

## **CHAPTER 15**

### **AN ENTERPRISE AS A RECEIVER IN THE INTERNET KNOWLEDGE MARKET**

#### **Introduction**

The internet knowledge market covers three key economic words: internet as a way of distribution, knowledge as a commodity, market as an allocating and distributing mechanism. It is relevant to consider the relationship between concepts of knowledge economy, assumed as a synonym of information society (a sociological notion, seen as the successor to industrial society), knowledge market due to their specifics, in particular in the context of an enterprise as a receiver in the market. Having defined attributes of the internet knowledge market an inquiry of so called inflection point as a symptom of the Polish enterprises' transformed manners in their market behaviour will be appropriate to attain the paper's objective.

Due to ICT's significance as a crucial component of the internet market three descriptors have been chosen for seeking firms' transformed manners in their receivers' performance. Utilization of banking or financing services by internet is assumed to be a descriptor of communication between customers, using internet for market monitoring as a descriptor of acquiring information, and utilization of education and training services by internet as a descriptor of purchasing commodities. The subject of the analysis is a percentage of enterprises using ICT in three above mentioned functions,<sup>1</sup> and conclusions are going to be formulated through two cross sections (approaches):

- a size of the firm (small, medium and large) taking a number of employees into account;
- seven sectors of economy: industry, construction, commerce and repairs, hotel business, transportation, storing and communication, immobilities' and firms' services, informatics.<sup>2</sup>

#### **Does the internet knowledge market differ from the others?**

Briefly, the knowledge economy (Drucker, 1992, p.p. 263 - 286) is a notion that refers either to an economy of knowledge or to a knowledge – based economy (Thurow). In the first meaning, it focuses on the production, management and spillover of knowledge in the frame of economic constraints. In the second one, more frequently used, it relates to the use of knowledge technologies (such as information and communication technologies) to produce economic benefits, mainly minimization of transactional costs during the transfer of goods between separate economic activities (Clemons, Row, 1991). Although the difference is not yet well distinguished in the literature for the reason of their interdisciplinary, the essential distinction is that in the knowledge economy, knowledge is a product, in knowledge – based economy it is a tool. For the reason that knowledge has manifold forms in which it may appear, it can be treated as:

- a business product (educational and innovative intellectual goods, even ideas might be

---

<sup>1</sup> Using internet by enterprises excludes firms' relationships with public administration.

<sup>2</sup> To avoid confusing the terms ICT, which is used in the text with reference to technological tools and IT for describing economy sector, the last one was deliberately substituted for informatics.

recognized as commodities)

- a productive asset (according to A. Toffler knowledge is the central resource of the information society), that is not scarce, but rather abundant, because unlike most resources which deplete when used, knowledge usually grows thanks to application.

Knowledge market consists of both economic goods. Taking market functions into consideration there are two opinions among scholars about its essence. From one point of view knowledge is a typical scarce resource, so the traditional market mechanism can be applied directly to distribute it. Another theory assumes knowledge as a public good and hence encourages its free sharing.

Although knowledge market have been thoroughly analyzed by T. A. Stewart, T. Davenport, L. Prusak and A. Simard, understanding of it has been still far from completion. They described it as a mechanism for enabling, supporting and facilitating the mobilization, sharing or exchange of knowledge, including information, among providers and users. This commercial approach assumes that knowledge – based commodities are available for trade because of demand for them, so the primary market function is to connect suppliers of existing solutions and receivers who have problems and want to find appropriate solutions (Davenport, Prusak, 1998, p. 199). Stewart argued that knowledge differs considerably from other, in particular, material goods since it can be in several places in the same time, selling it does not diminish the supply, it can be bought and sold only once and it cannot be recalled from distribution (Stewart, 1996, p. 342). Moreover, knowledge breeds more knowledge in a never – ending cycle, so its market may also be sequential in nature. In a Simard's model of cyclic end – to – end knowledge market there are nine stages, that embed, advance or extract value from (into) knowledge – based goods along a knowledge services value chain. One can point out four types of knowledge services: generate content, develop products, provide assistance and share solutions. In the model they cycle as a chain comprising the following stages: generate, transform, manage, use internally, transfer, enhance, use professionally, use personally, and evaluate. The first five stages are internal to a knowledge organization (production and transfer) while the last four are external (intermediaries, clients and citizens). In other words, Simard defines knowledge markets as a group of related circular knowledge – service value chains that function collectively as a sector to embed, advance and extract value to yield sector outcomes and individual benefits. For the reason of a circular value chain, it can be used to model either a supply (post – production evaluation) or a demand (pre – production evaluation) approach to the knowledge market (Simard, 2006, pp. 4 – 9).

