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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 2021

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A ICT specialists

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

ICT managers, engineers and professionals

1330 Information and communications technology service managers;
2152 Electronics engineers;
2153 Telecommunications engineers;
2434 Information and communications technology sales professionals;
*Note: The 1330, 2152, 2153 and 2434 subgroups **are merged** into one category called **ICT managers and engineers**.*

25 Information and communications technology professionals
251 Software and applications developers and analysts;
252 Database and network professionals.

ICT technicians, installers and servicers

3114 Electronics engineering technicians;

35 Information and communications technicians
351 ICT operations and user support technicians;
352 Telecommunications and broadcasting technicians;

742 Electronics and telecommunications (ICT) installers and repairers.

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

Detail description of CZ-ISCO occupations is available here *(only in Czech)*:
https://www.czso.cz/csu/czso/klasifikace_zamestnani_-cz_isco-

Numbers of ICT specialists

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

For further information on the **Czech LFS** see:
https://www.czso.cz/csu/czso/employment_unemployment_ekon

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

Wages of ICT specialists

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

For further information on the **Czech SES** see:
https://www.czso.cz/csu/czso/structure-of-earnings-survey-2019

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

For further information on ICT specialists see *(only in Czech)*:
https://www.czso.cz/csu/czso/ict-odbornici

A ICT specialists

Table A1 ICT specialists in Czechia

Thousand persons*

	2017	2018	2019
Total	**192,5**	**200,5**	**209,5**
Women	18,0	18,7	19,3
Occupation			
ICT managers, engineers and professionals	92,7	99,3	108,4
ICT technicians, installers and servicers	99,9	101,2	101,1
Age group			
Under 25 years	10,1	10,5	10,1
25–34 years	65,2	65,0	65,2
35–44 years	65,0	71,5	76,9
45–54 years	33,3	33,2	35,6
55 + years	18,9	20,3	21,7
Highest level of education attainment			
Tertiary	107,3	109,6	114,8
Secondary with A-level examination	74,4	79,8	84,3
Other (lower)	10,8	11,1	10,3

Figure A1 ICT specialists*

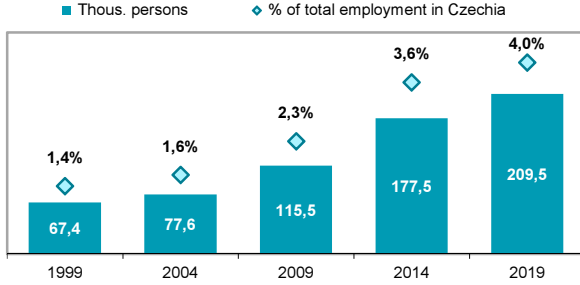
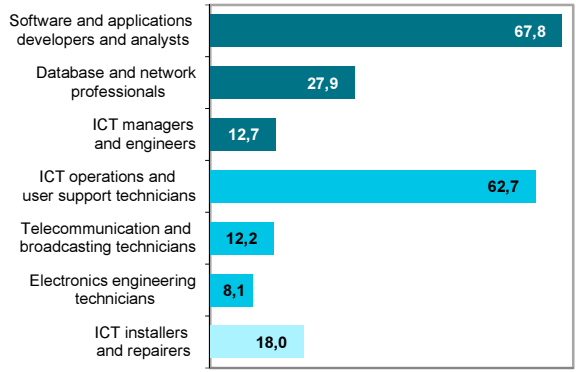


Figure A2 ICT specialists*, by occupation (thousands)**; 2019**



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

Source: CZSO, Labour Force Survey

Figure A3 ICT specialists in EU countries; 2020
(% of total emloyment)

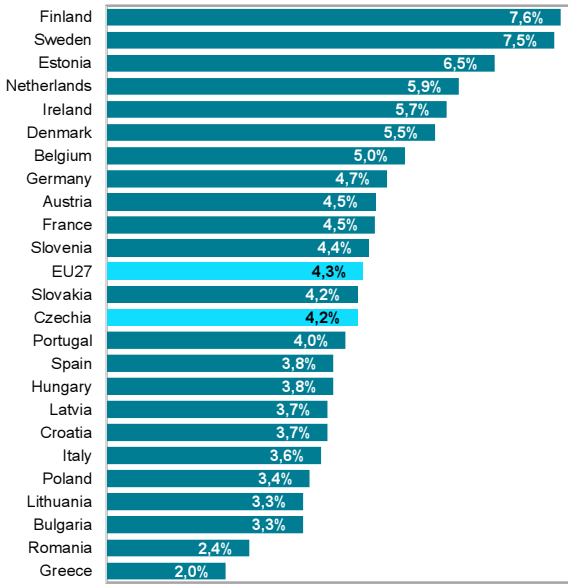
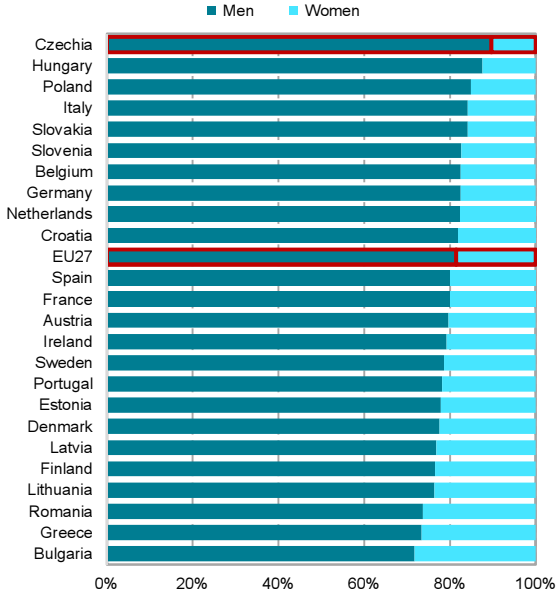


Figure A4 ICT specialists, by gender; 2020



Source: CZSO calculation based on the Eurostat LFS Database

A ICT specialists

Table A2 ICT managers, engineers and professionals in Czechia

Thousand persons*

	2017	2018	2019
Total	**92,7**	**99,3**	**108,4**
Women	9,4	10,1	11,2
Occupation			
ICT professionals, total	**76,0**	**84,5**	**95,8**
Software and app. developers and analysts	50,6	57,8	67,8
Database and network professionals	25,2	26,6	27,9
ICT managers and engineers	**16,7**	**14,8**	**12,7**
Age group			
Under 25 years	3,2	2,8	2,9
25–34 years	32,3	33,6	35,2
35–44 years	34,0	37,8	41,8
45–54 years	14,9	15,7	18,1
55 + years	8,3	9,4	10,4
Highest level of education attainment			
Master's and Doctoral	65,8	68,0	72,0
Bachelor's and Higher professional	12,8	14,5	16,1
Other (lower)	13,1	16,4	20,1

Figure A5 ICT professionals*

Figure A6 ICT professionals*, by gender

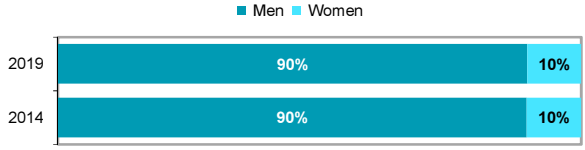
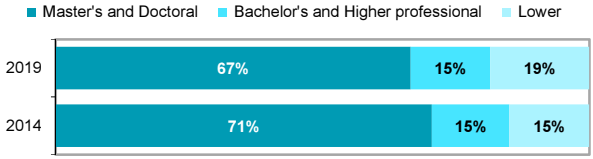


Figure A7 ICT professionals*, by level of education



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

Source: CZSO, Labour Force Survey

Figure A8 ICT professionals in EU countries; 2020
(% of total employment)

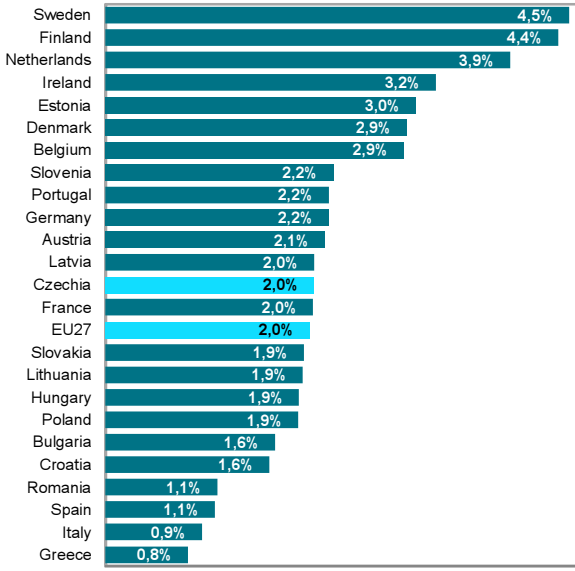
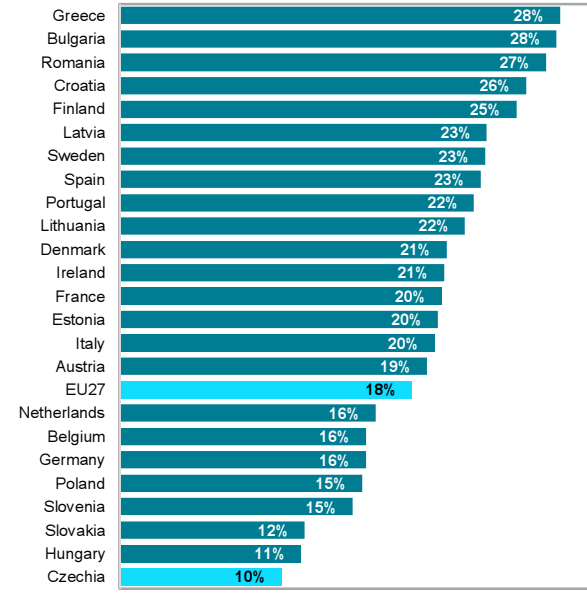


Figure A9 Share of women among ICT professionals; 2020



Source: CZSO calculation based on Eurostat LFS Database

Table A3 ICT technicians, installers and servicers in Czechia

Thousand persons*

	2017	2018	2019
Total	**99,9**	**101,2**	**101,1**
Women	8,6	8,5	8,1
Occupation			
ICT technicians, total	**71,4**	**74,8**	**75,0**
ICT operations and user support technicians	57,3	61,0	62,7
Telecomm. and broadcasting technicians	14,0	13,7	12,2
ICT installers and servicers	**28,5**	**26,3**	**26,1**
Age group			
Under 25 years	7,0	7,7	7,2
25–34 years	32,9	31,4	30,0
35–44 years	31,0	33,7	35,1
45–54 years	18,4	17,5	17,5
55 + years	10,6	10,9	11,3
Highest level of education attainment			
Tertiary	28,7	27,1	26,7
Secondary with A-level examination	61,3	63,4	64,2
Other (lower)	9,8	10,7	10,1

Figure A10 ICT technicians*

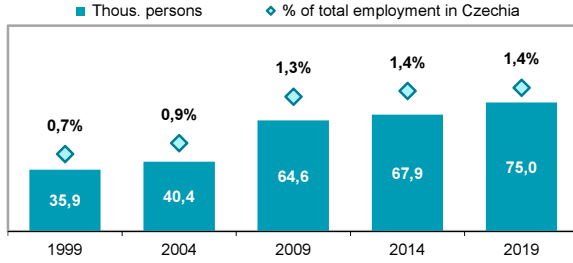


Figure A11 ICT technicians*, by gender

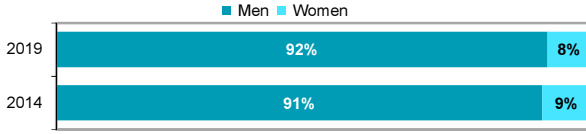
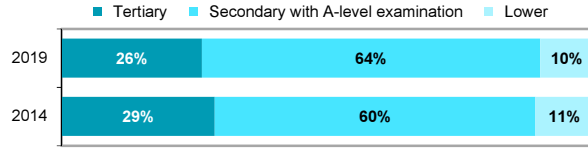


Figure A12 ICT technicians*, by level of education



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

Source: CZSO, Labour Force Survey

Figure A13 ICT technicians in EU countries; 2020
(% of total employment)

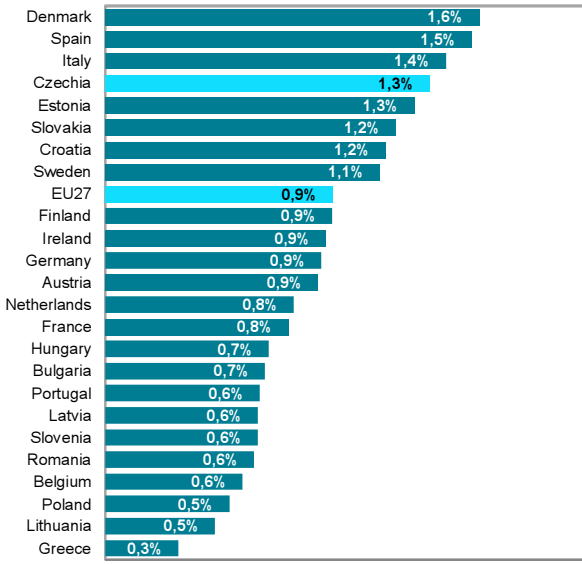
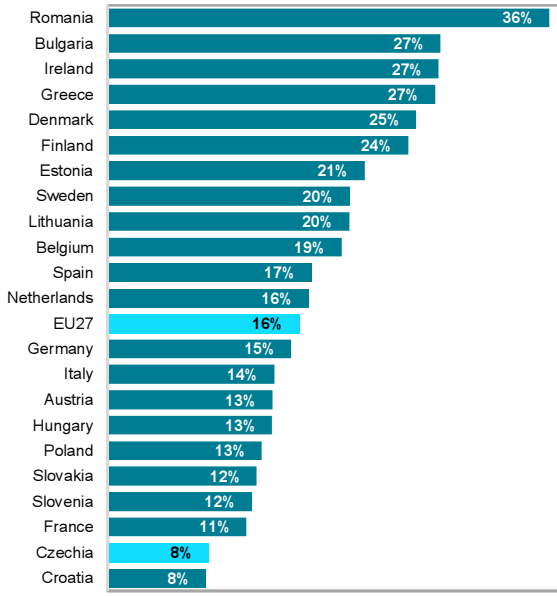


Figure A14 Share of women among ICT technicians; 2020



Source: CZSO calculation based on Eurostat LFS Database

Table A4 Wages of ICT professionals in Czechia

Average gross monthly wage in CZK

	2018	2019	2020
Total	**61 026**	**65 787**	**70 018**
Men	62 460	67 439	71 707
Women	51 550	55 512	59 507
Citizenship			
Czech citizens	59 103	63 439	67 204
Foreigners	73 574	79 941	85 220
Sphere of activity (remuneration)			
Business (wage) sphere	62 073	66 964	71 258
Government (salary) sphere	42 060	44 351	47 347
Age group			
Under 25 years	34 403	38 149	41 509
25–34 years	55 064	59 311	64 022
35–44 years	69 650	74 702	78 322
45–54 years	65 425	71 122	75 550
55 + years	57 134	58 588	60 666
Highest level of education attainment			
Master's and Doctoral	67 578	72 620	76 933
Bachelor's and Higher professional	56 425	62 025	66 575
Secondary with A-level examination	54 396	58 258	59 895

Figure A15 Wages of ICT professionals

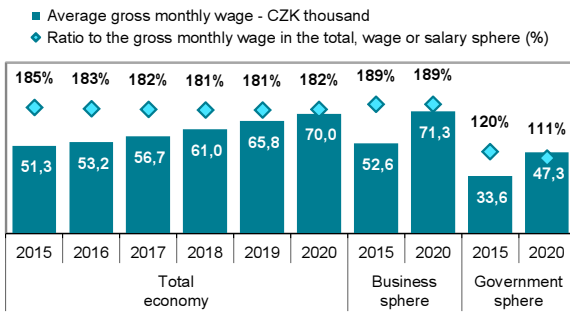
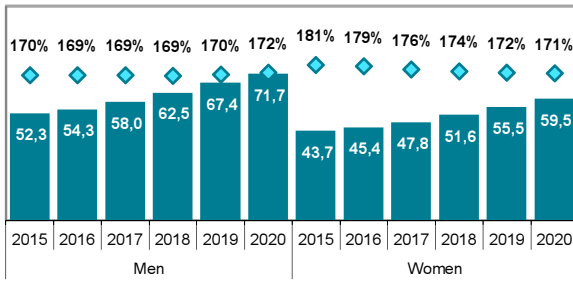


Figure A16 Wages of ICT professionals, by gender



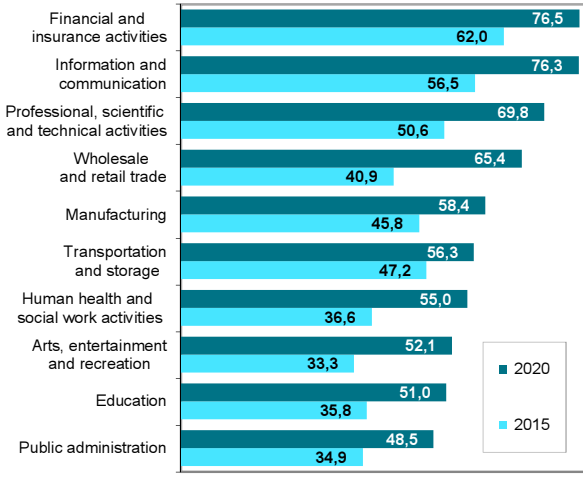
Source: CZSO, Structural Earnings Statistics

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

Average gross monthly wage in CZK

	2018	2019	2020
Total	**61 026**	**65 787**	**70 018**
Occupation			
Software and app. developers & analysts	**63 530**	**69 035**	**73 719**
Systems analysts	66 790	72 136	73 181
Software developers	64 173	70 788	78 136
Web and multimedia developers	.	61 266	68 922
Applications programmers	58 386	64 315	68 899
Other SW & App. developers and analysts	63 466	64 788	66 959
Database and network professionals	**54 364**	**57 610**	**60 715**
Database designers/admin.	54 355	64 852	69 303
Systems administrators	52 777	55 160	57 329
Computer network professionals	59 161	62 793	69 570
Data security specialists	66 488	71 428	73 289
Industry (CZ-NACE Section)			
Manufacturing (C)	53 864	56 459	58 447
Wholesale and retail trade (G)	53 925	67 329	65 435
Transporting and storage (H)	52 998	55 837	56 268
Information and communication (J)	65 749	70 290	76 344
Financial and insurance activities (K)	69 909	74 932	76 476
Professional, scientific and techn. act. (M)	60 775	66 387	69 778
Public administration (O)	43 379	46 037	48 516
Education (P)	44 395	47 924	50 999
Human health and social work act. (Q)	43 799	46 445	54 968
Arts, entertainment and recreation (R)	43 540	43 074	52 094

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

	2018	2019	2020
Total	**42 016**	**45 219**	**48 175**
Men	42 616	45 644	48 503
Women	38 269	42 068	45 710
Citizenship			
Czech citizens	41 024	44 170	46 649
Foreigners	55 168	56 840	62 263
Sphere of activity (remuneration)			
Business (wage) sphere	42 726	45 999	48 906
Government (salary) sphere	34 228	36 802	39 692
Age group			
Under 25 years	28 806	31 664	32 541
25–34 years	38 800	42 302	45 476
35–44 years	45 408	49 204	52 992
45–54 years	45 011	49 829	52 598
55 + years	43 452	42 926	44 403
Highest level of education attainment			
Master's and Doctoral	52 020	55 485	59 284
Bachelor's and Higher professional	44 403	45 944	51 049
Secondary with A-level examination	38 449	41 710	43 888
Other (lower)	31 753	36 371	37 337

