

Knowledge Based Economy Assessment in Romania

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ABSTRACT

Knowledge and ability to create it, access and use effectively, has long been both an instrument of innovation and competition and a key economic and social development. However, a series of dramatic changes in recent years have increased the importance of knowledge for generating competitive advantage. Ability to process and use information globally and instantly increased exponentially in recent years due to a combination of scientific progress in computing and distributed computing, exacerbation of competition, innovation in all its forms and cuts of operating costs in global communication networks.

As barriers to access knowledge regarding a process, product or market are gradually decreasing (distance, geographical features, and costs), knowledge and skills are becoming increasingly a key to competitiveness, both locally and globally.

This paper, based on a survey of 551 Romanian companies, address a sensitive issue of both business and academic fields – perception of knowledge based economy in Romanian companies. Its conclusion can guide decision makers in Romania to develop an integrated approach to foster knowledge based economy in our country.

KEYWORDS: *knowledge based economy, Romanian companies, awareness of KE, transition to KE*

JEL CLASSIFICATION: *D83, O32*

INTRODUCTION

In the contemporary economy, learning and knowledge have become key success factors for both companies and national economies. Competition between firms and countries moved in large part from tangible resources to intangible ones. In terms of the latter, elements such as knowledge and ability to use it (knowledge based economy and knowledge based management) are crucial.

Knowledge becomes the basic resource of companies, the way they get power, prestige and wealth in the economy and modern society. Generation, acquisition and use of knowledge - to name just a few of the transformation of knowledge (Ciocoiu, 2011) - are extremely important for sustainable economic, social and cultural development. This trend applies equally to individuals, organizations, institutions, companies, regions or states.

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1. LITERATURE SURVEY

The concept of knowledge-based economy and its variants - "knowledge economy", "new economy" or "intangible economy" (Coyle, 1999) - is widely used and increasingly in a variety of contexts and with several meanings. We therefore consider it useful to present some considerations on the use of the term in the literature (Huang & Soete, 2007):

Knowledge-based economy is linked to an extent rooted in what came to be seen as the key role of high-tech industry growth and competitive advantage. It is also due to the increasing application of information and communication technologies and the spread of digital technologies in various different types of activity. So in other words, knowledge-based economy was initially addressed as the sum of high-tech and telecommunications industries. They remain an important component, but now knowledge-based economy is addressed more broadly and is seen as broader than simply overall high-tech and telecommunications industries.

Most of the literature points to the difference between "knowledge" and "information" or between explicit and tacit knowledge (Lundvall & Johnson, 1998). Without denying their importance, we believe that for knowledge based economy both types of knowledge are important, suffering various conversion processes.

In other works (Ordoñez & Serrat, 2009) is the difference between knowledge found in natural products and therefore can be used or applied by others to add value in the production and knowledge built form of human capital.

Process innovation, generation and in particular, application of knowledge to generate new products or services, also occupies a central place in the literature devoted to the knowledge economy. However, more recent work (Sissons, 2011) tends to address broader concept, addressing not only innovation.

Spatial geographic knowledge based economy is also important, authors considering that networks and clusters are vital in generating and sharing various types of knowledge and innovation. This was reflected in such concepts as "regional innovation systems" or "learning regions", found mainly in United Kingdom, as generators of wealth. Other recent works (REKENE, 2011) have emphasized the importance of a wider geographical approach than the regional knowledge based economy. This includes knowledge workers and / or knowledge based activities and the role they can play in driving innovation and economic development at national level. Florida (2002) emphasizes the key role of "social class creative" in generating competitive advantage.

A global knowledge-based economy creates simultaneously significant opportunities and threats for all countries, but especially for those who struggle to combat widespread poverty and create sustainable development, or those who are in transition from the centralized forms of economic organization to democratic forms.

To create these opportunities and face the risks, a country must simultaneously provide three premises (Jones, 2002):

- Set up a coherent, multi-dimensional national strategy, to build and support knowledge-based economy;
- Develop this strategy in a participatory manner, using a broad-based support to include all major sectors of society including the private sector, education, scientists, civil society, media and others;

- Implement a strategy to create knowledge-based economy in a sustained and persistent manner, carefully balancing priorities in the context of increasingly openness to the unpredictable and highly competitive global economy.

There are four essential and interrelated components of any strategy to create a knowledge based economy (Ásgeirsdóttir, 2005):

First. Creating a stimulating economic and institutional environment, to encourage widespread and efficient use of local and global knowledge in all sectors of the economy, fostering entrepreneurial spirit and enabling and supporting economic and social transformations generated by the knowledge revolution;

Two. Creating a society based on qualified, creative and flexible employees (Ceptureanu S., Ceptureanu E., 2010), offering opportunities for quality education and lifelong learning available to all, and a flexible and appropriate public and private funding;

Three. Building a dynamic ICT infrastructure and ICT sector has a competitive and innovative solutions and services to promote information and communication available to the economy and society (Verboncu et al., 2009). These services will include not only "high end" products such as internet and mobile telephony, but also a wide range of communications services and other elements of a developed information society, such as radio, television and other media, computers and other devices for storing, processing and use of information.

Four. Creating an efficient system of innovation including companies, research centers, universities, think tanks (Ceptureanu S., Ceptureanu E., 2010), facilitating access and use the growing stock of global knowledge, adapting it to local needs and using it to create new products and services.

2. RESEARCH

The importance of this empirical research is given by the following considerations:

- It is one of the first researches that examine local knowledge economy perception among managers of Romanian companies;
- Allows a better analysis of the relationship between awareness of knowledge-based economy and company's features;
- It is a useful tool for both academics - professors, researchers - and practitioners - managers, professionals, interested in the field.

