

ACCELERATION GROWTH OF ICT MARKET

Summary

The work points to the importance of ICT (Information Communication Technologies), as one of the main trajectories by which advanced economies have come to the high dynamism and richness. How do the performances of these technological changes, determined mainly by ICT, exert influences on the economic growth or, in general, on production results at the aggregate, macroeconomic level?

The U.S.A. supremacy in this field has faced challenges. It loses tempo, and the EU countries, after the multi-decade syndrome of technological catching up to U.S.A., go through faster into the future, giving an accelerating tone to the technological race.

Key words: information communication technologies, income, research and development, economic growth, global market

ACM classification

J.4 SOCIAL AND BEHAVIORAL SCIENCES, *Economics*, B.4 INPUT/OUTPUT AND DATA COMMUNICATIONS, B.4.0 General

JEL classification

O4 – Economic Growth and Aggregate Productivity, O47 – Measurement of Economic Growth; Aggregate Productivity; Cross-Country Output Convergence, M1 – Business Administration, M15 - IT Management

INTRODUCTION

Technological changes are one of the key factors of economic growth. Information technologies and their mass applications have determined for almost three decades the level and dynamics of economic growth, as well as economic reconstruction, as electronics, process industry equipments and devices, telecommunications, biotechnology, new materials, aircraft and space industry, saving production and technologies, and energy and material substitution.

During the 1980s information technologies became the formed core of market and structural dynamism in advanced economies, determining in this way the strategic coordinates of their development policies. Since the 1990s, information technologies (IT) have become the constant of the whole process of reconstructing production, demand and trade in the world. IT is in the center of the current discussions about economic growth and performances in advanced economies. As IT keep going into jobs, households and educational industries, many aspects of work and leisure are radically changing. The

intensity of technological changes, and an increasing connectivity making it possible, result in the richness of new products, new markets and new business models, but they also cause new risks, new challenges and new concerns. Information technology is a strong catalyst for growth and efficiency and it influences very much on many social and economic characteristics of advanced countries.

ICT MARKET SIZE AND TRENDS

The work will also point to the relationship between technological changes, through the significant ICT sector and the economies in advanced countries.

The quantitative expression of an increasing importance of IT will be illustrated in OECD countries, from different standpoints. Being in the center, IT is often identified with the wide group of information and communication technologies because of increasing importance of telecommunications and the fact that it is not possible to determine the clear limit between technologies

changing rapidly. Taking into consideration the big importance and role of IT industry in the economy, in the parameters as production, trade and employment, the implications of the strong development of these technologies on macroeconomic courses in developed economies are evident, mainly the structural moving of the economy to tertiary sector, research, development, innovation, decrease of prices, new segments as the Internet and e-commerce, changes in the way of regulation and trade discipline.

The strong ICT growth is one of the main generators of changes, growth and development at the macroeconomic level. The most important angle of this macroeconomic aspect is recognizing, i.e. measuring the contribution of IT sectors in production results, labor productivity, i.e. economic growth.¹

What does this sector include? There are different definitions emphasizing different aspects of offers of "digital economy". The world production of ICT equipments is divided into six main product groups:

1. Electronic data processing,
2. Office supplies,
3. Radio communications and radar equipments,
4. Telecommunication equipments,
5. Consumer equipments,
6. Electronic components.

Commodity classifications at one very non-aggregate level are used for production, trade and market statistics in order to test ICT products, while the wider classification of industry is used for production, employment and data on research and development when comparing ICT with other sectors. Data show that the share of IT production sectors in GDP in the U.S.A. is higher for 8% in 1998; in Canada it is higher for 6 % in 1997, in France for 5.2% in 1997, in Italy for 3.5% in 1996.²

In the period of 1996-1997, production increased insignificantly in these value relationships, about 0.6% in OECD countries, mostly in the segments of radio communication and telecommunication equipments. Some of these countries had fast development, Sweden (20.6 %, mainly in radio communication equipments), Finland (115%, mainly in telecommunications), Ireland (14%

in EDP mostly), and UK (11%). On the other side, electronics production decreased a little in the OECD region, about 0.9%, while the economies of OECD non-member countries, as Malaysia, Brazil, Hong Kong, Singapore and Indonesia kept strengthening their positions of main world producers of these goods.

In 1997, OECD countries produced over 80% of the total ICT equipments and almost 90% of radio, communication and radar equipments. The structure of specialties vary among OECD countries: Ireland concentrated on EDP production, Holland on office supplies, Finland on radio communications and telecommunication equipments, Portugal on consumer electronics. Some countries, OECD non-members took over the increasing role in the world production, Singapore, Taiwan and Malaysia recorded 3% of the world production of ICT products and even bigger share in some segments as EDP and consumer electronics.