Figure A18 Wages of ICT technicians

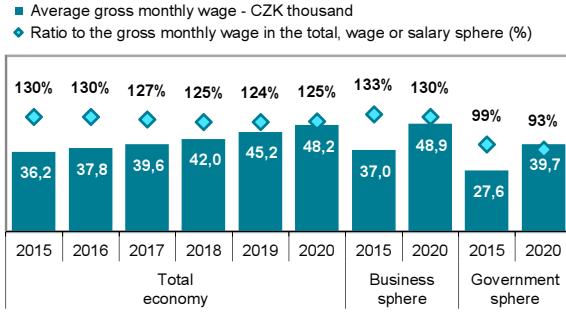
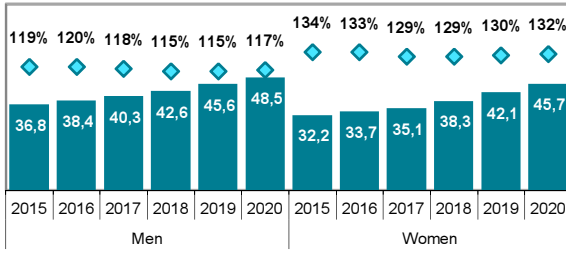


Figure A19 Wages of ICT technicians, by gender



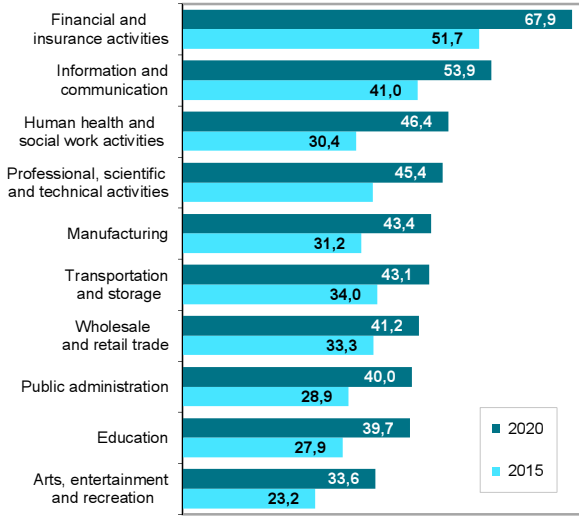
Source: CZSO, Structural Earnings Statistics

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

Average gross monthly wage in CZK

	2018	2019	2020
Total	**42 016**	**45 219**	**48 175**
Occupation			
ICT operations and user support techn.	**42 789**	**46 134**	**49 269**
ICT operations technicians	40 751	45 950	48 752
ICT user support technicians	46 576	49 438	52 166
Computer network and systems technicians	43 127	43 219	47 309
Web technicians	.	40 840	45 545
Telecomm. and broadcasting technicians	**37 922**	**39 641**	**40 889**
Broadcasting and audiovisual technicians	35 590	36 333	36 526
Telecommunications engineering techn.	38 940	40 599	42 210
Industry (CZ-NACE Sections)			
Manufacturing (C)	38 292	41 695	43 396
Wholesale and retail trade (G)	37 410	38 740	41 241
Transporting and storage (H)	41 654	42 972	43 091
Information and communication (J)	46 934	49 913	53 907
Financial and insurance activities (K)	59 387	65 315	67 928
Professional, scientific and techn. act. (M)	38 776	44 241	45 416
Public administration (O)	34 995	37 718	40 038
Education (P)	34 184	38 083	39 697
Human health and social work act. (Q)	37 997	39 835	46 367
Arts, entertainment and recreation (R)	30 827	32 964	33 648

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



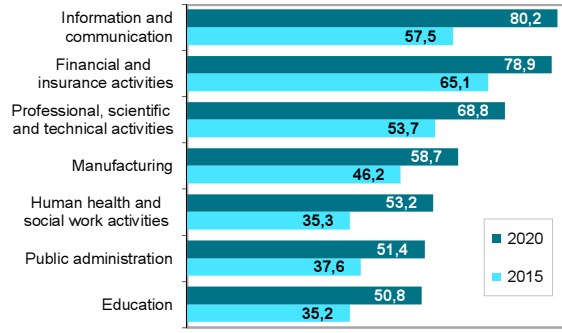
Source: CZSO, Structural Earnings Statistics

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

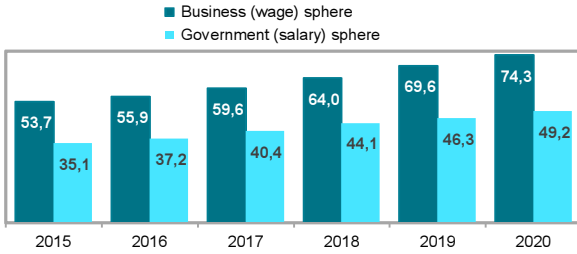
Average gross monthly wages in CZK

	2018	2019	2020
Total	**63 530**	**69 035**	**73 719**
Men	64 961	70 785	75 499
Women	53 840	58 197	62 765
Sphere of activity (remuneration)			
Business (wage) sphere	63 994	69 577	74 284
Government (salary) sphere	44 068	46 300	49 241
Age group			
Under 25 years	34 834	39 235	43 317
25–34 years	57 078	61 441	66 457
35–44 years	73 966	80 165	84 012
45–54 years	67 764	74 758	80 184
55 + years	59 379	61 346	63 771
Highest level of education attainment			
Master's and Doctoral	69 316	75 268	79 598
Bachelor's and Higher professional	58 580	64 237	69 119
Secondary with A-level examination	56 591	60 990	63 233

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



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



Source: CZSO, Structural Earnings Statistics

B ICT students

Students of and graduates from ICT fields of education (in short ICT students and graduates) are **defined** by the International Standard Classification of Education: Fields of Education and Training 2013 used in the Czech Republic **(CZ-ISCED-F 2013).** ICT-related studies correspond to the broad 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).

Detail description of **CZ-ISCED-F 2013** is available here *(only in Czech)*: https://www.czso.cz/csu/czso/klasifikace-oboru-vzdelani-cz-isced-f-2013

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

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

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

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

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

Eurostat database was used for **the international comparisons.** Data about number of students of and graduates from ICT fields of education contain information for tertiary level of education, ie 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

Table B1 University students of ICT education in Czechia

Number of students

	2018	2019	2020
Total	**20 049**	**20 366**	**21 660**
of which 25 years and older	4 740	4 660	4 992
Gender			
Men	16 742	16 988	17 951
Women	3 307	3 378	3 709
Citizenship			
Czech citizens	14 850	14 909	15 363
Foreigners	5 199	5 457	6 298
Study programme			
Bachelor study programme	14 156	14 565	15 700
Master study programme	5 152	5 034	5 112
Doctoral study programme	748	776	858

Figure B1 University students of ICT fields of education

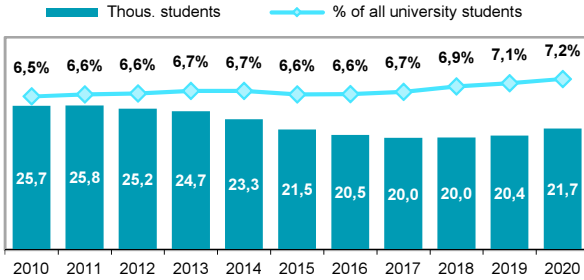


Figure B2 University students of ICT, by gender

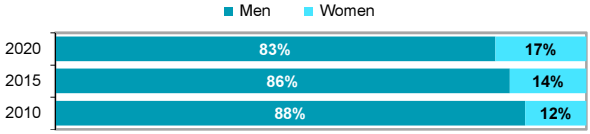


Figure B3 University students of ICT, by citizenship

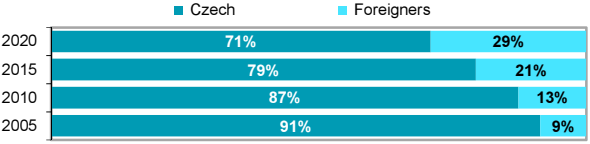
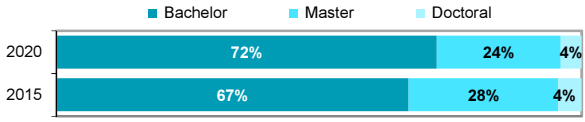


Figure B4 University students of ICT, by study programme



Source: CZSO calculation based on MEYS database

Figure B5 Tertiary students of ICT education; 2019
(% of all tertiary students)

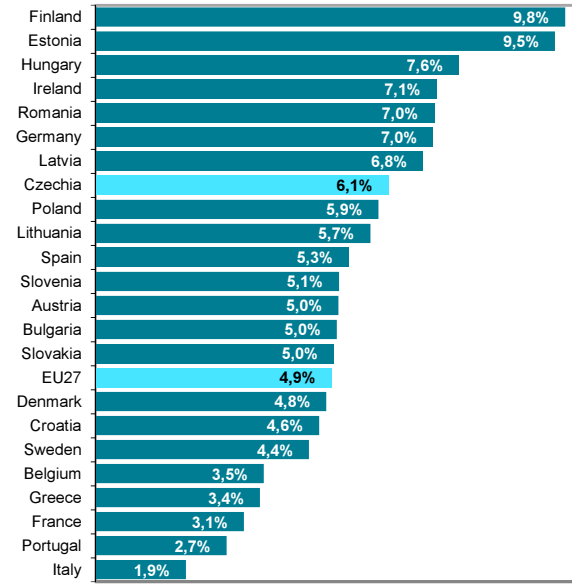
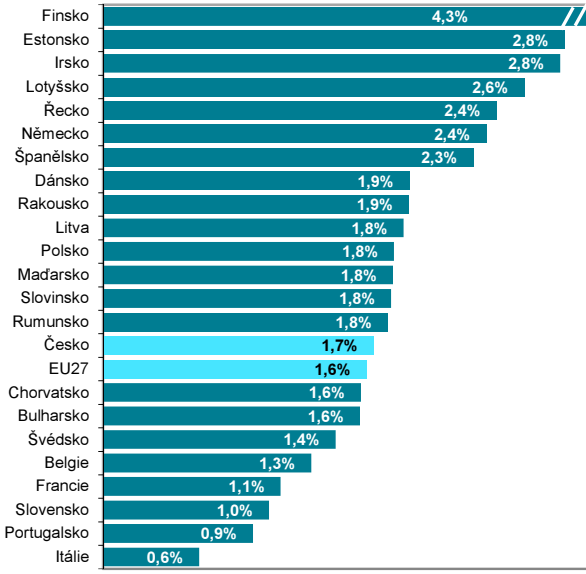


Figure B6 Tertiary students of ICT education; 2019
(% of population aged 20 to 29 years)



Source: CZSO calculation based on Eurostat database

Table B2 University graduates from ICT education in Czechia

Number of graduates

	2018	2019	2020
Total	**3 802**	**3 606**	**3 668**
Men	3 181	2 955	2 979
Women	621	651	689
Citizenship			
Czech citizens	2 921	2 641	2 733
Foreigners	881	965	935
Study programme			
Bachelor	2 055	1 957	2 078
Master	1 667	1 580	1 542
Doctoral	80	69	48

Figure B7 University graduates from ICT fields of education

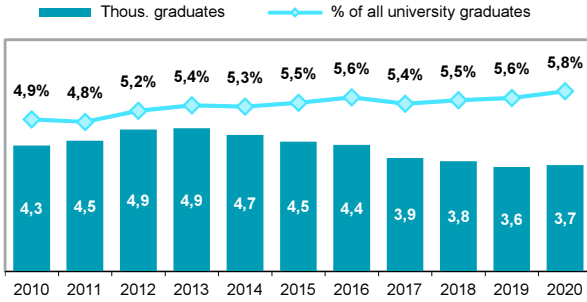


Figure B8 University graduates from ICT, by gender

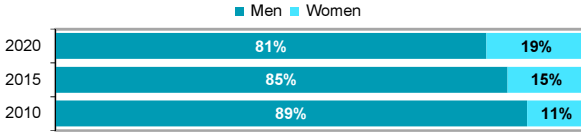


Figure B9 University graduates from ICT, by citizenship

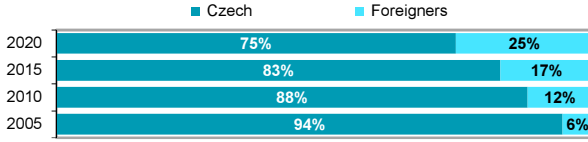
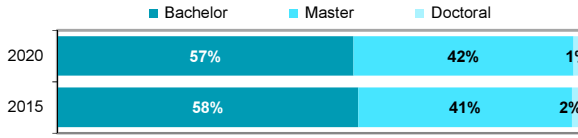


Fig. B10 University graduates from ICT, by study programme



Source: CZSO calculation based on MEYS database

Figure B11 Tertiary graduates from ICT; 2019
(% of all tertiary graduates)

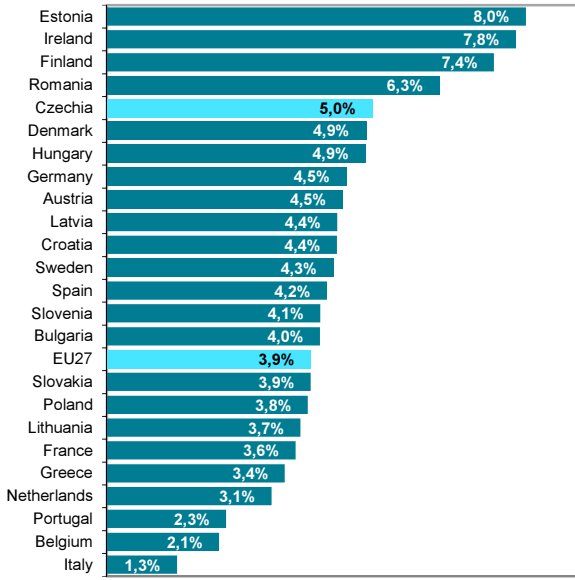
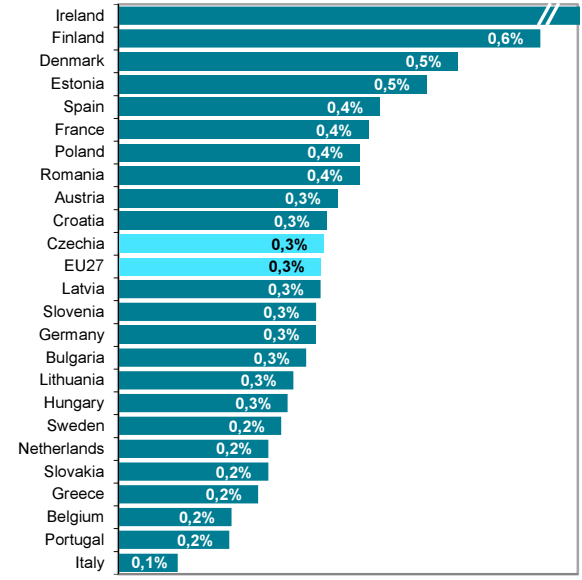


Figure B12 Tertiary graduates from ICT; 2019
(% of population aged 20 to 29 years)



Source: CZSO calculation based on Eurostat database

Figure B13 Share of women among all tertiary students of ICT fields of education; 2019

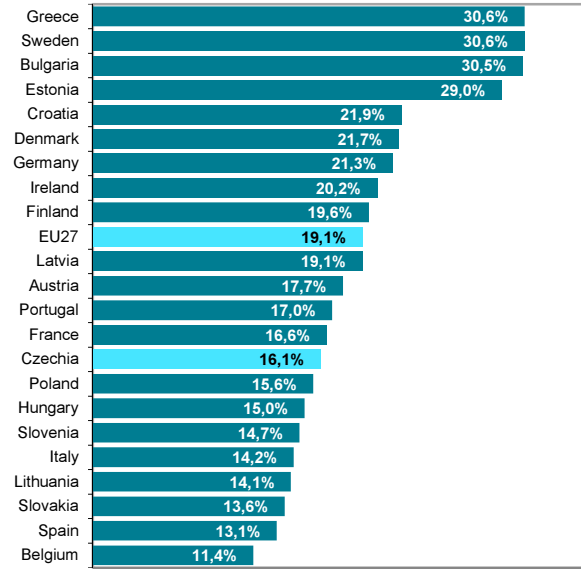
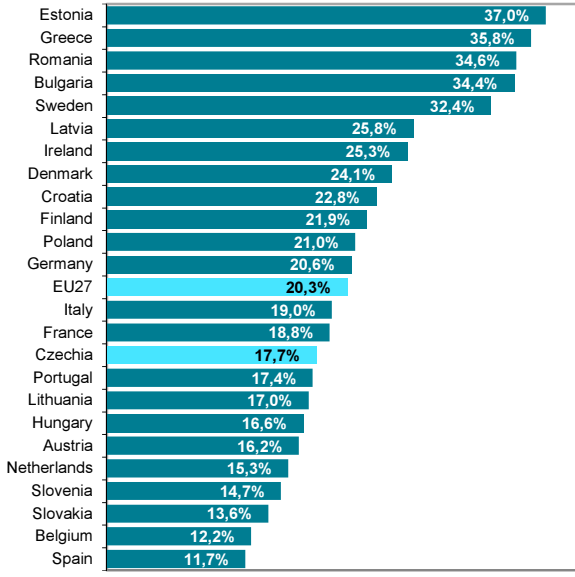


Figure B14 Share of women among all tertiary graduates from ICT fields of education; 2019



Source: CZSO calculation based on Eurostat database

Investments into ICT equipment and software

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

Investment here shall mean the **gross fixed capital formation** (GFCF: P.51), which includes mainly acquisitions of fixed assets (P.511) and expenses for transition of non-produced assets into ownership (P.512). The definition of GFCF follows **The European System of Regional and National Accounts** (ESA 2010): http://ec.europa.eu/eurostat/web/esa-2010

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

Computer software and databases (AN.1173) involve according to the ESA 2010 two sub-items as follows: **Computer software (AN.11731)** involves computer programs, program descriptions and supporting materials for both systems & application SW and **Databases (AN.11732) that** include data files organized so as to enable cost-effective data access and use.

ICT equipment can be also **classified** to the groups of **the Classification of Products by Activity (CZ-CPA)** as follows: 26.2 Computers and peripheral equipment and 26.3 Communication equipment.

