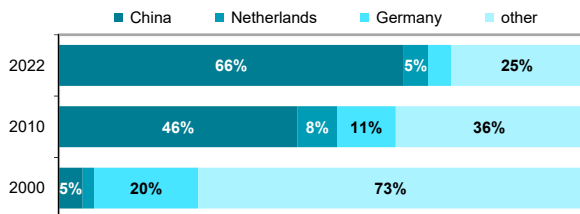


Figure E26 Cross-border movements of ICT goods to Czechia, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Figure E27 Cross-border movements of ICT goods to countries; 2022

(% of total movements of goods to the given countries)

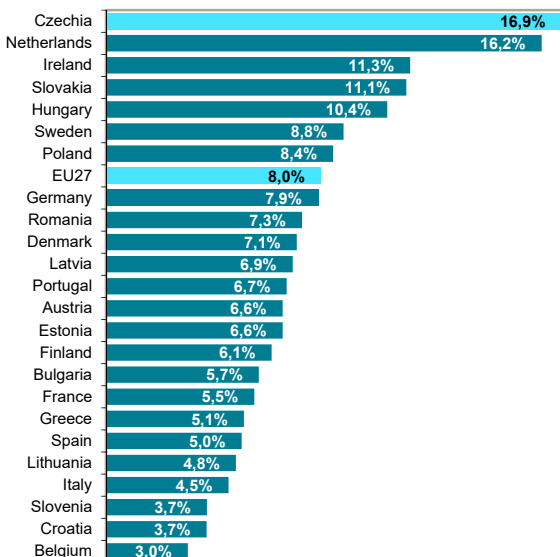
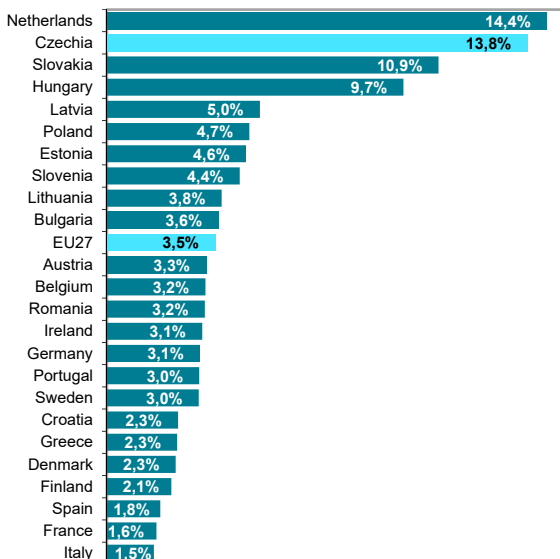


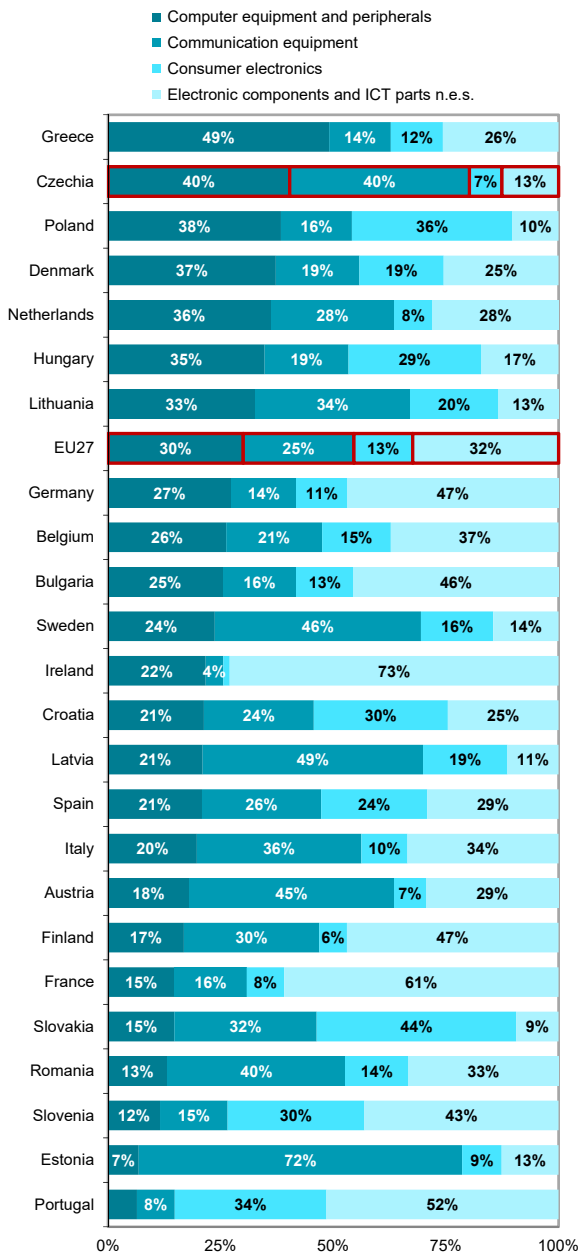
Figure E28 Cross-border movements of ICT goods to countries; 2022 (% GDP)



Source: CZSO calculations based on Eurostat

E International trade in ICT goods

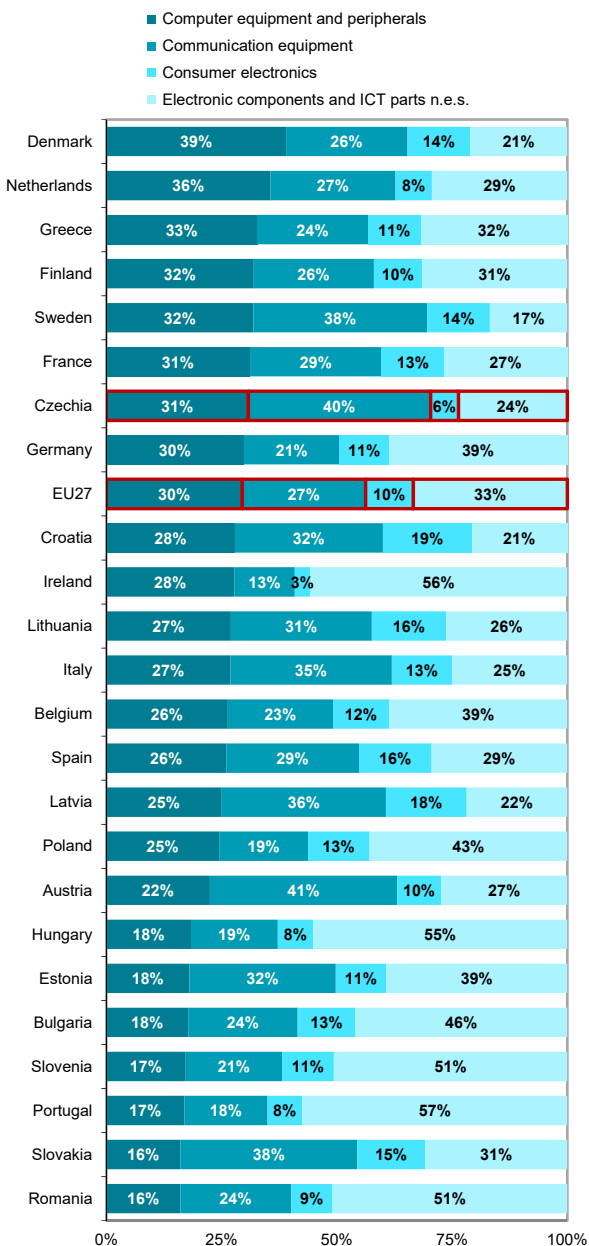
Figure E29 Cross-border movements of ICT goods from countries by commodities; 2022



