RENÁTA MADZINOVÁ
College of International Business ISM Slovakia in Prešov

THE IMPACT OF INNOVATION ON INTERNATIONAL TRADE

Abstract: The paper describes innovation outputs and their influence on export efficiency in the country. The analysis is concentrated on V4 countries. Buy and sell patents and licensees have influence on import and export of high-tech goods. The production of those products, which is difficult for added value, has an impact not only on balance of payment, but also on GDP and living standards. At the end, there are significiant the major SR problems of using R&D in production.

Introduction

One of the typical features of economic and social life in the world is the struggle for continuous growth. Economic growth is being measured by several indexes. On the level of a country it is measured by GDP, on the level of an enterprise by increasing profit and market share, and by the growing price of company's stocks. Citizens perceive economic growth through increasing employment, rising incomes and living standards, expanding consumption. Often the consumption of better quality products leads enterprises not only to the expansion of the capacity of production, but it also prompts them to focus on further improvement of the quality of supplied production. Thank to the open borders and increased mobility of workforce, but also globalization in general, everything that market requires and that cannot be produced in home enterprises can be imported. The circumstances of contemporary economic and social life pose increased requirements on both production and consumption. Only two types of enterprises can survive in strong competition: first the companies producing high-quality products and then the enterprises implementing the latest research and science results. The first group of enterprises – innovating enterprises represents the moving force of development. Because of the production which is very demanding in respect of science and research, it is possible to push the limits of production possibilities, saturate the needs of population on qualitatively higher level. Businesses, regions, states which desire to succeed in competition struggle, need to have – apart

from financial resources – high-quality and creative workforce. For a country wishing to develop it is inevitable that enterprises producing in it indulge in innovating activities. Without innovations it is impossible to maintain a lasting growth of businesses, branches, regions, or states.

In order to assess innovative productivity of enterprises, but also regions, in international dimensions a set of standardized indexes is used. Usually the indexes of innovative productivity can be divided into two basic classes – innovating inputs and innovating outputs. **Innovating inputs** are constituted by *financial resources* spent on research and development. Financial resources may come from various sources. It can be government finance, most often perceived as a measure of expenditures on GDP (so called GERD index – Government Expenditure on Research and Development). The Lisbon Strategy from 2000 mentions the planned index of expenditures on research and development on the level of 3% of GDP as one of preconditions of a successful development of EU countries. The measure of expenditures however was not reached within EU as a whole or in its individual countries. That is why the measure of the index didn't change even in the following strategic document named Europe 2020. While the complex amount of expenditures on research and development in 2020 should be on the level of 3% of GDP, GERD index should be gradually decreasing. The business expenditures on research and development – BERD, which is the second most decisive source of financing research and development (R&D), should constitute about 70% of the overall expenditures on research and development. Among other constituents of the expenditures on R&D there are expenditures of higher-education institutions, non-profit organizations and non-government organizations[1].

The second significant index for R&D is *human resources facilitation*. Without human resources it is impossible to facilitate research in any business. Facilitation of R&D then is observed on several levels and apart from the overall number of employees involved in R&D, their qualifications, age, field of expertise are being recorded.

The result of the combination of financial resources and human resources facilitation should be manifested in innovative output. Innovative effectiveness can be measured *via* several indexes – bibliometric analysis, patent activity of businesses, innovative activities of enterprises based on statistic exploration. The complex innovative effectiveness has immediate impact not only on GDP, employment and living standards of citizens, but it also reflects in the foreign trade. The results of spiritual ownership still more frequently become an object of purchase and sale, for that reason their influence is evident in both export and import of a country as well as in the cash flow and competitiveness of businesses and the country too.

Wishing to assess the innovating activities of a country, regions, businesses, it is useless to evaluate individual indexes of innovative inputs and outputs in isolation. The measure and quality of innovative inputs determines the number and quality of

[1] *Europe 2020...* (2010).

innovative outputs. And, of course, without the implementation of innovative outputs in practice any research is utterly useless.

The aim of this paper is to analyse both the innovative outputs of businesses in Slovakia and the impact of results of innovative activities on foreign trade.