The major objectives of the research are:

Objective 1: Awareness level of knowledge-based economy in Romanian companies;

Objective 2: Identify opportunities and threats arising from the transition to knowledge economy, according to managers of surveyed companies.

A. Sample characteristics

Analysis of knowledge-based economy in Romania was performed on a sample of 551 companies - from all branches of activity, age and development regions, is considered representative of the research objectives.

Considering **the age of companies** in the sample, most of them are between 5 and 10 years old (27.77%), followed by firms aged less than five years (31.94%), companies older than 15 years (21.41%) and 10-15 years (18.88%).

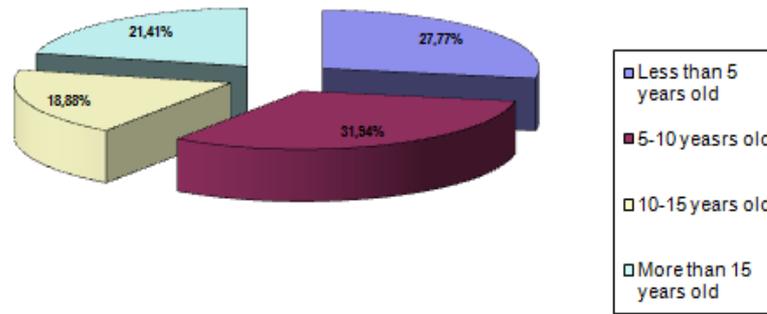


Figure 1. Structure of sample based on the age of surveyed companies

Source: own research

Distribution of sample' companies on Romania's development regions are as follows: South West - 12.71%, Bucharest - 19.77%, North East - 12.52%, North West - 12.16%, South East - 11.43%, Western region - 10.16%, Central Region - 10.89% and South - 10.34%.

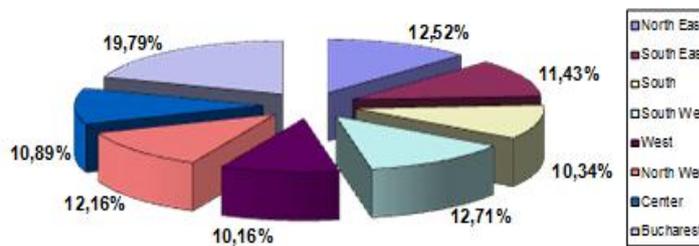


Figure 2. Structure of sample by development regions

Source: own research

Considering the **size class**, micro companies constituted 15.97% of companies' surveyed, small companies are 57.53%, medium-sized companies have a rate of 20.87% and 5.63% are large sized companies.

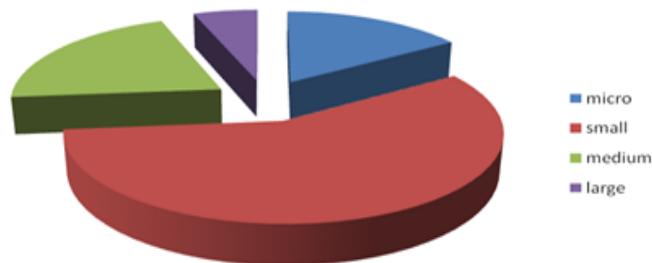


Figure 3. Structure of sample based on dimension of surveyed companies

Source: own research

Regarding **legal form**, 72.41% of companies are limited liability companies, 10.89% have other legal forms and 16.70% of companies are joint stock companies.

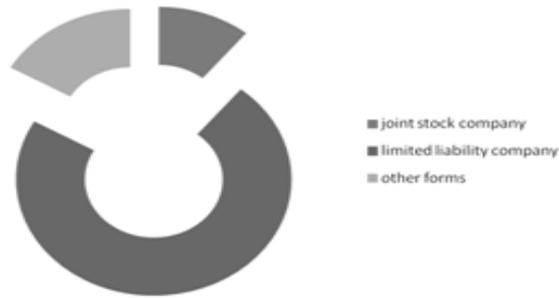


Figure 4. Structure of sample based on legal form of surveyed companies

Source: own research

Considering **industry** in which surveyed companies operates, the situation is as follows: 30.49% of companies operating in trade, services are 27.04%, 18.15% are manufacturing enterprises, 11.43% operates in construction, 7.63% and 5.26% in transport and tourism, respectively. It is important to mention that we consider their main activity, especially since most of them are operating in several areas.

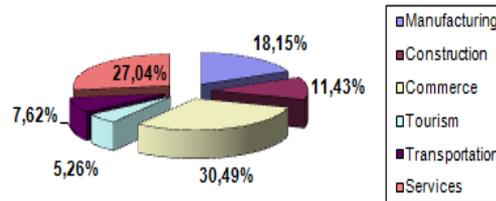


Figure 5. Structure of sample based on industry of the surveyed companies

Source: own research

In terms of **ownership**, almost all companies investigated - 97.82% - are private companies, the remaining 2.18% being held by the state.

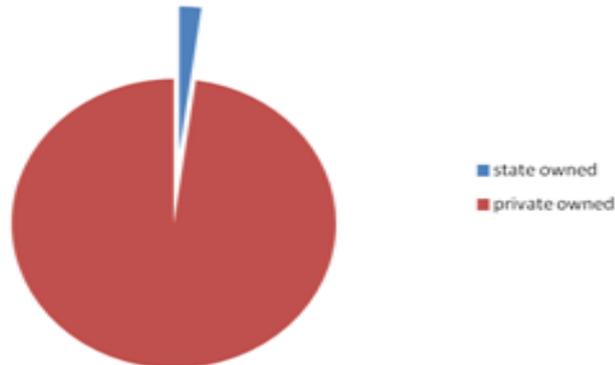


Figure 6. Structure of sample based on ownership of surveyed companies

Source: own research

B. Results

In the following analysis of knowledge based economy perception by Romanian managers were analyzed several aspects:

Familiarity of the subjects with the concept

According to survey, 45.37% of subjects responded that they are familiar with the concept, 35.39% said they were partly familiar and 19.24% have never heard of it. So, overall, the situation is, surprisingly, very good, more than 80% of managers surveyed saying that they at least know the concept.

