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INFORMATION ECONOMY IN FIGURES

2017

CZECH REPUBLIC AND WORLD

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Introduction

The role of **information and communication technologies (ICT)** has received considerable attention in the last decade or so due to their exceptional role in enhancement of economic growth and social change. Even though the production and the expansion of ICT varies significantly among countries, a general agreement prevails that it is necessary to collect reliable and comprehensive ICT indicators in order to assess the impact of these technologies on growth, productivity or innovation.

The aim of **ICT statistics** is, on one hand, to provide data on the production of advanced ICTs, including data on investments, external trade or qualified human resources in this field **(information economy)** and, on the other hand, to track data on the penetration and usage of these technologies in particular sectors of society such as households, enterprise sector or public administration **(information society).**

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

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

- Chapter A: **'ICT specialists'** provides population estimates both ICT professionals and ICT technicians together with their average monthly gross earnings. Data on the **university students of ICT** and **university graduates in the field of ICT** is also included there.
- Chapter B: **'ICT expenditure and investment'** includes information about total ICT investment and about household consumption expenditures on ICT equipment and services.
- Chapter C: **'ICT research and development'** provides both data on the total financial resources invested in research and development of 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.
- Chapter D: **'ICT external trade'** includes detail data about exports and imports both in the ICT goods and ICT services.
- Chapter E: **'ICT sector'** consists of main economic indicators for industries that are primarily engaged in the production of ICT goods and services.

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.

Whenever possible, the data used in this brochure are based on the standards included in **The OECD Guide to Measuring the Information Society** (Paris, 2011). This publication summarizes the statistical standards and definitions developed by the OECD Working Party on Indicators for the Information Society.

If you need any further information, do not hesitate to contact us directly. Your suggestions will be incentives for future releases.

In Prague, December 2017

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Department of Research, Development and Information Society Statistics

A ICT specialists

A.1 ICT specialists

ICT specialists are **defined** as those individuals employed in "tasks related to developing, maintaining and operating ICT systems and where ICTs are the main part of their job".

The occupations of ICT specialists are subdivided into **two major groups** while their classification is based on the Classification of Occupations (CZ-ISCO) the corresponding national classification in the Czech Republic developed on the basis of the **International Standard Classification of Occupations (ISCO-08)**. The ICT specialists are assigned to the major groups, groups, and subgroups of the CZ-ISO based on recommendations of Eurostat and the International Labour Organisation (ILO) as follows:

- **ICT managers, professionals and engineers** include ICT service managers (133); Software and applications developers and analysts (251); Database and network professionals (252); ICT sales professionals (2434) and Electronics and Telecommunications (ICT) engineers (2152+2153).
- **ICT technicians, installers and servicers** include ICT operations and user support technicians (351); Telecommunications and broadcasting technicians (352); Electronics engineering technicians (3114) and Electronics and telecommunications (ICT) installers and servicers (742).

Data on the **employment** of ICT specialists come from the **Labour Force Sample Survey (LFS)** of the Czech Statistical Office (CZSO). Tables present average annual data for given years. Data since 2011 are not fully comparable with data for the previous years because of transition to the ICT specialists' definition by the CZ-ISCO in 2011. Further information on the Czech LFS can be found at:
https://www.czso.cz/csu/czso/employment-and-unemployment-as-measured-by-labour-force-survey-annual-averages

The **Eurostat Labour Force Survey Database** was used as a data source for the international comparison. For more information see:
http://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey

Data on **earnings** (**average monthly gross wages)** of ICT specialists come from the **Structural Earnings Statistics (SES)** and are available in a comparable time series since the ref. year 2012. For further information see: https://www.czso.cz/csu/czso/structure-of-earnings-survey-2016

Further information on ICT specialists can be found at (only in Czech)**:**
https://www.czso.cz/csu/czso/ict-odbornici

A.2 ICT students and graduates

Education at universities presented in the tables for the Czech Republic belongs to the tertiary level of education and includes a **bachelor** (ISCED level 6), **master** (ISCED level 7), and **doctoral** (ISCED level 8) **study programme** of all public and private universities.

Numbers of ICT students and graduates are based on the International Classification of Education (**ISCED-F 2013**), broad field code **06 Information and Communication Technologies.**

Data on ICT field of education come from the **Ministry of Education, Youth and Sports (MEYS)** from the Union Information from Students' Registers (the "**SIMS**").

Eurostat data sources are used for **international comparisons**.

A ICT specialists

Table A1 ICT specialists in the Czech Republic

Thousand persons

	2015	2016
Total	**173,9**	**185,3**
of which female ICT specialists	16,6	17,5
Occupation		
ICT managers, professionals and engineers, total	**86,3**	**88,5**
of wchich Software and apps developers and analysts	45,2	46,7
ICT technicians, installers and servicers, total	**87,9**	**96,8**
of which ICT operations and user support technicians	48,6	51,9
Age group		
20-29 years	37,3	38,3
30-39 years	63,4	68,1
40-49 years	44,5	45,1
50+ years	28,6	33,5
Highest level of education attainment		
Tertiary	97,7	103,9
Secondary with A-level examination	68,4	70,6
Other (lower)	7,8	10,8

Figure A1 ICT specialists, total

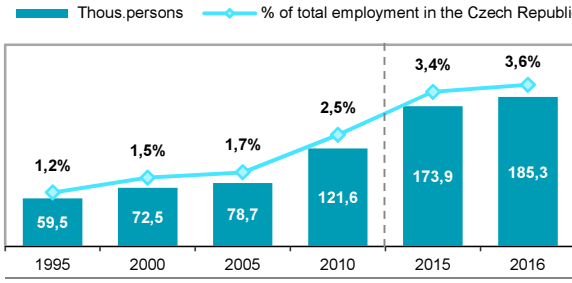
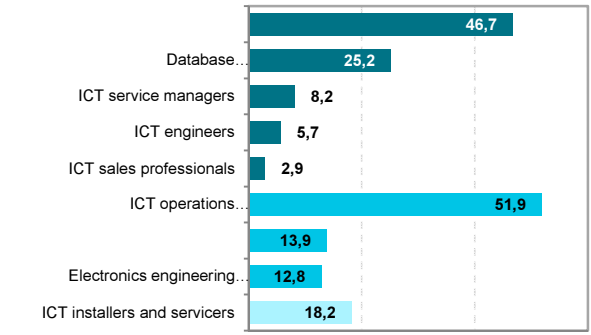


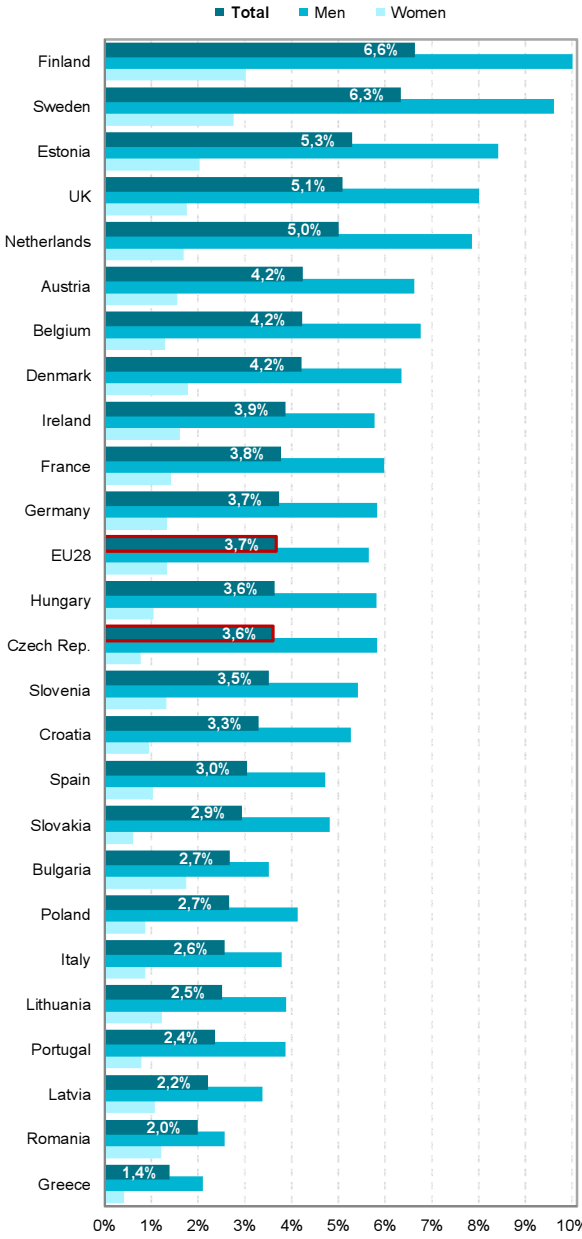
Figure A2 ICT specialists by occupation (thous.); 2016



Source: CZSO, Labour Force Survey

A ICT specialists

Figure A3 ICT specialists in EU countries; 2016
(as a percentage of total, men and women emloyment)



Source: CZSO calculation based on Eurostat Labour Force Survey Database

A ICT specialists

Table A2 ICT managers, professionals and engineers in the Czech Republic

Thousand persons

	2014	2015	2016
Total	**84,2**	**86,3**	**88,6**
Women	8,2	8,8	8,7
Occupation			
ICT professionals, total (ISCO 25)	**63,4**	**66,6**	**71,9**
Software and apps developers and analysts	45,0	45,2	46,7
Database and network professionals	18,4	21,4	25,2
Other ICT managers, profess. and engineers	**20,3**	**19,7**	**16,7**
Age group			
20-29 years	16,0	17,1	17,6
30-39 years	31,8	32,5	35,4
40-49 years	18,9	22,5	21,1
50+ years	17,4	14,3	14,2
Highest level of education attainment			
Master's and Doctoral	59,2	60,9	62,8
Bachelor's and Higher professional	12,4	11,5	11,7
Other (lower)	12,6	13,6	14,0

Figure A4 ICT professionals, total (ISCO 25)

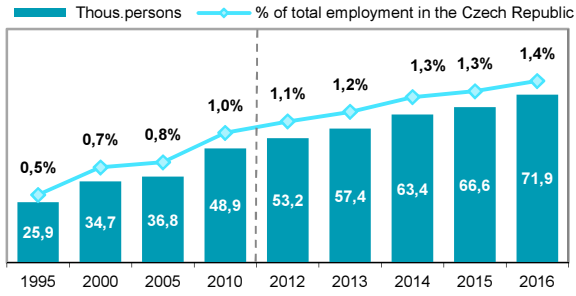


Figure A5 ICT professionals, total (ISCO 25) by sex

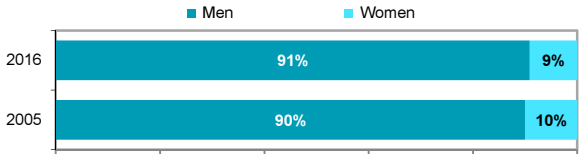
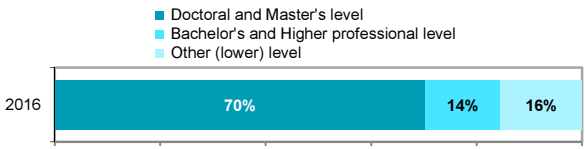


Figure A6 ICT professionals (ISCO 25) by education



Source: CZSO, Labour Force Survey

Figure A7 ICT Professionals in EU countries; 2016 (as percentage of total employment)

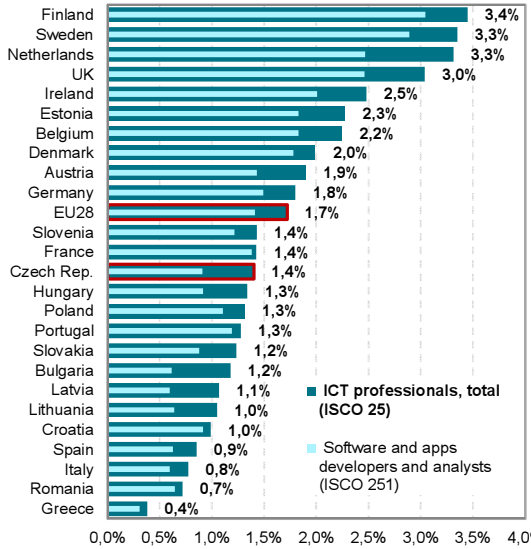
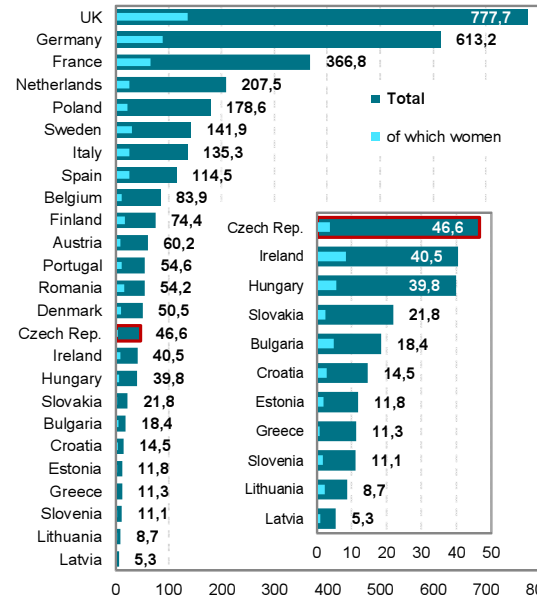


Figure A8 Software and apps developers and analysts; 2016 (Thous.persons)



Source: CZSO calculation based on Eurostat Labour Force Survey Database

A ICT specialists

Table A3 ICT technicians, installers and servicers in the Czech Republic

Thousand persons

	2015	2016
Total	**87,9**	**96,8**
of which women	7,9	8,9
Occupation		
ICT technicians, total (ISCO 35)	**61,5**	**65,7**
ICT operations and user support technicians	48,6	51,9
Telecommunications and broadcasting technicians	12,9	13,9
Other ICT technicians, installers and servicers	**26,4**	**31,1**
Age group		
20-29 years	20,3	20,6
30-39 years	30,9	32,6
40-49 years	22,1	24,0
50+ years	14,6	19,5
Highest level of education attainment		
Tertiary	25,2	29,4
Secondary with A-level examination	55,8	58,2
Other (lower)	6,9	9,2

Figure A9 ICT technicians, total (ISCO 35)

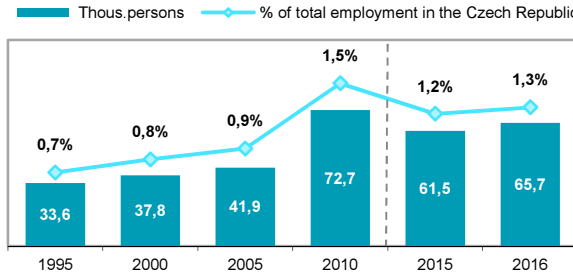


Figure A10 ICT technicians, total (ISCO 35) by sex

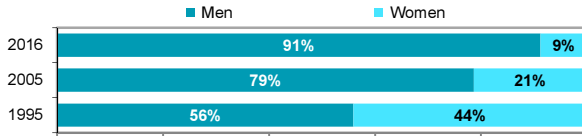
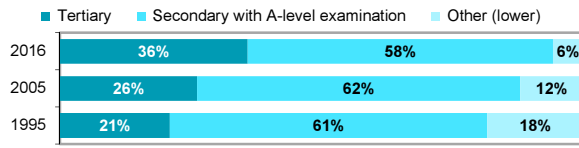


Figure A11 ICT technicians, total by education



Source: CZSO, Labour Force Survey

Figure A12 ICT technicians in EU countries; 2016 (as percentage of total employment)

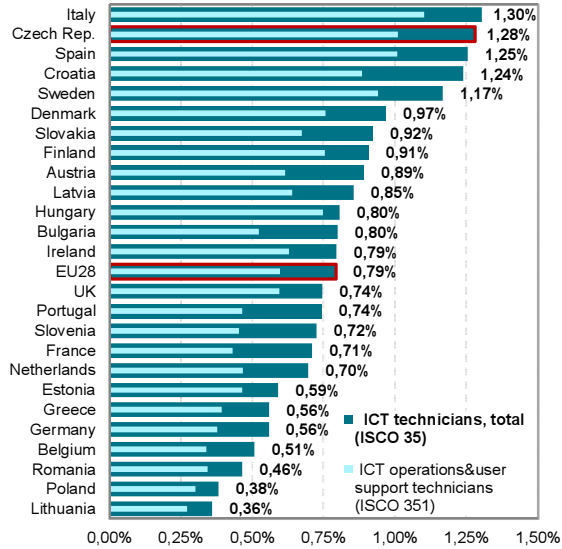
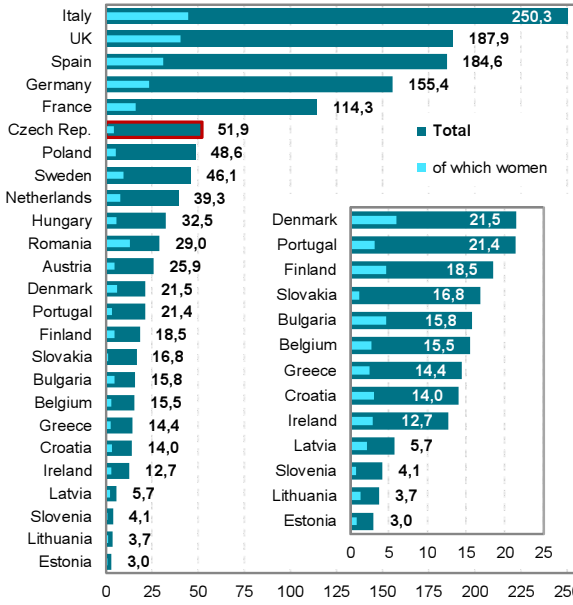


Figure A13 ICT operations and user support technicians; 2016 (Thous. persons)



Source: CZSO calculation based on Eurostat Labour Force Survey Database

A ICT specialists

Table A4 Earnings of ICT professionals in the Czech Republic

average gross monthly earnings (wage) in CZK

	2014	2015	2016
Total (CZ ISCO 25)	**49 259**	**51 319**	**53 241**
Men	50 206	52 296	54 325
Women	42 381	43 701	45 369
Sphere of activity (earnings)			
Business (wage sphere)	50 558	52 643	54 391
Government (salary sphere)	32 006	33 607	35 422
Age group			
under 24 years	27 669	28 393	30 237
25-34 years	45 124	47 296	48 582
35-44 years	56 903	58 751	60 624
45-54 years	50 431	52 543	55 882
55+ years	45 441	46 338	49 522
Highest level of education attainment			
Master's and Doctoral	54 387	56 172	58 831
Bachelor's and Higher professional	43 611	46 238	48 644
Secondary with A-level examination	43 324	44 930	47 751

Figure A14 Earnings of ICT professionals by sphere of activity

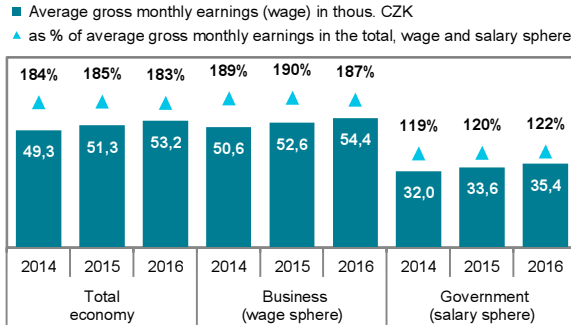
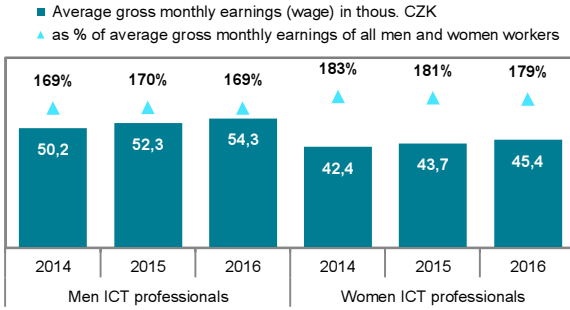


Figure A15 Earnings of ICT professionals by sex



Source: CZSO, Structural Earnings Statistics

Table A5 Earnings of ICT professionals in the Czech Republic according to their occupation and industry

average gross monthly earnings (wage) in CZK

	2014	2015	2016
Total (CZ ISCO 25)	**49 259**	**51 319**	**53 241**
Selected occupation (ISCO unit groups)			
Systems analysts (ISCO 2511)	54 708	56 843	58 868
Software developers (ISCO 2512)	53 722	55 216	58 049
Applications programmers (ISCO 2514)	47 140	49 620	51 210
Database designers and admin.(ISCO 2521)	44 868	47 001	49 319
Systems administrators (ISCO 2522)	43 118	45 306	47 432
Data security specialists (ISCO 2524)	58 068	58 789	61 073
Selected industries (NACE Sections)			
Manufacturing (NACE: C)	43 760	45 769	46 246
Wholesale and retail trade (NACE: G)	40 631	40 868	41 938
Information and communication (NACE: J)	54 238	56 457	57 786
Financial and insurance activities (NACE: K)	59 932	61 962	64 436
Public administration (NACE: O)	33 055	34 929	36 657
Education (NACE: P)	35 442	35 763	37 421
Human health and social work act. (NACE: Q)	35 237	36 649	37 713

Figure A16 Average gross monthly wage of ICT professionals in selected occupations (CZK thousand)

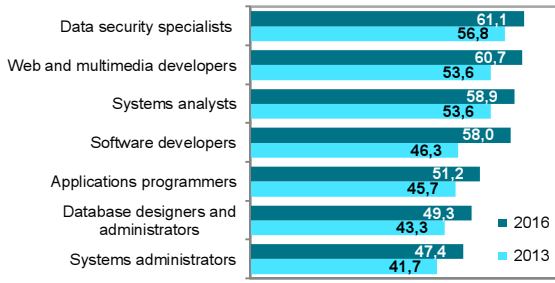
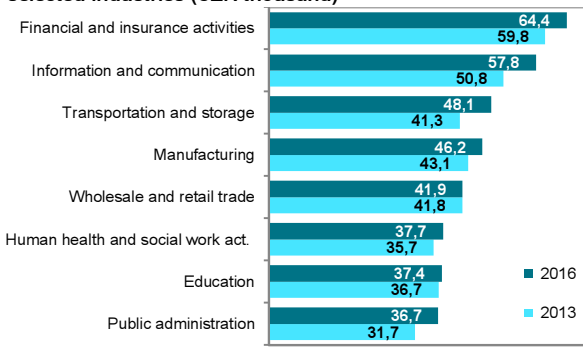


Figure A17 Average gross monthly wage of ICT professionals in selected industries (CZK thousand)



Source: CZSO, Structural Earnings Statistics

Table A6 Earnings of Software and applications developers and analysts in the Czech Republic

average gross monthly earnings (wage) in CZK

	2014	2015	2016
Total (CZ ISCO 251)	**50 909**	**53 075**	**55 404**
Men	51 923	54 062	56 531
Women	43 596	45 245	47 313
Sphere of activity (earnings)			
Business (wage sphere)	51 493	53 662	55 916
Government (salary sphere)	33 567	35 077	37 206
Age group			
25-34 years	46 621	48 513	50 215
35-44 years	60 253	62 326	65 529
45-54 years	51 282	53 637	58 844
55+ years	45 941	47 162	52 483
Highest level of education attainment			
Master's and Doctoral	55 291	57 285	60 297
Bachelor's and Higher professional	45 064	47 294	50 087
Secondary with A-level examination	44 747	46 164	49 530

Figure A18 Average gross monthly wage of software and apps developers and analysts by sphere of activity (CZK thous.)

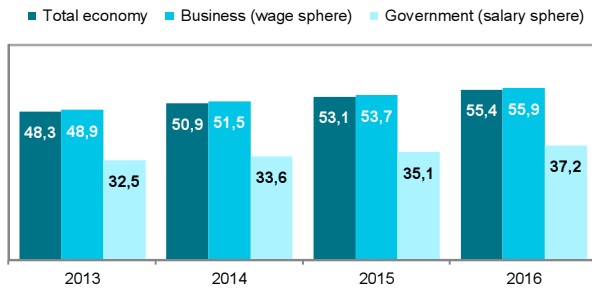
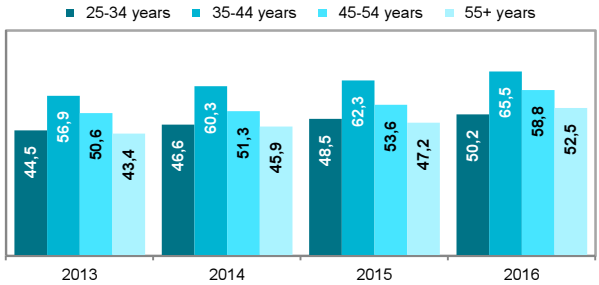


Figure A19 Average gross monthly wage of software and apps developers and analysts by age (CZK thous.)



