TECHNOLOGY READINESS OF THE CZECH REPUBLIC

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Abstract

World Economic Forum makes since 2001 comparison of the countries all over the world in the Growth Competitiveness Index. The article proposes to describe the technology level of the Czech Republic. We will concretely focus on the Technological Readiness. This sub index is the part of the Efficiency Enhancer which has 50% of the percentage share of the Global Competitiveness Index. The first part of the article contains the description of the Technological Readiness index and the results of the development in the evaluation in the Czech Republic. The Technological Readiness is since 2008 composed from indicators that will be described in the article. The technological readiness of the country, business entities and their citizens has an integral impact on the economic situation. Due it will be the obtained results connected with the results of the various investigations of the Czech statistical office in the second part of the article and with the investigation carried out by the author done in 2014 in the third part of the article. The article is based on primary and secondary sources.

Key words: Advanced Technology, Growth Competitiveness Index, Development, Statistics, Technology Readiness

JEL Code: F43, O44, P51

Introduction

Since 2001 makes World Economic Forum comparison of the states all over the world. The article proposes to describe the technology level of the Czech Republic since 2008 to 2015. The previous article of the author was aimed on the results from 2001 to 2006 (Svobodová, 2010). The aim was on the sub index (technology index) of the Growth Competitiveness Index (GCI). The new process of calculation is used since 2007 for GCI and technology index was substituted. The Czech Republic was ranked from 19th to 22nd position in the previous evaluation.

With this topic focused for example also Parasuraman (2000), Lin et. al. (2007), Peltier et. al. (2012), Jong-Wha (2001), Moorhouse (2002), Richey et. al. (2007), Scholleová (2009) and others.

1 Methodology

The article is based on primary and secondary sources. The primary sources are represented by the results from the conducted questionnaire investigation and by ideas of the author. The secondary sources are represented more. They comprise information about technological readiness, professional literature, information collected from professional press, discussions or previous participations in professional seminars and conferences relating to the chosen subject. Most of the information is gained from the World Economic Forum and Czech Statistical Office. Then it was necessary to select, classify and update accessible relevant information from the numerous published materials that would provide the basic knowledge of the selected topic.

The aim of the paper is to describe the situation in the field of technological readiness in the Czech Republic from 2008 to 2015.

It has been established the following hypotheses: it can be expected that the technological readiness is in the Czech Republic each year improving.

2 Results

The next part contains results from the Global Competitiveness report, Statistics from the Czech Statistical Office and Results of the questionnaire investigation done by the author of this paper.

2.1 Global Competitiveness Report and Technological Readiness

The World Economic Forum (WEF) annually prepares the Global Competitiveness Report, which evaluates the competitiveness of 144 countries.

In today's globalized world, technology is increasingly essential for firms to compete and prosper. The technological readiness pillar measures the agility with which an economy adopts existing technologies to enhance the productivity of its industries, with specific emphasis on its capacity to fully leverage information and communication technologies (ICTs) in daily activities and production processes for increased efficiency and enabling innovation for competitiveness. ICTs have evolved into the "general purpose technology" of our time, given their critical spillovers to other economic sectors and their role as industry-

wide enabling infrastructure. Therefore ICT access and usage are key enablers of countries' overall technological readiness.

Whether the technology used has or has not been developed within national borders is irrelevant for its ability to enhance productivity. The central point is that the firms operating in the country need to have access to advanced products and blueprints and the ability to absorb and use them. Among the main sources of foreign technology, FDI often plays a key role, especially for countries at a less advanced stage of technological development. It is important to note that, in this context, the level of technology available to firms in a country needs to be distinguished from the country's ability to conduct blue-sky research and develop new technologies for innovation that expand the frontiers of knowledge. That is why we separate technological readiness from innovation, captured in the 12th pillar. (World Economic Forum, The Global Competitiveness Report 2014-2015)

In the table 1 there are presented the overall results of the technological readiness of the Czech Republic from 2008 till 2015.

