

**COMPETITIVENESS THROUGH KNOWLEDGE –
ASSESSMENT OF THE EUROPEAN UNION MEMBER STATES BASED
ON THE KNOWLEDGE ASSESSMENT METHODOLOGY (KAM)
DEVELOPED BY THE WORLD BANK**

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Abstract

The present study attempts to make a diagnosis of the progress of European Union member states in the transition towards the knowledge economy. We used the World Bank KAM Methodology developed in the programme Knowledge for Development and the database available on the web page of the World Bank. KAM Methodology was described and the European progress towards the knowledge economy was assessed according to this methodology, with the focus on the Romanian situation, from a comparative perspective.

Key-words: *knowledge economy, competitiveness through knowledge*

JEL Classification: O₁₀

Introduction

This study is focused on achieving a comparative analysis of the Romanian progress in the transition towards a knowledge based economy and also on developing a short assessment of the Member States' steps towards the development of knowledge economies. The Knowledge Assessment Methodology – KAM and the database available on the World Bank website were used for these purposes. The KAM methodology was created in the Knowledge for Development – K4D programme, a programme with an important role for the national stakeholders' understanding of the “powerful effect that knowledge has on economic growth” and for encouraging the states to combine global and local knowledge for the development of their own comparative advantages. The first step in developing a national knowledge based economy is that of understanding the country's strong, but also weak points towards this goal.

The methodology proposed by the World Bank experts is very useful to identify them.

KAM 2009 is offered interactively, on the internet, offering the possibility to compare 146 countries, based on 109 qualitative and structural variables, used as proxy variables for four pillars considered being of the highest importance for the development of the knowledge based economy.

In this article the four pillars developed by the World Bank were presented, the KAM methodology was shortly described and an assessment of the European countries progress towards a knowledge based economy was developed according to this methodology, with focus on the analysis of the Romanian situation from a comparative perspective. The progress of Romania between 1995 and 2009 was also presented.

Review of the literature on the tackled theme

In 1996, OECD published the study “Knowledge-Based Economy”, contributing to the naturalization of the concept of *knowledge-based economy*. OECD explained the meaning of this concept as following: “The term “*knowledge-based economy*” stems from this fuller recognition of the place of knowledge and technology in modern OECD economies. Knowledge, as embodied in human beings (as “*human capital*”) and in technology, has always been central to economic development. But only over the last few years has its relative importance been recognised, just as that importance is growing. The OECD economies are more strongly dependent on the production, distribution and use of knowledge than ever before.” (OECD 1996, p 9)

Amongst the intensive preoccupations on the role of knowledge for development, we must also mention the activity of the World Bank. World Bank’s Institute initiated the program Knowledge for Development – K4D, a program that is focused on offering support to the countries, no matter of their level of development, in their transition towards a “knowledge based economy”.

The World Bank uses the term of “knowledge based economy”, affirming that technology and knowledge are the heart and mind of the global economy. The experts of the World Bank consider that presently the stakeholders must build a knowledge based economy and acknowledge the fact that numerous developing countries didn’t manage to identify the pieces of global knowledge and combine them with the uniqueness of the local knowledge in order to build a knowledge economy (World Bank, 2007). Even if, according to their vision, the steps for a successful transition towards a knowledge based economy are known, the states face difficulties in this line due to an insufficient institutional capacity.

Thus, the World Bank’s program K4D was created for increasing the awareness of decision makers on a national level of the strong positive effect that knowledge has on economic growth and for encouraging the states to create institutions that will support and not discourage the attempts of exploiting the competitive opportunities through knowledge.

Theoretical foundations

According to the World Bank the knowledge economy must be developed on four pillars. These are:

- I. *A tendered economic incentive and institutional regime*
- II. *An educated work force*
- III. *An efficient innovative system*
- IV. *An adequate informational structure*

Each of the four mentioned elements must function efficiently for a knowledge based growth and the investment in these four elements must be balanced and coordinated so that the interaction of these four elements could produce higher benefits than those that could be obtained by an independent action

on each of these elements. The economic incentive and institutional regime is considered by the World Bank's experts to be the base on which the other three pillars are upheld.

