

COMPETITIVENESS AND CHEMICAL INDUSTRY IN THE SLOVAK REPUBLIC

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Abstract

The main objective of the contribution is to analyze the development and trends of chemical industry and also to identify potential opportunities and threats determining the competitiveness of this field. It deals with selected risk areas incorporating chiefly the expenditures on research and development, the legislative development after entering into the EU, environmental protection, security and health protection at work, ecology, the "gas crisis", economic crisis, impacts of introducing the uniform European currency and, at the same time, the expenditures on the innovative advancement of the Slovak industry. In an attempt to maintain the competitiveness of the chemical industry and its products it is necessary to monitor continually the situation influencing the development of this field, demand for chemical products, behaviour of the market and consumers, and also the action of competitive firms. The contribution refers to the importance of the society's and individual's responsible approach to the key problems of chemical industry.

Keywords: chemical industry, competitive advantages, opportunities, threats, legislation.

Introduction

The contribution is aimed to evaluate, analyze and predict the possibilities of solving the economic situation in the chemical industry of the Slovak Republic from the aspect of the global economic crisis. The main objective of the contribution is to analyze the development and trends of the chemical industry and also to identify potential opportunities and threats determining the competitiveness of this field. It deals with the selected risk areas incorporating chiefly expenditures on the research and development, legislative development after the entry into the EU, environmental protection, security and health protection at work, ecology, "gas crisis", economic crisis, impacts of introducing the uniform European currency and also expenditures on the innovative advancement of the Slovak industry. The contribution refers to the importance of the society's and individual's responsible approach to the key problems of chemical industry.

The contribution was elaborated by employing these scientific and research methods: analysis, comparison, synthesis and deduction.

It deals with the new stimuli which are an object of the investigation of a great number of chemical companies trying to create and maintain the competitive advantages. In an attempt to maintain the competitiveness of the chemical industry and its products it is necessary to monitor continually the situation influencing the development of this field, demand for chemical products, behaviour of the market and consumers, and also the action of competitive firms. The field of chemistry and pharmacy in Slovakia gives employment to more than 30 000 workers and has a long tradition and perspective. In the Slovak Republic, the production of chemicals and chemical products belongs to the strategic fields of industry. The main priority of the economic development in the years of 2009 to 2013 will be given to the growth of productivity and to the mobilization of all factors having influence on it. At the stage of acquiring the investments for existing and also for new industrial structures the systems should be adjusted so in order that the economic growth was continuously generated not only now but even and in the future by innovations, financial and other services, by new products or ecological technologies.

In general, the influence of the economic crisis on Slovak companies has recently been more and more discussed. Countries which not long ago monitored the financial and later on the economic crisis from a certain distance now they are obliged to solve some contemporary problems and new situations arising from its action. The movement of the crisis from the U.S.A. towards Western- European countries up to the Slovak Republic has become a reality. The countries of the European Union negotiate this problem and discuss the possibilities and solutions of moderating its impacts.

Also, the Slovak Republic is searching for the modes of approaching this adverse world-wide phenomenon. It has taken some precautions which require to:

- reduce or stop the growth of unemployment,
- create and maintain job opportunities, since the Slovak Republic is one of the EU countries which has permanently the highest rate of unemployment,
- motivate small and medium entrepreneurs to the higher employment,

- ensure sufficient energetic sources,
- decrease recession impacts on the automobile industry,
- ensure the inflow of further foreign capital,
- prevent the displacement of foreign companies to eastern countries offering the cheaper labour force,
- create acceptable conditions in the area of a tax burden and other obligatory payments,
- acquire financial sources for a final construction of the necessary infrastructure in regions with a critical employment,
- economize on public finances more effectively,
- support key and load-bearing branches,
- restart the economics.

1. Situation in the Slovak chemical industry

The chemical industry has been affected by a global economic crisis equally as other industrial branches. The main problems, which have arisen in the Slovak Republic, are not only the instability in oil markets, a link-up to the machine or automobile industry, the restructuring of the industry and acquisition of financial sources, but also a drop in the consumption of chemical products, the lower competitiveness of firms and their products, the problematic value of company outputs with respect to the strength of the euro and to the decline in currencies in neighbouring countries and, at a final stage, the liquidation of “previous chemical giants” or smaller companies.