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

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

Household consumption expenditures on ICT equipment and services

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

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

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

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

Detail description of CZ- COICOP is available here (only in Czech): https://www.czso.cz/csu/czso/klasifikace_individualni_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

	2018	2019	2020
Total	**233 830**	**268 874**	**284 305**
ICT equipment	82 840	87 703	91 184
Software	150 990	181 171	193 121
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	2 197	3 099	1 145
Mining and quarrying	578	650	260
Manufacturing	58 101	65 166	70 964
Electricity, gas and water supply	6 035	7 257	6 418
Construction	4 416	6 572	7 163
Wholesale and retail trade	16 895	18 699	17 529
Transportation and storage	7 739	8 881	7 722
Accommodation and food service activiti	2 030	2 768	3 180
Information and communication	68 858	80 261	87 862
Financial and insurance activities	27 208	33 026	35 533
Real estate activities	2 466	3 033	2 523
Professional, scientific and technical acti	14 651	15 654	22 774
Administrative and support service activ.	2 919	4 298	3 905
Public administration and defence	9 225	9 292	10 743
Education	3 708	3 069	3 024
Human health and social work activities	4 224	4 375	4 791
Arts, entertainment and recreation	1 905	2 104	1 933
Other services	675	670	464

Figure C1 ICT investment

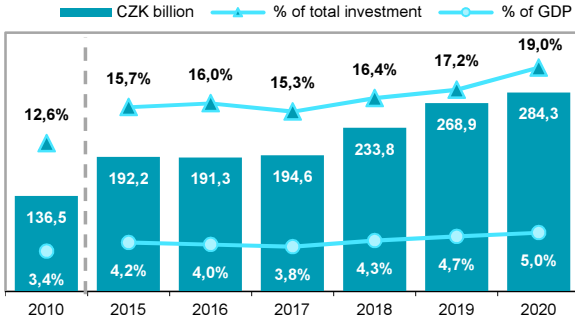
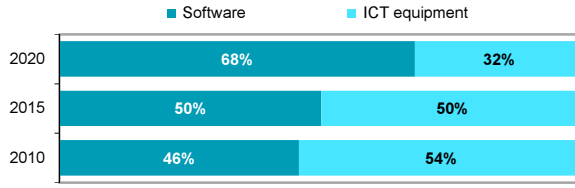


Figure C2 ICT investment, by asset (%)



Source: CZSO, Annual National Accounts Statistics

Figure C3 ICT investment (% of GDP)

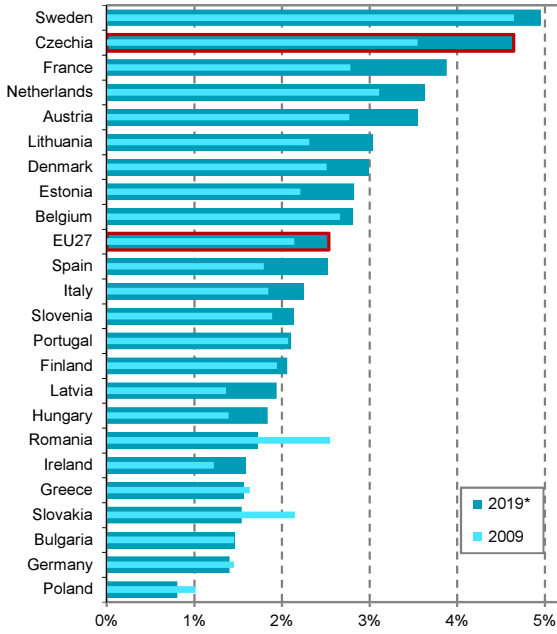
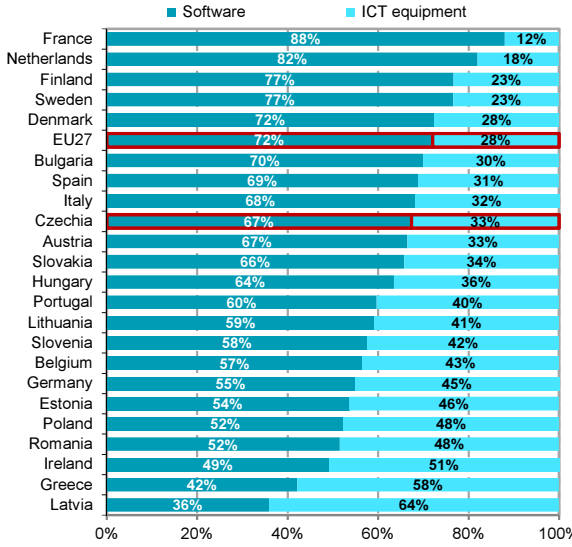


Figure C4 ICT investment, by asset (%)**; 2019***



* or the nearest available year

Source: CZSO calculations based on Eurostat data

Table C2 ICT equipment investment in Czechia

CZK million

	2018	2019	2020
Total	**82 840**	**87 703**	**91 184**
Computer equipment	63 956	68 321	71 327
Communication equipment	18 884	19 382	20 121
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	1 726	2 505	489
Mining and quarrying	483	559	160
Manufacturing	40 263	42 993	46 309
Electricity, gas and water supply	3 104	4 101	2 929
Construction	2 947	4 894	5 329
Wholesale and retail trade	3 985	4 577	1 931
Transportation and storage	2 252	2 794	1 436
Accommodation and food service activitie	1 615	2 143	2 507
Information and communication	9 549	5 210	6 315
Financial and insurance activities	1 662	4 316	7 659
Real estate activities	715	829	131
Professional, scientific and technical acti	3 491	4 073	7 626
Administrative and support service activ.	615	773	140
Public administration and defence	3 898	2 719	3 100
Education	2 605	1 832	1 765
Human health and social work activities	3 010	2 480	2 552
Arts, entertainment and recreation	623	606	532
Other services	297	299	274

Figure C5 ICT equipment investment

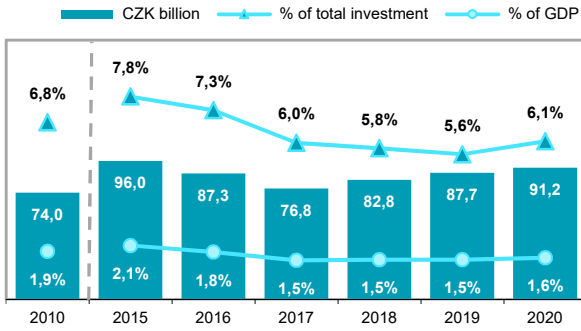
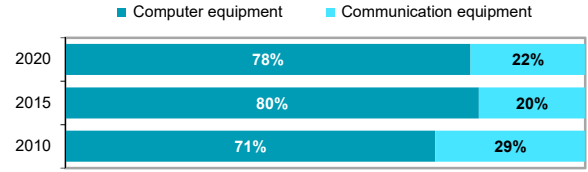


Figure C6 ICT equipment investment, by asset



Source: CZSO, Annual National Accounts Statistics

Figure C7 ICT equipment investment (% GDP)

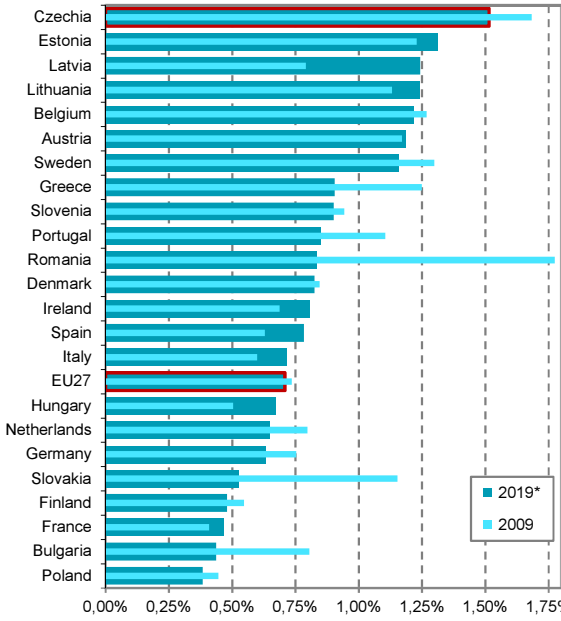
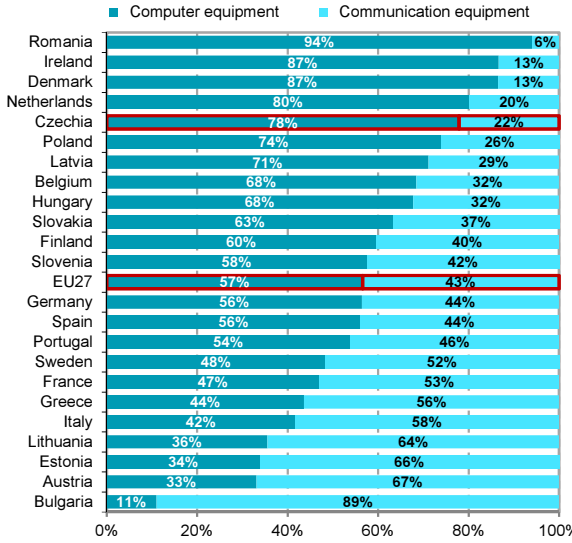


Figure C8 ICT equipment investment, by asset (%)**; 2019***



* or the nearest available year

Source: CZSO calculations based on Eurostat data

Table C3 Software investment in Czechia

CZK million

	2018	2019	2020
Total	**150 990**	**181 171**	**193 121**
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	471	594	656
Mining and quarrying	95	91	100
Manufacturing	17 838	22 173	24 655
Electricity, gas and water supply	2 931	3 156	3 489
Construction	1 469	1 678	1 834
Wholesale and retail trade	12 910	14 122	15 598
Transportation and storage	5 487	6 087	6 286
Accommodation and food service activiti	415	625	673
Information and communication	59 309	75 051	81 547
Financial and insurance activities	25 546	28 710	27 874
Real estate activities	1 751	2 204	2 392
Professional, scientific and technical acti	11 160	11 581	12 366
Administrative and support service activ.	2 304	3 525	3 765
Public administration and defence	5 327	6 573	7 643
Education	1 103	1 237	1 259
Human health and social work activities	1 214	1 895	2 239
Arts, entertainment and recreation	1 282	1 498	1 401
Other services	378	371	190

Figure C9 Software investment

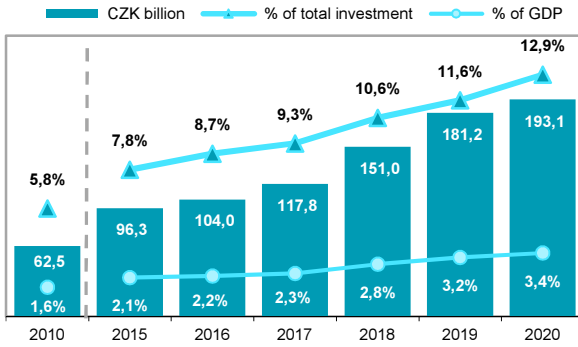
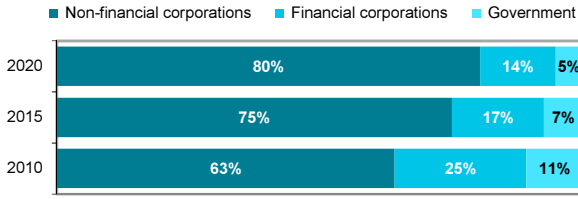


Figure C10 Software investment, by institutional sectors



Source: CZSO, Annual National Accounts Statistics

Figure C11 Software investment
(% of total investment)

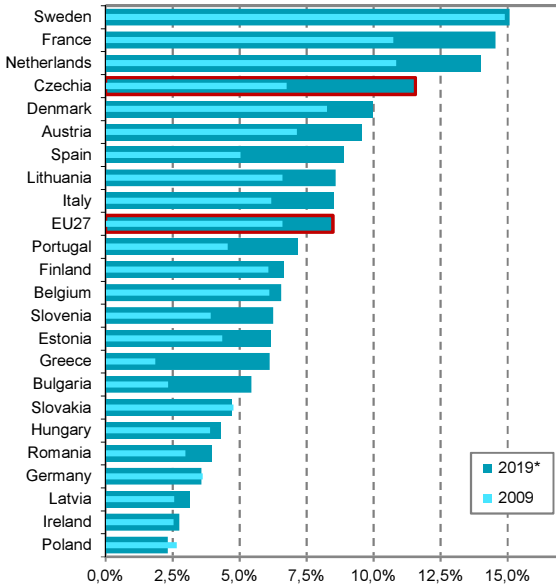
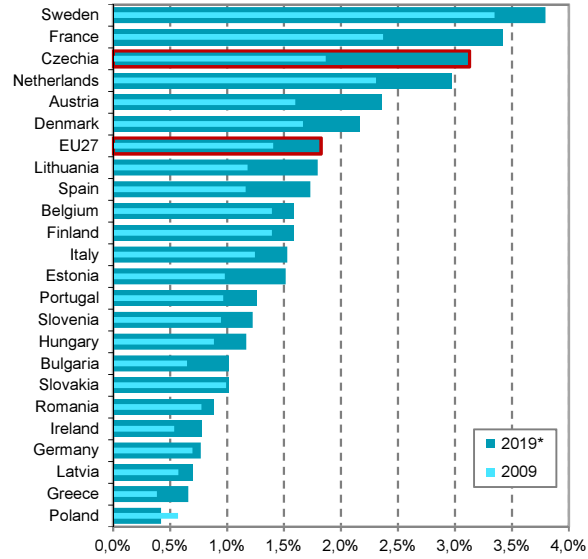


Figure C12 Software investment (% of GDP)



* or the nearest available year

Source: CZSO calculations based on Eurostat data

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

CZK million

	2018	2019	2020
Total	**102 382**	**109 608**	**114 878**
ICT equipment	**38 837**	**41 015**	**42 236**
Telephone equipment	8 119	9 432	8 627
Computers and consumer electronics	30 718	31 583	33 609
ICT (telephone) services	**63 545**	**68 593**	**72 642**

Figure C13 Household consumption expenditures on ICT

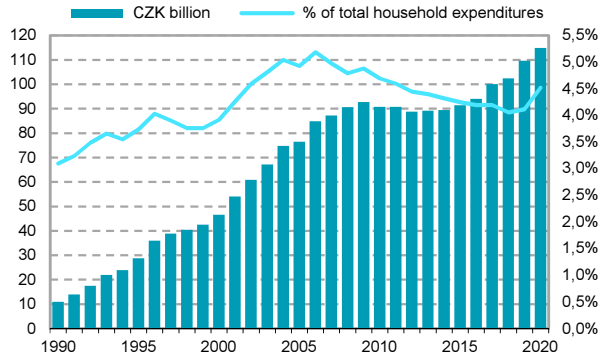


Figure C14 Household expenditures on ICT, by type of product

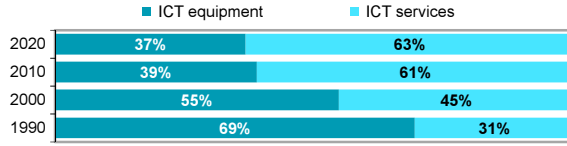
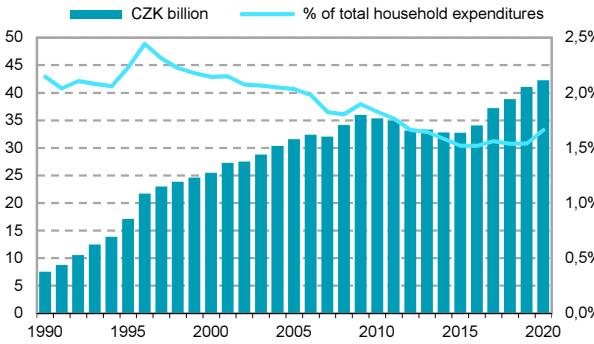


Figure C15 Households expenditures on ICT equipment



Source: CZSO, Annual National Accounts Statistics

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

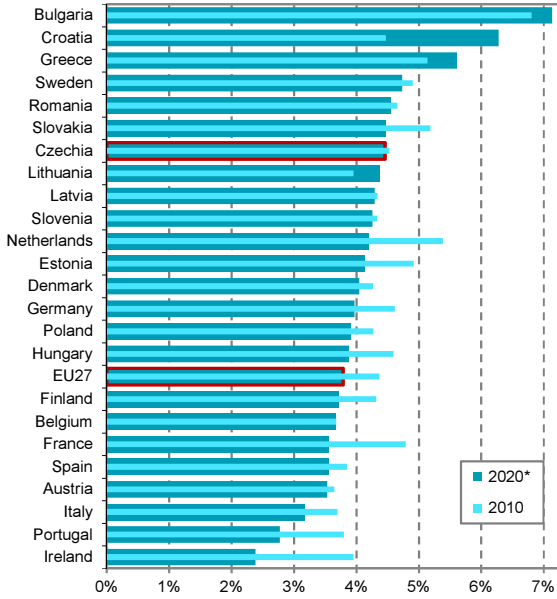
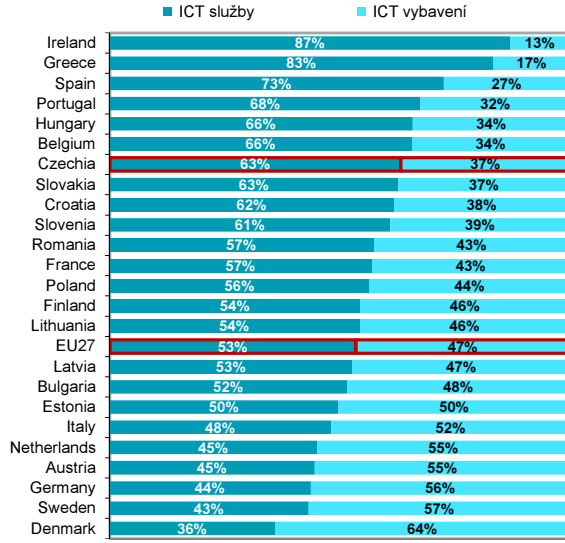


Figure C17 Household consumption expenditures on ICT, by type of product; 2020* (%)



* or the nearest available year

Source: CZSO calculations based on Eurostat data

Table C5 Household consumption expenditures on telecommunication in Czechia

CZK million

	2018	2019	2020
Total	**71 664**	**78 025**	**81 269**
Telephone equipment	8 119	9 432	8 627
Telephone (ICT) services	63 545	68 593	72 642

Figure C18 Household expenditures on telecommunication

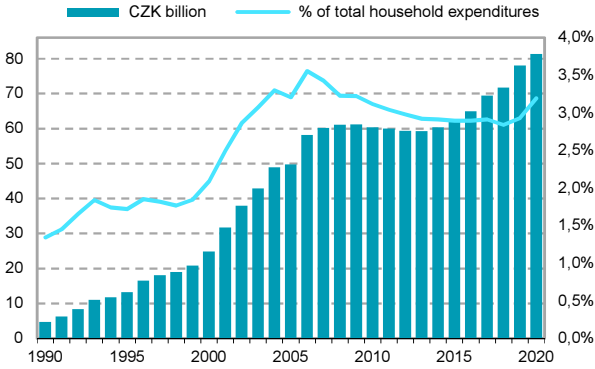


Figure C19 Household expenditures on telecommunication, by type of product

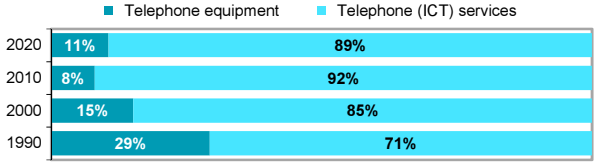
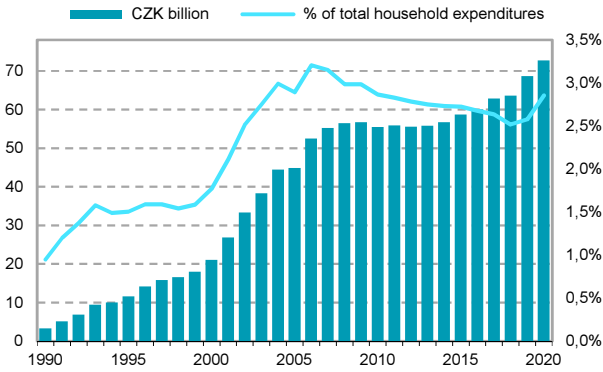


Figure C20 Household expenditures on ICT services



Source: CZSO, Annual National Accounts Statistics

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

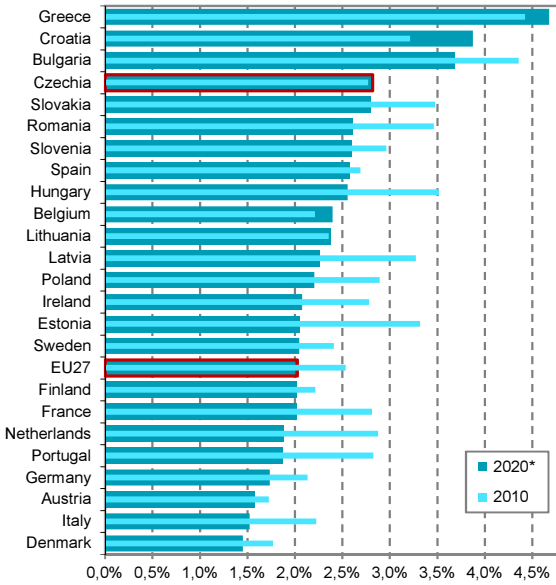
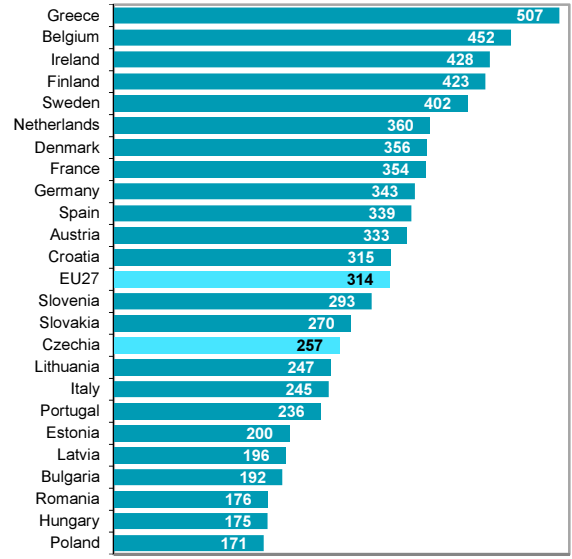


