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SYSTEM-RELATED OPPORTUNITIES AND DETERMINANTS OF INNOVATIVENESS, INTERNATIONAL COMPETITIVENESS AND ECONOMIC GROWTH

Мета статті – розкрити відносини між іноваційністю та міжнародною конкуренцією на противагу основам інституціонального, структурного та інших системних підходів та детермінант в сучасній економіці. Стаття базується на вивченні економічної літератури та результатах емпіричного дослідження.

Цель статьи – раскрыть отношения между инновативностью и международной конкуренцией в противовес основам институционального, структурного и других системных подходов и детерминант в современной экономике. Статья базируется на изучении экономической литературы и результатах эмпирического исследования.

The aim of this paper is to outline the relationships between innovativeness and international competitiveness against the background of institutional, structural and other system-related opportunities and determinants in modern economy. The paper is based on the study of economic literature and results of empirical research.

innovativeness, competitiveness, determinants, system-related opportunities

1. Introduction

A new phenomenon called «new economy» or knowledge-based economy emerged in the 90s of the 20th century. Formation of the knowledge-based economy has been accompanied by globalization processes and internationalization of economic life. Globalization and scientific and technological progress are changing the status of the hitherto economic centres in the world. Some countries, which until the 1990s were less developed, started to develop rapidly at the beginning of the 1990s and at the start of the new millennium. Subsequent reports of the International Economic Forum in Davos – International Competitiveness Reports – reveal the changes that occur in the field of competitiveness of particular economies and their competitive ability.

A number of questions arise with reference to the above said, among others: Why do some countries develop faster and are more competitive than others? Why are many newly-industrialized countries more competitive in comparison to some well-developed countries?

This article attempts to answer these questions and, in particular, the following ones: What are the relationships between innovativeness, international competitiveness and economic growth in short-run and long-run?

What opportunities and determinants influence national innovativeness and international competitiveness of economy?

How do structural and institutional factors (system of property rights; functional subsystem which embraces market flexibility, financial system efficiency, level of fiscalism, international co-operation, currency exchange rate, efficiency of economic mechanism; macroeconomic policy) determine innovativeness and international competitiveness of economy?

What is the role of government and economic policy in promotion of innovativeness and international competitiveness?

What should the relation be between economic policy and market mechanism based on the flexible markets?

2. International competitiveness and innovativeness of economy

The literature on the subject distinguishes between the concept of international competitiveness understood as a long-term competitive ability of economy and the concept of competitive position (static approach). W. Bieńkowski writes it is a problem what «the term competitiveness or (...) the term of competitive ability really mean. To tell the truth, the difficulty in precise usage of these terms results from the fact that even etymologically, competitive ability means both an ability to participate in a fight as well as ex post assessment of the result of this fight. Thus, it contains both a dynamic element (diachronic approach) including the analysis of factors determining a long-term ability to compete and a static element (synchronic approach) that is the assessment of this ability at a specific moment» (see: Bieńkowski, 1995, p. 21; Bieńkowski, 1988).

Competitive position (in other words, resultant competitiveness) concerns mainly participation of a given country's economy in international trade.

It is a narrower concept than that of international competitive ability. Competitive position or international competitive ability of the given country's economy at a given moment is nothing else but a sum of international competitiveness of the basic business entities functioning in the country (see: Bieńkowski, 1995, p. 32).

International competitive ability is a broad term indicating a long-term ability of national economy to face international competitiveness. J. Bossak understands international competitive ability in the same way. According to him competitive economy in the international context is «the one which – on the one hand – adjusts its social and economic objectives and the functioning mechanism not only to internal conditions but also to the international situation; on the other hand, it is able to undertake effective activities which not only use the changes occurring in the world's economic structure in a creative way to stimulate its own development but also affects the changes in competitors' conditions in the way ensuring higher benefits resulting from participation in the international labour division» (Bossak, 1984, p. 42). The following factors determine international competitive ability perceived in such a way:

– resources of factors of production and effectiveness of their usage (land and raw materials, labour, capital),

– resources and level of development of technical knowledge and knowledge in the fields of organization, management and marketing, as well as effectiveness of their usage,

– efficiency of social and economic system and economic policy together with possibilities of their influence on international economic environment.