Regardless of concept or definition of contemporary society (Webster, 2006), information and communication technologies are crucial determinants to transform the rules of business and competitiveness throughout the entire economy. ICT have made knowledge more intensive and therefore efficient, required new media (e.g. internet) to produce and distribute knowledge, that resulted in collective intelligence and made it easier to access as an outcome of networked data-bases which promote online interaction between suppliers (producers, providers) and receivers (users). Finally, goods can be invented, developed, sold, bought and delivered over electronic networks. So this approach treats knowledge as common commodity. The demander (buyer) posts a request, usually in the form of question and sets a price for a valid answer. On the other hand, the provider of knowledge (answerer) can post their bids to have the question answered.

Model treating knowledge as a public good uses knowledge market out of fee. Nowadays two kinds of websites exist that exchange free knowledge offering:

- solely an increase in reputation as payment for researchers, often limiting the quality of the answers;
- subsidized knowledge where researchers are paid to generate answers despite the service remaining free to users.

Concluding, an internet knowledge market differs essentially from other commodity market when treated as public good. Then providers (suppliers) and users (receivers) perform alike in any other public good market including whole array of demerits e.g. free rider phenomena and intellectual property rights. That is why contemporarily, this partial market is considered to be of limited quality as it comprises mainly an information submarket.

If only knowledge – based goods, including above mentioned knowledge services, possess attributes of traditionally meant commodities they perform in the market alike but virtually. ICT is – on one hand – typical profit-making product, and – on the other hand – internet in particular, a basis for enterprises in all sectors to be effective and therefore the market mechanism as a whole.

### **ICT as a driving force in economy**

Consciousness of ICT importance to promote development has been imprinted amidst politicians as well as entrepreneurs as the result of theoretical findings in which scholars had exposed how innovations in ICT could be harnessed to promote the socioeconomic growth of developing nations. ICT's lead role in the future economy is comparable to that of traditional production factors in the past, such as steam or electricity, therefore “[...] a new divide is appearing, the divide between those who have access to information and communication technology and those who do not” ([www.unece.org](http://www.unece.org)). That is why it is sometimes called the “Digital Wall” which is beginning to separate not only countries, but regions, cities and people as well in terms of economic and social development in the “knowledge triangle”: education, research and innovation. Finally, the borders of this digital wall follow the new digital map determined by network topographies, availability of service providers, educational levels, language barriers and so forth, separating the digitally skilled from the digitally unskilled. For transitional economies ICT is an opportunity to leapfrog some long and painful stages in the development process, thereby saving time and resources.

There are manifold, well known benefits of ICT innovation spread across the society and economy, having a direct impact on competitiveness based on: e-government, e-commerce, e-business, e-health, and so on. It is worth to stress that all these innovations work only if there are both an accurate legal framework and a suitable infrastructure. They are necessary to protect consumers and users' rights to have e.g. online orders and payments sheltered thanks to ensuring that the infrastructure they use is trustworthy.

Moreover, ICT is capable to contribute to welfare and growth indirectly since it has a major role to play in greening the world economy by improving energy efficiency and lowering emissions because:

- ICT can be used for adding intelligence to components, products, equipment and services, meaning ICT is able to substitute for physical products by using online services, moving business to the internet and adopting new ways of performing, like video-conferencing;
- the ICT sector itself must clean up its own work as its carbon footprint though insignificant but is still growing;
- the ICT sector is an enabler to tackle climate change thanks to utilize smart technologies in industry, construction and rural sectors.

Generally and briefly speaking it turns out that ICT might become a meaningful factor to diminish market failures in the coming future although persisting global recession may have its ranking temporarily decreased.

Researches conducted in high developed countries (e.g. Canada, United States and United Kingdom) shed light on two types of relationship, i.e. the correlation between ICT and productivity, and between competency and appropriate use of ICT tools.

Having a detailed overview of ICT investment and capital stock per worker by ICT

component in Canada and the United States for the total economy and 20 NAICS industries, focusing on trends over the 1980 – 2005 period, A. Sharpe – basing on a two-factor of production (capital and labour) model – stated (Sharpe A., 2006, pp. 32 – 42):

- Due to decomposition of labour productivity growth into two components: changes in capital intensity (the capital/labour ratio), and changes in total factor productivity (TFP – the residual unexplained by changes in the capita/labour ratio), labour productivity growth equals TFP growth if the capital/labour ratio remains constant over time. Therefore ICT investment can affect labour productivity both through the capital intensity and the TFP channels;
- ICT investment has a positive effect on productivity growth, but the relationship is not straightforward. Trends in labour productivity depend on many variables in addition to ICT capital intensity, such as business cycle, R&D intensity, profitability, and industry specific input prices;
- Investments complementary to ICT investment such as training, the adoption of best practice managerial techniques, and the intensity of competition pressures influence the impact of ICT investment on labour productivity.