Figure C22 Household consumption expenditures on ICT services; 2020* (EUR per capita)



* or the nearest available year

Source: CZSO calculations based on Eurostat data

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

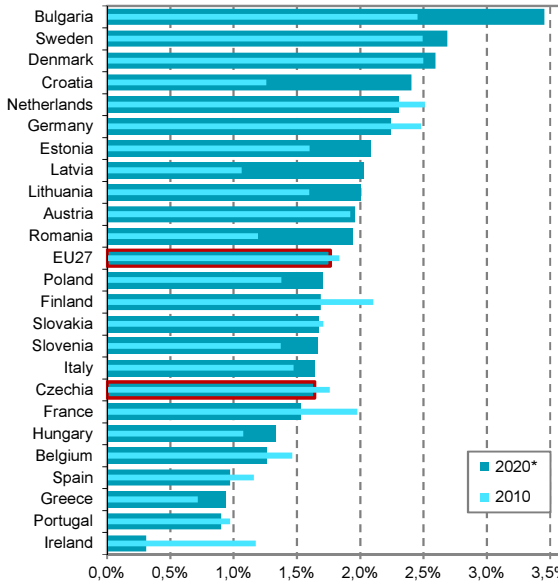
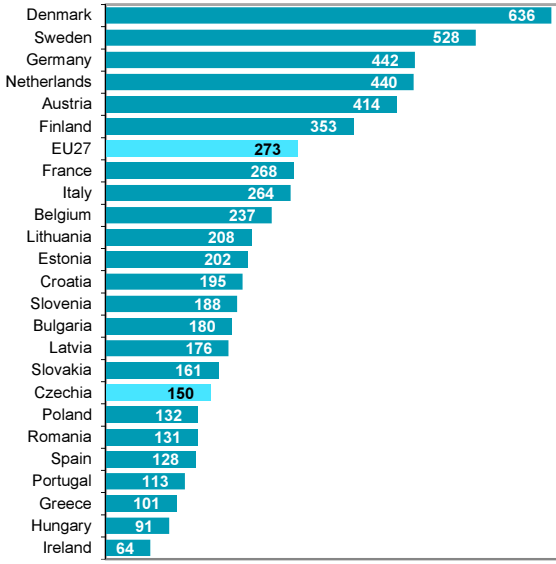


Figure C24 Household consumption expenditures on ICT equipment; 2020* (EUR per capita)



* or the nearest available year

Source: CZSO calculations based on Eurostat data

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 ICT R&D expenditures in Czechia

CZK million

	2018	2019	2020
Total	**18 720**	**20 474**	**22 975**
financed from government funds	1 924	1 920	1 828
Type of ICT product			
ICT equipment	5 594	5 791	6 691
Software	13 125	14 683	16 284
Type of R&D performer			
Enterprises, total	**17 101**	**18 830**	**21 517**
National enterprises	5 203	5 915	6 799
Foreign-controlled enterprises	11 898	12 914	14 718
Public universities	**1 535**	**1 576**	**1 348**
Other R&D performers	**84**	**69**	**111**

Figure D1 ICT R&D expenditures

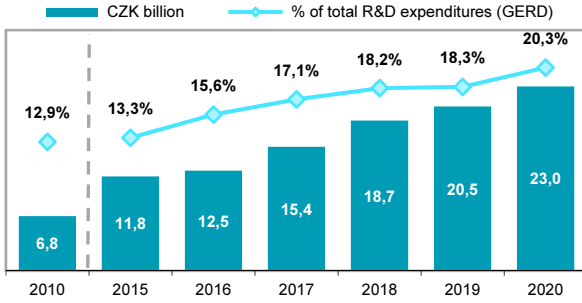


Figure D2 ICT R&D expenditures, by type of product

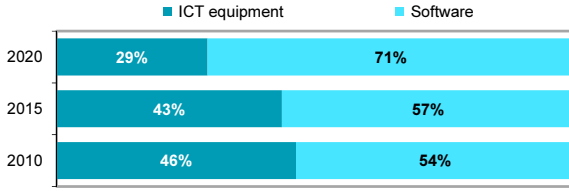
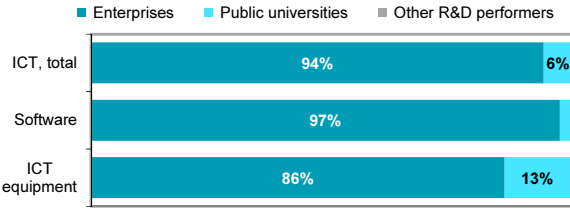


Figure D3 ICT R&D expenditures, by type of performer; 2020



Source: CZSO, Annual R&D survey

Table D2 Software R&D expenditures in Czechia

CZK million

	2018	2019	2020
Total	**13 125**	**14 683**	**16 284**
financed from government funds	751	652	573
Type of R&D performer			
Enterprises, total	**12 464**	**14 041**	**15 792**
National enterprises	3 597	4 302	4 679
Foreign-controlled enterprises	8 867	9 739	11 112
Public universities	**630**	**609**	**445**
Other R&D performers	**32**	**33**	**48**

Figure D4 Software R&D expenditures

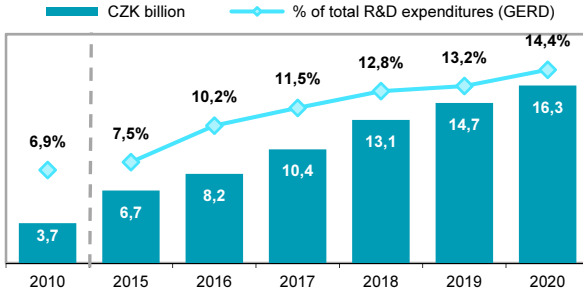


Figure D5 Software R&D expenditures, by performer; 2020

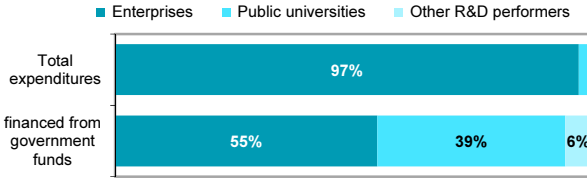
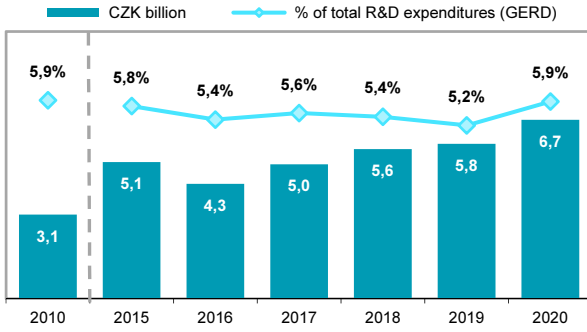


Figure D6 ICT equipment R&D expenditures



Source: CZSO, Annual R&D survey

Table D3 Business ICT R&D expenditures in Czechia

CZK million

	2018	2019	2020
Total	**17 101**	**18 830**	**21 517**
financed from government funds	861	784	900
Type of ICT product			
ICT equipment	4 637	4 789	5 725
Software	12 464	14 041	15 792
Enterprise size group			
Small (0-49 employees)	1 674	1 968	2 154
Medium (50-249 employees)	3 677	3 845	3 957
Large (250+ employees)	11 749	13 017	15 406
Ownership of enterprises			
National enterprises	5 203	5 915	6 799
Foreign-controlled enterprises	11 898	12 914	14 718
Industry of enterprises (CZ-NACE)			
ICT sector industries, total	**12 644**	**13 286**	**15 262**
ICT manufacturing	295	335	323
Telecommunications	794	366	971
IT services	11 555	12 585	13 968
Other industries	**4 457**	**5 544**	**6 255**

Figure D7 Business ICT R&D expenditures

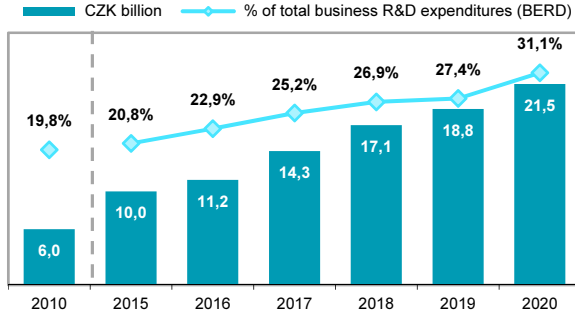
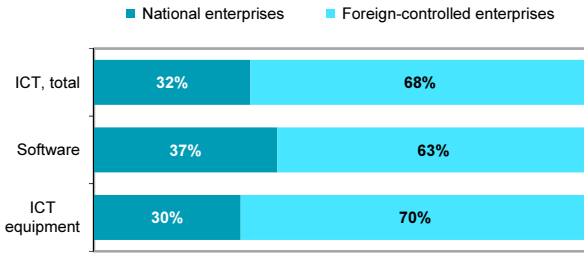


Figure D8 Business ICT R&D expenditures, by ownership; 2020



Source: CZSO, Annual R&D survey

Table D4 Business ICT R&D expenditures in Czechia; 2020

CZK million

	Total	ICT equipment	Software
Total	**21 517**	**5 725**	**15 792**
financed from government funds	900	586	314
Enterprise size group			
Small (0-49 employees)	2 154	578	1 576
Medium (50-249 employees)	3 957	1 197	2 759
Large (250+ employees)	15 406	3 950	11 456
Ownership of enterprises			
National enterprises	6 799	2 120	4 679
Foreign-controlled enterprises	14 718	3 606	11 112
Industry of enterprises (CZ-NACE)			
ICT sector industries, total	**15 262**	**1 652**	**13 610**
ICT manufacturing	323	206	116
Telecommunications	971	12	959
IT services	13 968	1 434	12 534
Other industries	**6 255**	**4 073**	**2 182**

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

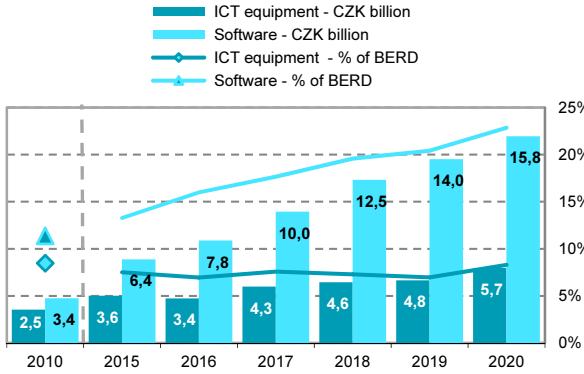
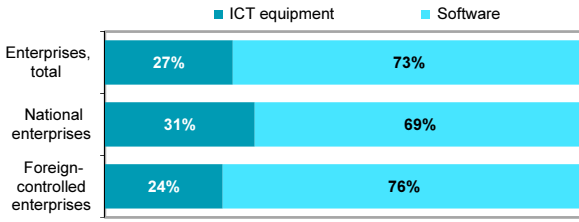


Figure D10 Business ICT R&D expenditures, by ownership of R&D performers and type of product; 2020



Source: CZSO, Annual R&D survey

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

CZK million

	2018	2019	2020
Total	**13 495**	**14 600**	**16 739**
financed from government funds	1 067	983	1 071
Type of product			
ICT equipment	1 802	1 802	1 802
Software	10 842	11 869	13 610
Other non ICT related products	851	928	1 327
Enterprise size group			
Small (0-49 employees)	1 568	1 933	2 031
Medium (50-249 employees)	3 187	3 441	3 329
Large (250+ employees)	8 740	9 225	11 379
Ownership of enterprises			
National enterprises	4 306	4 830	5 454
Foreign-controlled enterprises	9 189	9 770	11 285
Industry of enterprises (ICT sub-sectors)			
ICT manufacturing	591	902	999
ICT services, total	**12 903**	**13 698**	**15 740**
Telecommunications	801	377	983
Computer programming	10 052	10 378	11 867
Data processing and hosting	1 101	1 066	1 236
Other IT services	949	1 877	1 655

Figure D11 R&D expenditures in the ICT sector

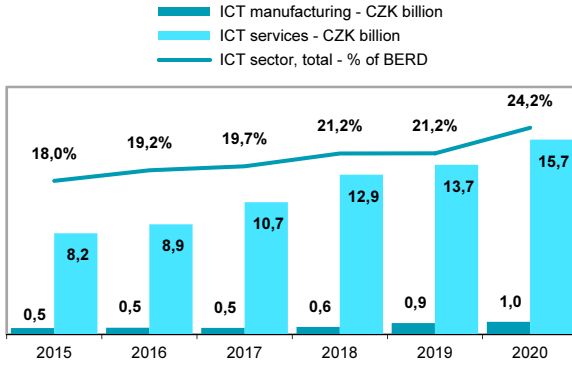
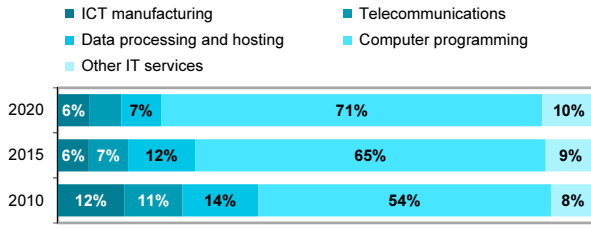


Figure D12 R&D expenditures in the ICT sector, by industry



Source: CZSO, Annual R&D survey

Figure D13 R&D expenditures in the ICT sector; 2019
(% of GDP)

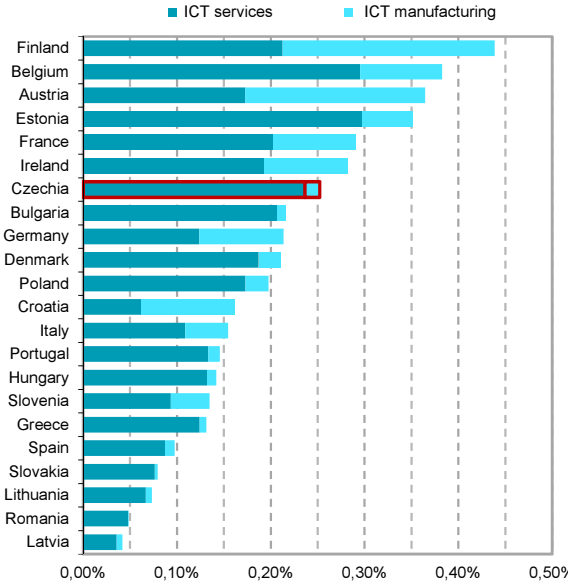
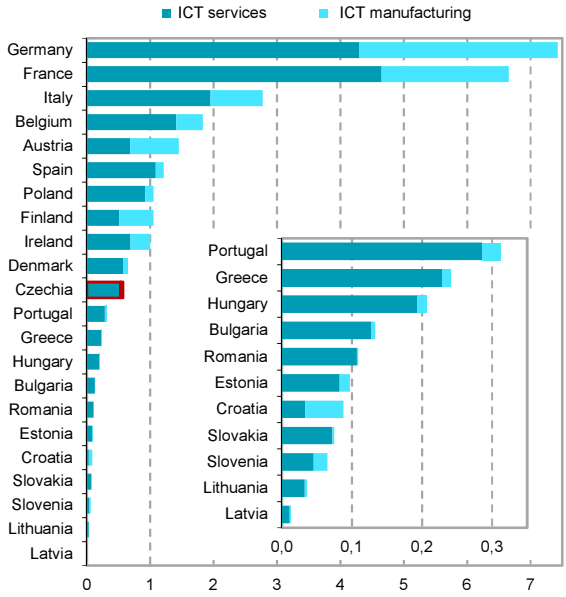


Figure D14 R&D expenditures in the ICT sector; 2019
(EUR billion)



Source: CZSO calculations based on Eurostat data

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

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

	2018	2019	2020
Total	**10 196**	**11 102**	**11 593**
Men	1 141	1 363	1 462
Women	9 055	9 739	10 130
Enterprise size group			
Small (0-49 employees)	1 857	2 078	2 021
Medium (50-249 employees)	2 891	2 998	2 838
Large (250+ employees)	5 449	6 026	6 734
Ownership of enterprises			
National enterprises	4 428	4 815	4 937
Foreign-controlled enterprises	5 768	6 287	6 656
Industry of enterprises (ICT sub-sectors)			
ICT manufacturing	623	818	832
ICT services, total	**9 573**	**10 284**	**10 760**
Telecommunications	352	248	223
Computer programming	7 489	7 788	8 493
Data processing and hosting	852	866	1 010
Other IT services	880	1 382	1 034

Figure D15 R&D personnel in the ICT sector

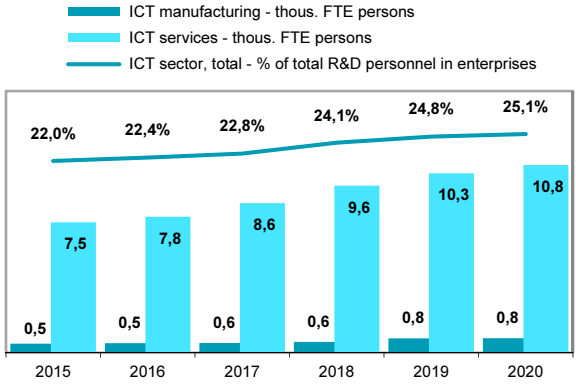
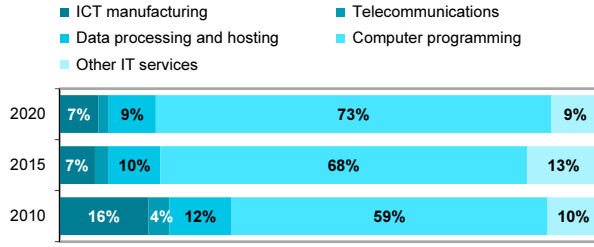


Figure D16 R&D personnel in the ICT sector, by industry



Source: CZSO, Annual R&D survey

E International trade in ICT goods

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

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

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

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

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

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

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

Data for the Czech Republic comes from the Cross-border movements of goods database, for more see Cross-border movements of goods (CBmG) (czso.cz).