The 2009 KAM version manages to make comparisons based on 109 structural and qualitative variables, that serve as proxy variables for the four pillars of the knowledge economy that were already described here. Also, 146 countries can be compared, the most developed OECD countries, but also approximately 100 developing countries. The data used by this methodology are regularly updated and are provided by a multitude of sources, such as the internal databases of the World Bank, databases provided by other organizations, such as Freedom House, Heritage Foundation, ILO, UNESCO, UNDP and so on. All the 83 variables are normalized on a scale from 0 (weakest) to 10 (strongest) and all the countries are placed on an ordinal scale. This methodology offers information on the *relative* performance of the countries in transition towards a knowledge economy.

The most often quoted index offered by the KAM methodology is the Knowledge Economy Index – KEI, offering a global image on a country's preparation for the knowledge economy. **KEI** sums up the performances of each country based on 11 variables that correspond to the four pillars of the knowledge economy. KEI is built as the simple average of the normalized values of these indexes, from 0 to 10. A score that is close to 10 implies a good development of the four pillars in comparison to other countries.

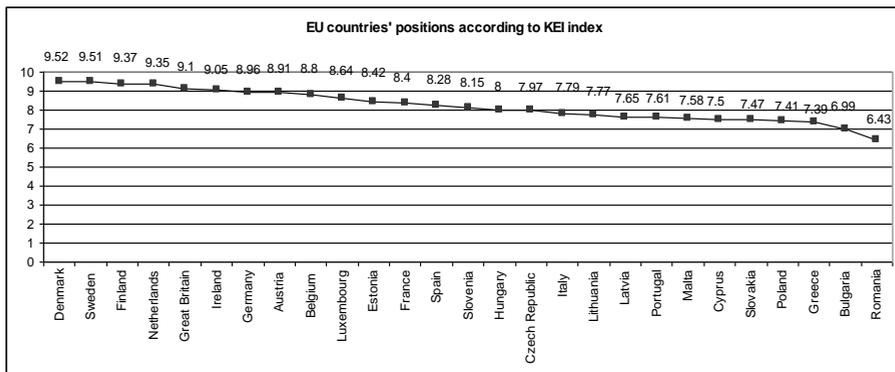
The Economic Incentive and Institutional Regime is the simple average of the normalized scores for three key variables: Tariff and Non-tariff Barriers, Regulatory Quality and Rule of Law.

The Innovation System is the simple average of the normalized values for three key variables: Total Royalty Payments and Receipts, Patent Applications Granted by the US Patent and Trademark Office, Scientific and Technical Journal Articles

Education and Human Resources Index is the simple average of the normalized scores of three key variables: Adult Literacy Rate, Secondary Enrolment, Tertiary Enrollment.

Information and Communication Technology is the simple average of the normalized scores of three key variables: Telephone, Computer and Internet penetrations (per 1000 people).

The assessment of the EU member states progress towards a knowledge economy and comparative analysis of Romania's progress



Source: Data obtained using the World Bank database, www.worldbank.org/kam.

Fig. 1. EU countries' positions according to KEI index

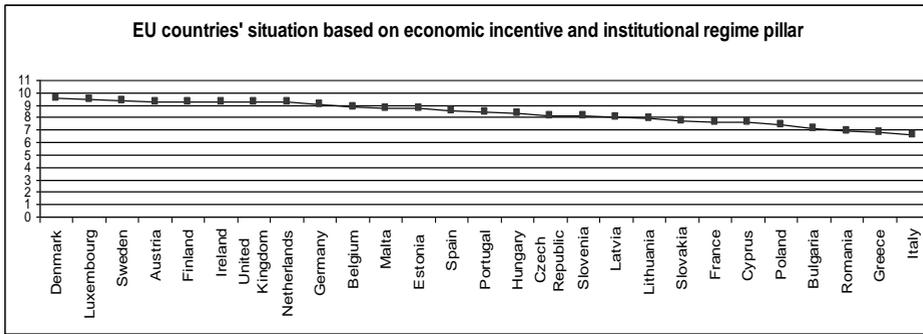
Romania had an important progress measured through the KEI index, with a positive leap of 10 positions, occupying in 2009 the 47th place, compared to the 57th place in 1995. Thus Romania is one of the countries with spectacular improvements. Romania's KEI score is 6.43, a score that places Romania to the upper half of the normalized scale from 0 to 10. Yet Romania has the lowest score of the EU member states. Bulgaria has a better position compared to Romania, being on the 43rd position, with a 6.99 score for KEI. Only two member states obtained for KEI scores below 6 and these are Bulgaria and Romania.