1. Definition of concepts

R&D may be implemented on several levels. The notion of research often encompasses basic and applied research, as well as experimental development. Along with technological innovations R&D appears to be a part of science and technology (Figure 1).

In this knowledge system the broadest concept then is science and technology. **Science** *represents a certain degree of systematization of knowledge within a particular field; it creates hypotheses, which are consequently being tested, and on these grounds it creates theory.* The system of **scientific and technological branches** according to OECD *is constituted by natural sciences, technological, medical and pharmaceutical, agricultural, social sciences and humanities.*

The narrower notion in this system is technology and innovations, although technological knowledge and innovations have equally broad, if not broader, possibilities of application in different scientific and technical branches.

For the definition of fundamental concepts in the field of science and technology Frascati and other manuals prepared in OECD countries have lately been considered a standard. According to Oslo manual[2] ***technological and innovating process*** *(TPP – technological product and process) is a process covering implementation of new products and processes as well as description of technological improvement in products and processes.*

The definition of TPP is a starting point also for the Slovak Academy of Sciences[3] (SAV), according to which ***technology*** *applies the knowledge of science and technical branches, of research and development in the creation, improvement and application of producing – and lately also non-producing – approaches and means with the aim of gaining a product of required qualities.*

R&D includes basic and applied research and experimental development too. Frascati manual defines ***basic research***[4] *as a research built on theoretical or experimental work which primarily relates to the gained knowledge that constitutes the basis for important and observable facts regardless of their partial use or application.*

World Investment Report (WIR) understands ***basic research***[5] in a simplified form as *gaining varied general or comprehensible knowledge.* For the commercial

[2] *Oslo manual* (1997).
[3] *Identification...* (2005).
[4] *Frascati Manual* (2002).
[5] *World Investment...* (2005).

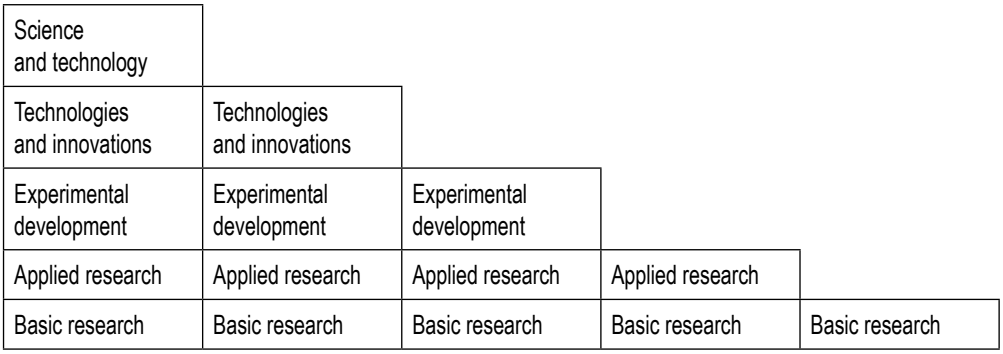

Figure 1. Architecture of science and technology, research and development
Source: Author's own work

use in an industrial enterprise the results of basic research have no immediate application. Most often basic research is being carried out in specialized research institutions or at universities. Evaluation of basic research results in scientific specialized publications. In an academic community not only evaluation of outputs from basic research based on the number and quality of publications is common but also citation index is being used. Bibliometric analysis derives from SCI (Science Citation Index) and SSCI (Social Science Citation Index).

The results of bibliometric analysis rather have an indicative character. They reflect the trend of scientific and research orientation in a certain field in the whole world[6]. Among the members of academic community the citation index still more often is an object of discussion concerning the quality of scientific output.

Applied research *represents an original discovery related to other newly gained knowledge. The substance of applied research dwells in its orientation on a specific field of activity or on a precisely specified object of research*[7]. It dominates the corporate research or is being carried out in specialized research institutions, which co-operate with businesses and carry out research on order. In an industrial enterprise applied research is reflected in the commercial use in the development of products, services or processes[8].