The key conclusion of the report is that ICT intensive sectors appear to have been the drivers of aggregate labour productivity growth in both above mentioned countries (Canada and USA) since 1996. Most studies provided weak evidence of positive complementary innovations/spillovers effects occurring at the time of investment. However, these could possibly take time to materialize as accelerator of productivity growth at three examined levels: the macroeconomic level, the sector level, and the firm level.

A behavioural perspective of socioeconomic development based on ICT is seen to require cultural changes in societies to foster innovative use of ICT, particularly in terms of the reshaping of interpretive schemes, i.e. ways of performance perceiving. Following behavioural competencies are pointed out to encourage advance through ICT (Corea S., 2007, p.60). Firstly, information technology artfulness had been proposed as a broad salient competency to aim for. Secondly, consideration of ICT artefact indicated that both identification of potential for innovation and skill of transformation arrangement is needed. Thirdly, the notion of articulation pointed to the intervention of interpretive schemes in shaping actions. These developments are thus tied up together by the framework, which identifies: various subcompetencies of ICT artfulness that need to be promoted, and corresponding interpretive schemes in the functioning of a developing society that need to be formed to cultivate such competencies. This involves setting up conditions for learning and reframing to occur, in ways that permit the articulation of ICT-based practices to provoke a willingness to adopt new behaviours conducive to greater welfare (Ibidem, p. 67).

Business and capital, whose place becomes that of producing and trading knowledge (information), seem to require the specific control over this new resource so that it can successfully be the most powerful driver of effectiveness (Neilson G. L., et al., 2008, p. 61). All the more the Commission of the European Union presented proposals towards “the fifth freedom” of the European Single Market, i.e. the free movement of knowledge, including the respect of intellectual property rights and the mobility and career prospects of researchers, thus creating a genuine European Research Area, where ICT was attached to be one of dominating conditions (Barroso, 2008).

### **Enterprises as users of internet services – the firm’s size approach**

In this fragment results of the first cross section are presented, i.e. charts from 1 to 3 show the extent to which the Polish enterprises – of three sizes (small, medium and large taking the number of employees into account) – used internet to banking or financing serv-

ices, training and educational services, and market monitoring. By analogy to a knowledge economy empirical definition, a 50 – percentage share is claimed to identify so called an inflection point that indicates a sufficient symptom of the Polish enterprises' transformed manners in their market behaviour as receivers (buyers). The researching period covers the time after Poland's access to the European Union.

As concerns using internet to banking or financing services all groups of firms in entire period used the ICT in number exceeding 50% (figure 1). The small business sector's share is the lowest (from 63,2% in 2005 to 77,7% in 2008) but rising steadily. A number of large firms was coming near 100% in the previous year. It is worth to point out at least two tendencies:

- lowering rate of increase in utilization of that kind of services in each group (yearly increase among small firms by 7,6 percentage points in 2006 relating to 2005, 3,8 percentage points in 2007, and 3,1 in 2008 respectively; among medium firms respective numbers are as follows: 6,7 , 3,2 , and 1,5; among large ones – 6,1 , 1,8 , and 1,4 respectively);
- diminishing difference between the numbers of firms using internet involving each group in each year (the difference between medium and small sized firms equalled 17,4 percentage points in 2005, 16,5 in 2006, 15,9 in 2007, and 14,3 in 2008; the difference between large and medium ones equalled 6,2 percentage points in 2005, 5,6 in 2006, 4,2 in 2007, and 4,1 in 2008).

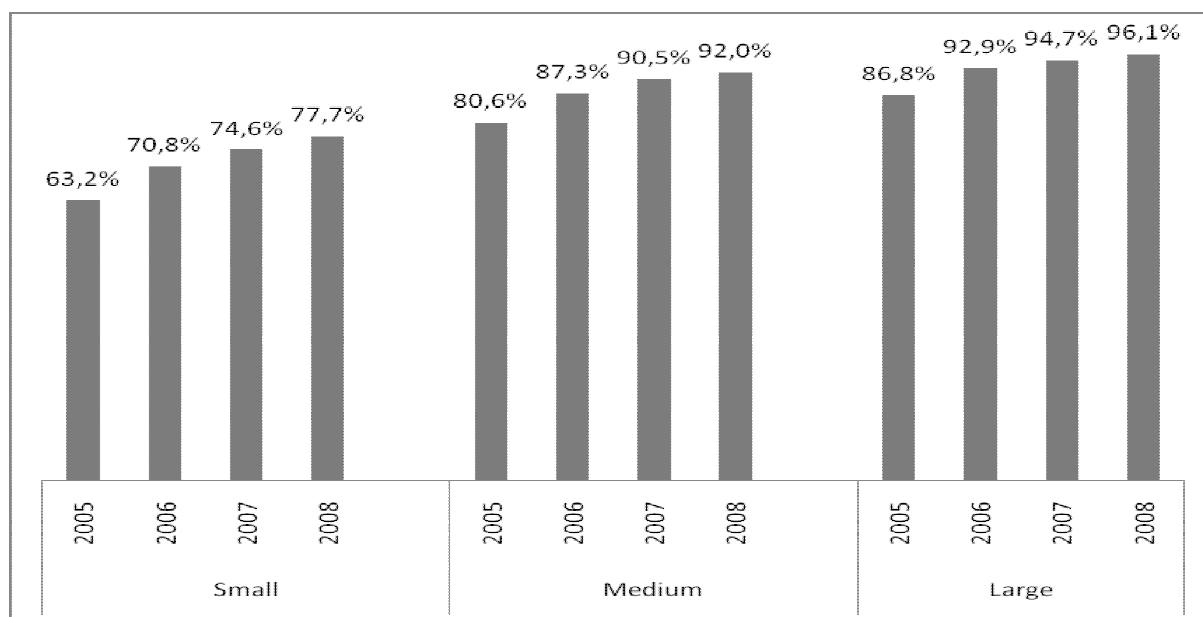
Tendencies presented above prove that using internet to banking or financing services got common to make contact with customers.