Tab. 1: Technological readiness, total ranking and values

2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
rank	rank	rank	rank	rank	rank	rank
33	30	32	31	31	34	36
value	value	value	value	value	value	value
4,5	4,7	4,5	4,8	5,1	4,9	5,0

Source: World Economic Forum

Technological readiness remains low in (36th) and Czech businesses - although doing comparatively well in a regional context - are less sophisticated and innovative than other economies in the European Union. (World Economic Forum, The Global Competitiveness Report 2014-2015) The worst position was gained in the last evaluation.

Tab. 2: Ranking of Technological readiness Factors

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Availability of latest technologies	49	48	46	40	43	53	51
Firm-level technology absorption	38	35	36	45	49	54	50
FDI and technology transfer	13	14	15	15	18	27	36
Individuals using Internet, %	40	38	30	30	28	28	31
Fixed broadband Internet subscriptions /100 pop.	33	32	33	41	38	41	41
Int´l Internet bandwidth, kb/s per user	-	-	34	20	16	19	25
Mobile broadband subscriptions/100 pop.	7	13	-	-	20	35	44

Source: World Economic Forum

The most problematic are evaluated availability of latest technologies and firm-level technology absorption. Also get worse FDI and technology transfer. Those three factors are evaluated by Executive Opinion Survey. The people gained three questions:

- In your country, to what extent are the latest technologies available? [1 = not available at all; 7 = widely available]
- In your country, to what extent do businesses adopt new technology? [1 = not at all; 7 = adopt extensively]
- To what extent does foreign direct investment (FDI) bring new technology into your country? [1 = not at all; 7 = to a great extent—FDI is a key source of new technology]

Disadvantage of this evaluation can be subjective feeling of evaluators. Some may be less critical, others more.

Tab. 3: Values of Technological readiness Factors

	2011/2012	2012/2013	2013/2014	2014/2015
Availability of latest technologies	5,6	5,5	5,2	5,2
Firm-level technology absorption	5,2	5,1	4,9	5,0
FDI and technology transfer	5,3	5,3	5,1	5,0
Individuals using Internet, %	68,8	73,0	75,0	74,1
Fixed broadband Internet subscriptions/100 pop.	14,7	15,7	16,6	17,0
Int´l Internet bandwidth, kb/s per user	47,7	91,1	101,0	111,2
Mobile broadband subscriptions/100 pop.	-	43,1	44,0	45,3

Source: World Economic Forum

Despite the fact that some factors increase (for example last two factors), when we are compared with other countries is our position deteriorates. This means that other countries in the given factors improved more than the Czech Republic.

Each country has evaluated the most problematic factors for doing business. It is positive that none of them is from the technological readiness.

Spending and investment in ICT accelerate the expansion of ICT in society and also contribute to GDP growth. Use of ICT in all parts of the economy do not only helps businesses increase the overall efficiency, but also at the same time increasing productivity growth. Despite the share of ICT investments in total investment in the Czech Republic is since 1993 growing with minor exceptions the technological readiness in the comparison with other countries is getting worse.

Next table presents countries that are on the highest positions in the evaluation of the technological readiness. The positions are changing each year. The most stable were in the comparison in the last years Sweden, Hong Kong and Denmark.

Tab. 4 Ranking of Technological readiness – the first places

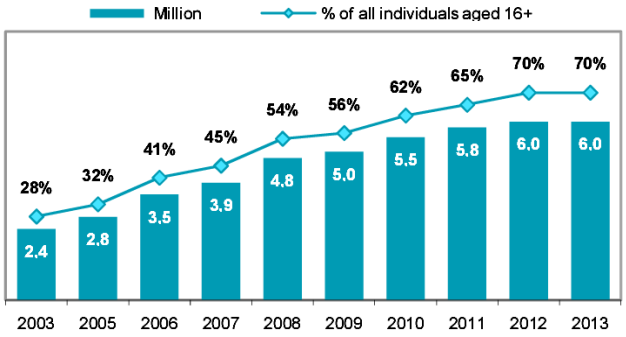
	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Luxembourg	12	5	2	9	2	2	1
Great Britain	8	8	8	8	7	4	2
Sweden	2	1	1	2	1	1	3
Norway	4	7	9	-	13	3	4
Hong Kong	10	9	5	6	4	6	5
Denmark	3	4	6	4	3	5	6
Singapore	7	6	11	10	5	7	7
Iceland	6	14	4	3	8	10	8
Netherlands	1	2	3	5	9	8	9
Switzerland	5	3	7	1	6	9	10