One of the parts of R&D also is ***experimental development***[9]. *It is represented by systematic work utilizing the knowledge gained from research and/or practical experience in the production of new products, materials, or in implementation of new processes, systems and service, or it can be used in order to improve significant components of a product.* According to WIR ***experimental development*** *is a systematic application of knowledge or understanding of opportunities for research directly in*

[6] *Competitiveness...* (2010), pp. 280-281.
[7] *Frascati Manual* (2002).
[8] *World Investment Report...* (2005).
[9] *Frascati Manual* (2005).

production from materials, discoveries or methods, including design, development of prototypes and processes[10]. In practice it is often almost impossible to distinguish basic research from applied research and development.

Applied or experimental research often results in a discovery or invention, which is then patented by its author or by a group of scientists. An invention must meet the fundamental criteria:

- Novelty – in the world dimensions, not only regional. An invention simultaneously cannot be a part of the present state technology.
- Inventive activity – means that an invention does not derive from the present state science and technology in the world.
- Industrial applicability – the object of patent may be repeatedly produced. At the same time it is not gained from the nature[11].

Gaining a patent its owner acquires an exclusive right for a particular period of time to use the invention. Patent is one of the most topical sources of technical information which is available in the sphere of science[12]. Patent can be given only to such results of inventive activity which are applicable in industry. It cannot be granted to unique and original approaches that cannot be repeated (*e.g.* works of art). In Slovakia patent is valid for 20 years after its registration and for its maintenance a fee must be paid. Transfer of the patent rights onto another person is also paid and it can be done on the basis of a licence contract.

Apart from an entry of a patent in the Industrial Property Office, an invention or discovery can be patented in international patent offices too. Most often in the international context European Patent Office (EPO) is being addressed, or the United States Patent and Trademark Office (USPTO) and the Japanese Patent Office (JPO). In case that a discovery is patented in more than two other countries, except for the home country, we speak of *triadic patent family.*

Oslo manual delimitates the notion of innovative business company. Usually it is a company manifesting innovating activities in the innovations of products, processes, organizational or marketing innovations.

Inovation of products or services is such innovation, which rests in improvement of the product and its new parameters, material, possibilities of utilization or functional form. With regard to services innovations relate especially to a significant improvement of supplied services and/or adding new ones. Its aim is to achieve an increase in market share[13].

Another group of innovations is constituted by ***process innovations***. Here we encounter new technological approaches to the production, launching of a new soft-

[10] *World Investment...* (2005).
[11] *Čo a jako patentovať.*
[12] *Ibidem.*
[13] *Konkuenčníschopnost České republiky...* (2010), p. 284.

ware supporting production, but also changes in the logistics of production and buyer-supplier relations. Often they complement innovations of a product.

Marketing innovations represent changes in marketing methods. In principle they relate to the four P's, thus to the product itself (significant changes in design, package of a product), prices (creation of a price strategy), support of sales (new advertising method, change of brand) and placement of the market (introduction of new sales channels and methods of sales). Their aim is to saturate customers' needs better and for the company to facilitate increase in sales[14].

The last group of innovations is that of ***organizational innovations***. These are connected particularly with new organizational approaches to work management. They include new ways of collection and processing of information, approach to employees' learning, co-operation with external subjects. Such innovations are aimed at the reduction of administrative or transaction costs of a company. Usually they are accompanied by changes in the supplier chain. Unlike process innovations they are less dependent on technologies.

In order to assess the competitiveness and development of a region, or a country it is necessary to focus on the production with a high added value. It's obvious that not all enterprises will and can produce goods and services in ***high-tech sphere***. Diversification of production on the level of NUTS 1-3 grants an opportunity of trade with the production of varied quality and in various branches of production. Diversification acts as a kind of reserve so that a region or a whole country didn't become dependent on a single branch. Production in the branch with a high added value then has impact on foreign trade and the growth of GDP.

According to the Branch Classification of Economic Activities among high-tech branches of processing industry there are: production of basic pharmaceutical products and pharmaceutical substances, production of computers, electronic and optic products, production of planes and space-shuttles, *etc*. High-tech branches in services incorporate production of films, video-records, and TV programmes, production and publishing of audio-records, activities for radio and TV broadcasting, telecommunications, computer programming, consultancy and related services, information service and scientific research and development[15]. Typical of high-tech branches is a high intensity of research and development as well as high measure of added value. Usually these branches are demanding in respect of financial resources allocated for R&D, but also in respect of human resources facilitation.

