

## The Commercialization of the Knowledge as the Supposition of the Economic Growth

Viera Kubičková<sup>1</sup> – Ladislav Bažó<sup>2</sup> – Roman Staňo<sup>3</sup>

### **Abstract**

*The Endogenous growth theory assumes that the economy automatically benefits from its investments in to the knowledge. The knowledge is the public ware that can be used by the Entire economy. It leads to the innovation and the economic growth. The entrepreneurship has the main role in the successful process of the commercialization of the knowledge. The aim of this article is to present the situation of this process in the enterprises in the Slovak Republic.*

### **Key words**

*Knowledge, economic growth, innovation, service enterprises*

**JEL Classification:** E23, E24, F29, L19, L84, O25

### **Introduction**

The supposition of the active causal chain: "Knowledge – Innovation – Economic growth – Competition" is possible only by the transformation of the new knowledge into the real innovations. The production of the knowledge can not automatically secure their realization by the economical and social effects. The creation of the knowledge supports the flow of the knowledge in the society. The realization through the business channels guarantee the real economical acquisition. The natural environment for this process is the entrepreneurship of the small and middle enterprises. The theory of the Economy of the Service centralizes attention into the important position of the Service enterprises. They are the source of the creation of remarkable economical performances. The Service enterprises create employment. They implement innovative solutions which are realized by the intermediary service consumption in the universal economical environment. The challenge for the future is to search how high is the level of the ability of the small and medium Service enterprises to transform the new knowledge of the new solutions and secure their commercialization. The article offer the theoretical starting points of this problem. The aim is the identification of the situation in the commercialization of the knowledge in the conditions of the Slovak republic. The target is based and realized by the analysis of the comparation.

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<sup>1</sup> doc. Ing. Viera Kubičková, PhD.; University of Economics in Bratislava, Faculty of Commerce, Department of Services and Tourism, Dolnozemska cesta 1, 852 35 Bratislava; E-mail: viera.kubickova@euba.sk

<sup>2</sup> Ing. Ladislav Bažó, PhD.; University of Economics in Bratislava, Faculty of Commerce, Department of Services and Tourism, Dolnozemska cesta 1, 852 35 Bratislava; E-mail: bazo@euba.sk

<sup>3</sup> Ing. Roman Staňo, PhD.; University of Economics in Bratislava, Faculty of Commerce, Department of Services and Tourism, Dolnozemska cesta 1, 852 35 Bratislava; E-mail: stano@euba.sk

## 1 The Endogenous growth theory

The knowledge and innovations are the most important tools in the enterprise competition by the view of the theory. There exists an symbiosis of the innovation, competition and entrepreneurship in modern capitalist economy (Metcalf, 2005). The intensity of this phenomenon depends by the political and economical system of the every country. The realization of the state policy has the influence on the innovation policy.

The Swedish economy is the strong social motivated economy. The state plays an important role. The Sweden has a special position in the international comparisons of the innovation intensity in the economy.

The Endogenous growth theory supposes the automatical advantage from the investment into the new knowledge (Lucas, 1988; Romer, 1990). The knowledge is the public property so it can be used in the economy universally. This situation has an influence on the innovations and economical growth. The real experiences presented by statistical data: TFP (total factor of the productivity) give us information about the different use of the knowledge in the different economics.

The TFP (Total factor of the productivity) accepts entries of all factors of the production. It reduces these factors on working power, investment and level of technology, technological effectivity, management capacity and other components of the enterprise which are not able to observe directly. The TFP (Total factor of the productivity) is influenced by two basic important factors of production (working power and a investment). It includes also innovations, technologies and organization (Hall & Williams, 2008).

**Table 1** Total factor productivity, annual increase rate 1996-2002

Country	The annual increase rate TFP 1996-2002
Greece	-1,72
Italy	-0,21
Austria	-0,10
Poland	-0,005
Hungary	0,08
Germany	0,64
<b>Slovakia</b>	<b>0,65</b>
Spain	0,88
Belgium	1,13
Netherlands	1,23
France	1,5
Portugal	1,63
USA	1,82
Finland	2,19
Denmark	2,29
Great Britain	2,63
Czech Republic	3,53
Sweden	5,65

Source: European Commission (2010): *The National Specialisation and the Innovation Performance*. Luxembourg: Europe Innova.