Source: CZSO, Structural Earnings Statistics

Table A7 Earnings of ICT operations and user support technicians in the Czech Republic

average gross monthly earnings (wage) in CZK

	2014	2015	2016
Total (CZ ISCO 351)	**36 080**	**36 724**	**38 376**
Men	36 657	37 297	38 953
Women	32 282	32 899	34 574
Sphere of activity (earnings)			
Business (wage sphere)	36 877	37 437	39 126
Government (salary sphere)	27 047	28 377	29 883
Age group			
25-34 years	33 626	33 884	36 006
35-44 years	39 492	40 234	41 894
45-54 years	35 939	37 771	39 979
55+ years	38 587	38 352	38 370
Highest level of education attainment			
Master's and Doctoral	43 325	44 126	46 541
Bachelor's and Higher professional	35 143	37 345	40 499
Secondary with A-level examination	32 936	33 150	34 722
Secondary without A-level examination	29 017	29 781	29 540

Figure A20 Average gross monthly wage of ICT operations and user support technicians by sphere of activity (CZK thous.)

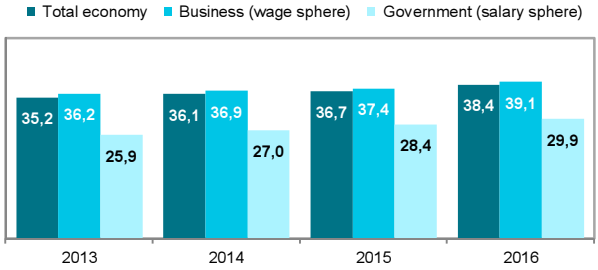
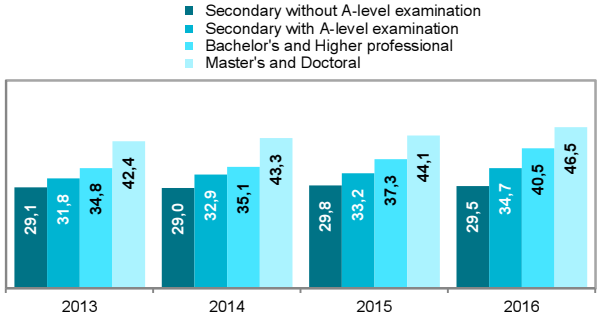


Figure A21 Average gross monthly wage of ICT operations and user support technicians by education (CZK thous.)



Source: CZSO, Structural Earnings Statistics

Table A8 University students of ICT in the Czech Republic

number of students

	2014	2015	2016
Total	**18 175**	**17 757**	**17 251**
of which 25 years and older	4 441	4 508	4 424
Gender			
Men	15 606	15 162	14 543
Women	2 569	2 595	2 708
Study programme			
Bachelor (ISCED level 6)	12 260	11 994	11 787
Master (ISCED level 7)	4 979	4 811	4 574
Doctoral (ISCED level 8)	945	963	899
Nationality			
Czech	14 365	13 676	12 937
Foreigners	3 810	4 081	4 314

ICT - Information and Communication Technologies field of study refers to the ISCED-F 2013 broad field of education code 06.

Figure A22 University students of ICT field of education

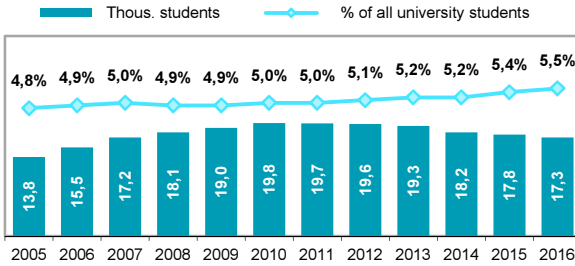


Figure A23 University students of ICT by gender

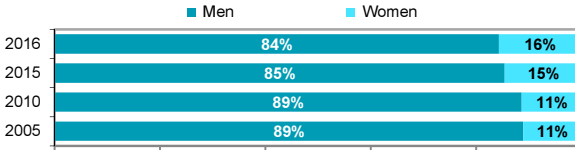


Figure A24 University students of ICT by nationality

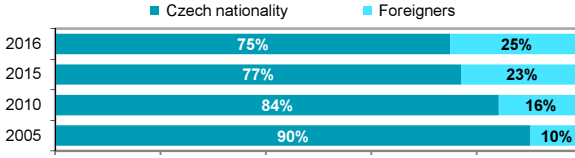
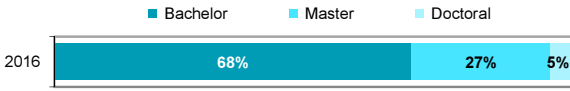


Figure A25 University students of ICT by study programme



Source: CZSO calculation based on MEYS database

Figure A26 ICT tertiary students*; 2015
(as a percentage of all tertiary students*)

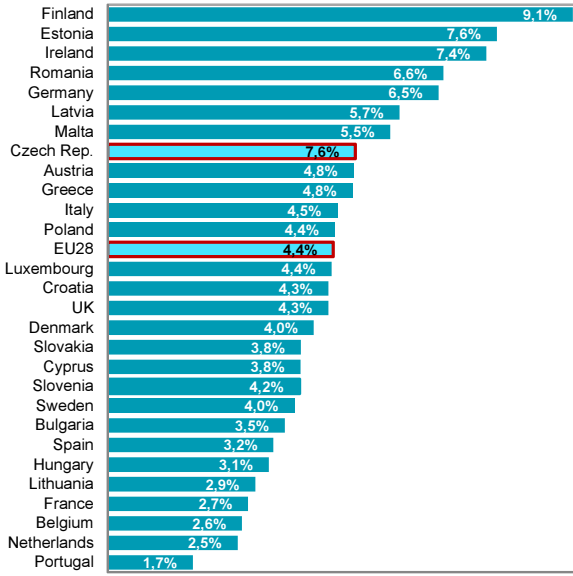
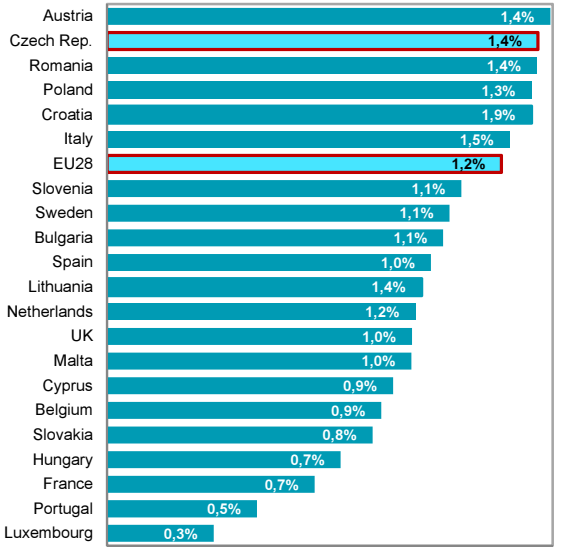


Figure A27 ICT tertiary students*; 2015
(as percentage of population aged 20 to 29 years)



* Tertiary education comprises here only ISCED-2011 classification levels 6 (Bachelor or equivalent level) and 7 (Master or equivalent level).

Source: CZSO calculation based on Eurostat database

Table A9 ICT students in bachelor programmes in the Czech Republic

number of students

	2014	2015	2016
Total	**12 260**	**11 994**	**11 787**
of which 25 years and older	1 512	1 643	1 650
Gender			
Men	10 392	10 178	9 878
Women	1 868	1 816	1 909
Nationality			
Czech	9 819	9 355	8 942
Foreigners	2 441	2 639	2 845

Figure A28 Bachelor's students of ICT - Total

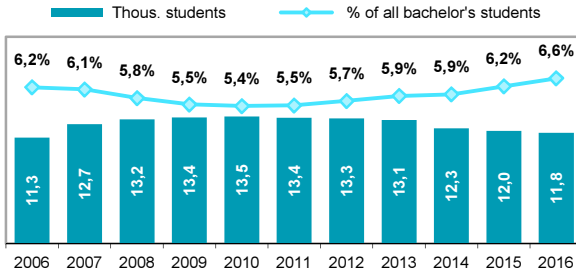


Figure A29 Bachelor's students of ICT - Men

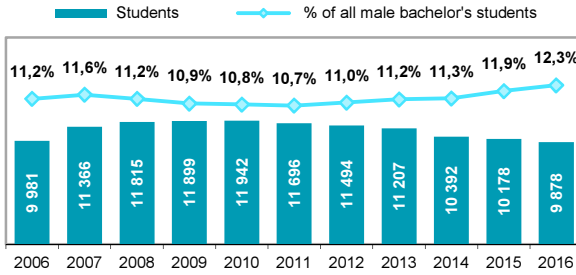
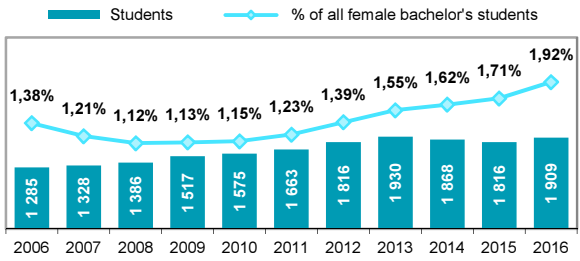


Figure A30 Bachelor's students of ICT - Women



Source: CZSO calculation based on MEYS database

Figure A31 ICT students in bachelor programmes*; 2015
(Thousand students)

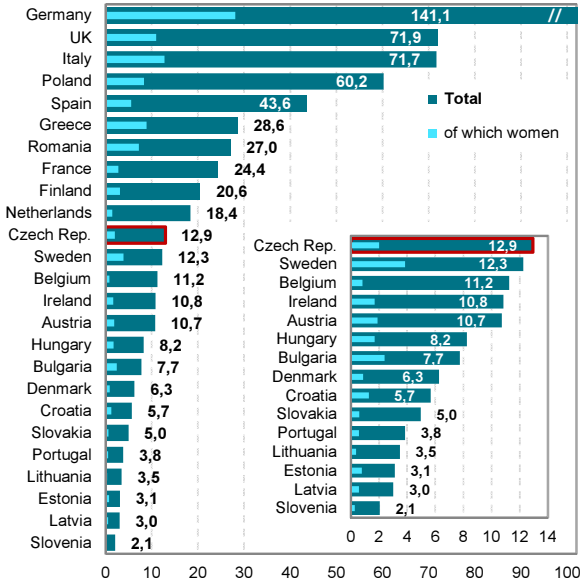
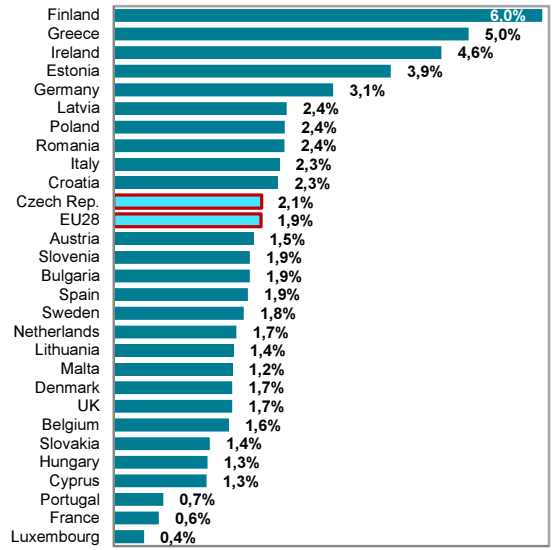


Figure A32 ICT students in bachelor programmes*; 2015
(% of population aged 20 to 24 years)



* ISCED level 6

Source: CZSO calculation based on Eurostat database

Table A10 ICT students in master programmes in the Czech Republic

number of students

	2014	2015	2016
Total	**4 979**	**4 811**	**4 574**
of which 25 years and older	2 038	1 956	1 920
Gender			
Men	4 388	4 149	3 889
Women	591	662	685
Nationality			
Czech	4 058	3 839	3 543
Foreigners	921	972	1 031

Figure A33 Master's students of ICT - Total

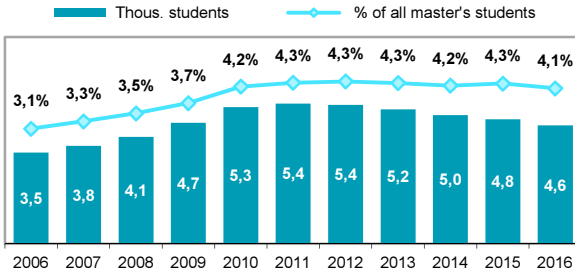


Figure A34 Master's students of ICT - Women

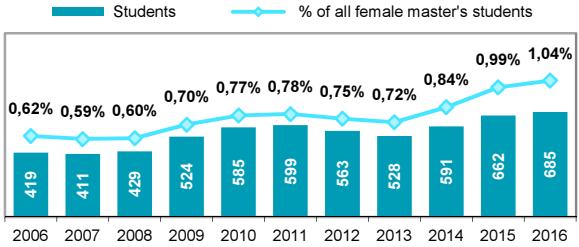
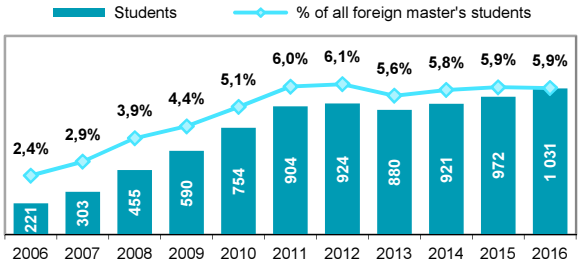


Figure A35 Master's students of ICT - Foreigners



Source: CZSO calculation based on MEYS database

Figure A36 ICT students in master programmes*; 2015
(Thousand students)

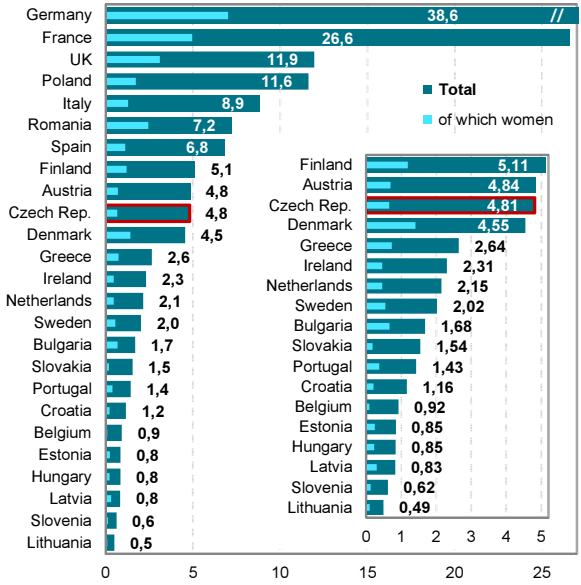
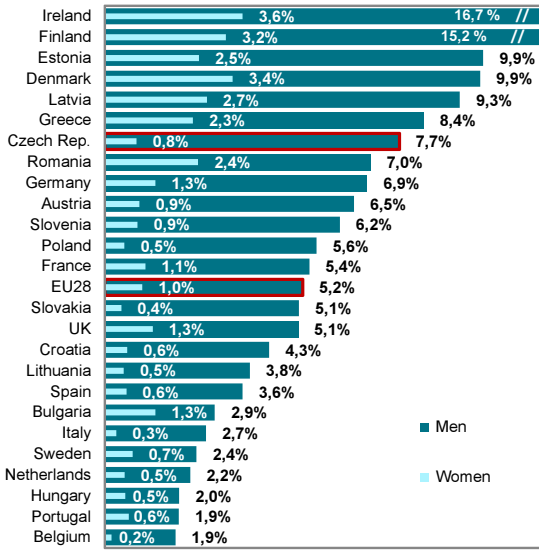


Figure A37 ICT students in master programmes*; 2015
(% of all students in master programmes)



* ISCED level 7

Source: CZSO calculation based on Eurostat database

Table A11 University graduates in ICT in the Czech Republic

number of graduates

	2014	2015	2016
Total	**3 764**	**3 638**	**3 463**
Men	3 314	3 161	2 951
Women	450	477	512
Study programme			
Bachelor (ISCED level 6)	2 107	2 059	1 874
Master (ISCED level 7)	1 589	1 503	1 504
Doctoral (ISCED level 8)	69	76	85
Nationality			
Czech	3 133	2 934	2 750
Foreigners	631	704	713

Figure A38 Graduates in ICT bachelor programmes

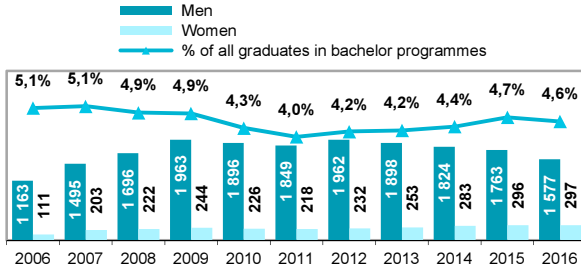


Figure A39 Graduates in ICT master programmes

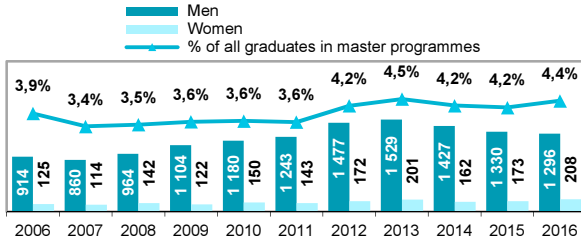
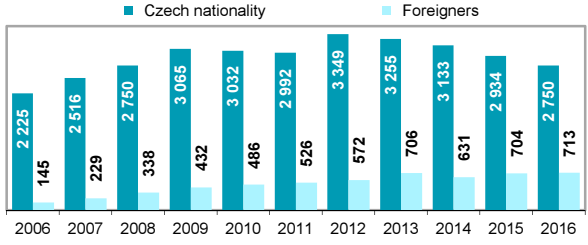


Figure A40 University graduates in ICT by nationality



Source: CZSO calculation based on MEYS database

Figure A41 Graduates in ICT bachelor programmes *; 2015 (Thousand persons)

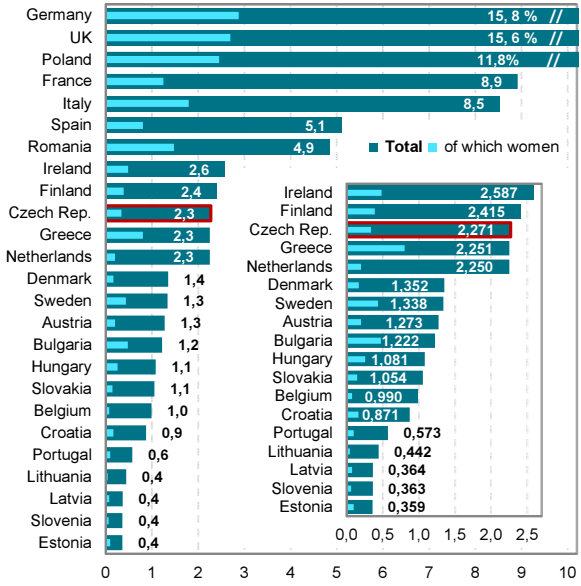
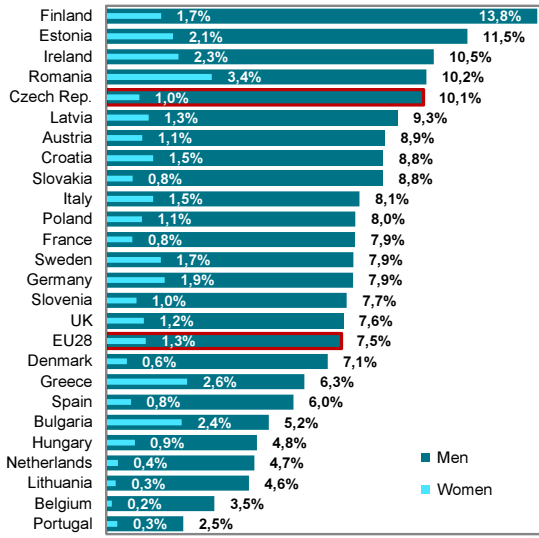


Figure A42 Graduates in ICT bachelor programmes *; 2015 (% of all graduates in bachelor programmes)



* ISCED level 6

Source: CZSO calculation based on Eurostat database

Figure A43 Graduates in ICT master programmes*; 2015 (Thousand persons)

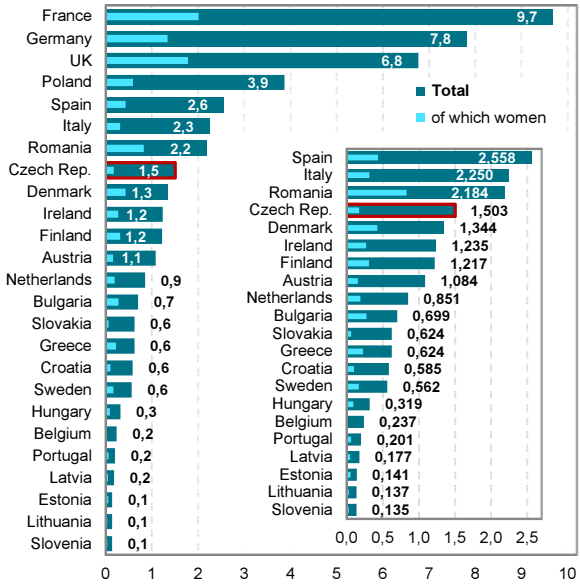
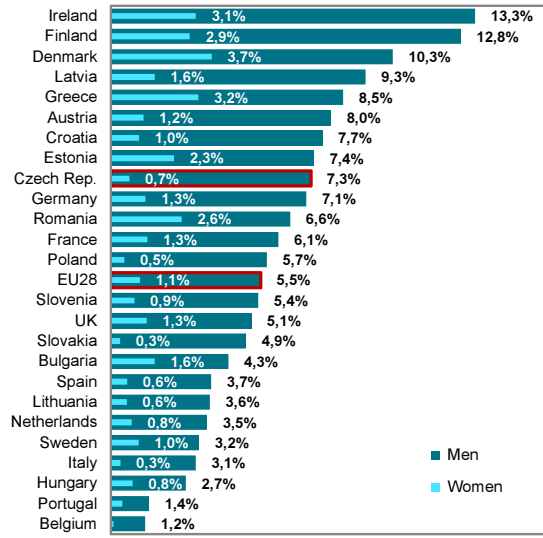


Figure A44 Graduates in ICT master programmes*; 2015 (% of all graduates in master programmes)



* ISCED level 7

Source: CZSO calculation based on Eurostat database

B ICT expenditure and investment

B. 1 Investment in ICT equipment and software

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

ICT investment has **three components**: **information technology (IT) equipment** (computers and related hardware), **communications equipment** and computer software and databases (hereafter **software)**. Software includes acquisition of pre-packaged software, customized software and software developed in-house (own-account software).

ICT assets can be also classified to the groups of the **Classification of Products by Activity (CZ-CPA)** as follows:

- **ICT equipment:** Computers and peripheral equipment (26.2); Communication equipment (26.3) and Consumer electronics (26.4)
- **IT services (software):** Software publishing services (58.2); Computer programming, consultancy and related services (62.0) and Data processing, hosting and related services; web portals (63.1).

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

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

B. 2 Households expenditures on ICT equipment and ICT services

Data on the total ICT investment in this chapter are supplemented with data on **Final ICT consumption expenditure of households** The final consumption expenditure of households is recorded in international classification COICOP. This is a classification where individual items of consumption are divided according to its purpose.

ICT equipment and ICT services according to this classification include the following items*:*

- **ICT equipment:** Telephone and telefax equipment (08.2); Audio-visual, photographic and information processing equipment (09.1)
- **Telecommunication (ICT) services:** Telephone and telefax services (08.3). This category contains primarily payments for calls via landline, mobile phone and payments for Internet connection.