In fact, in the EU, the performances in the transition towards a knowledge based economy are quite differentiated: there are advanced countries (with a KEI higher than 9) – the Nordic countries, the Netherlands, United Kingdom; countries with a strong rhythm of the progress (with KEI between 8 and 9) – Germany, Austria, Belgium, Luxembourg, France, Estonia, Slovenia, Spain, but also countries that have weaker comparative performances – Italy, Lithuania, Latvia, Cyprus, aso.

Denmark remains in 2009 the most advanced knowledge based economy in the world. Its KEI index in 2009 is 9.52, thus Denmark keeps the top position, also held in 1995. Although the KEI index had a very low variation for this country, Denmark improved its educational and institutional pillars. For the educational pillar the value of the index grew from 9.63 in 1995 to 9.78, thus Denmark occupying the first place from 146 countries in 2009. This situation is due to the levels of secondary and tertiary enrolment. The increase is also registered for the institutional pillar, from a value of 9.30 in 1995 to 9.61 in 2009, Denmark occupying the second position from 146 countries, on a global level. Compared to 1995, Denmark registered decreases in the ITC pillar, which shows that there are other countries that improved much more their ITC structure in the same period of time.

The Nordic countries are in the top five knowledge economies: Sweden has the second position, Finland the third, and Norway the fifth. They all have strong performances for the educational pillar as they are all in the top seven positions from this perspective. Unlike Sweden that occupies the second position for ITC, all the other Nordic countries had a comparative decrease of their ITC performances: Finland is on the 16th position, descending 13 positions, and Denmark is on the 9th position, descending 4 positions compared to 1995. The Nordic countries have very high performances on the innovation pillar, being in the top ten globally.

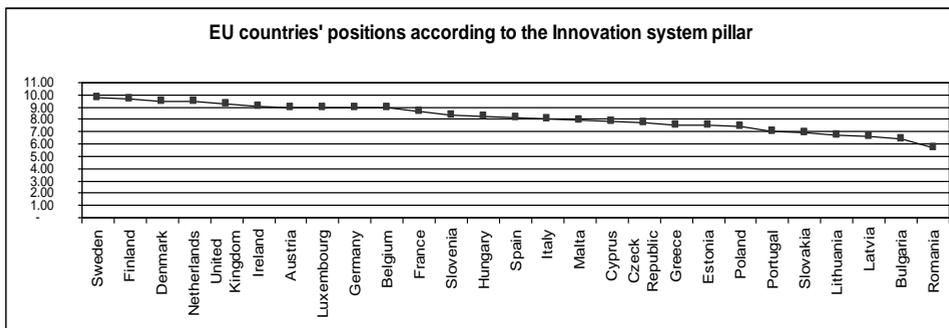
Great Britain occupies the 7th position regarding the KEI index in 2009, globally, the 6th position regarding the ITC pillar, with a significant increase compared to 1995, due to important progress regarding the penetration of internet and phone services. Its weak point is represented by the educational pillar, where, due to decreases in the secondary and tertiary enrolment, Great Britain occupied the 15th position in 2009, losing its top position from 1995.



Source: Data obtained using the database built using the KAM methodology, www.worldbank.org/kam.