The active role of TFP in choiced countries confirms the activity of the support of innovations and knowledge in the economy. The countries with the high level of TFP performance (Sweden, Great Britain, Danmark, Finland) are presented in the highest charts in competition and innovation performance. The Czech Republic has one of the highest increase rate but its position in the charts is not significant. There is question of ability of economical groups to transform the knowledge into the commercial mode which will brings economical effects. There is a minimal application of two factors (working power and investment) in Slovak Republic (0,65 annual increase rate). This data are connected with the application of knowledge and innovations, which present innovation index and competition index.

## **2 The conditioned task of knowledge in the realization of the economic growth**

The main part of the scientifical researches create testimony that the knowledge lead to the economical growth. There exits evident difference in the ability of the countries to use the knowledge more effectively with the advantages of the large impact.

The USA have higher ability to applicate the knowledge better than the countries of the European Union. The economical growth is conditioned by the commercialization of the knowledge.

The important phase of the knowledge is their application and transformation into the real and practical solutions on the market.

In the microeconomical conditions they present necessity to create conditions from the side of the enterprise not only for the creation of the knowledge but also for their own or subsidiary use. This phase brings economical advantages in the form of the competition advantage which brings higher incomes and profit. We separate two different groups with the effect of the innovation on economical growth in the research:

- New innovations for the market
- New innovations for the enterprise

The first group of the innovations is unknown. It has no equivalent. It brings solutions which have no compensation in these conditions. These innovations bring advantage in the competition.

The second group of the innovations has incremental feature in the dependance from the type of the innovation it brings saving of the costs for the enterprise or satisfaction of the clients based on the experiences.

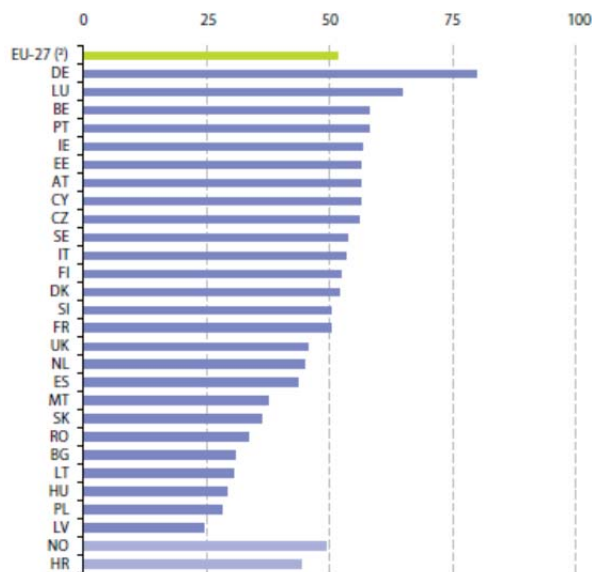
The natural environment for the creation and commecialization of the knowledge should be the enterprise. This situation need the condition that the environment of the enterprise is oriented on the creation for the realization of the research. The research is conditioned with the inflence of this situation. The situation of of the finicial support of research is in the Slovak Republic not acceptable. It si determined by the low level

of the investments into the science and research from the public sources. The small and medium enterprises have a low level of the activity on the the international market. There is a low consumption of the innovative products. The market of the risk investments is undeveloped. The cooperation between private and public economical sector in creation and commercialization of the knowledge is low. The public economic sector has law demand for the innovations. There is a law level of the innovative atmosphere in the society.

The entrepreneurship sector should have important role in conditions suitable for the establishment and commercialization of the knowledge which plays important role and guarantee the economic growth. The enterprise which has own new knowledge could offer it to the other enterprises through the own patent. The new knowledge can be used by the public and competitive enterprises. The economical connections in the local area will use the knowledge locally. They create conditions of the economical growth in the region. The Net and Cluster Connections can help for the development of the regions especially in the area with the low level of the economical power.