The both data, the total ICT investment and final household consumption expenditure on ICT equipment and ICT services come from the **Annual National Accounts Statistics** of the Czech Statistical Office. **2016 data are preliminary.** For more information see:
http://apl.czso.cz/pll/rocenka/rocenka.indexnu?mylang=EN

For the **international comparison OECD and Eurostat** data sources were used.

Further information on ICT investment can be found at (only in Czech)**:**
https://www.czso.cz/csu/czso/investice_v_ict

B ICT expenditure and investment

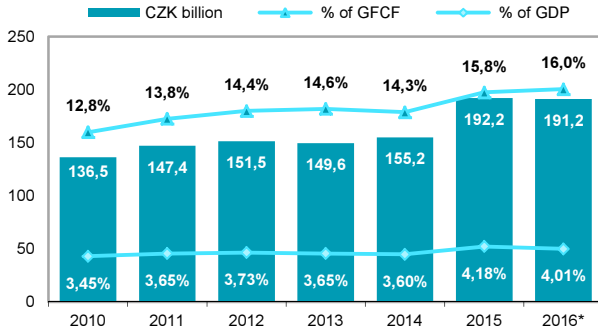
Table B1 ICT investment in the Czech Republic

CZK million

	2014	2015	2016*
Total	**155 156**	**192 247**	**191 226**
ICT equipment	77 338	95 977	93 238
Computer software and databases	77 818	96 270	97 988
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	951	808	2 284
Mining and quarrying	542	522	642
Manufacturing	44 469	53 940	65 374
Electricity, gas and water supply	4 524	5 372	7 143
Construction	2 986	3 246	4 013
Wholesale and retail trade	9 326	11 300	13 390
Transportation and storage	3 759	5 031	5 043
Accommodation and food service activities	1 535	1 650	1 742
Information and communication	41 599	49 744	40 451
Financial and insurance activities	13 569	19 217	20 657
Real estate activities	1 476	1 731	1 765
Professional, scientific and technical activ.	8 267	10 367	10 255
Administrative and support service activ.	1 482	1 964	2 174
Public administration and defence	9 902	12 484	7 104
Education	4 988	5 468	2 477
Human health and social work activities	3 768	6 274	3 865
Arts, entertainment and recreation	902	1 535	1 201
Other services	1 111	1 594	1 646

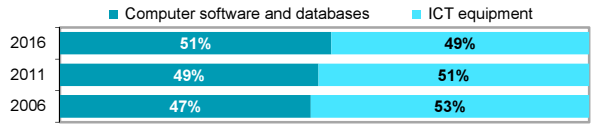
** Preliminary data*

Figure B1 Total ICT investment



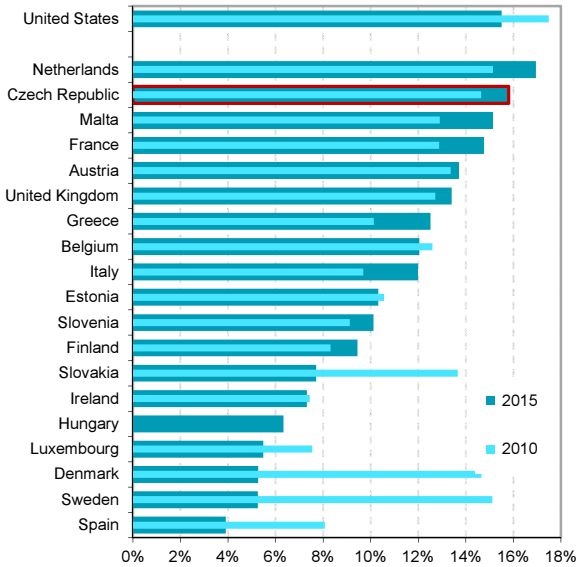
GFCF - Gross Fixed Capital Formation (total investment)

Figure B2 ICT investment by asset (%)



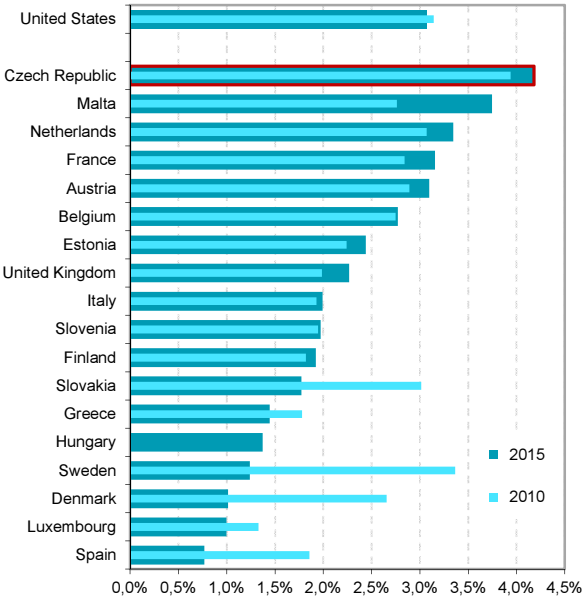
Source: CZSO, Annual National Accounts Statistics

Figure B3 ICT investment (% of total GFCF)



GFCF - Gross Fixed Capital Formation (total investment)

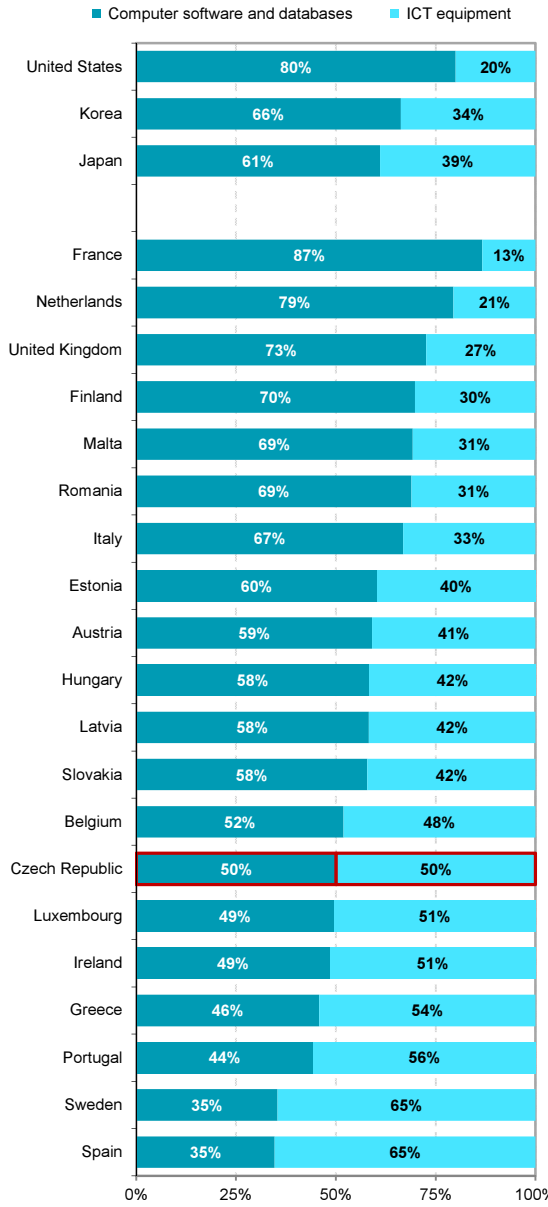
Figure B4 ICT investment (% GDP)



Source: CZSO calculations based on Eurostat and OECD data, 2017

B ICT expenditure and investment

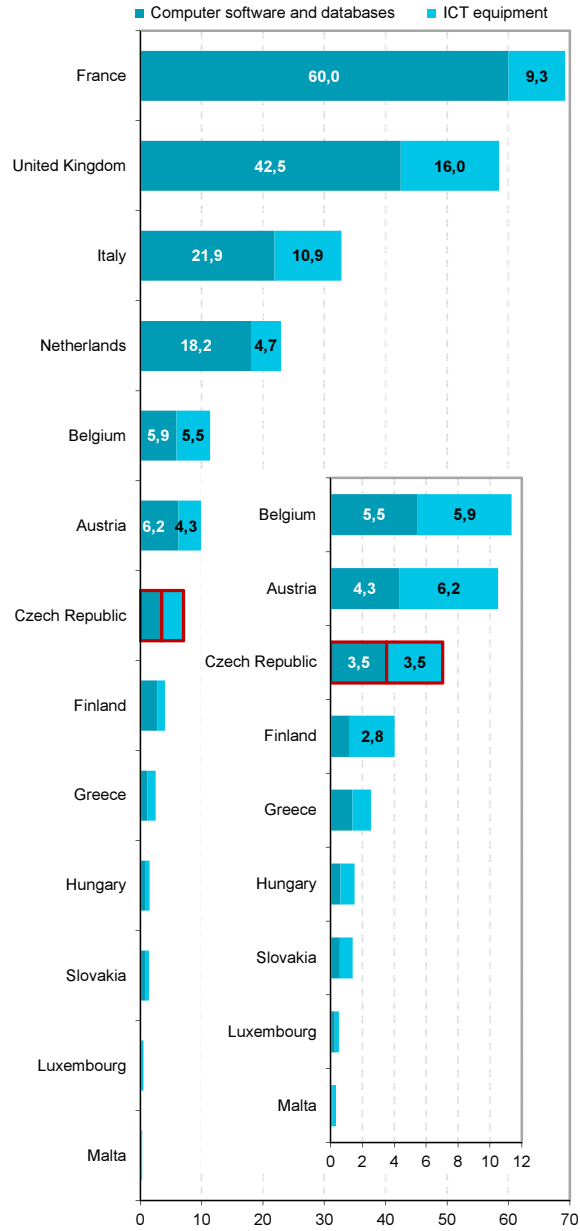
Figure B5 ICT investment by asset; 2015* (%)



** or the latest year available*

Source: CZSO calculations based on Eurostat and OECD data, 2017

Figure B6 ICT investment by asset; 2015* (EUR billion)



** or the latest year available*

Source: CZSO calculations based on Eurostat and OECD data, 2017

B ICT expenditure and investment

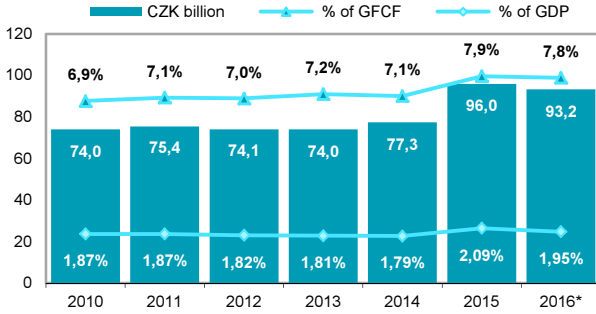
Table B2 ICT equipment investment in the Czech Republic

CZK million

	2014	2015	2016*
Total	**77 338**	**95 977**	**93 238**
Computer (IT) equipment	55 680	76 398	73 094
Communication equipment	21 658	19 579	20 144
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	683	498	1 960
Mining and quarrying	419	431	551
Manufacturing	34 135	41 090	52 073
Electricity, gas and water supply	2 836	3 528	5 146
Construction	2 142	2 353	3 111
Wholesale and retail trade	2 791	2 816	4 708
Transportation and storage	1 266	1 949	1 762
Accommodation and food service activities	1 310	1 360	1 448
Information and communication	14 245	16 426	5 781
Financial and insurance activities	933	2 499	3 165
Real estate activities	531	668	689
Professional, scientific and technical activ.	3 209	4 195	3 677
Administrative and support service activ.	381	624	776
Public administration and defence	4 837	6 789	3 020
Education	3 868	4 385	1 487
Human health and social work activities	2 986	5 283	2 976
Arts, entertainment and recreation	544	828	621
Other services	222	255	287

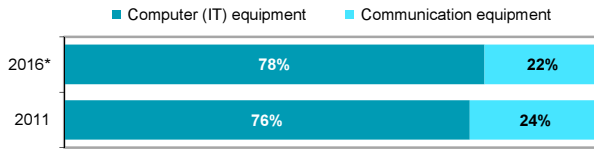
** Preliminary data*

Figure B7 Total ICT equipment investment



GFCF - Gross Fixed Capital Formation (total investment)

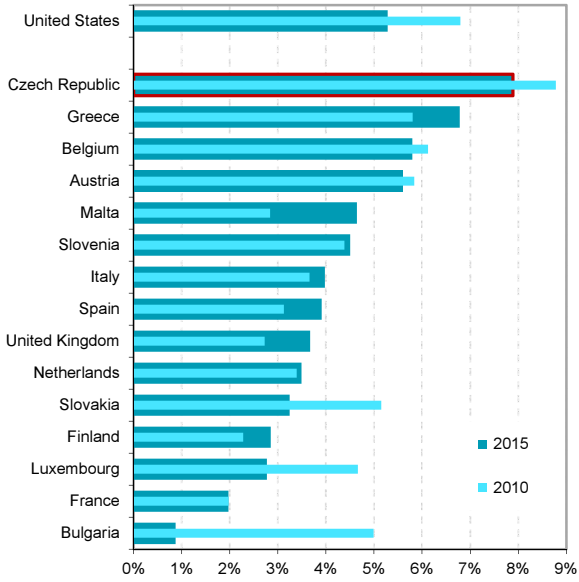
Figure B8 ICT equipment investment by asset



Source: CZSO, Annual National Accounts Statistics

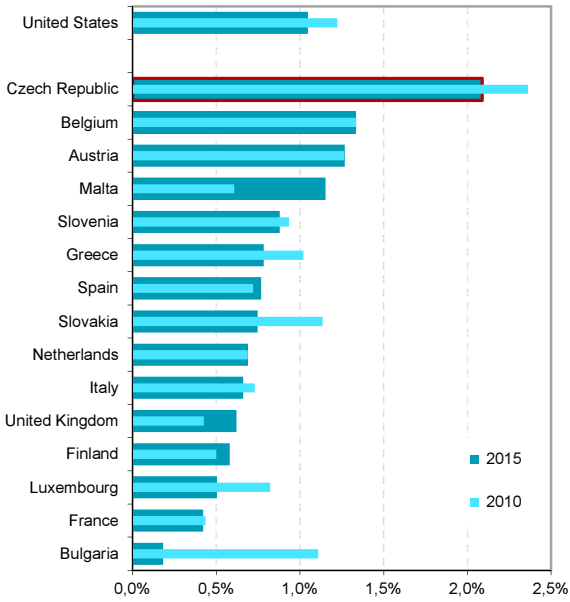
B ICT expenditure and investment

Figure B9 ICT equipment investment (% of total GFCF)



GFCF - Gross Fixed Capital Formation (total investment)

Figure B10 ICT equipment investment (% of GDP)



Source: CZSO calculations based on Eurostat and OECD data, 2017

B ICT expenditure and investment

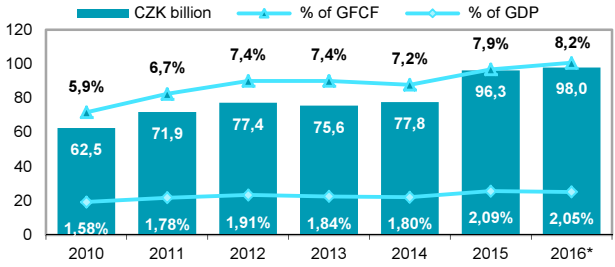
Table B3 Software investment in the Czech Republic

CZK million

	2014	2015	2016*
Total	**77 818**	**96 270**	**97 988**
own-account software	17 815	.	.
Type			
Computer Software	63 584	79 772	81 274
Databases	14 234	16 498	16 714
Industry (CZ-NACE Section)			
Agriculture, forestry and fishing	268	310	324
Mining and quarrying	123	91	91
Manufacturing	10 334	12 850	13 301
Electricity, gas and water supply	1 688	1 844	1 997
Construction	844	893	902
Wholesale and retail trade	6 535	8 484	8 682
Transportation and storage	2 493	3 082	3 281
Accommodation and food service activities	225	290	294
Information and communication	27 354	33 318	34 670
Financial and insurance activities	12 636	16 718	17 492
Real estate activities	945	1 063	1 076
Professional, scientific and technical activ.	5 058	6 172	6 578
Administrative and support service activ.	1 101	1 340	1 398
Public administration and defence	5 065	5 695	4 084
Education	1 120	1 083	990
Human health and social work activities	782	991	889
Arts, entertainment and recreation	358	707	580
Other services	889	1 339	1 359

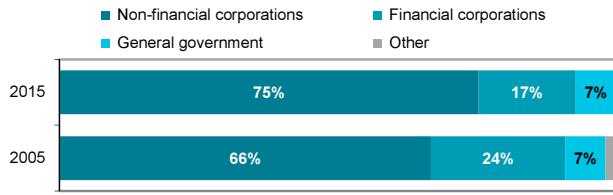
** Preliminary data*

Figure B11 Total software investment



GFCF - Gross Fixed Capital Formation (total investment)

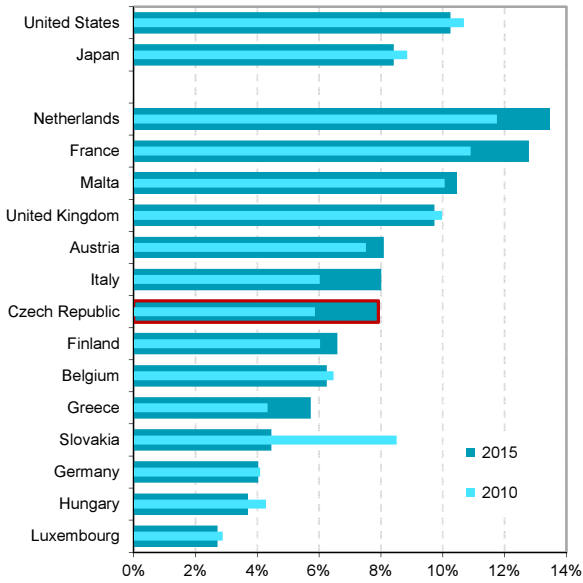
Figure B12 Software investment by sector



Source: CZSO, Annual National Accounts Statistics

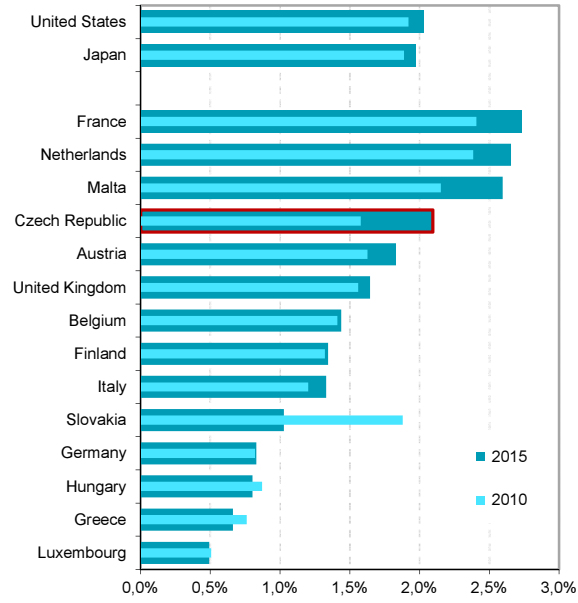
B ICT expenditure and investment

Figure B13 Software investment (% of total GFCF)



GFCF - Gross Fixed Capital Formation (total investment)

Figure B14 Software investment (% of GDP)



Source: CZSO calculations based on Eurostat and OECD data, 2017

B ICT expenditure and investment

Table B4 Household consumption expenditures on ICT equipment and services in the Czech Republic

CZK million

	2014	2015	2016*
Total	**86 984**	**88 331**	**90 786**
Total ICT equipment	31 333	31 413	32 931
Telephone equipment	3 256	3 210	3 416
Computers and consumer electronics	28 077	28 203	29 515
Telecommunication (ICT) services	55 651	56 918	57 855

** Preliminary data*

Figure B15 Total household consumption expenditures on ICT

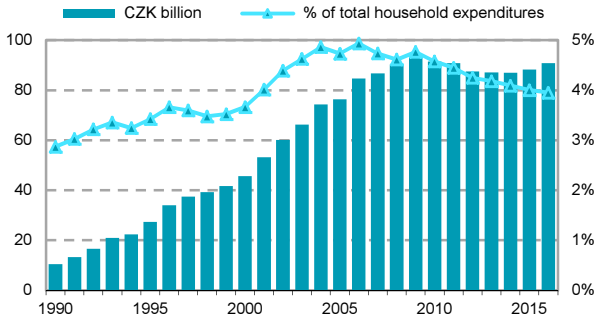


Figure B16 Households ICT expenditures by commodities

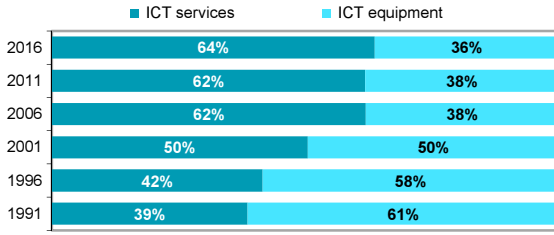
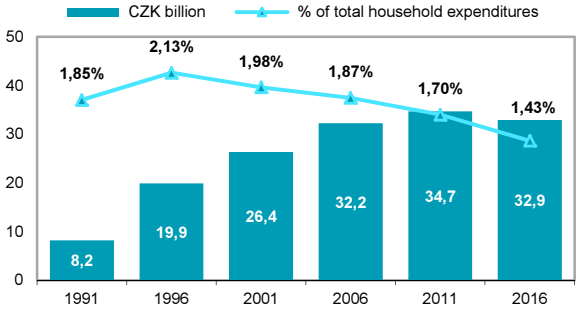


Figure B17 Households ICT equipment expenditures



Source: CZSO, Annual National Accounts Statistics

Figure B18 Household consumption expenditures on ICT; (% of total households consumption expenditures)

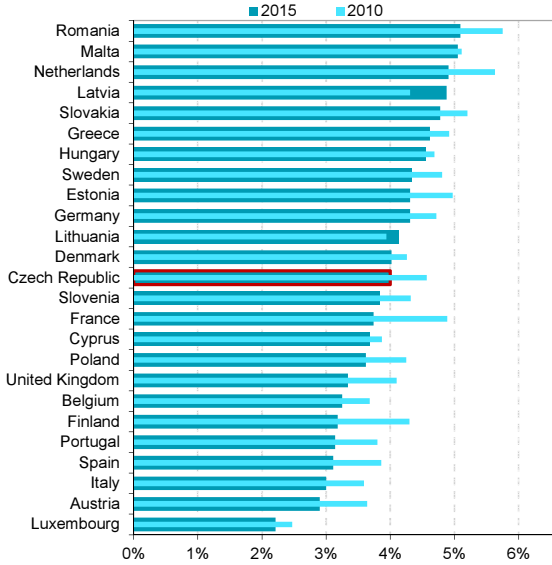
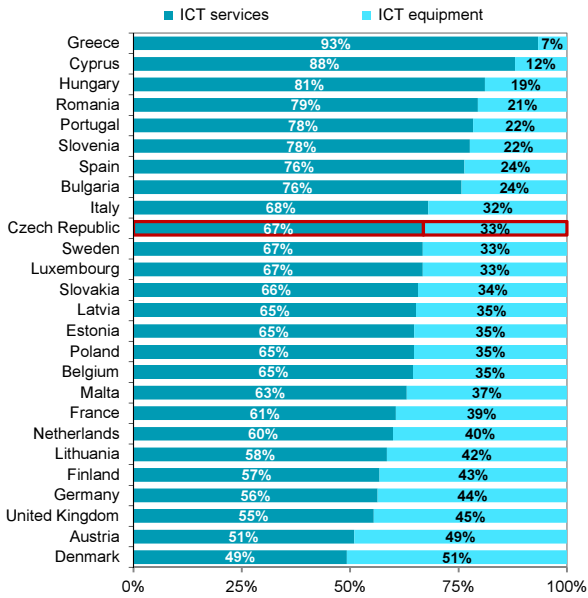


Figure B19 Household ICT expenditures by commodities; 2015 (%)



Source: CZSO calculations based on Eurostat data, 2017

B ICT expenditure and investment

Table B5 Household consumption expenditures on telecommunication in the Czech Republic