According to the Standard International Trade Classification *high-tech* goods are defined as those belonging to the groups: aviation technologies, computing technologies, electronics and communications, pharmacy, scientific devices, chemistry and non-electric machines[16].

---

[14] Kadeřábková *et al.* (2005).

[15] *High-tech Statistics*. Statistics Office SR.

[16] *Ibidem*.

Except of the mentioned high-tech branches, each economy is characterised by the production in sectors belonging to upper-middle, lower-middle and low technologies. Individual branches are marked by gradual reduction of costs on innovation activities, expenditures on innovations, and also by lower added value. For numerous branches not belonging to high-tech, use of cheap imitations is typical and production in large numbers which supports cheap production.

2. Innovating Outputs

One of the most frequently used indexes of evaluation of business' innovative activity is patent. Their registration on international level grants the patent owner the right to use it for a particular period of time – usually 20 years. On the one hand patent represents a monopoly in the use of spiritual property of a patent owner or inventor. Patent protects the owner, inventor against imitations or misuse and simultaneously makes the return of finance invested by the inventor in research and development possible. On the other hand over a certain period the patent owners become monopoly producers on the market which enables them to increase prices of the goods sold.

The chart reflects the number of patent applications delivered to the European Patent Office in V4 countries (Table 1). The numbers in the chart are presented regardless of the fact whether the patent was accepted or not.

The largest number of patent applications was during the researched period submitted in Hungary. Over 12 years the number of applications was multiplied by 2.8. Even though in innovating activities Czech Republic is not far behind, the number of submitted applications still does not reach Hungarian numbers. The overall number of patent applications in Czech Republic even grew at a higher speed than in Hungary and was multiplied by 4.95. Still higher speed of growing application numbers could be observed in Poland. In 2007 the number of applications was 5.76 times higher compared to the year 1996. However, not even such rapid increase could overcome the numbers of applications submitted in Hungary and Czech Republic.

Table 1

Number of patent applications in EPO from selected countries

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
ČR	32,8	43,13	66,73	59,98	66,58	71,72	87,86	113,9	112,88	106,42	150,21	162,31
HU	60,99	76,34	57,16	116,02	120,64	98,84	120,15	127,71	156,1	134,13	161,43	172,67
PL	25,25	29,99	28,39	36,25	43,39	58,07	81,22	114,47	120,21	122,03	137,76	145,52
SR	8,33	12,7	11,97	15,42	11,23	12,16	24,27	31,48	20,61	30,7	39,56	42,25

Source: *Eurostat* and own work.

Despite the fact that the numbers of submitted patent applications grow annually in all V4 countries, Slovakia ranks among the countries with the lowest numbers of patent applications delivered to EPO. Slovak Republic is the last in the evaluated chart. The number of patent applications in 2007 was almost 5.1 times larger than in 1996. In spite of that the lagging behind Poland is triple and compared to Hungary even more than quadruple. According to the Industrial Property Office SR, out of all patents registered by EPO Slovak ones make approximately 3%. In 2010 innovating activity of Slovak businesses increased and the Industrial Property Office SR registered 376 more new patents[17]. With regard to Eurostat data it can be said that most patent applications have national character.

Even though other V4 countries in comparison with Slovakia seem to be truly innovating countries, compared to the countries at the head of the chart the lag is evident as well. Most patents are registered from Germany, France, United Kingdom and Holland. The number of applications in these countries is from around 24 thousand (Germany) to 3 665.83 in Holland. The mentioned countries are at the head of all charts of innovating activities. Within EU they are bearers of innovative trends despite the fact that the numbers of patent applications increased over 12 years twice on average. Based on the data it can be concluded that patent activities must be developed on a long-term basis.