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

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

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

E International trade in ICT goods

Table E1 ICT goods exports from Czechia

CZK million

	2018	2019	2020
Total	**667 983**	**740 780**	**798 057**
Computer equipment and peripherals	324 867	335 466	364 383
Communication equipment	196 020	242 408	259 421
Consumer electronics	78 676	71 661	70 864
Electronic components	34 371	38 808	45 845
ICT parts n.e.s.	34 049	52 438	57 544

Figure E1 ICT goods exports

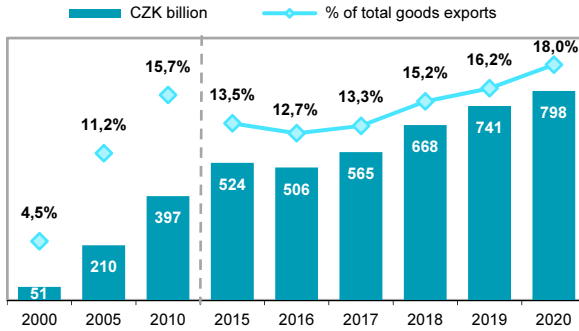


Figure E2 ICT goods exports, by commodities

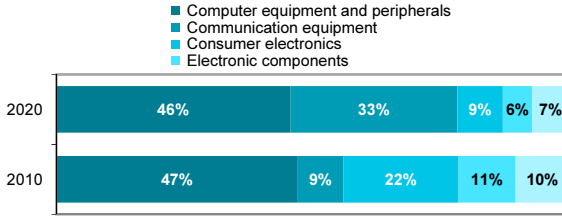
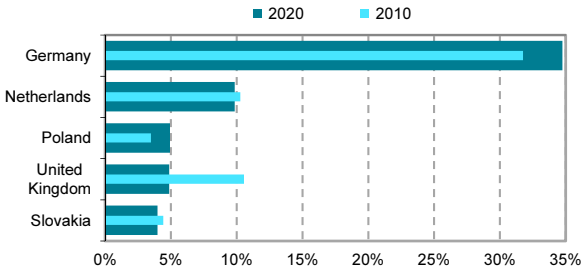


Figure E3 ICT goods exports, by countries



Source: CZSO, Cross-border movements of goods database

Figure E4 ICT goods exports; 2020
(% of total goods exports)

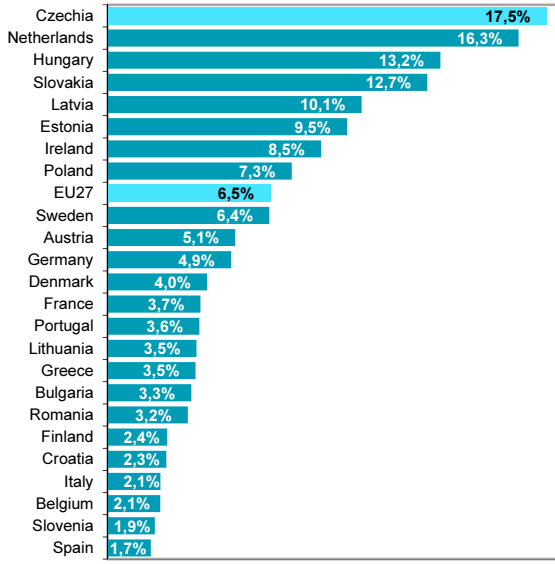
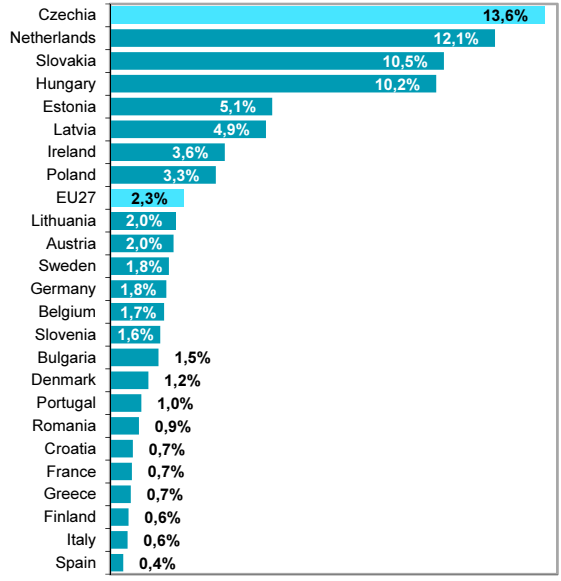


Figure E5 ICT goods exports; 2020 (% of GDP)



Source: CZSO calculations based on Eurostat

E International trade in ICT goods

Table E2 ICT goods imports to Czechia

CZK million

	2018	2019	2020
Total	**657 289**	**715 750**	**796 391**
Computer equipment and peripherals	206 974	224 436	253 026
Communication equipment	209 053	255 061	264 728
Consumer electronics	45 400	51 065	52 205
Electronic components	105 611	93 257	106 347
ICT parts n.e.s.	90 251	91 931	120 086

Figure E6 ICT goods imports

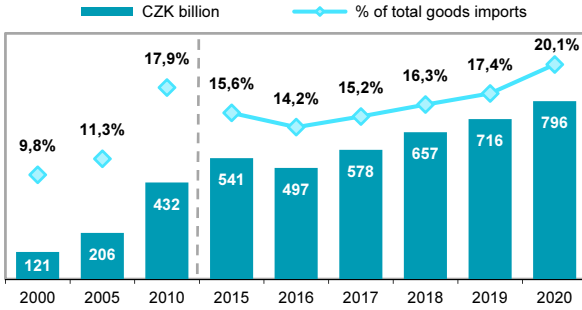


Figure E7 ICT goods imports, by commodities

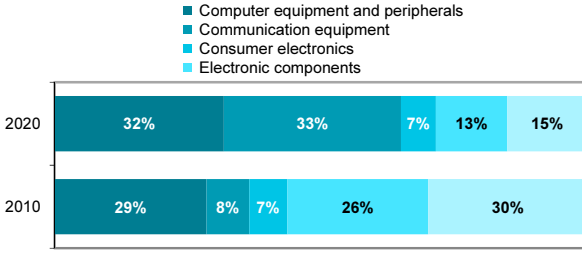
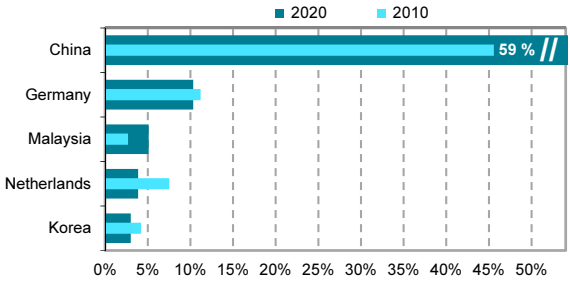


Figure E8 ICT goods imports, by countries



Source: CZSO, Cross-border movements of goods database

Figure E9 ICT goods imports; 2020
(% of total goods imports)

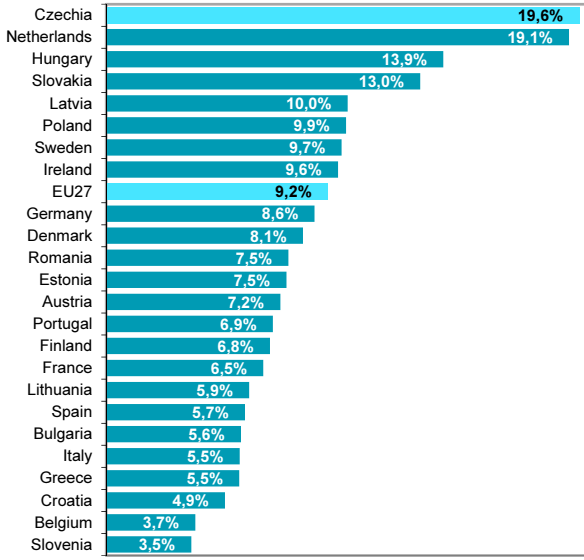
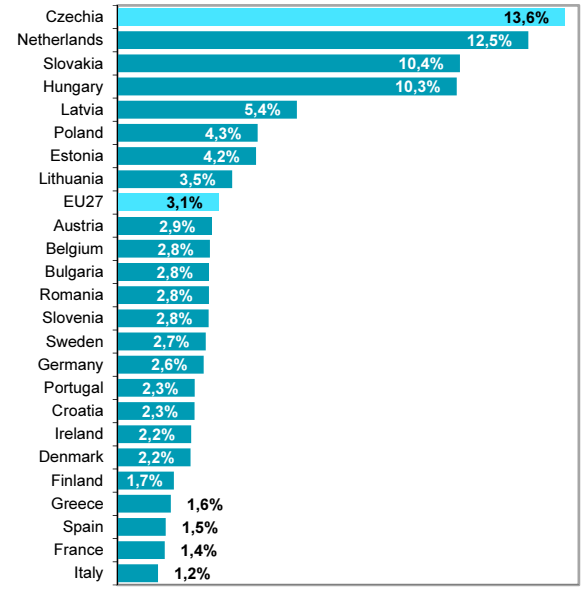
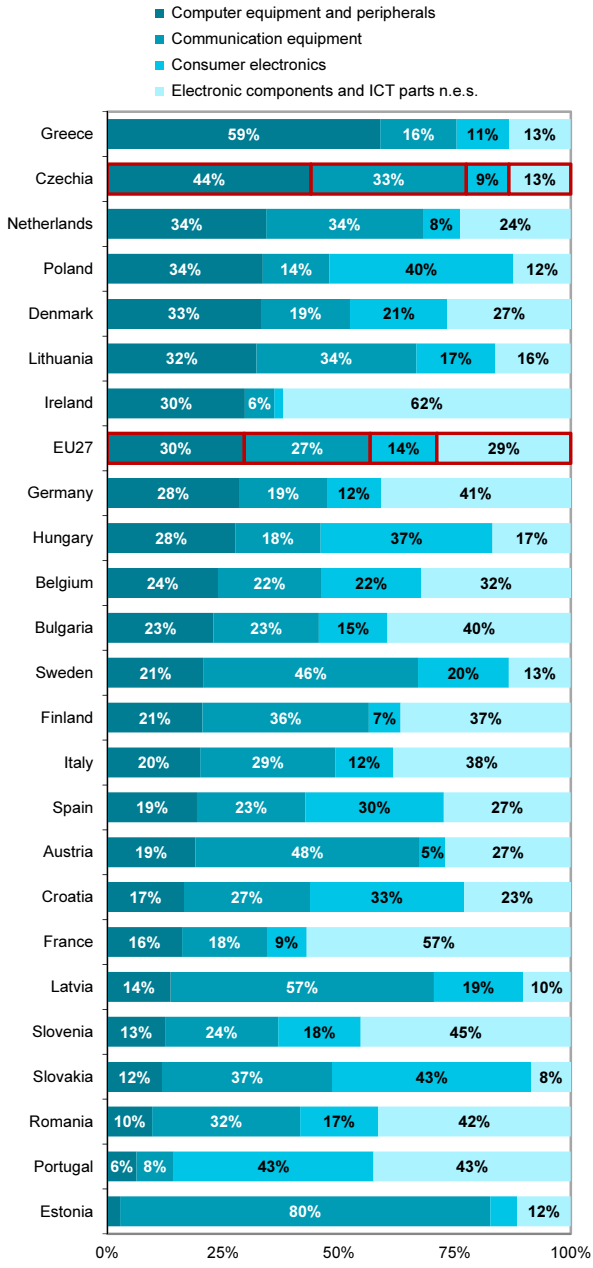


Figure E10 ICT goods imports; 2020 (% of GDP)



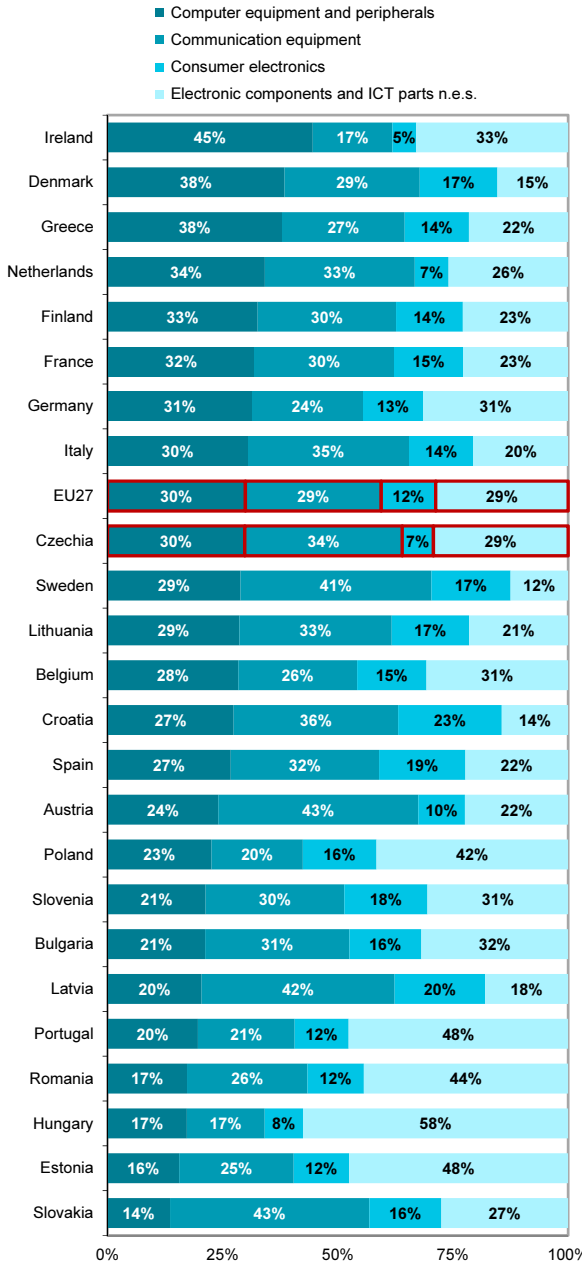
Source: CZSO calculations based on Eurostat

Figure E11 ICT goods exports, by commodities; 2020



Source: CZSO calculations based on Eurostat

Figure E12 ICT goods imports, by commodities; 2020



Source: CZSO calculations based on Eurostat

Table E3 Computer equipment exports from Czechia

CZK million

	2018	2019	2020
Total	**324 867**	**335 466**	**364 383**
Portable computers	66 589	78 471	105 748
Other computers	162 401	153 517	146 524
Computer peripherals, total	95 877	103 478	112 111
Storage units	48 255	44 588	43 498
Sound, video, network and similar cards	13 751	20 388	24 575
Monitors used with computers	19 324	22 392	23 591
Printers, copying or faxing machines	5 589	5 251	4 742
Other input or output peripherals*	8 957	10 859	15 705

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

Figure E13 Computer equipment exports

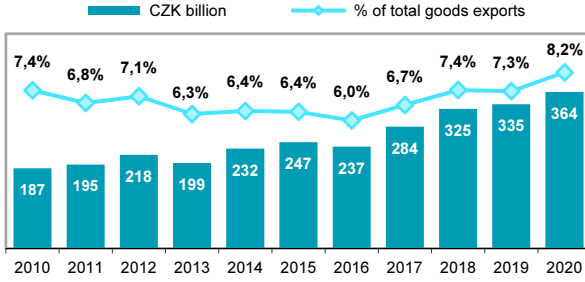


Figure E14 Computer equipment exports, by commodities

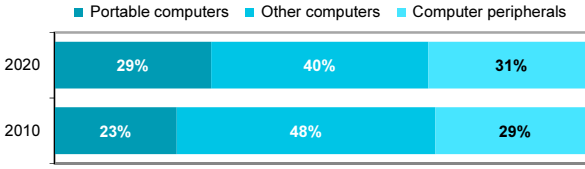
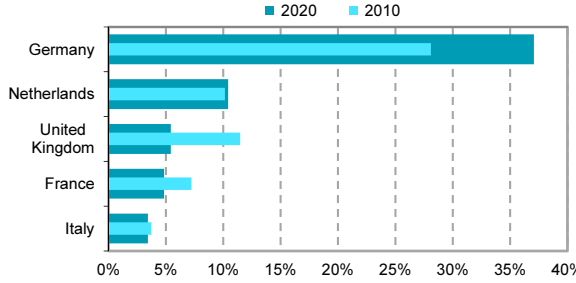


Figure E15 Computer equipment exports, by countries



Source: CZSO, Cross-border movements of goods database

Table E4 Computer equipment imports to Czechia

CZK million

	2018	2019	2020
Total	**206 974**	**224 436**	**253 026**
Portable computers	76 491	83 235	110 222
Other computers	21 843	24 700	22 898
Computer peripherals, total	108 640	116 501	119 906
Storage units	58 638	51 090	56 006
Sound, video, network and similar cards	12 933	23 000	18 083
Monitors used with computers	19 511	22 034	21 952
Printers, copying or faxing machines	6 798	7 387	6 001
Other input or output peripherals*	10 760	12 990	17 863

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

Figure E16 Computer equipment imports

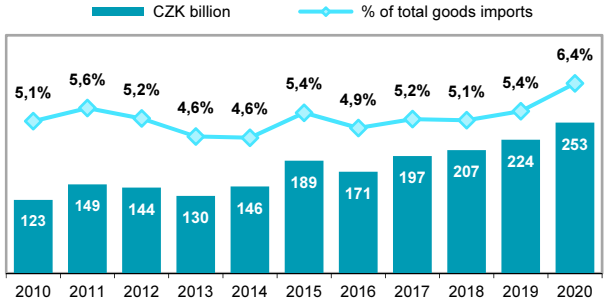


Figure E17 Computer equipment imports, by commodities

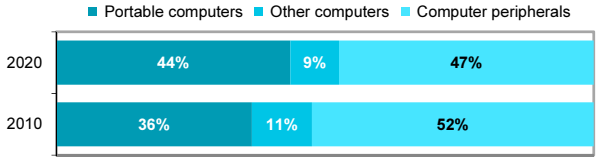
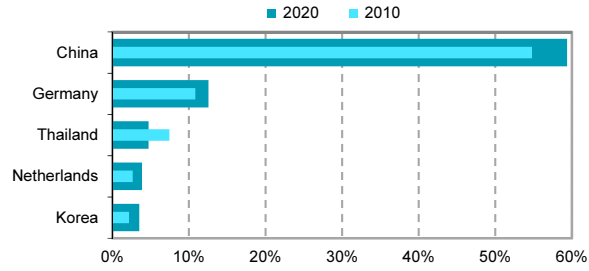


Figure E18 Computer equipment imports, by countries



Source: CZSO, Cross-border movements of goods database

E International trade in ICT goods

Table E5 Communication equipment exports from Czechia

CZK million

	2018	2019	2020
Total	**196 020**	**242 408**	**259 421**
Mobile phones	141 592	153 944	149 863
Other communication equipment	54 428	88 463	109 558

Figure E19 Communication equipment exports

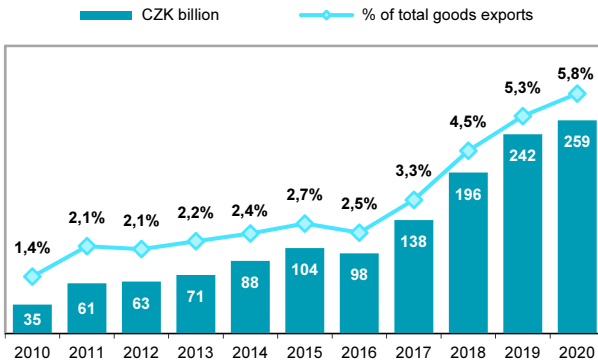


Figure E20 Communication equipment exports by commodities

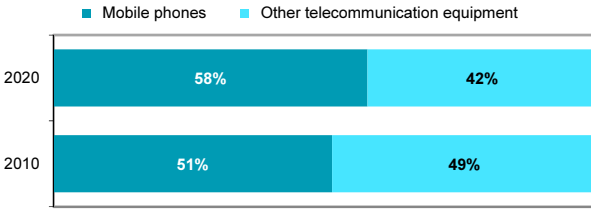
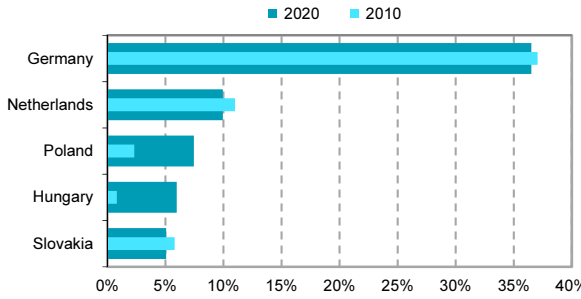


Figure E21 Communication equipment exports, by countries



Source: CZSO, Cross-border movements of goods database

Table E6 Communication equipment imports to Czechia

CZK million

	2018	2019	2020
Total	**209 053**	**255 061**	**264 728**
Mobile phones	156 153	165 170	165 790
Other communication equipment	52 900	89 891	98 938