CZK million

	2014	2015	2016
Total	**58 907**	**59 228**	**61 271**
Telephone equipment	3 256	2 310	3 416
Telecommunication services	55 651	56 918	57 855

Figure B20 Household expenditures on telecommunication

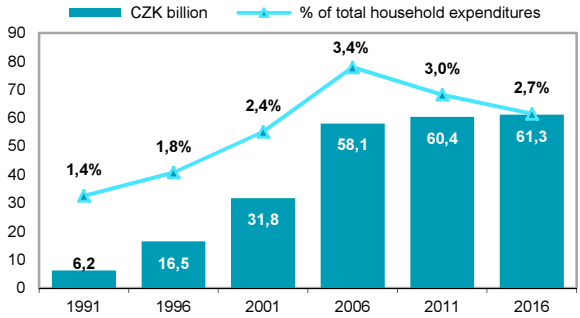


Figure B21 Household expenditures on telecommunication by commodities

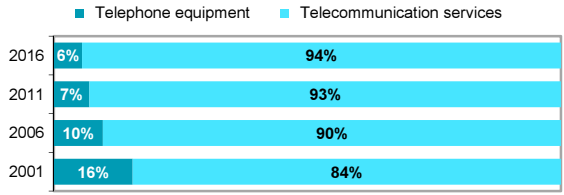
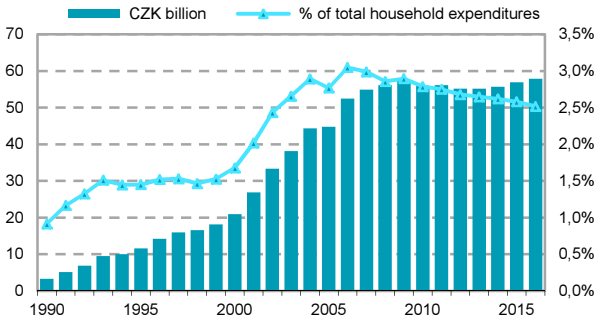


Figure B22 Household expenditures on telecommunication services



Source: CZSO, Annual National Accounts Statistics

Figure B23 Household expenditures on telecommunication services (% of total households expenditures)

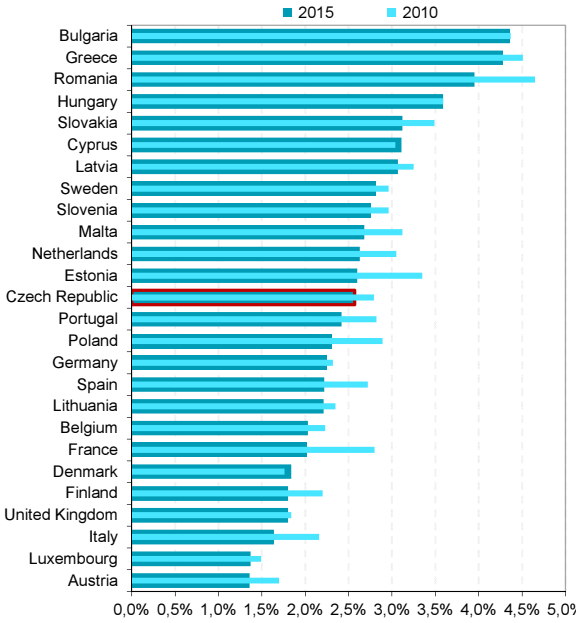
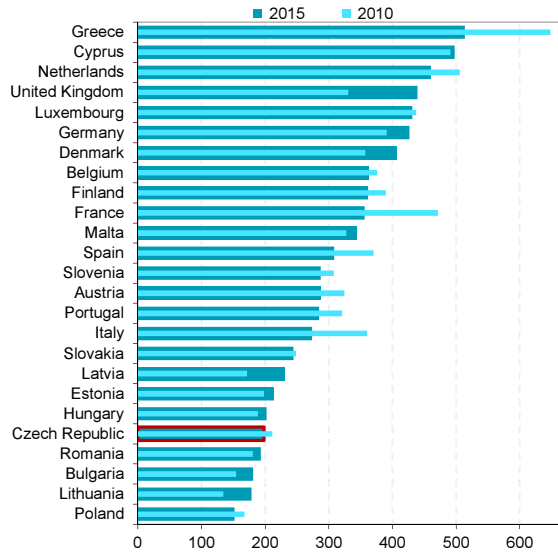


Figure B24 Household expenditures on telecommunication services (per 1 inhabitant, in EUR)



Source: CZSO calculations based on Eurostat data, 2017

C ICT research and development

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. **Research** is original investigation undertaken to acquire new knowledge; **Experimental development** builds upon research to produce new or improved products or processes.

Data for this chapter comes from the results of the **Czech annual questionnaire on research and developmen**t, which includes questions on human and financial resources determined for R&D activities realized on the territory of the Czech Republic. The statistical survey fully complies with methodological principles of the EU and the OECD mentioned in the Frascati Manual (OECD, Paris 2015) and Commission Implementing Regulation (EU) No 995/2012.

Further information on the **Czech R&D statistics** can be found at: https://www.czso.cz/csu/czso/vysledky_vyzkumu_a_vyvoje

C. 1 Expenditures on R&D of ICT products

This sub-chapter presents data on the total **financial resources invested in research and development of ICT equipment and software (ICT products)** in the Czech Republic regardless of main economic activity and sector of R&D performers.

ICT products are classified into two main categories based on the following CPA divisions and groups:

- **ICT equipment** (CZ-CPA 261-4 a 268)
- **Software** (CZ-CPA 62)

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 included in R&D.

Data on expenditures related to the research and development of ICT equipment and software **(ICT R&D expenditures)** are based on the results of the special module that is included in the **Czech annual questionnaire on research and development.**

International comparison is not available for this data set.

C. 2 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 industries** which are associated with the production and/or distribution of information and communication technologies (ICT) and a provision of related services.

ICT sector is divided into the **two main categories**: ICT manufacturing and ICT services. **For more information see Chapter E ICT sector.**

Data on R&D expenditure (BERD) and R&D personnel in ICT sector have 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.

Further information on ICT sector can be found at (only in Czech):

https://www.czso.cz/csu/czso/odvetvi-informacni-ekonomiky

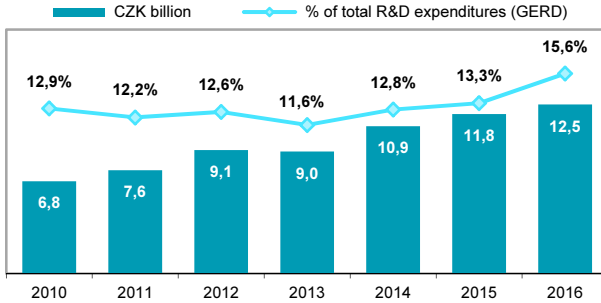
C ICT research and development

Table C1 Total ICT R&D expenditures in the Czech Republic

CZK million

	2014	2015	2016
Total	**10 868**	**11 763**	**12 477**
financed from government funds	1 491	1 742	1 579
ICT products for which R&D is carried out			
ICT equipment	4 483	5 112	4 295
Software	6 385	6 651	8 182
Type of R&D performers			
Enterprises, total	**10 066**	**10 000**	**11 234**
National enterprises	4 330	3 600	3 601
Foreign-controlled enterprises	5 736	6 400	7 632
Public universities	**759**	**1 704**	**1 190**
Other R&D performers	**42**	**59**	**53**

Figure C1 Total ICT R&D expenditures



GERD - Gross Domestic Expenditure on Research and Development

Figure C2 ICT R&D expenditures by type of ICT products

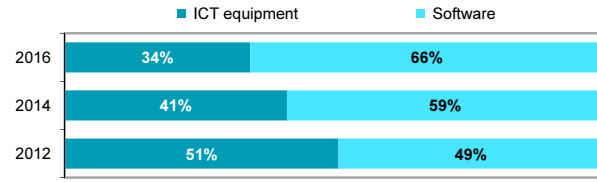
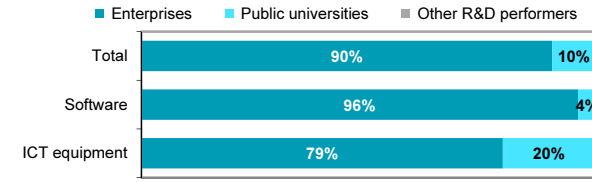


Figure C3 ICT R&D expenditures by R&D performers; 2016



Source: CZSO, Annual R&D survey

C ICT research and development

Table C2 Software R&D expenditures in the Czech Republic

CZK million

	2014	2015	2016
Total	**6 385**	**6 651**	**8 182**
financed from government funds	337	400	425
Type of R&D performers			
Enterprises, total	**6 146**	**6 388**	**7 830**
National enterprises	2 438	2 086	2 213
Foreign-controlled enterprises	3 708	4 302	5 617
Public universities	**219**	**222**	**326**
Other R&D performers	**20**	**41**	**26**

Figure C4 Software R&D expenditures

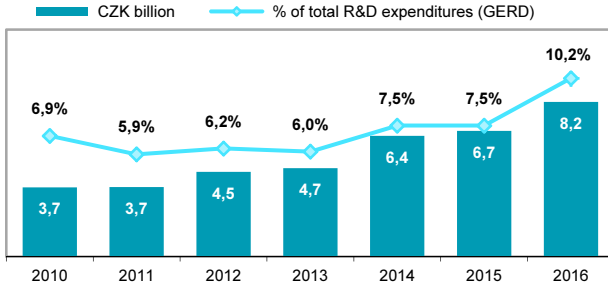


Figure C5 Software R&D expenditures by R&D performers; 2016

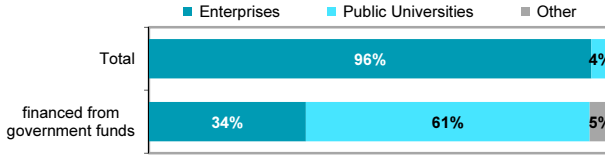
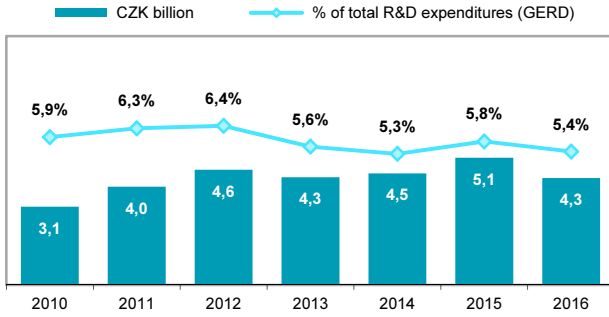


Figure C6 ICT equipment R&D expenditures



GERD - Gross Domestic Expenditure on Research and Development

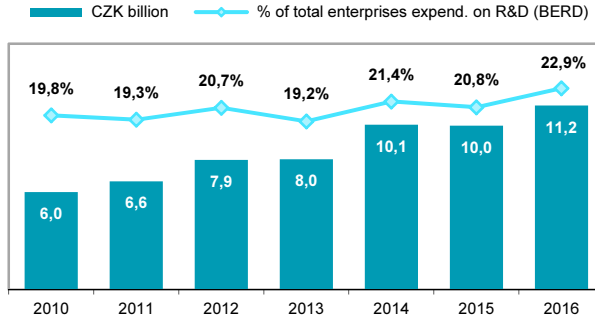
Source: CZSO, Annual R&D survey

Table C3 ICT R&D expenditures of enterprises in the Czech Rep.

CZK million

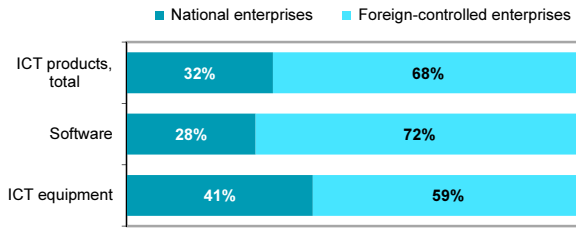
	2014	2015	2016
Total	**10 066**	**10 000**	**11 234**
financed from government funds	951	789	531
ICT products for which R&D is carried out			
ICT equipment	3 921	3 612	3 403
Software	6 146	6 388	7 830
Enterprise size group			
Small (0-49 employees)	1 445	1 169	1 260
Medium (50-249 employees)	3 923	3 416	2 691
Large (250+ employees)	4 698	5 415	7 283
Ownership of enterprises			
National enterprises	4 330	3 600	3 601
Foreign-controlled enterprises	5 736	6 400	7 632
Main economic activity of enterprises (CZ-NACE)			
ICT sector industries, total	**7 585**	**7 304**	**8 135**
ICT manufacturing (261-264)	271	167	262
Telecommunications (61)	603	624	672
IT services (465+582+62+631+951)	6 711	6 514	7 202
Other industries	**2 481**	**2 696**	**3 098**

Figure C7 ICT R&D expenditures of enterprises



BERD - Total Intramural R&D Expenditure in the Business Enterprise Sector

Figure C8 ICT R&D expend. by ownership of enterprises; 2016



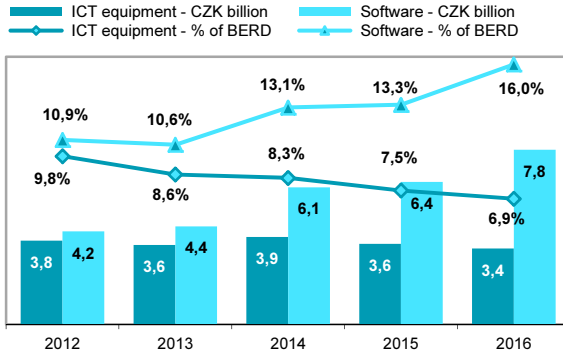
Source: CZSO, Annual R&D survey

Table C4 ICT R&D expenditures of enterprises in the Czech Republic by type of ICT products; 2016

CZK million

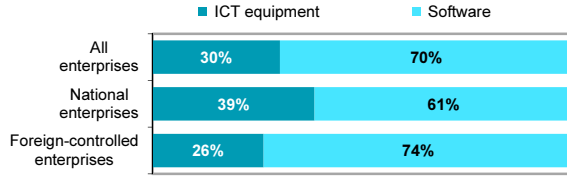
	Total	ICT equipment	Software
Total	**11 234**	**3 403**	**7 830**
financed from government funds	531	386	144
Enterprise size group			
Small (0-49 employees)	1 260	363	897
Medium (50-249 employees)	2 691	719	1 972
Large (250+ employees)	7 283	2 321	4 962
Ownership of enterprises			
National enterprises	3 601	1 388	2 213
Foreign-controlled enterprises	7 632	2 015	5 617
Main economic activity of enterprises (CZ-NACE)			
ICT sector industries, total	**8 135**	**1 538**	**6 597**
ICT manufacturing (261-264)	262	171	91
Telecommunications (61)	672	438	234
IT services (465+582+62+631+951)	7 202	929	6 272
Other industries	**3 098**	**1 865**	**1 233**

Figure C9 ICT R&D expenditures of enterprises by type of ICT products



BERD - Total Intramural R&D Expenditure in the Business Enterprise Sector

Figure C10 ICT R&D expenditures by type of ICT products and ownership of enterprises; 2016



Source: CZSO, Annual R&D survey

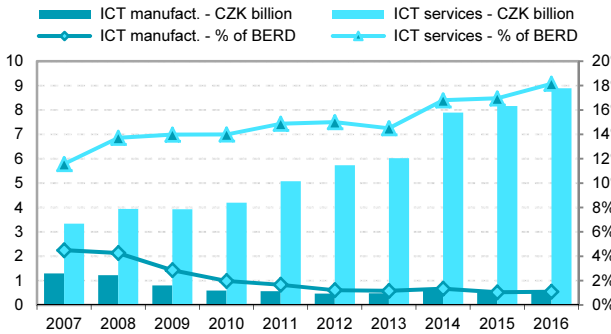
C ICT research and development

Table C5 R&D expenditures in the ICT sector in the Czech Rep.

CZK million

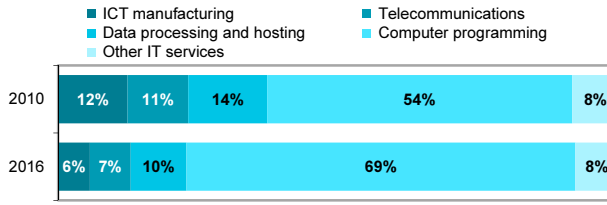
	2014	2015	2016
Total	**8 515**	**8 659**	**9 421**
financed from government funds	1 099	1 052	655
Products for which R&D is carried out			
ICT equipment	2 306	1 886	1 538
Software	5 279	5 416	6 597
Other non ICT related products	930	1 357	1 285
Enterprise size group			
Small (0-49 employees)	1 259	1 065	1 147
Medium (50-249 employees)	3 312	3 491	2 391
Large (250+ employees)	3 943	4 103	5 883
Ownership of enterprises			
National enterprises	3 706	3 095	2 929
Foreign-controlled enterprises	4 809	5 564	6 491
Main economic activity of enterprises (CZ-NACE)			
ICT manufacturing (261-264)	**625**	**500**	**532**
ICT services, total	**7 889**	**8 159**	**8 889**
Telecommunications (61)	603	630	685
Computer programming (582+6201)	4 879	5 643	6 534
Data processing and hosting (631)	1 580	1 080	938
Other IT services (465+951+62 without 6201)	827	806	731

Figure C11 R&D expenditures in the ICT sector



BERD - Total Intramural R&D Expenditure in the Business Enterprise Sector

Figure C12 R&D expenditures in the ICT sector by industry



Source: CZSO, Annual R&D survey

Figure C13 R&D expenditures in the ICT sector; 2015*
(% of GDP)

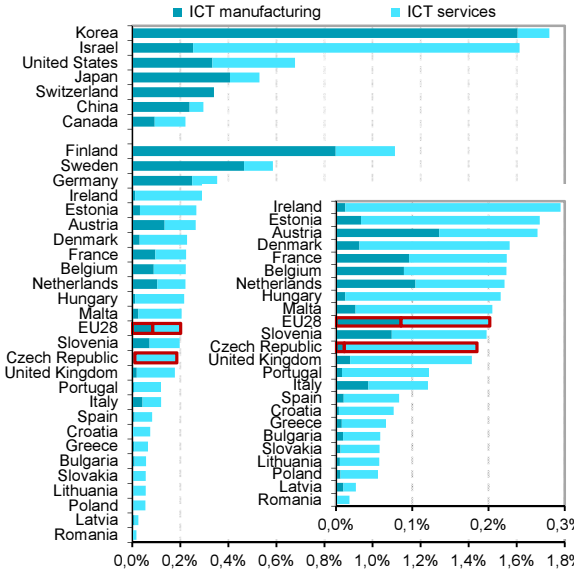
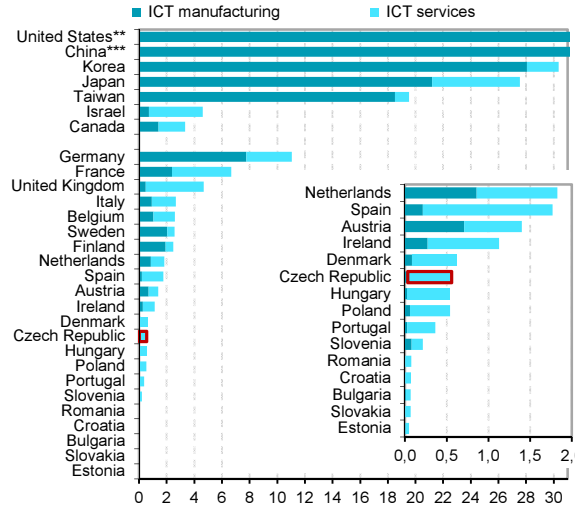


Figure C14 R&D expenditures in the ICT sector; 2015*
(USD billion PPP)



** or the latest year available*

*** United States: ICT manufacturing 57,9, ICT services 59,9 USD billion PPP*

**** China: ICT manufacturing 40,8 , ICT services 9,5 USD billion PPP*

Source: CZSO calculations based on Eurostat and OECD data, 2017

Table C6 R&D personnel in the ICT sector in the Czech Republic

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

	2014	2015	2016
Total	**7 725**	**7 988**	**8 339**
By occupation			
Researchers	4 480	4 829	5 300
Technicians and equivalent staff	2 648	2 637	2 323
Other supporting and administrative staff	597	522	716
Enterprise size group			
Small (0-49 employees)	1 468	1 356	1 470
Medium (50-249 employees)	2 869	3 062	2 408
Large (250+ employees)	3 388	3 570	4 462
Ownership of enterprises			
National enterprises	3 431	3 202	3 213
Foreign-controlled enterprises	4 294	4 786	5 126
Main economic activity of enterprises (CZ-NACE)			
ICT manufacturing (261-264)	**656**	**523**	**546**
ICT services, total	**7 069**	**7 465**	**7 793**
Telecommunications (61)	151	197	210
Computer programming (582+6201)	4 831	5 434	5 923
Data processing and hosting (631)	843	762	888
Other IT services (465+951+62 without 6201)	1 243	1 072	771

Figure C15 R&D personnel in the ICT sector

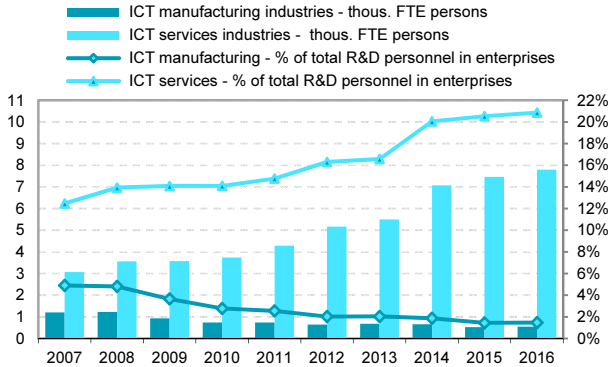
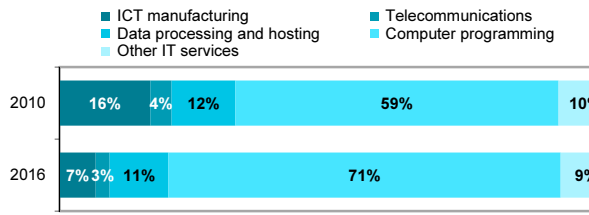


Figure C16 R&D personnel in the ICT sector by industry



Source: CZSO, Annual R&D survey

D ICT external trade

ICT external trade **contains** trade in both ICT goods and ICT services. **ICT products** are defined as goods or services which must be primarily intended to fulfill or enable the function of information processing and communication **by electronic means**, including transmission and display (OECD 2008). Further information can be found at „**OECD Guide to Measuring the Information Society 2011**":

D. 1 External trade of ICT goods

The **list of ICT goods** that is used for the external trade statistics is based on the Harmonised System Nomenclature (HS Nomenclature 2007), a classification of goods used for the international trade. List of ICT goods defined at 6-digit level of HS2007 was further grouped into the five main categories as follows:

- Computer equipment and peripherals;
- Communication equipment;
- Consumer electronics;
- Electronic components;
- Miscellaneous ICT components and accessories (ICT parts n.e.s.)

The **External Trade Statistics Database** of the Czech Statistical Office (CZSO) was used as a data source for national data. For more information see: http://apl.czso.cz/pll/stazo/STAZO.STAZO?jazyk=EN

The **UNCTAD database** and **The UN Comtrade database** was used as a data source for the international comparison:
http://unctad.org/en/Pages/Statistics.aspx; http://comtrade.un.org/db/

D. 2 External trade of ICT services

Data on exports and imports of the **ICT services** come from the CZSO direct survey at respondents on exports and imports of services.

Respective items of the ICT services are then defined according to the **International Classification** of **Extended Balance of Payment Services** (EBOPS 2010). The ICT services are subdivided into three categories as follows:

- Telecommunications services (code SI1);
- Other computer services (code SI22); and
- Computer software and Licences to reproduce and/or distribute computer software (codes SI21 and SH3).

Telecommunication services 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.

Computer services 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 involves purchase and sale of tailor-made software and applications (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.