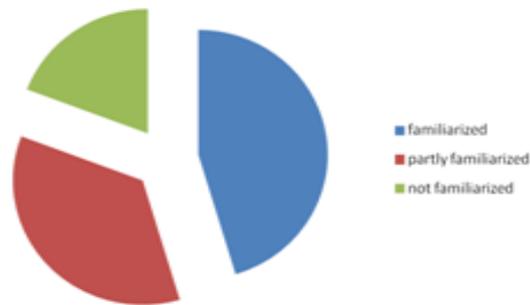


Figure 7. Familiarity with the concept of knowledge-based economy in Romanian companies

Source: own research

Considering **the age of companies**, our research found out that managers of companies established in the last 10 years are more familiar with the concept of knowledge based economy than those of older firms. By category, the percentage is highest among young (62.5%) and very young companies (59.48%), while the proportion of managers who have not heard of the knowledge economy is highest among mature ones (57.63%). This finding is not surprising, in that it was expected that young firms to be more connected and more willing to use opportunities generated by the new economy.

Considering Romania's **development regions** we found out that firms localized in Bucharest are more familiar with knowledge-based economy (30.8%), followed by companies from Central Region and the North West Region, while at the opposite side were companies from North East (15.9%) and South East Regions. So, in other words, results based on geographical situation are quite heterogeneous.

Table 1

Region of development	North East	South East	South	South West	West	North West	Center	Bucharest
Yes	8,40%	7,60%	6,80%	13,20%	9,60%	10,40%	13,20%	30,80%
No	15,90%	13,33%	12,82%	12,31%	10,26%	12,31%	9,23%	13,85%
Partly	16,04%	16,98%	14,15%	12,26%	11,32%	16,04%	8,49%	4,72%

Source: own research

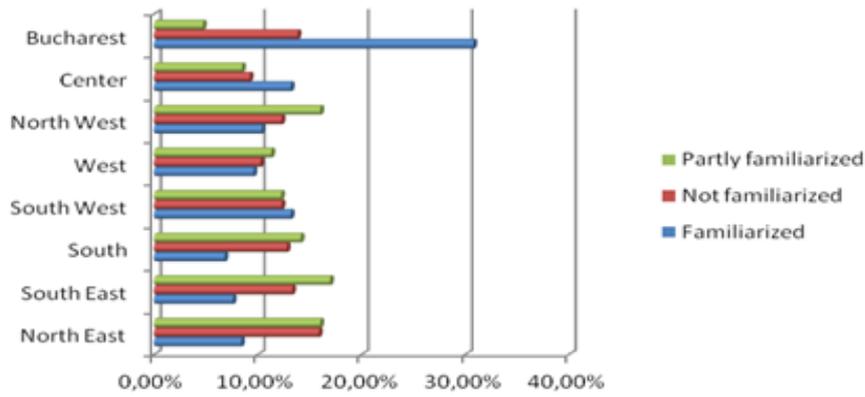


Figure 8. Awareness of knowledge-based economy concept in Romanian companies, by development regions

Source: own research

By size of companies investigated, we conclude that knowledge based economy is known predominantly in small (53%) and medium companies (41.74%), while the most unfavorable situation is among micro companies (40.91% of surveyed managers stated that they did not know the concept). In large companies there is the highest percentage of respondents stating the notion of knowledge-based economy is known in part. These findings are validated by the fact that in knowledge based economy SMEs are advantaged by their organizational flexibility and adaptability, enabling them to cope better their customers' requirements, on the one hand, and the type of business pursued by managers (predominantly service or trade), on the other hand.

Table 2

Dimension	Micro			Small			Medium			Large		
Answer	Yes	No	Partly									
Percentage	29,55%	40,91%	29,55%	53,00%	35,02%	11,99%	41,74%	33,04%	25,22%	25,81%	32,26%	41,94%

Source: own research

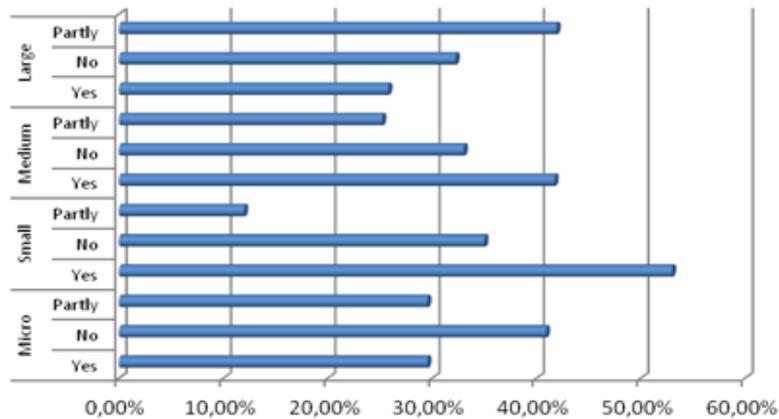


Figure 9. Level of familiarity with knowledge based economy, by size of companies surveyed

Source: own research

Considering their **legal form**, in stock companies notion of knowledge-based economy is best known (67.39%), followed by other forms of organization with 43.33% and limited liability companies (40.6%). Although it may seem a contradiction considering size criterion, where managers of small and micro firms were most aware of the concept, it is not the case because many small firms in sectors such as services and trade can be organized as stock companies. Weakest in terms of familiarity are limited liability companies with a share almost identical between those who know and have no idea (40.6% and 40.35%).

