

# BENCHMARKING TOOLS ANALYSING THE ICT SECTOR FOCUSING ON HUNGARY

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## 1. SUMMARY

The article examines some benchmarking indices, which are useful tools to monitor the development level of the knowledge economies considering the aspect of their level of information and communication technology (ICT) development. The article also tries to place Hungary within this context.

Keywords: benchmarking, ICT development, Hungary

## 2. BENCHMARKING TOOLS

Information and communication technologies are one of the driving forces of knowledge economies. The phrase knowledge economy was used first by Peter Drucker, although Drucker accredited the phrase to economist Fritz Machlup (Machlup, 1962). Drucker described the difference between the hand worker and the knowledge worker. The hand worker constructs goods or services. However, a knowledge worker produces ideas, knowledge, and information (Drucker, 1993).

The measurement of a country's ranking concerning their development level in this field is always a challenge. Several organisations attempt to offer a measurement based on several indicators. As these indicators differ it is problematical to make a comparison between them as they do not build on the same, only on a similar basis. Nevertheless this article makes an effort to give a short outline of these different benchmarking tools with a focus on Hungary's ranking within these hierarchies compared to other members of the EU.

The following rankings are examined:

- The World Bank's Knowledge Economy Index (KEI)
- The ITU (International Telecommunication Union)'s ICT Development Index (IDI)
- The Networked Readiness Index of the World Economic Forum

- Economist Intelligence Unit's Digital economy rankings
- The Connectivity Scorecard

All the above tools contain not only European Union member states, but other countries of the world, too. Thus the rankings also have a wider range. Nevertheless these lists help to decide the countries relative position weighing against each other.

## 3. METHODOLOGY

Due to the limited length of this publication the detailed methodology and all indicators will not be listed within this article, nevertheless links are given to these data within the bibliography references. The article tries to give a general overview of the types of indicators and approaches, which are used to measure the different fields of a knowledge society. In general the indicators used to define the indices fall into the following categories: access indicators, use indicators and skills indicators.

### 3.1 World Bank's Knowledge Economy Index (KI), 2009

The World Bank has developed a Knowledge Assessment Methodology (KAM) for benchmarking a country's position in comparison with others in the global knowledge economy. The KAM Knowledge Index (KI) measures the potential of knowledge development in a certain country. The KI is the average of the normalized performance results of a country on the main variables in three Knowledge Economy pillars – education and human resources, the innovation system and information and communication technology.

### 3.2 ITU IDI, 2010

The ITU (International Telecommunication Union) is the United Nations specialized agency for information and communication technologies. The two indices, the ICT Development Index (IDI) and the ICT Price Basket are two benchmarking tools to measure Information Society.

The ICT Development Index (IDI) is a composite index made up of 11 indicators covering ICT access, use and skills. It has been constructed to measure the level and evolution over time of ICT developments.

The indicators ITU uses to define the IDI are the following:

(A) Access indicators:

- Fixed telephone lines per 100 inhabitants
- Mobile cellular telephone subscriptions per 100 inhabitants
- International Internet bandwidth (bit/s) per Internet user
- Proportion of households with a computer
- Proportion of households with Internet access at home

(B) Use indicators:

- Internet users per 100 inhabitants
- Fixed broadband Internet subscribers per 100 inhabitants
- Mobile broadband subscriptions per 100 inhabitants

(C) Skills indicators:

- Adult literacy rate
- Secondary gross enrolment ratio
- Tertiary gross enrolment ratio

### **3.3 The Networked Readiness Index of the World Economic Forum, 2010-2011**

The networked readiness framework consists of three sub-indices, that measure the environment for ICT, together with the main stakeholders' readiness and usage:

(A) Environment sub-index:

- Market environment
- Political and regulatory environment
- Infrastructure environment

(B) Readiness sub-index:

- Individual readiness
- Business readiness
- Government readiness

(C) Usage sub-index:

- Individual usage
- Business usage
- Government usage

### **3.4 The Economist Intelligence Unit Digital economy rankings, 2010**

The digital economy rankings assess the quality of a country's ICT infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit.

(A) Category:

- Connectivity and technology infrastructure
- Business environment
- Social and cultural environment
- Legal environment
- Government policy and vision
- Consumer and business adoption

### **3.5 Connectivity Scorecard, 2011**

The Connectivity Scorecard is created by the Law and Economics Consulting Group (LECG) with the support of Nokia Siemens. It divides the countries of the world into two groups based on their main driving force: innovation driven economies and efficiency and resource driven economies. The terms originate from the World Economic forum (WEF). The countries examined are relatively small in numbers (16), thus we did not use the rankings in the general comparison. The reason we refer to this scorecard is, that Hungary appears within the first group (innovation driven economies), besides Poland, the Czech Republic and Korea. The rest of the group members are mostly Western European countries.

