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Contents

Introduction

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

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

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

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

A. **ICT specialists:** this chapter provides information about **employment** in ICT specialist occupations both for ICT professionals and ICT technicians together with data about their **wages.**

B. **ICT students:** this chapter contains data on the number and structure of students and graduates of ICT disciplines at universities.

C. **ICT investments:** this chapter includes detail information about total ICT investment **by asset type** and **industry**. Data on **household expenditures** on ICT equipment and services is also included here.

D. **ICT research and development:** this chapter provides both data on the total financial resources invested in research and development (R&D) in ICT equipment and software and data about R&D expenditures and personnel in enterprises with the main economic activity that belongs to the ICT sector.

E. **Cross-border movements of ICT goods:** this chapter informs the reader about the movement of ICT products across borders, both as a whole and broken down into different categories.

F. **International trade in ICT services:** this chapter informs the reader about the export and import of ICT services, both as a whole and broken down into different categories.

G. **ICT sector:** this chapter consists of main economic indicators for industries that are primarily engaged in the production of ICT goods and services.

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

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

For more information on digital economy statistics, visit our website:
https://www.czso.cz/csu/czso/vyuzivani_informacnich_technologii

In Prague, December 2022

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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 2020 is calculated as an average from the values for 2019, 2020, and 2021).*

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-2021

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*

	2018	2019	2020
Total	**200,5**	**209,5**	**219,8**
Women	18,7	19,3	20,8
Occupation			
ICT managers, engineers and professionals	99,3	108,4	119,1
ICT technicians, installers and servicers	101,2	101,1	100,6
Age group			
Under 25 years	10,5	10,1	9,9
25–34 years	65,0	65,2	66,4
35–44 years	71,5	76,9	79,8
45–54 years	33,2	35,6	41,9
55 + years	20,3	21,7	21,8
Highest level of education attainment			
Tertiary	109,6	114,8	123,5
Secondary with A-level examination	79,8	84,3	86,2
Other (lower)	11,1	10,3	10,1

Figure A1 ICT specialists*

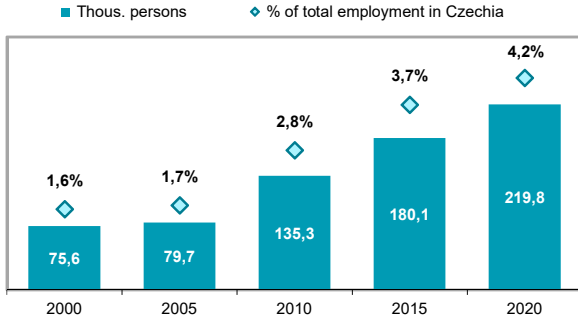
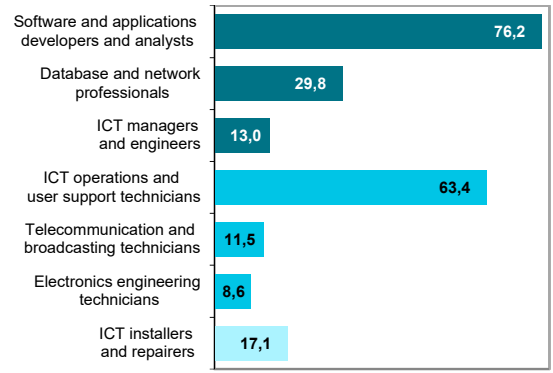


Figure A2 ICT specialists*, by occupation (thousands); 2020



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

Source: CZSO, Labour Force Survey

Figure A8 ICT professionals, 2021
(% of total employment)

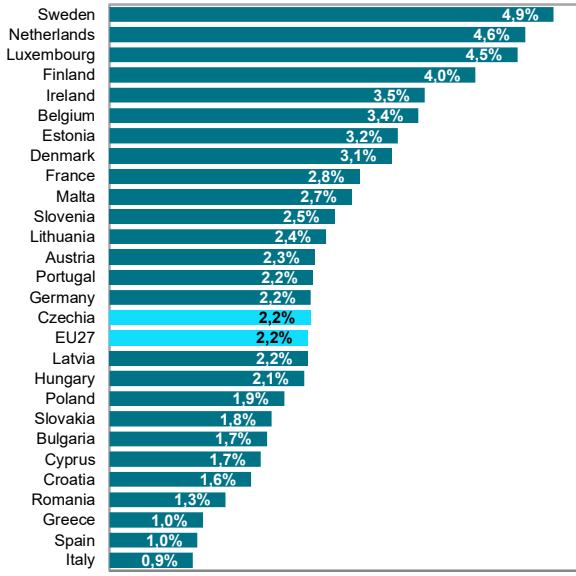
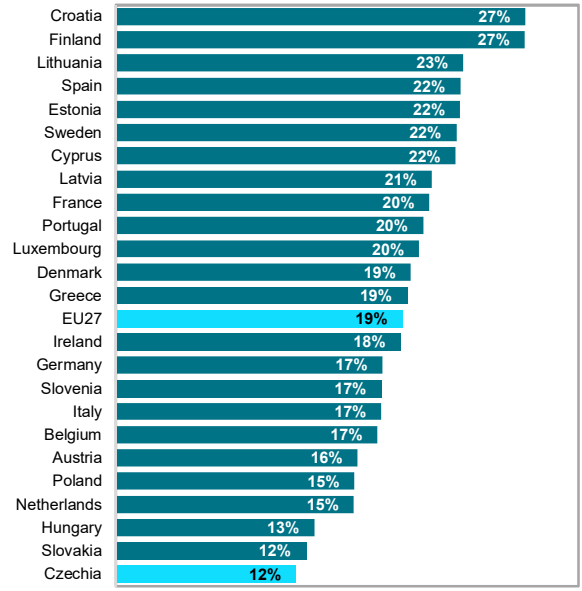


Figure A9 Share of women among ICT professionals; 2021



Source: CZSO calculation based on Eurostat LFS Database

A ICT specialists

Figure A3 ICT specialists; 2021
(% of total emloyment)

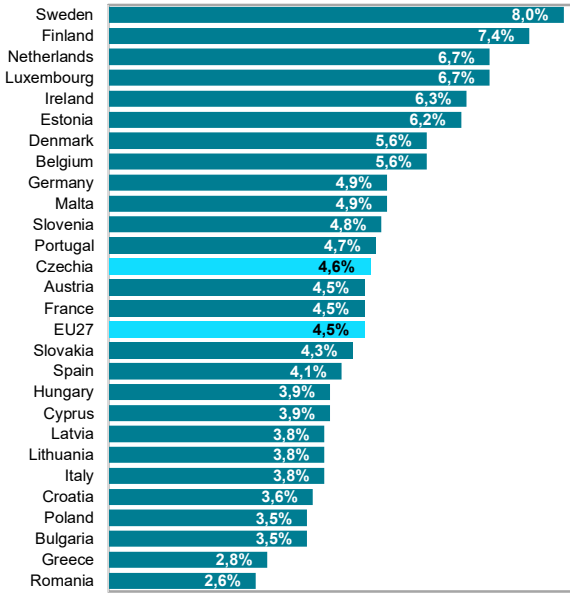
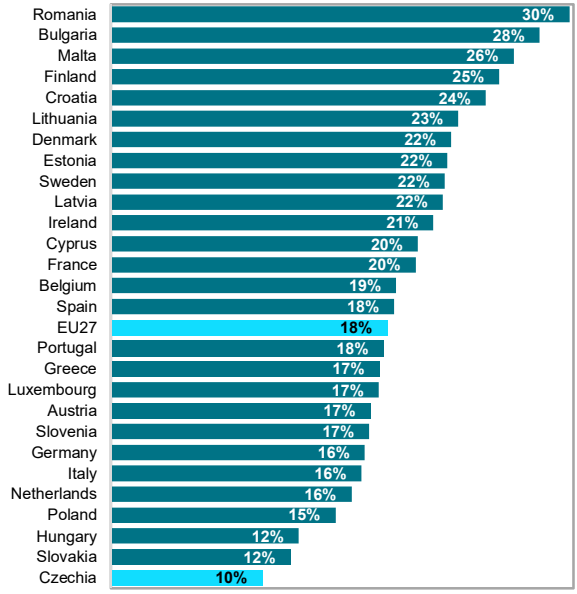


Figure A4 Share of women among ICT specialists; 2021



Source: CZSO calculation based on the Eurostat LFS Database

A ICT specialists

Table A2 ICT managers, engineers and professionals in Czechia

Thousand persons*

	2018	2019	2020
Total	**99,3**	**108,4**	**119,1**
Women	10,1	11,2	13,0
Occupation			
ICT professionals, total	**84,5**	**95,8**	**106,1**
Software and app. developers and analysts	57,8	67,8	76,2
Database and network professionals	26,6	27,9	29,8
ICT managers, engineers and sales professionals	**14,8**	**12,7**	**13,0**
Age group			
25–34 years	33,6	35,2	38,3
35–44 years	37,8	41,8	44,0
45–54 years	15,7	18,1	23,1
55 + years	9,4	10,4	11,0
Highest level of education attainment			
Master's and Doctoral	68,0	72,0	77,6
Bachelor's and Higher professional	14,5	16,1	19,9
Other (lower)	16,4	20,1	21,4

Figure A5 ICT professionals*

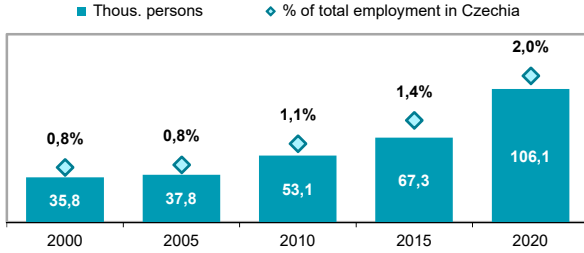


Figure A6 ICT professionals*, by gender

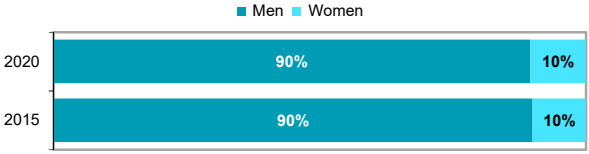
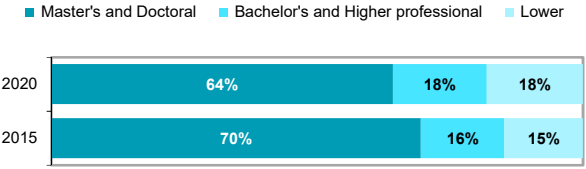


Figure A7 ICT professionals*, by level of education



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

Source: CZSO, Labour Force Survey

A ICT specialists

Table A3 ICT technicians, installers and servicers in Czechia

Thousand persons*

	2018	2019	2020
Total	**101,2**	**101,1**	**100,6**
Women	8,5	8,1	7,8
Occupation			
ICT technicians, total	**74,8**	**75,0**	**74,9**
ICT operations and user support technicians	61,0	62,7	63,4
Telecomm. and broadcasting technicians	13,7	12,2	11,5
Electronics engineering technicians	**8,4**	**8,1**	**8,6**
ICT installers and repairers	**17,9**	**18,0**	**17,1**
Age group			
Under 25 years	7,7	7,2	7,2
25–34 years	31,4	30,0	28,1
35–44 years	33,7	35,1	35,8
45–54 years	17,5	17,5	18,8
55 + years	10,9	11,3	10,8
Highest level of education attainment			
Tertiary	27,1	26,7	26,0
Secondary with A-level examination	63,4	64,2	64,8
Other (lower)	10,7	10,1	9,8

Figure A10 ICT technicians*

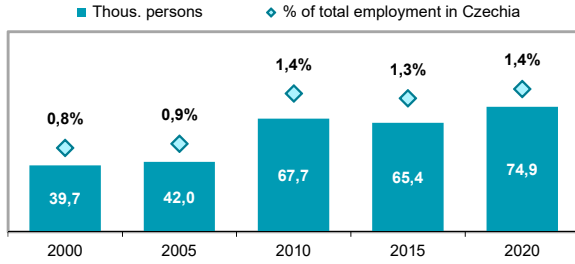


Figure A11 ICT technicians*, by gender

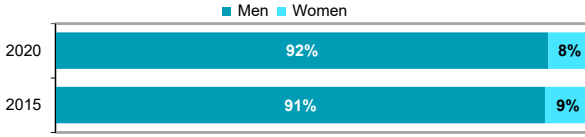
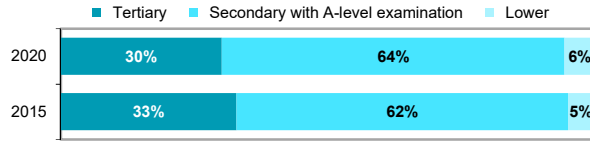


Figure A12 ICT technicians*, by level of education



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

Source: CZSO, Labour Force Survey

Figure A13 ICT technicians; 2021
(% of total employment)

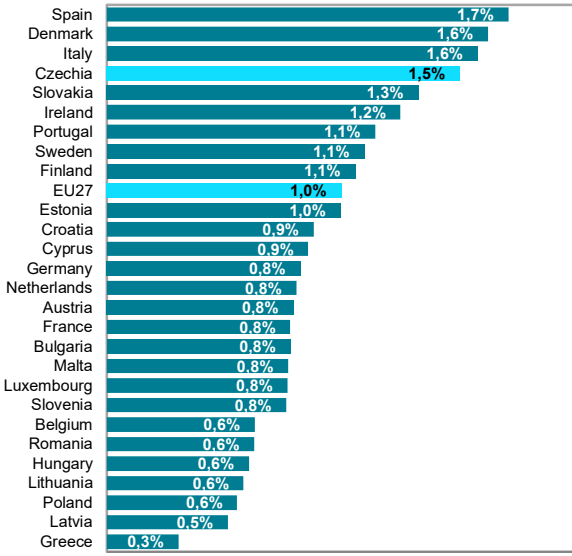
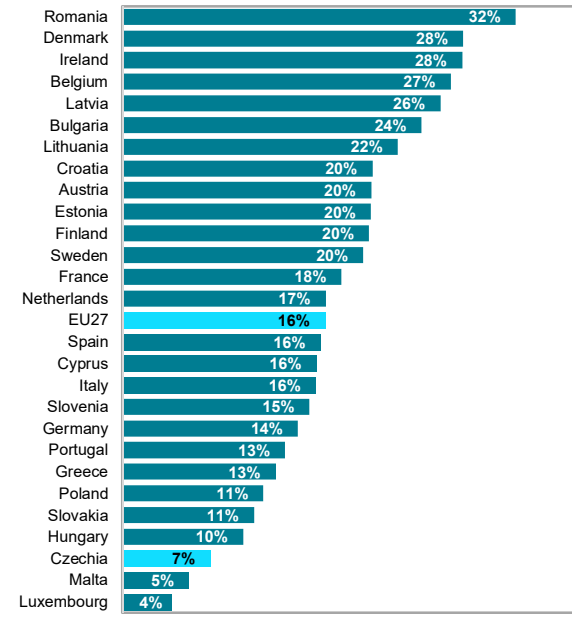


Figure A14 Share of women among ICT technicians; 2021



Source: CZSO calculation based on Eurostat LFS Database

Table A4 Wages of ICT professionals in Czechia

Average gross monthly wage in CZK

	2019	2020	2021
Total	**65 787**	**70 018**	**74 357**
Men	67 439	71 707	76 360
Women	55 512	59 507	62 499
Citizenship			
Czech citizens	63 439	67 204	70 733
Foreigners	79 941	85 220	92 688
Sphere of activity (remuneration)			
Business (wage) sphere	66 964	71 258	75 718
Government (salary) sphere	44 351	47 347	47 968
Age group			
25–34 years	59 311	64 022	67 447
35–44 years	74 702	78 322	83 448
45–54 years	71 122	75 550	79 959
55 + years	58 588	60 666	64 402
Highest level of education attainment			
Master's and Doctoral	72 620	76 933	81 694
Bachelor's and Higher professional	62 025	66 575	70 524
Secondary with A-level examination	58 258	59 895	62 720

Figure A15 Wages of ICT professionals

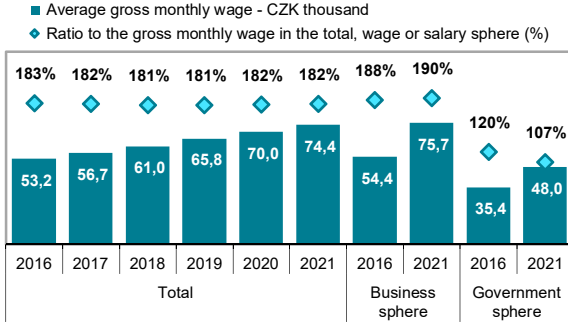
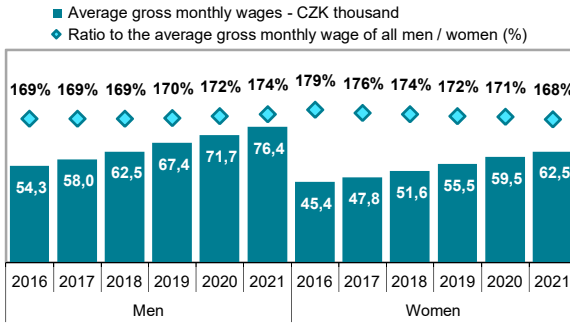


Figure A16 Wages of ICT professionals, by gender



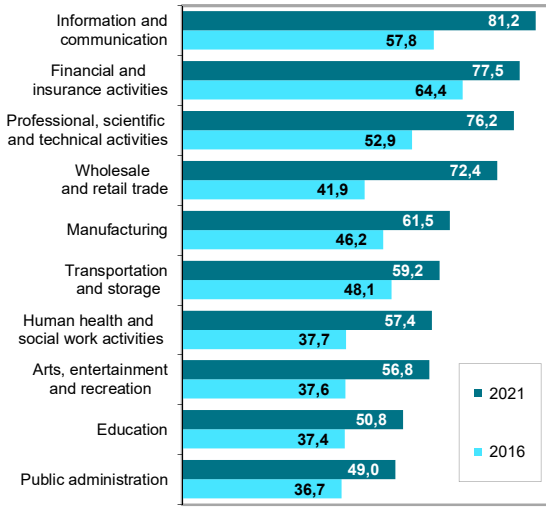
Source: CZSO, Structural Earnings Statistics

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

Average gross monthly wage in CZK

	2019	2020	2021
Total	**65 787**	**70 018**	**74 357**
Occupation			
Software and app. developers & analysts	**69 035**	**73 719**	**78 049**
Systems analysts	72 136	73 181	76 980
Software developers	70 788	78 136	84 925
Web and multimedia developers	61 266	68 922	59 692
Applications programmers	64 315	68 899	72 915
Other software developers and analysts	64 788	66 959	71 415
Database and network professionals	**57 610**	**60 715**	**64 829**
Database designers	64 852	69 303	68 113
Systems administrators	55 160	57 329	62 082
Computer network professionals	62 793	69 570	70 574
Data security professionals	71 428	73 289	79 419
Industry (CZ-NACE Section)			
Manufacturing (C)	56 459	58 447	61 486
Wholesale and retail trade (G)	67 329	65 435	72 415
Transporting and storage (H)	55 837	56 268	59 176
Information and communication (J)	70 290	76 344	81 184
Financial and insurance activities (K)	74 932	76 476	77 515
Professional, scientific and techn. act. (M)	66 387	69 778	76 211
Public administration (O)	46 037	48 516	49 029
Education (P)	47 924	50 999	50 788
Human health and social work act. (Q)	46 445	54 968	57 417
Arts, entertainment and recreation (R)	43 074	52 094	56 843

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



Source: CZSO, Structural Earnings Statistics

Table A6 Wages of ICT technicians in Czechia

Average gross monthly wage in CZK

	2019	2020	2021
Total	**45 219**	**48 175**	**48 322**
Men	45 644	48 503	49 046
Women	42 068	45 710	43 312
Citizenship			
Czech citizens	44 170	46 649	47 031
Foreigners	56 840	62 263	59 890
Sphere of activity (remuneration)			
Business (wage) sphere	45 999	48 906	48 923
Government (salary) sphere	36 802	39 692	40 527
Age group			
25–34 years	42 302	45 476	45 525
35–44 years	49 204	52 992	51 697
45–54 years	49 829	52 598	53 203
55 + years	42 926	44 403	45 724
Highest level of education attainment			
Master's and Doctoral	55 485	59 284	57 542
Bachelor's and Higher professional	45 944	51 049	52 228
Secondary with A-level examination	41 710	43 888	43 658
Other (lower)	36 371	37 337	39 776