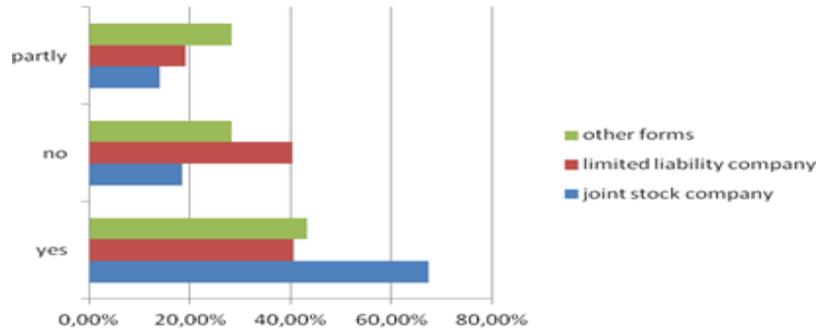


Figure 10. Awareness of knowledge based economy in the investigated companies, by legal status

Source: own research

By industry, knowledge based economy is well known in services and manufacturing, with percentages exceeding 50%, and trade, with almost 50%, while in tourism, construction and especially transport is worst in this respect.

Table 4

Industry	Manufacturing	Construction	Commerce	Tourism	Transportation	Services
Yes	53,00%	17,46%	46,43%	24,14%	11,90%	64,43%
No	43,00%	46,03%	28,57%	55,17%	69,05%	20,13%
Partly	4,00%	36,51%	25,00%	20,69%	19,05%	15,44%

Source: own research

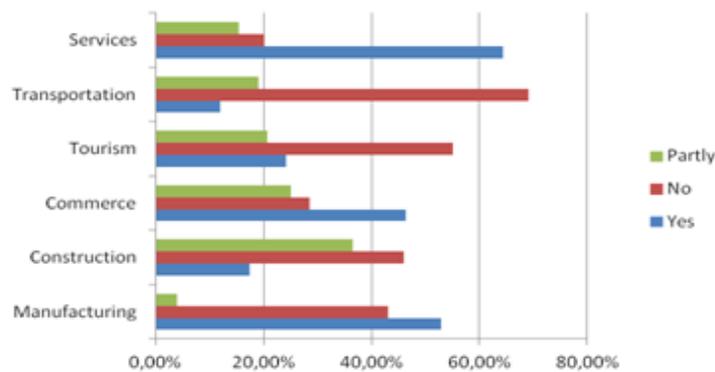


Figure 11. Percentage of knowledge based economy awareness in the investigated companies, by industry

Source: own research

Finally, **by ownership**, surprisingly, state owned companies are more familiar with the concept (50%), higher than private firms (45.27%), but the result is influenced by the share of small firms in the sample state (2.18% of total). The situation is shown in Figure 19.

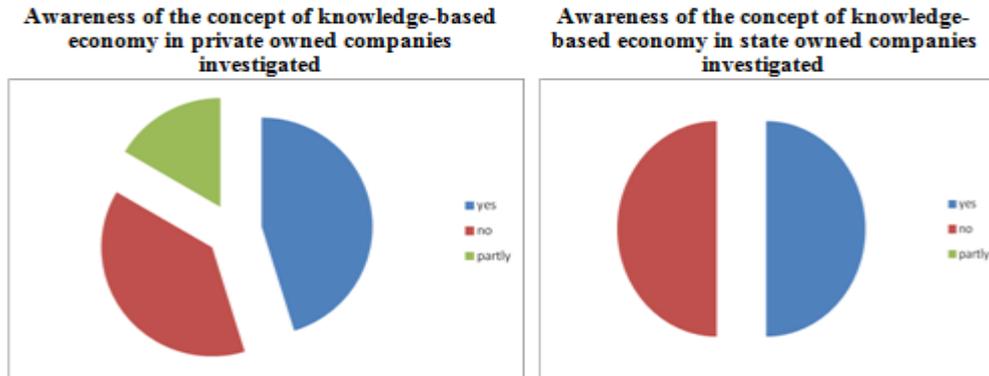


Figure 12. Awareness of the concept of knowledge-based economy in companies investigated, by ownership

Source: own research

Perception of Romania's transition to knowledge based economy among Romanian managers

Regarding Romanian companies' managers perception of our country's transition to knowledge-based economy, managers of more than half of the companies analyzed (56.44%) believe that this is an opportunity, one third perceive as a threat (35.39%), while 8.17% have a neutral attitude.

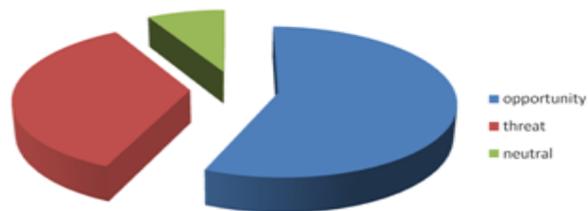


Figure 13. Perception of Romania's transition to knowledge economy

Source: own research

Considering **the age** of surveyed companies, the very young (79.74%) and young companies (65.91%) perceived the transition as an opportunity, while in mature and old firms is the other way around (56.73% for firms from 10 to 15 years old and 57.63% for firms older than 15 years). In our opinion, managers often fear of what they do not know and correlating previous answer to this question, it is natural that under the ignorance of the concept to consider the transition more as of a threat.