In 2007 EPO registers around 57 thousand applications. They come from the EU member countries plus Iceland, Lichtenstein, Switzerland, Monaco, and Turkey. The patent activity at EPO in the US is higher than 31 thousand and in Japan EPO has registered almost 21 thousand patent applications.

Relativizing the index through the view per a million inhabitants Hungary appears to be one of the innovatively most effective countries, closely followed by Czech Republic. For Poland the relative calculation is not flattering – because of the large number of inhabitants. Slovakia and Poland occupy positions among the least effective countries according to the patent applications submitted at EPO. In the group of the least patent active countries there belong other post-communist countries too, *e.g.* Croatia, Bulgaria, Romania, but also Greece. Among the leading countries in this respect then we can mention innovatively strongest countries. Lichtenstein acts as a most significant innovator and the number of patent applications per a million inhabitants is 895.42.

The number of patent applications at EPO during the observed period had been growing (Figure 2). The increase in numbers and complicated procedure of registration of individual patents caused that EU has been making efforts to unify and standardize the patent procedure. In 2009 EU passed a regulation which is designed to simplify the process of patent applications entry, it should make the process cheaper and better accessible for applicants. At the same time it should make the patent protection and protection of patent owners more effective.

[17] *Industrial Property Office* SR.

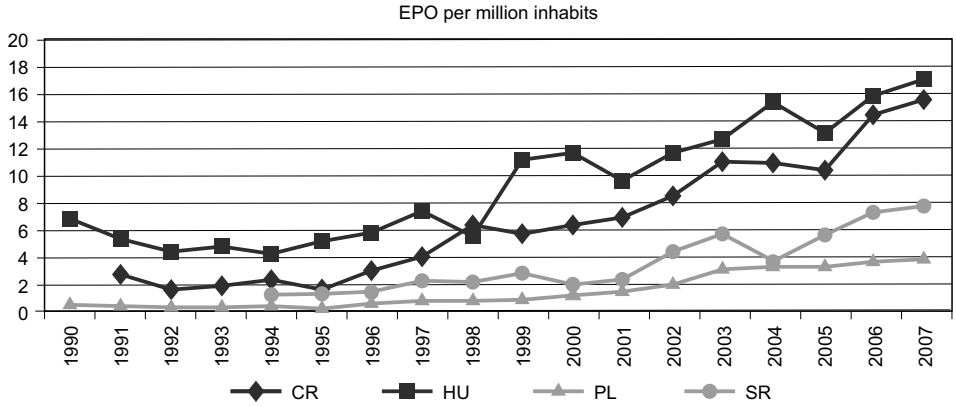

Figure 2. Number of patent applications in V4 countries per a million inhabitants

Source: *Eurostat.*

Patent protection has still been complicated by certain barriers. Among them one can mention translations of patents, differing national legislature related to patent protection, fees connected with patents[18].

Even less active are countries in applying for patents at USPTO (United States Patent and Trademark Office). While in 2004, which is the latest available information, Lichtenstein has registered 377.23 patent applications per million inhabitants, in Czech Republic it is 4.79 applications, in Hungary 3.88, in Slovak Republic 1.12 and in Poland 1.04 application per a million inhabitants.

Patent owners may allow other persons to use their spiritual property for a fee which is called licence. Licence, as any other product, is an object of purchase and sale. The patent owner has the right to sell it on particular conditions and for a specified period of time. By the sale of a licence the patent owner is receiving back the financial resources invested in research and development. Simultaneously the sale of a licence entails spreading good reputation and brand of the business/private person who owns the patent. For buyers the purchase of a licence means acquisition of the latest scientific knowledge on international level. The trade with licences is an object of international trade. For the country selling a licence abroad it is a source of additional financial resources. A sold licence is considered to be active (Table 2).

The low patent activity of Slovak businesses manifests also in the sale of licences. Slovak enterprises in principle have nothing to sell. This state of affairs is evident in the incomes for active licences. The incomes are according to the Statistics Office of SR calculated as incomes for licences regardless whether they are new or maintaining fees and regardless of the branch of economic activity too.

An effort to gain new knowledge for practice should show in Slovak businesses in an increased measure of licence purchase.

[18] *Eurostat Yearbook 2010*. s. 605-606.