Figure A18 Wages of ICT technicians

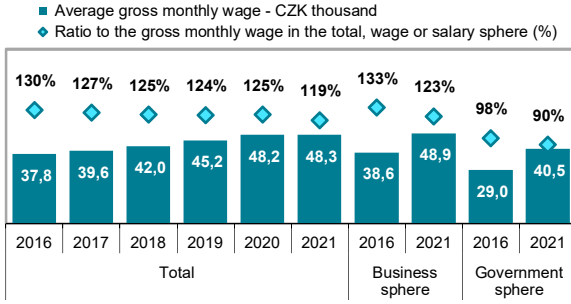
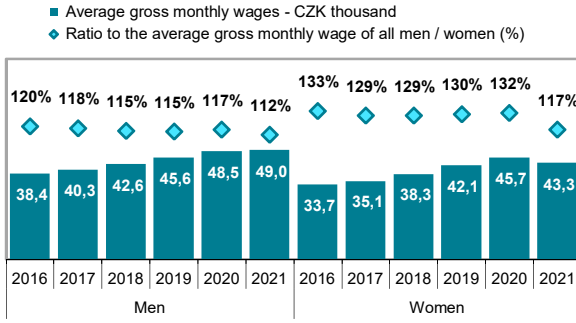


Figure A19 Wages of ICT technicians, by gender



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 filed 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

	2019	2020	2021
Total	**20 368**	**21 647**	**22 442**
Gender			
Men	16 991	17 940	18 555
Women	3 377	3 707	3 887
Age			
Under 20 years	2 244	2 522	2 709
20-24 years	13 463	14 136	14 608
25-29 years	3 251	3 462	3 436
30-34 years	766	802	924
35 + years	644	725	765
Citizenship			
Czech citizens	14 909	15 359	15 535
Foreigners, total	**5 459**	**6 288**	**6 907**
Slovakia	3 204	3 248	3 163
Russia	716	1 081	1 323
Ukraine	422	535	661
Kazakhstan	226	313	398
other countries	891	1 111	1 362

Figure B1 University students of ICT fields of education

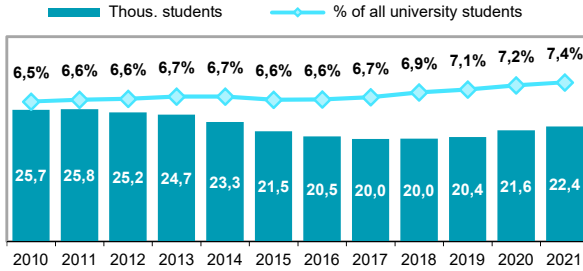


Figure B2 University students of ICT, by gender

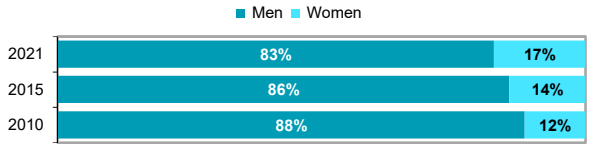
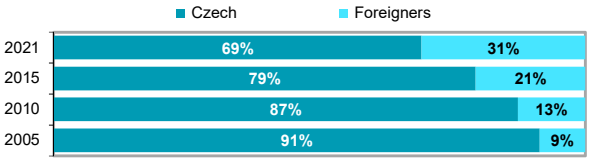


Figure B3 University students of ICT, by citizenship



Source: CZSO calculation based on MEYS database

Figure B4 Tertiary students of ICT; 2020
(% of all tertiary students)

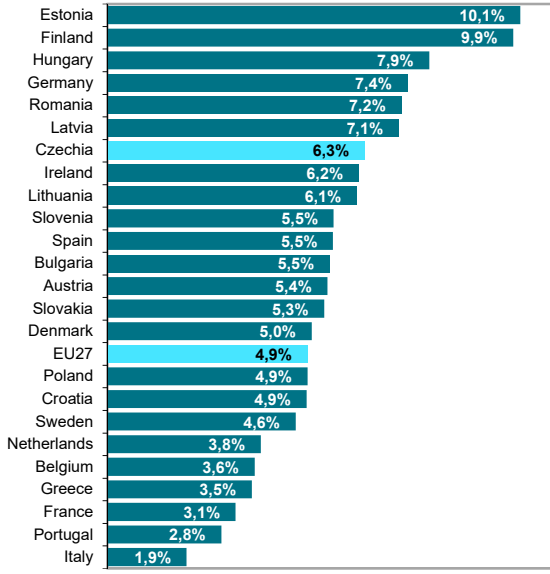
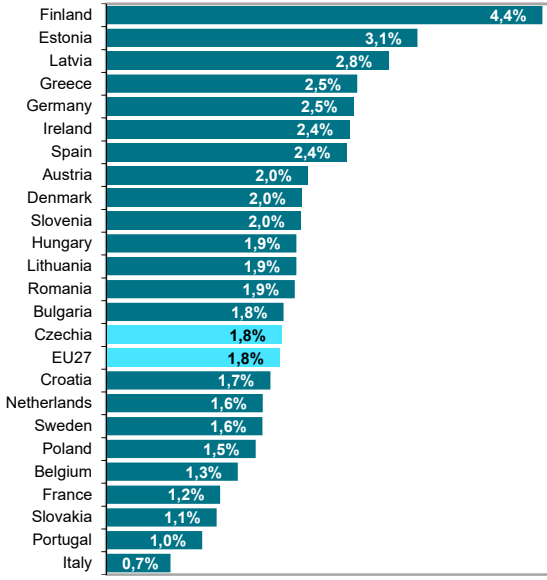


Figure B5 Tertiary students of ICT; 2020
(% of population aged 20 to 29 years)



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

	2019	2020	2021
Total	**20 368**	**21 647**	**22 442**
Students of public universities	19 805	21 013	21 617
Students of private universities	572	644	828
Studies			
Full-time studies	17 810	18 943	19 653
Distance and combined studies	2 572	2 726	2 803
Study programme			
Bachelor	14 568	15 693	16 330
Master	5 034	5 108	5 188
Doctoral	775	856	931
Field of study			
Database and network design and administration	1 664	1 454	1 097
Software and applications development and analysis	12 756	14 384	16 133
ICT n.e.c. and Inter-disciplinary ICT fields	5 985	5 848	5 256

Figure B6 University students of ICT, by studies

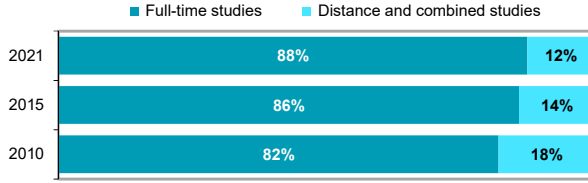


Figure B7 University students of ICT, by study programme

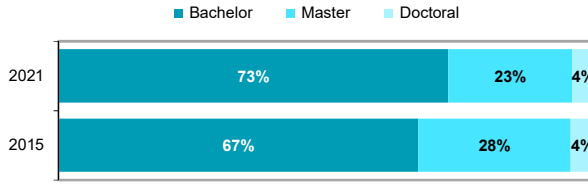
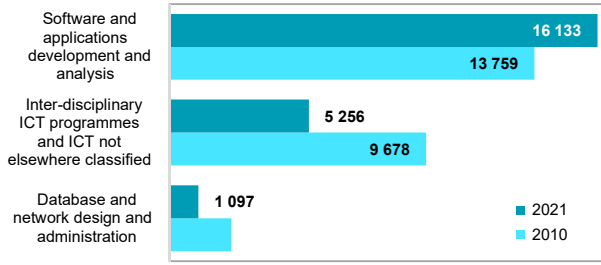
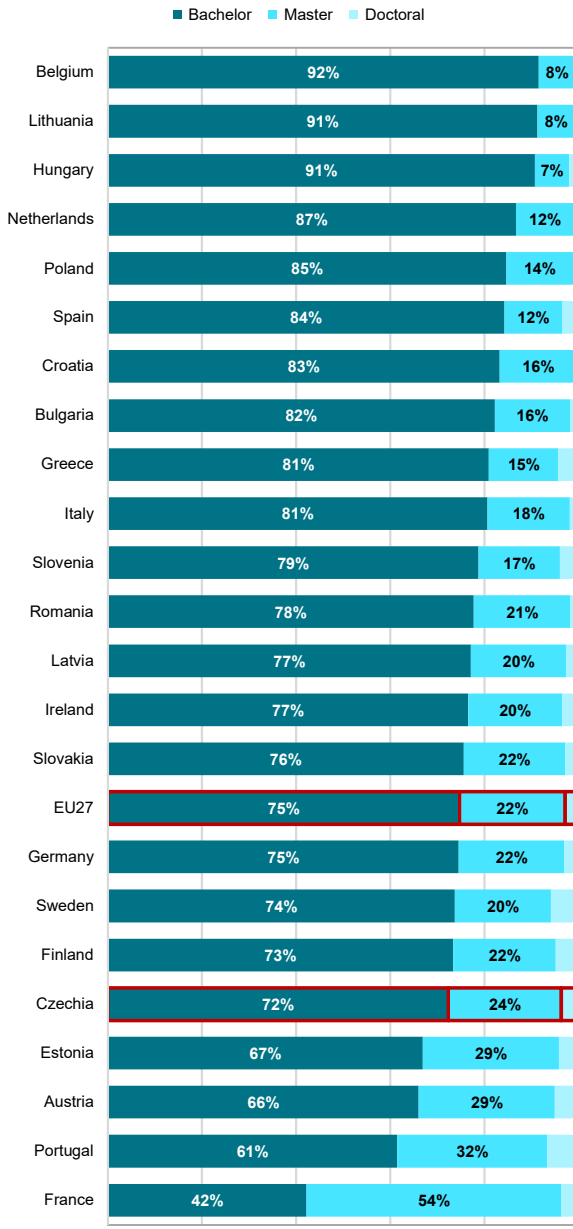


Figure B8 University students of ICT, by field of study



Source: CZSO calculation based on MEYS database

Figure B9 Tertiary students of ICT field of education by study programme; 2020



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

	2019	2020	2021
Total	**3 606**	**3 673**	**3 801**
Gender			
Men	2 955	2 983	3 091
Women	651	690	710
Age			
20-24 years	1 751	1 864	2 039
25-29 years	1 592	1 567	1 525
30-34 years	154	142	135
35 + years	109	100	102
Citizenship			
Czech citizens	2 641	2 734	2 786
Foreigners, total	**965**	**939**	**1 015**
Slovakia	708	628	721
Russia	87	97	89
Ukraine	37	66	61
Kazakhstan	22	16	20
other countries	111	132	124

Figure B10 University graduates from ICT fields of education

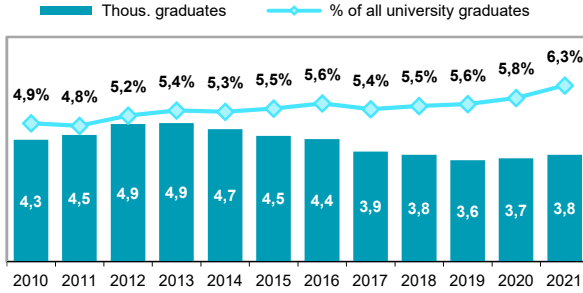


Figure B11 University graduates from ICT, by gender

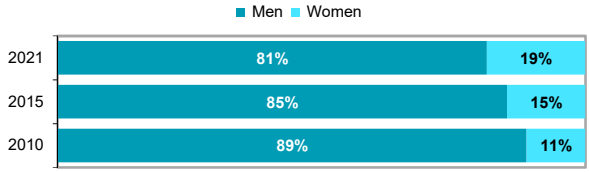
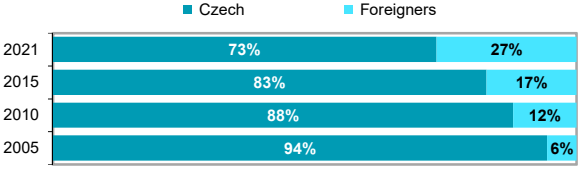


Figure B12 University graduates from ICT, by citizenship



Source: CZSO calculation based on MEYS database

Figure B13 Tertiary graduates from ICT; 2020
(% of all tertiary graduates)

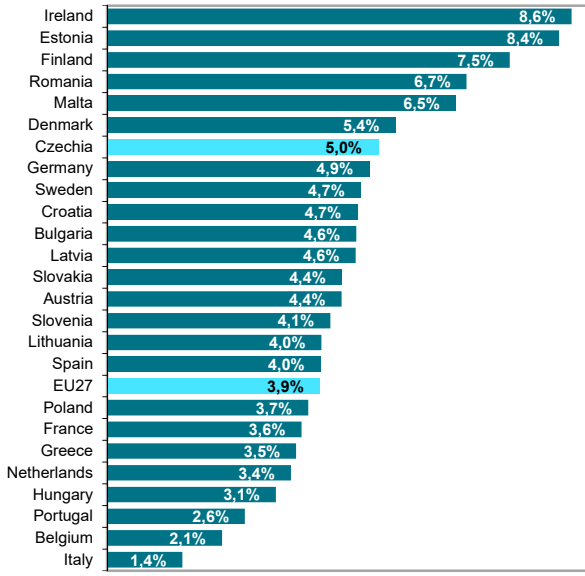
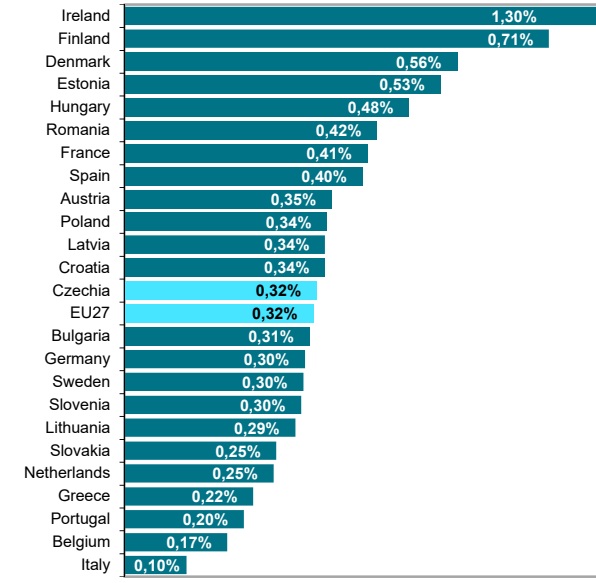


Figure B14 Tertiary graduates from ICT; 2020
(% of population aged 20 to 29 years)



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

	2019	2020	2021
Total	**3 606**	**3 673**	**3 801**
Graduates from public universities	3 566	3 633	3 732
Graduates from private universities	40	40	69
Studies			
Full-time studies	3 307	3 337	3 503
Distance and combined studies	299	336	298
Study programme			
Bachelor	1 957	2 081	2 241
Master	1 580	1 543	1 497
Doctoral	69	49	63
Field of study			
Database and network design and administration	512	456	431
Software and applications development and analysis	1 810	1 947	2 011
ICT n.e.c. and Inter-disciplinary ICT fields	1 284	1 270	1 359

Figure B15 University graduates from ICT, by studies

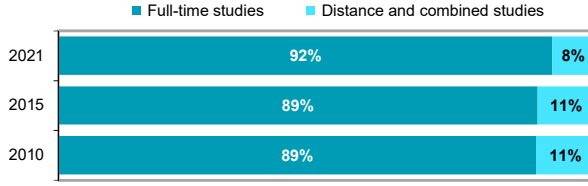


Fig. B16 University graduates from ICT, by study programme

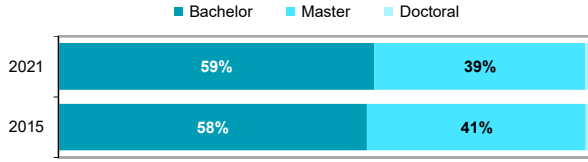
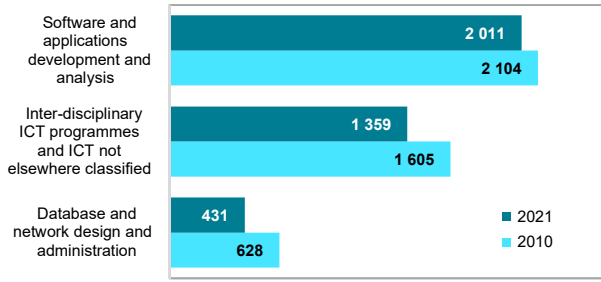
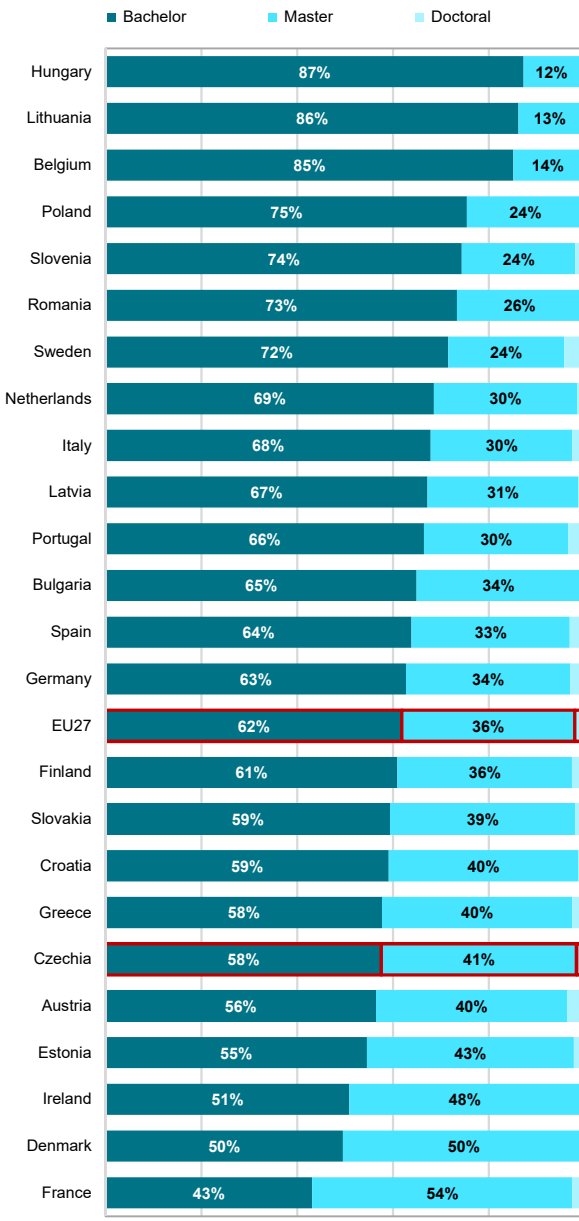


Figure B17 University graduates from ICT, by field of study



Source: CZSO calculation based on MEYS database

Figure B18 University graduates from ICT, by study programme; 2020



Source: CZSO calculation based on Eurostat database

Figure B19 Share of women among all tertiary students of ICT fields of education; 2020