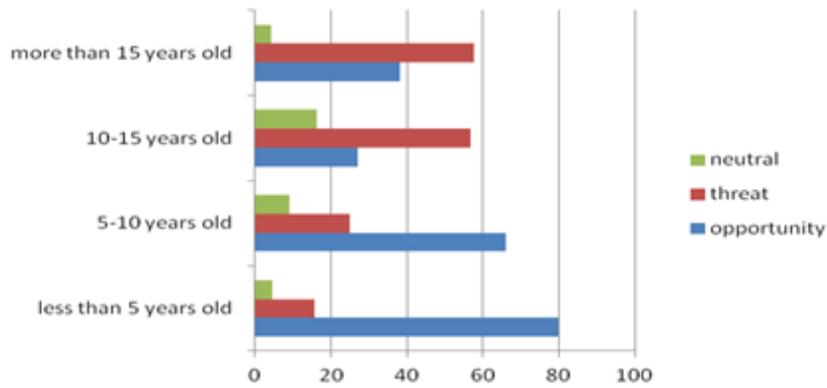


Figure 14. Perception of Romania's transition to knowledge economy, by companies age
 Source: own research

Considering **development regions**, the transition of Romania to the knowledge economy is seen as an opportunity to absolutely all developing regions, with higher percentages in the South (87.50%), Southeast (87.23%), West (86.79%) and South Western (86.15%) regions, while higher proportions of distrust were found in Bucharest (26.85%) and North East (20.83%) Regions.

Table 5

Region of development	North East	South East	South	South West	West	North West	Center	Bucharest
Opportunity	79,17%	87,23%	87,50%	86,15%	86,79%	81,63%	80,70%	73,15%
Threat	20,83%	12,77%	12,50%	13,85%	13,21%	18,37%	19,30%	26,85%

Source: own research

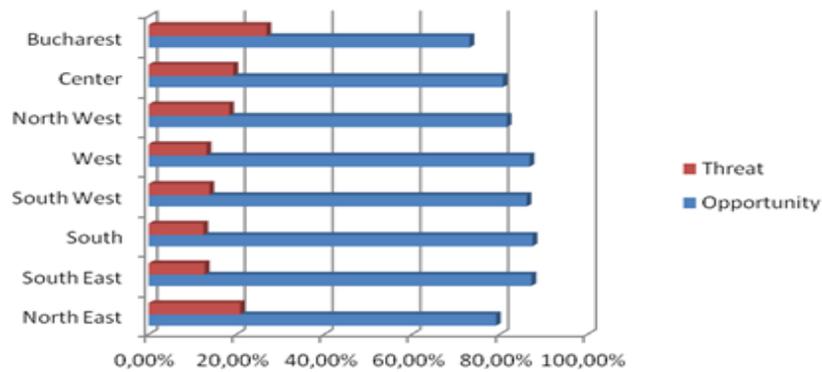


Figure 15. Perception of Romania's transition to knowledge-based economy, on development regions
 Source: own research

By **size class**, managers of large companies see the transition as generating opportunities (80.65%), while medium-sized companies are facing the most striking negative attitude (22.61%). However, for the same medium sized firms our research reveals

a strong segmentation between the two approaches - opportunity or threat, undecided percentage is below 1%, while for managers of small firms we find the highest percentage of neutral attitude (18.61%).

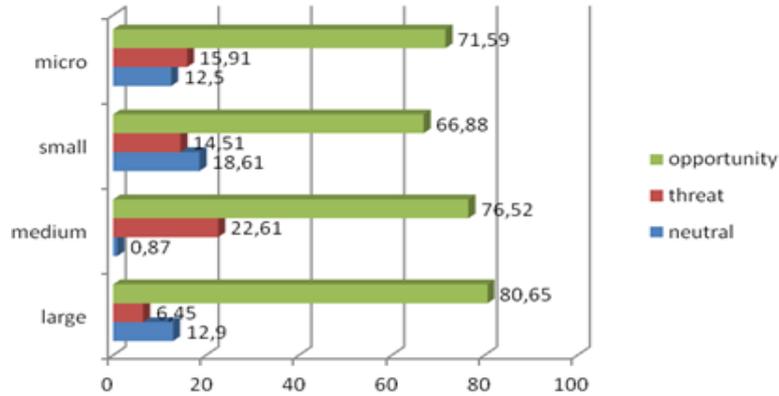


Figure 16 Perception of Romania's transition to knowledge economy, by size of surveyed companies

Source: own research

By **legal form**, we found out that in stock companies and limited liability companies the trend is to consider the transition to knowledge-based economy as an opportunity, while in other types of organization situation is much more heterogeneous.

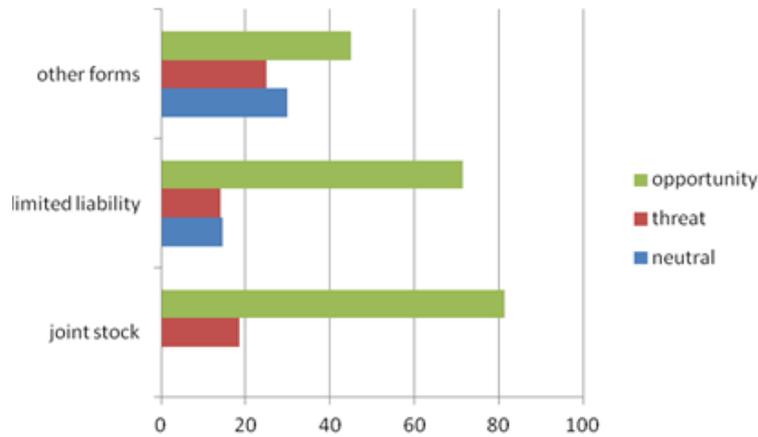


Figure 17 Perception of Romania's transition to knowledge economy, based on legal form of surveyed companies

Source: own research

By **industry**, it is found that firms in Services, Manufacturing and Commerce are most receptive to opportunities generated by knowledge-based economy - a situation to understand, in fact, because innovation is present primarily in these sectors, while among the Tourism and especially Construction managers the attitude is more negative.