## **4. COMPARISON AND ANALYSIS OF HUNGARY**

As we have stated before within this following chapter, we will only focus on EU member states.

The indices shows, that Hungary and the new member states, which joined the EU in 2004 and later, are lagging behind, concerning their level of ICT development. Nevertheless this position may be argued about as the examination of the detailed results of the following benchmarking tools show.

### **4.1 The World Bank's Knowledge Economy Index (KEI)**

According to the World Bank's Knowledge Economy Index Hungary performs quite well being on the 27<sup>th</sup> place. Hungary improved 3 ranks since 200 and has a better position than most of

the post-Socialist peers plus all of the South European countries (Italy, Portugal, Malta, Cyprus, Greece) except Spain.

#### 4.2 The ITU (International Telecommunication Union)'s ICT Development Index (IDI)

Most countries in Europe, and in particular the EU members belong to the first two groups (high and upper), only Albania falls into the medium category. It means, that EU member countries have progressed from the first stage of ICT development (access) to the second stage (use). (IDI, 2010)

- (A) High (IDI values above 5.67): Economies in this group have high levels of ICT access and use and high ICT skills. Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Malta, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, UK.
- (B) Upper (IDI values between 3.64 and 5.64): Economies in this category have achieved a prominent level of access to and use of ICTs, and ICT skills. Bulgaria, Cyprus, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic.

The index shows that Hungary and the new member states, which joined the EU in 2004 and later, are lagging behind, concerning their level of ICT development compared to Western and Southern European EU countries. Nevertheless Hungary is still ahead of Lithuania, Cyprus, the Czech Republic, Poland, the Slovak Republic, Latvia, Romania and Bulgaria.

#### 4.3 The Networked Readiness Index of the World Economic Forum

Since 2006–2007 Hungary fall back 16 places from 33 to 46, which may be considered as a serious weakening. However these results are not so poor, if we take into consideration the sub-indices.

Considering the environment sub-index Hungary performs better than the Slovak Republic, Greece, Italy, Latvia, Romania, Poland and Bulgaria. In the readiness sub-index Hungary is lagging behind, bettering only Greece and Bulgaria. Nevertheless in the usage sub-index Hungary is way ahead of Bulgaria, Italy, Latvia,

Slovak Republic, Poland, Greece and Romania in this descending order.

In defining a wider place the WEF places Hungary into the converging adopters' group, which means a medium level of development.

#### 4.4 Economist Intelligence Unit's Digital economy rankings

Hungary retains its 35<sup>th</sup> place ahead of Latvia, Slovakia, Poland, Bulgaria and Romania. Hungary's overall ranking did not change since 2009. Nevertheless considering the subindices in the connectivity sub-index Hungary is ahead of Greece, in the business environment sub-index it outperforms Italy, Portugal and Greece, while in the government policy and vision sub-index Hungary surpasses Lithuania, Greece and the Czech Republic.

#### 4.5 The Connectivity Scorecard

Hungary scores 4.50 and retains its ranking of 23<sup>rd</sup> among the innovation-driven economies on the Connectivity Scorecard 2011 index.

In 2010, Hungary held the same rank with a score of 4.31. With these scores, Hungary is ahead of only Poland and Greece. Hungary is a low performer within all six components of the Scorecard. However, despite its low score, Hungary has made some significant steps in ICT adoption especially in terms of broadband coverage and Hungary outperforms the other post-Socialist countries as well in this feature

#### 4.6 Comparison

The figure below illustrates the positions of EU member states compared to each other based on the four indicators examined above: the World Bank's Knowledge Economy Index (WB), the International Telecommunication Union's ICT Development Index (ITU), the Networked Readiness Index of the World Economic Forum (WE), and the Economist Intelligence Unit's Digital economy rankings (EIU). The Connectivity scorecard was not taken into consideration due to the small number of countries observed thus lack of data. The countries are arranged based on the sum of the four gauges and represent a position within the EU with the top performers on the first places.