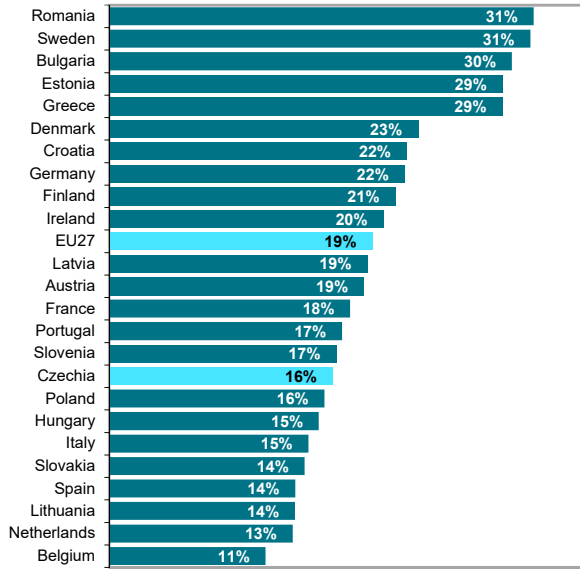
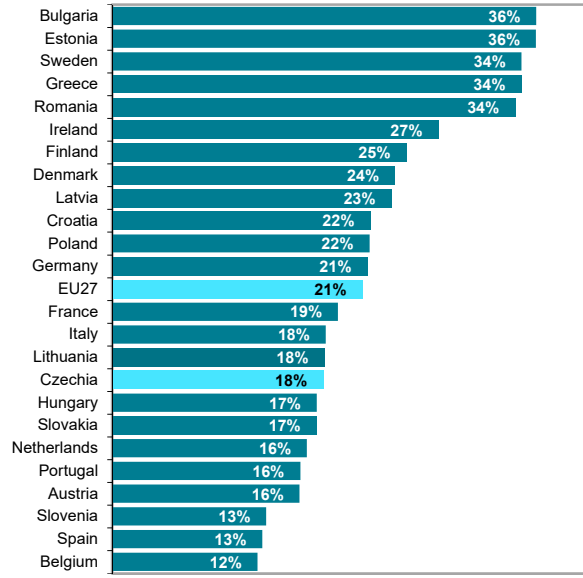


Figure B20 Share of women among all tertiary graduates from ICT fields of education; 2020



Source: CZSO calculation based on Eurostat database

C ICT investment

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 2020 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

	2019	2020	2021
Total	**268 874**	**287 958**	**298 849**
ICT equipment	87 703	88 434	81 399
Software	181 171	199 524	217 450
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	3 099	3 614	1 650
Mining and quarrying	650	628	256
Manufacturing	65 166	67 656	62 327
Electricity, gas and water supply	7 257	8 809	8 967
Construction	6 572	5 856	8 407
Wholesale and retail trade	18 699	20 227	18 396
Transportation and storage	8 881	8 440	8 208
Accommodation and food service activities	2 768	2 194	2 423
Information and communication	80 261	94 648	107 250
Financial and insurance activities	33 026	32 705	35 369
Real estate activities	3 033	3 448	2 858
Professional, scientific and technical activ.	15 654	15 139	18 032
Administrative and support service activ.	4 298	3 681	3 588
Public administration and defence	9 292	10 801	10 344
Education	3 069	3 129	2 711
Human health and social work activities	4 375	4 365	5 833
Arts, entertainment and recreation	2 104	1 916	1 776
Other services	670	702	454

Figure C1 ICT investment

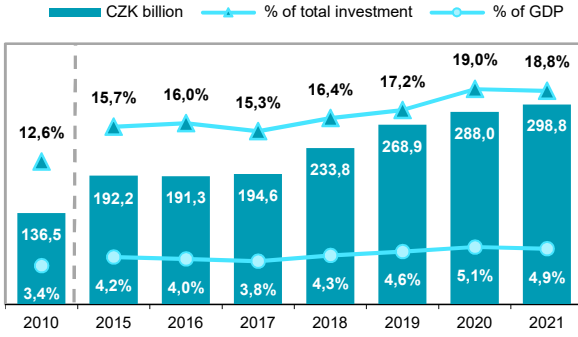
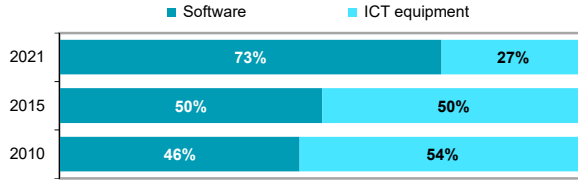


Figure C2 ICT investment, by asset



Source: CZSO, Annual National Accounts Statistics

Figure C3 ICT investment; 2020* (% of GDP)

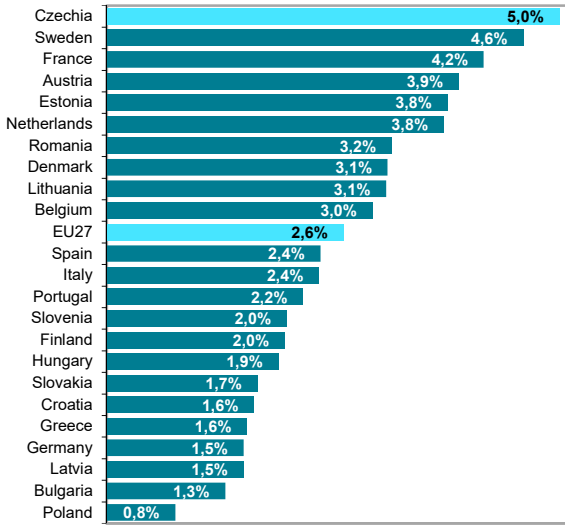
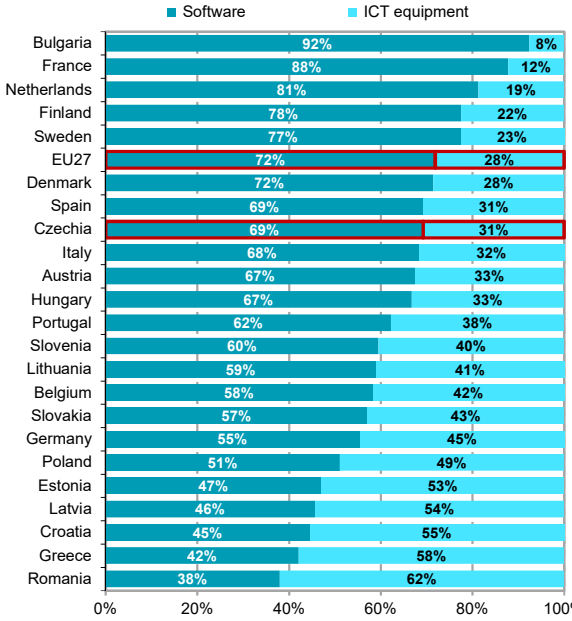


Figure C4 ICT investment, by asset (%)**; 2020***



* or the nearest available year

Source: CZSO calculations based on Eurostat data

C ICT investment

Table C2 ICT equipment investment in Czechia

CZK million

	2019	2020	2021
Total	**87 703**	**88 434**	**81 399**
Computer equipment	69 021	68 049	.
Communication equipment	18 682	20 385	.
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	2 505	2 961	880
Mining and quarrying	559	539	161
Manufacturing	42 993	45 541	37 910
Electricity, gas and water supply	4 101	4 633	3 453
Construction	4 894	4 131	6 556
Wholesale and retail trade	4 577	4 492	1 565
Transportation and storage	2 794	2 267	1 277
Accommodation and food service activities	2 143	1 553	1 724
Information and communication	5 210	6 331	7 124
Financial and insurance activities	4 316	3 101	5 545
Real estate activities	829	919	196
Professional, scientific and technical activ.	4 073	3 655	6 639
Administrative and support service activ.	773	566	131
Public administration and defence	2 719	3 101	2 629
Education	1 832	1 911	1 447
Human health and social work activities	2 480	1 788	3 321
Arts, entertainment and recreation	606	613	566
Other services	299	332	275

Figure C5 ICT equipment investment

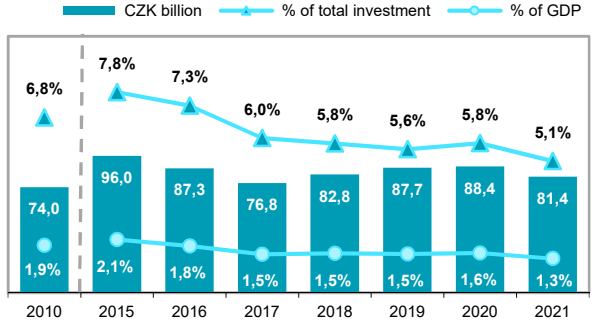
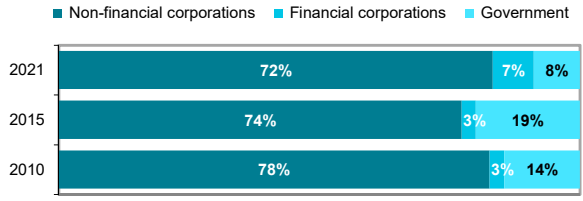


Figure C6 ICT equipment investment, by sector



Source: CZSO, Annual National Accounts Statistics

Figure C7 ICT equipment investment; 2020* (% GDP)

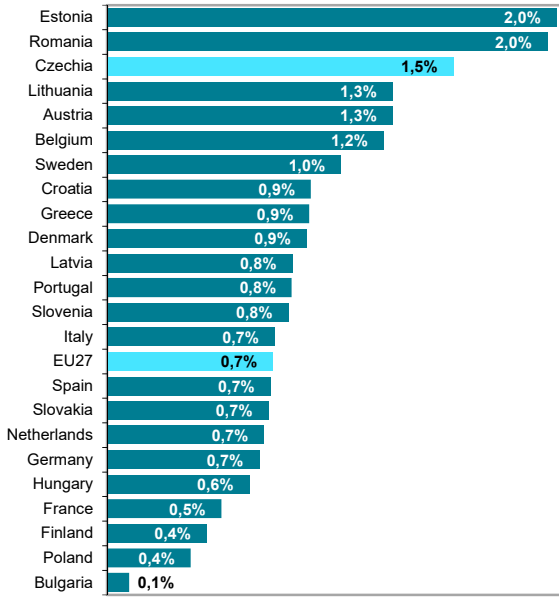
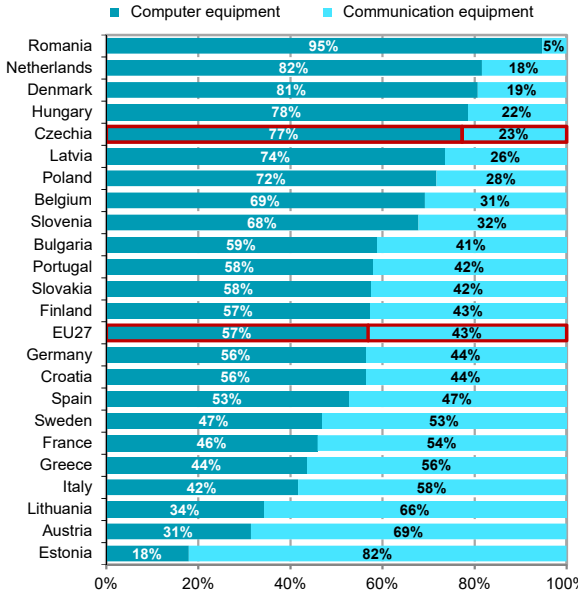


Figure C8 ICT equipment investment, by asset (%)**; 2020***



* or the nearest available year

Source: CZSO calculations based on Eurostat data

C ICT investment

Table C3 Software investment in Czechia

CZK million

	2019	2020	2021
Total	**181 171**	**199 524**	**217 450**
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	594	653	770
Mining and quarrying	91	89	95
Manufacturing	22 173	22 115	24 417
Electricity, gas and water supply	3 156	4 176	5 514
Construction	1 678	1 725	1 851
Wholesale and retail trade	14 122	15 735	16 831
Transportation and storage	6 087	6 173	6 931
Accommodation and food service activities	625	641	699
Information and communication	75 051	88 317	100 126
Financial and insurance activities	28 710	29 604	29 824
Real estate activities	2 204	2 529	2 662
Professional, scientific and technical activ.	11 581	11 484	11 393
Administrative and support service activ.	3 525	3 115	3 457
Public administration and defence	6 573	7 700	7 715
Education	1 237	1 218	1 264
Human health and social work activities	1 895	2 577	2 512
Arts, entertainment and recreation	1 498	1 303	1 210
Other services	371	370	179

Figure C9 Software investment

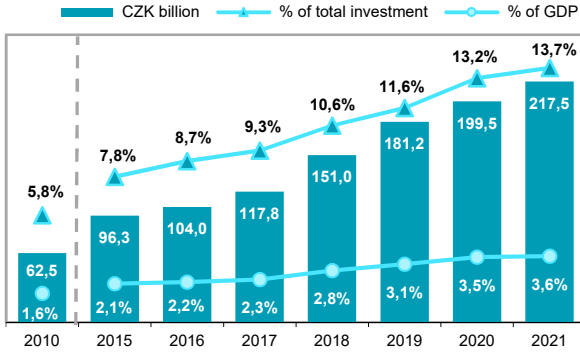
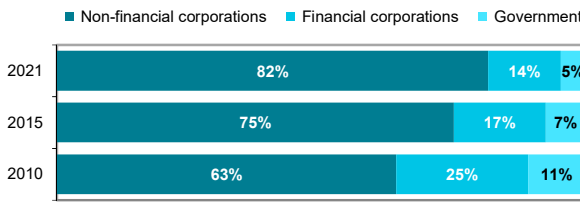


Figure C10 Software investment, by sector



Source: CZSO, Annual National Accounts Statistics

C ICT investment

Figure C11 Software investment; 2020*
(% of total investment)

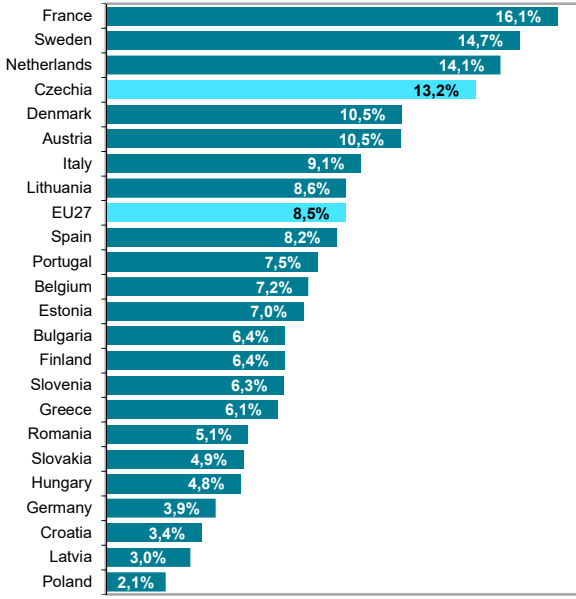
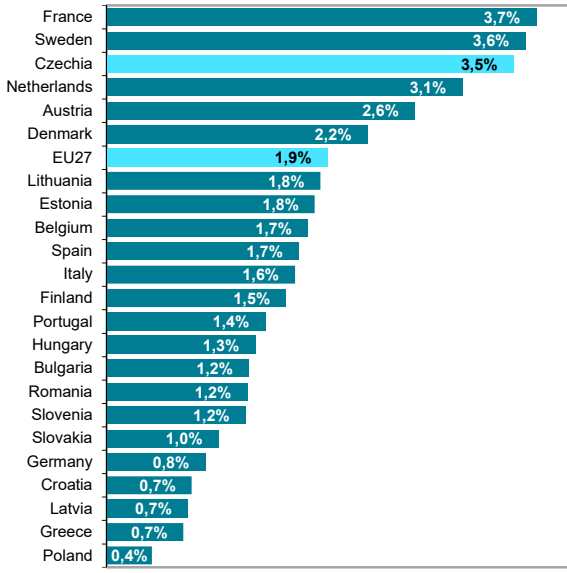


Figure C12 Software investment, 2020* (% of GDP)



* 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

	2019	2020	2021
Total	**109 608**	**111 201**	**117 268**
ICT equipment	**41 015**	**40 085**	**42 672**
Telephone equipment	9 432	9 471	8 999
Computers and consumer electronics	31 583	30 614	33 673
ICT services	**68 593**	**71 116**	**74 596**

Figure C13 Household consumption expenditures on ICT equipment and services

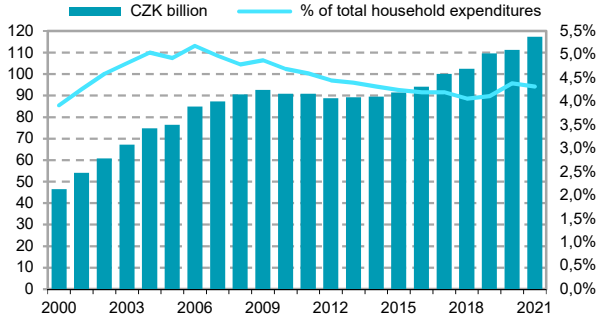


Figure C14 Household expenditures on ICT, by product

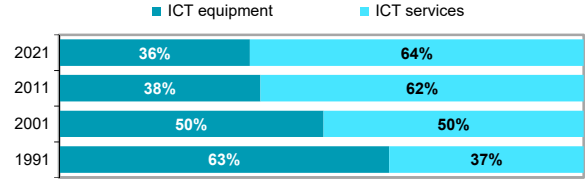
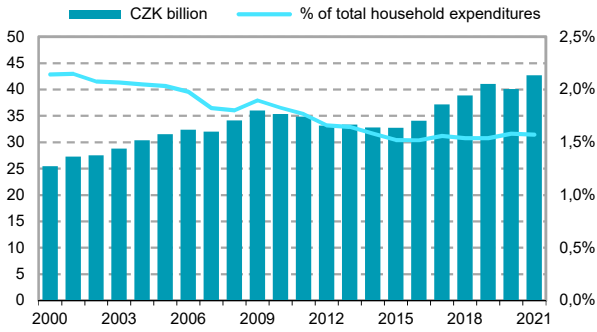


Figure C15 Households expenditures on ICT equipment



Source: CZSO, Annual National Accounts Statistics

Figure C16 Household expenditures on ICT; 2021
(% of total households consumption expenditures)

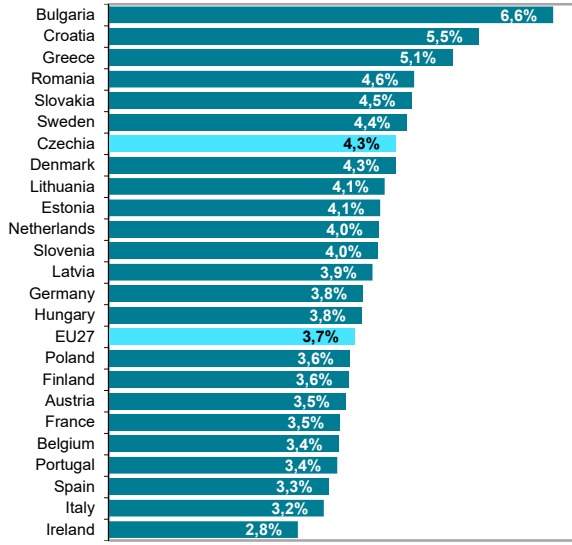
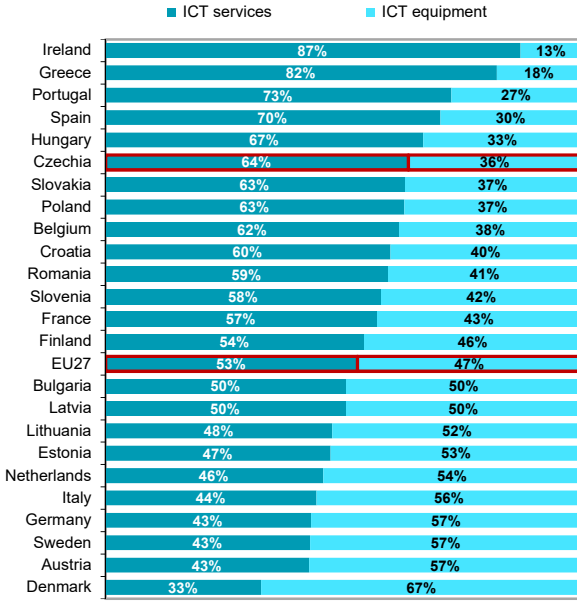
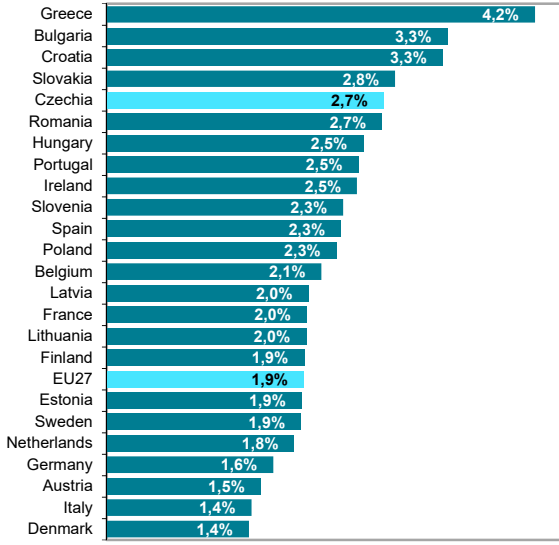