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

D ICT external trade

Table D1 ICT goods exports from the Czech Republic

CZK million

	2014	2015	2016
Total	**487 462**	**523 827**	**506 018**
Computer equipment and peripherals	232 424	247 168	236 892
Communication equipment	88 432	104 021	97 651
Consumer electronics	71 144	70 087	72 922
Electronic components	35 112	42 707	45 144
ICT parts n.e.s.	60 349	59 844	53 409

Figure D1 ICT goods exports

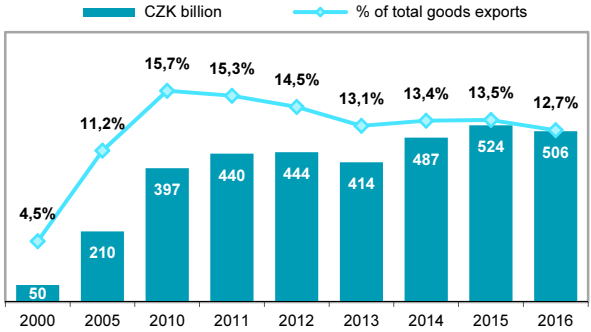


Figure D2 ICT goods exports by commodities

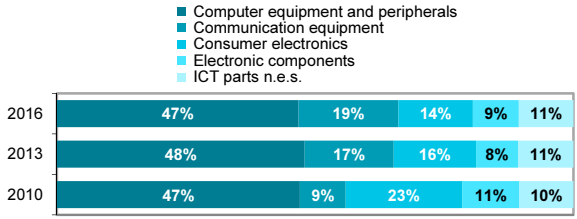
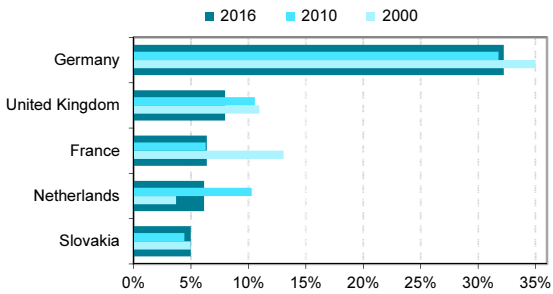


Figure D3 ICT goods exports from the Czech Rep. by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Figure D4 ICT goods exports (% of total goods exports)

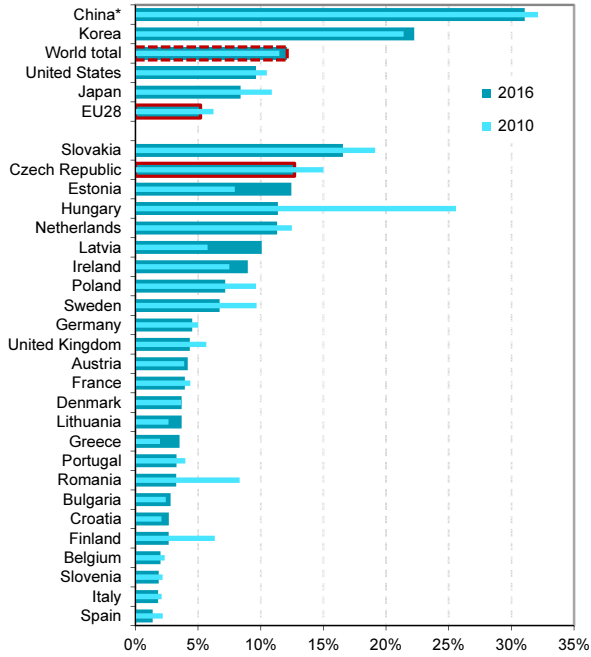
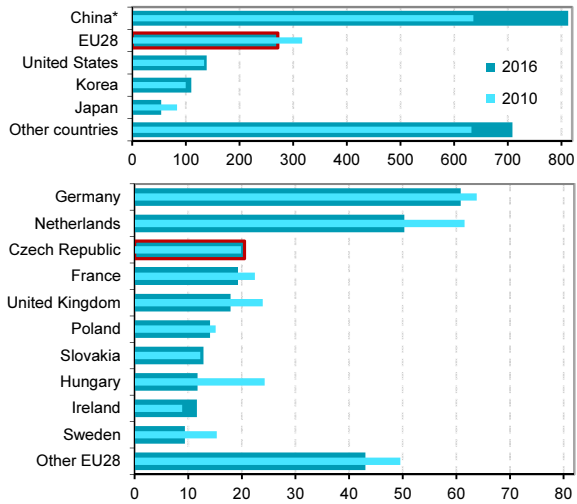


Figure D5 ICT goods exports (USD billion)



China = (China; Hong Kong China; Macao China; China Taiwan)*

Source: CZSO calculations based on UNCTAD

D ICT external trade

Table D2 ICT goods imports to the Czech Republic

CZK million

	2014	2015	2016
Total	**450 580**	**540 741**	**496 943**
Computer equipment and peripherals	145 750	189 009	170 630
Communication equipment	82 719	121 222	103 219
Consumer electronics	33 108	41 813	44 109
Electronic components	83 906	78 750	84 734
ICT parts n.e.s.	105 096	109 946	94 251

Figure D6 ICT goods imports

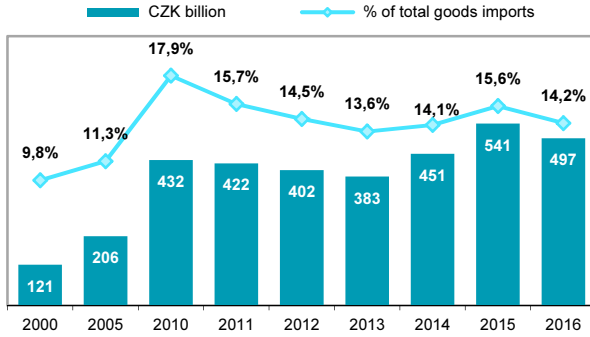


Figure D7 ICT goods imports by commodities

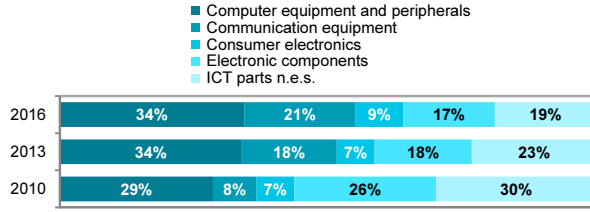
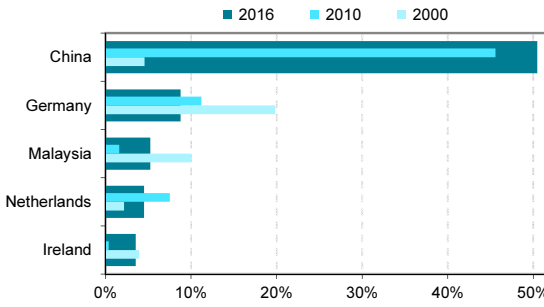


Figure D8 ICT goods imports to the Czech Rep. by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Figure D9 ICT goods imports (% of total goods imports)

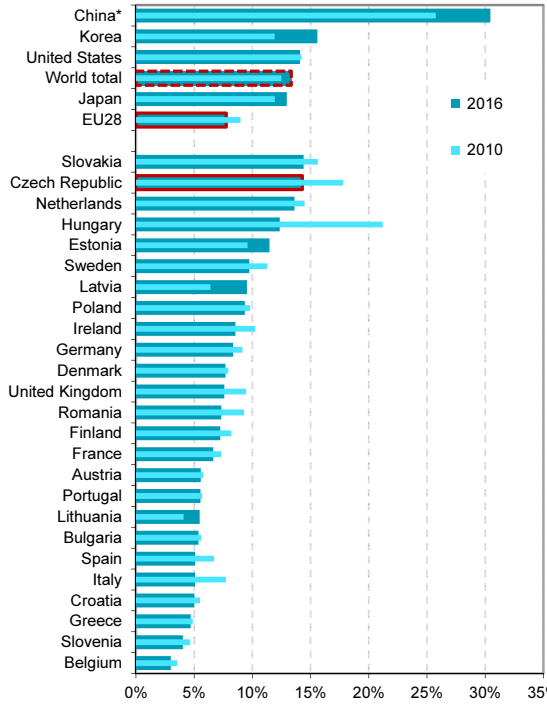
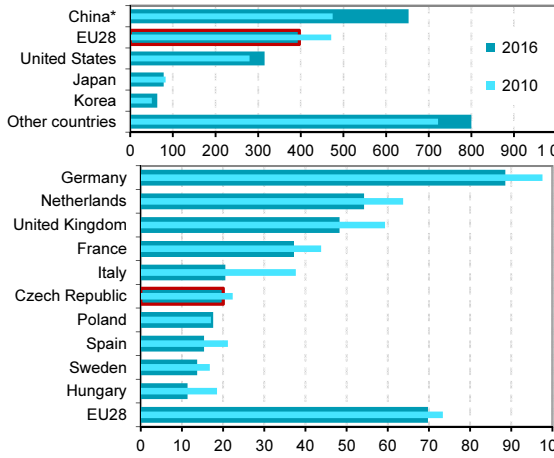


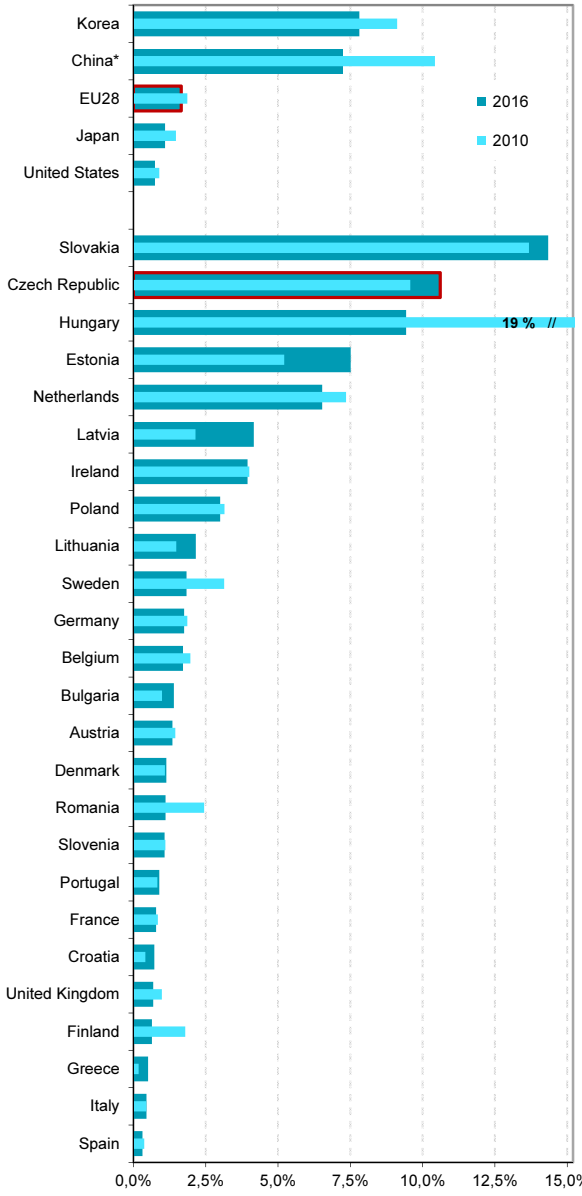
Figure D10 ICT goods imports (USD billion)



China = (China; Hong Kong China; Macao China; China Taiwan)*

Source: CZSO calculations based on UNCTAD

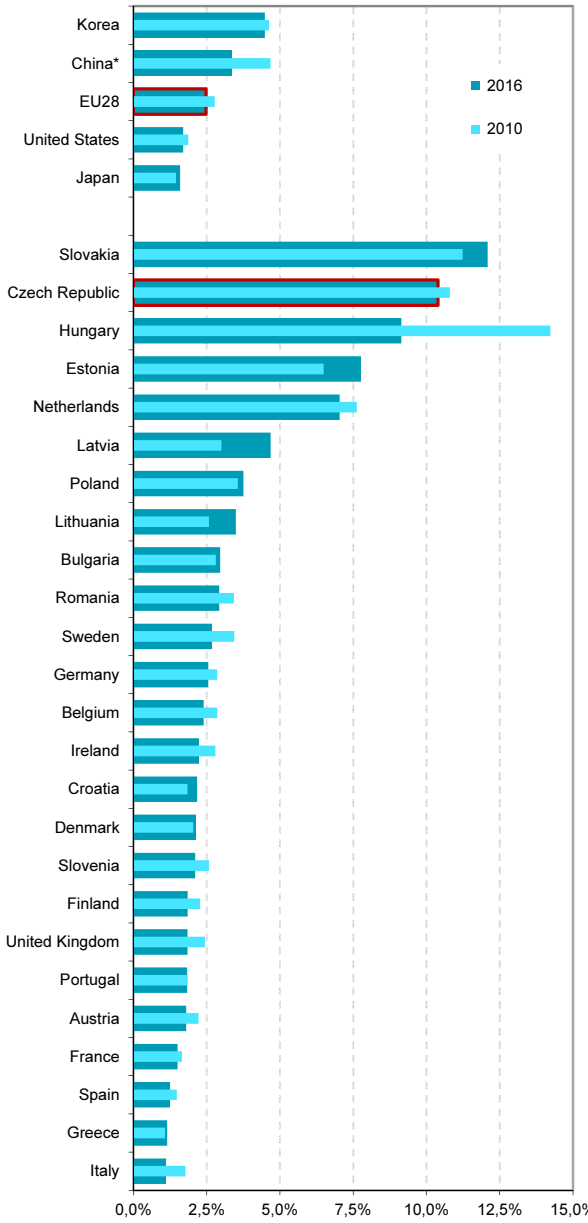
Figure D11 ICT goods exports (% of GDP)



China = (China; Hong Kong China; Macao China; China Taiwan)*

Source: CZSO calculations based on UNCTAD

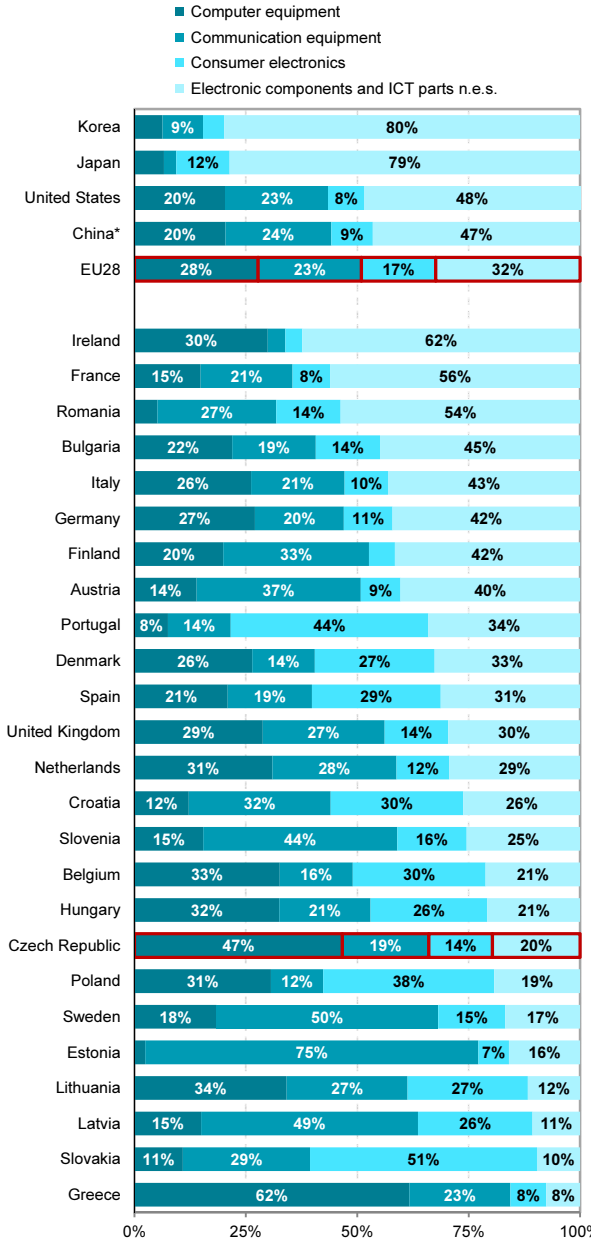
Figure D12 ICT goods imports (% of GDP)



China = (China; Hong Kong China; Macao China; China Taiwan)*

Source: CZSO calculations based on UNCTAD

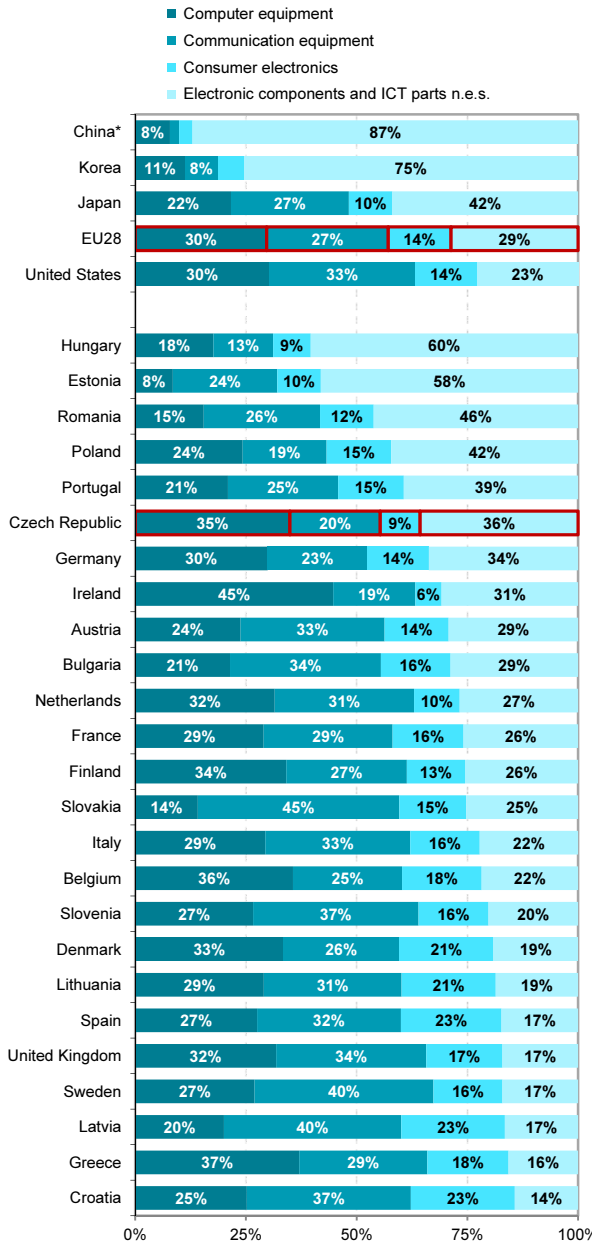
Figure D13 ICT goods exports by commodities; 2016



China = (China; Hong Kong China; Macao China; China Taiwan)*

Source: CZSO calculations based on UNCTAD

Figure D14 ICT goods imports by commodities; 2016



China = (China; Hong Kong China; Macao China; China Taiwan)*

Source: CZSO calculations based on UNCTAD

D ICT external trade

Table D3 Computer equipment exports from the Czech Republic

CZK million

	2014	2015	2016
Total	**232 424**	**247 168**	**236 892**
Portable computers	60 266	59 098	56 158
Other computers	93 090	88 595	80 871
Computer peripherals, total	79 068	99 476	99 862
Storage units	45 330	59 505	56 238
Sound, video, network and similar cards	8 119	8 933	9 930
Monitors used with computers	11 662	15 956	16 286
Printers, copying or faxing machines	6 565	7 036	7 813
Other input or output peripherals*	7 392	8 046	9 596

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

Figure D15 Computer equipment exports

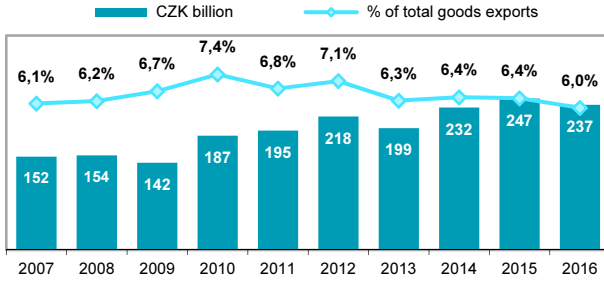


Figure D16 Computer equipment exports by commodities

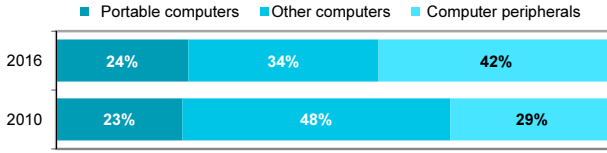
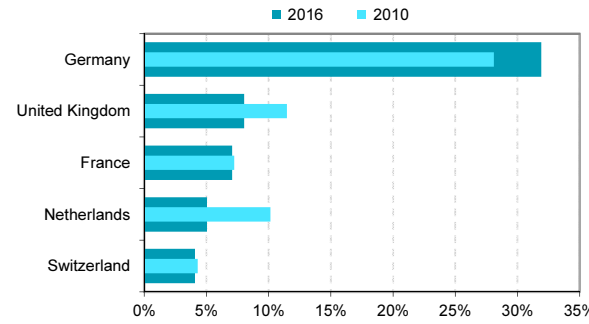


Figure D17 Computer equipment exports by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Table D4 Computer equipment imports to the Czech Republic

CZK million

	2014	2015	2016
Total	**145 750**	**189 009**	**170 630**
Portable computers	55 391	75 255	60 020
Other computers	20 520	23 745	19 599
Computer peripherals total	69 838	90 009	91 011
Storage units	37 875	50 873	50 022
Sound, video, network and similar cards	7 943	8 750	8 565
Monitors used with computers	10 746	15 164	15 885
Printers, copying or faxing machines	8 368	8 457	7 862
Other input or output peripherals*	4 906	6 766	8 677

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

Figure D18 Computer equipment imports

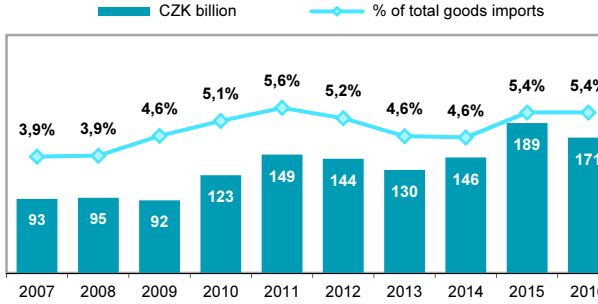


Figure D19 Computer equipment imports by commodities

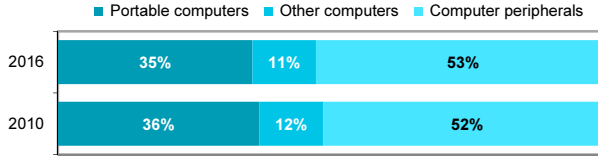
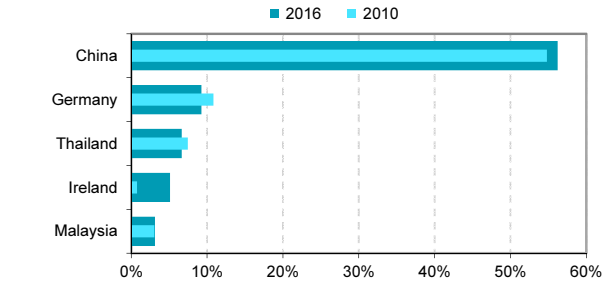


Figure D20 Computer equipment imports by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Table D5 Communication equipment exports from the Czech Rep.

