

**Liudmyla Ryneiska**

PhD (Economics), Associate Professor,
Yuriy Kondratyuk Poltava National Technical University, Ukraine
24 Pershotravnevyi Ave, Poltava, 36011, Ukraine
ryneyskaya_ls@ukr.net

THE WORLD INNOVATION ECONOMY: MODERN TRENDS OF DEVELOPMENT

Abstract. *Problem statement.* Scientific and technological progress has always been the determining factor of economic development. Under globalization conditions, the modern economy is acquiring more and more innovation nature. Therefore, investigation of the world's innovative economy problems, including today's trends of its development, is currently important. *The purpose of the article* is determination and study of the modern trends in the world innovation economy development. Special attention is drawn to functioning of innovation sectors in the national economies of the developed and developing countries.

The main results of the study. The principle vector of the world economy development is high-tech production. In this respect, growing of the governmental support to research studies in the countries with the most efficient economies has been analyzed. The innovation policy types – active and passive – have been studied together with the main groups of countries, formed on their basis, each of them mainly exporting or importing innovations necessary for the economic development. Features of mutual influence of the innovation sectors in the national economies of the developed and developing countries have been analyzed. Expansion of innovative activities in the spheres of large and small business and functioning of MNCs as innovative production centers have been explored.

Conclusions. The innovation nature of the present day economy and the following trends of its development have been determined as follows: 1) formation of the two main groups of countries in the world innovations transfer. One of them includes the most technologically advanced countries (such as the USA, Germany), which are exporters of innovations, while the other group is the majority of countries importing them; 2) growing participation of developing countries in the world innovation activity (China, India, Brazil and others); 3) expansion of mutual influence of innovative sectors in the national economies of the developed countries and those with developing economies; 4) significant increase of the multinational corporations role in the science research activity and commercialization of its results; 5) development of innovation activity at small and medium-sized enterprises.

Keywords: world innovation economy; scientific and technological progress; innovations; innovation sectors of national economies; trends of development.

JEL Classification: F20, O31, O57

Л. С. Рынейская

кандидат экономических наук, доцент кафедры международной экономики и маркетинга, Полтавский национальный технический университет имени Юрия Кондратюка, Украина

МИРОВАЯ ИННОВАЦИОННАЯ ЭКОНОМИКА: СОВРЕМЕННЫЕ ТЕНДЕНЦИИ РАЗВИТИЯ

Аннотация. В статье обосновывается целесообразность инновационной направленности экономики в условиях научно-технического прогресса. Исследуются современные тенденции развития международной инновационной экономики. В этом контексте проанализировано усиление государственной поддержки фундаментальных научных исследований. Изучены активный и пассивный виды инновационной политики, формирование на их основе двух основных групп стран, каждая из которых преимущественно экспортирует или импортирует инновации, необходимые для роста экономики. Рассмотрены такие мировые тенденции, как активизация инновационной деятельности и формирование инновационной экономики в развивающихся странах, а также расширение взаимного влияния инновационных секторов национальных экономик развитых и развивающихся стран мира. Показано повышение роли транснациональных корпораций в инновационной деятельности и коммерциализации ее результатов. Проанализированы перспективы использования потенциала инновационной деятельности для малых и средних предприятий.

Ключевые слова: инновационная мировая экономика, научно-технический прогресс, инновации, инновационные сектора национальных экономик, тенденции развития.

Л. С. Ринейська

кандидат економічних наук, доцент кафедри міжнародної економіки та маркетингу, Полтавський національний технічний університет імені Юрія Кондратюка, Україна

СВІТОВА ІННОВАЦІЙНА ЕКОНОМІКА: СУЧАСНІ ТЕНДЕНЦІЇ РОЗВИТКУ

Анотація. У статті обґрунтовується доцільність інноваційної спрямованості економіки в умовах науково-технічного прогресу. Досліджено сучасні тенденції розвитку міжнародної інноваційної економіки. У цьому контексті проаналізовано посилення державної підтримки фундаментальних наукових досліджень. Вивчено активний та пасивний види інноваційної політики, формування на їх основі груп країн, кожна з яких переважно експортує або імпортує інновації, необхідні для росту економіки. Розглянуто такі світові тенденції, як активізація інноваційної діяльності та формування інноваційної економіки у країнах, що розвиваються, а також поширення впливу інноваційних секторів національних економік розвинутих країн і країн, що розвиваються. Показано зростання ролі транснаціональних корпораций в інноваційній діяльності та комерціалізації її результатів. Проаналізовано перспективи використання потенціалу інноваційної діяльності для малих і середніх підприємств.