Utilization of training and educational services by internet is far worse than a latter one (figure 2). No matter a group of enterprises none has exceeded the established threshold. Small business attained one fourth share in the period but in 2008 (a number of firms decreased to nearly one fifth). The group of medium business used internet in this activity only in about one third, except year 2008 (28,1% firms took advantage from training and education by the media). Although large firms did not reach the inflection point either, in year 2007 they approached to nearly one half share of enterprises using internet to develop employees' qualifications. Small and medium businesses attained their extreme share in 2006 (a year of the highest GDP growth ratio), and large one did a year later. What interesting is that decrease in number of firms using internet to training and educational needs between the best and the worst years in this context was the greatest among large firms (9,1 percentage points), then medium (7,2), and small business (6,8) respectively.

Summing up, relatively low number of enterprises utilizing internet as a manner of improving human resources' knowledge and professional experience proves that benefits for them are not satisfactory enough or they mentally are not ready to take up e-learning in common.

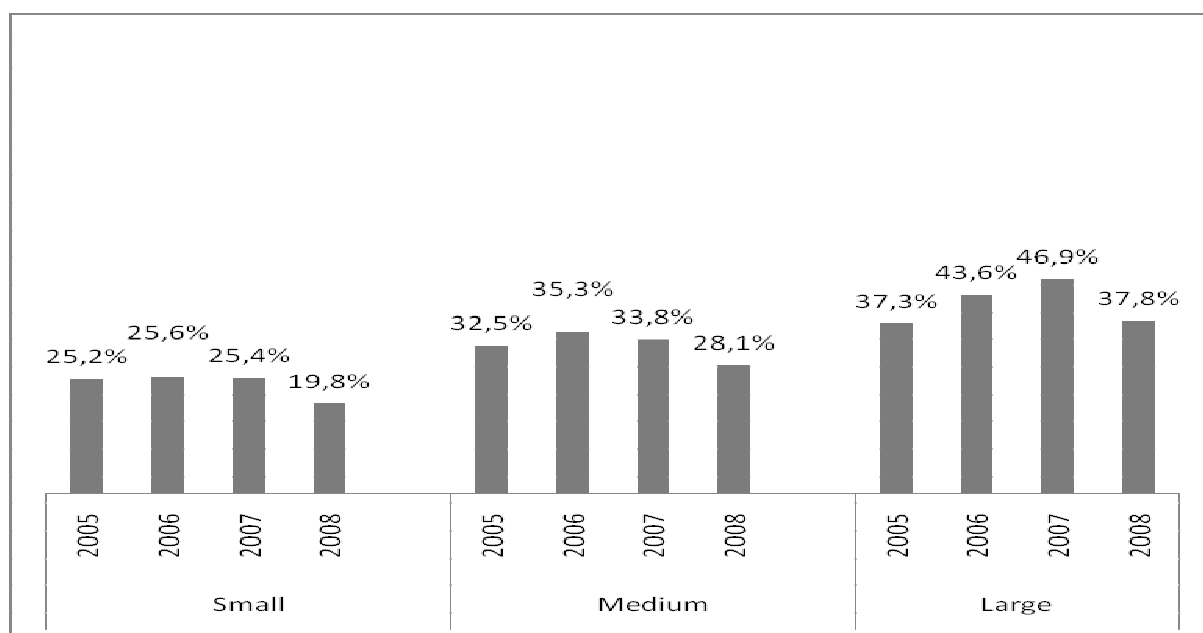
Enterprises, when acting in the role of information receivers, attained the inflection point in groups of medium (58,1% in the weakest year 2007, according to the available data, versus 64,7% in the best year 2006) and large firms (73% in 2005 versus 78,3% in 2006, respectively). A sector of a small business reached the required percentage in the year of blooming economy, before and afterwards came nearly the point. All enterprises in the three groups attained their extreme share in the year 2006 and tended to lower market monitoring by internet in the following year (in both small and medium businesses similarly by nearly 7 percentage points and by 4 percentage points among large firms). Unavailable data in the following year make concluding to a certain extent not exhaustive.