The above named factors determining the economy's international competitive ability can be measured by means of:

– indicators of the general rate of economic development for a given country, GDP growth rate, unemployment rate, inflation rate, condition of the state budget, current account balance, the balance of payments, level of foreign trade reserves, internal and external debts,

– indicators informing about structural changes and changes in the effectiveness of usage of individual factors of production as well as freedom of mobility of factors of production domestically and internationally,

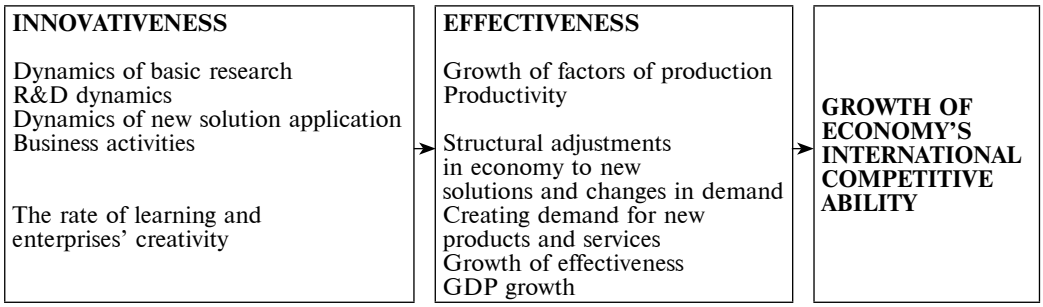
– indicators informing about the degree of involvement in international trade (see: Misala, 1995, pp. 14–15).

While considering the issue of measuring the international competitive ability, it is worth citing W. Bieńkowski's definition which points to the necessity of analyzing and

measuring this ability in a dynamic way. According to him «the measure of competitive ability growth is not only, or perhaps not so much, improved competitive advantage (status) but rather sustainability of the economy's long-term profitable development (i.e. retaining an appropriate accumulation level) which would result in such a structure of exports which corresponds to long-term changes in the world's demand structure» (see: Bieńkowski, 1995, p. 34).

International competitive ability is a broader term than innovativeness. The important factors of economy's competitiveness are technical resources, the level of development and effective usage of technical knowledge, and knowledge in the fields of organization, management and marketing. These are the areas of activities which can be broadly defined as innovativeness of economy.

The relationships between innovativeness and economy's competitive ability are presented in Figure 1.



Source: author's own development

Fig. 1. Economy's innovativeness vs. competitive ability

Innovativeness means a set of innovative actions which can take place in industry or services. They can refer to products (creating new ones or significant modifying of already existing products), production processes (making them more efficient) and production methods (development of new production technologies and techniques). Moreover, innovativeness includes also changes increasing efficiency and effectiveness of enterprise activities, thus it also refers to the spheres of organization, management, marketing and finance.

National innovative capacity, characteristic of a given economy is a long-term capacity to create and commercialize the stream of new innovations. Thus, it means a long-term trend towards creative activity in different areas of economy and practical usage of its results. It is a function of material and intellectual resources, outlays indispensable for using these resources (outlays on basic research, R&D), innovative and economic policies of the state creating conditions for development of entrepreneurship and innovativeness, and market competition among enterprises (see: Stern, Porter, Furman, 2000, pp. 1–10; Weresa, 2003, p. 97).

Ability to create innovations has become one of the most important factors of long-term growth and economic development. Innovativeness is based on research and development activities, i.e. on works conducted in laboratories aiming at making production processes more efficient and improving them, developing and creating new technologies and products.

The economies within which the enterprises of greatest innovative capacity function achieved the highest rate of growth at the end of the 20th and beginning of the 21st century (Japan, Singapore, South Korea, Hong Kong , the United States, Ireland).

The relationship between the economy's international competitiveness and innovativeness was revealed clearly when the so-called «new economy» or, in other words, «knowledge-based economy» appeared.