Graph 1 offers the overview about the shares of the innovative enterprises in the countries of the EU 27, Norway and Croatia. The Slovak Republic does not reach the average of the EU countries. The better values have Czech Republic, Finland, Estonia, Slovenia, Croatia, Austria and other countries. The lower values are presented by the following countries: Romania, Bulgaria, Lithuania, Hungary, Poland and Lithuania. The support of the small and middle entrepreneurship is the condition for the future development of the Slovak economy realized by the intensive economical growth.

**Graph 1** The Share of the Innovative Enterprises (2008, % from the all enterprises)



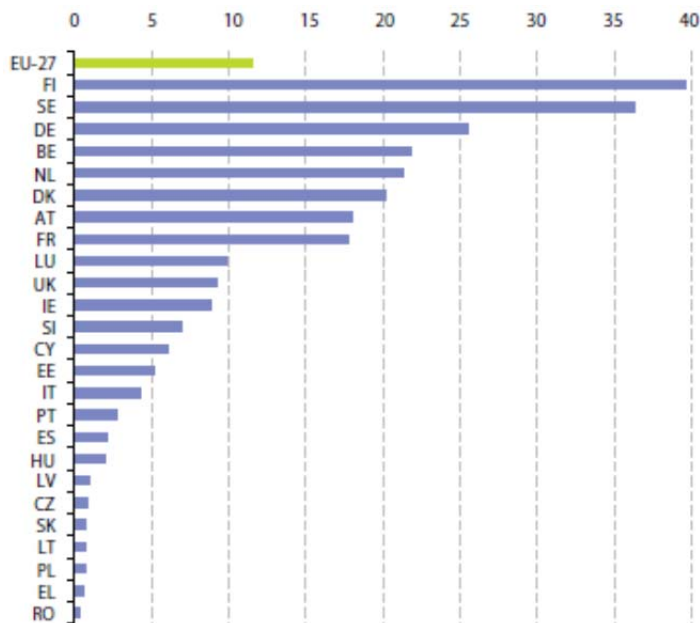
(\*) Greece, not available.  
 (†) Excluding Greece.

Source: Eurostat. (2011). *The Key Figures on Europe*. Luxembourg: Publications Office of the European Union.

The representation of the innovative enterprises in the individual economies presents the patent activity with the comparison of the data from the Graph 1 and Graph 2. There is possible to analyze their mutual connection. The low representation of the innovative enterprises in the economy is not possible to secure the realization of the patents. There is a low level of the competition ability based on the sophisticated production. This position threatens intensive, intelligent and inclusive economical growth as it is defined by the present documents of the European Commission for the development.

The registration of the patents in the conditions of the Slovak republic is secured mostly by the foreign enterprises. The number of the valid patents in the year 2010 was 1907. The foreign enterprises owned 1587 patents in the year 2010. The Slovak enterprises owned 320 patents in the year 2010. This fact presents that the enterprises with the Slovak investments in the Slovak Republic have low level of the research base.

**Graph 2** The High-Tech Patents registered in the EPO. 2007.  
(per million inhabitants)



(\*) Estimates; Bulgaria and Malta, not available.