Figure 1. Utilization of banking or financing services by internet



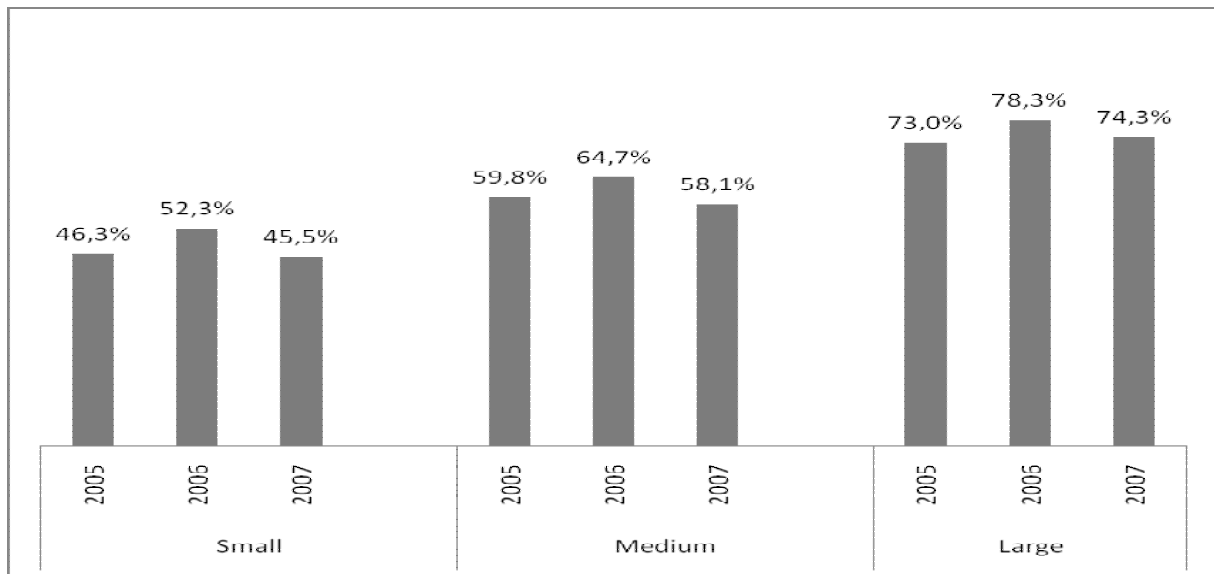
Source: own compilation based on the Polish Central Statistical Office reports (2005, 2006, 2007, 2008).

Figure 2. Utilization of training and educational services by internet



Source: own compilation based on the Polish Central Statistical Office reports (2005, 2006, 2007, 2008).

Figure 3. Utilization of internet to market monitoring



Source: own compilation based on the Polish Central Statistical Office reports (2005, 2006, 2007).