Table 2

Active licences in SR in years 2000-2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Number of signed contracts for sale of licences (items)	45	48	36	31	53	49	43	36	43
Of it in the running year (items)	4	13	5	6	11	8	14	13	15
Incomes for active licences (thousands Sk)	13,395	41,074	27,126	2,817	34,536	168,047	58,291	81,168	181,544
Of it in the running year (thousands Sk)	1,222	11,097	5,382	1,929	8,404	143,194	33,341	2,530	20,519

Source: *Ročenka vedy a výskumu 2007, 2010.* Štatistický úrad SR., own work.

By comparison of purchased and sold licences the lagging of SR in the field of innovative effectiveness becomes evident. Slovakia is still more a receiver of new knowledge than its creator

With regard to branch classification of economic activities most licences are being sold in the field of chemical products, although year by year the number of active licences decreases. What grows, however, is the number of sold licences in the field called Other Branches. Technological and innovative demands in other fields are very low which manifests in the low pressure on innovations and innovative activities. Consequently the branch with low added value and low high-tech demands has low incomes from the licence sales. It can be considered a positive fact that from 2006 sales of licences have been recorded in the field of research and development. Despite the falling numbers of active licences it would be useful if particularly this branch, ranked among high-tech ones, could retain the latest trend and continue in development and sales of patent rights.

Most passive licences can be observed in the field of machines and electrical machines. This state is conditioned by the fact that in Slovakia automobile industry prevails closely followed by electric-technical industry (Figure 3).

With regard to the type of ownership in the purchase of licence, foreign companies are leading. The measure of foreign businesses in the purchase of licences has been gradually falling for the benefit of private home businesses. This can be viewed as a positive trend. As equally positive can be seen the sales of licences where private home companies belong among the strongest sellers. Based on these facts it can be concluded that even though there still exists ‘intra-branch trade between the parent company and its daughters, its significance has been constantly decreasing. Multinational companies move their production demanding for cheap workforce to other countries and Slovakia begins to use the whole value chain. It’s worth considering, though, if the slow tempo of arrival of qualitatively demanding investments in Slovakia is not too slow. For several years now in Slovakia the question has been discussed

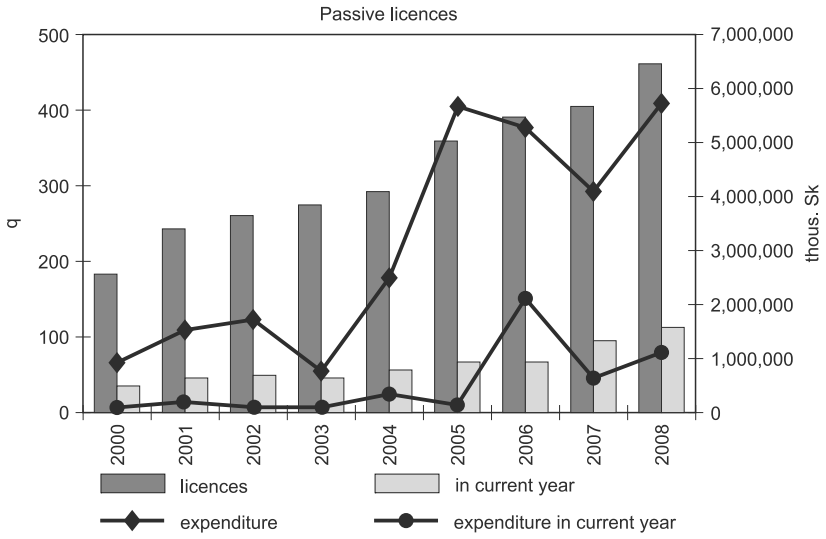

Figure 3. Passive licences in SR in items and thousands Sk in years 2000-2008

Source: *Ročenka vedy a výskumu 2007, 2010.* Štatistický úrad SR, own adjustments.

concerning what to offer investors as a substitute for cheap labour. The competitive advantage should be prominent enough to distinguish Slovakia and make it attractive in comparison to India or China.