Most of the Slovak chemical companies are exhibited to a strong pressure in the main sales markets of the European Union. They try to face this phenomenon through restructuring. Although it is true that a lot of firms have already modern, up-to-date-level productions and achieve the potentially highest indicators of quality, namely in the field of economics, ecology and effective production, on the other hand, there exist plants which are relatively obsolete and require the high investment costs for their revitalization and the intensification of their own competition ability. This can be possible if the following factors complicating and worsening the situation in many aspects will be eliminated or minimized.

They include:

- inadequately high oil prices occurring in recent years, which, however, decrease their previous threats just due to the economic crisis,
- price-raising of the labour force – in the last 5 years by more than twice,
- high prices of energies,
- maintenance of the stable euro currency versus currencies in neighbouring countries.

A forecast of the development of the Slovak and also the European chemical industry up to the year 2015 is not encouraging and it appears that without necessary activities it will bring a risk. The year 2004 did not meet expectations and although a certain improvement should come in 2005, the next crude oil shock in that year negatively affected the trend of the development of chemical industry.

Many adverse factors act on the chemical industry, such as the growing import from China and the Middle East, but also the EURO/USD rate of exchange, etc. (Baran & Mikloš, 2006).

1.1. Competitiveness of the chemical industry

Competition plays crucial role in sustainable development of economy, welfare and technological progress. It fosters companies to be better than competitors, to minimize production costs and to maximally satisfy customers (Bogdanova & Orlovska, 2008). In the chemical company, the evaluation of the competitiveness needs to consider the amount of costs depending on a great number of factors. It is also necessary to consider the high demanding criteria for production equipments and technologies ensuring the mass and often continual productions. The high values of the long-time tangible and intangible property are reflected in costs through the amortization of the above-indicated property and costs for repair works and maintenance.

The next aspect is the aggression of chemicals and products requiring the higher requirements for costs in the area of transport, storage and manipulation in the form of specific vessels, transport modes, utilized packing materials, and specially trained employees. The level of these costs is influenced also by the necessity to observe security regulations and the regulations connected with health protection.

The nature of chemical products predetermines the year-round production as, for example, the production of fertilizers and spraying substances despite the fact that they belong to seasonal products. A major part of the production is designed for the manufacturing consumption not only in other industrial branches, but also in the chemical production itself. This fact points out to the next aspect of interconnection with other industrial branches representing in the present economic situation a threat of shifting the impacts of the economic crisis from one industrial branch to another, and thus to the chemical production, too.

The necessity of competitiveness is justified also by a large use of chemical products and by a wide possibility of the substitution which gives rise to pressures encouraging the entrepreneurial subjects to consider thoroughly the position, quality, production and support of their products. This is observable mainly in the case of solvents, among which are many products of identical properties. Another possibility of the substitution is realizable by products from other industrial branches (Šubertová, 2004).

The application of chemical products is dependent also on the products of the machine industry; as an example can serve liquid fertilizers requiring the pressure equipments for their application. Again, this example shows a closer link among industrial branches.

The continual research and development have revealed that many possibilities of the new exploitation of chemical products exist and enable companies to increase their production effectiveness, the better utilization of their property and sources, and thereby the simpler and quicker fulfillment of their defined objectives. The chemical industry is positively influenced also by the expansion of electrical engineering, especially in the case of those chemical products which are ideal for packaging and the production of protective layers in technical household equipments, etc.

However, not less important influence of the chemical industry is exerted also on the environment. The air and water pollution is a highly relevant and often discussed problem. The great amount of legislative rules resulting from the joint effort of EU countries are dealing with this problem and searching for optimum approaches and solutions. The economics of chemical companies is markedly influenced also by the high costs expended for environmental protection, namely for building sewage plants or for the use of equipments being necessary to decrease the amount of air pollutants.

2. REACH

The chemical industry has been understood for a long time as a source of the environmental pollution and of the negative impact on working conditions of employees and, at the same time, as a problem of the safety at work and health protection. Proceeding from the character of inputs and outputs of the chemical industry it is necessary to register, correct and control all chemicals which are produced, employed and sold in our markets.