Source: World Economic Forum

2.2 Statistics from the Czech Statistical Office

The statistics from the Czech Statistical Office are presented in the next three figures and related text. Those data were used by World Economic Forum in the selected indicators. All three main indicators have rising trend until 2012. From this year remained the using of internet by individuals on the same level. On the other hand average household member spend in 2012 1,556 CZK on ICT equipment and 4,955 on ICT services. The highest expenditures were done in 2006 by 5% of total household expenditures. It was turning point. From 1994 until 2006 those expenditures rose. From 2008 they have decreasing tendency. It is interesting to compare the percentage of household expenditure on ICT by type of product. In 1995 was spent 35% on ICT services and 65% on ICT equipment. In 2000 was this ratio 53% to 47% on ICT equipment. In 2012 was the situation reverse to 1995. 24% was spent on ICT equipment and 76% on ICT services.

Fig. 1: Individuals using internet

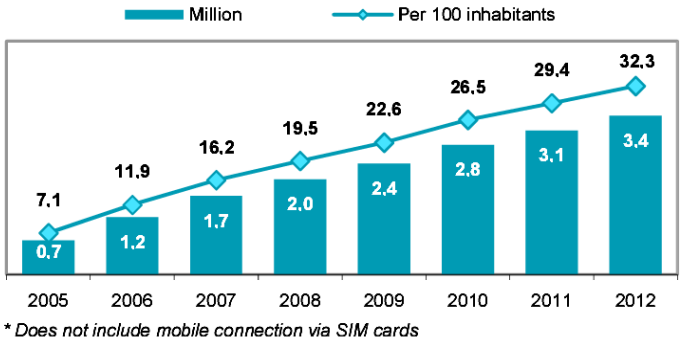


Source: Czech Statistical Office

The using of internet by individuals rose each year from 2003 until 2012. In 2013 73% of males and 68% of females use internet. The utilization is falling by age.

Internet connections used by households should by divided into four groups. The biggest one, fixed wireless access (FWA, Wi-Fi), is presented by 50% in 2013. The next ones are xDSL Line with 22% and Cable modem with 21%. Only 4% of households used Dial-up, ISDN line for internet connection.

Fig. 2: Permanent broadband subscriptions

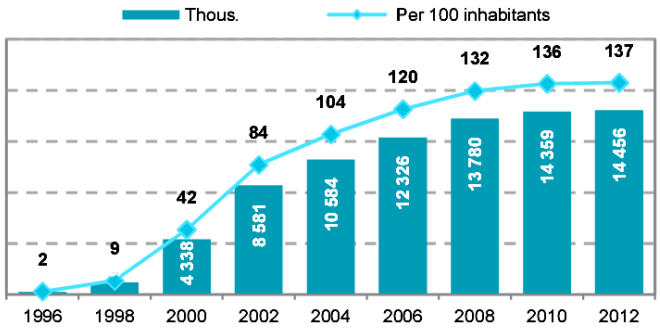


Source: Czech Statistical Office

The fixed wired broadband subscriptions is in 62% presented by DSL (ADSL) lines, 33% Cable modem and remaining 5% are Fibre.

The internet was mostly used in 2013 on sending or receiving e-mails (66%), reading on-line news, newspaper, magazines (60,1%), searching information on goods and services (60%), information about travel and accommodation (41,3%) and internet banking (39,3%). The next ones are information about health (38,5%), watching movies, short films and videos (36,3%) and participation of social networks is represented by 34,3%.