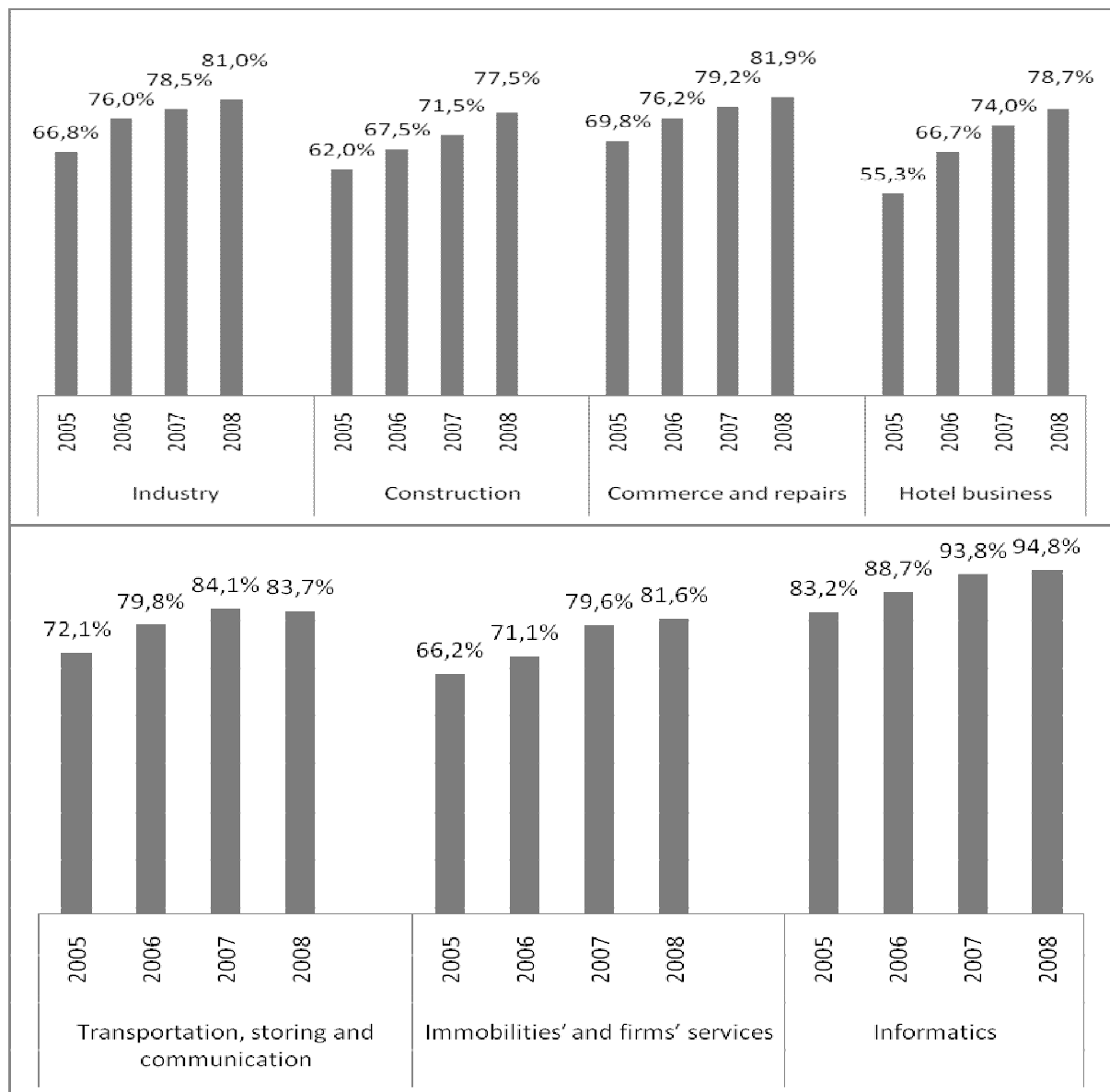
Internet as a way of distribution in knowledge market is a meaningful tool for any enterprises as ICT's receivers in that partial market, although they judge analyzed knowledge services with various value, mostly banking or financing services (communication between customers), then market monitoring (acquiring information), and training and educational services (purchasing commodities) the least.

### Enterprises as users of internet services – the sector approach

The second cross section approach analyzes internet utilization to banking or financing services, training and educational services, and market monitoring by seven sectors of economy, i.e. industry, construction, commerce and repairs, hotel business, transport, storing and communication, immobilities' and firms' services, and informatics (charts from 4 to 6). Evaluation criterion remains alike to the contents of the previous fragment.

The first general remark proves that internet utilization of banking or financing services by sectors (figure 4) was satisfactory, since a number of enterprises using the media exceeded the inflection point considerably in all sectors and in the entire examined period. As expected, internet was utilized most intensively in this extent by informatics (83,2% in year 2005 and 94,8% in 2008), and the rate of growth was smooth. Alternatively, construction and hotels used internet the least (amid hotels 55,3% and in construction sector 62,% in 2005; 78,7% and 77,5% respectively in 2008), although the rates of growth were the most dynamic. A share of firms contacting in banking or financing affairs in remaining five sectors was already over 80% in 2008. In only one case (transportation, storing and communication), a number of enterprises lowered slightly within the period (83,7% in 2008 versus 84,1% in 2007).

Figure 4. Utilization of banking or financing services by internet



Source: own compilation based on the Polish Central Statistical Office reports (2005, 2006, 2007, 2008).

Summing up, a quantity of firms using ICT in all described sectors to communicate with their customers proves correct observations in enterprises' size approach and satisfies a requirement of knowledge economy in this area.