Figure C17 Household expenditures on ICT, by type of product; 2021* (%)

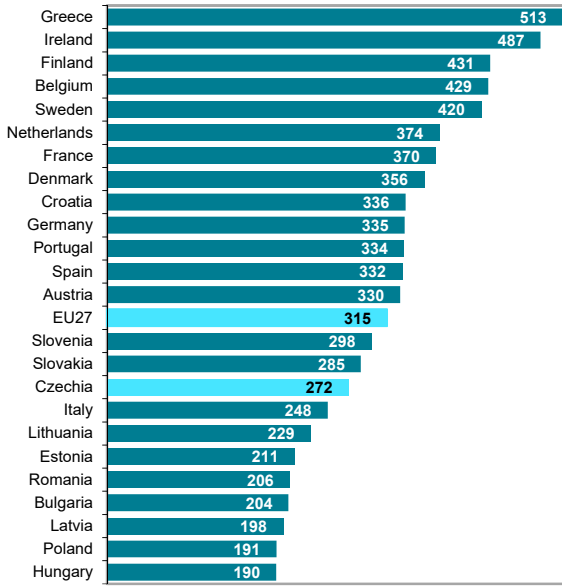


Source: CZSO calculations based on Eurostat data

Graf C18 Household expenditures on ICT services; 2021
(% of total households expenditures)



Graf C19 Household expenditures on ICT services; 2021
(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

	2019	2020	2021
Total	**20 474**	**22 975**	**27 450**
financed from government funds	1 920	1 828	1 979
Type of ICT product			
ICT equipment	5 791	6 691	7 372
Software	14 683	16 284	20 078
Type of R&D performer			
Enterprises, total	**18 830**	**21 517**	**26 096**
National enterprises	5 915	6 799	8 607
Foreign-controlled enterprises	12 914	14 718	17 489
Public universities	**1 576**	**1 351**	**1 265**
Other R&D performers	**68**	**107**	**89**

Figure D1 Total ICT R&D expenditures

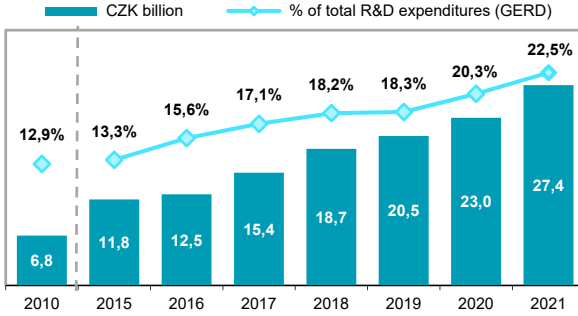


Figure D2 ICT R&D expenditures, by type of product

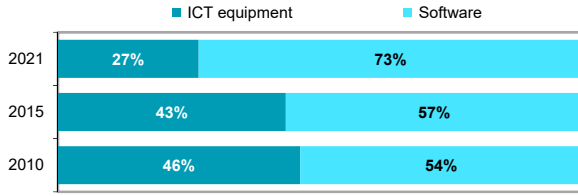
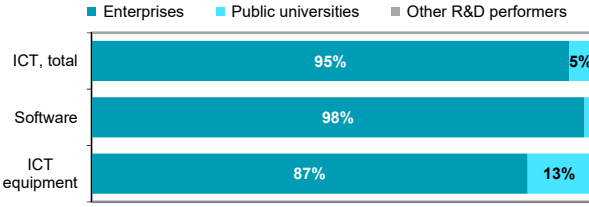


Figure D3 ICT R&D expenditures, by type of performer; 2021



Source: CZSO, Annual R&D survey

Table D2 Software R&D expenditures in Czechia

CZK million

	2019	2020	2021
Total	**14 683**	**16 284**	**20 078**
financed from government funds	652	573	611
Type of R&D performer			
Enterprises, total	**14 041**	**15 792**	**19 699**
National enterprises	4 302	4 679	6 246
Foreign-controlled enterprises	9 739	11 112	13 453
Public universities	**609**	**448**	**340**
Other R&D performers	**33**	**44**	**39**

Figure D4 Software R&D expenditures

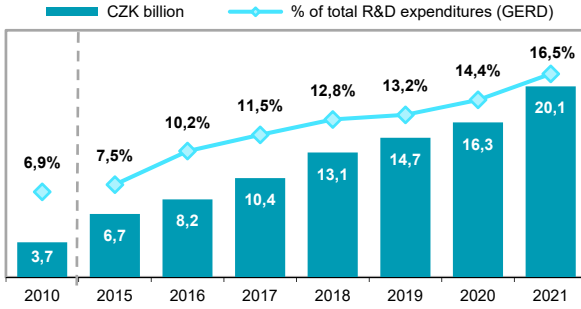


Figure D5 Software R&D expenditures, by performer; 2021

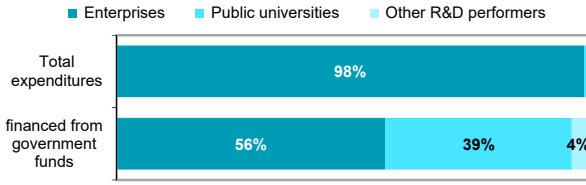
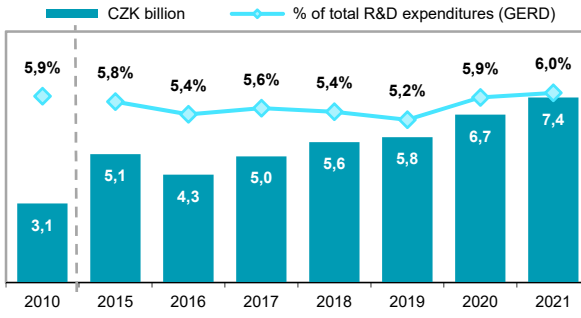


Figure D6 ICT equipment R&D expenditures



Source: CZSO, Annual R&D survey

Table D3 ICT R&D expenditures in enteprises in Czechia

CZK million

	2019	2020	2021
Total	**18 830**	**21 517**	**26 096**
financed from government funds	784	900	945
Type of ICT product			
ICT equipment	4 789	5 725	6 397
Software	14 041	15 792	19 699
Size group (employees)			
Small enterprises (0-49)	1 968	2 154	2 582
Medium enterprises (50-249)	3 845	3 957	4 938
Large enterprises (250+)	13 017	15 406	18 576
Ownership			
National enterprises	5 915	6 799	8 607
Foreign-controlled enterprises	12 914	14 718	17 489
Industry (CZ-NACE)			
ICT sector industries, total	**13 286**	**15 262**	**18 906**
ICT manufacturing	335	323	374
Telecommunications	366	971	769
IT services	12 585	12 585	12 585
Other industries	**5 544**	**6 255**	**7 190**

Figure D7 ICT R&D expenditures in enteprises

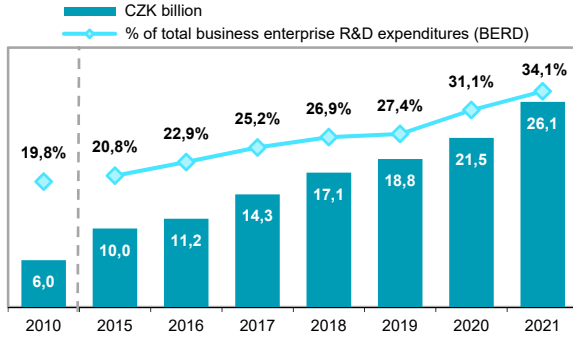
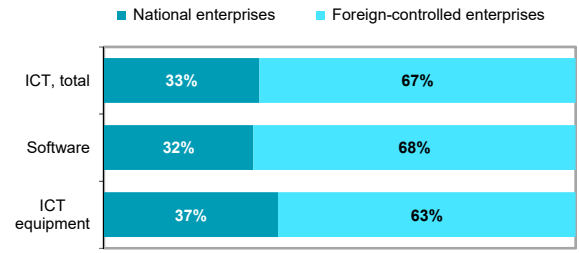


Figure D8 ICT R&D expenditures in enteprises, by ownership; 2021



Source: CZSO, Annual R&D survey

Table D4 ICT R&D expenditures in enterprises in Czechia by type of product; 2021

CZK million

	Total	ICT equipment	Software
Total	**26 096**	**6 397**	**19 699**
financed from government funds	945	600	345
Size group (employees)			
Small enterprises (0-49)	2 582	686	1 896
Medium enterprises (50-249)	4 938	1 156	3 782
Large enterprises (250+)	18 576	4 555	14 021
Ownership			
National enterprises	8 607	2 361	6 246
Foreign-controlled enterprises	17 489	4 036	13 453
Industry (CZ-NACE)			
ICT sector industries, total	**15 262**	**1 652**	**13 610**
ICT manufacturing	374	230	144
Telecommunications	769	8	760
IT services	17 764	1 599	16 165
Other industries	**10 834**	**4 745**	**6 089**

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

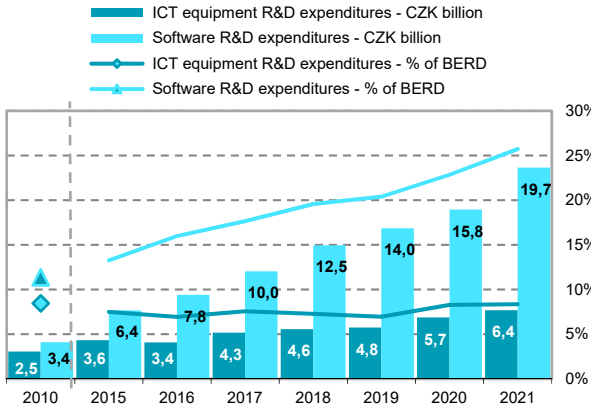
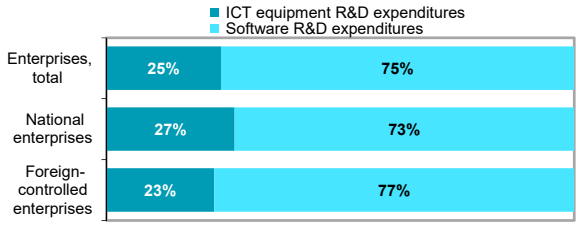


Figure D10 ICT R&D expenditures in enterprises, by ownership of R&D performers; 2021



Source: CZSO, Annual R&D survey

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

CZK million

	2019	2020	2021
Total	**14 600**	**16 739**	**20 190**
financed from government funds	983	1 071	1 715
Type of product			
ICT equipment	1 417	1 652	1 837
Software	11 869	13 610	17 069
Other non ICT related products	1 313	1 477	1 284
Size group (employees)			
Small enterprises (0-49)	1 933	2 031	2 332
Medium enterprises (50-249)	3 441	3 329	4 230
Large enterprises (250+)	9 225	11 379	13 628
Ownership			
National enterprises	4 830	5 454	6 851
Foreign-controlled enterprises	9 770	11 285	13 339
ICT sub-sectors			
ICT manufacturing	902	999	727
ICT services, total	**13 698**	**15 740**	**19 463**
Telecommunications	377	983	780
Computer programming	10 378	11 867	15 005
Data processing and hosting	1 066	1 236	1 706
Other IT services	1 877	1 655	1 972

Figure D11 R&D expenditures in the ICT sector

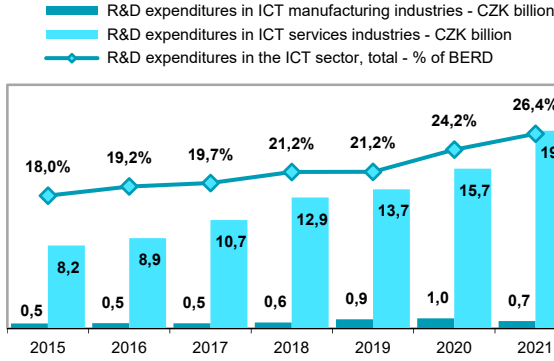
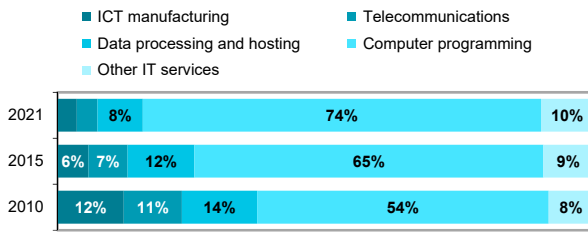


Figure D12 R&D expenditures in the ICT sector, by industry



Source: CZSO, Annual R&D survey

Figure D13 R&D expenditures in the ICT sector; 2020
(% of GDP)

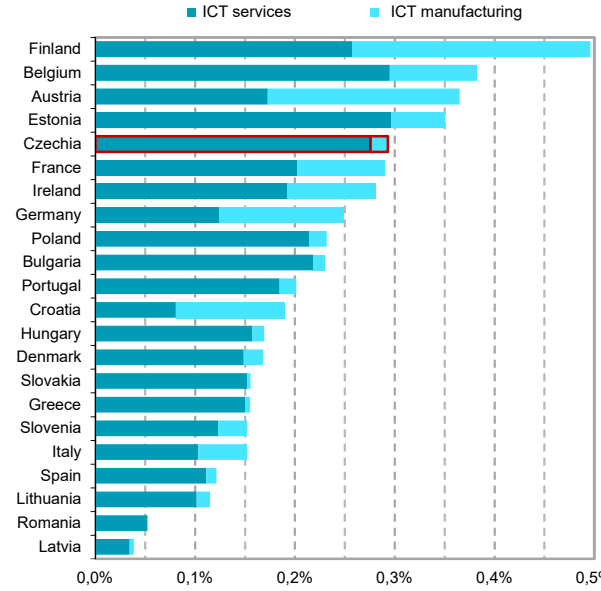
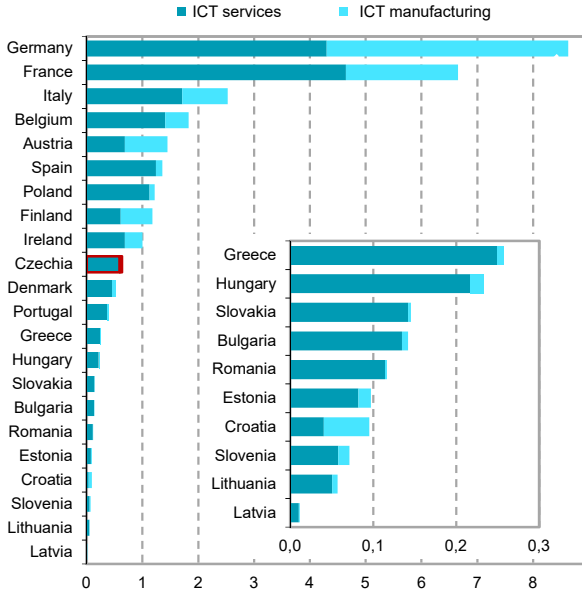


Figure D14 R&D expenditures in the ICT sector; 2020
(EUR billion)



Source: CZSO calculations based on Eurostat data

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

Full Time Equivalent Numbers

	2019	2020	2021
Total	**11 102**	**11 593**	**12 971**
Men	9 739	10 130	11 106
Women	1 363	1 462	1 866
Size group (employees)			
Small enterprises (0-49)	2 078	2 021	2 225
Medium enterprises (50-249)	2 998	2 838	3 093
Large enterprises (250+)	6 026	6 734	7 653
Ownership			
National enterprises	4 815	4 937	5 380
Foreign-controlled enterprises	6 287	6 656	7 591
ICT sub-sectors			
ICT manufacturing	818	832	761
ICT services, total	**10 284**	**10 760**	**12 210**
Telecommunications	248	223	202
Computer programming	7 788	8 493	9 858
Data processing and hosting	866	1 010	1 013
Other IT services	1 382	1 034	1 137

Figure D15 R&D personnel in the ICT sector

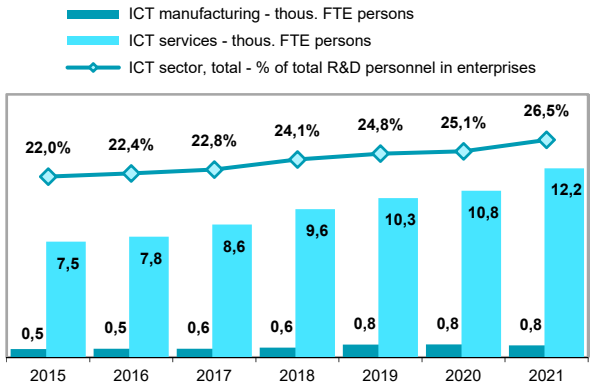
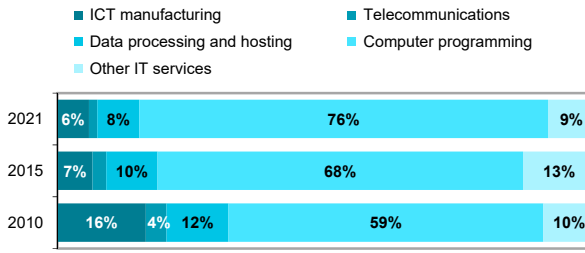


Figure D16 R&D personnel in the ICT sector, by industry



Source: CZSO, Annual R&D survey

E International trade in ICT goods

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

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

Data on the movement of goods across borders are more detailed and better internationally comparable, but they do not indicate the trade in these goods, ie the change of ownership between residents and non-residents. On the contrary, this is taken into account by external trade statistics, which monitor the external trade in goods between Czech and foreign entities. More details on this issue of the dual concept of foreign trade can be found here: https://www.czso.cz/csu/czso/2-vzonu_m
and here:
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/3smUqu2

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

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

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

Data for the Czech Republic comes from the Cross-border movements of goods database, for more see
https://apl.czso.cz/pll/stazo/STAZO.STAZO?jazyk=EN&prvni=N.