CZK million

	2014	2015	2016
Total	**88 432**	**104 021**	**97 651**
Mobile phones	59 345	67 793	62 246
Other communication equipment*	29 087	36 229	35 405

** Switching, routing and similiar apparatus such as routers, bridges, hubs or modems; Base stations and other apparatus for transmission or reception of voice, images or other data; Radio or television transmission apparatus*

Figure D21 Communication equipment exports

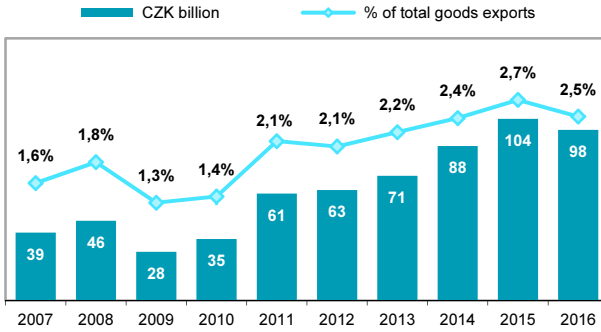


Figure D22 Communication equipment exports by commodities

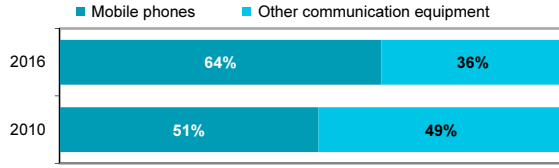
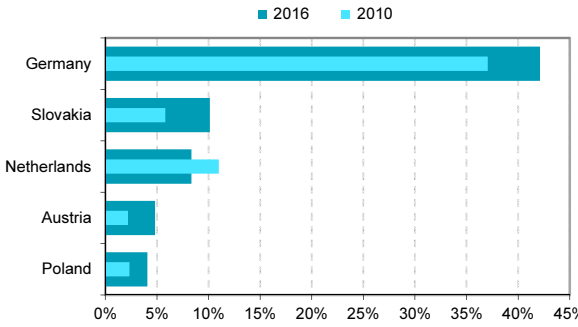


Figure D23 Communication equipment exports by countries



Source: CZSO, External Trade Statistics Database

Table D6 Communication equipment imports to the Czech Rep.

CZK million

	2014	2015	2016
Total	**82 719**	**121 222**	**103 219**
Mobile phones	56 211	85 666	68 538
Other communication equipment*	26 508	35 556	34 681

** Switching, routing and similiar apparatus such as routers, bridges, hubs or modems; Base stations and other apparatus for transmission or reception of voice, images or other data; Radio or television transmission apparatus*

Figure D24 Communication equipment imports

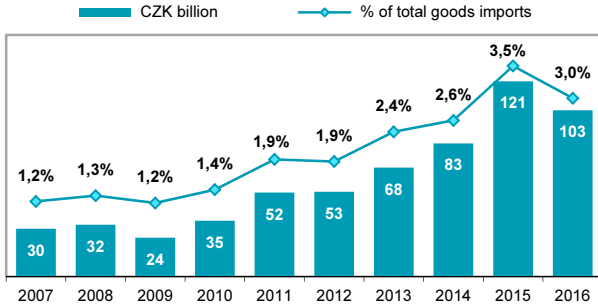


Figure D25 Communication equipment imports by commodities

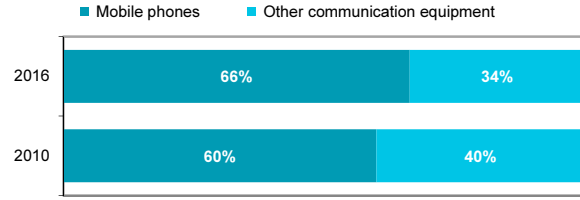
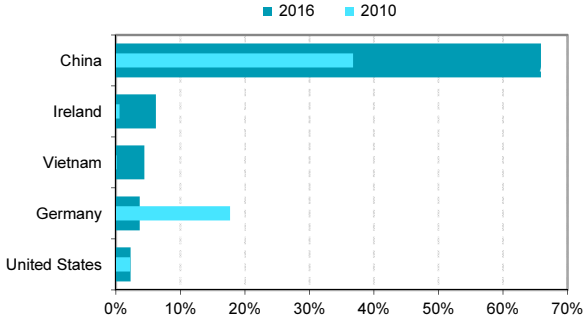


Figure D26 Communication equipment imports by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Table D7 Consumer electronics exports from the Czech Republic

CZK million

	2014	2015	2016
Total	**71 144**	**70 087**	**72 922**
Radio and TV receivers	50 320	42 537	39 009
Sound and image recording and reproducing apparatuses	8 149	13 366	15 119
Consumer electronics accessories*	12 675	14 183	18 793

** 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 D27 Consumer electronics exports

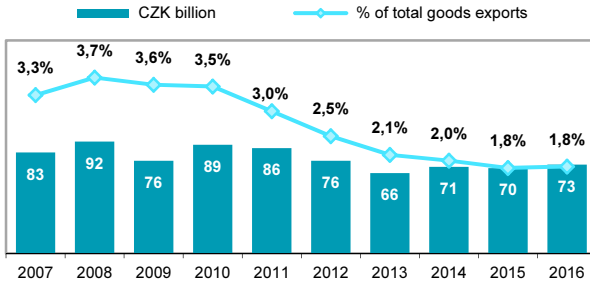


Figure D28 Consumer electronics exports by commodities

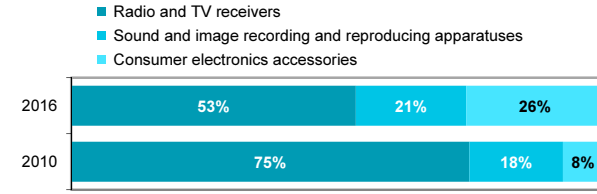
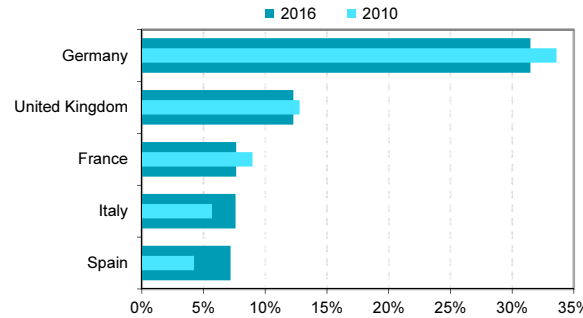


Figure D29 Consumer electronics exports by countries



Source: CZSO, External Trade Statistics Database

Table D8 Consumer electronics imports to the Czech Republic

CZK million

	2014	2015	2016
Total	**33 108**	**41 813**	**44 109**
Radio and TV receivers	14 707	17 529	15 088
Sound and image recording and reproducing apparatuses	9 296	12 899	14 446
Consumer electronics accessories*	9 105	11 385	14 574

** 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 D30 Consumer electronics imports

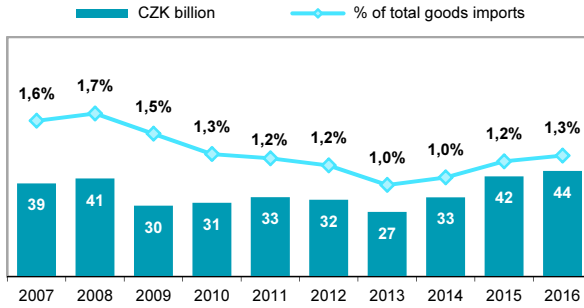


Figure D31 Consumer electronics imports by commodities

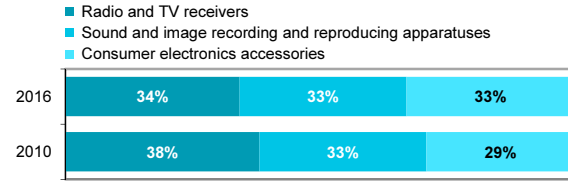
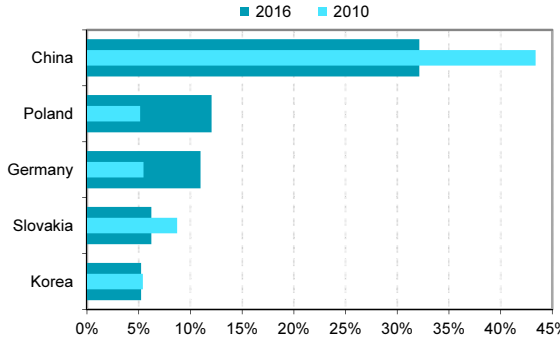


Figure D32 Consumer electronics imports by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Table D9 Electronic components exports from the Czech Rep.

CZK million

	2014	2015	2016
Total	**35 112**	**42 707**	**45 144**
Electronic integrated circuits	22 938	30 686	33 789
of which Processors	*18 185*	*25 414*	*28 850*
Printed circuits	4 548	4 584	4 874
Other electronic components	7 626	7 436	6 481

Figure D33 Electronic components exports

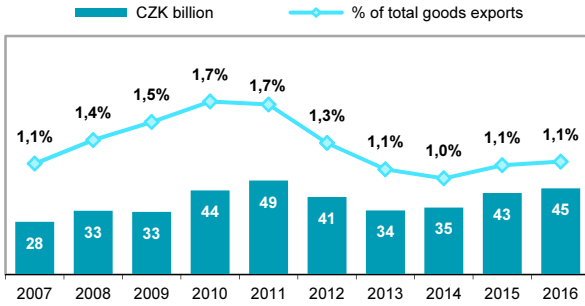


Figure D34 Electronic components exports by commodities

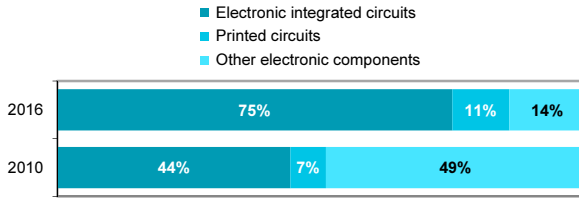
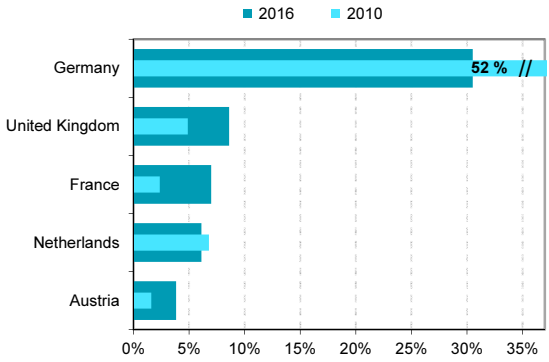


Figure D35 Electronic components exports by countries



Source: CZSO, External Trade Statistics Database

Table D10 Electronic components imports to the Czech Rep.

CZK million

	2014	2015	2016
Total	**83 906**	**78 750**	**84 734**
Electronic integrated circuits, total	64 141	57 802	63 101
of which Processors	*53 981*	*47 651*	*53 352*
Printed circuits	8 746	9 914	11 570
Other electronic components	11 019	11 034	10 064

Figure D36 Electronic components imports

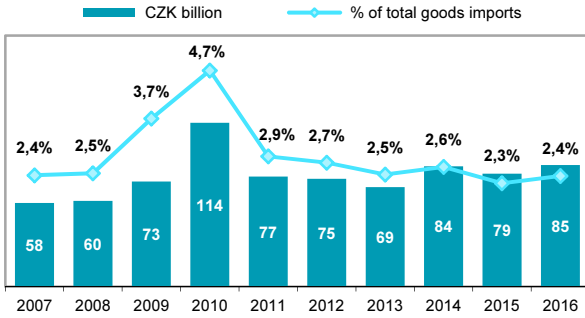


Figure D37 Electronic components imports by commodities

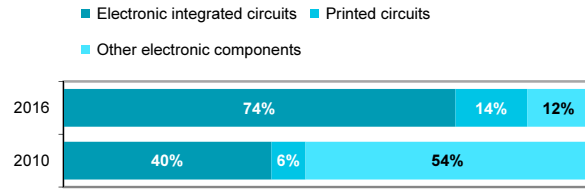
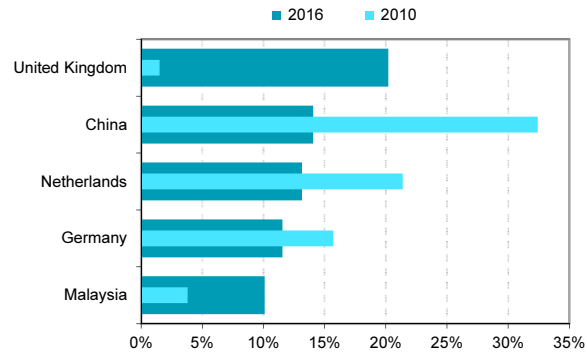


Figure D38 Electronic components imports by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Table D11 Exports of ICT parts n.e.s. from the Czech Republic

CZK million

	2014	2015	2016
Total	**60 349**	**59 844**	**53 409**
Parts and accessories n.e.s. of			
- computers	40 413	35 203	29 212
- telecommunication equipment	14 909	18 987	19 520
- consumer electronics	5 028	5 654	4 677

n.e.s. - not else specified

Figure D39 Exports of ICT parts and accessories n.e.s.

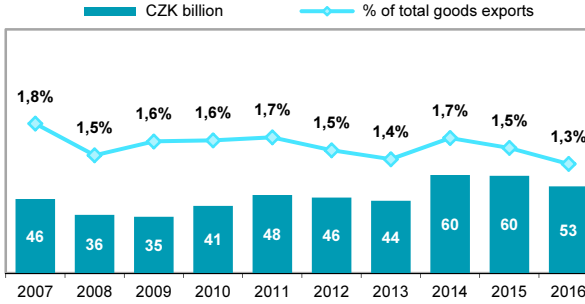


Figure D40 Exports of ICT parts n.e.s. by commodities

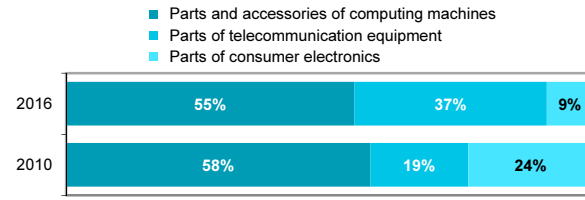
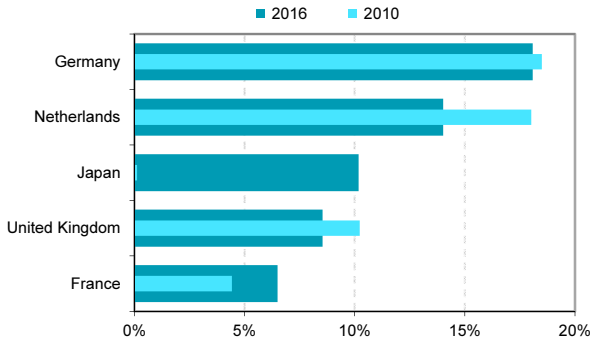


Figure D41 Exports of ICT parts n.e.s. by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Table D12 Imports of ICT parts n.e.s. to the Czech Republic

CZK million

	2014	2015	2016
Total	**105 096**	**109 946**	**94 251**
Parts and accessories n.e.s. of			
- computers	63 719	66 188	54 163
- telecommunication equipment	15 412	19 500	14 324
- consumer electronics	25 966	24 258	25 765

n.e.s. - not else specified

Figure D42 Imports of ICT parts and accessories n.e.s.

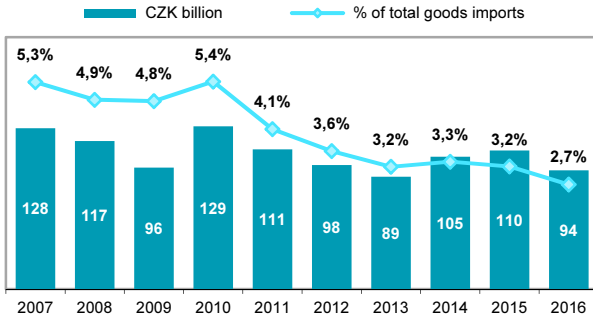


Figure D43 Imports of ICT parts n.e.s. by commodities

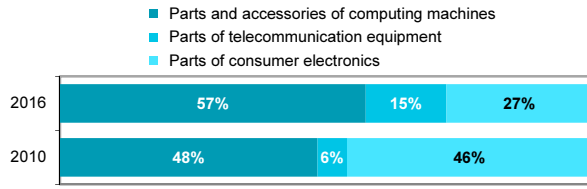
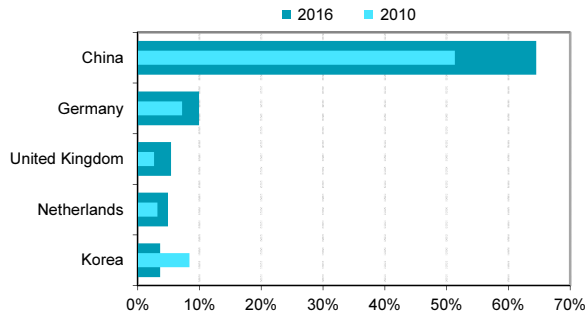


Figure D44 Imports of ICT parts n.e.s. by countries



Source: CZSO, External Trade Statistics Database

D ICT external trade

Table D13 Total ICT services exports from the Czech Republic

CZK million

	2014	2015	2016
Total	**61 364**	**67 988**	**79 068**
Telecommunication services	11 554	11 299	15 420
Computer services	36 788	39 502	43 709
Computer software	13 023	17 188	19 938
by selected countries			
EU28, total	42 587	44 680	49 587
of which to Germany	11 447	12 851	15 178
Other countries, total	18 777	23 308	29 481
of which to the United States	7 798	11 586	14 839

Figure D45 Total ICT services exports

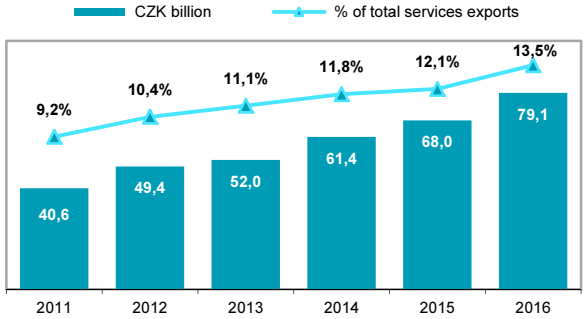


Figure D46 ICT services exports by type of service

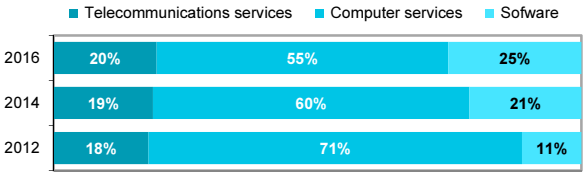
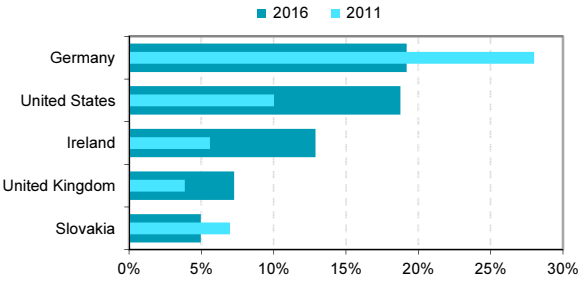


Figure D47 ICT services exports by countries



Source: CZSO, Survey on exports and imports of services

Figure D48 ICT services exports (% of total services exports)

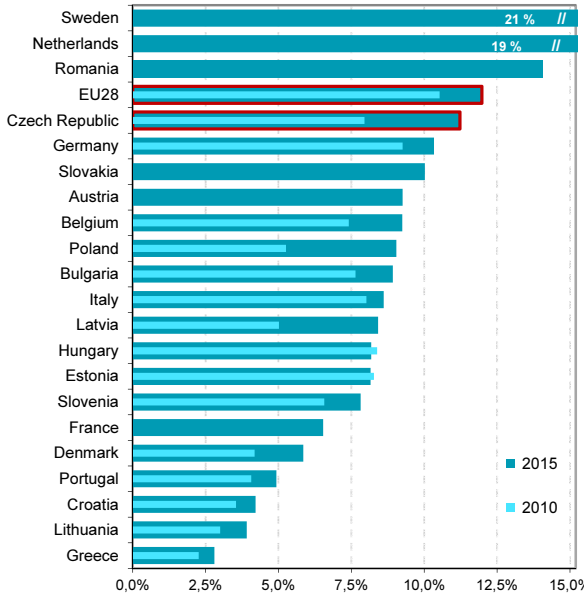
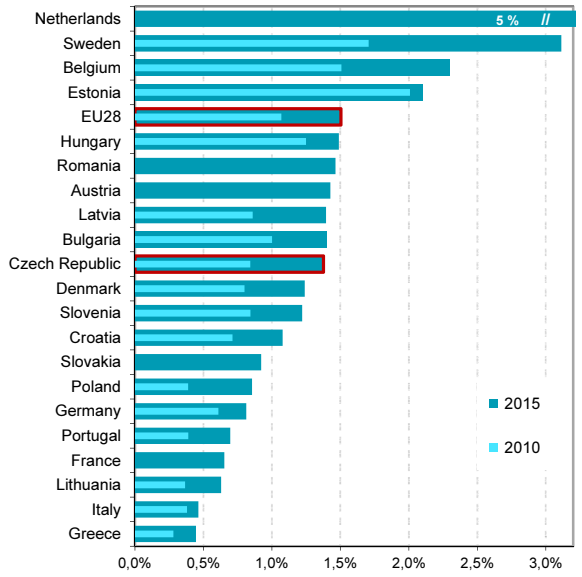


Figure D49 ICT services exports (% of GDP)



Source: Eurostat

D ICT external trade

Table D14 Total ICT services imports to the Czech Republic

CZK million

	2014	2015	2016
Total	**39 242**	**40 080**	**44 344**
Telecommunication services	11 227	11 902	14 798
Computer services	22 561	21 566	22 453
Computer software	5 454	6 613	7 093
by selected countries			
EU28, total	27 580	27 255	30 090
of which from Germany	9 671	9 526	11 398
Other countries, total	11 662	12 826	14 254
of which from the United States	4 216	3 616	3 782

Figure D50 Total ICT services imports

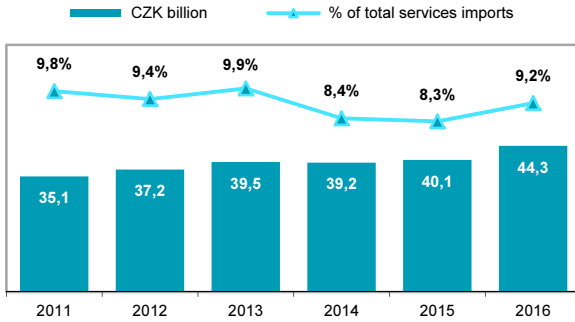


Figure D51 ICT services imports by type of service

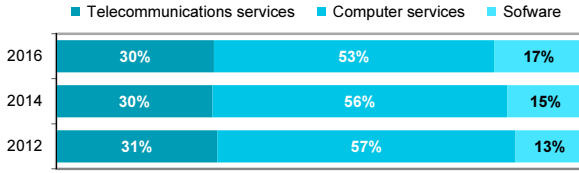
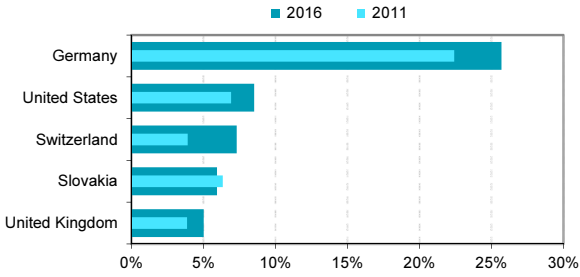


Figure D52 ICT services imports by countries



Source: CZSO, Survey on exports and imports of services

Figure D53 ICT services imports (% of total services imports)

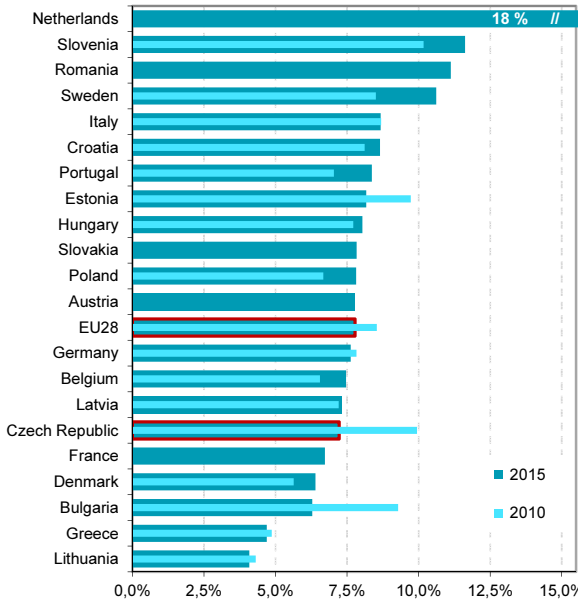
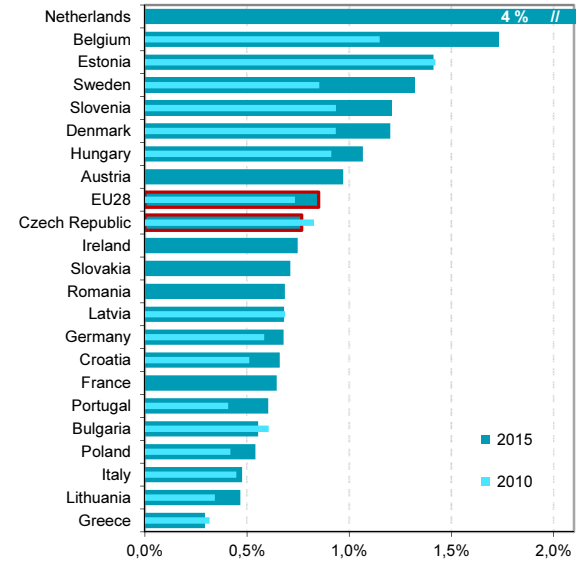