A proposal incorporated into the Regulation of the European Parliament and of the Council for the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) was submitted on the basis of conclusions from the White book (a future trend of the EU policy in the area of chemicals) which point out to such a reality that the present legislative framework for chemicals in the EU does not provide the sufficient information about the chemicals' effects on man's life and health and on the environment. Furthermore, the conclusions point out also to the fact that in the case of recorded risks the legislative framework is inflexible, namely from the viewpoint of their assessment and the introduction of necessary precautions. The present system is hindering the development of research and innovation and leads in the EU to lagging of the chemical industry behind the U.S.A. and Japan (Jahnátek, 2009).

The REACH system is expected to introduce the similar requirements for testing of new and existing chemicals in dependence on the volume, on the confirmed or suspicious dangerous properties, application, exposition and on the amount of produced or imported substances.

The REACH process incorporates the following phases (Jahnátek, 2009):

- pre-registration phase, during which each registering person will give the basic information on the planned registration inclusive of the identification of a substance and its weight extent since 1st June up to 31st December, 2008,
- registration of adopted substances (existing substances) proceeding in 3 phases:
 - the 1st phase** with a deadline of its termination up to 1st December of 2010 relates to:
 - adopted substances classified as carcinogenic, mutagenic or damaging the reproduction are ranked into the first or second category in harmony with a guideline of 67/548/EHS and produced in the Union or imported in the amount of 1 ton yearly and more per producer or importer at least once after the 1st June, 2007;

- adopted substances classified as very toxic for water organisms which may cause the long-term harmful effects in the water component of the environment (R 50/53) according to a guideline of 67/548/EHS, and which are produced in the Union or imported in the amounts of 100 tons and more yearly per producer or importer at least once after the 1st June, 2007;
- adopted substances produced in the Union or imported in the amount of 1 000 tons yearly and more per producer or importer at least once after the 1st June, 2007;

the second phase with a deadline of its ending up to the 1st June, 2013 relates to adopted substances produced in the Union or imported in the amount of 100 tons and more yearly per producer or importer at least once after the 1st June, 2007;

the third phase with a deadline of its ending up to the 1st June, 2018 relates to adopted substances produced in the Union or imported in the amount of 1 ton and more yearly per producer or importer at least once after the 1st June, 2007.

The substances applied in harmony with a guideline of 67/548/EHS are considered as registered in accordance with REACH. The substances taken generally and those in preparations or products, which are not registered according to the regulation of REACH, must not be produced nor introduced into the Union market as far as the regulation does not enact this in another way.

An objective of the REACH system is to:

- constitute the comprehensible and unified registration system of substances in general and those in preparations or in products (if the substance is releasing from it in the common or reasonably presupposed conditions of its application), produced or imported into the EU in the amount of 1 t per year,
- give the basic information about dangers and risks concerned with new and existing substances,
- transfer a burden of evidences about the safe application of substances from the respective bodies of state administration in member countries to producers and importers who will be responsible for them,
- introduce the authorization process as a new instrument of controlling the application of substances arousing a great fear (mainly carcinogenic and mutagenic substances and the substances which damage the reproduction),
- establish the European chemical agency responsible for the performance of the REACH regulation and to ensure the uniform application of the system all over the EU.

3. Human resource recruitment in the chemical industry

As was mentioned earlier, one of the factors producing a pressure on the chemical industry is the price-raising of the labour force. The average wage represents a sum of gross wages of the group of individuals divided by the number of individuals of the given group. Table 1 illustrates the development of an average wage in Slovakia in the period of years from 2003 to 2007.

Table 1. The average wage in the period of years from 2003 to 2007

Year	2003	2004	2005	2006	2007
Average wage in €	346	395	448	504	596

Source: Statistical Office of the Slovak Republic (Chrappa, 2009)

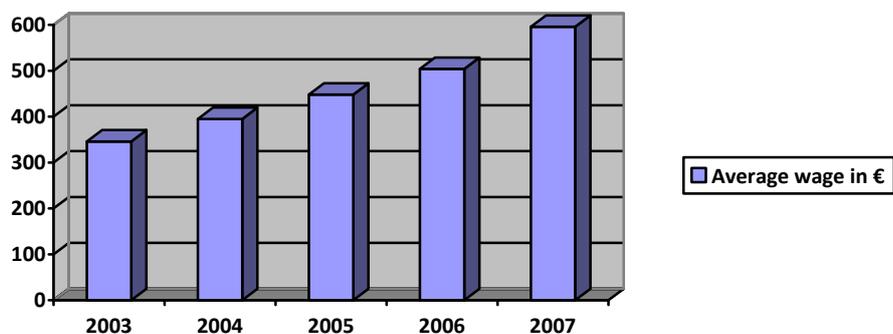


Figure 1. The development of an average wage in Slovakia in the period of years from 2003-2007

The data from the year of 2008 have not been so far published. Fig. 1 shows the development of an average wage in the given period.