Figure 5. Utilization of training and educational services by internet

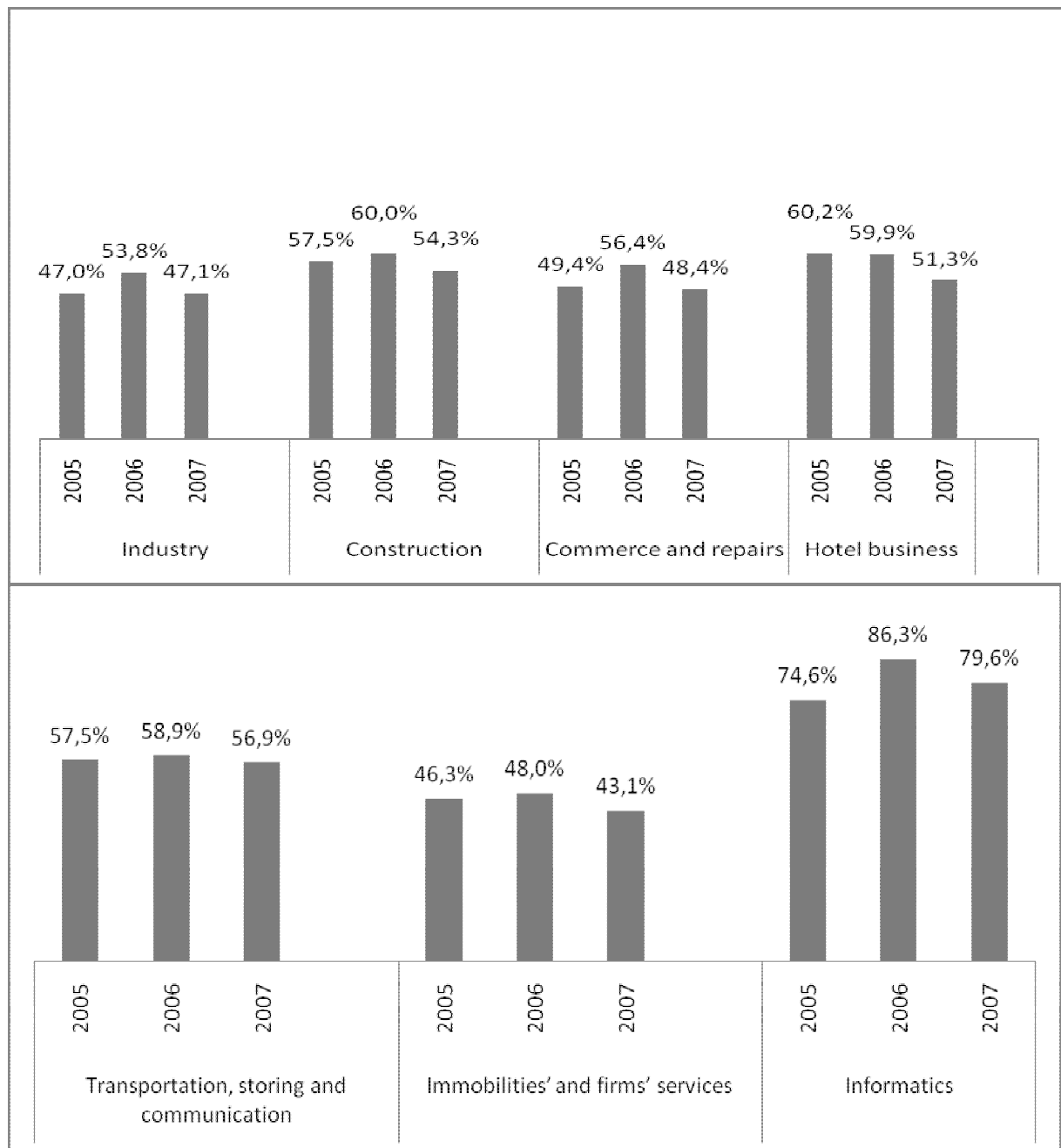


Source: own compilation based on the Polish Central Statistical Office reports (2005, 2006, 2007, 2008).

A general picture of utilization internet to training and educational services by sectors seems to be worse in comparison with the firms' size approach as six sectors, except informatics (figure 5), are far below the inflection point. Next remark concerns an inverse tendency within the period in such sectors as industry (25% of firms in 2005 and only 19,9% in 2008), construction (26,8% in 2005 vs 19% in 2008), commerce and repairs (27% in 2005 vs 23,2% in 2008), and hotels (21,8% vs 19,2% respectively). The deepest decrease was noted in construction sector (7,8 percentage points between beginning and the end of the term, but decline as much as 6,4 percentage points in year 2008 in comparison with 2007), what might

be one of the symptoms of recession in the economy. As regards transportation, storing and communication a slight increase in number of firms using internet was observed from 2005 to 2007 then it diminished as much as 8,5 percentage points in 2008. Similarly, one could portray immobilities' and firms' services, since the number of enterprises had been growing until 2007, afterwards it declined as much as 9 percentage points in 2008. The slump in this sector and in construction are alike. A kind of exception against the background of the above presented sectors was informatics, where enterprises had the inflection point exceeded within the years, however the slump as much as nearly 14 percentage points in 2008 was dramatic.

Figure 6. Utilization of internet to market monitoring



Source: own compilation based on the Polish Central Statistical Office reports (2005, 2006, 2007, 2008).

Utilizing internet to take advantages from training and educational services has been still underestimated and seems to be absolutely inefficient in sectors where labour precise skills and real experience is highly required (e.g. industry, construction).