Figure D54 ICT services imports (% of GDP)



Source: Eurostat

D ICT external trade

Table D15 Computer services and software exports from the Czech Republic

CZK million

	2014	2015	2016
Total	**49 811**	**56 690**	**63 648**
Computer services	36 788	39 502	43 709
Computer software	13 023	17 188	19 938
by selected countries			
EU28, total	35 376	38 564	41 311
of which to Germany	9 566	10 345	11 811
Other countries, total	14 435	18 126	22 337
of which to the United States	7 476	10 958	13 617

Figure D55 Computer services and software exports

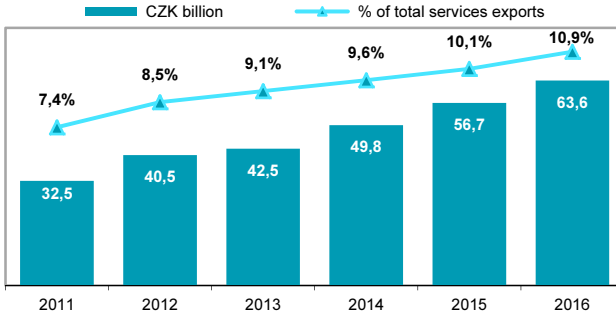


Figure D56 Computer services and SW exports by type of service

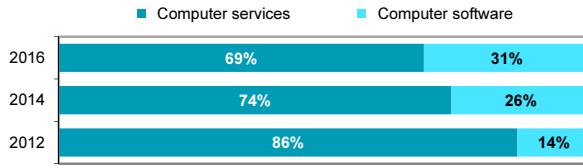
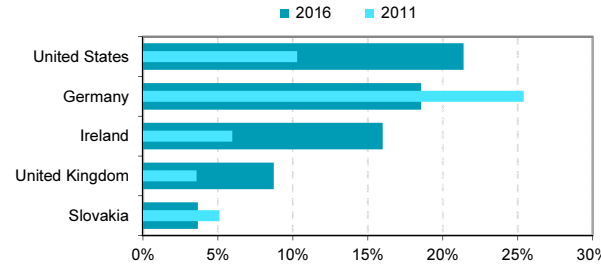


Figure D57 Computer services and SW exports by countries



Source: CZSO, Survey on exports and imports of services

Figure D58 Computer services and software exports (% of total services exports)

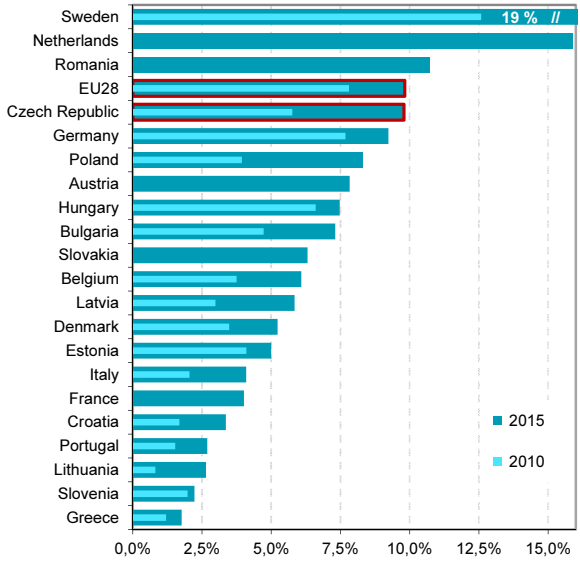
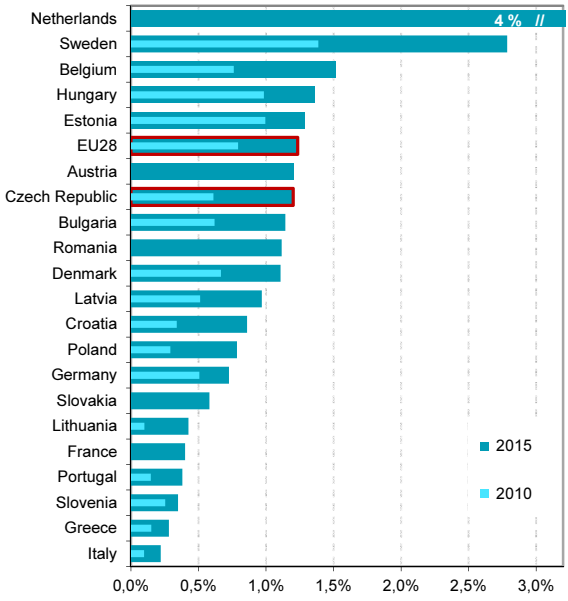


Figure D59 Computer services and software exports (% of GDP)



Source: Eurostat

Table D16 Computer services and software imports to the Czech Republic

CZK million

	2014	2015	2016
Total	**28 015**	**28 178**	**29 546**
Computer services	22 561	21 566	22 453
Computer software	5 454	6 613	7 093
by selected countries			
EU28, total	20 233	20 219	21 330
of which from Germany	7 550	6 554	7 289
Other countries, total	7 781	7 959	8 216
of which from the United States	4 001	3 358	3 331

Figure D60 Computer services and software imports

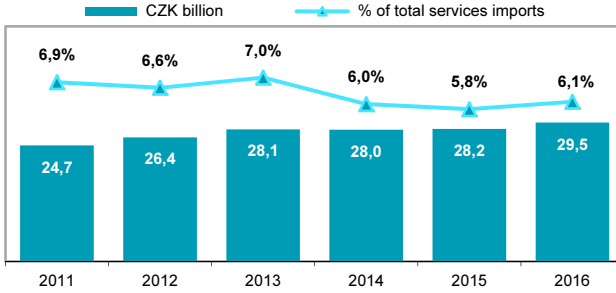


Figure D61 Computer services and SW imports by type of service

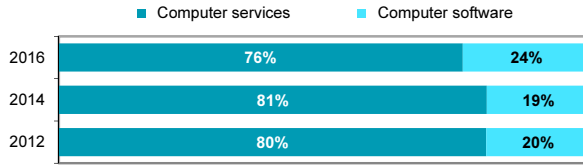
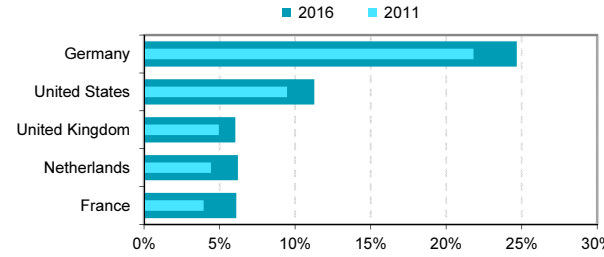


Figure D62 Computer services and SW imports by countries



Source: CZSO, Survey on exports and imports of services

Figure D63 Computer services and software imports (% of total services imports)

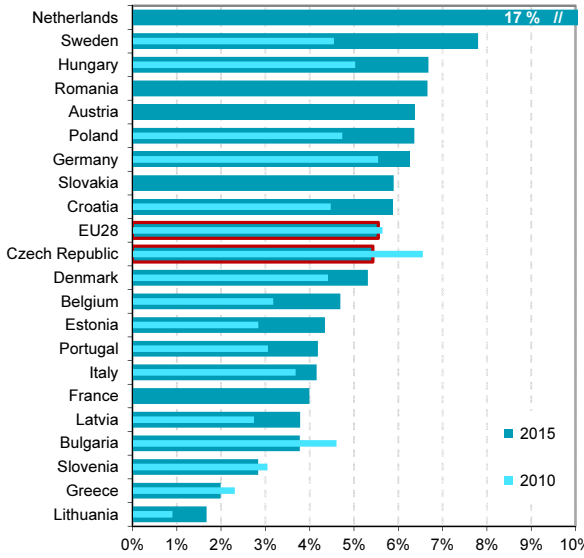
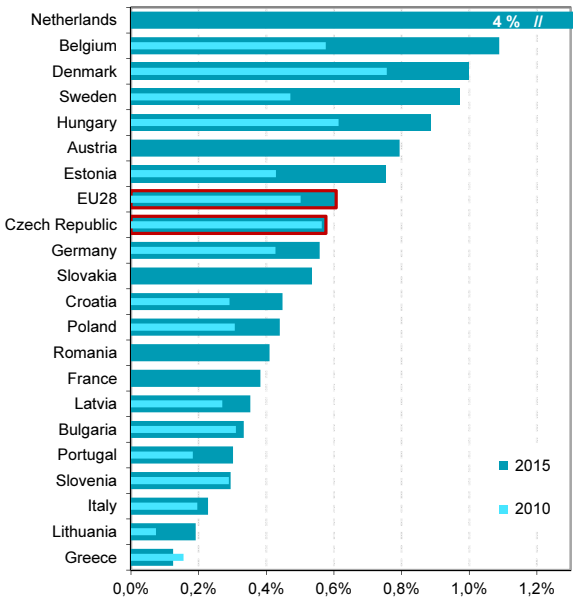


Figure D64 Computer services and software imports (% of GDP)



Source: Eurostat

E ICT sector

In general, the term **ICT sector** includes a combination of ICT manufacturing and ICT services industries which are associated with the production and/or distribution of information and communication technologies (ICT) and a provision of related services. For more details see: „**OECD Guide to Measuring the Information Society 2011:** www.oecd.org/sti/measuring-infoeconomy/guide"

ICT sector together with Content and media sector was already in 2007 recognized by the **United Nation Statistics Division** as a new alternative grouping of economic activities called information economy. The **information economy** sector is defined within the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4. For more information see following web page: http://unstats.un.org/unsd/cr/registry/docs/i4_information_economy.pdf

ICT sector is divided into the **four main categories**: ICT manufacturing industries, ICT trade industries, Telecommunications and IT services. The ICT sector involves enterprises, which dominating activities belong to the **CZ-NACE groups and classes** as follows:

ICT manufacturing industries:

- 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 trade industries (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 industries:

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

Data for this chapter, except for R&D expenditures (source: **R&D annual survey – see chapter C**), 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 2016 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 the data from the SBS, including definitions of individual indicators, is available at: http://ec.europa.eu/eurostat/web/structural-business-statistics/overview

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

E ICT sector

Table E1 Employment in ICT sector in the Czech Republic

number of persons employed - headcount persons

	2014	2015	2016*
Total	**143 425**	**147 389**	**157 796**
ICT manufacturing, total	**23 346**	**23 771**	**25 853**
Manuf. of computers & electr. components	13 905	13 907	15 118
Manufacturing of communication equipment and consumer electronics	9 440	9 864	10 734
ICT services, total	**120 080**	**123 618**	**131 943**
ICT wholesale	12 356	11 837	11 383
Telecommunications	18 189	17 733	18 997
IT services**	89 535	94 048	101 563

** Preliminary data*

*** Programming, consultancy & related IT activities including data processing*

Figure E1 Employment in the ICT sector

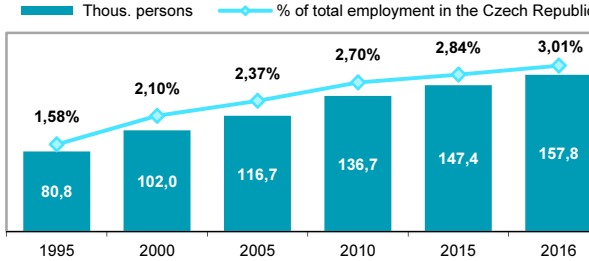


Figure E2 Employment in ICT sector by industry

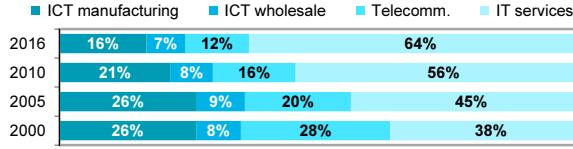


Figure E3 Employment in ICT sector by ownerships; 2016

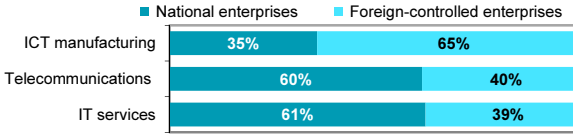
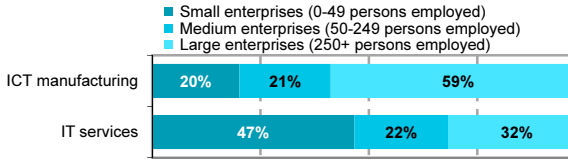
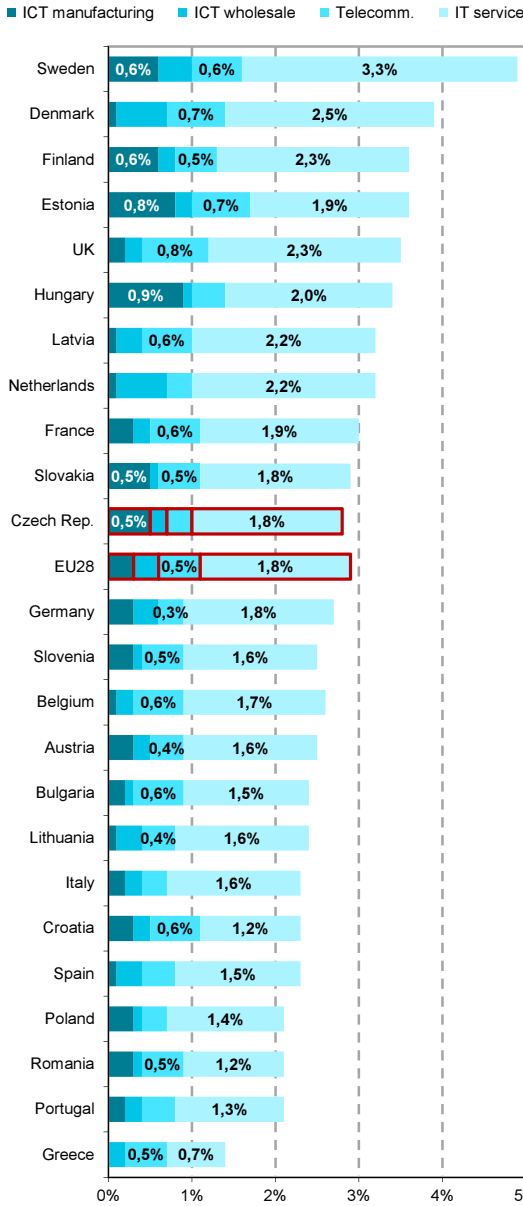


Figure E4 Employment in ICT sector by size; 2016



Source: CZSO, Structural Business Statistics

Figure E5 Employment in the ICT sector; 2015*
(as a percentage of total employment)



** or the latest year available*

Source: CZSO calculations based on the Eurostat SBS database

Figure E6 Employment in ICT manufacturing in the Czech Rep.

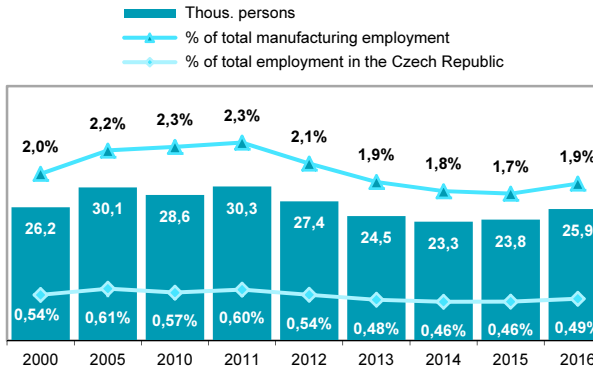


Figure E7 Employment in Telecommunications in the Czech Rep.

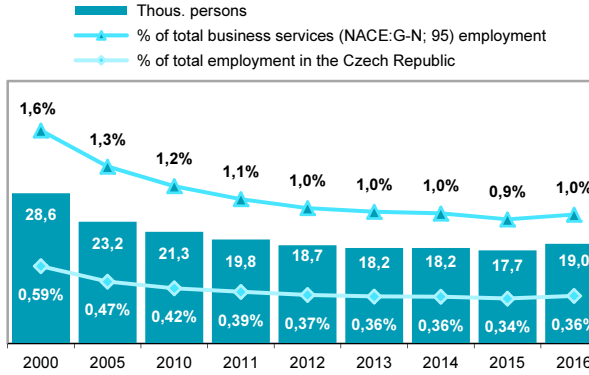
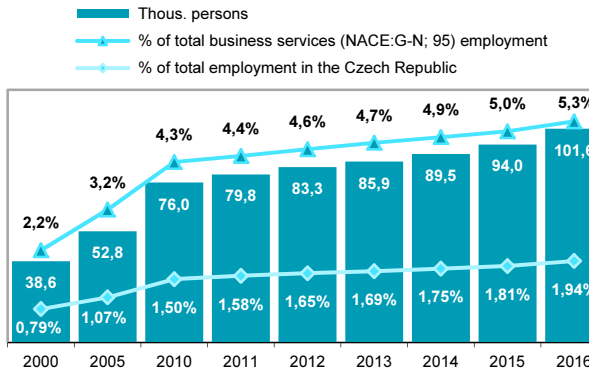


Figure E8 Employment in IT services in the Czech Republic



Source: CZSO, Structural Business Statistics

Figure E9 Employment in ICT manufacturing; 2015*
(as a percentage of total manufacturing employment)

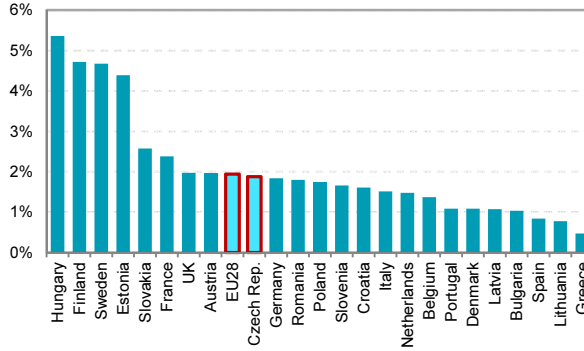


Figure E10 Employment in Telecommunications; 2015*
(as a percentage of total business enterprise sector employment)

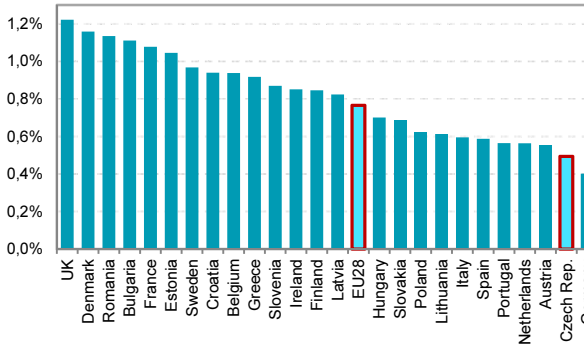
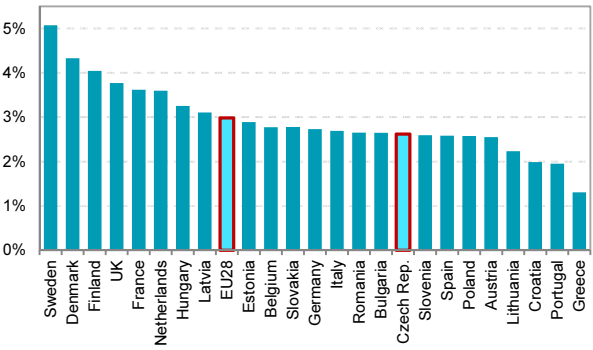


Figure E11 Employment in IT services industries; 2015*
(as a percentage of total business enterprise sector employment)



** or the latest year available*

Source: CZSO calculations based on the Eurostat SBS database

E ICT sector

Table E2 Production value in the ICT sector in the Czech Rep.

CZK million, current prices

	2014	2015	2016*
Total	**513 330**	**554 630**	**572 949**
ICT manufacturing, total	**211 726**	**219 645**	**220 367**
Manuf. of computers & electron. components	156 516	168 030	168 686
Manufacturing of communication equipment and consumer electronics	55 210	51 615	51 681
ICT services, total	**301 603**	**334 985**	**352 582**
ICT wholesale	22 547	22 660	22 485
Telecommunications	100 678	113 128	117 365
IT services**	178 378	199 197	212 732

** Preliminary data*

*** Programming, consultancy & related IT activities including data processing*

Figure E12 Production value in the ICT sector

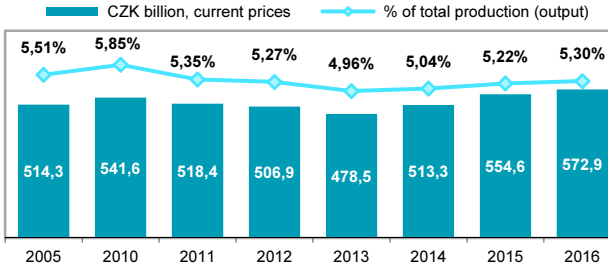


Figure E13 Production value in ICT sector by industry

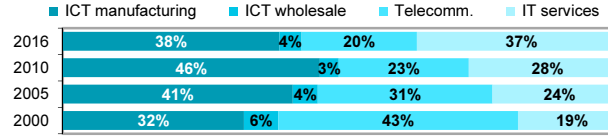


Figure E14 Production value in ICT sector by ownerships; 2016

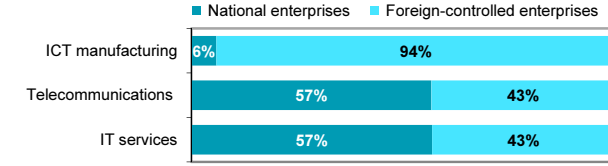
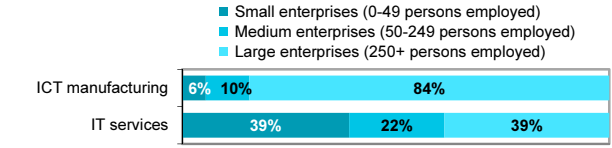
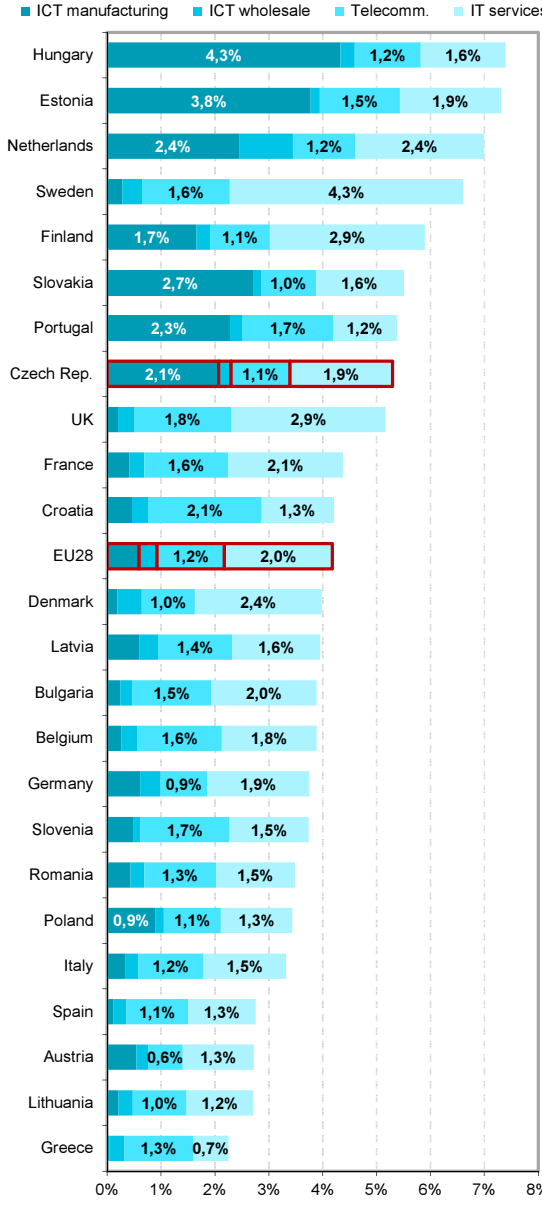