Table 6

Industry	Manufacturing	Construction	Commerce	Tourism	Transportation	Services
Opportunity	62,64%	46,34%	66,20%	50,00%	54,17%	96,92%
Threat	37,36%	53,66%	33,80%	50,00%	45,83%	3,08%

Source: own research

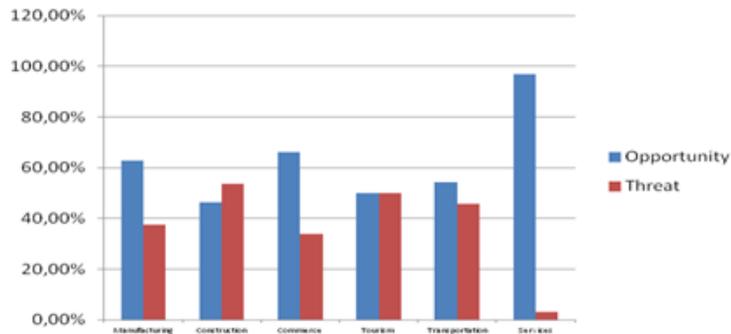


Figure 18 Perception of Romania's transition to knowledge-based economy, based on industry

Source: own research

Finally, **by ownership** we found predominantly positive perception towards knowledge-based economy, this time stronger in the private sector (75%) compared with the state owned companies (66.67%).

In terms of awareness of the changes induced by the transition to knowledge-based economy, similar to previous questions we find a higher degree of information among managers of young and very young companies.

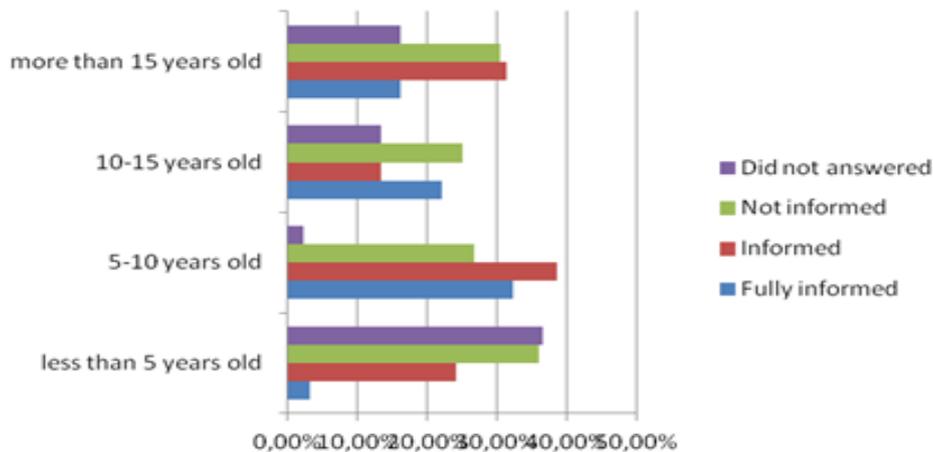


Figure 19 Perception transition to knowledge economy among Romanian managers, by companies' age

Source: own research

Considering **development regions**, in Bucharest, Center and West regions managers are better informed compared with regions like North East, North West and South. Lowest level of awareness is in North East region.

Table 7

Region of development	North East	South East	South	South West	West	North West	Center	Bucharest
Fully informed	17,39%	22,22%	22,81%	30,00%	35,71%	28,36%	38,33%	43,12%
Informed	24,64%	30,16%	31,58%	31,43%	41,07%	26,87%	36,67%	27,52%
Not informed	37,68%	31,75%	33,33%	32,86%	19,64%	34,33%	23,33%	25,69%
Did not answered	20,29%	15,87%	12,28%	5,71%	3,57%	10,45%	1,67%	3,67%

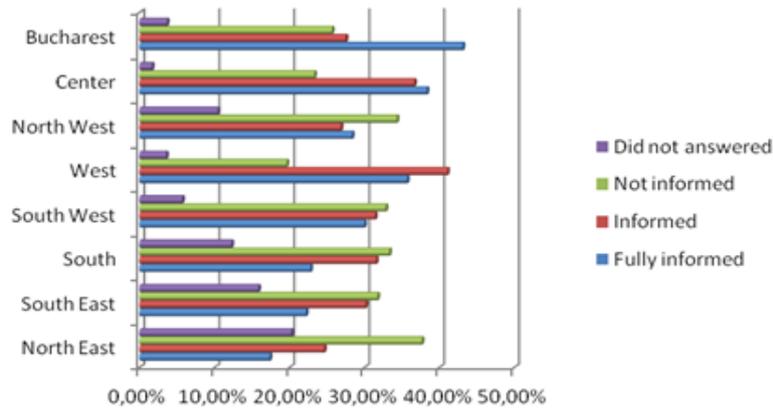


Figure 20 Perception transition to knowledge economy among Romanian managers, by development region
Source: own research

By size class, large firms seem again to be the most informed, while micro companies and small business managers are the least informed.