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 ICT goods exports from Czechia

CZK million

	2019	2020	2021
Total	**740 780**	**798 057**	**766 230**
Computer equipment and peripherals	335 466	364 383	356 328
Communication equipment	242 408	259 421	235 585
Consumer electronics	71 661	70 864	73 694
Electronic components	38 808	45 845	47 816
ICT parts n.e.s.	52 438	57 544	52 806

Figure E1 ICT goods exports

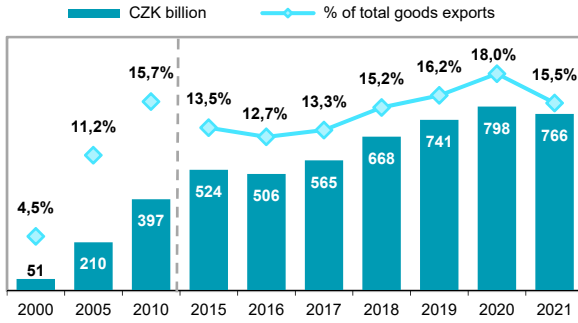


Figure E2 ICT goods exports, by commodities

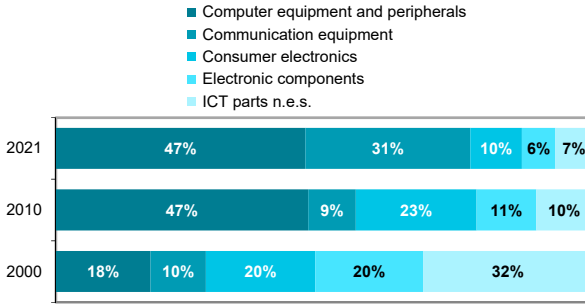
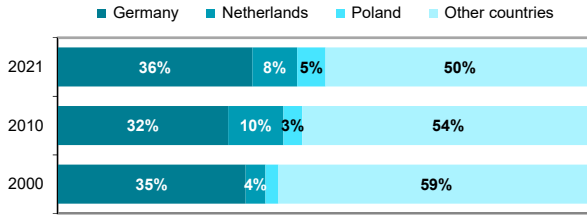


Figure E3 ICT goods exports, by countries



Source: CZSO, Cross-border movements of goods database

Figure E4 ICT goods exports; 2021
(% of total goods exports)

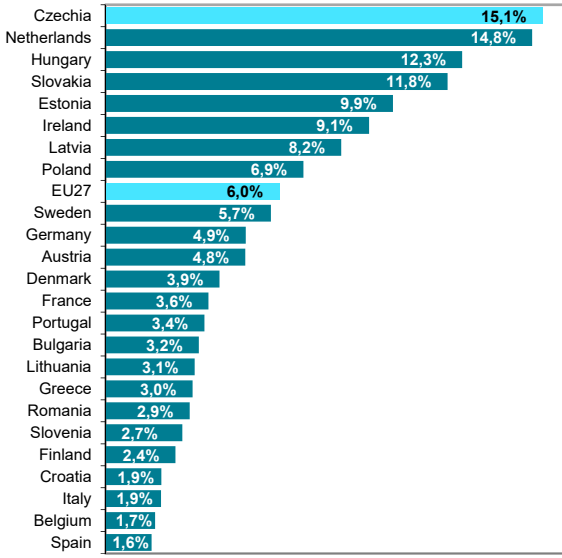
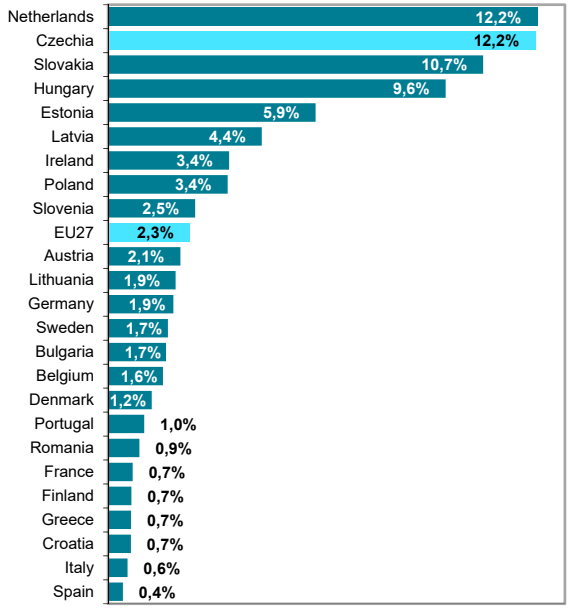


Figure E5 ICT goods exports; 2021 (% of GDP)



Source: CZSO calculations based on Eurostat

E International trade in ICT goods

Table E2 ICT goods imports to Czechia

CZK million

	2019	2020	2021
Total	**715 750**	**796 391**	**780 412**
Computer equipment and peripherals	224 436	253 026	275 788
Communication equipment	255 061	264 728	223 242
Consumer electronics	51 065	52 205	56 583
Electronic components	93 257	106 347	105 822
ICT parts n.e.s.	91 931	120 086	118 976

Figure E6 ICT goods imports

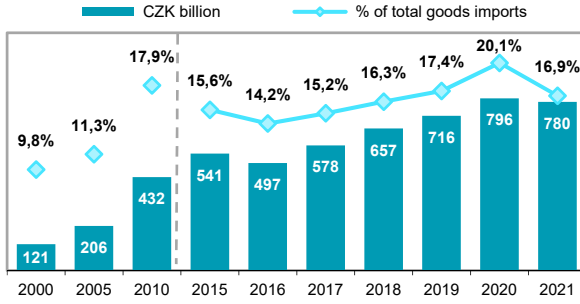


Figure E7 ICT goods imports, by commodities

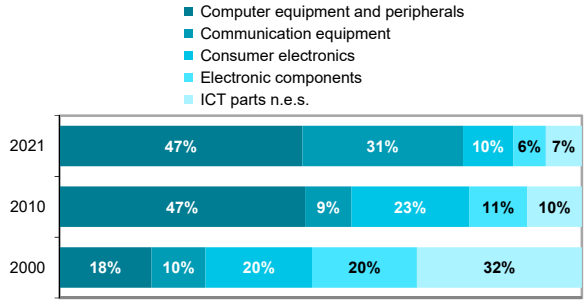
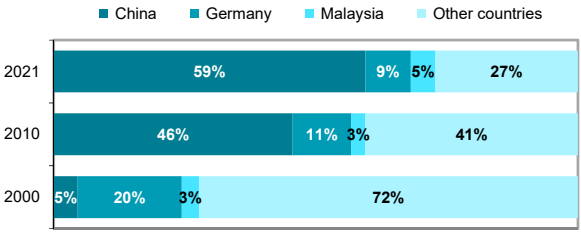


Figure E8 ICT goods imports, by countries



Source: CZSO, Cross-border movements of goods database

Figure E9 ICT goods imports; 2021
(% of total goods imports)

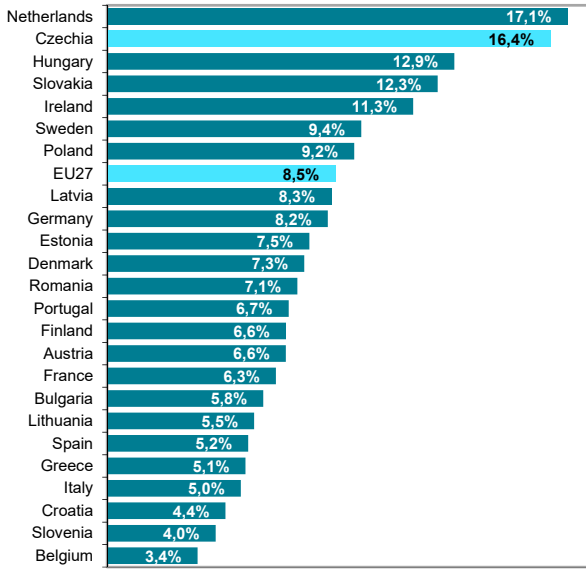
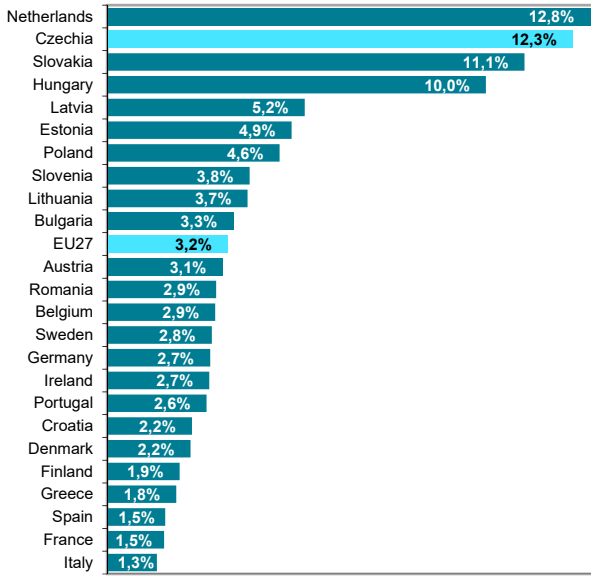
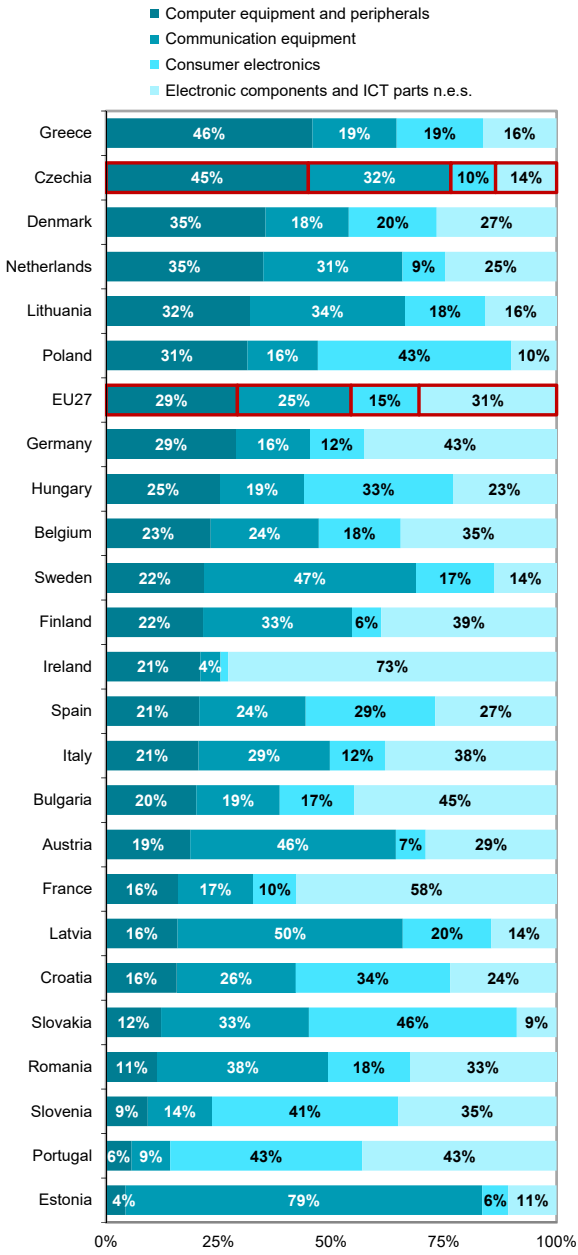


Figure E10 ICT goods imports; 2021 (% of GDP)



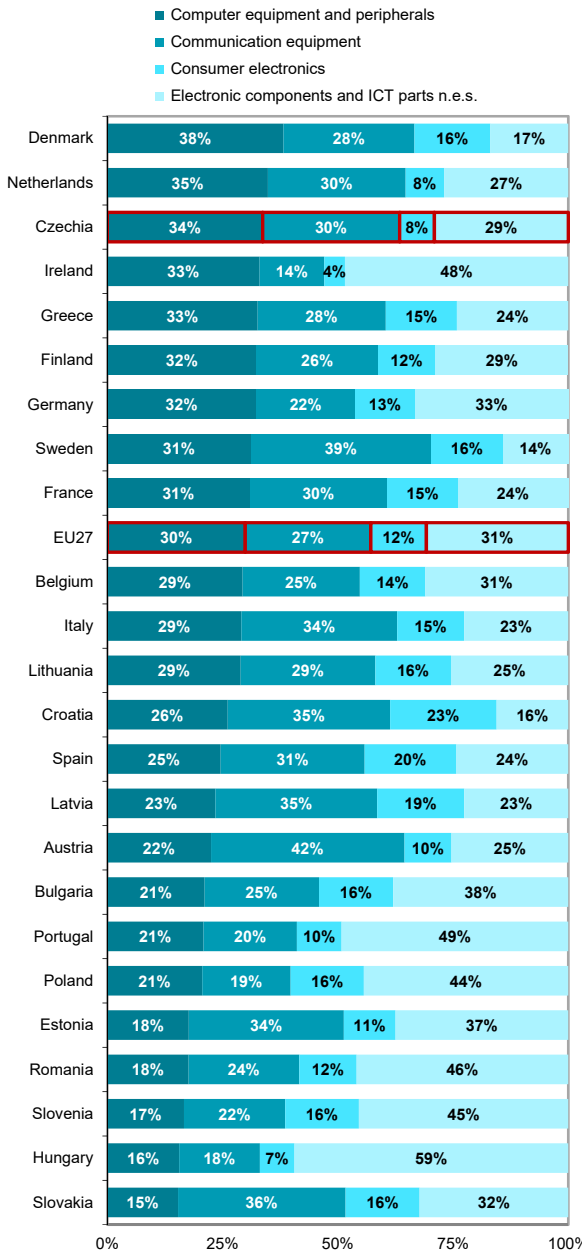
Source: CZSO calculations based on Eurostat

Figure E11 ICT goods exports, by commodities; 2021



Source: CZSO calculations based on Eurostat

Figure E12 ICT goods imports, by commodities; 2021



Source: CZSO calculations based on Eurostat

E International trade in ICT goods

Table E3 Computer equipment exports from Czechia

CZK million

	2019	2020	2021
Total	**335 466**	**364 383**	**356 328**
Portable computers	78 471	105 748	117 744
Other computers	153 517	146 524	132 128
Computer peripherals, total	103 478	112 111	106 456
Storage units	44 588	43 498	45 554
Sound, video, network and similar cards	20 388	24 575	16 641
Monitors used with computers	22 392	23 591	22 115
Printers, copying or faxing machines	5 251	4 742	5 370
Other input or output peripherals*	10 859	15 705	16 777

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

Figure E13 Computer equipment exports

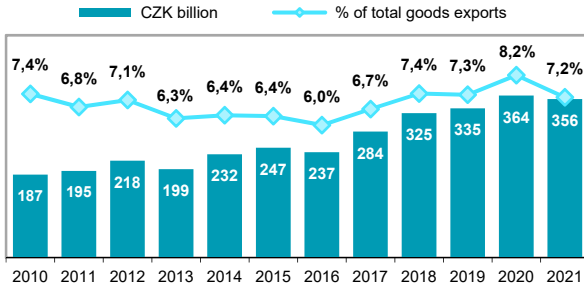


Figure E14 Computer equipment exports, by commodities

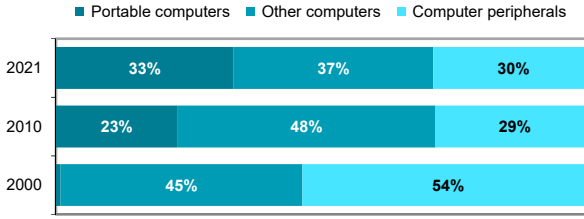
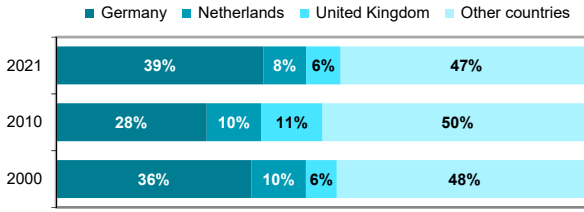


Figure E15 Computer equipment exports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Table E4 Computer equipment imports to Czechia

CZK million

	2019	2020	2021
Total	**224 436**	**253 026**	**275 788**
Portable computers	83 235	110 222	125 104
Other computers	24 700	22 898	26 381
Computer peripherals, total	116 501	119 906	124 303
Storage units	51 090	56 006	56 030
Sound, video, network and similar cards	23 000	18 083	18 557
Monitors used with computers	22 034	21 952	23 738
Printers, copying or faxing machines	7 387	6 001	6 832
Other input or output peripherals*	12 990	17 863	19 146

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

Figure E16 Computer equipment imports

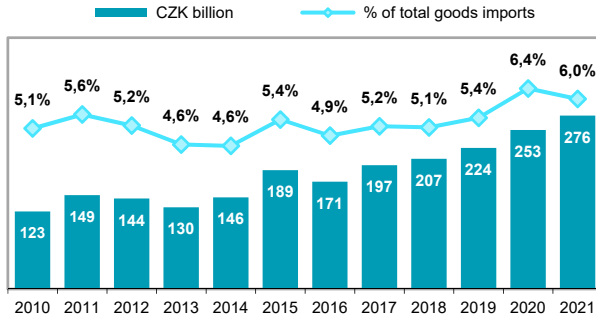


Figure E17 Computer equipment imports, by commodities

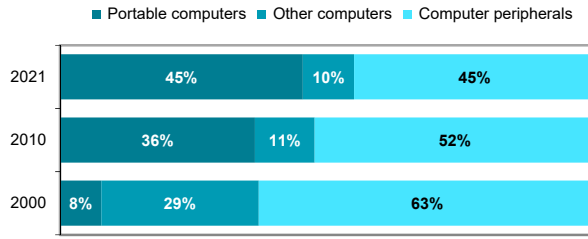
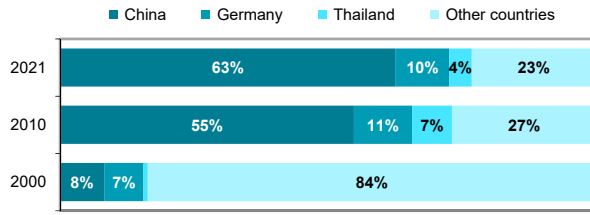


Figure E18 Computer equipment imports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Table E5 Communication equipment exports from Czechia

CZK million

	2019	2020	2021
Total	**242 408**	**259 421**	**235 585**
Mobile phones	153 944	149 863	118 324
Other communication equipment	88 463	109 558	117 262

Figure E19 Communication equipment exports

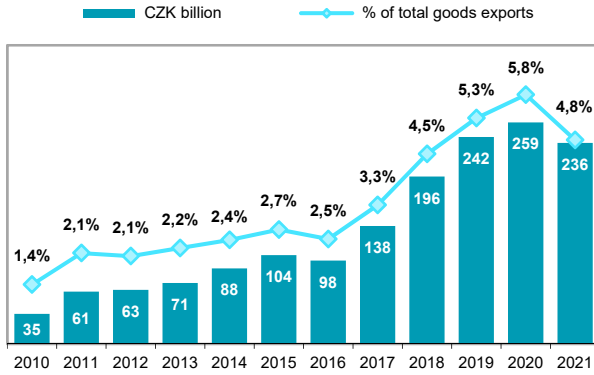


Figure E20 Communication equipment exports by commodities

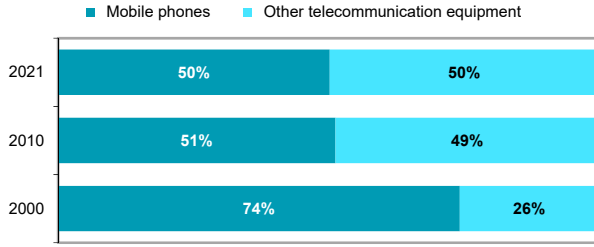
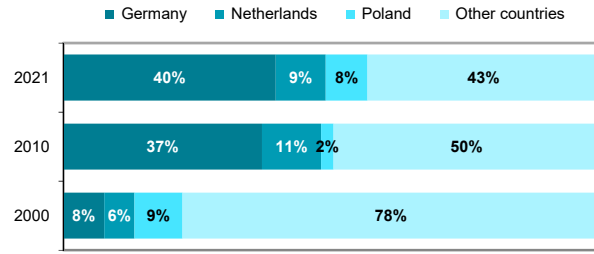


Figure E21 Communication equipment exports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Table E6 Communication equipment imports to Czechia

CZK million

	2019	2020	2021
Total	**255 061**	**264 728**	**223 242**
Mobile phones	165 170	165 790	123 691
Other communication equipment	89 891	98 938	99 551

Figure E22 Communication equipment imports

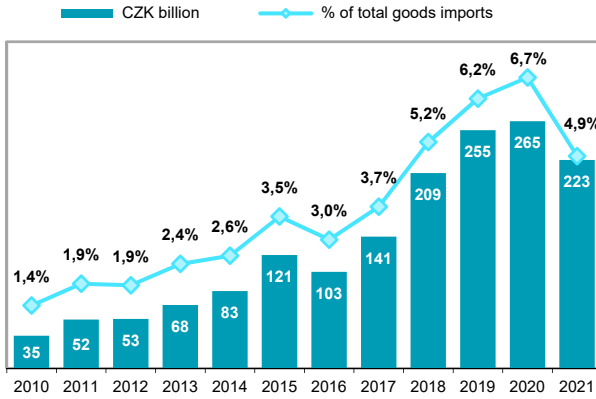


Figure E23 Communication equipment imports by commodities

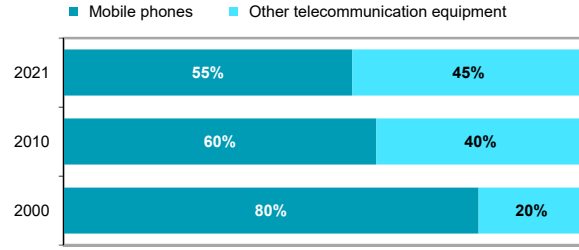
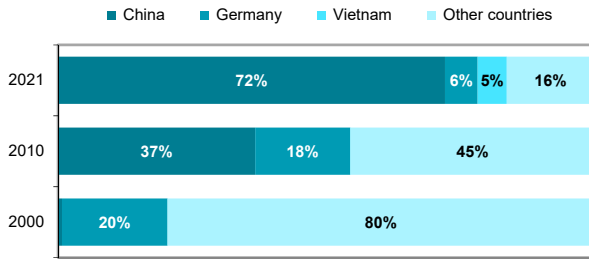