A shorter period of analyze of market monitoring by internet allows however to point out a magnitude regarding the inflection point (figure 6). In the best year of Poland's economy standing (2006) all sectors but one (immobilities' and firms' services) exceeded 50 percentage share of enterprises using internet in this activity, and only four sectors did a year after. Informatics was an obvious leader (86,3% in 2006 vs 79,6% a year later), and mentioned above immobilities' and firms' services could be described as underdeveloped sector in this performance (48% in the best year, and 43,1% a year later). All sectors' data but one (hotel business) characterized with strict parabolic charts indicating their extreme activity in 2006. The deepest slump was observed in commerce and repairs sector (fall by 8 percentage points in 2007), and the slightest one in transportation, storing and communication (a 2 percentage point drop in 2007). A ceaseless, pretty substantial fall was stated among hotels (by nearly 9 percentage points from 2005 to 2007).

Summing up, similarities regarding conclusions drawn thanks to two cross sections, using the market monitoring as a descriptor, could be pointed out. The first is the highest firms' activity in 2006 that made level of using internet satisfactory from the knowledge economy point of view. Next one concerns small business sector where the drop resulted in shifting under the inflection point, what was reflected by sectors' performance based on small business (commerce and repairs, and immobilities' and firms' services).

## Conclusion

The empirical analysis of utilization the internet as an intermediary or a market channel, necessary in order to acquire information, contact with the economic environment as well as to purchase commodities, indicates that:

- large firms as receivers (buyers) of knowledge services, are leaders in the internet knowledge market, however the small business sector is dominating in the economy regarding the number of enterprises and labour quantity employed;
- a significant advantage of banking or financing services utilized by internet should not wonder since it is a basic link with economic environment, and face – to face, meaning traditional communication between customers in this field is definitely ineffective and nowadays results in a giant waste of time;
- almost all statistic data got worse in year 2008, regardless the approach in analysis, what confirms a meaningful slowdown or even recession in the economy. The result is that the Polish firms, especially in small business and sectors based on small business have not transformed their market behaviour permanently, yet;
- certain worsening of educational and training expenditure might have been caused by a slowdown in the Polish economic activities and even deep world recession, and this kind of expenses in our circumstances is still the easiest way to cut costs.

Accepted descriptors of the Polish economy's modernity in the first decade of the 21<sup>th</sup> century verified its fractional performance and in this scope allowed evaluating a transformation level of market behaviour manners as regards receivers (buyers). A general assessment is not unambiguous since three descriptors of market behaviour manners indicate various levels of their transformation. Utilization of banking or financing services by internet have already changed firms' market behaviour permanently regardless the enterprises' size, sector or stage of business cycle. Utilization of internet to market monitoring can be assessed as intermediate level for the reason that it differs, depending on size of firm and stage of business cycle. Training and educational services by internet are still underdeveloped because of their sensi-

tivity to size of business, sector of economy and stage of business cycle, mostly.

## REFERENCES:

1. Barroso J.M.D., (2008), ICT Industry has a Major Role to Play in the European Economy of the 21<sup>st</sup> Century, SPEECH/08/120, CeBIT Trade Fair, Hannover
2. Clemons E. C., Row M. C., (1991), Sustaining IT Advantage: The Role of Structural Differences, MIS Quarterly, September, pp. 282-284.
3. Corea S., (2007), Promoting Development Through Information Technology Innovation: The IT Artifact, Artfulness, and Articulation, Information Technology for Development, Vol. 13 (1), Published online in Wiley InterScience ([www.interscience.wiley.com](http://www.interscience.wiley.com)).
4. Davenport T., Prusak L., (1998), Working Knowledge – How Organizations Manage What They. Harvard Business School Press.
5. Drucker P. F., (1992), The Age of Discontinuity, Guidelines to Our Changing Society, Library of Congress.
6. Neilson G. L., Martin K. L., and Powers E., (2008), The Secrets to Successful Strategy Execution, Harvard Business Review, June.
7. Sharpe A., (2006), The Relationship between ICT investment and Productivity in the Canadian Economy: A Review of the Evidence, CSLS Research Report 2006 – 05, Prepared by the Centre for the Study of Living Standards.
8. Simard A., (2006), Knowledge Markets: More than Providers and Users, IPSI BGD Internet Research Society Transactions
9. Stewart T. A., (1996), Intellectual Capital – The New Wealth of Organization, McGraw – Hill.
10. The Polish Central Statistical Office reports, (2005, 2006, 2007, 2008), Wykorzystanie technologii informacyjno-telekomunikacyjnych w przedsiębiorstwach i gospodarstwach domowych w 2005 r., 2006 r., 2007 r., [http://www.stat.gov.pl/gus/spoleczenstwo\\_informacyjne\\_PLK\\_HTML.htm](http://www.stat.gov.pl/gus/spoleczenstwo_informacyjne_PLK_HTML.htm). (as of 06.11.2008).
11. Webster F., (2006), Theories of the Information Society, London: Routledge.
12. World Summit on the Information Society, (2005), UN ICT Task Force, Geneva, <http://www.unece.org/estrades/ict>.