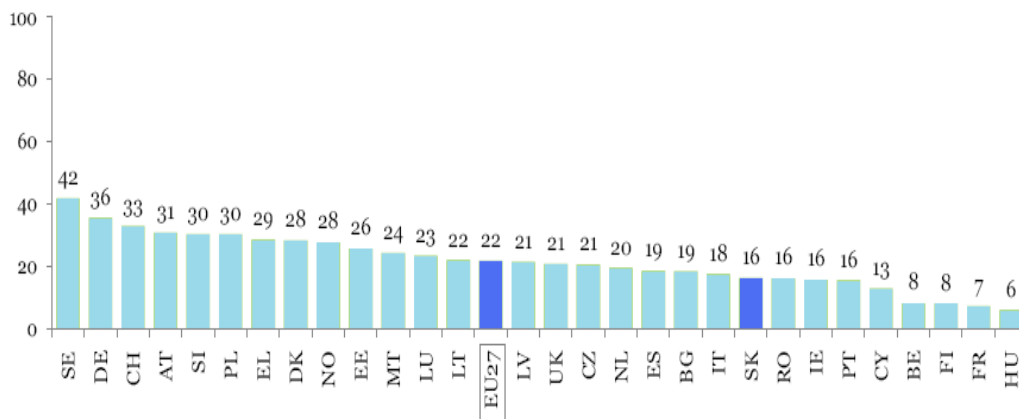
Source: Eurostat. (2011). *The Key Figures on Europe*. Luxembourg: Publications Office of the European Union.

The amounts of the patents, which are produced in the economy, indicate the development of the economy based on the knowledge and functionality on its individual tools. The transfer and use of the patents for the achievement of the new utility value for the enterprise and its relevant environment. The enterprise can use (Andersen, 2008, p. 13):

- The “*Licensing in*” The license bought from the patent owner. The use of the special technology for the license fee. The conditions specified by the patent owner.
- The “*Cross Licensing*” It arises when enterprises change their patents. The enterprise offers its patent to the other enterprise. The other enterprise offers its own patent. It is a mutual change of the patents.
- The “*Pool Licensing*” It is a unification of the patents. The various partners make the mutual consent about their own patents for the technologies. They agree with the change for the specified purpose. This type of the cooperation arises in one branch. The partners put their patents together after the mutual consent. They create mutual cooperation centers. The enterprises Sony, Philips and Pioneer realize their research and knowledge in the „Patent pools“. These giants and competitors also unite them to save the time and money. Many enterprises will not exist without the Pool Agreement today.
- The “*Licensing off*” The management of the research or realization of the specific changes which will not affect damage or destruction the conditions of the patent. The enterprise has alternative method for the development of the technologies. The enterprise can create these technologies individually. It has no duty to pay the fees for the commercialization of the products.

The transfer of knowledge can be realized by the cooperation. The data presented in Graph 3 offer the possibility of the comparison of reached level of the cooperation of the enterprise in gaining of the new knowledge. The Slovak Republic presents the value under the average. The lower values than Slovakia are presented by: Finland, Belgium and France. These countries have higher share of the knowledge in the economy. The sharing of the knowledge is not the basic condition to enforce the innovations in the wide range.

**Graph 3** The sharing and change of the mental ownership among the enterprises in the EU27 (in %)



Source: European Commission. (2009). *The Innobarometer 2009*.

### 3 The indicators of the innovations

The expert literature presents the following innovation indicators: the performance of the research and development, the range of the patent activity, the product indicators (Kleinknecht, 2002).

The performance of the research and development is the level of investments realized in the research and development and their share in the turnover of the sale. The range of the patent activity is the number of the registered and licensed patents. The Innovation indicator is connected with the product and is presented as the number of the applications of the new products. There is a difference between the new products for the enterprise and new products for the market. There are authors who have the opinion that the true innovations are products for the market. The reason is their effect. They have the new features and high level of the technological and market instability. There is a chance of the risk but also a chance for the competitiveness of the enterprise. The new products for the enterprise are marked by the application of the imitation strategy. This product is tested by the market. Is accepted by the consumer. The consumer knows its new utility value created by the previous original. The enterprise launches the new product and completes the product portfolio with a special imitation. It creates better offer and chance to present the cheaper solution for the market.