The sector of high technologies, seen in the framework of EU, is developing faster than the whole EU economy. Software industry and information technology services in 2006 recorded the highest growth, about 5.9%. IT sector contributed to it with almost 50% of the total growth of productivity in EU in the period of 2000- 2004. The European Commission concluded that public and private investments in information and communication technologies attained impressive results. The report of this Commission emphasized that technology stimulated innovation and productivity as part of the fundamental change that moved Europe to the knowledge-based economy. It was enabled by the enormous increase of users of the "broadband" Internet with a record number of 20.1 million connections for data transfer. The highest rates of accepting connections of wide specter were recorded in Holland (30%) and Nordic countries (25-29%). The online content market (video, music, publishing, games and adult content) is thus expected to more than double in value in the next four years, from close to 1 billion € in 2006 to 2,2 billion € in 2009.³

¹ Drakulic D., Makroekonomija i tehnoloske promene (Macroeconomics and Technological Changes), pp. 102

² OECD, 2000, pp. 2.

³ European Information Technology Observatory 2006, pp.78

The European scientific researches have got the significant stimulus by starting the Seventh Framework Program for research and development, with € 9 billions for ECT researches. Although the prognosis that investments of some countries for scientific researches will be 2.6% of the total GNP till 2010, there are efforts to reach the aim of 3%.⁴

The results provoking satisfaction in EU include:

- Increased level of public services by the Internet in EU countries,
- Significant support growth of ICT to health care and education,
- Italy is a leader in developing 3G mobile telephones and optic fibers,
- Households with digital TV are the most numerous in Great Britain, Denmark, Holland and Sweden,
- Great Britain and Belgium have bigger rate of broadband development in households than in the U.S.A. and Japan,
- The biggest ICT school development in Europe is in Denmark, and businessmen in Denmark are the most often users of the Internet and e-business,
- Finland is the biggest user of points for public access to the Internet with biggest investments in ICT. Business people share with 64.3% in research and development expenses.
- Sweden and Finland spend 3.9%, i.e. 3.5% of GDP for researching; it is more than the EU aim is, which 3% is.⁵

The World Economic Forum (WEF) created the Net Readiness Index (NRI) that assesses a country's readiness to use possibilities ICT offers for development and increased competitiveness, in three dimensions: general business, regulatory and infrastructural ICT environment; readiness of key participants – individuals, businessmen and governments – to make use of and benefit from ICT; and how much they really use ICT.⁶ According to the WEF report from Davos, Denmark has been first place since 2006 when it ascended for two positions. It is followed by the Nordic countries: Sweden, Finland and Norway being second, fourth

and tenth place. These are countries that continually, especially since 2000, have been holding these positions, and being concentrated on education. It enabled to form and develop very efficient educational institutions and the culture of innovations, very functional public institutions creating very good business surroundings, as well as readiness of the key factors in these countries to accept the newest technologies.

The qualitative expression of an increasing importance of information technologies can be illustrated through the trends on the world ICT market, including geographic trends and dynamics of different segments of this industry according to the countries. The period of the 1990s can be said to be the start of the acceleration of this sector. This sector of high technologies has been developing faster than the total economy, especially in EU countries.

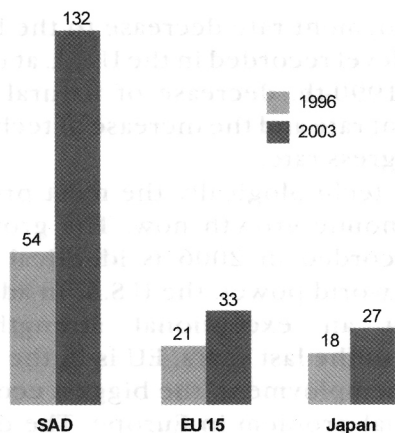


The trends on ICT markets are divided into three main segments: 1. Hardware, 2. IT services and software (including IT costs), and 3. Telecommunications. The analysis of the world ICT markets shows that in this period, telecommunications recorded the biggest share, right before IT services and software. More than a half of the total growth is ascribed to selling of telecommunication equipments and services

⁴ Ekonomist magazin, 23. april 2007, no. 361, pp. 54

⁵ Ibid, pp. 54

⁶ Ekonomist magazin, 23. april 2007, no. 361, pp. 56



The income of the 20 biggest world software companies/ € millions

Source: EITO 2007.