The knowledge-based economy («new economy») is a term which appeared at the beginning of the 1990s in the USA. It was adopted to describe a new type of market economy in which economic growth and structural changes are the results of technological progress, first of all, in the spheres of information and communication technology (ICT), and telecommunications, and its diffusion in other areas of economy. «New economy» is also defined as the economy in which the main participants (business entities) can obtain information and apply knowledge and consequently change their strategic capabilities. A small number of big structural and institutional changes allows for these new capabilities and consequently business entities can achieve positive external changes. Individual participants of the economic game have rather unequal positions when it comes to the benefits achieved from new conditions of their activity (Petit, 2002, p. 2). This means increased significance of competition between business entities.

This type of economy is characterized by a dominating role of the sector of services in generating GDP and employment. The high-tech sector (modern technologies) and new technologies play the leading role in economic development. Another significant feature is growth of competitiveness. This, in turn, is – to a large extent – related to deregulation of economy.

The following premises account for the development of «new economy»:

– higher level of education in societies of highly-developed countries, first of all in the USA,

– internationalization of economies characterized in particular by a fast rate of international trade in services,

– development and diffusion of information and telecommunication technologies.

Electronic revolution of the 1980s and 1990s (another one after the 2nd world war) created conditions for an exceptionally fast growth of productivity of factors of production, especially labour productivity. Technological changes were accompanied by institutional changes. On a microeconomic scale they dealt with innovations in enterprise organization and management. Such management methods as re-engineering, benchmarking, outsourcing, TQM, GMP, ISO, etc. have been popularized (Petit, 2002, p. 2).

Development processes in the ICT sphere resulted in the growth of productivity of factors of production (including labour), increased rate of economic growth and GDP growth, mainly in highly-developed countries. These effects appeared first in the United States and later in Western Europe and other parts of the world.

3. International competitiveness and innovativeness of economy versus economic growth

In the models of endogenous growth, an example of which is P. Romer's model (see: P. Romer, pp. 71–102), technology is an endogenous factor. Thus, authors of these models consider technology to be an essential factor of economic growth and concentrate on explaining endogenous factors affecting technical progress.

The model of endogenous growth assumes that two sectors function in economy: the sector manufacturing goods and the R&D sector. Achievements enriching resources of technological knowledge are the product of the R&D sector. Part of labour resources a_L as well as part of capital a_K are employed in the R&D sector. Consequently, production sector employs $1 - a_L$ of labour resources and $1 - a_K$ of capital resources.

A simplified model of economic growth based on technology as an endogenous factor can be represented as follows (a Cobb-Douglas function):

$$Y(t) = [(1 - a_K)\, K(t)]^{\alpha} [A(t)(1 - a_L)L(t)]^{1-\alpha}, \; 0 < \alpha < 1, \tag{1}$$

where: $Y(t)$ – output manufactured in time t, $A(t)$ – resources of technological knowledge at time t, $K(t)$ – capital resources at time t, $L(t)$ – labour resources at time t.

Production of new technological solutions ($\check{A}(t)$) depends on the size of capital and labour employed in the R&D sector and the level of technology ($A(t)$), which can be illustrated as follows:

$$\check{A}(t) = f(a_K K(t), a_L L(t), A(t)). \quad (2)$$

Following the application of the generalized Cobb-Douglas function, the above formula looks as below:

$$\check{A}(t) = B[a_K K(t)]^{\beta} [a_L L(t)]^{\gamma} A(t)^{\theta}, B > 0, \beta \geq 0 \gamma \geq 0, \quad (3)$$

where: B – is the shift parameter.

The above function does not have to have constant returns. However, it is worth mentioning that mutual interaction of people conducting research and fixed costs connected with creating research structures can be so crucial in the R&D sector that doubling the capital and labour force can give more than doubling the output.

Therefore, a possibility of increasing returns must be taken into consideration. Besides, there are no limitations concerning the way in which existing technological resources (technological knowledge) $A(t)$ may affect production of the new technological knowledge $\check{A}(t)$, and thus affect the Θ parameter.