Figure E15 Production value in ICT sector by size; 2016



Source: CZSO, Structural Business Statistics

Figure E16 Production value in the ICT sector; 2015*
(as a percentage of total production)



** or the latest year available*

Source: CZSO calculations based on the Eurostat SBS database

Figure E17 Production value in ICT manufacturing

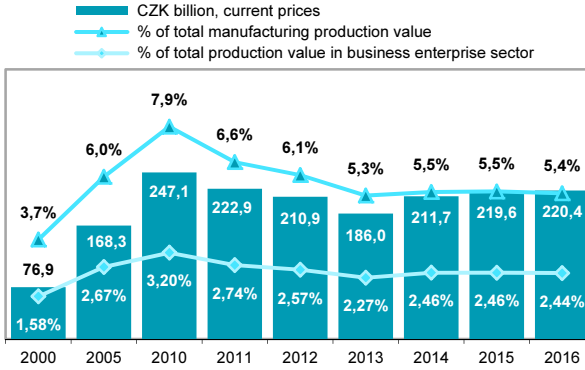


Figure E18 Production value in Telecommunications

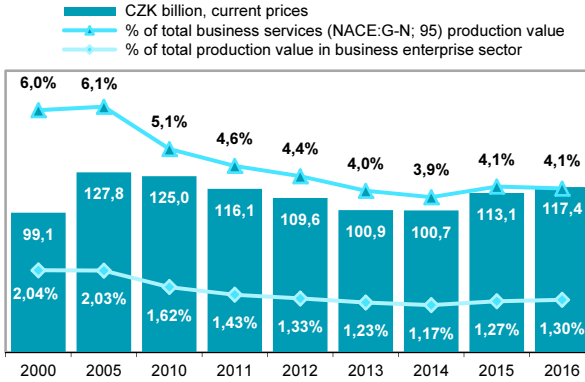
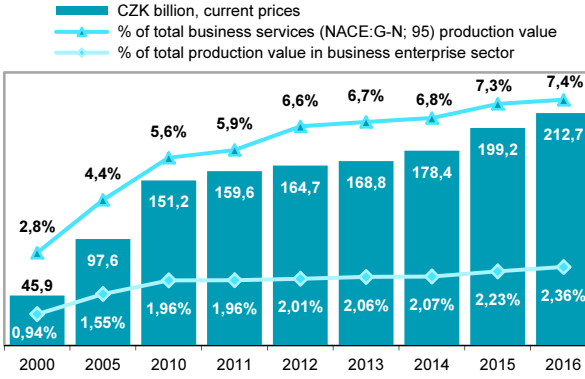


Figure E19 Production value in IT services



Source: CZSO, Structural Business Statistics

Figure E20 Production value in ICT manufacturing; 2015*
(as a percentage of total manufacturing production value)

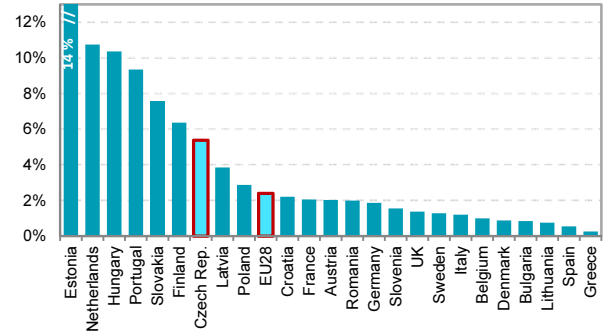


Figure E21 Production value in Telecommun.; 2015*
(as a percentage of total production value in business sector)

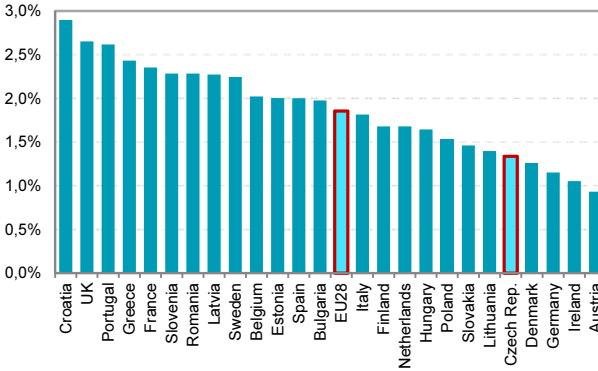
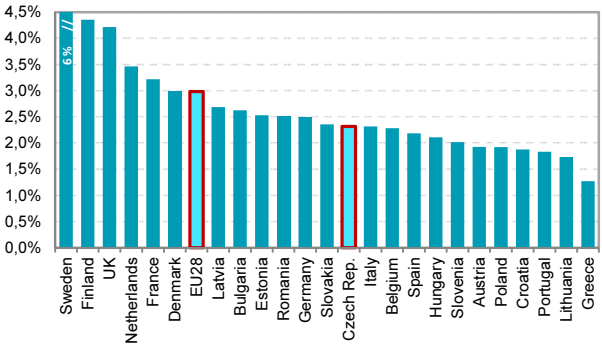


Figure E22 Production value in IT services; 2015*
(as a percentage of total production value in business sector)



** or the latest year available*

Source: CZSO calculations based on the Eurostat SBS database

E ICT sector

Table E3 Value added of the ICT sector in the Czech Republic

CZK million, current prices

	2014	2015	2016*
Total	**165 899**	**174 965**	**182 453**
ICT manufacturing, total	**17 046**	**15 416**	**15 749**
Manuf. of computers & electron. components	8 728	9 123	8 252
Manufacturing of communication equipment and consumer electronics	8 318	6 293	7 497
ICT services, total	**148 854**	**159 549**	**166 704**
ICT wholesale	11 105	11 738	11 703
Telecommunications	46 543	45 972	47 142
IT services**	91 206	101 839	107 859

** Preliminary data*

*** Programming, consultancy & related IT activities including data processing*

Figure E23 Value added of the ICT sector

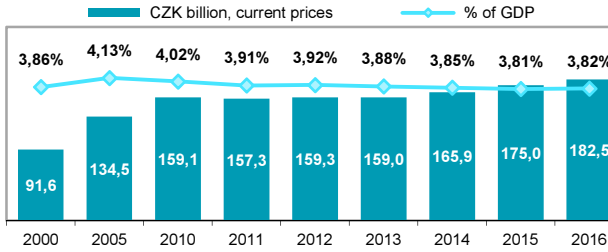


Figure E24 Value added of ICT sector by industry

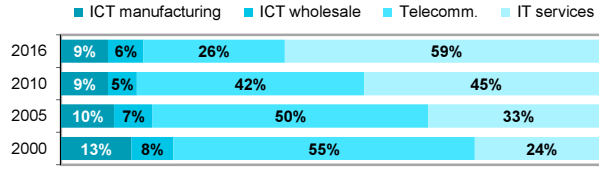


Figure E25 Value added of ICT sector by ownerships; 2016

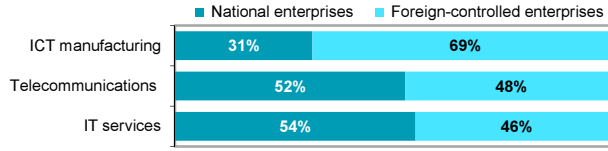
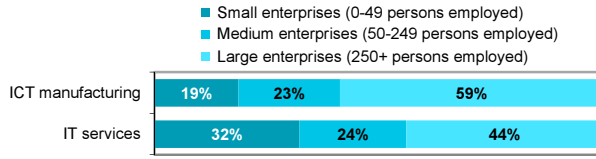
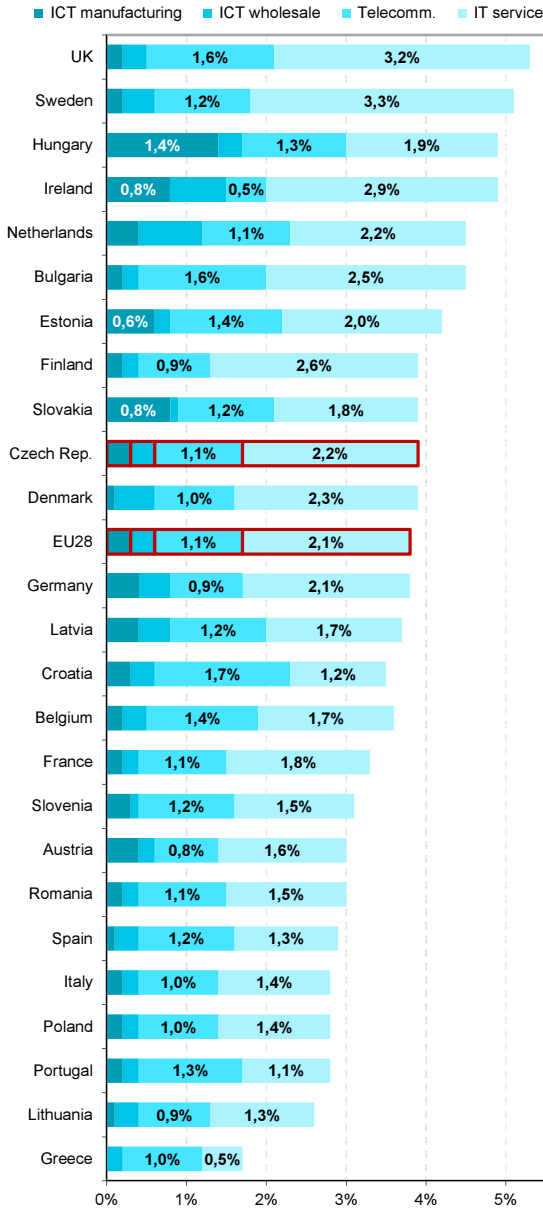


Figure E26 Value added in ICT sector by size; 2016



Source: CZSO, Structural Business Statistics

Figure E27 Value added of ICT sector; 2015*
(as a percentage of GDP)



** or the latest year available*

Source: CZSO calculations based on the Eurostat SBS database

Figure E28 Value added of ICT manufacturing

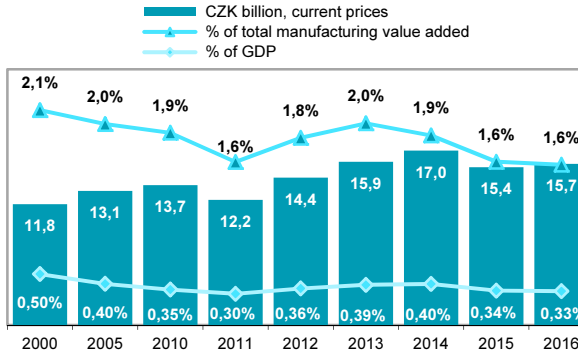


Figure E29 Value added of Telecommunications

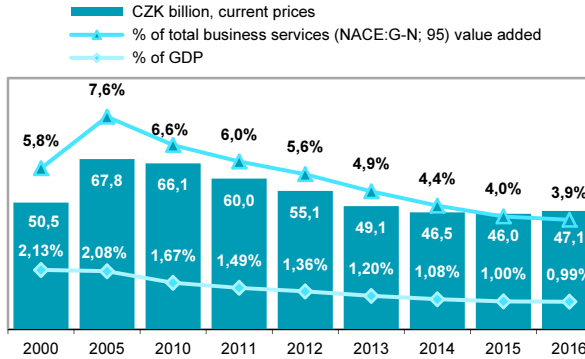
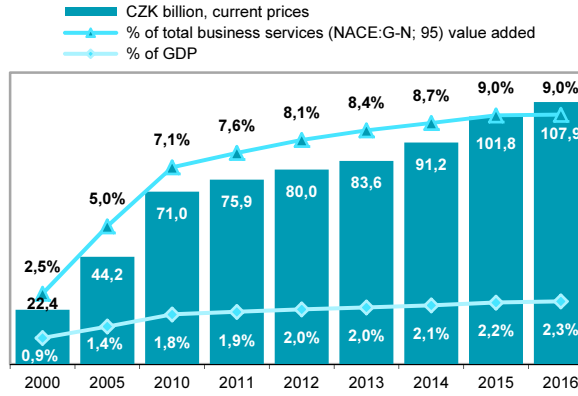


Figure E30 Value added of IT services



Source: CZSO, Structural Business Statistics

Figure E31 Value added of ICT manufacturing; 2015*
(as a percentage of total manufacturing value added)

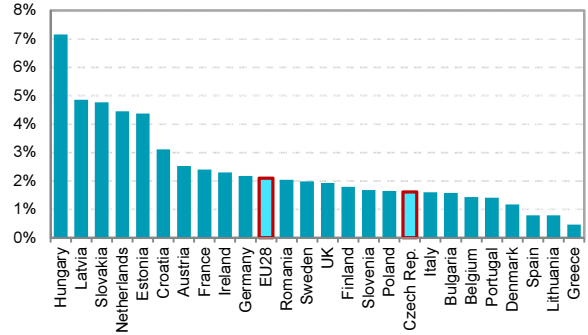


Figure E32 Value added of Telecommunications; 2015*
(as a percentage of total value added in business sector)

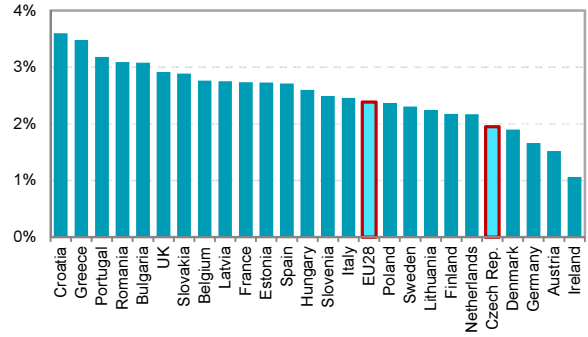
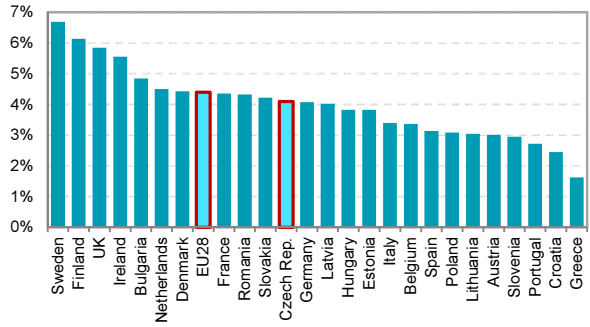


Figure E33 Value added of IT services; 2015*
(as a percentage of total value added in business sector)



** or the latest year available*

Source: CZSO calculations based on the Eurostat SBS database

E ICT sector

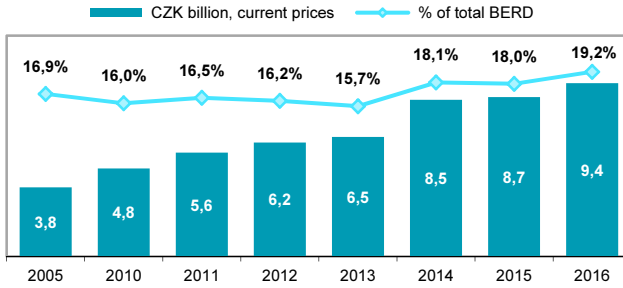
Table E4 R&D expenditure in the ICT sector in the Czech Republic

CZK million, current prices

	2014	2015	2016
Total	**8 515**	**8 661**	**9 421**
ICT manufacturing, total	**625**	**500**	**532**
Manuf. of computers & electron. components	208	161	174
Manufacturing of communication equipment and consumer electronics	417	338	358
ICT services, total	**7 889**	**8 162**	**8 889**
ICT wholesale	140	134	100
Telecommunications	603	633	685
IT services*	7 147	7 395	8 104

** Programming, consultancy & related IT activities including data processing*

Figure E34 R&D expenditure in the ICT sector



BERD - Intramural R&D Expenditure in the Business Enterprise Sector

Figure E35 R&D expenditure in ICT sector by industry

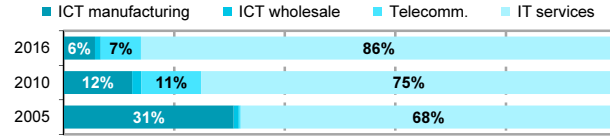


Figure E36 R&D expenditure in ICT sector by ownerships; 2016

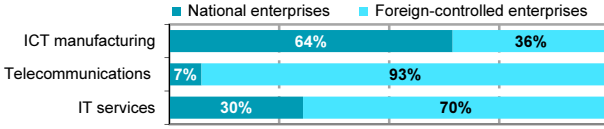
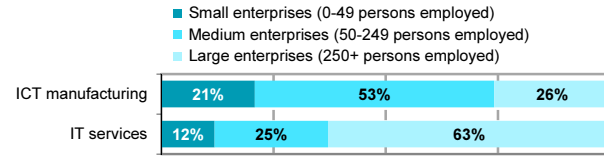
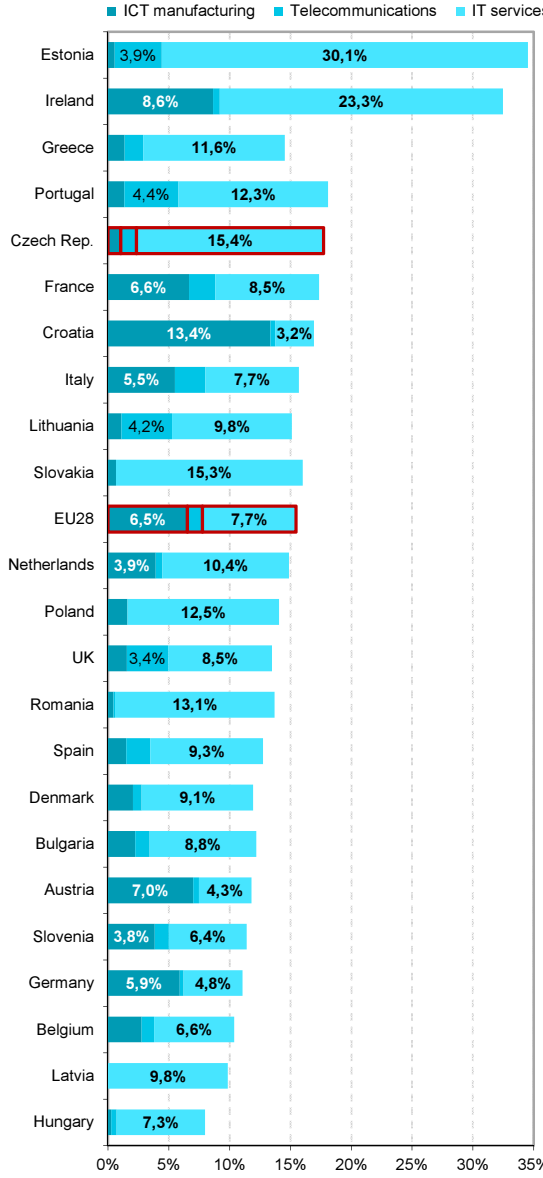


Figure E37 R&D expenditure in ICT sector by size; 2016



Source: CZSO, Annual R&D survey

Figure E38 R&D expenditure in the ICT sector; 2015*
(as a percentage of total BERD)



BERD - Intramural R&D Expenditure in the Business Enterprise Sector

** or the latest year available*

Source: CZSO calculations based on the Eurostat STI Database

Figure E39 R&D expenditure in ICT manufacturing

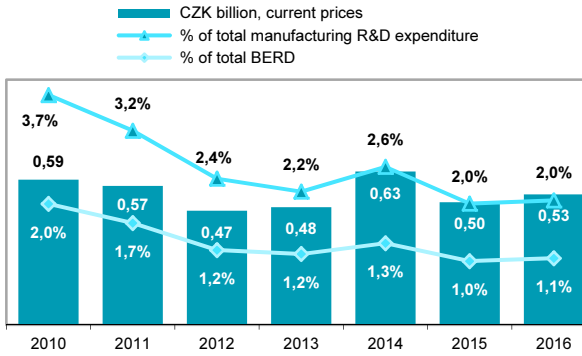


Figure E40 R&D expenditure in Telecommunications

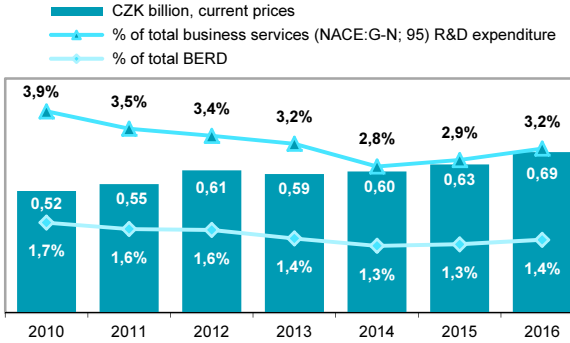
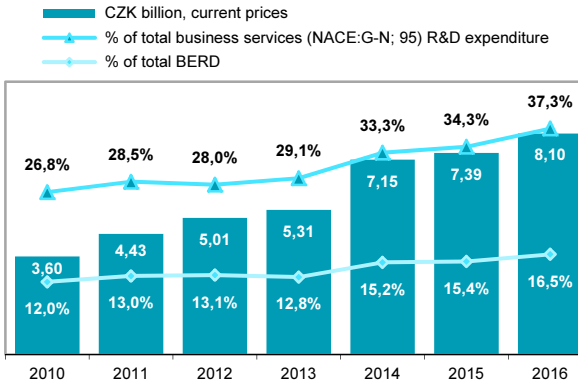


Figure E41 R&D expenditure in IT services



BERD - Intramural R&D Expenditure in the Business Enterprise Sector

Source: CZSO, Annual R&D survey

Figure E42 R&D expenditure in ICT manufacturing; 2015*
(as a percentage of total manufacturing R&D expenditure)

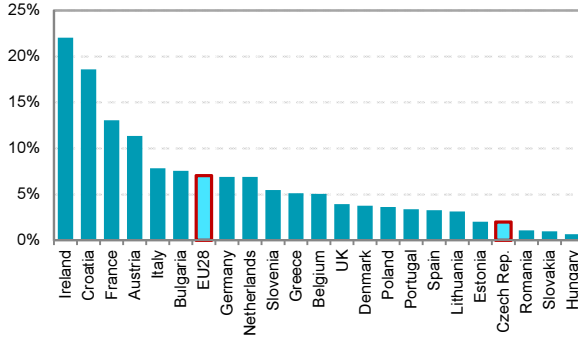


Figure E43 R&D expenditure in Telecommun.; 2015*
(as a percentage of total BERD)

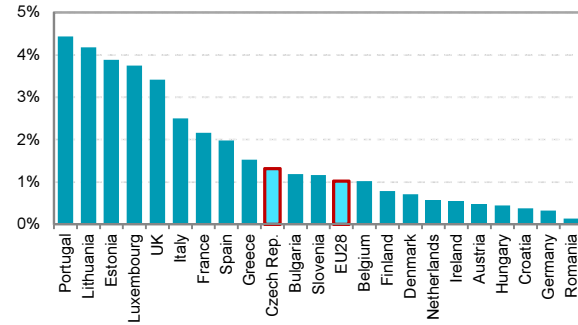
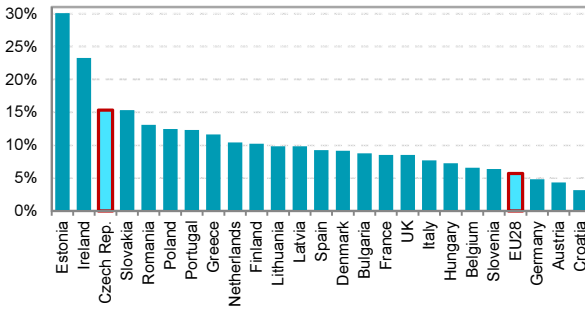


Figure E44 R&D expenditure in IT services; 2015*
(as a percentage of total BERD)



BERD - Intramural R&D expenditure in the business enterprise sector
** or the latest year available*

Source: CZSO calculations based on the Eurostat STI Database