Figure E24 Communication equipment imports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Table E7 Consumer electronics exports from Czechia

CZK million

	2019	2020	2021
Total	**71 661**	**70 864**	**73 694**
Radio and TV receivers	28 407	26 238	22 173
Sound and image recording and reproducing apparatuses	16 038	17 099	19 884
Consumer electronics accessories*	27 215	27 528	31 637

Headphones, earphones and combined microphone/speaker sets; Audio-frequency electric amplifiers; Electric sound amplifier sets; Non-recorded media

Figure E25 Consumer electronics exports

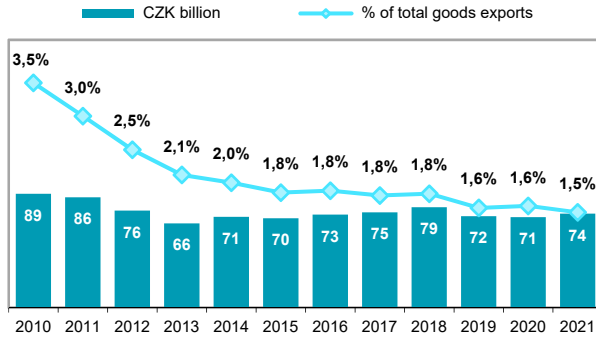


Figure E26 Consumer electronics exports, by commodities

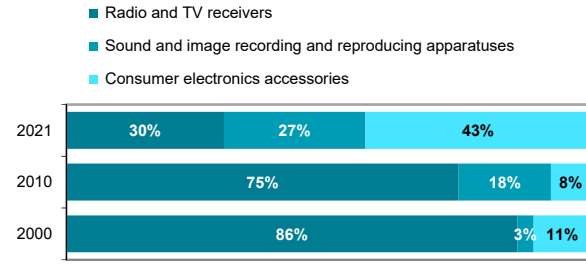
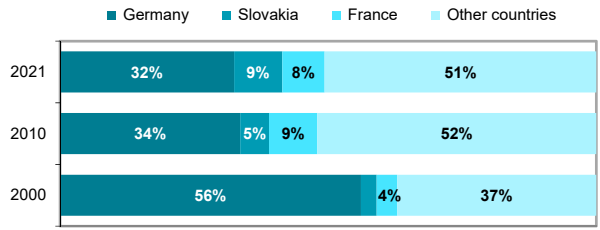


Figure E27 Consumer electronics exports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Table E8 Consumer electronics imports to Czechia

CZK million

	2019	2020	2021
Total	**51 065**	**52 205**	**56 583**
Radio and TV receivers	16 784	18 051	16 558
Sound and image recording and reproducing apparatuses	16 590	17 021	20 194
Consumer electronics accessories*	17 691	17 132	19 831

Headphones, earphones and combined microphone/speaker sets; Audio-frequency electric amplifiers; Electric sound amplifier sets; Non-recorded media

Figure E28 Consumer electronics imports

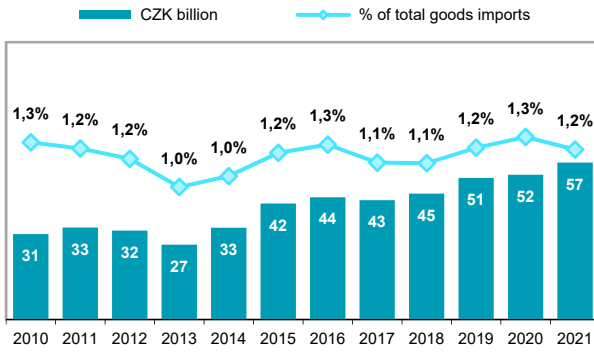


Figure E29 Consumer electronics imports, by commodities

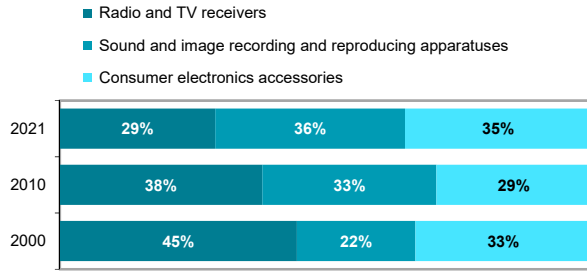
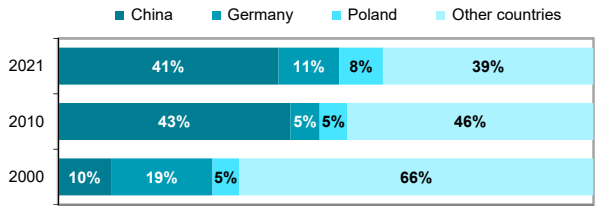


Figure E30 Consumer electronics imports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Table E9 Electronic components exports from Czechia

CZK million

	2019	2020	2021
Total	**38 808**	**45 845**	**47 816**
Electronic integrated circuits	27 067	34 631	33 976
Printed circuits	4 668	5 168	6 601
Other electronic components	7 072	6 046	7 239

Figure E31 Electronic components exports

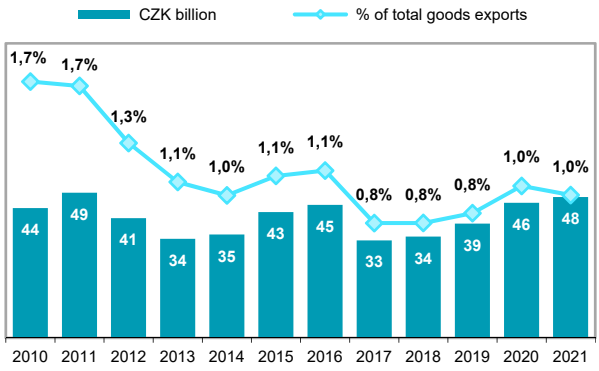


Figure E32 Electronic components exports, by commodities

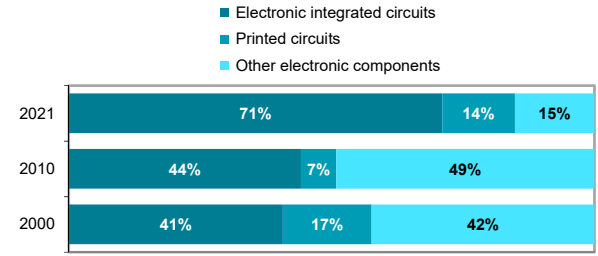
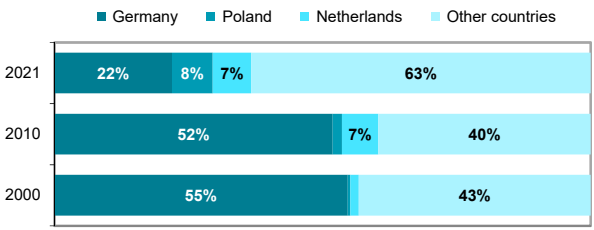


Figure E33 Electronic components exports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Table E10 Electronic components imports to the Czechia

CZK million

	2019	2020	2021
Total	**93 257**	**106 347**	**105 822**
Electronic integrated circuits	71 185	86 867	79 010
Printed circuits	11 333	9 663	12 912
Other electronic components	10 738	9 818	13 901

Figure E34 Electronic components imports

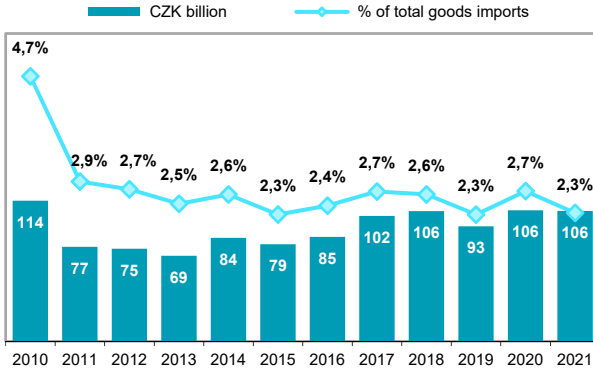


Figure E35 Electronic components imports, by commodities

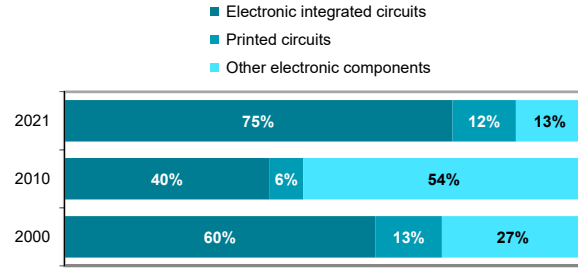
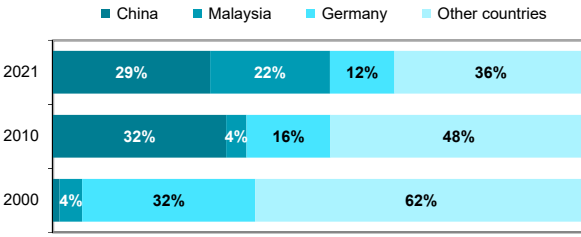


Figure E36 Electronic components imports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

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

CZK million

	2019	2020	2021
Total	**52 438**	**57 544**	**52 806**
Parts and accessories n.e.s. of			
computers	29 897	32 972	32 278
telecommunication equipment	12 979	15 531	11 398
consumer electronics	9 561	9 041	9 131

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

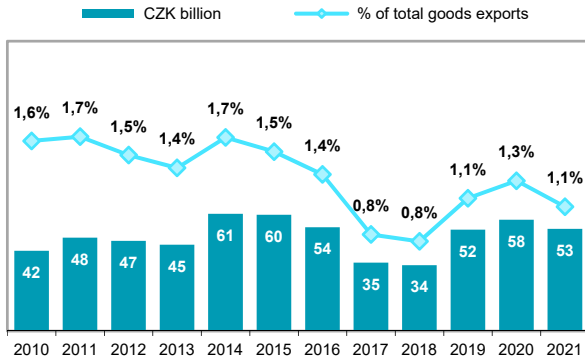


Figure E38 Exports of ICT parts n.e.s., by commodities

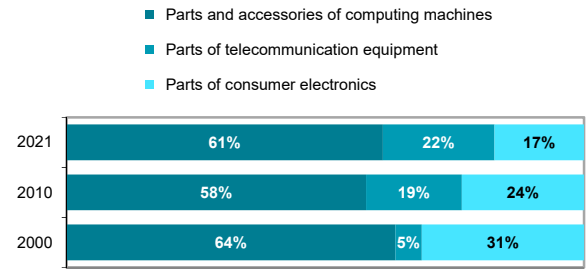
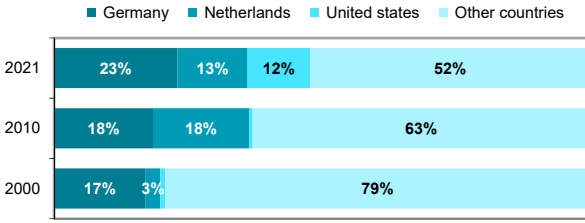


Figure E39 Exports of ICT parts n.e.s., by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

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

CZK million

	2019	2020	2021
Total	**91 931**	**120 086**	**118 976**
Parts and accessories n.e.s. of			
computers	57 829	88 399	86 869
telecommunication equipment	8 923	9 699	8 230
consumer electronics	25 179	21 988	23 877

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

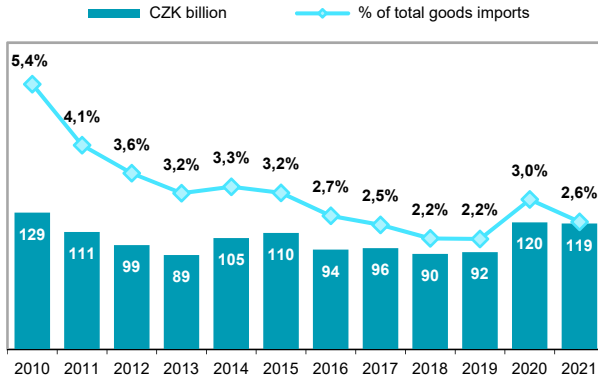


Figure E41 Imports of ICT parts n.e.s., by commodities

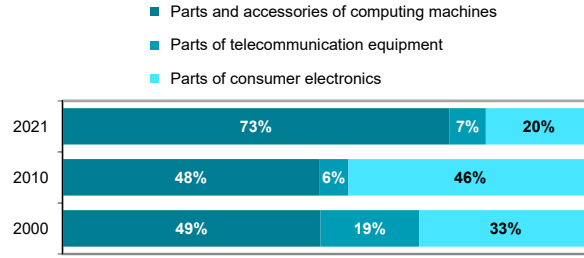
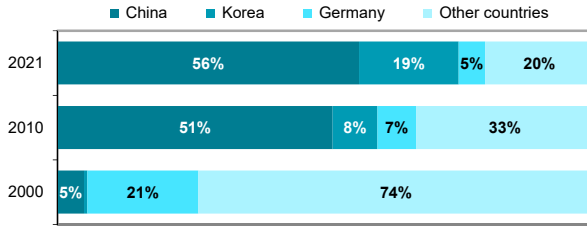


Figure E42 Imports of ICT parts n.e.s., by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

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

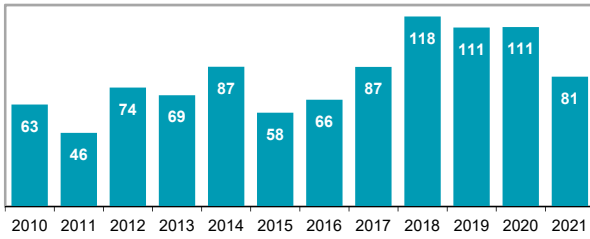


Figure E44 Balance of cross-border movement of Communication equipment (CZK billion)

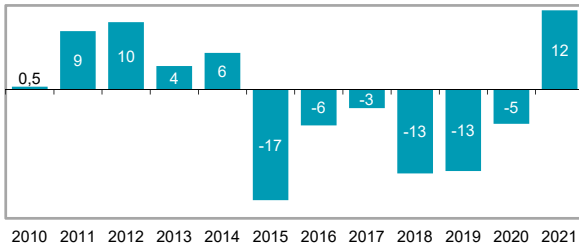


Figure E45 Balance of cross-border movement of Consumer electronics (CZK billion)

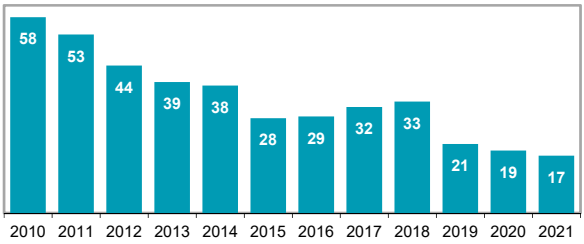
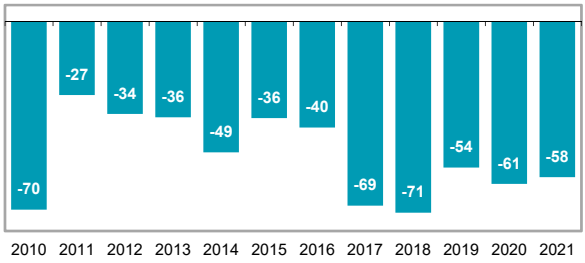


Figure E46 Balance of cross-border movement of Electronic components (CZK billion)



Source: CZSO, Cross-border movements of goods database

F International trade in ICT services

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

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

- **Telecommunication services (code SI1/9.1)** include, first of all, transactions of Czech and foreign telecommunication operators for implemented international calls by means of fixed or mobile telephone networks. Other telecommunication services involve payments for the access to the Internet, cable television, and to other computer networks, including providing of services as e-mail, video conferences, or transmitting of audio-visual signal over the Internet, cable networks or satellites.
- **Computer services (code 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

	2019	2020	2021
Total	**105 286**	**118 327**	**130 626**
Telecommunication services	14 286	17 314	21 143
Computer services	54 261	56 239	60 954
Computer software	36 739	44 774	48 529
by selected countries			
EU27, total	54 500	61 480	64 874
of which to Germany	16 432	18 664	19 262
Other countries, total	50 786	56 847	65 752
of which to the United States	23 027	26 589	31 597

Figure F1 ICT services exports

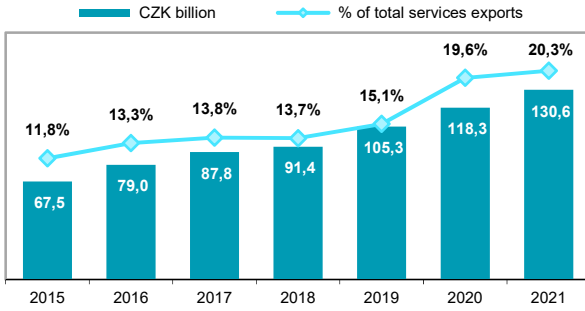


Figure F2 ICT services exports, by type of ICT services

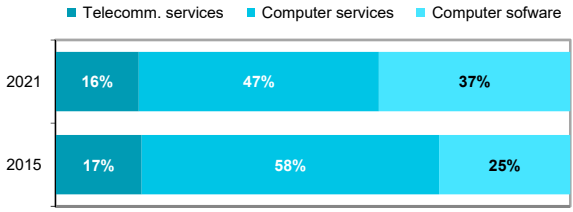
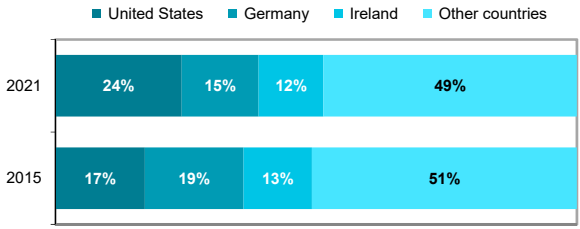


Figure F3 ICT services exports, by countries



Source: CZSO, Survey on exports and imports of services

Figure F4 ICT services exports; 2020
(% of total services exports)

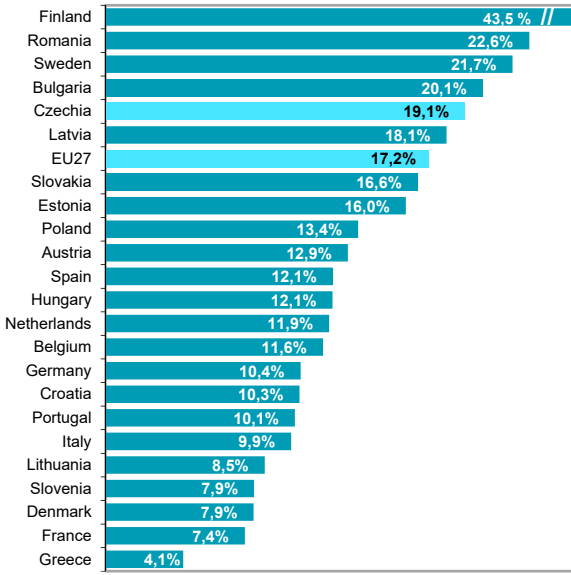
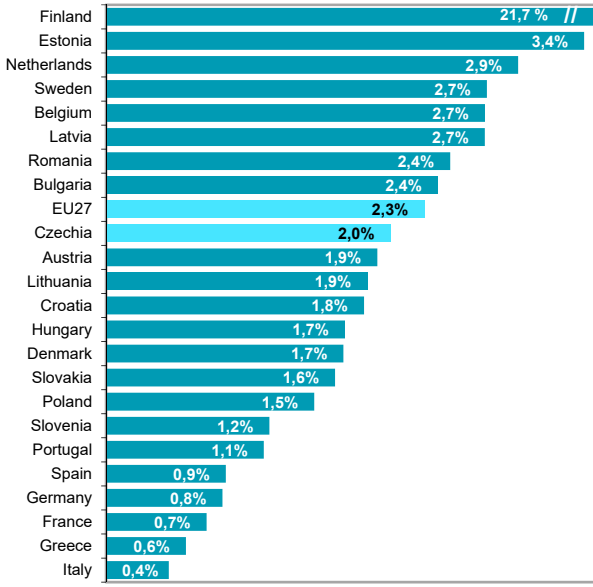