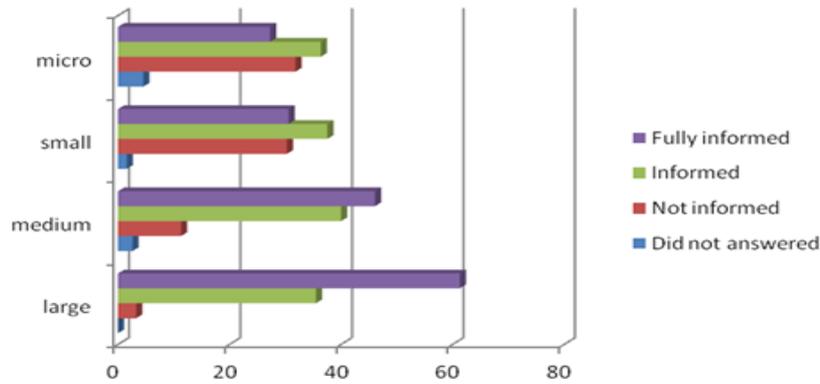


Figure 21 Perception of transition to knowledge based economy among Romanian managers, by size of companies
Source: own research

By legal form, managers of joint stock companies are the most informed (39.13% fully, 41.3% partial), while managers of other legal forms are the least informed (45%).

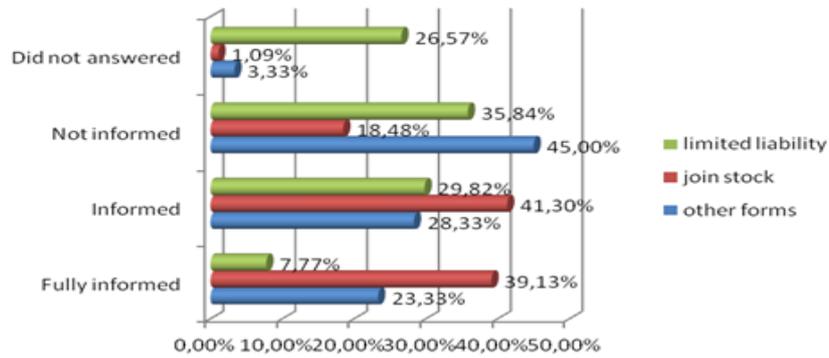


Figure 22 Perception of transition to knowledge based economy among Romanian managers, by legal form
 Source: own research

By **industry**, Services and Tourism companies are the most informed, while Construction and Transportation companies are the least informed.

Table 8

Industry	Manufacturing	Construction	Commerce	Tourism	Transportation	Services
Fully informed	28,00%	9,52%	25,00%	37,93%	19,05%	45,64%
Informed	37,00%	19,05%	33,93%	41,38%	30,95%	42,95%
Not informed	31,00%	66,67%	39,88%	17,24%	50,00%	10,74%
Did not answered	4,00%	4,76%	1,19%	3,45%	0,00%	0,67%

Source: own research

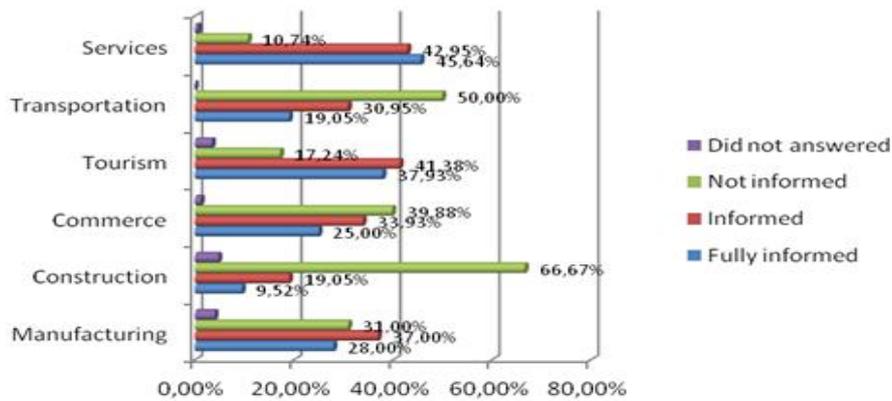


Figure 23 Perception of transition to knowledge economy among Romanian managers, by industry
 Source: own research

Finally, **by ownership**, overall private firms are more informed about the changes induced by the knowledge economy (aggregate 83.33%).

Table 9

Ownership	Private owned				State owned			
	Fully informed	Informed	Not informed	Did not answered	Fully informed	Informed	Not informed	Did not answered
	28,20%	38,22%	28,94%	4,64%	16,67%	33,33%	50,00%	0,00%

Source: own research

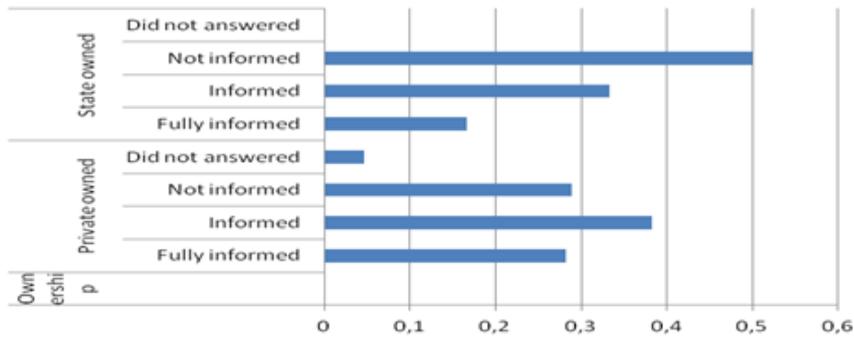


Figure 24. Perception of transition to knowledge economy among Romanian managers, by ownership

Source: own research

Among the factors generated by Romania's transition to knowledge-based economy with positive effect on firms, managers had said that better cooperation for innovation (20.51%) and the emergence of cheaper and better suppliers (19.78 %), whereas among the negative factors they mentioned increased competition from imported products (21.96%) and increasing difficulties in maintaining workforce (17.60%).