The effect is stronger if $\Theta > 1$ and weaker when $\Theta < 1$. When $\Theta = 1$ then $\check{A}(t)$ is proportional to $A(t)$ (see: Romer D., 2000, pp. 119–120).

The presented model, like the Solow model, assumes that the rate of savings is exogenously stable and depreciation equals zero. Similarly, the growth in population is treated as an exogenous variable. However, generally, within the theory of the endogenous growth, models with savings endogenization are also applied. The analysis of these models reveals that savings can also contribute to economic growth in the long run (see: Romer D., 2000, pp. 140–144; Romer P. M., 1986, pp. 1002–1037).

The models of this type assume that the production function looks as follows:

$$Y = AHK^{1-\alpha}L^{\alpha} (A > 0, 0 < \alpha < 1), \quad (4)$$

where: Y – the size of manufactured product (output), K – capital resources, L – labour resources, A – resources of scientific and technical knowledge, H – human resources or level of technology. If one assumes that the higher technical tools of labour ($H = (K/L)^{\alpha}$) are, the higher human resources or level of technology are, then the production function looks as follows:

$$Y = AK. \quad (5)$$

Capital accumulation that determines technological growth of labour tools and human capital depends on the relationship savings/investments. Therefore the rate of economic growth does not result from exogenous technological progress but depends on savings, which are transformed into investments (see: Tokarski, 2005, p. 38).

From the theory of endogenous economic growth it comes out that if technology does not reveal diminishing returns while generating technological growth then increased outlays on technological improvement increase the rate of production growth. An important implication of this theory is that the economic policy may increase the rate of economic growth as well as the rate of national income permanently. This is a supply-side policy aiming at increased savings, investments in research and development, higher level of education, etc.

4. System-related determinants of international competitiveness and innovativeness of economy

In modern economy, the growth in productivity of factors of production is mainly a consequence of the accelerated scientific and technological progress (outlays on scientific and technological development, R&D), the quality of human resources,

entrepreneurship and innovativeness. The very outlays on scientific research measured by their share in GDP do not decide about future effects. A mechanism stimulating conversion of scientific solutions into practical applications in the form of new production methods and new products is indispensable.

The state, to a large extent, is able to influence the amount of outlays on research but it cannot cause that the research results are applied in economy. A mechanism of market competition is indispensable to this end. It enforces improvement of production methods and introduction of new products to the market. The state can create conditions for efficient functioning of the market and competition or it can restrict their activities and sometimes, in many areas, even replace them. However, the experience of many countries proved that such actions are not effective.

Overregulation of economy (including labour market) which is reflected in excessive bureaucratic restrictions in the form of regulations (governing activities in different economic areas), directives, bans and licences leads to limiting the stimuli of innovativeness and reducing productivity of factors of production. The latter is the result of fiscalism in the economic policy of the state accompanied by overregulation of economy. On a macroeconomic scale it is revealed by a high share of taxes and parafiscal charges in GDP and, on the other hand also in the high share of the state expenditures in GDP (the so-called fiscalism index). On a microeconomic scale fiscalism means high tax burden for enterprises as well as different levies of social nature and administrative charges. High fiscal burden reduces the rate of national savings in GDP and hence it has an adverse effect on economic growth. On the other hand, high state expenditures trigger the crowding-out effect, which means a drop in investments and private consumption.

Administrative intervention in the form of excessive restrictions regulating business activities leads to reduced flexibility of enterprises in adjustment to market signals and changes that occur in the world's economy.