The research into wages in the area of chemical industry has revealed that the average wage of the qualified chemical engineer in Slovakia is 900 €, of the chemical laboratory technician - 560 €, chemist - 660 €, operator of machines and equipments - 690 € and technologist - 870 €. Despite the values, which are higher than the average wage in Slovakia, the chemical industry is still a less attractive branch for contemporary secondary - school leavers and university graduates. The frequent changes in chemical companies do not permit the sufficient stability and background for a long-term persistence of their employees.

The next problem in Slovakia is an increasing unemployment resulting from the financial and economic crisis. In the following table, the development of unemployment in the Slovak Republic is indicated since the time of its establishment up to now.

Table 2. The development of unemployment in the Slovak Republic

year	1993	1994	1995	1996	1997	1998	1999	2000
unemployment (%)	14,4	14,8	13,1	12,8	12,5	15,6	19,2	17,9
year	2001	2002	2003	2004	2005	2006	2007	2008
unemployment (%)	18,6	17,5	15,6	13,1	11,4	9,4	8,0	8,0

Source: Statistical Office of the Slovak Republic (Chrappa, 2009)

Figure 1 shows the development of unemployment in the Slovak Republic. At the beginning of the year of 2009 the unemployment reached the level of 9,03 %. It appears that in the future Slovakia will experience the next increase as a result of the impacts of the economic crisis, return of people from neighbouring countries who left Slovakia to find there their jobs also because of the unsolved situation in the gas import.

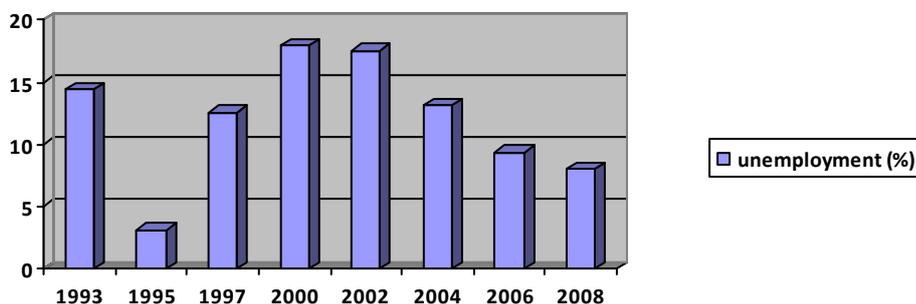


Figure 2. The development of unemployment in the Slovak Republic (Chrappa, 2009)

The unemployment will slightly increase also in the chemical industry because companies are inclined to reduce the number of employees as one of the possibilities to enhance their effectiveness and economy.

A new danger and a weak spot in the Slovak industry is a dependence on the energy supply from Russia. At present, this only source is becoming a threat for the continual operation of industrial productions and for a restart of the economics. The so-called „gas crisis“, which was experienced by Slovakia in January of this year, led to a lot of discussions and to the elaboration of new precautions which should minimize the negative impacts in the similar situation in future. The Slovak government is dealing with the improvement of legislature in the period of the future potential crisis and emergency situations. On reducing the power consumption to the minimum chemical companies cannot halt their productions immediately without threatening their own technologies, the public and environment.

4. A slump of the Slovak industry

The industrial production decreased during the half of the year by 16,8 %. Besides the leather industry all industrial branches range among the warning red numbers. Since January of this year the situation has been even worse because companies must react not only to the economic crisis but also to the impacts of the “gas crisis”. The situation in the Slovak industry is documented in the following table.