The biggest business partner for the licence trade in Slovakia is Czech Republic, followed by Holland and France. In case of Holland and France the issue is licence purchase only.

For the economic life of a country the effects of innovating activities of businesses are crucial. Apart from being manifested in the purchase/sale of licences, their impact on foreign trade is undeniable.

Among V4 countries the leading position in the export of high-tech products belongs to Hungary (Figure 4). And even though the measure has been fluctuating, in the 21st century – with the exception of 2005 – it has always been above 20% high-tech products from the whole export production. Export of high-tech products brings the country financial resources which can be used to purchase goods and services missing in the home country market. High measure of high-tech exports is also directly linked with the number of patent applications submitted at EPO. Among V4 countries Hungary definitely occupies the strongest position in high-tech branches. It belongs among the most innovating V4 countries and even within the whole EU it is among the best. The biggest exporter of high-tech products is Malta where more than a half of total export is represented by high-tech products. High export of high-tech production can be observed in Luxemburg, Ireland, Cyprus, United Kingdom, Switzerland, and Hungary. From among non-EU countries the ones with a high rate of high-tech exports are South Korea, the US, and Japan.

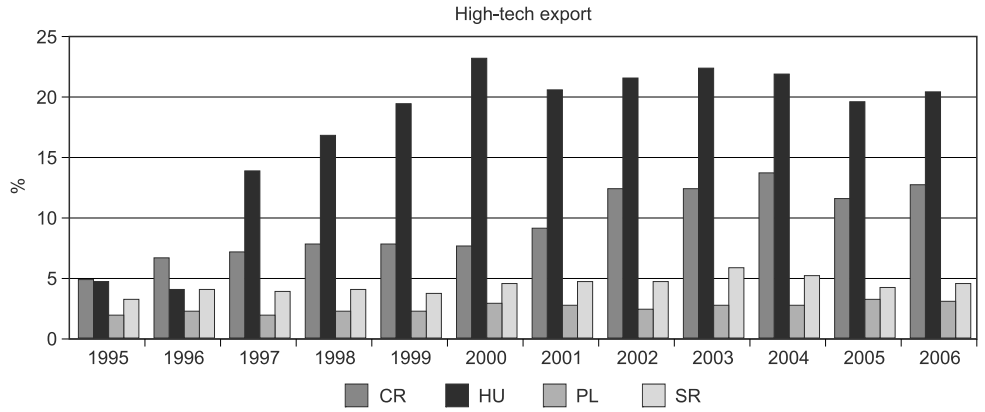

Figure 4. Measure of high-tech products in the overall export

Source: *Eurostat.*

Slovakia and Poland are among the countries whose high-tech export is on the opposite side of the spectrum than Hungary. Not only among V4 countries but also within the whole EU the countries with the measure of high-tech exports lower than 10% include Bulgaria, Estonia, Latvia, Lithuania, Romania, and Croatia. From among the original, 'old' EU member countries the ones lagging in high-tech exports are Greece, Spain, Portugal, and Iceland.