Source: CZSO calculations based on Eurostat

E International trade in ICT goods

Figure E30 Cross-border movements of ICT goods to countries by commodities; 2022



Source: CZSO calculations based on Eurostat

E International trade in ICT goods

Figure E31 Balance of cross-border movement of Computer equipment and peripherals (CZK billion)

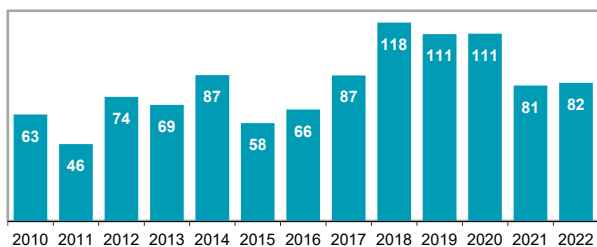


Figure E32 Balance of cross-border movement of Communication equipment (CZK billion)

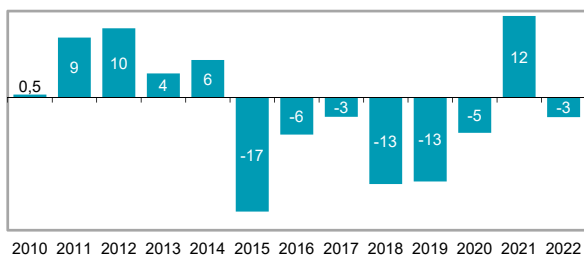


Figure E33 Balance of cross-border movement of Consumer electronics (CZK billion)

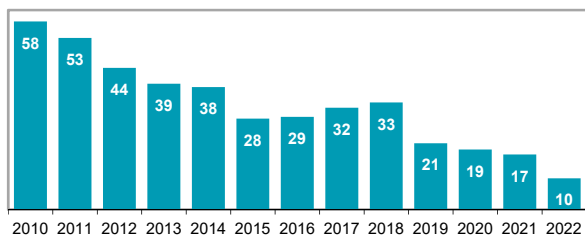
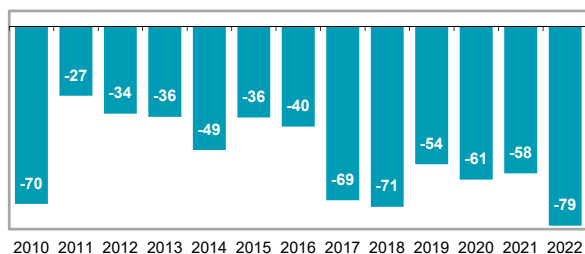


Figure E34 Balance of cross-border movement of Electronic components (CZK billion)



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 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.
- **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).*

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.

Data on international trade in ICT services for the Czech Republic for 2020 are preliminary.

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

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

F International trade in ICT services

Table F1 ICT services exports from Czechia

	CZK million		
	2020	2021	2022
Total	118 327	130 626	150 482
Telecommunication services	17 314	21 143	24 000
Computer services and software	101 013	109 483	126 481
by selected countries			
EU27, total	61 482	64 863	76 049
Germany	18 664	19 262	24 446
Ireland	17 519	16 230	13 235
Netherland	3 204	3 966	4 765
others	22 095	25 406	33 603
Other countries, total	56 845	65 763	74 433
United states	26 589	31 597	37 295
United Kingdom	8 995	9 575	10 738
Switzerland	3 423	4 611	6 841
others	17 838	19 980	19 558

Figure F1 ICT services exports

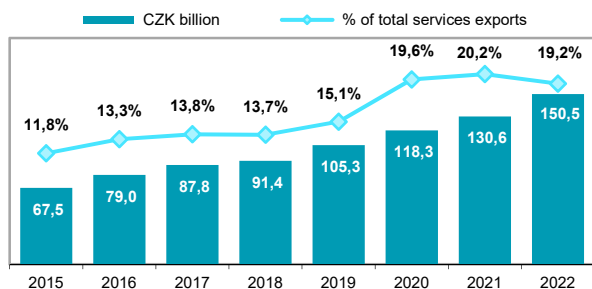


Figure F2 ICT services exports, by type of ICT services

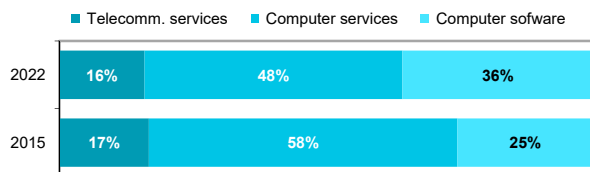
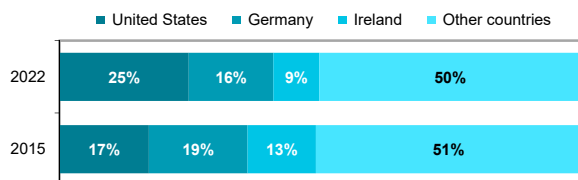


Figure F3 ICT services exports, by countries



Source: CZSO, Survey on exports and imports of services

F International trade in ICT services

Figure F4 ICT services exports; 2021
(% of total services exports)

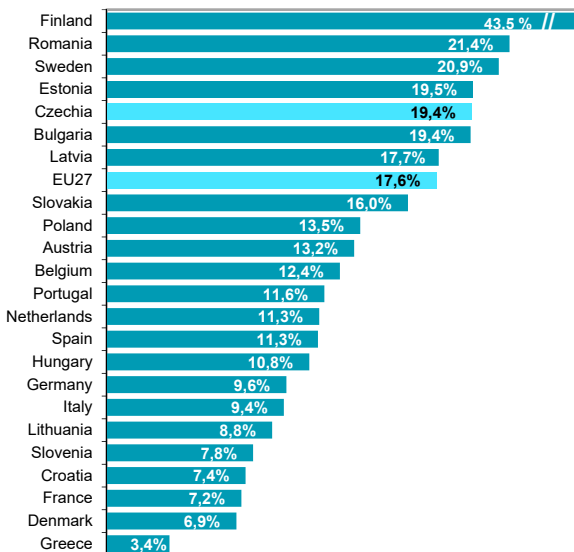
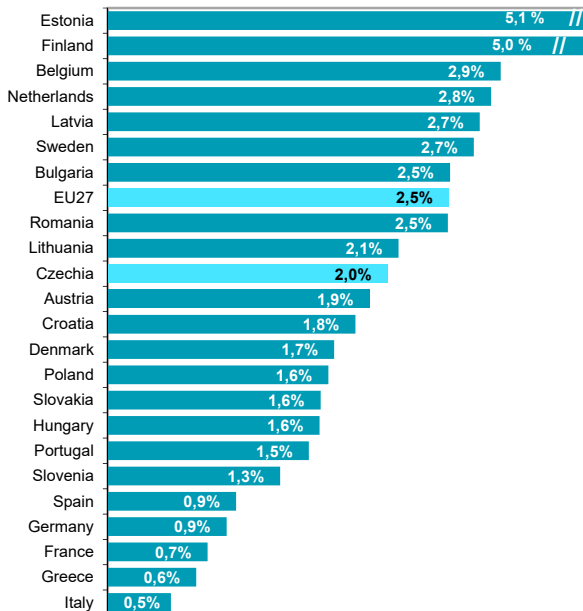