The global market data include big variations among the regions relating to different production segments. Telecommunications are the biggest segment in Japan, while the main segments in the U.S.A. and EU are IT services and software. The fast world growth of telecommunication segments appeared thanks to the stable growth in the OECD region, making more than 83% of the world market and a very powerful expansion of markets outside OECD, where the value doubled only in the period of 1992-1997. In 1999, the world ICT market valued US\$ 1.8 billions, comparing to 1.3 billions five years ago. Since 1992, the world grew increased averagely at 7% per year, mainly led by the US market, being now the biggest market.

The general economic outlook at a global level has remained substantially unchanged over the first half of 2005. The European economy is still somewhat under-performing compared to the world-wide average but some of the smaller economies show signs of improvement. Others, like France, Italy, and Germany, are still faced with large scale economic restructuring whose effects will have a deep impact in 2006. on their economies and on their national ICT investments. Overall, total GDP grew by 2,2% in 2006 and it is expected to grow 2,3% in 2007.⁷

In 2005, the overall value of the ICT market in Europe amounted to €659 billion (or 6,5% GDP). While the IT market (including office equipment, electronic data processing and

data-com equipment, software and services) accounted for € 312 billion, the telecommunications market achieved a total value of € 348 billion in 2005. The ICT sector in the United States performed well during 2005, although the country suffered from unexpected natural disasters and rising oil prices. In the US, ICT grew by 3,9% in 2005 with the IT sector registering an increase of 4,6% and the telecommunications sector reaching a value of €221 billion. Japan's ICT market also achieved a more moderate 2,1% growth in 2005, to reach some 14,7% of the total world ICT market.

As a result of these trends, Europe was set to achieve a 33,8% share of the worldwide ICT market in 2005.⁸

Worldwide ICT market by region: percentage breakdown calculated on market values. 2004 - 2006. € billion

	2005 Value	2004 %	2005 %	2006 %
Europe*	659	34,1	33,8	33,6
US	545	28,2	28,0	28,0
Japan	287	15,1	14,7	14,3
RoW**	457	22,6	23,5	24,1
Total	1,949	100,0	100,0	100,0

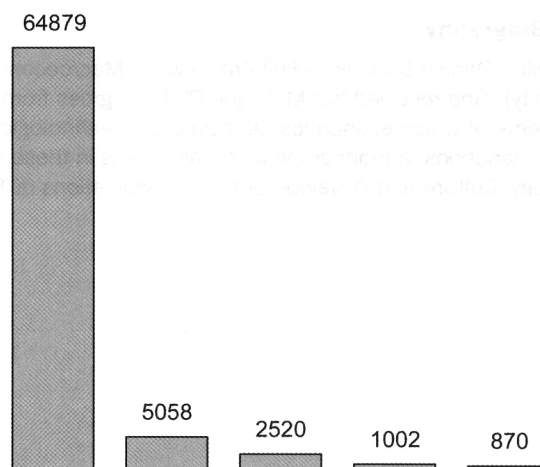
Note

* Europe includes the EU, Norway, Switzerland, Romania and Bulgaria.

** RoW = Rest of World

Source: EITO 2006, pp. 43

Regarding to the advance of this sector, data illustrate the costs of ICT research and development. It is obvious that ICT intensity in the U.S.A. has been increasing, as well as in all these presented countries.



Source: ANBERD, OECD

⁷ EITO 2006, pp.42

⁸ EITO 2006, pp. 43

CONCLUSION

Implications of the strong ICT sectors in the global, and especially macroeconomic flows of leading economies being the center of their expansive, almost an accelerating growth, can be seen mainly in the move of the economic structure towards the tertiary sector, research, development, innovation, decrease of prices, new segments as the Internet and e-commerce, changes in the way of legislation and trade rules. The most important angle of this macroeconomic aspect is to recognize and measure the contributions of the ICT sector according to production results, productivity labor, i.e. economic growth. There is empirical evidence about the increase of productivity rate, coming mostly from the high rate of technological progress of the ICT sector, combined with the increasing share of this sector in these economies.

The evolution of technological progress is linked to the powerful increase of aggregate demand. The expectations of high profits have caused the sudden increase of investments, mainly, but not only, in the ICT sector. The expectations of high profits in the future have got into the sudden growth of personal consumption. The big move of aggregate demand has resulted in a significant increase of the social product, big employment increase, and gradual unemployment decrease in this period. Many economists see the relationship between

unemployment rate decrease to the historical low level recorded in the U.S.A. at the end of the 1990-th, decrease of natural unemployment rate and the increase of technological progress rate.

EU is technologically the most prepared for economic growth now. The growth of 2.8% recorded in 2006 is identical to the leading world power, the U.S.A. In addition, showing an exceptional strength and growth in the last years, EU is in the way to solve unemployment, the biggest economic and social problem in Europe. The decadal syndrome, unemployment rate fell at 7.2% in the beginning of 2007.

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