**Table 2** The share of the enterprises which realize the application of the product innovation - new product to the market, 2008 (in %)

Country	Total	The Small Enterprises	The Medium-sized Enterprises	The Large Enterprises
BE	45,7	47,1	45,5	59,3
BG	25,9	23,3	30,8	30,8
CZ	39,1	34,0	47,0	54,1
DK	44,4	44,1	42,3	54,1
DE	26,8	23,2	29,6	43,7
EE	25,8	24,2	28,0	36,1
ES	21,5	18,0	28,1	43,6
FR	43,2	39,9	46,3	60,0
IT	47,7	45,5	55,5	61,4
CY	26,8	24,0	33,6	40,9
LV	23,4	22,7	21,5	35,6
LT	37,2	40,2	28,8	47,1
LU	40,6	35,3	47,6	55,8
HU	33,1	31,2	32,0	45,2
MT	39,1	38,3	32,7	60,0
NL	49,2	48,1	51,3	53,6
AT	49,5	46,3	52,1	66,4
PL	41,5	40,1	41,6	47,5
PT	35,6	33,1	41,7	53,7
RO	24,8	23,0	26,8	31,4

SI	51,3	51,3	48,1	59,5
SK	35,7	34,2	33,4	48,0
FI	37,3	35,5	35,9	57,5
SE	50,4	48,3	53,6	62,8
NO	34,5	36,8	28,5	34,6
HR	37,4	36,7	38,5	39,1

Source: Eurostat. (2011). *The Key Figures on Europe*. Luxembourg: Publications Office of the European Union.

The data in Table 2 reflects the reality that the radical innovations are typical for the big enterprises. They are able to secure all of the innovation indicators. The big enterprises has high level of the financial investment and enough personnel. These factors create conditions for direct own investments and investments of the partners. The small enterprises are able to launch more innovated products than the middle enterprises although they have less financial means than the middle enterprises. The reason is their higher flexibility on the market. They are able to offer the special solutions for the limited market. The small sized enterprises are mostly oriented as the service enterprises. The small enterprises are successful in the service of the Information Technologies. The start-up enterprises, which are technologically oriented, bring products with the new ideas on the market. The leaders in launching for the new products are Sweden, Slovenia, Austria, Netherlands, Italy and Belgium. It is also important to know the structure of the innovations, which is not to the disposition. The countries, which are innovation leaders as Norway and Finland, have the share of launching the new products on the market comparable with Slovakia and Poland. The Slovakia is average innovator. The Germany is in this comparison the country with weak innovation performance. This comparison confirms the idea that the structure of the radical innovations determines their efficiency in the innovation performance in the economy.

The environment with the social and economical conditions is decisive for the implication of the radical innovation effects. The use of the new products has the influence in the economy, intermedial and final consumption. The intermedial consumption increases the effects of the transfer of the knowledge in the wide range. The final consumption has important role in increasing of the living standard.

The Statistics Office of the Slovak Republic (2009) presents information that all of the innovation enterprises of the Slovak Republic implement radical innovation 58 % of the enterprises, 54,8 % of the service enterprises a 59,8 % of the industrial enterprises. The cooperation of the enterprises in the development of the product innovations is 20 % and 30 % of the enterprises realize the development of the process innovations. There is a low level of the cooperation of the enterprises in the innovation activities, which is confirmed by the Graph 3. There is low level of the innovation potential of the Slovak entrepreneur sector and its outputs.

The Slovak Republic received average values in the launching of the new products on the market. The patent activity of the Slovak economy is very low. The differences among the countries are enormous. There are differences in the efficiency of the innovation tools by each country.



**Table 3** The registered patents in the choiced countries

	<b>The patents registered in the EPO (abs.) Year 2002</b>	<b>The patents registered in the EPO (abs.) Year 2007</b>	<b>The patents registered in the EPO (mil. inhab.) Year 2007</b>
EU 27	50 462	57 725	116,5
BE	1 287	1 472	139,0
BG	15	29	3,8
CZ	88	162	15,8
DK	935	1 057	194,1
DE	21 503	23 929	290,7
FR	7 321	8 421	132,4
HU	120	173	17,2
NL	3 442	3 656	223,5
AT	1 269	1 797	217,0
PL	81	146	3,8
SK	24	42	7,8
FI	1 257	1 323	250,8
NO	377	515	110,0
JP	20 218	20 657	161,7
USA	31 171	31 908	105,8

Source: Eurostat. (2011). *The Key Figures on Europe*. Luxembourg: Publications Office of the European Union.