Figure F5 ICT services exports; 2021 (% of GDP)



Source: CZSO calculations based on Eurostat

F International trade in ICT services

Table F2 ICT services imports to Czechia

CZK million

	2020	2021	2022
Total	62 374	69 512	82 911
Telecommunication services	15 578	19 537	20 506
Computer services and software	46 796	49 976	62 405
by selected countries			
EU27, total	37 286	41 831	53 904
Germany	13 214	13 466	16 217
Ireland	5 664	7 837	11 737
Netherland	2 690	3 860	4 585
others	15 718	16 668	21 365
Other countries, total	25 088	27 681	29 007
United Kingdom	5 712	7 605	6 916
United states	3 058	3 192	4 168
Switzerland	2 772	3 115	3 226
others	13 547	13 769	14 698

Figure F6 ICT services imports

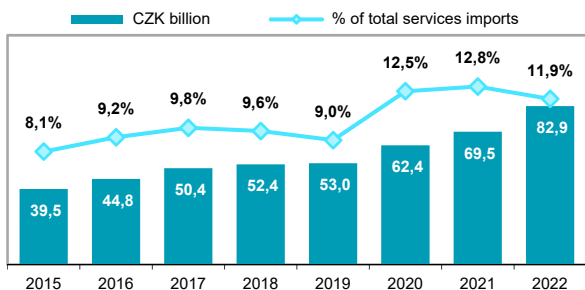


Figure F7 ICT services imports, by type of ICT services

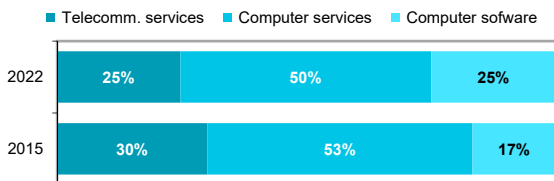
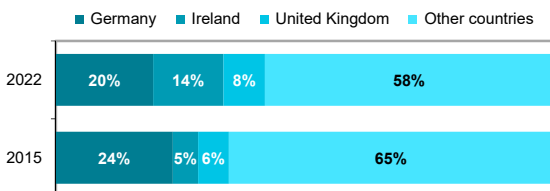


Figure F8 ICT services imports, by countries



Source: CZSO, Survey on exports and imports of services

F International trade in ICT services

Figure F9 ICT services imports, 2021
(% of total services imports)

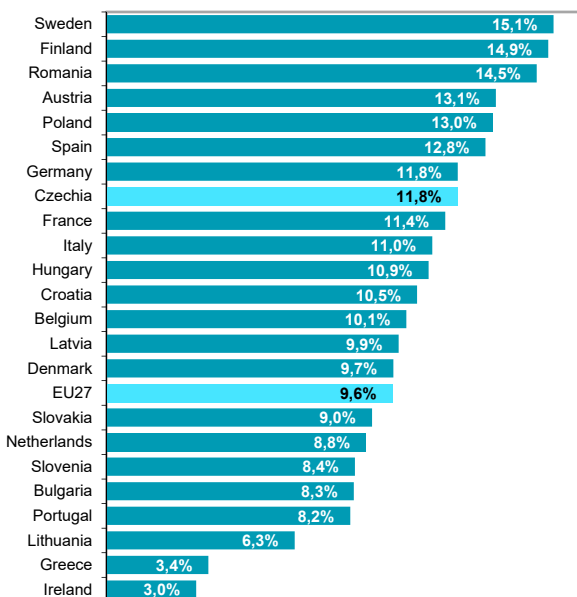
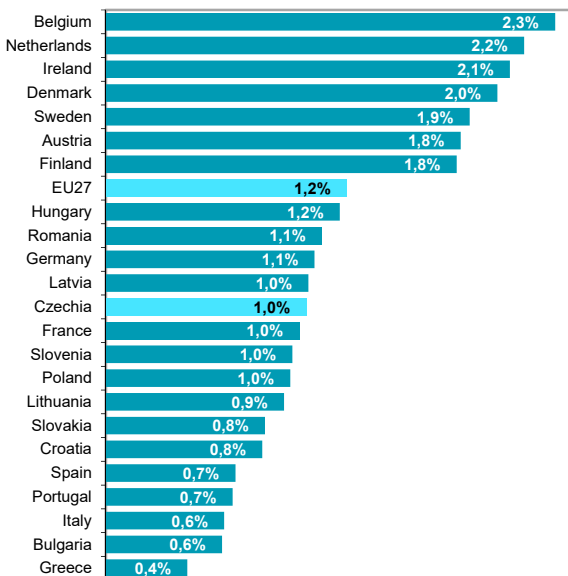


Figure F10 ICT services imports, 2021 (% of GDP)



Source: CZSO calculations based on Eurostat

F International trade in ICT services

Tab F3 Computer services and software exports from Czechia

CZK million

	2020	2021	2022
Total	101 013	109 483	126 481
Computer services	56 239	60 954	72 677
Computer software	44 774	48 529	53 804
by selected countries			
EU27, total	53 853	56 578	65 340
Germany	16 738	17 978	23 039
Ireland	17 505	16 186	13 202
Netherland	2 811	3 252	4 035
others	16 799	19 162	25 064
Other countries, total	47 160	52 905	61 141
United states	24 965	29 177	35 082
United Kingdom	6 956	7 034	7 920
Switzerland	3 347	4 484	6 564
others	11 892	12 210	11 575