Fig. 3: Mobile telephone subscriptions – active SIM cards



Source: Czech Statistical Office

The mobile telephone subscriptions should be divided by type of used SIM card on pre-paid and post-paid card. Turning point came in 2009, when the post-paid cards face-off with pre-paid cards. The prepaid-cards reached peak in 2004. From this time almost remained on the same level till 2008. From this time have pre-paid cards decreasing tendency. The post-paid cards have from 2002 the rising tendency each year.

In 2003 used 66% of all individuals aged 16+ a mobile phone. In 2007 it was 85%, in 2009 91% and from 2012 it it 96%. In 2013 used 100% of individuals aged 16+ to 44 years mobile phone. The percentage of utilization of mobile phone fall on 99% of individuals aged 44-54, 98% aged 55-64 and 90% aged 65%. There is no important difference in gender.

There is the significant difference in using mobile phone to access the internet by individuals. In 2010 only 4% of individuals use mobile phone to access the internet. From this time it has rising tendency. In 2011 it was 8%, in 2012 it was 13% and in 2013 it was 21% of individuals aged 16+. The trend is similar as by using internet. The percentage of utilization is falling with the age.

2.3 Results of the questionnaire investigation

Description of the project

In 2014, a survey was conducted among nearly 300 businesses. Concretely were gained 295 questionnaires. Three of them were not possible to use for next evaluation. The survey was done on the Faculty of Informatics and Management of the University of Hradec Králové. The partial results will be presented in the article. The survey involved 77% of SMEs and 23% of large enterprises from all regions of the Czech Republic.

Due to the use of technology, IS/IT and ICT, their benefits and the importance for managers and companies was included in the given questionnaire the question focused on managerial accounting and utilization of software in solving managerial problems. This topic is also closely connected to technology readiness.

Results of the survey

There were defined the following four areas:

- We are using accounting software
- We are using specialized software
- We are using MS Excel
- We do not use SW

Answers and their results are shown in the following table 5.

242 of involved SME use software in solving managerial problems. 29 SMEs said that the software is not used in solving managerial problems. In the event that we will focus on large enterprises, 31 of them use accounting software, almost a third of them use specialized software, and 36 of them are using MS Excel. Four large companies stated that they do not use any software in the managerial accounting. It is alarming. It can be assumed that small and medium-sized businesses do not have the capacity to deal with managerial problems and they estimate it. The reason may be that the owner of the company is very often also a manager. He manages a company by the internal processes and knowledge based on knowledge of the business environment. He does not need to control the work of another manager. For large companies, it is not expected that by solving management problems in today's turbulent times full of technology is not used any software.

Tab. 5: Utilization of software in solving managerial problems

Size of the firm	Accounting SW	Specialized SW	MS Excel	Total – is used	We do not use SW
Small	59	15	89	163	29
Medium	35	14	30	79	2
In insolvency		1		1	
In bankruptcy	1			1	
In liquidation					1
Large	31	19	36	86	4
Total	126	49	155	330	36

Source: own elaboration

Conclusion

Czech Republic was under review technological readiness ranked on 36th position. Despite the fact that the last three factors have improved in recent years and the previous four remained at similar levels, technological readiness in the Czech Republic decreased. Thus, we reject the hypothesis. The Czech firms should be better in exploitation the technological readiness of the Czech Republic and get better advantage - foreign direct investment and technology transfer – to know how to exploit and develop the conditions for entrepreneurship and business environment. The support from the state and other organizations is also needed. In the future we should strive to gain a competitive advantage and continue to support not only the development of technology in the Czech Republic, but also the development of innovation, which is currently being evaluated in a study by the World Economic Forum on the twenty-fifth rung. With this context it is also connected education and high school, where are evaluated selected criteria (eg. the cooperation between universities and the business sector in research and development, as many scientists and engineers, etc.).

Acknowledgment

This paper is written with financial support from specific university research funds of the Czech Republic Ministry of Education, Youth and Sport allocated to the University of Hradec Králové Faculty of Informatics and management, project no. 2110/2015.

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Results from the questionnaire investigation done in 2014 on the Faculty of Informatics and Management of the University of Hradec Králové

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