#### **4 The effects of the entrepreneurship on transfer of the knowledge**

The effects of the entrepreneurship and transfer of the knowledge into the differenced innovative solutions is the subject of the research of the authors Block, Thurik and Zhou (2012). Their research offers the application of the theory of the infiltration of the knowledge on the analysis of the influence of the entrepreneurship for the implementation of the knowledge into the innovations.

There are two basic hypotheses:

1. The entrepreneurship makes relation between the knowledge and innovations for the new market relief.
2. The entrepreneurship does not make relation between the knowledge and innovations for the new market relief.

They present two analyses of the features which have the differences in the level of the risk. The risk is on the side of the innovator by the implementation process of the changes. The risk of the acceptance of the new product is much higher by the innovations which are presented as the market knowledge. The entrepreneur sector can win some cases prevent of the change of the knowledge into the innovation. There are 3 % of the inovations successful. Than the reactions of the private investment we can understand.

The incremental innovations have no risk influenced by disbelief in consumption. The new innovations are for the enterprise more easy and often.

The hypothesis of the research confirms that the results open the space for the next research of the identification, support and stimulation of the entrepreneur sector in the environment of the implementation of the radical innovations.

The stagnation of the competitiveness ability of the Europe is caused by the disability of the entrepreneur sector to transform new ideas into the radical innovations with the remarkable commercial power. This knowledge is the challenge for the development and commercialization of innovations policy in the European Union.

The creation, discovery and commercialization of the new technologies is the necessary supposition to behave the competitiveness of the country in the modern market. It is caused because the high technologies sectors are the machines of the economical growth, productivity and welfare. They are source of the high added value and good payed jobs.

The enterprises which are technologically intensive are known as high-tech enterprises. They are very important for their position in the competition of the national economies because:

- They are connected direct with the innovations. They have the possibility to gain the higher market share. They create series of the new products with the new type of the demand. They use the sources more effectively.
- They are connected with the production of the higher added value. They have success on the international market. The incomes of their employees are higher.
- The own research and development which they realize has a chain effect which has the influence on other entrepreneur environments by the creation of the new products and processes. This increases the production, entrepreneurship and creation of good payed working positions.

The Strategy Europe 2020 identifies developed sector of the services as the competition advantage for the Europe against other economical space of the world. The choiced countries of the Europe as: Great Britain, Belgium, Germany, France, Spain can present the production of the service over average. Their knowledge are intensive. They are successful on the international market. The Slovak Republic has the good results in production of information services. The production of other services is lower in comparison with other high economically developed countries of the European Union. The structure of the Slovak economy is fragile. The important role in the Slovak economy plays automotive and machine industry owned by the foreign investors. It is very sensitive to the human resources and infrastructural resources.

The orientation to support the genesis and development of the dynamical service enterprises in the Slovak economy is the real present challenge which realization can secure intensive and intelligent economical growth.

## **Conclusion**

The dynamics of the changes in the society and economy supported by the modern information and communication technologies make the cycles of the production shorter. The lifetime of the products is shorter too. The pressure on the creation of the

new knowledge is a logical development of this situation and the determinant also. The efficiency of the knowledge for these processes is conditioned by the implementation of the innovations. This fact secures the commercialization of the market economy. The trade with the new knowledge is an important business for the world economies with the high performance.

It secures their sustainable competitiveness. The entrepreneurship sector is the environment where the commercialization of the knowledge is realized. The development of the commercial use of the knowledge is conditioned by the implementation of the radical innovations in the enterprises. The enterprises in the Slovak Republic are not able to accept the risks of the use of the radical innovations. The evidence of the patent activity is influenced by this situation. There is the necessity to create conditions for entrepreneur sector which will lead to the inspiration and the creativity. It is solution for the consideration of the ability of the Slovak economy to secure its following growth: intensive, intelligent and inclusive.

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