Figure F11 Computer services and software exports

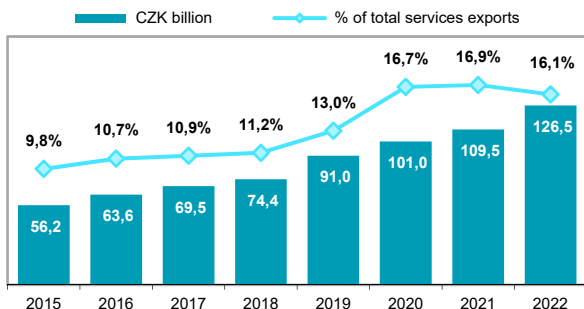


Figure F12 Computer services and software exports, by type of services

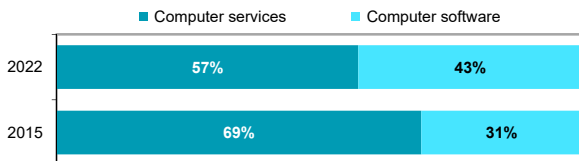
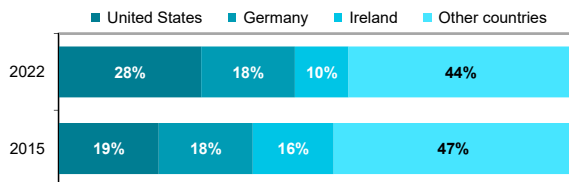


Figure F13 Computer services and software exports, by country



Source: CZSO, Survey on exports and imports of services

F International trade in ICT services

Tab F4 Computer services and software imports to Czechia

CZK million

	2020	2021	2022
Total	46 796	49 976	62 405
Computer services	31 501	33 526	41 682
Computer software	15 295	16 450	20 723
by selected countries			
EU27, total	29 820	34 397	44 455
Germany	11 242	12 089	14 983
Ireland	5 489	7 134	10 859
Netherland	2 522	3 587	4 223
others	10 567	11 587	14 391
Other countries, total	16 976	15 578	17 950
United Kingdom	4 251	3 346	4 121
United states	2 800	2 600	3 303
Switzerland	2 601	2 746	3 163
others	7 324	6 886	7 363

Figure F14 Computer services and software imports

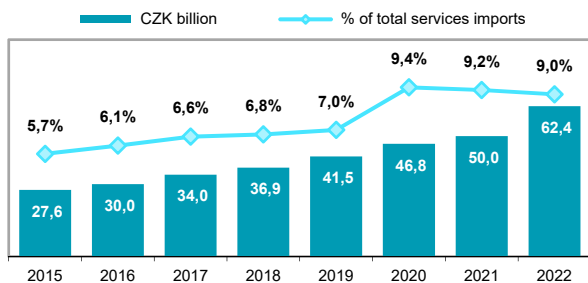


Figure F15 Computer services and software imports, by type of services

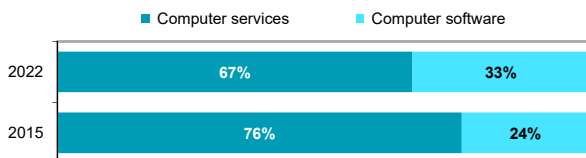
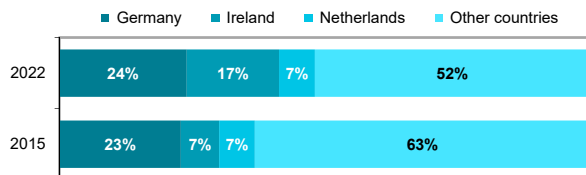


Figure F16 Computer services and software imports, by countries



Source: CZSO, Survey on exports and imports of services

F International trade in ICT services

Figure F17 Computer services and software exports;
2021 (% of GDP)

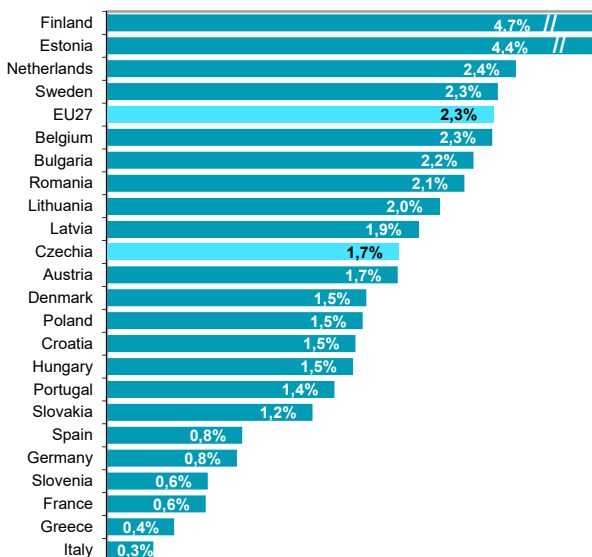
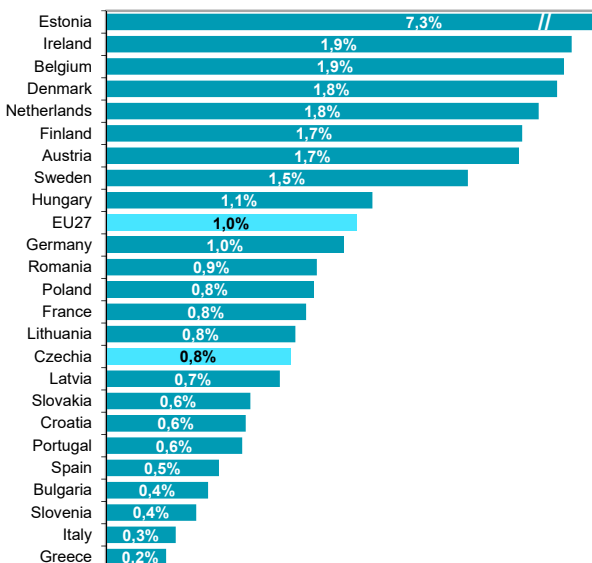


Figure F18 Computer services and software imports;
2021 (% of GDP)



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

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

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

All 2022 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

	2020	2021	2022
Total	179 562	186 170	195 495
ICT manufacturing, total	23 777	24 669	25 771
Manufacture of electronic components peripheral equipment	8 256	8 427	9 114
Manuf. of communication equipment	6 486	6 883	7 216
Manufacture of consumer electronics	5 463	5 487	5 635
ICT services, total	155 785	161 501	169 724
ICT wholesale	11 716	11 654	12 051
Telecommunications	22 190	21 769	21 689
IT services	121 879	128 078	135 984

Figure G1 Employment in the ICT sector

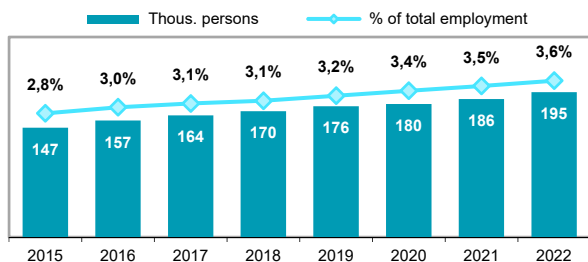


Figure G2 Employment in the ICT sector, by industry

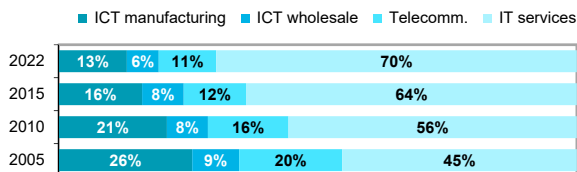


Figure G3 Employment in the ICT sector, by ownership; 2022

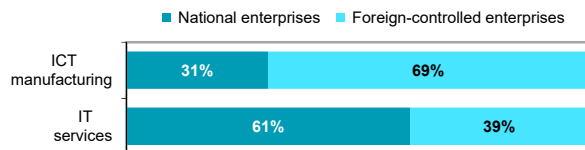
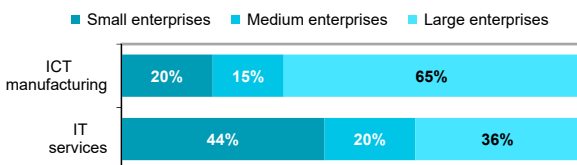