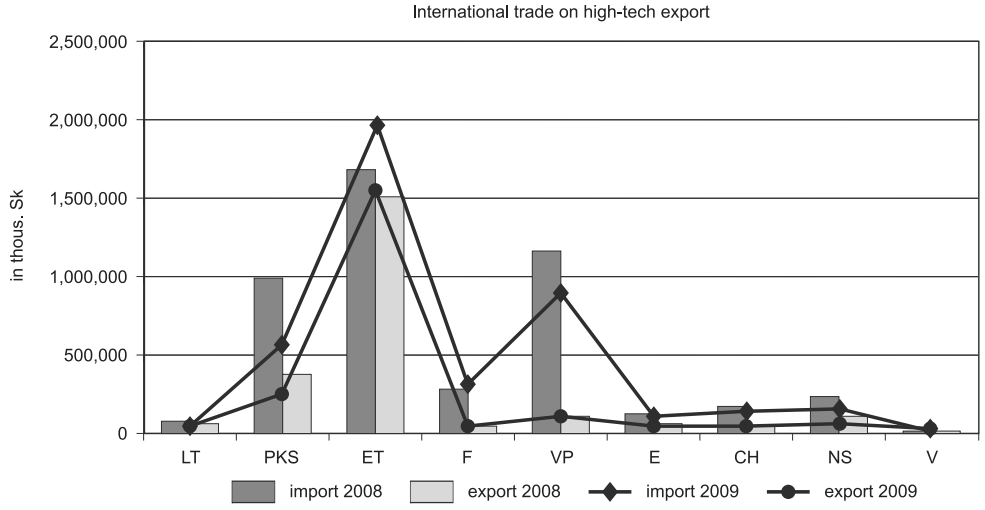

Figure 5. Import and export of high-tech goods in SR in thous. € in years 2008 and 2009
Legend: LT – aviation technology, PKS – computers and office machines, ET – electronics and telecommunications, F – pharmacy, VP – scientific devices, E – electrotechnics, CH – chemistry, NS – non-electric machines, V – armament

Source: *Statistic Office SR*.

Comparing the export and import of the products with high demand on R&D, it can be concluded that Slovakia is lagging in innovations in high-tech branches (Figure 5). With the exception of armament production in all other branches our import is higher than export. It means that the production of high-tech goods in Slovakia is practically irrelevant. Such state of affairs reflects low demands on production and still the use of relatively cheap and productive workforce. In the final account it shows the low innovating effectiveness of Slovak businesses. The balance with high tech products in Slovakia is passive. This is very surprising because SR is one of the most open economies.

Conclusion

In Slovakia a National Innovating Strategy is missing which could be spread within the business and academic communities. Even though in the era of centrally planned economy the then Czechoslovakia was a strong innovating country, particularly in the field of machinery, it was largely due to the low competition operating in centrally controlled economies. Nevertheless, Slovakia lost the position of an innovating country. In the early 1990's and after the opening of markets in economically developed countries it became evident that Slovakia doesn't keep the pace and to catch up with the innovating effectiveness of the world leaders is much harder than to lose that position.

From the exploration of innovating effectiveness in V4 countries with special focus on Slovak Republic it can be said that:

1. One of the factors which immediately influence economic growth and the growth of competitiveness of a business, city, region, or country is R&D.
2. R&D is represented by basic and applied research and experimental development. Along with technologies and innovations it is a part of science and technology.
3. Innovating activity is assessed based on its inputs and outputs. Inputs determine the number and quality of outputs. Without outputs R&D has no sense for any subject (enterprise, city, region, country).
4. Innovating outputs are assessed for instance on the grounds of patent applications (EPO, USPTO, JPO), purchase/sales of licences, measure of high-tech production in international trade.
5. SR belongs among the countries with low innovating effectiveness. Low innovating inputs (on the whole in the country there is a lack of free financial resources) have impact on innovating outputs.
6. In patent activity SR belongs among lagging countries which also manifests in foreign trade with high-tech products where our balance is passive.
7. Low innovating activity and growing salaries cause the loss of competitiveness of Slovakia compared to other world countries. For the time being a new competitive

advantage isn't and cannot be in the sphere of innovations. In a long-term perspective it can reflect in the inability of our country to keep up with the world trend.

References

Competitiveness of Czech republic 2008-2009. Linde, Prague, 2010, pp. 280-281.

Čo a ako patentovať. Úrad priemyselného vlastníctva SR.

Europe 2020. Strategy for Facilitation of Intelligent, Sustainable and Inclusive Growth. Brussels, 2010.

Frascati Manual, OECD, Paris, 2002.

Frascati Manual, OECD, Paris, 2005.

Identification of Conditions and Possibilities of Overcoming the Technological and Innovative gap. SR. Summary. Bratislava: SAV – Institute of Slovak and World Economy. SAV, 2005.

Kadeřábková A. *at al.,* 2005, *Ročenka konkurenceschopnosti české republiky 2005.* Linde, Praha.

Konkuenčníschopnost České republiky 2008-2009. Linde, Praha, 2010,

Oslo Manual, OECD, Paris, 1997.

World Investment Report 2005, Transnational Corporations and the Internationalization of R&D, United Nations, 2005.