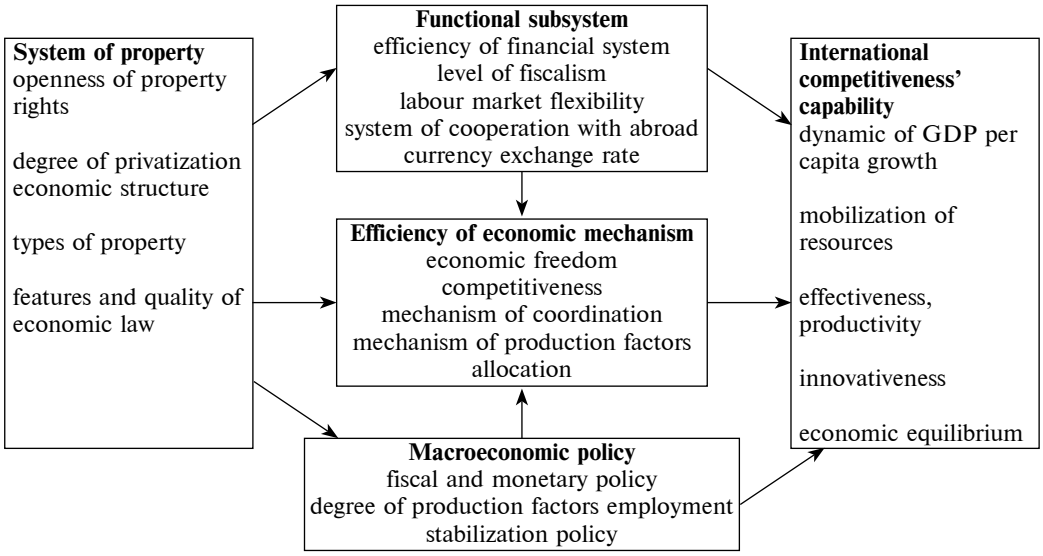
Protectionism in foreign trade is another unfavourable factor affecting competitiveness of economic innovativeness. It leads to disturbances in the market mechanism of allocating resources of factors of production in economy, weakening of stimuli of effective management in enterprises and stimuli of technical and technological progress. Enterprises are deprived of competitive pressure from abroad (see: Bukowski, 2003, pp. 45–47)

The above mentioned factors (overregulation of economy, fiscalism and protectionism) lead to petrification of economic structures, reduced entrepreneurship and innovativeness, reduced management effectiveness and consequently lower productivity of factors of production, slow rate of economic growth and eventually lower competitiveness of economy in comparison to foreign countries.

Figure 2 presents system-related determinants of international competitiveness of economy.

What is particularly important is assuring openness of property (ownership) rights. The open system of property rights means that there are no restrictions to undertake, run and benefit from business activities. This system includes different forms of ownership and treats them equally. Yet, it must be borne in mind that when there is freedom of undertaking business activities and competition, private ownership is the factor strengthening development of private sector which is more effective and efficient and innovative than the public sector based on non-capitalistic ownership (see: Bossak, Bieńkowski, 2004, p. 64). Hence, privatization processes play a very important role in economy. These processes broaden the scale of economic freedom. As J. Bossak puts it: «Privatization of economy means broadening the limits of economic freedom and competition and reducing market regulation, including ownership rights, finances, labour and foreign co-operation.

Broadening of the range and intensity of market mechanism influence enhances selective and location functions of the market and thus mobility of resources (especially,



Source: Bossak, 2001, p. 52.

Fig. 2. system-related detrminants of economy's competitive ability

labour mobility) and promotes higher economic effectiveness» (see: Bossak, Bieńkowski, 2004, p. 64).

Macroeconomic policy based on deregulation of economy and liberalization of economic links with abroad as well as creating conditions for competition mechanisms among enterprises may favour the long-term economic growth based on innovativeness to a greater extent. Creation of institutional conditions enabling flexible market functioning, including labour market, is of crucial importance here. It is also important to ensure a high degree of economic freedom and freedom of competition mechanisms between domestic and foreign enterprises. Economic policy of the country may only correct effects of market mechanisms but it cannot replace them. It is essential to reduce fiscalism in economic policy which is measured by the share of taxes, contributions towards social insurance and other parafiscal charges in GDP. Deregulation effects are presented in Table 1.

As Table 2 indicates, there are numerous restrictions which make it impossible to implement reforms based on deregulation and liberalization of economic life, which does not mean that they cannot be overcome. After all it was possible in many countries. The examples of the United States, Ireland, Great Britain or Slovakia can be given here (though in the case of Slovakia the future of reforms is endangered by the plans of the new government). The processes of this type occur have occurred recently in Japan. Also the Lisbon Strategy aims at deregulation.