Figure E22 Communication equipment imports

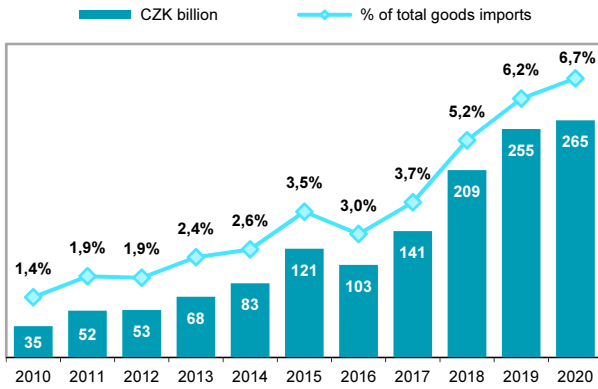


Figure E23 Communication equipment imports by commodities

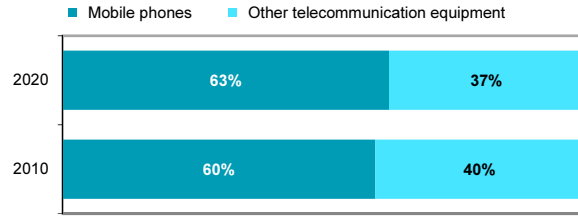
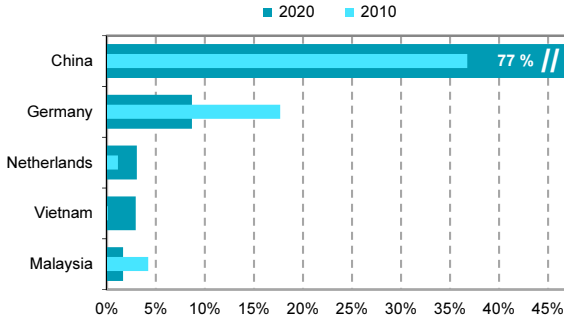


Figure E24 Communication equipment imports, by countries



Source: CZSO, Cross-border movements of goods database

Table E7 Consumer electronics exports from Czechia

CZK million

	2018	2019	2020
Total	**78 676**	**71 661**	**70 864**
Radio and TV receivers	35 627	28 407	26 238
Sound and image recording and reproducing apparatuses	15 935	16 038	17 099
Consumer electronics accessories*	27 114	27 215	27 528

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

Figure E25 Consumer electronics exports

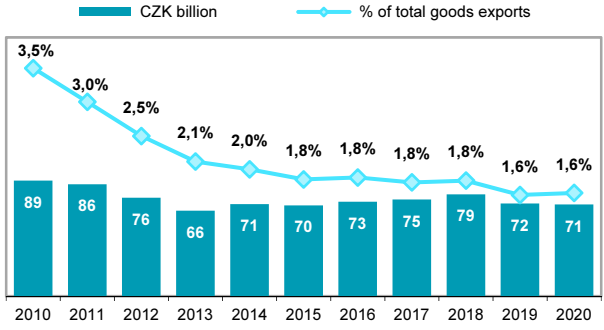


Figure E26 Consumer electronics exports, by commodities

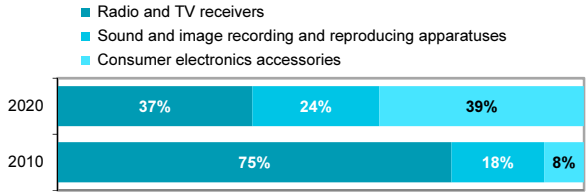
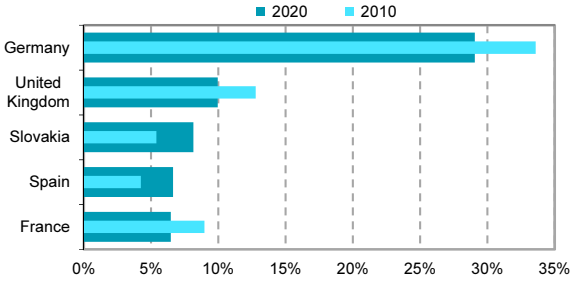


Figure E27 Consumer electronics exports, by countries



Source: CZSO, Cross-border movements of goods database

Table E8 Consumer electronics imports to Czechia

CZK million

	2018	2019	2020
Total	**45 400**	**51 065**	**52 205**
Radio and TV receivers	14 914	16 784	18 051
Sound and image recording and reproducing apparatuses	15 564	16 590	17 021
Consumer electronics accessories*	14 922	17 691	17 132

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

Figure E28 Consumer electronics imports

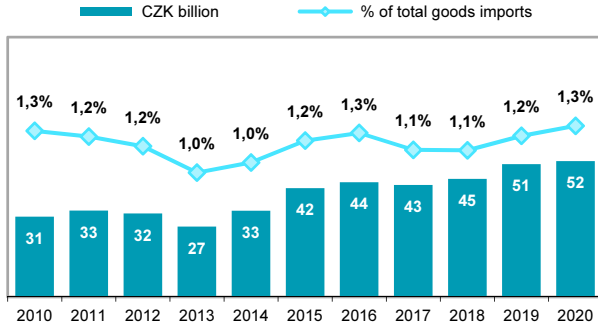


Figure E29 Consumer electronics imports, by commodities

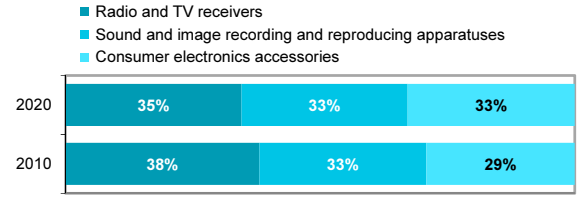
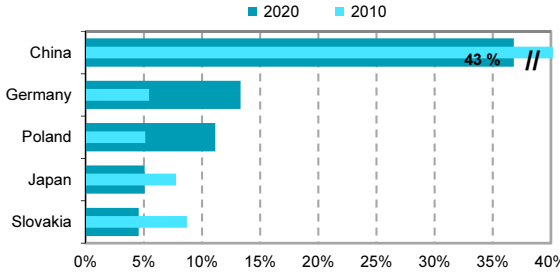


Figure E30 Consumer electronics imports, by countries



Source: CZSO, Cross-border movements of goods database

Table E9 Electronic components exports from Czechia

CZK million

	2018	2019	2020
Total	**34 371**	**38 808**	**45 845**
Electronic integrated circuits	21 718	27 067	34 631
Printed circuits	4 782	4 668	5 168
Other electronic components	7 870	7 072	6 046

Figure E31 Electronic components exports

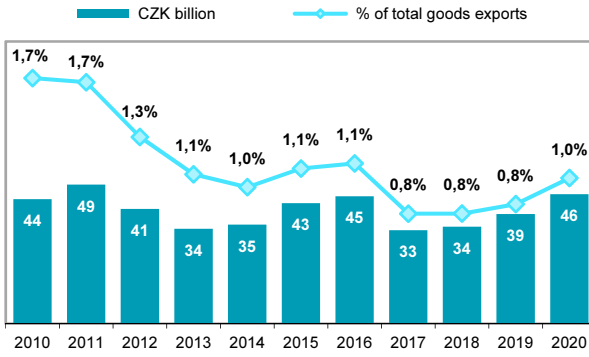


Figure E32 Electronic components exports, by commodities

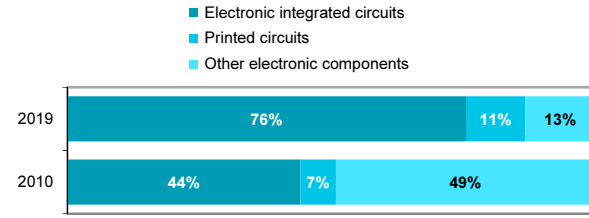
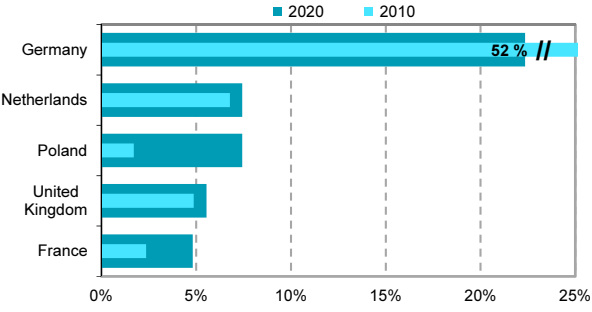


Figure E33 Electronic components exports, by countries



Source: CZSO, Cross-border movements of goods database

Table E10 Electronic components imports to the Czechia

CZK million

	2018	2019	2020
Total	**105 611**	**93 257**	**106 347**
Electronic integrated circuits	81 468	71 185	86 867
Printed circuits	12 460	11 333	9 663
Other electronic components	11 683	10 738	9 818

Figure E34 Electronic components imports

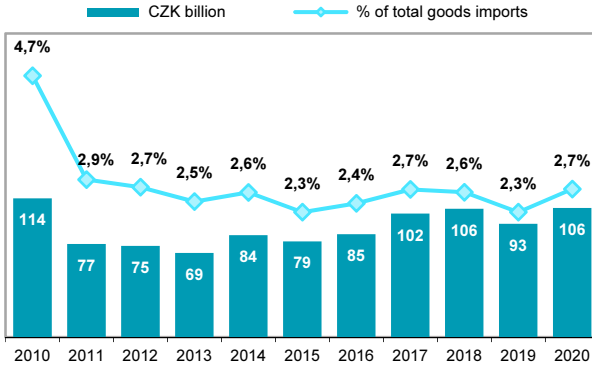


Figure E35 Electronic components imports, by commodities

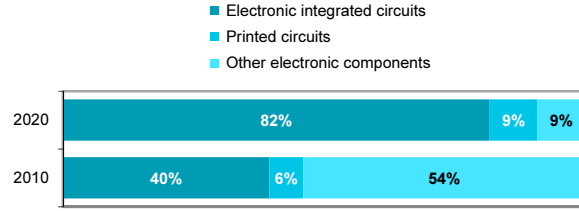
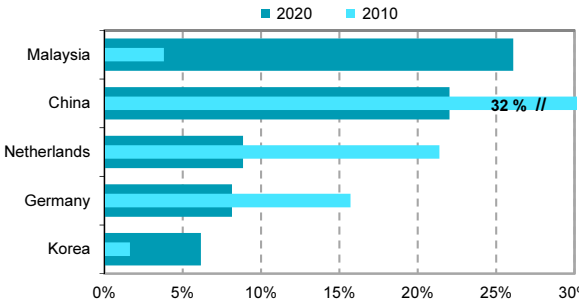


Figure E36 Electronic components imports, by countries



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

	2018	2019	2020
Total	**34 049**	**52 438**	**57 544**
Parts and accessories n.e.s. of			
computers	16 629	29 897	32 972
telecommunication equipment	10 752	12 979	15 531
consumer electronics	6 668	9 561	9 041

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

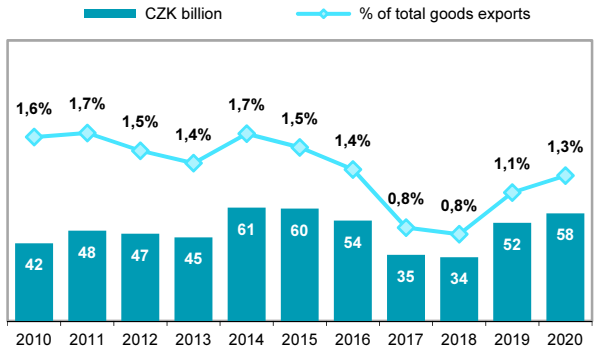


Figure E38 Exports of ICT parts n.e.s., by commodities

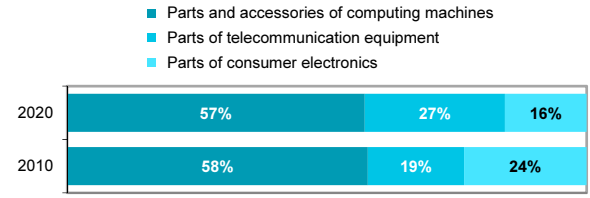
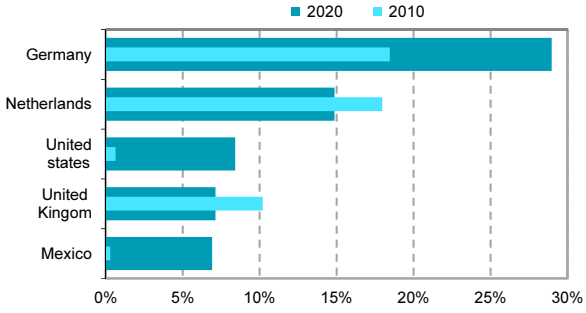


Figure E39 Exports of ICT parts n.e.s., by countries



Source: CZSO, Cross-border movements of goods database

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

CZK million

	2018	2019	2020
Total	**90 251**	**91 931**	**120 086**
Parts and accessories n.e.s. of			
computers	55 786	57 829	88 399
telecommunication equipment	7 295	8 923	9 699
consumer electronics	27 170	25 179	21 988

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

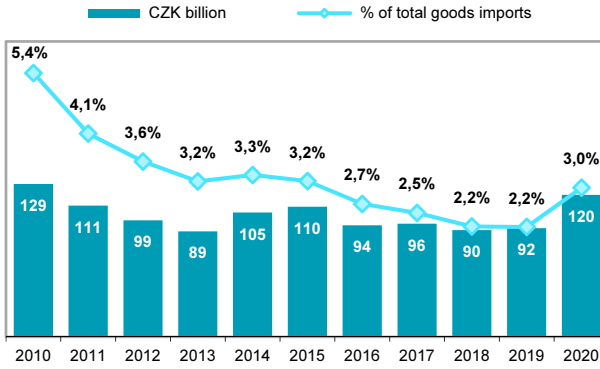


Figure E41 Imports of ICT parts n.e.s., by commodities

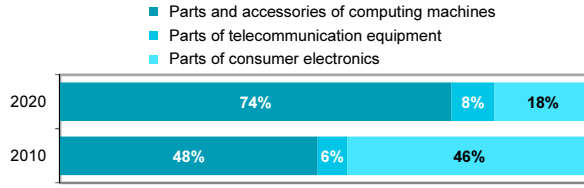
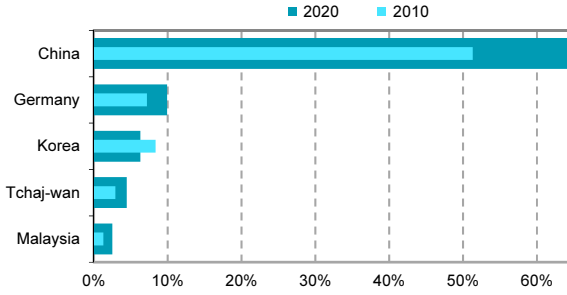


Figure E42 Imports of ICT parts n.e.s., by countries



Source: CZSO, Cross-border movements of goods database

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

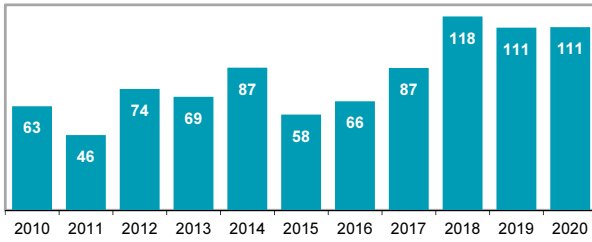


Figure E44 Balance of cross-border movement of Communication equipment (CZK billion)

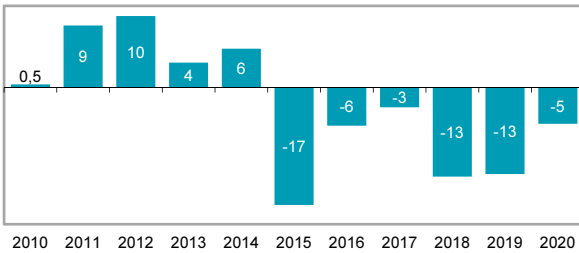


Figure E45 Balance of cross-border movement of Consumer electronics (CZK billion)

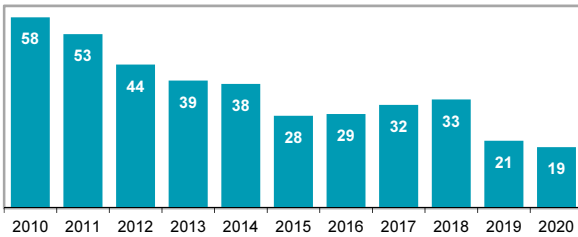
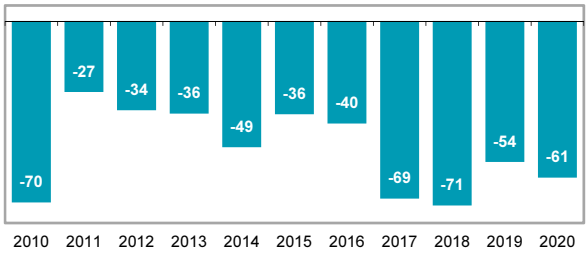


Figure E46 Balance of cross-border movement of Electronic components (CZK billion)



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

	2018	2019	2020
Total	**91 441**	**105 286**	**118 327**
Telecommunication services	17 077	14 286	17 314
Computer services	46 146	54 261	56 239
Computer software	28 217	36 739	44 774
by selected countries			
EU27, total	47 843	54 500	61 480
of which to Germany	15 445	16 432	18 664
Other countries, total	43 598	50 786	56 847
of which to the United States	17 688	23 027	26 589

Figure F1 ICT services exports

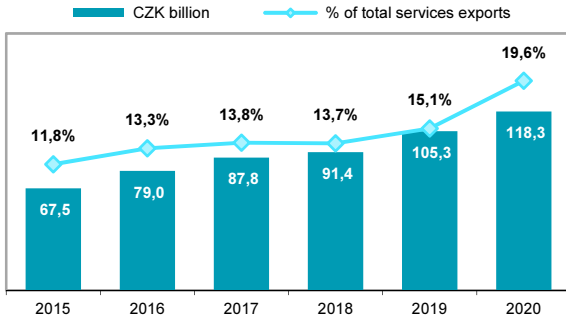


Figure F2 ICT services exports, by type of ICT services

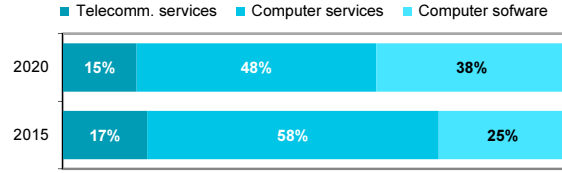
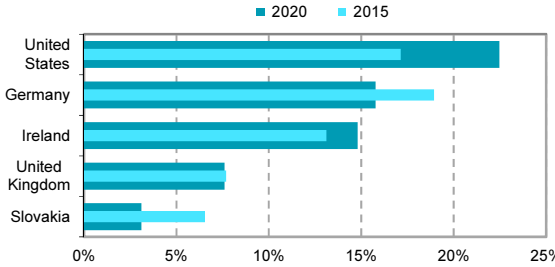


Figure F3 ICT services exports, by countries



Source: CZSO, Survey on exports and imports of services

Figure F4 ICT services exports; 2019
(% of total services exports)

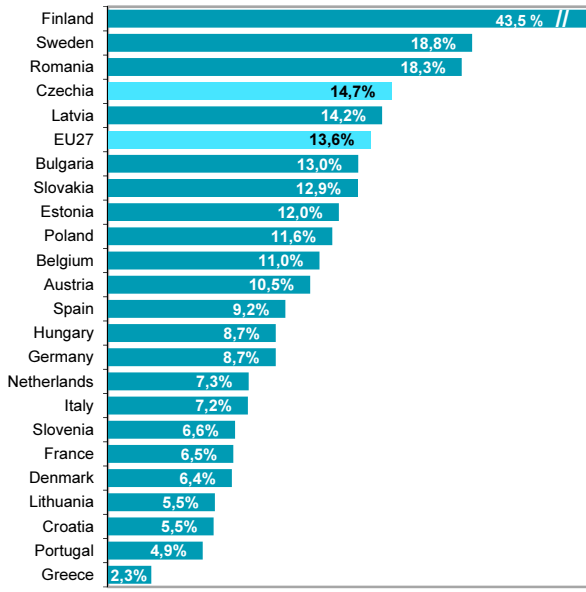
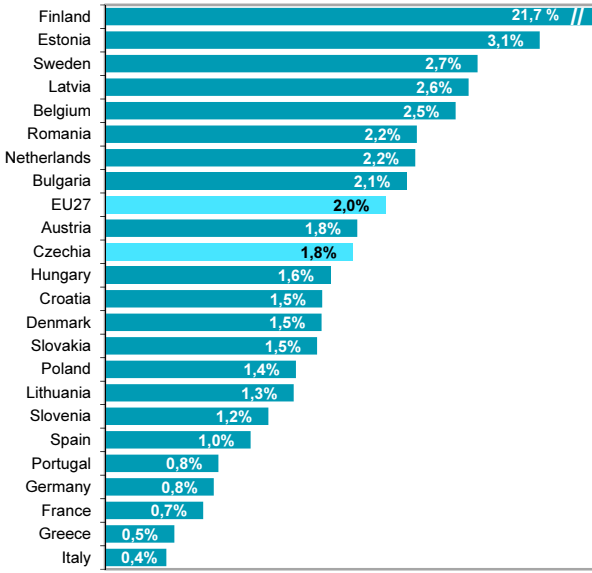