Table 3. A half-year change in the industry of the Slovak Republic

Industry together with the exploitation of raw-materials and power engineering	-16,8 %
Industrial production	-18,8 %
including:	
- production of communication vehicles	-35,7 %
- production of materials from rubber and plastics	-28,5 %
- production of chemicals and chemical products*	-25,9 %
- production of machines and equipments	-25,4 %
- production of metals	-22,7 %
- production of other non-metal and mineral products	-13,1 %
- production of electrical and optical equipments	-12,2 %
- production of food-stuffs, drinks and tobacco products	-7,7 %
- processing of wood and production of wood products	-6,7 %
- production of textiles and clothes	-6,5 %
- production of coke, refined oil products and nuclear fuels	-1,9 %
- production of cellulose, paper and paper-made products; publishers and press	-0,2 %
- processing of leather and production of leather products	2,7 %

*including chemical fibres

The maximum decline has been recorded in the production of transport vehicles representing now more than 20 %. The only exception is the processing of leather and the production of leather products where the growth is corresponding to 2,7 %.

In the next period, a certain stabilization of the industry is expected also in the chemical industry due to the introduction of corrective precautions minimizing the negative impacts of the crisis.

Conclusion

The main pillars of chemical productions will always be the producers of fuels, plastic units for the automobile and electronic industry, the producers of tires and many others. However, the successfulness of chemical enterprises will depend:

- a) on the ability to participate in the competitive struggle,
- b) to employ all opportunities for the extension of markets,
- c) to compare the quality and face the confrontation of our enterprises and products with those in the foreign countries which have at disposal the strong competitive advantages.

In the global and competitive environment our chemical industry should approximate to the economic level of EU and other advanced countries, namely in assortment structures, the level of technological processes enabling the lower energetic and raw-material requirements for production, and especially in the labour productivity.

After the moderate recession and expressive slump manifested in recent months it can be expected that the chemical industry will experience the period of stabilization. The speed and length will depend on the final impacts of the economic crisis and on the restart of the Slovak economics.

In order to maintain and intensify the competitiveness of chemical companies it is necessary to stabilize the qualified human potential, to support the quality of the chemical production, and to correctly and quickly react to changes ongoing in the competitive environment. The successfulness of the revitalization of chemical productions depends on the amount of financial sources released for new technologies distinguishing themselves by a positive relation to the environment, by the economical exploitation of sources, and by the expansion of the sphere of chemical products and services.

The opportunities to expand the market of chemical products include mainly the possibilities to offer the products in foreign markets, the inflow of foreign capital, the effort to stimulate the higher competitiveness of our companies, the possibility of co-operation, the establishment of supranational subjects, the extension of possibilities to acquire the high-level human potential, etc.

The chemical industry is threatened by:

- increased unemployment,
- weak and unstable currencies of surrounding countries for which our products are expensive,
- lower consumption in the sphere of chemical products,
- enhancement of the amount of substituted products allocated in the global market.

The potential risks can be identified if the companies are prepared to compete in the sphere of technology, know-how and the state of technical and other equipments. The inevitable prerequisites are also storage capacities, the flexibility of containers, safety of supplies, ability to react to the requirements of the extended market or to the continually changeable legislature of the European Union and, of course, to the legislature of the Slovak Republic.

The chemical industry in Slovakia is a strategic branch also in the present economic situation. Its attenuation or the potential liquidation of small chemical companies would have a negative impact not only on the total output of this branch but also on the amount and growth of the gross domestic product as well as on the overall level of the Slovak economics.

References

1. Baran, D., & Mikloš, M. (2006). European chemical industry – the past, present, and future. *VADYBA / MANAGEMENT*, 2(11), 1822-3133.
2. Bogdanova, O. & Orlovska, A. (2008). Competition – the key factor for effective business development. The problems of development of national economy and entrepreneurship. Riga: RTU Publishing house.
3. Jahnátek, L. (2009). Chemical industry. Document of Economy Ministry. Retrieved February 20, 2009, from: <http://www.economy.gov.sk/index/tlac.php?id=89&lang=sk&id=89&idm=1.html>
4. Chrappa, I. (2009). Employment. Statistical Office of the Slovak Republic. Retrieved February 23, 2009, from: <http://www.statistics.sk.html>
5. Šubertová, E. (2004). Business Environment and Situation in SME's after Entrance to the EU. *International Business Cooperation*, 4(2004), 1336-2828
6. Piškanin, A. & Bajžíková, L. (2001). Entrepreneurship in Europe. Bratislava: Ofprint.
7. Blažej, A. (2007). The 21st century – century of society biologization. Bratislava: Statistical and Evidence Publishing House.
8. Nemcová, E. (2004). Industry of Slovak Republic and Selected Small EU' Economics. Bratislava: Prognostic Institute of SAS.