The state can support processes of economic growth by ensuring openness and protection to ownership rights, providing broad economic freedom and supporting entrepreneurship and innovativeness. In particular, the state can and should care about development of infrastructure, society's education, development of the system of education at different levels and financing scientific research (first of all basic research which builds the foundation for progress in the sphere of technology and education and adjusting society and economy to challenges posed by foreign environment in the long-run).

Table 1

Long-term and short-term deregulation effects in economy (short term – up to 1 year; middle-term 2–4 years; long-term more than 4 years)

Mechanism	Mechanism's effect	Short-term effects	Medium- and long-term effects	Limitations
Flexible wages	Adjusting labour prices to the supply-demand relationship; Improving enterprise competitiveness through lower wages	1.Improving microeconomic effectiveness; 2. Increased production and employment;	1. Reduced unemployment; 2.Acceleration of adjustment processes;	1.Trade Unions activities; 2. Restrictive labour law and collective labour agreements; 3. Social barriers and possibility of strikes;
Flexible prices	Adjusting supply and demand, improved microeconomic competitiveness	Negligible	1. Allocation effects 2. Acceleration of adjustment of supply and demand-side processes;	1.Monopolized economy; 2. Rigidity of markets and enterprise behaviour in establishing prices;
De-regulation of product markets	Accelerates supply, demand and price adjustments. Stimulates economic growth;	Negligible;	1. Increased competitiveness and microeconomic effectiveness; 2. Increased price flexibility; 3.Accelerated adjustment processes;	1. Counteraction by economic interest groups; 2. Politicians' conservatizm if the country withdraws from regulation;
De-regulation of llabour market	Reduction of labour costs through reduction of administration and social protection costs pertaining to employment; flexible systems of employment and remuneration. Stimulated employment growth;	Negligible	1.Reduction of enterprise costs; 2. Increased tendency to work and employment growth; 3.Stimulated economic growth; 4. Speeding up adjustment processes	1. Social and political barriers; 2. Strong trade unions; 3. Possibility of strikes;
Reduction of taxes including the direct ones and simplifying the tax system	Stimulation of economic activity, capital accumulation, economic growth and employment;	Temporary fall in budget revenues and increased budget deficit;	1.Increased savings and capital accumulation; 2. Increased investment and employment; 3. Accelerated economic and GDP growth; 4. Increased competitiveness of enterprises and economy; 5. Increased budget revenues; 6. Reduction of grey economy;	1. Social and political barriers; 2. High budget deficit and public debt at the moment of initiating the tax reform;
Reduction of budget deficit and public debt by reducing expenditure	Diminishing the crowding out effect; Stimulation of the long-term economic growth; Creating a possibility of a reform and tax reduction;	Temporary decrease in the economic growth;	1. Increased economic stability; 2. Higher tendency to work due to less social protection; 3. Lower interest rates; 4. Increased private investment due to the limited crowding out effect;	1.Social and political barriers;

Source: author's own development.

5. Conclusions

The paper showed an important relationship between innovativeness and international competitiveness of economy. In the situation of globalization and knowledge-based economy, innovativeness is a key factor of economic growth. Other factors contributing to better innovativeness and international competitiveness of economy and consequently economic growth include: outlays on scientific research and education, deregulation of economic processes and liberalization of economic life, domination of market mechanisms of regulation (based on flexibility of prices, wages and markets) and free competition between enterprises, liberalization of economic links with abroad, openness and protection of property rights, domination of private ownership and privatization, low taxes and parafiscal charges.

The factors which have an adverse effect include: domination or too big a share of the state-owned enterprise sector in economy, overregulation of economy, limitations in the system of the property rights, fiscalism and high fiscal burden for population and enterprises, protectionism in foreign trade.

The state can and should promote innovativeness by financing basic scientific research, education and creating infrastructure. Its activities cannot however replace market mechanisms (including market competition) which stimulate entrepreneurship and innovativeness.

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