Figure F5 ICT services exports; 2019 (% of GDP)



Source: CZSO calculations based on Eurostat

F International trade in ICT services

Table F2 ICT services imports to Czechia

CZK million

	2018	2019	2020
Total	**52 446**	**53 040**	**62 374**
Telecommunication services	15 558	11 535	15 578
Computer services	26 390	29 715	31 501
Computer software	10 498	11 790	15 295
by selected countries			
EU27, total	31 591	31 122	37 287
of which to Germany	11 300	11 875	13 214
Other countries, total	20 855	21 918	25 088
of which to the United States	3 104	3 277	3 058

Figure F6 ICT services imports

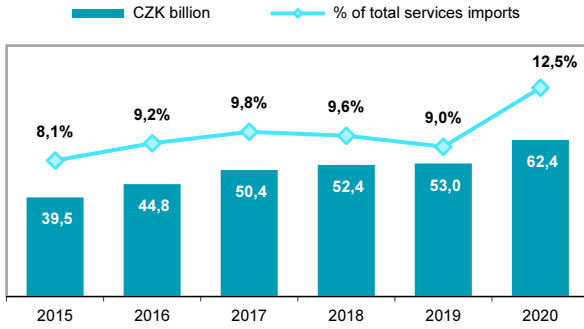


Figure F7 ICT services imports, by type of ICT services

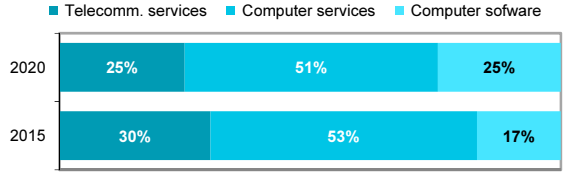
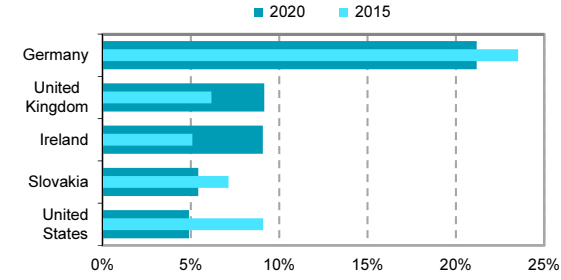


Figure F8 ICT services imports, by countries



Source: CZSO, Survey on exports and imports of services

Figure F9 ICT services imports, 2019
(% of total services imports)

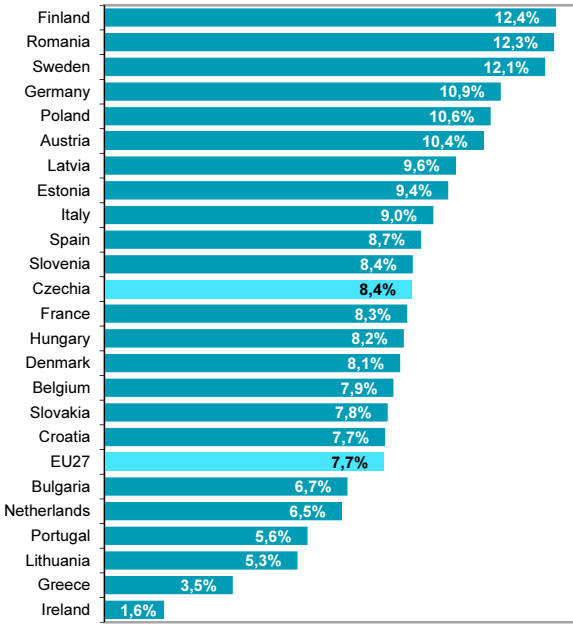
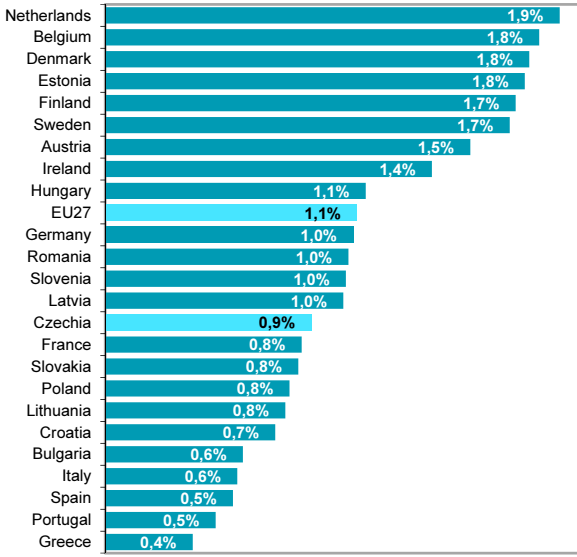


Figure F10 ICT services imports, 2019 (% of GDP)



Source: CZSO calculations based on Eurostat

Tab F3 Computer services and software exports from Czechia

CZK million

	2018	2019	2020
Total	**74 364**	**91 000**	**101 013**
Computer services	46 146	54 261	56 239
Computer software	28 217	36 739	44 774
by selected countries			
EU27, total	41 100	48 662	53 851
of which to Germany	13 370	15 128	16 738
Other countries, total	28 067	36 397	36 397
of which to the United States	16 099	21 625	24 965

Figure F11 Computer services and software exports

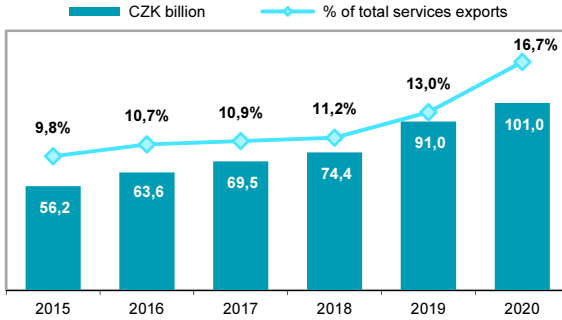


Figure F12 Computer services and software exports, by type of services

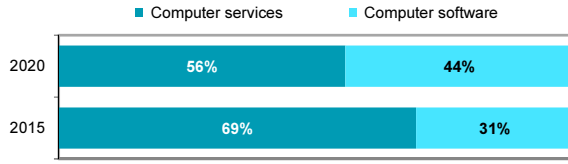
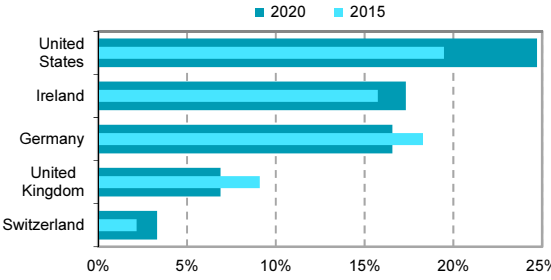


Figure F13 Computer services and software exports, by countries



Source: CZSO, Survey on exports and imports of services

Tab F4 Computer services and software imports to Czechia

CZK million

	2018	2019	2020
Total	**36 888**	**41 504**	**46 796**
Computer services	26 390	29 715	31 501
Computer software	10 498	11 790	15 295
by selected countries			
EU27, total	24 377	26 166	29 820
of which to Germany	9 832	10 761	11 242
Other countries, total	9 978	11 808	35 554
of which to the United States	2 875	3 097	2 800

Figure F14 Computer services and software imports

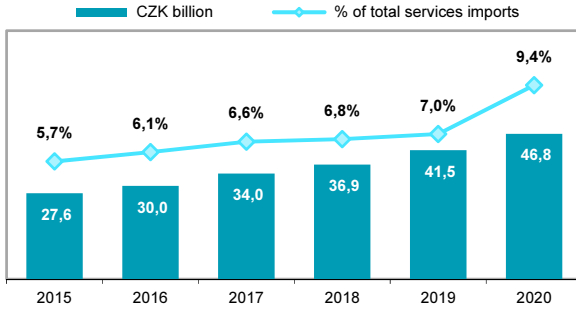


Figure F15 Computer services and software imports, by type of services

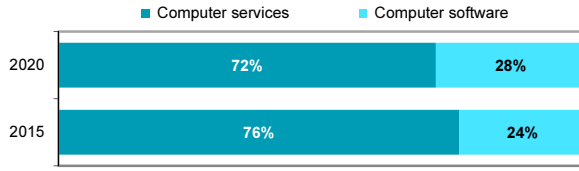
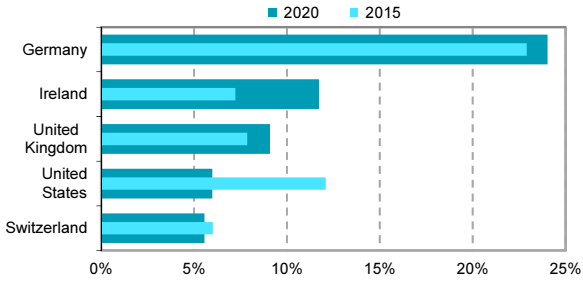


Figure F16 Computer services and software imports, by countries



Source: CZSO, Survey on exports and imports of services

Figure F17 Computer services and software exports; 2019 (% of GDP)

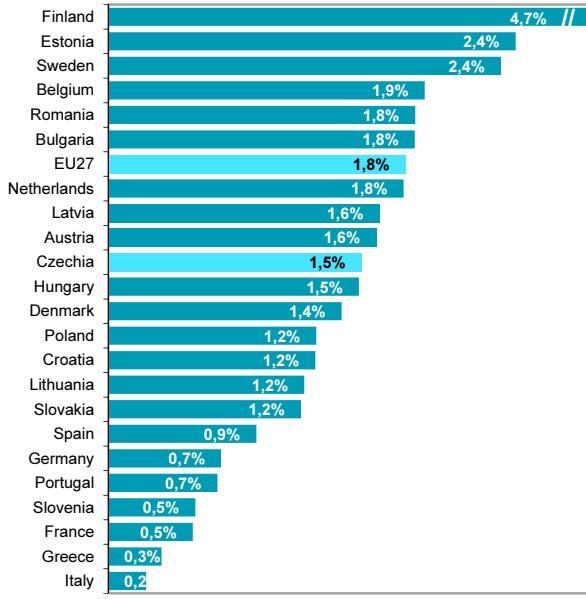
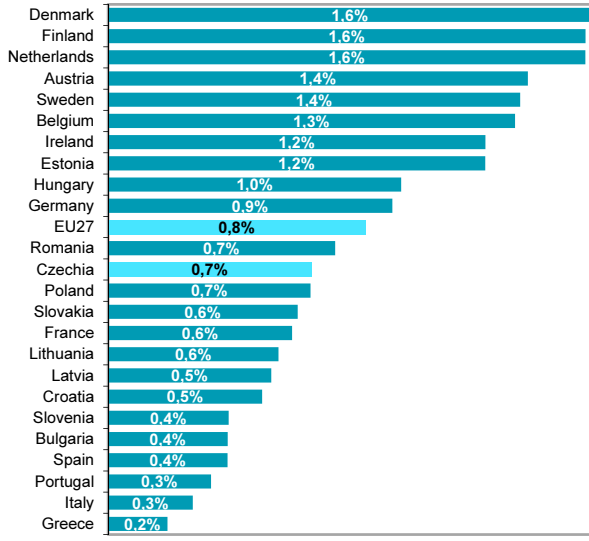


Figure F18 Computer services and software imports; 2019 (% of GDP)



Zdroj: Eurostat a vlastní dopočty ČSÚ

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.aspxt

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 2020 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

Table G1 Employment in the ICT sector in Czechia

Number of persons employed - headcount persons

	2018	2019	2020
Total	**169 722**	**176 484**	**178 774**
ICT manufacturing, total	**24 253**	**24 001**	**23 791**
Manufacture of electronic components peripheral equipment	8 410 5 873	8 687 5 829	8 294 6 489
Manuf. of communication equipment	6 129	5 862	5 495
Manufacture of consumer electronics	3 842	3 623	3 512
ICT services, total	**145 469**	**152 484**	**154 983**
ICT wholesale	11 601	11 536	11 413
Telecommunications	22 009	22 374	21 888
IT services	111 859	118 573	121 681

Figure G1 Employment in the ICT sector

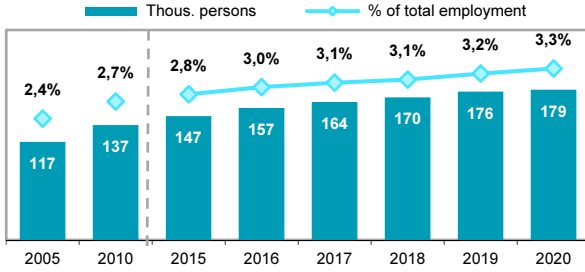


Figure G2 Employment in the ICT sector, by industry

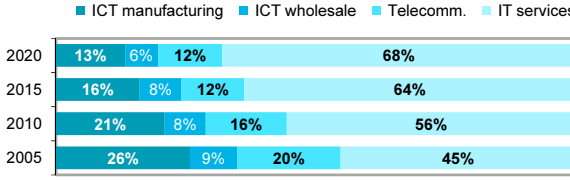


Figure G3 Employment in the ICT sector, by ownership; 2020

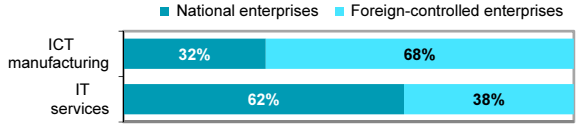
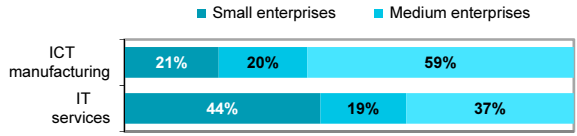


Figure G4 Employment in the ICT sector, by size; 2020



Source: CZSO, Structural Business Statistics

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

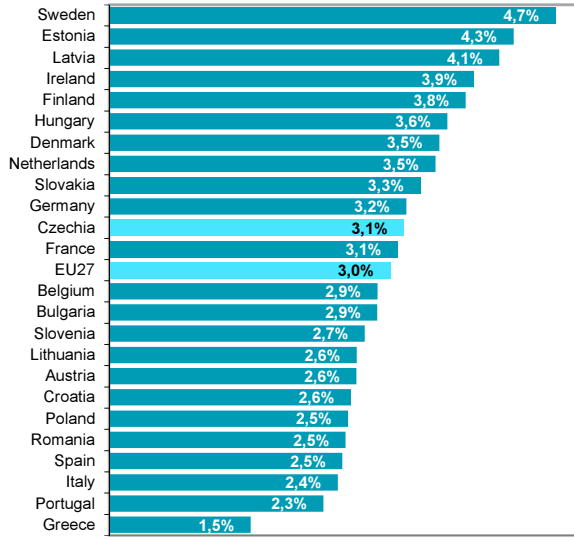
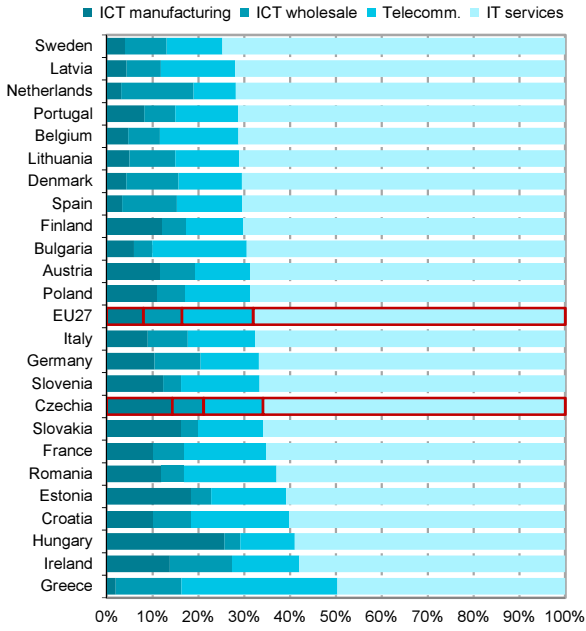


Figure G6 Employment in the ICT sector, by industry; 2018



Source: CZSO calculations based on the Eurostat SBS database

Figure G7 Employment in ICT manufacturing in Czechia

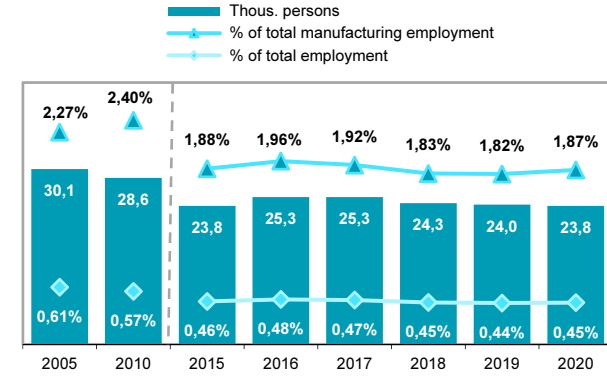


Figure G8 Employment in Telecommunications in Czechia

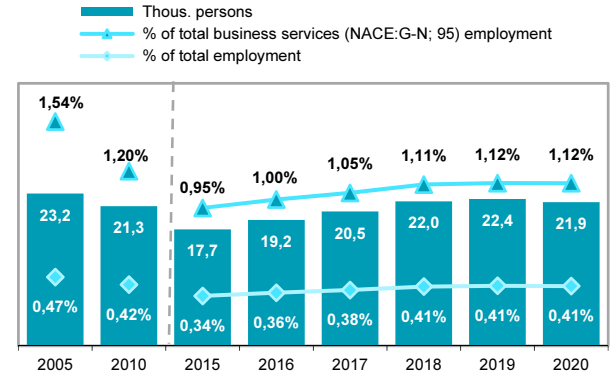
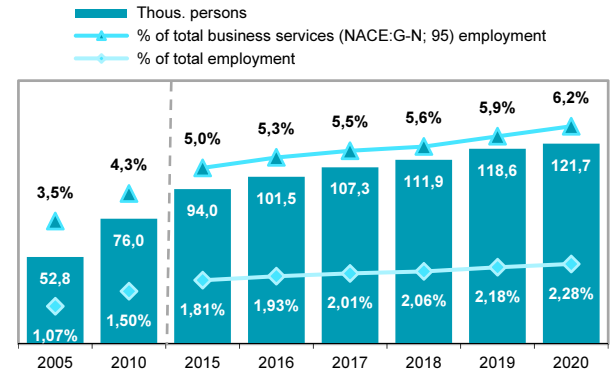


Figure G9 Employment in IT services in Czechia



Source: CZSO, Structural Business Statistics

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

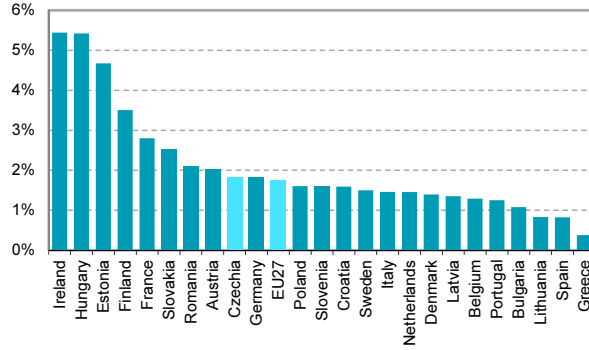


Figure G11 Employment in Telecommunications; 2018
(% of total business enterprise sector employment)