Figure G4 Employment in the ICT sector, by size; 2022



Source: CZSO, Structural Business Statistics

G ICT sector

Figure G5 Employment in the ICT sector; 2021
(% of total employment)

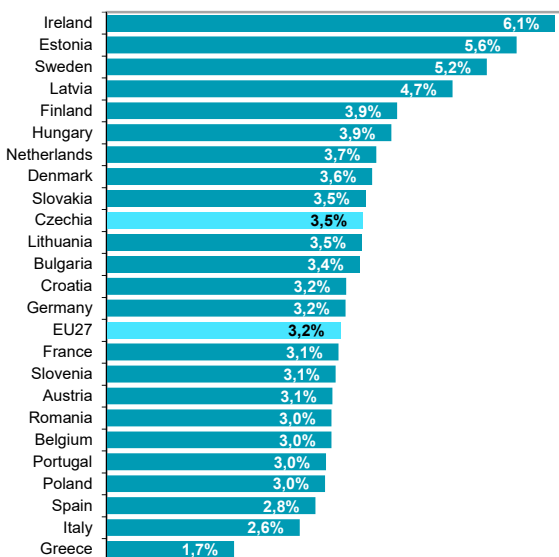
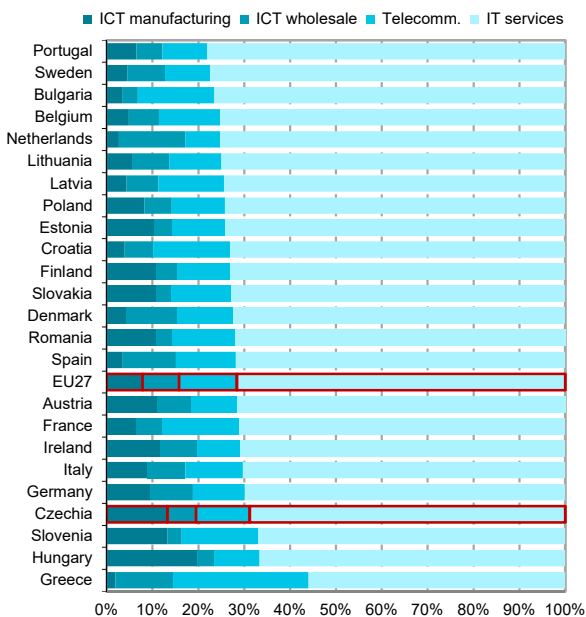


Figure G6 Employment in the ICT sector, by industry; 2021



Source: CZSO calculations based on the Eurostat SBS database

G ICT sector

Figure G7 Employment in ICT manufacturing in Czechia

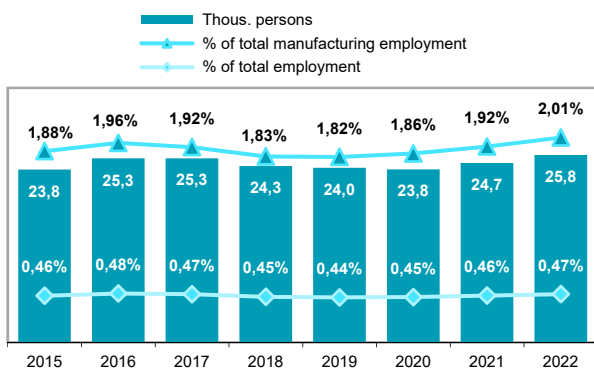


Figure G8 Employment in Telecommunications in Czechia

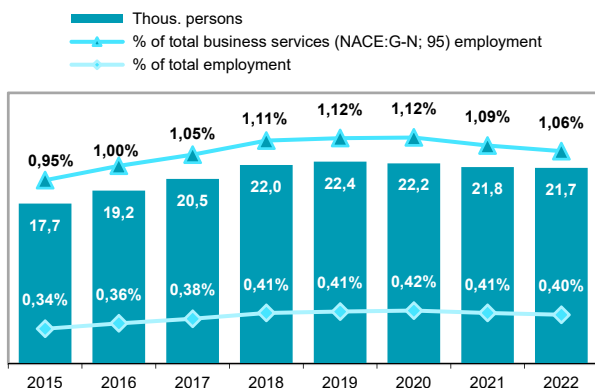
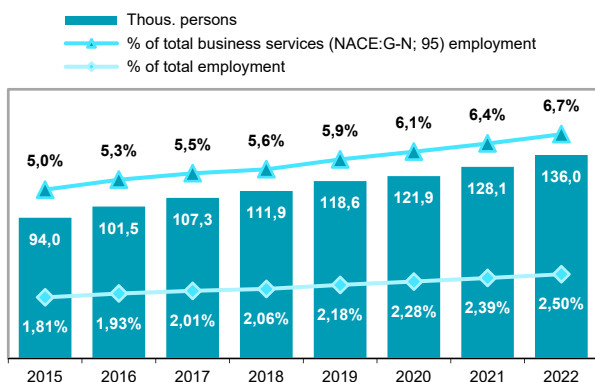


Figure G9 Employment in IT services in Czechia



Source: CZSO, Structural Business Statistics

G ICT sector

Figure G10 Employment in ICT manufacturing; 2021
(% of total manufacturing employment)

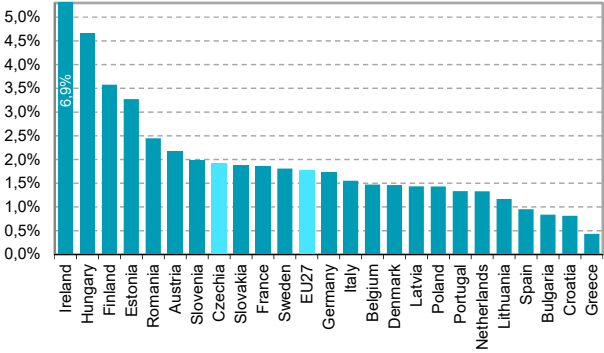


Figure G11 Employment in Telecommunications; 2021
(% of total business enterprise sector employment)