Figure F5 ICT services exports; 2020 (% of GDP)



Source: CZSO calculations based on Eurostat

F International trade in ICT services

Table F2 ICT services imports to Czechia

CZK million

	2019	2020	2021
Total	**53 040**	**62 374**	**69 512**
Telecommunication services	11 535	15 578	19 537
Computer services	29 715	31 501	33 526
Computer software	11 790	15 295	16 450
by selected countries			
EU27, total	31 122	37 287	41 854
of which to Germany	11 875	13 214	13 466
Other countries, total	21 918	25 088	27 658
of which to the United States	3 277	3 058	3 192

Figure F6 ICT services imports

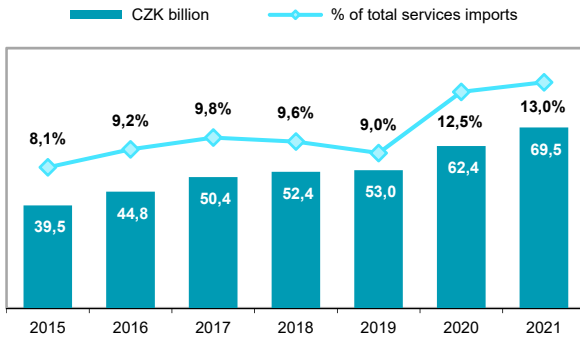


Figure F7 ICT services imports, by type of ICT services

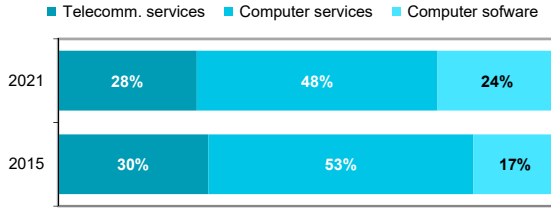
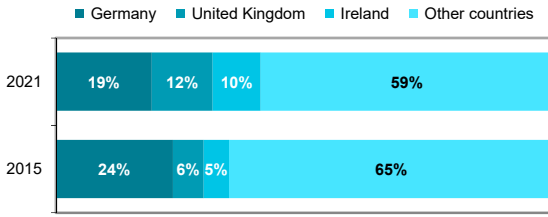


Figure F8 ICT services imports, by countries



Source: CZSO, Survey on exports and imports of services

F International trade in ICT services

Figure F9 ICT services imports, 2020
(% of total services imports)

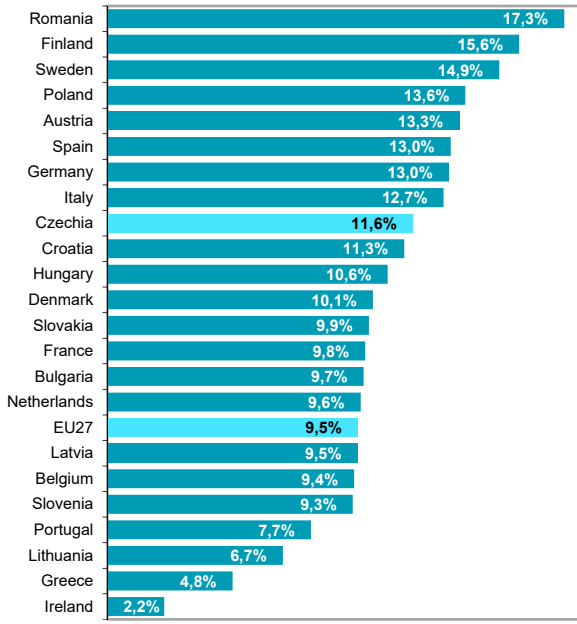
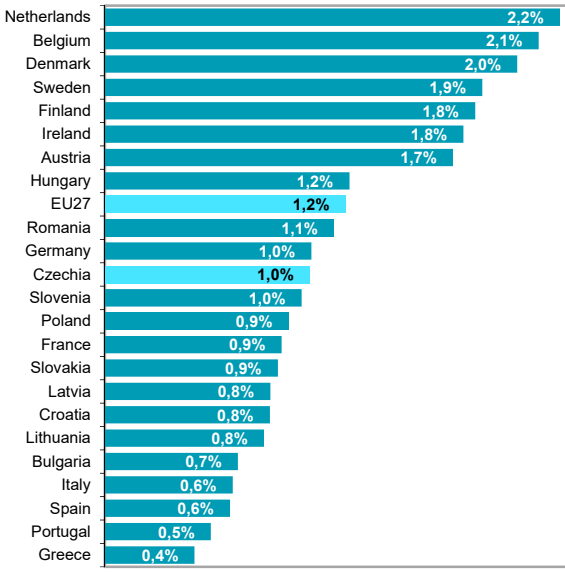


Figure F10 ICT services imports, 2020 (% of GDP)



Source: CZSO calculations based on Eurostat

F International trade in ICT services

Tab F3 Computer services and software exports from Czechia

CZK million

	2019	2020	2021
Total	**91 000**	**101 013**	**109 483**
Computer services	54 261	56 239	60 954
Computer software	36 739	44 774	48 529
by selected countries			
EU27, total	48 662	53 851	56 589
of which to Germany	15 128	16 738	17 978
Other countries, total	36 397	36 397	52 894
of which to the United States	21 625	24 965	29 177

Figure F11 Computer services and software exports

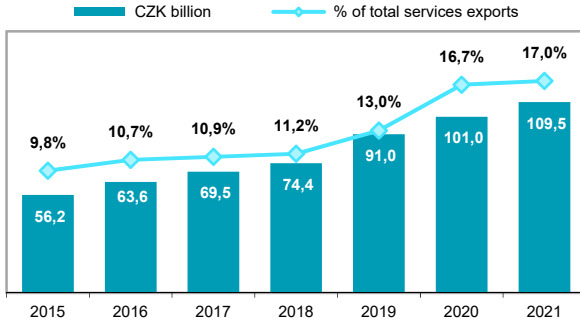


Figure F12 Computer services and software exports, by type of services

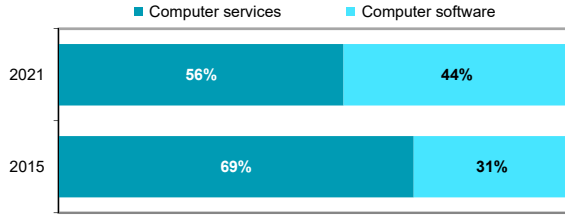
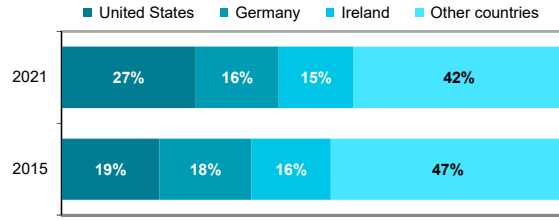


Figure F13 Computer services and software exports, by countries



Source: CZSO, Survey on exports and imports of services

Tab F4 Computer services and software imports to Czechia

CZK million

	2019	2020	2021
Total	**41 504**	**46 796**	**49 976**
Computer services	29 715	31 501	33 526
Computer software	11 790	15 295	16 450
by selected countries			
EU27, total	26 166	29 820	34 420
of which to Germany	10 761	11 242	12 089
Other countries, total	11 808	35 554	15 555
of which to the United States	3 097	2 800	2 600

Figure F14 Computer services and software imports

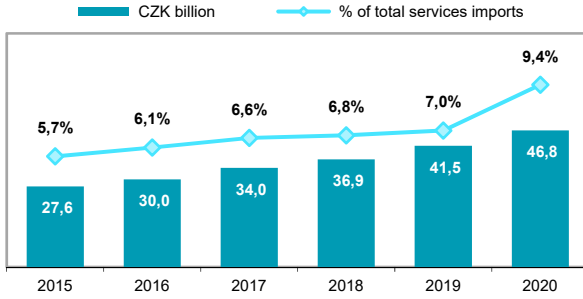


Figure F15 Computer services and software imports, by type of services

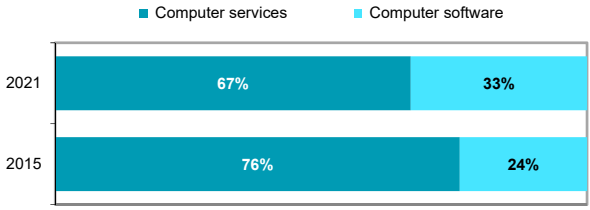
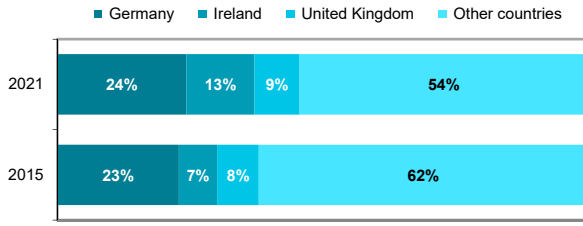


Figure F16 Computer services and software imports, by countries



Source: CZSO, Survey on exports and imports of services

Figure F17 Computer services and software exports; 2020 (% of GDP)

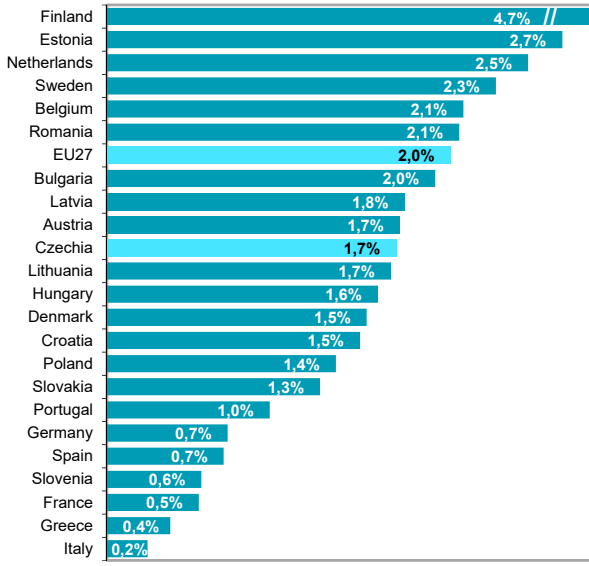
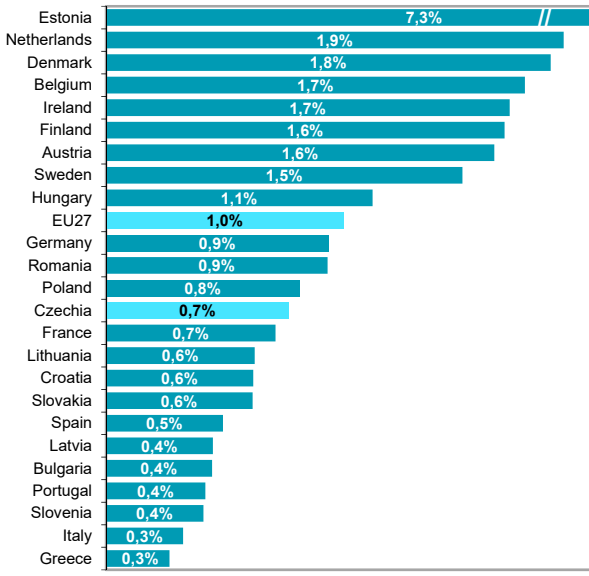


Figure F18 Computer services and software imports; 2020 (% of GDP)



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_ekonomickych_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 2021 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

	2019	2020	2021
Total	**176 484**	**178 818**	**186 201**
ICT manufacturing, total	**24 001**	**23 754**	**24 677**
Manufacture of electronic components	8 687	8 249	8 506
peripheral equipment	5 829	6 484	6 884
Manuf. of communication equipment	5 862	5 451	5 518
Manufacture of consumer electronics	3 623	3 570	3 768
ICT services, total	**152 484**	**155 064**	**161 524**
ICT wholesale	11 536	11 591	12 003
Telecommunications	22 374	22 080	21 993
IT services	118 573	121 393	127 528

Figure G1 Employment in the ICT sector

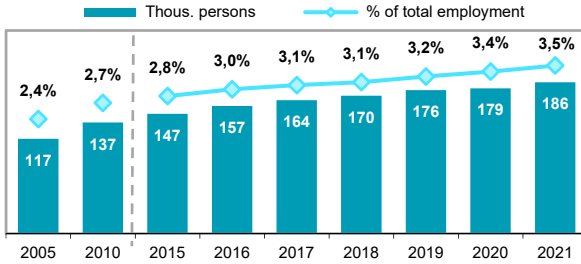


Figure G2 Employment in the ICT sector, by industry

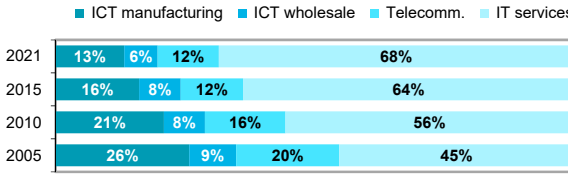


Figure G3 Employment in the ICT sector, by ownership; 2021

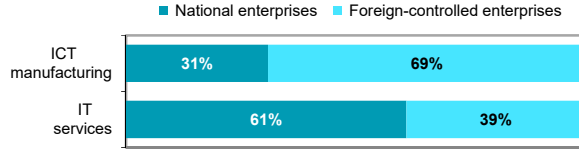
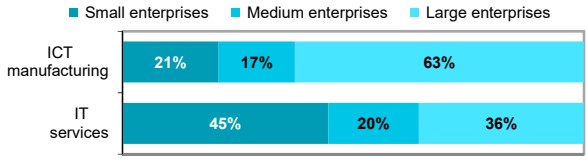


Figure G4 Employment in the ICT sector, by size; 2021



Source: CZSO, Structural Business Statistics

Figure G5 Employment in the ICT sector; 2020
(% of total employment)

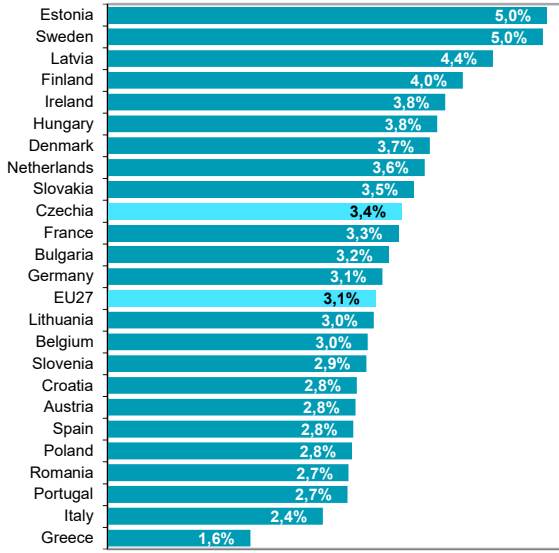
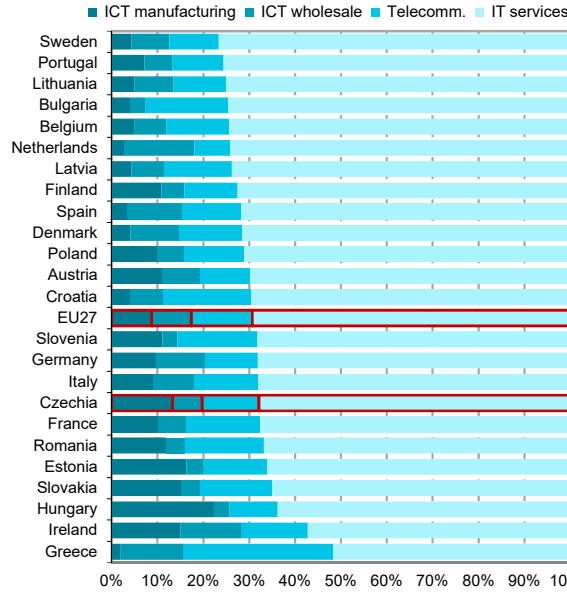


Figure G6 Employment in the ICT sector, by industry; 2020



Source: CZSO calculations based on the Eurostat SBS database

Figure G7 Employment in ICT manufacturing in Czechia

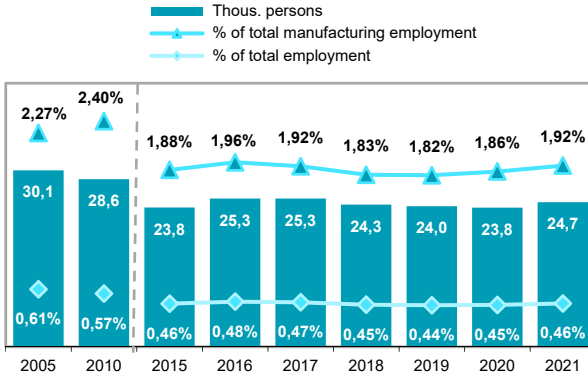


Figure G8 Employment in Telecommunications in Czechia

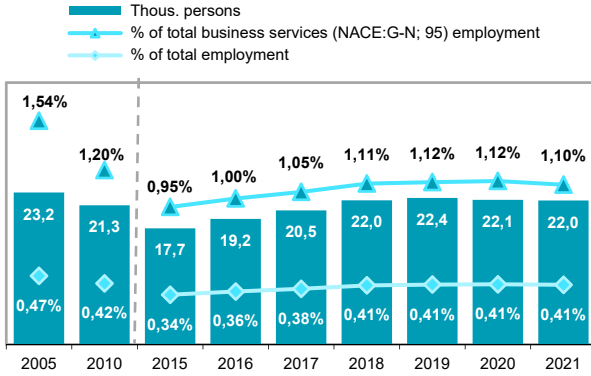
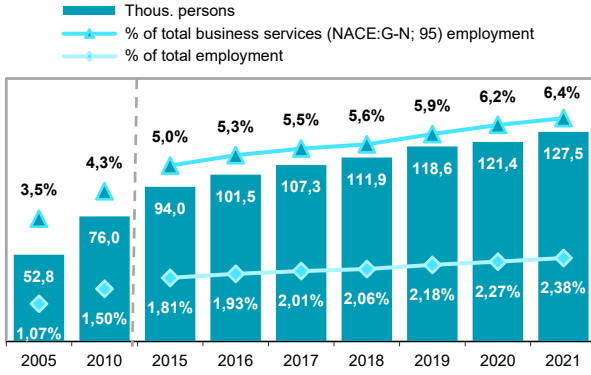


Figure G9 Employment in IT services in Czechia



Source: CZSO, Structural Business Statistics

Figure G10 Employment in ICT manufacturing; 2020
(% of total manufacturing employment)

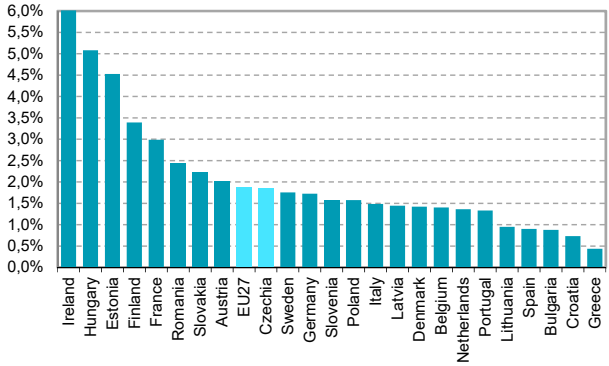


Figure G11 Employment in Telecommunications; 2020
(% of total business enterprise sector employment)