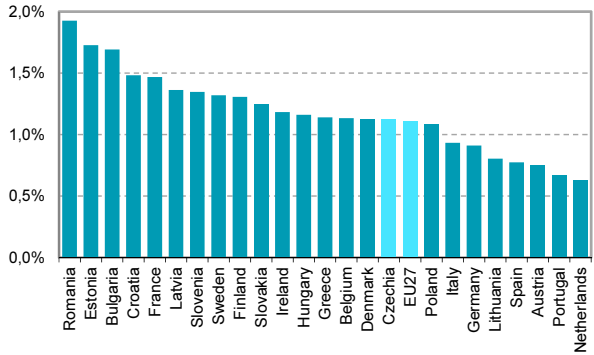
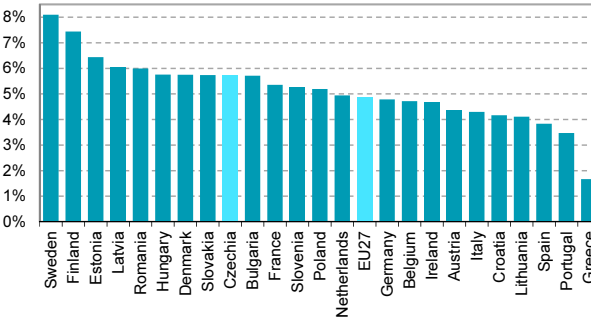


Figure G12 Employment in IT services; 2018
(% of total business enterprise sector employment)



Source: CZSO calculations based on the Eurostat SBS database

Table G2 Turnover in the ICT sector in Czechia

CZK million

	2018	2019	2020
Total	**847 611**	**899 422**	**914 046**
ICT manufacturing, total	**260 301**	**255 587**	**248 362**
Manufacture of electronic components	16 002	18 181	18 618
peripheral equipment	191 655	185 728	180 372
Manuf. of communication equipment	17 416	18 321	17 512
Manufacture of consumer electronics	35 229	33 357	31 861
ICT services, total	**587 310**	**643 835**	**665 684**
ICT wholesale	162 408	174 289	175 091
Telecommunications	127 568	132 752	131 530
IT services	297 334	336 794	359 063

Figure G13 Turnover in the ICT sector

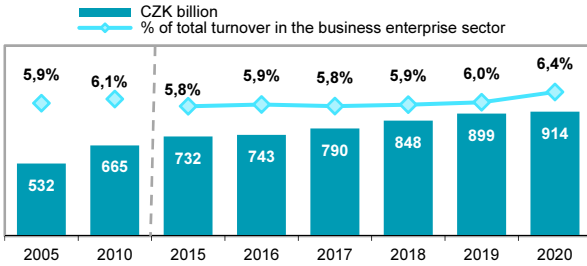


Figure G14 Turnover in the ICT sector, by industry

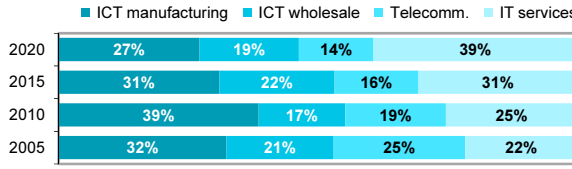


Figure G15 Turnover in the ICT sector, by ownership; 2020

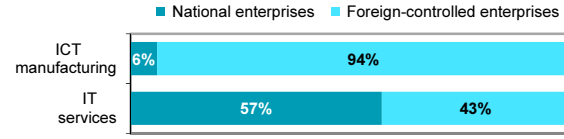
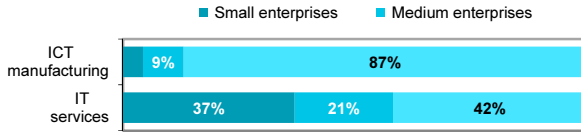


Figure G16 Turnover in the ICT sector, by size; 2020



Source: CZSO, Structural Business Statistics

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

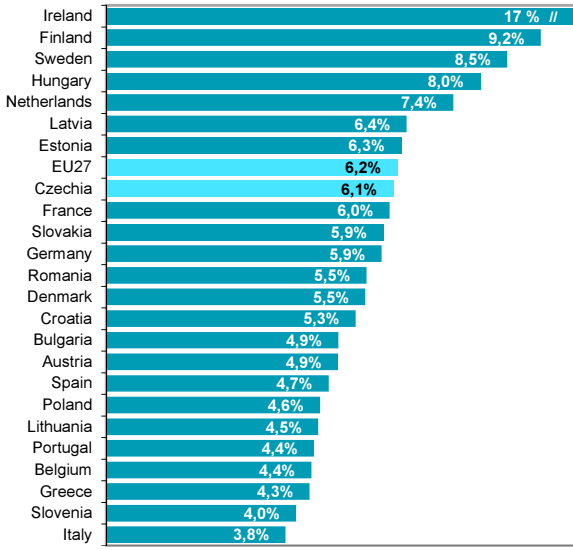
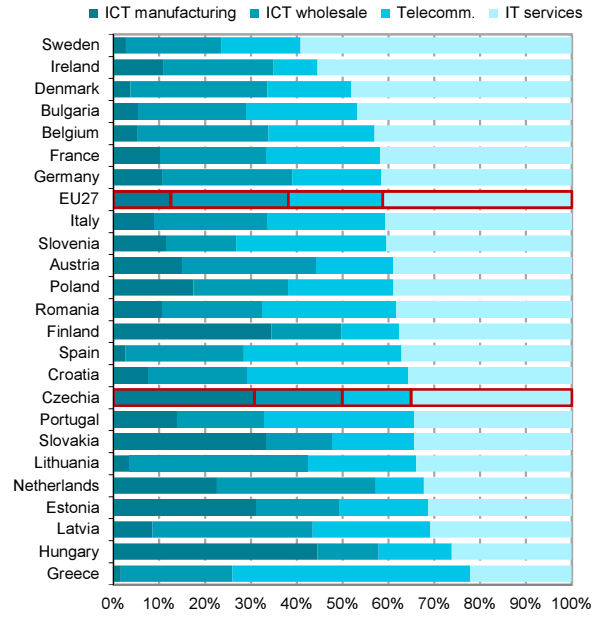


Figure E18 Turnover in the ICT sector, by industry; 2018 (%)



Source: CZSO calculations based on the Eurostat SBS database

Figure G19 Turnover in ICT manufacturing in Czechia

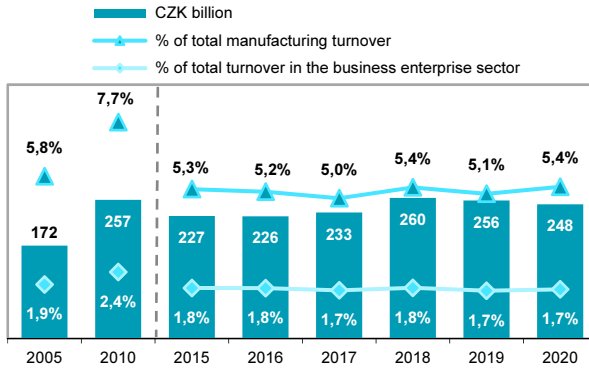


Figure G20 Turnover in Telecommunications in Czechia

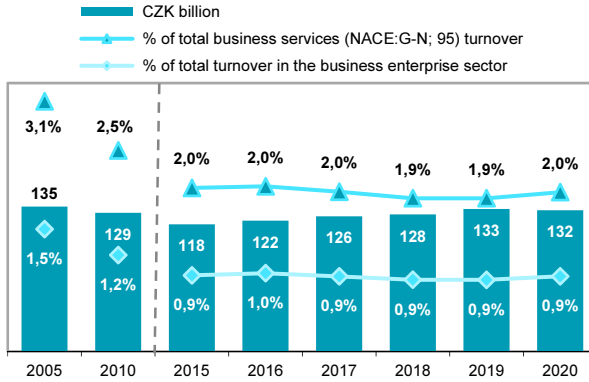
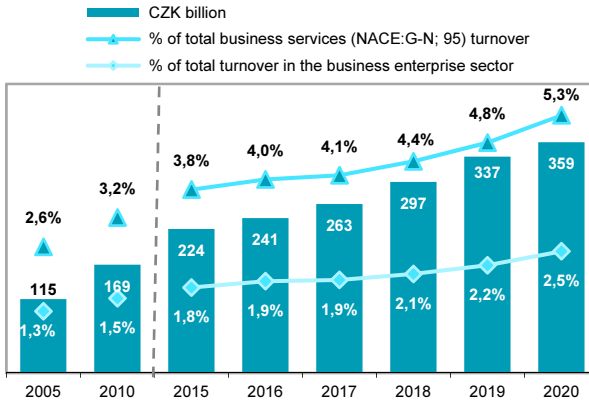


Figure G21 Turnover in IT services in Czechia



Source: CZSO, Structural Business Statistics

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

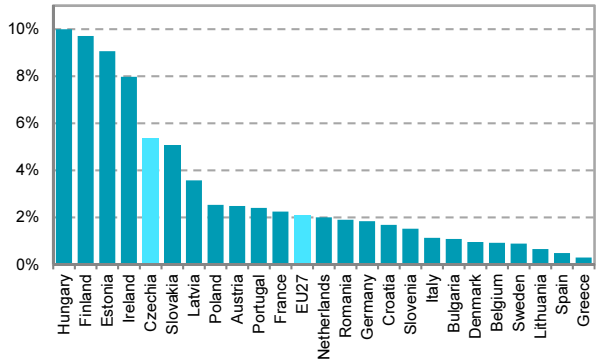


Figure G23 Turnover in Telecommunications; 2018
(% of total turnover in the business enterprise sector)

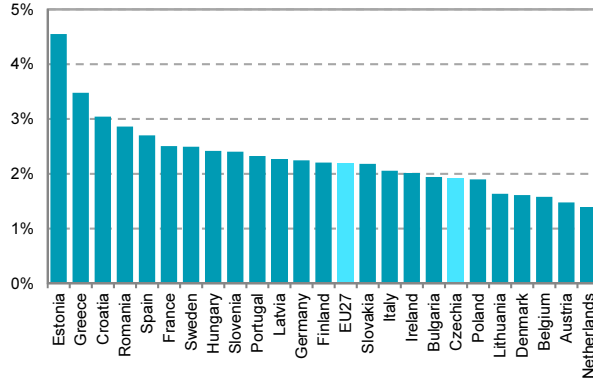
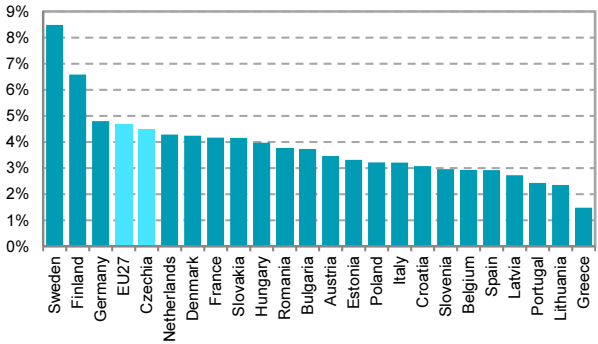


Figure G24 Turnover in IT services; 2018
(% of total turnover in the business enterprise sector)



Source: CZSO calculations based on the Eurostat SBS database

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

CZK million

	2018	2019	2020
Total	**13 495**	**14 600**	**16 739**
ICT manufacturing, total	**591**	**902**	**999**
Manufacture of electronic components	241	497	593
peripheral equipment	14	14	27
Manuf. of communication equipment	299	337	342
Manufacture of consumer electronics	38	53	37
ICT services, total	**12 903**	**13 698**	**15 740**
ICT wholesale	86	234	225
Telecommunications	801	377	983
IT services	12 017	13 087	14 533

Figure G25 R&D expenditure in the ICT sector

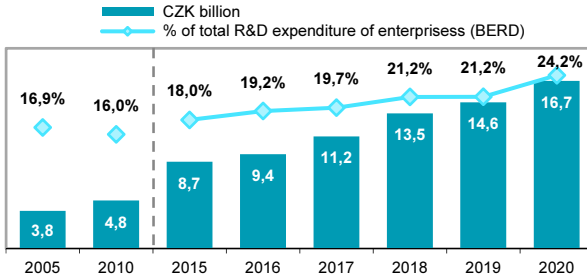


Figure G26 R&D expenditure in the ICT sector, by industry

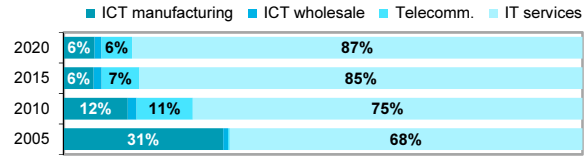


Fig.G27 R&D expenditure in the ICT sector, by ownership; 2020

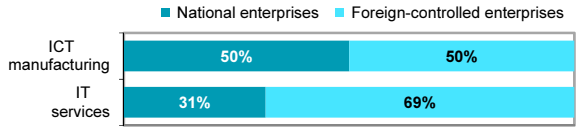
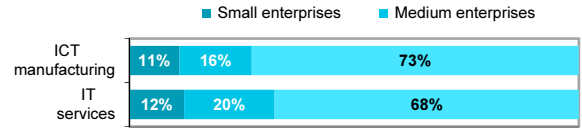


Figure G28 R&D expenditure in the ICT sector, by size; 2020



Source: CZSO, Annual R&D survey

Figure G29 R&D expenditure in the ICT sector; 2019
(% of total R&D expenditure of enterprises)

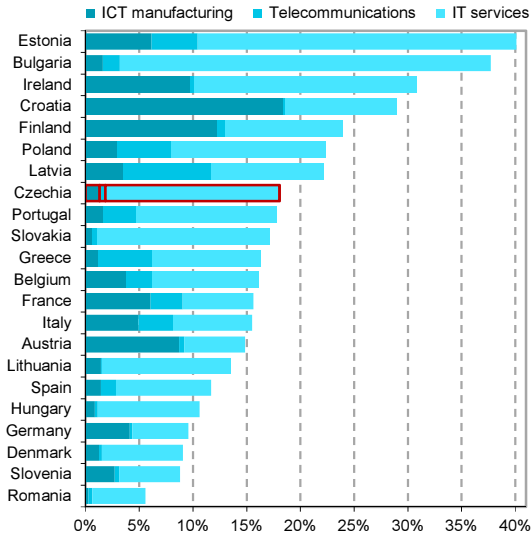
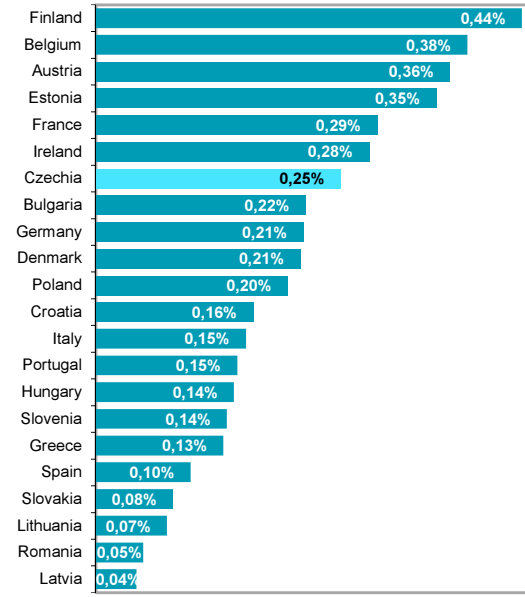


Figure G30 R&D expenditure in the ICT sector; 2019
(% of GDP)



Source: CZSO calculations based on the Eurostat STI Database

Figure G31 R&D expenditure in ICT manufacturing in Czechia

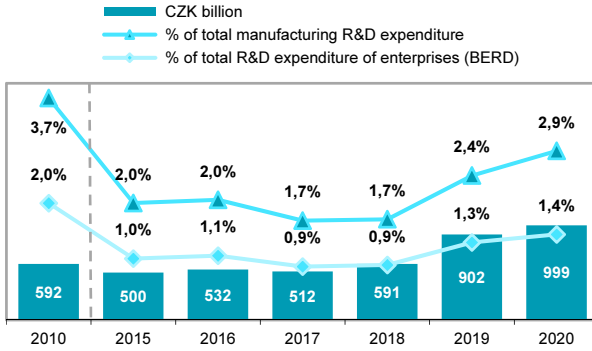


Figure G32 R&D expenditure in Telecommunications in Czechia

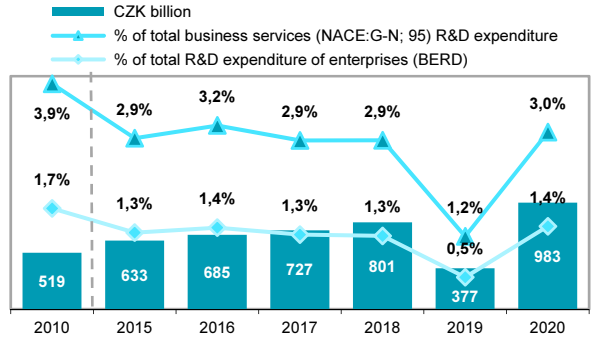
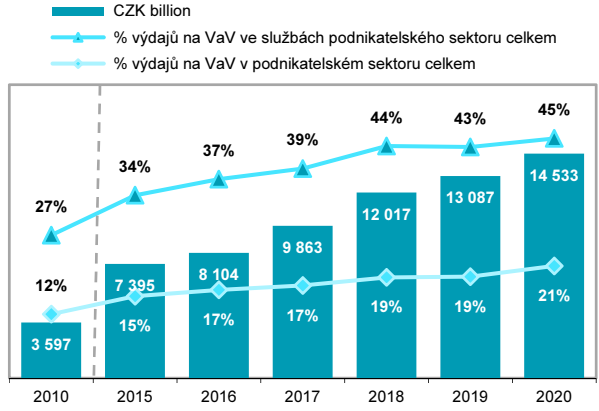


Figure G33 R&D expenditure in IT services in Czechia



R&D - Research and development

Source: CZSO, Annual R&D survey

Figure G34 R&D expenditure in ICT manufacturing; 2019
(% of total manufacturing R&D expenditure)

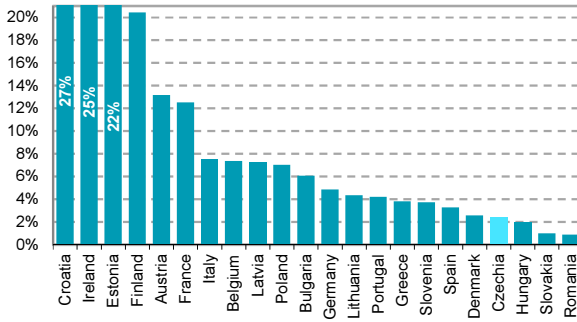


Figure G35 R&D expenditure in Telecommun.; 2019
(% of total R&D expenditure of enterprises)

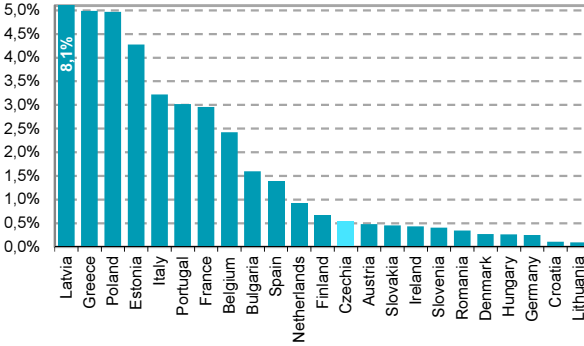
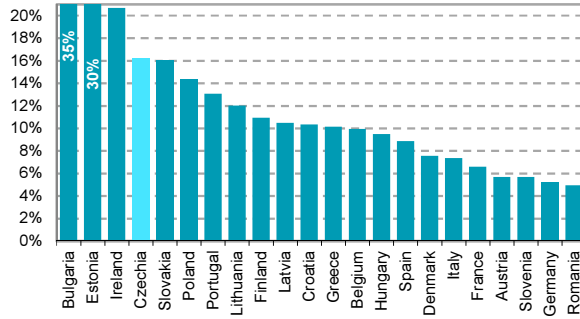


Figure G36 R&D expenditure in IT services; 2019
(% of total R&D expenditure of enterprises)



Source: CZSO calculations based on the Eurostat STI Database