Figure 25 The main advantages of the transition to knowledge economy

Source: own research

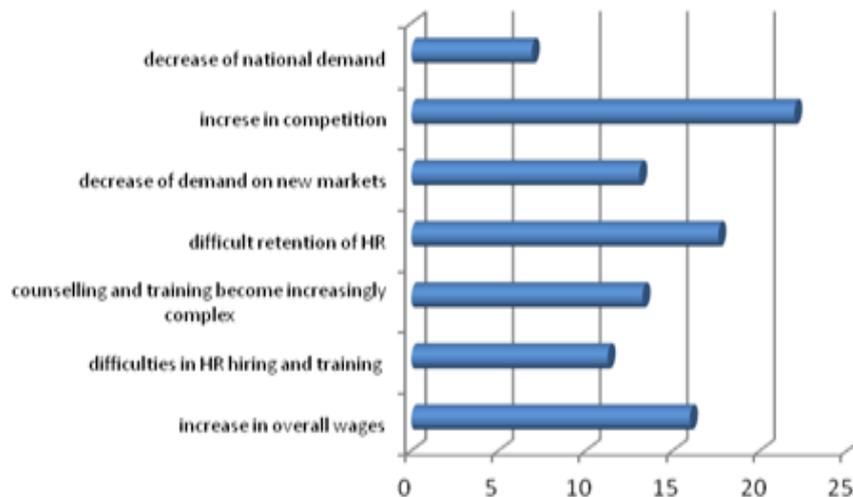


Figure 26 The main disadvantages of the transition to knowledge economy

Source: own research

CONCLUSIONS

- Knowledge based economy is a concept known for 45.37% of the managers of Romanian companies, 35.39% said they were partly familiar and 19.24% have never heard of it. So, overall, a very good situation.

- After the age of the surveyed companies we found that managers of companies established in the last 10 years are more familiar with the concept than those of older firms.

- In the development region of Bucharest we found out that firms are most familiar with the concept of knowledge-based economy (30.8%), followed by the North Central Region and Western Region, while at the opposite pole there are companies from North East (15.9%) and South East regions.

- By size, predominantly small (53%) and medium companies (41.74%) are familiar with the concept. In large companies shows that the highest percentage of respondents to the notion of knowledge-based economy is a concept known in part.

- By legal form, in joint stock companies knowledge-based economy is best known (67.39%), followed by other forms of legal form (GP, partnership, etc.) with 43.33% and limited liability companies (40.6%).

- Considering industry, the concept is known in services and industry, with percentages exceeding 50%, and trade, with almost 50%, while tourism, construction and especially transport are the worst in this respect.

- By ownership, state owned companies are more familiar with the concept (50%) than private firms (45.27%),

- In terms of perception of our country's transition to knowledge-based economy, managers of more than half of the companies analyzed (56.44%) believe that this is an opportunity, one third perceive as a threat (35.39%) while 8.17% have a neutral attitude.

- By age, in very young (79.74%) and young companies (65.91%) transition was perceived as an opportunity, while for mature and old firms is the reverse situation (56.73%

for established firms from 10 and 15 years and 57.63% for firms that operate more than 15 years).

- In developing regions, our country's transition to knowledge-based economy is seen as an opportunity to absolutely all developing regions, with higher percentages in the South (87.50%), Southeast (87.23%), West (86.79%) and South Western (86.15%), while higher proportions of distrust were found in Bucharest (26.85%) and the North East (20.83%).

- By size class, managers of large companies see the transition as generating opportunities (80.65%), while medium-sized companies are facing the most striking negative attitude (22.61%), while for managers of small firms we find the highest percentage of neutral attitude (18.61%).

- By legal form, it is found that in joint stock companies and in limited liability ones the tendency is to consider the transition to knowledge-based economy as an opportunity, while in other types of legal form situation is much more heterogeneous.

- By industry, we found out that service firms, manufacturing and commerce are most receptive to opportunities generated by knowledge-based economy, while tourism, and especially construction managers are more reluctant.

- After ownership we found predominantly positive perception towards knowledge-based economy, stronger in private sector (75%) compared with the state sector (66.67%).

- With regard to the information on the changes induced by the transition to knowledge-based economy, there is a higher degree of information for managers of young and very young companies.

- The development regions Bucharest, Central and West are best in terms of information on changes to the knowledge economy, while the lowest level of information can be found in the North East, North West and South. Least informed managers can be found in the North East region.

- By legal form, managers of joint stock companies are the most informed (39.13% fully, 41.3% partial), while managers of other legal forms are the least informed (45%).

- By industry, in manufacturing, services and tourism companies' managers are the most informed, while construction and transport companies are the least informed.

- By ownership, overall private firms are more informed about the changes induced by the knowledge economy (aggregate 83.33%).

- The factors generated by Romania's transition to knowledge-based economy, with positive effect on firms conducted in the next period, managers have said that better cooperation for innovation (20.51%) and the emergence of cheaper and better supplies (19, 78%), whereas among the negative factors have said increased competition from imported products (21.96%) and increasing difficulties in maintaining workforce (17.60%).

- Hypothesis 1: Romanian companies are familiar with the concept of knowledge-based economy is confirmed;

- Hypothesis 2: Managers of Romanian companies know and are prepared to exploit opportunities and counter threats related to the transition to knowledge-based economy is partly confirmed;

- Hypothesis 3: Organizations' age, origin, legal form, industry, ownership and size affect the perception of the knowledge economy is confirmed.

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