Fig. 2. EU countries' positions according to the economic incentive and institutional regime pillar

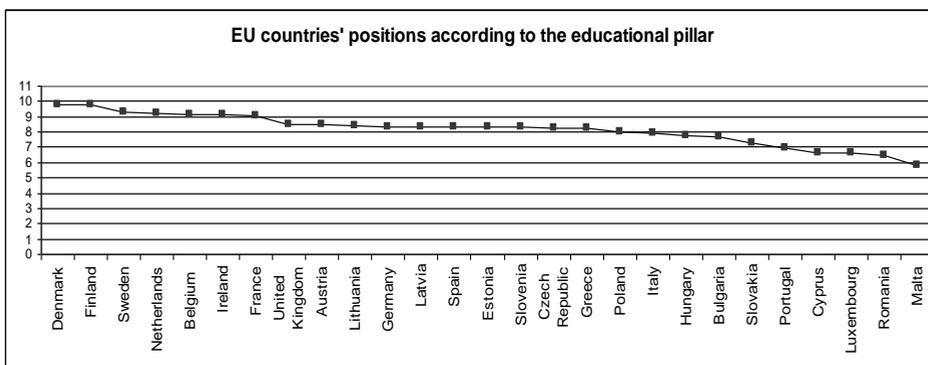
Romania occupies the 45th place considering this index, with a score of 6.98. Compared to 1995, Romania ascended 9 positions for this pillar. Of all the EU countries, the only countries that obtain a lower score than Romania are Italy (49th position) and Greece (46th position). This is the most developed pillar for Romania, obtained especially due to the good score for the Tariff and Non-tariff Barriers variable.



Source: Data obtained using the database built using the KAM methodology, www.worldbank.org/kam.

Fig. 3. EU countries' positions according to the Innovation System pillar

Romania occupies the 60th position globally, with a score of 5.74. All the member states of the EU obtained, based on the data used in the KAM methodology higher scores than Romania. Romania is the only country with a score lower than 6. In fact this is the pillar with the lowest development for Romania.



Source: Data obtained using the database built using the KAM methodology, www.worldbank.org/kam.

Fig. 4. EU countries' position according to the educational pillar

Romania occupies the 48th position globally, with a score of 6.47. All the other EU member states obtained higher scores than Romania, except for Malta.

Regarding the ITC pillar, Romania is placed on the 50th position, with a score of 6.55. Romania held the last position of the EU states regarding the ITC penetration. The states that obtained, together with Romania, a score lower than 7 are Greece and Bulgaria.

Romania – comparative situation 1995 – 2009 (normalized scores)

1. **The Economic Incentive and Institutional Regime** – in 1995 a score of **5,83** compared to **6,98** in 2009
2. **The Innovation System** – in 1995 a score of **4,89**, compared to **5,74** in 2009
3. **Education and Human Resources Index** – in 1995 a score of **6,26**, compared to **6,47** in 2009
4. **Information and Communication Technology** – in 1995 a score of **6,16**, compared to **6,55** in 2009

Conclusions

On an EU level the range of performances in the transition towards a knowledge economy is quite large: from advanced countries (with a KEI score above 9) – the Nordic countries, the Netherlands, Great Britain, countries with a strong rhythm of progress towards the knowledge economy (with the KEI score between 8 and 9) – Germany, Austria, Belgium, Luxembourg, France, Estonia, Slovenia, Spain, but also countries with weaker comparative performances – Italy, Lithuania, Latvia, Cyprus and so on..

Denmark remains in 2009 the most advanced knowledge economy in the world, keeping the top position from 1995.

According to KEI, Romania is in the first third of the classification, occupying the 47th place from 146 countries, with a normalized score of 6.43.

Inside the EU, Romania occupies the last position, as far as the KEI index is concerned.

Also, Romania occupies the last place compared to the other EU countries, when analysed based on the data for the Innovation system and ITC. Romania is the last but one, when analysed based on data for the pillar Education and human resources, a lower score being obtained by Malta. On the index of Economic Incentive and Institutional Regime, Romania occupies the antepenultimate place, followed by Greece and Italy.

Comparing Romania's situation in 2009 with that from 1995, one can observe an improvement of Romanian performances for all the four pillars of the knowledge economy.

Important progresses were registered for Romania regarding Regulatory Quality, Tertiary Enrolment (5.31 in 1995 – 7.75 in 2009), Total Royalty Payments and Receipts (3.56 in 1995 – 5.71 in 2009), Computer penetration for 1000 persons (from 5.32 in 1995 to 7.18 in 2009).

The analysis can be considered as a starting point for a more thoroughly study of Romania's situation for each pillar, thus understanding the elements that brake the progress towards the knowledge economy and for the development of policy proposals based on the identification of good practices through the analyses of other countries performances.

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