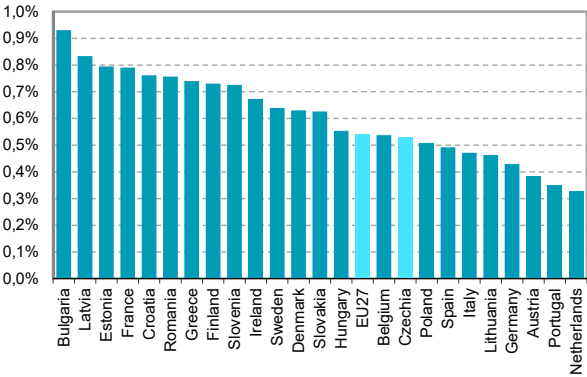
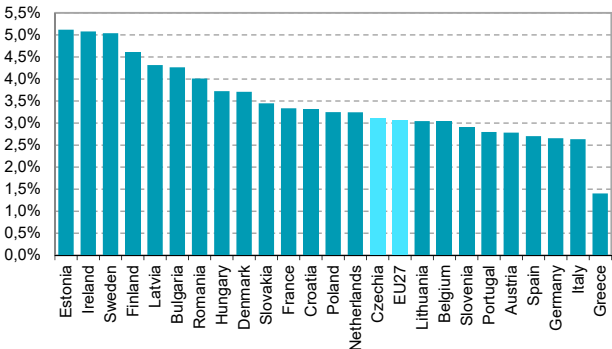


Figure G12 Employment in IT services; 2021
(% of total business enterprise sector employment)



Source: CZSO calculations based on the Eurostat SBS database

G ICT sector

Table G2 Turnover in the ICT sector in Czechia

	CZK million		
	2020	2021	2022
Total	926 669	950 226	1 033 182
ICT manufacturing, total	249 315	231 363	240 672
Manufacture of electronic components	18 387	20 590	26 734
Manufacture of computers and peripheral	179 926	158 124	166 913
Manuf. of communication equipment	17 453	18 818	19 145
Manufacture of consumer electronics	33 549	33 831	27 880
ICT services, total	677 354	718 863	792 510
ICT wholesale	183 642	184 817	204 169
Telecommunications	134 726	140 288	143 838
IT services	358 986	393 759	444 503

Figure G13 Turnover in the ICT sector

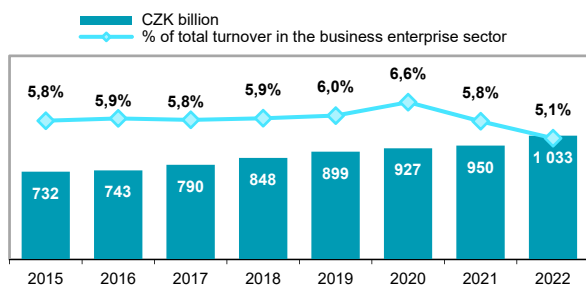


Figure G14 Turnover in the ICT sector, by industry

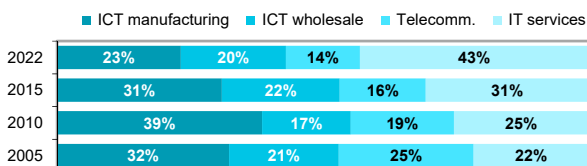


Figure G15 Turnover in the ICT sector, by ownership; 2022

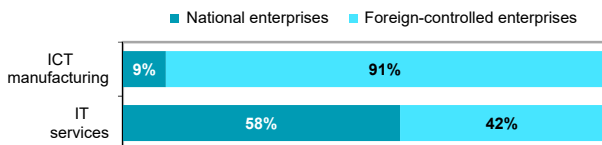
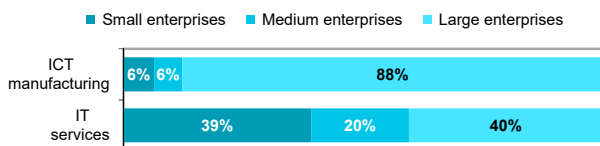


Figure G16 Turnover in the ICT sector, by size; 2022



Source: CZSO, Structural Business Statistics

Figure E17 Turnover in the ICT sector; 2021
(% of total turnover in the business enterprise sector)

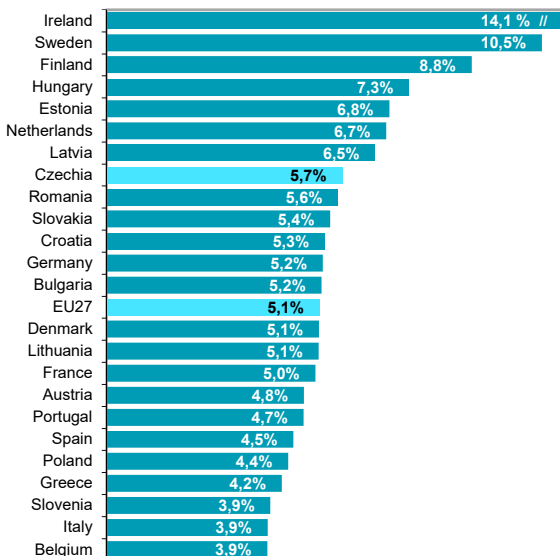
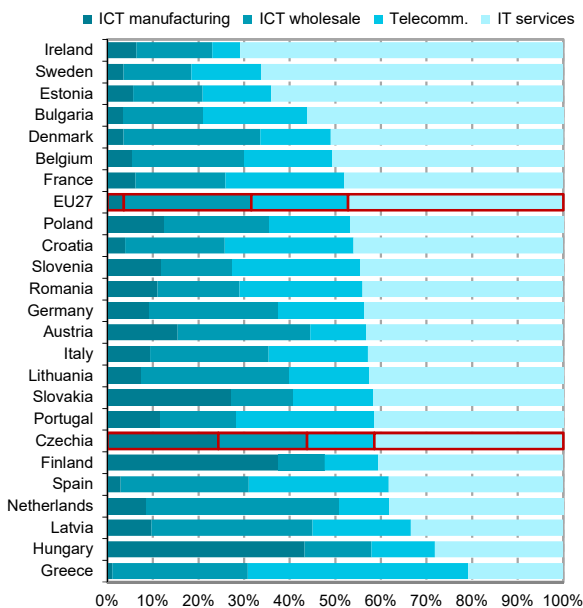


Figure E18 Turnover in the ICT sector, by industry; 2021 (%)