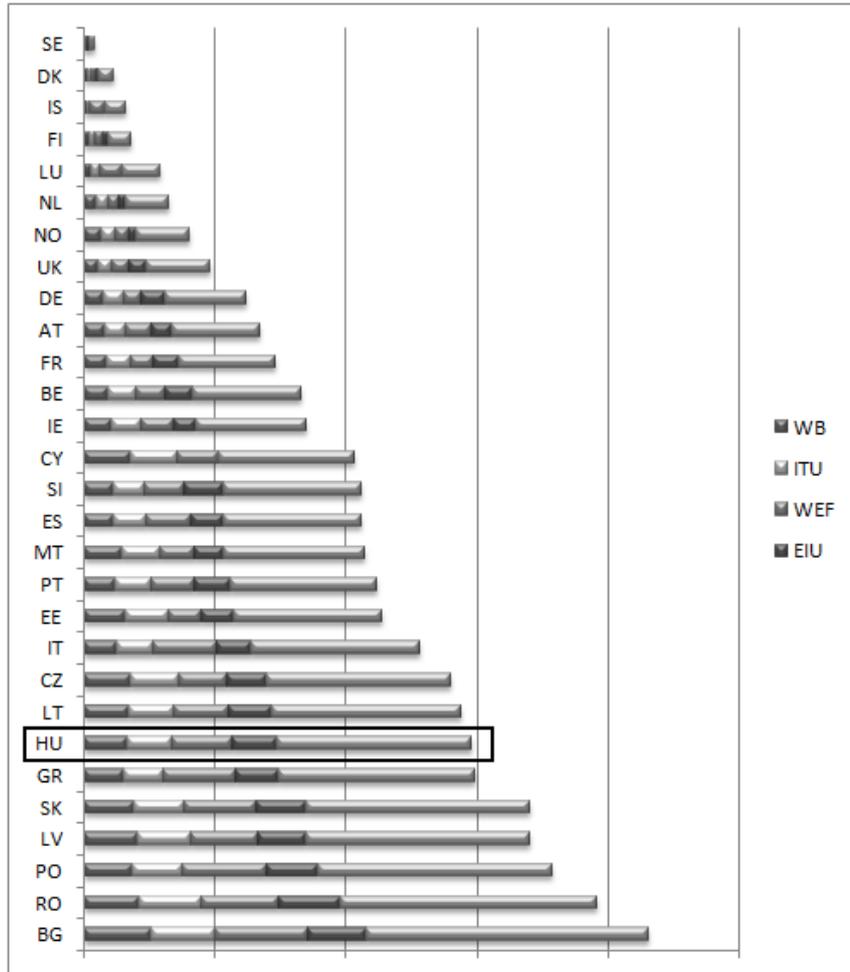


Figure 1. Rankings of the EU member states by four benchmarking tools. Edited by the author.

The figure shows, that Hungary is in the lower third of the hierarchy preceding Greece, the Slovak Republic, Latvia, Poland, Romania and Bulgaria.

**4.7 European Commission. Europe’s Digital Competitiveness Report. European Commission, Brussels, 2010**

We have not included the European Commission’s Digital Competitiveness Report into the benchmarking tools as it does not create a hierarchy of the member states. Nevertheless the country reports give deeper understanding of the member states in the aspect of ICT. According to this country report ICT represent about 6 % of the total Hungarian economy thus being one of its most dynamic sectors. Broadband internet is widely available in Hungary, mainly in the capital and other cities. Despite the fact that internet penetration is still relatively low, the percentage

of internet users has already reached the EU average level. As for internet usage categories, an increasing trend is detected for the past few years. Hungary is close to the average, or in a number of cases already above it. The percentage of households using a broadband connection is close to EU average and definitely higher than Italy, Spain and Portugal. The percentage of internet users who have used the internet to find information about goods and services and behaviour related to buying in the last 3 months is also increasing.

**5. CONCLUSIONS**

A recent report on Hungary from the Business Monitor International (BMI, 2012) states, that in spite of current economic issues BMI “still expects growth in some IT market segments over the next few years, with EU funds supporting new public sector IT initiatives, and opportunities

around outsourcing and cloud computing” (BMI, 2012). However, much will depend on the speed of economic recovery, both in Hungary and globally.

According to the benchmarking tools examined above the situation in Hungary as a knowledge economy shows a mixed picture. We cannot state for 100% that Hungary is lagging behind as it overperforms some of the South European countries in certain aspects and has some outstanding results on a number of indicators, like broadband access and internet usage. After the elections in 2010 the new government issued the Digital Reform Action Plan, 2010-2014. If its strategy is realised it hopefully will improve Hungary's performance on the field of Information and Communication Technologies.

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