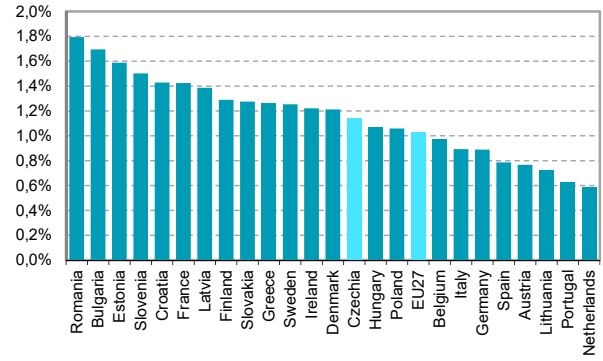
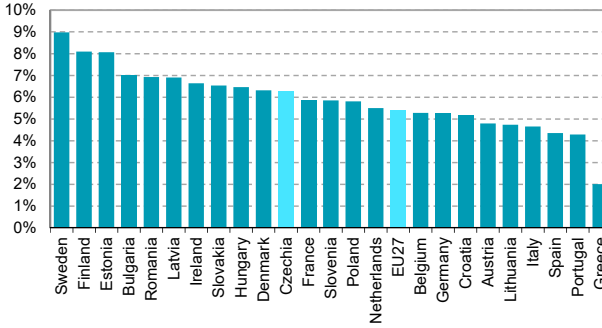


Figure G12 Employment in IT services; 2020
(% of total business enterprise sector employment)



Source: CZSO calculations based on the Eurostat SBS database

Table G2 Turnover in the ICT sector in Czechia

CZK million

	2019	2020	2021
Total	**899 422**	**926 501**	**948 217**
ICT manufacturing, total	**255 587**	**249 802**	**229 065**
Manufacture of electronic components	18 181	18 387	20 773
peripheral equipment	185 728	180 409	157 715
Manuf. of communication equipment	18 321	17 457	18 904
Manufacture of consumer electronics	33 357	33 549	31 672
ICT services, total	**643 835**	**676 700**	**719 152**
ICT wholesale	174 289	183 014	184 679
Telecommunications	132 752	134 726	140 786
IT services	336 794	358 960	393 687

Figure G13 Turnover in the ICT sector

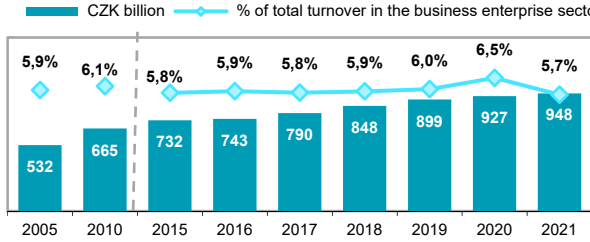


Figure G14 Turnover in the ICT sector, by industry

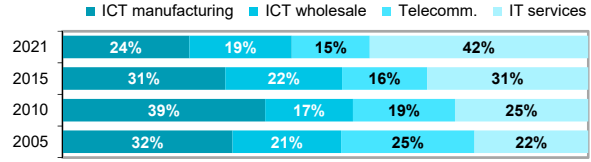


Figure G15 Turnover in the ICT sector, by ownership; 2021

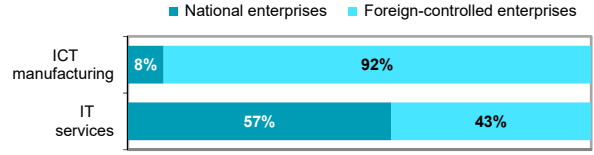
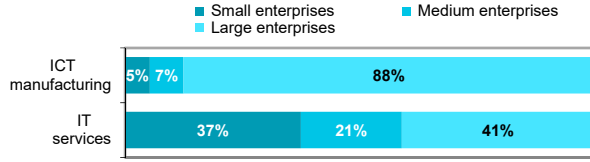


Figure G16 Turnover in the ICT sector, by size; 2021



Source: CZSO, Structural Business Statistics

Figure E17 Turnover in the ICT sector; 2020
(% of total turnover in the business enterprise sector)

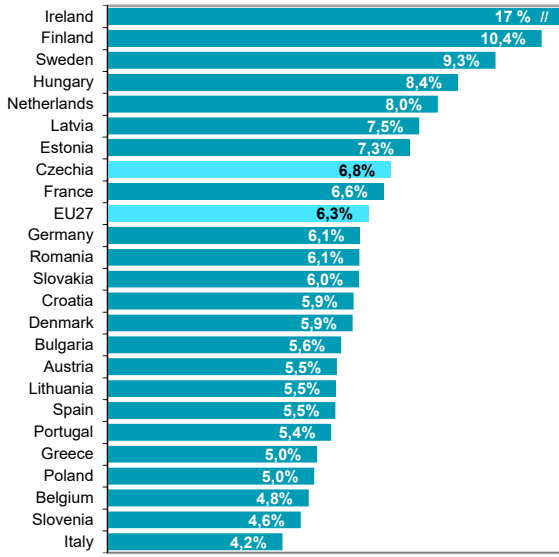
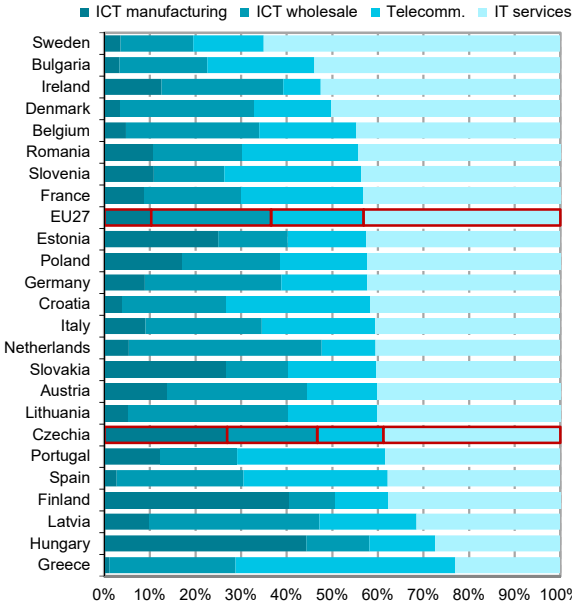


Figure E18 Turnover in the ICT sector, by industry; 2020 (%)



Source: CZSO calculations based on the Eurostat SBS database

Figure G19 Turnover in ICT manufacturing in Czechia

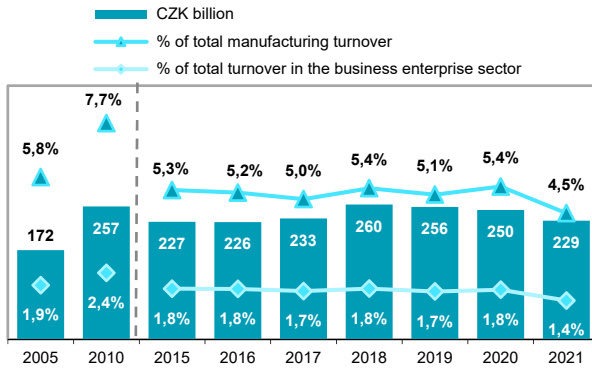


Figure G20 Turnover in Telecommunications in Czechia

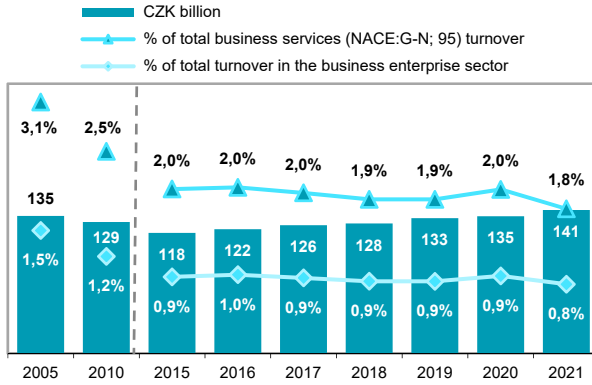
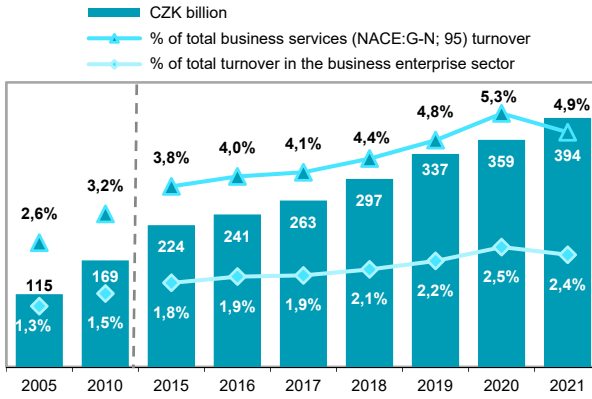


Figure G21 Turnover in IT services in Czechia



Source: CZSO, Structural Business Statistics

Figure G22 Turnover in ICT manufacturing; 2020
(% of total manufacturing turnover)

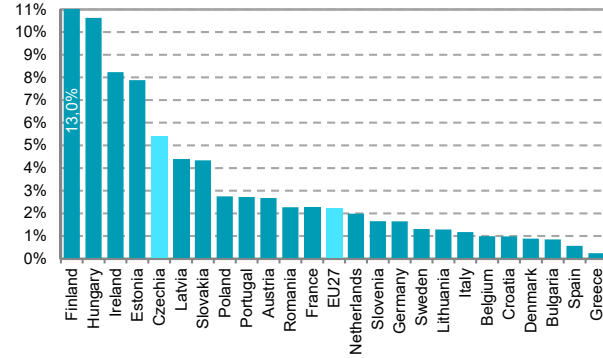


Figure G23 Turnover in Telecommunications; 2020
(% of total turnover in the business enterprise sector)

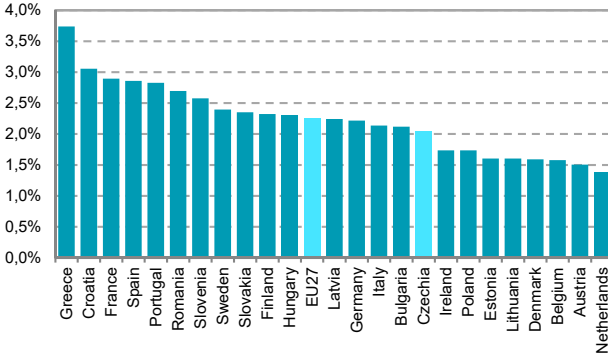
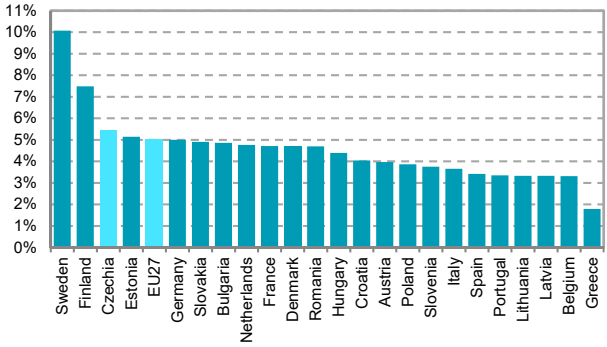


Figure G24 Turnover in IT services; 2020
(% of total turnover in the business enterprise sector)



Source: CZSO calculations based on the Eurostat SBS database

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

CZK million

	2019	2020	2021
Total	**14 600**	**16 739**	**20 190**
ICT manufacturing, total	**902**	**999**	**727**
Manufacture of electronic components	497	593	304
peripheral equipment	14	27	33
Manuf. of communication equipment	337	342	349
Manufacture of consumer electronics	52	35	39
ICT services, total	**13 698**	**15 740**	**19 463**
ICT wholesale	234	225	207
Telecommunications	377	983	780
IT services	13 087	14 533	18 475

Figure G25 R&D expenditure in the ICT sector

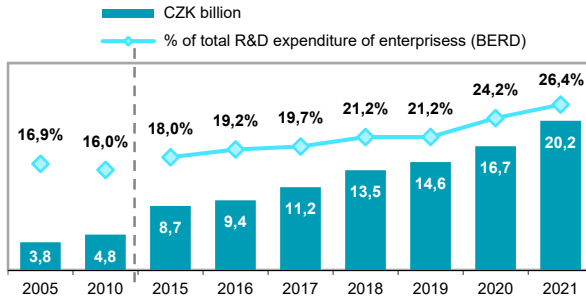


Figure G26 R&D expenditure in the ICT sector, by industry

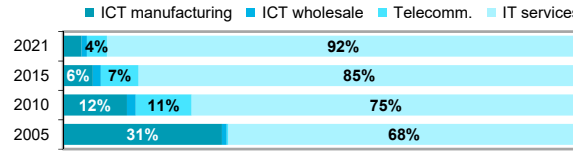


Fig.G27 R&D expenditure in the ICT sector, by ownership; 2021

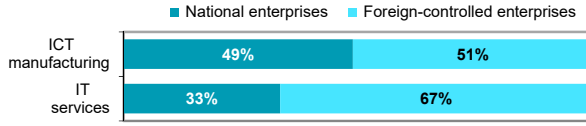
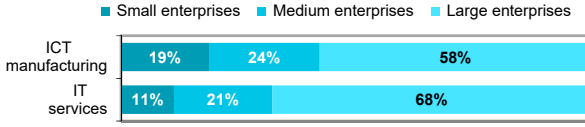


Figure G28 R&D expenditure in the ICT sector, by size; 2021



Source: CZSO, Annual R&D survey

Figure G29 R&D expenditure in the ICT sector; 2020
(% of total R&D expenditure of enterprises)

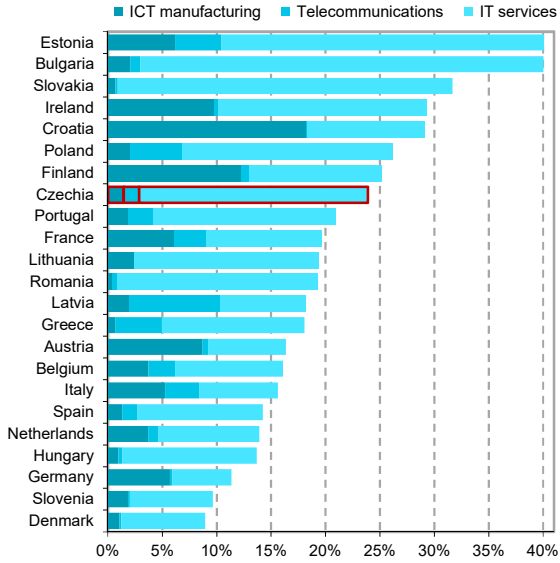
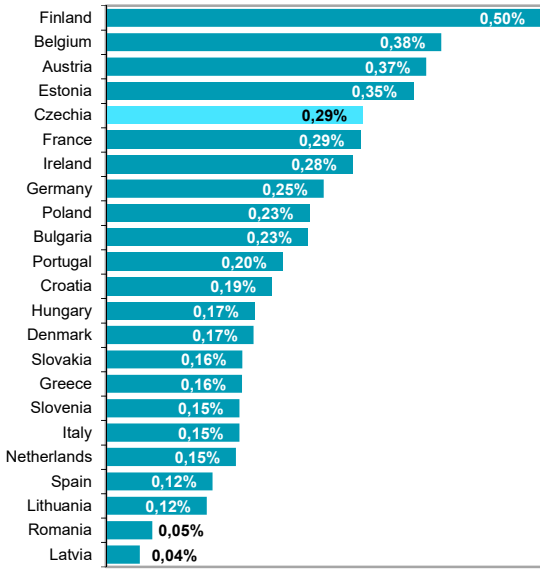


Figure G30 R&D expenditure in the ICT sector; 2020
(% of GDP)



Source: CZSO calculations based on the Eurostat STI Database

Figure G31 R&D expenditure in ICT manufacturing in Czechia

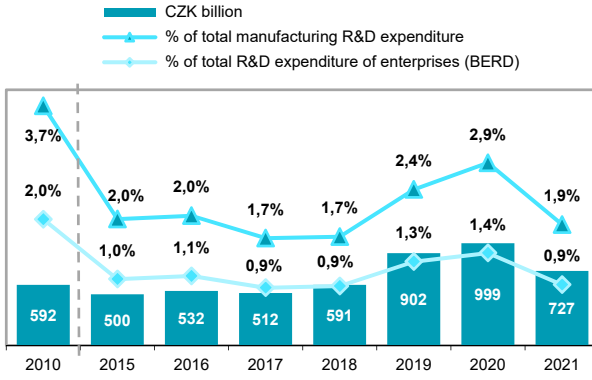


Figure G32 R&D expenditure in Telecommunications in Czechia

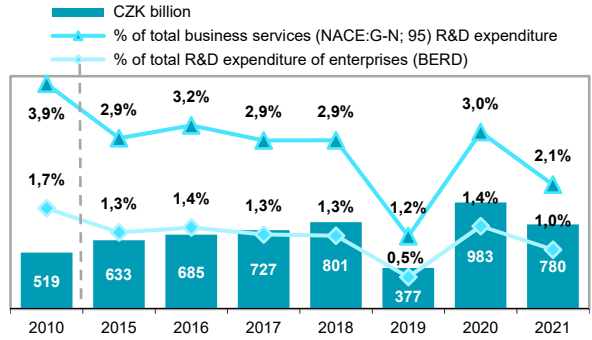
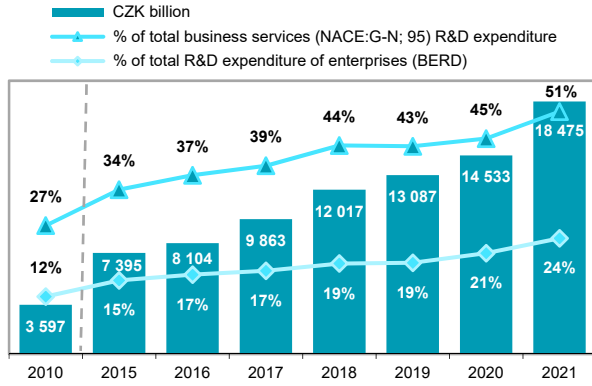


Figure G33 R&D expenditure in IT services in Czechia



R&D - Research and development

Source: CZSO, Annual R&D survey

Figure G34 R&D expenditure in ICT manufacturing; 2020
(% of total manufacturing R&D expenditure)

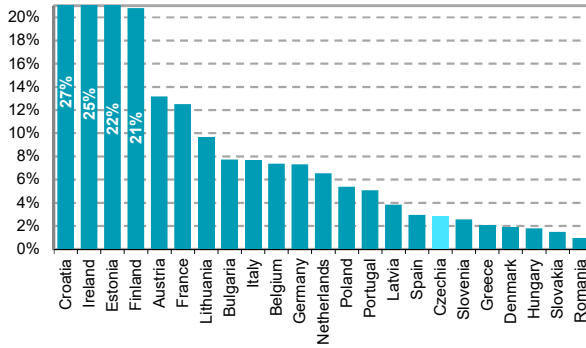


Figure G35 R&D expenditure in Telecommunications; 2020
(% of total R&D expenditure of enterprises)

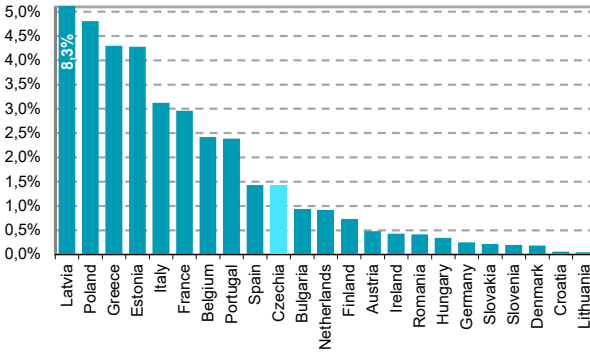
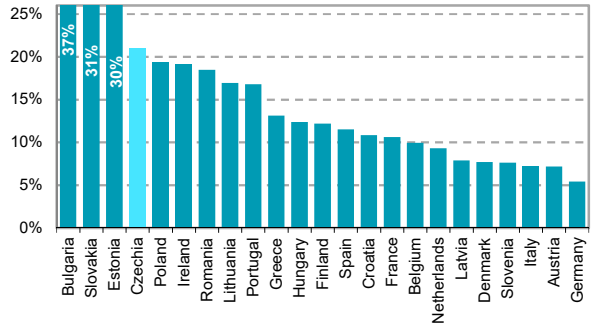


Figure G36 R&D expenditure in IT services; 2020
(% of total R&D expenditure of enterprises)



Source: CZSO calculations based on the Eurostat STI Database