Source: CZSO calculations based on the Eurostat SBS database

G ICT sector

Figure G19 Turnover in ICT manufacturing in Czechia

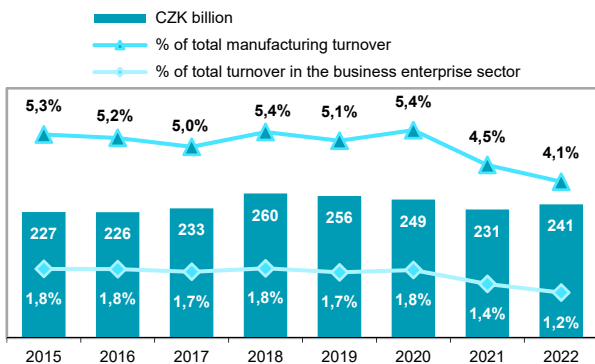


Figure G20 Turnover in Telecommunications in Czechia

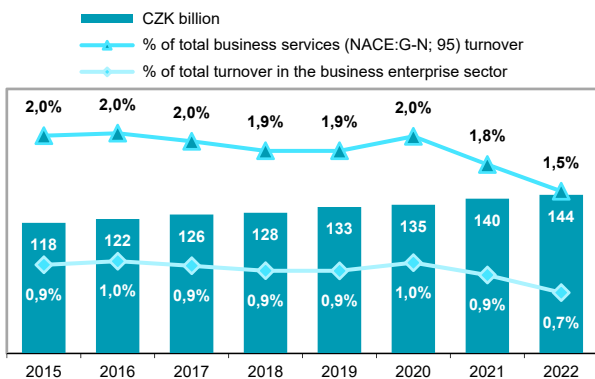
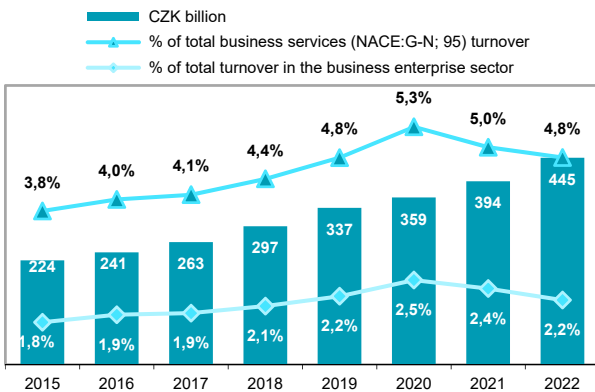


Figure G21 Turnover in IT services in Czechia



Source: CZSO, Structural Business Statistics

G ICT sector

Figure G22 Turnover in ICT manufacturing; 2021
(% of total manufacturing turnover)

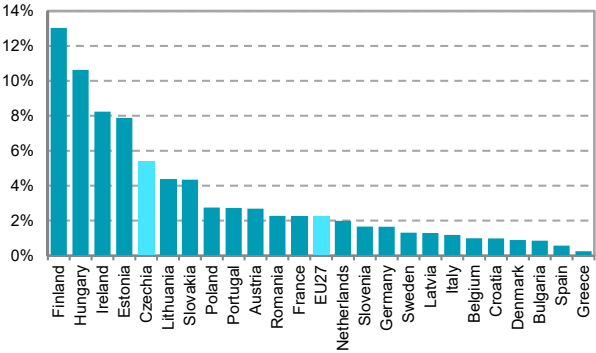


Figure G23 Turnover in Telecommunications; 2021
(% of total turnover in the business enterprise sector)

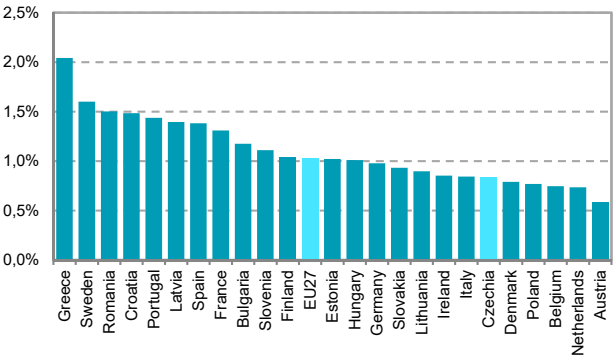
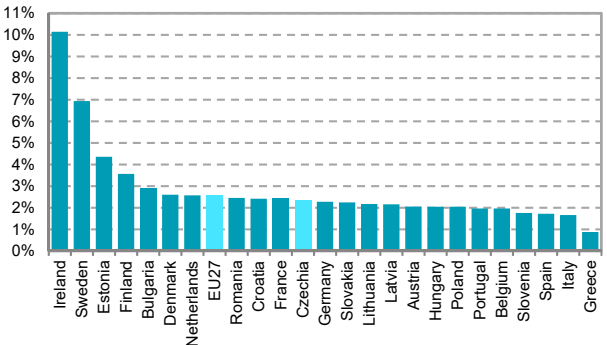


Figure G24 Turnover in IT services; 2021
(% of total turnover in the business enterprise sector)



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

	2019	2020	2021
Total	16 739	20 190	23 035
ICT manufacturing, total	999	727	1 054
Manufacture of electronic components	593	304	498
Manufacture of computers and peripheral	27	33	37
Manuf. of communication equipment	342	349	466
Manufacture of consumer electronics	37	42	53
ICT services, total	15 740	19 463	21 982
ICT wholesale	225	207	196
Telecommunications	983	780	836
IT services	14 533	18 475	20 950

Figure G25 R&D expenditure in the ICT sector

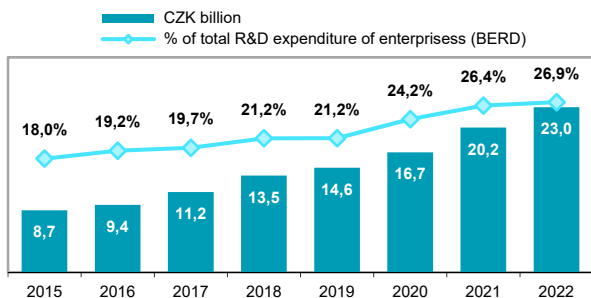


Figure G26 R&D expenditure in the ICT sector, by industry

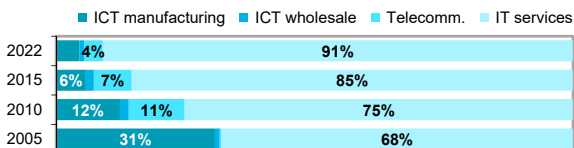


Fig.G27 R&D expenditure in the ICT sector, by ownership; 2021

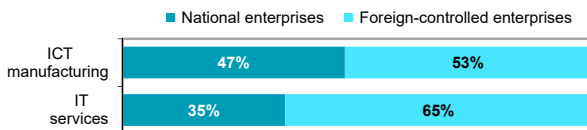
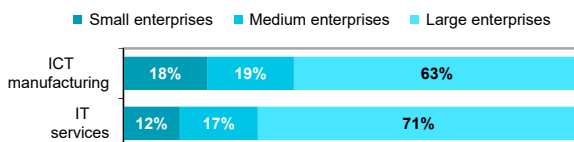


Figure G28 R&D expenditure in the ICT sector, by size; 2021



Source: CZSO, Annual R&D survey

Figure G29 R&D expenditure in the ICT sector; 2021
(% of total R&D expenditure of enterprises)

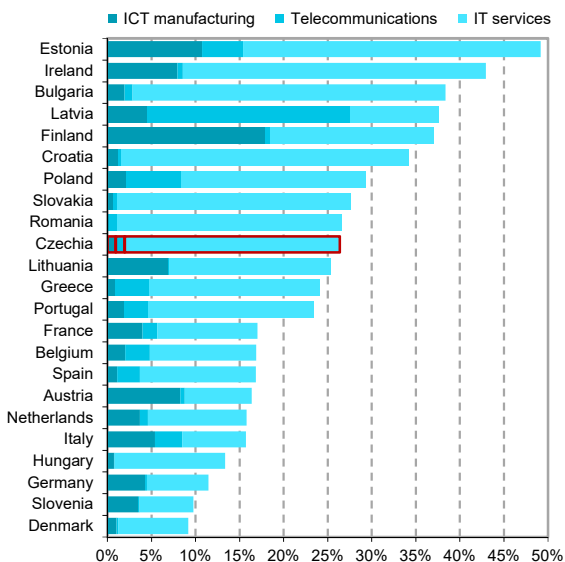
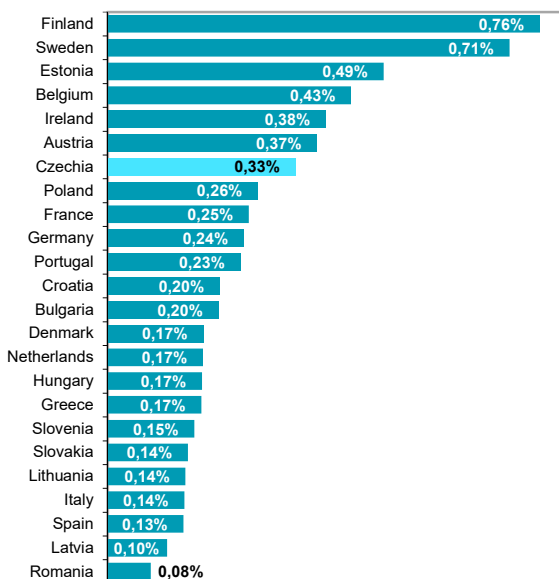


Figure G30 R&D expenditure in the ICT sector; 2021
(% of GDP)



Source: CZSO calculations based on the Eurostat STI Database

Figure G31 R&D expenditure in ICT manufacturing in Czechia

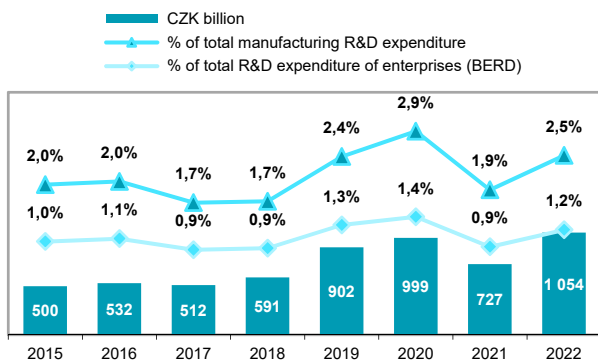


Figure G32 R&D expenditure in Telecommunications in Czechia

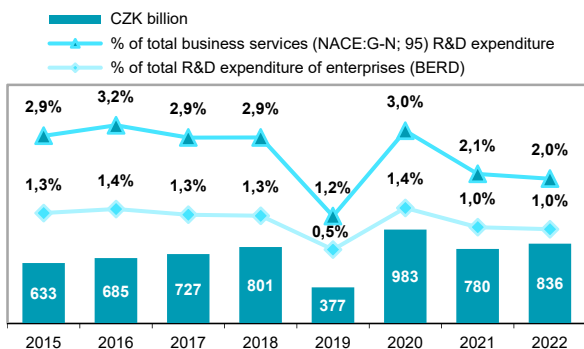
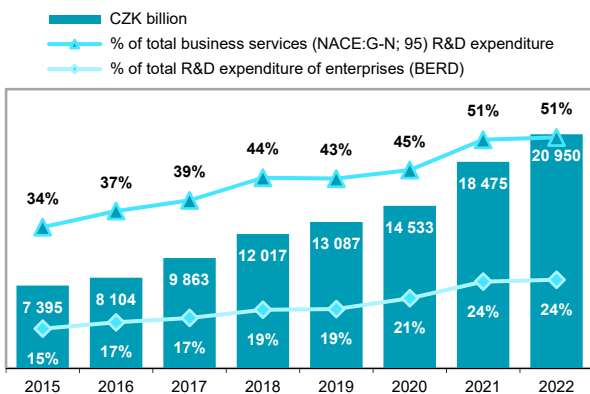


Figure G33 R&D expenditure in IT services in Czechia



R&D - Research and development

Source: CZSO, Annual R&D survey

G ICT sector

Figure G34 R&D expenditure in ICT manufacturing; 2021
(% of total manufacturing R&D expenditure)

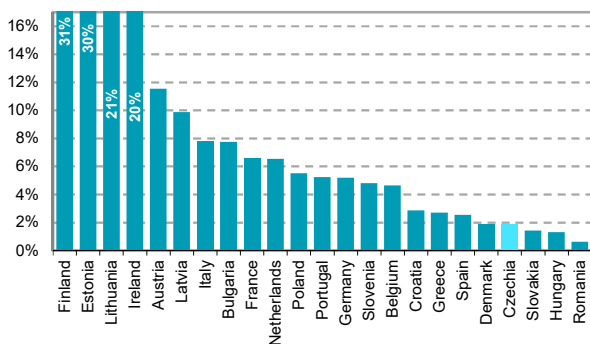


Figure G35 R&D expenditure in Telecommunications; 2021
(% of total R&D expenditure of enterprises)

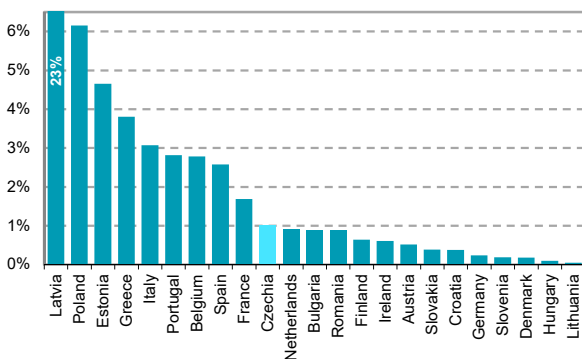
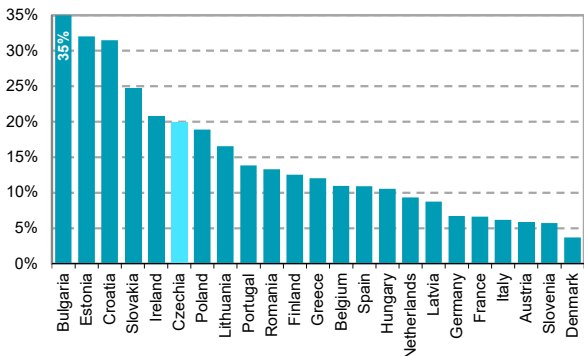


Figure G36 R&D expenditure in IT services; 2021
(% of total R&D expenditure of enterprises)



Source: CZSO calculations based on the Eurostat STI Database