Ключові слова: інноваційна світова економіка, науково-технічний прогрес, інновації, інноваційні сектори національних економік, тенденції розвитку.

Introduction. Research and technology progress has always been the determining factor of the economic development. Under the globalization conditions, it has acquired the game-changing level of influence. The global economy formation taking place is characterized by the national markets avail-

ability, particularly for high-tech; the world technology competition; further international specialization; high capital mobility; fast innovation technologies transfer. Thus, the modern economy acquires more and more innovation nature. In this respect, the problem of the world innovation economy development is

topical, and studying the today's trends of this process has great scientific and practical significance.

Brief Literature Review. The problems of the mutual influence of economic and innovative activities in various countries, as well as the resulting formation of the innovation economy, have been studied both by the national and foreign scholars: G. Androshchuk [1], V. Budkin [2], A. Yeroshkin [3; 4], V. Khamchuk [5], V. Supyan [6], V. Shavshukov [7], Yu. Linevych [8], G. Bak [9], I. Krasnov [10], O. Karpyuk [11], O. Dyuhovanets [12] and others. However, the main trends of the world innovation economy development have not been studied in full.

The purpose of the article is determination and study of the modern trends in the world innovation economy development. Special attention is drawn to functioning of innovation sectors in the national economies of the developed and developing countries.

Results. The principle vector of the world economy development is high-tech production. In general, high-tech products manufacturing in the today's world is based on using 50-55 macro-technologies, created and controlled by the advanced industrialized countries. World high-tech production markets are being controlled by the U.S. companies (39%), by Japan (30%), by Germany (16%) [1, p. 51].

Meanwhile, a tendency is being observed for the world countries subdividing into preferential exporters and importers of innovations. Only the U.S., Germany and some of the most technologically developed countries – OECD members – are the innovations exporters, including assignment of patents, licenses, know-how, various science research results and developments, technology equipment to business entities of other countries. However, the most of the world countries (including even highly developed ones, such as Japan, Taiwan, South Korea and other so called «Asian tigers») are acting as the innovation importers. Their principle difference from the innovations exporting countries lies in the fact, that they are only buying abroad the results of science and engineering research possessing their own, even more efficient than that of the exporters, mechanism of innovations regulatory support according to their national traditions and habits [2, p. 67].

In the globalized world, part of the national country's economic activity functions is either getting extinct or transforming. However, one of the traditional economic functions has remained: it is support of the research and technologic progress and innovation changes. For that reason, governments around the world are elaborating and implementing national programs of science and technology development, such as A Strategy for American Innovation: Driving Towards Sustainable Growth and Quality American Recovery and Reinvestment Act (U.S.), High-tech Strategy 2020 (Germany), Science and Innovation Investment Framework (UK), New Growth Strategy (Japan), Medium-and Long-term National Plan for Science and Technology Development (China), Science and Technology for the XI-th Five Year Plan (India) and others. These programs include increase of government expenditures on fundamental research and training researchers and engineers; stimulating business investments in innovations, including tax credit arrangements [3, p. 22; 13, p. 111].

In the today's world, two main types of innovation policy – active and passive – can be observed. The active type includes North American, West European and Japanese East Asian types of the innovation policy. This type is specific for the most developed countries, being members of the OECD, as well as for China and for part of ATEC Asian members. The passive type model is characterized by the innovation policy of receiving only those modern innovations, which their exporters allow to transfer to the world largest group of technologically developed countries. This innovation policy is specific for Latin American countries, as well as for the Post-Soviet countries (including Ukraine) since 1900s [2, p. 68].

The active type of the innovation policy causes the greatest scientific and practical interest. The peculiar feature of the innovations exporting countries' active subgroup is the possibility to provide their development primarily by means of their own science-research and engineering technology basis. However, that

doesn't mean absolute renouncing of more advanced projects from abroad. The U.S. dependence upon that sort of import is the least of all, as they have concentrated the most part of the world's high-tech projects. The specific nature of the U.S. innovation policy is self-development of business entities based on the principles of self-surviving in the severe competition. The U.S. were the first to implement such forms of innovation development as a research park, technopolis, business incubator, venture center, etc. Founded in 1950s, Silicon Valley in California has become the first technopolis in the world. For several decades Silicon Valley (where such high-tech world leading companies as Apple, Adobe, Google, Yahoo, Xerox, Intel, Hewlett-Packard and others are located) has turned into a profitable enterprise: the gross annual profit of 4000 companies functioning in the Valley makes approximately 200 billion USD [5, p. 24].

Unlike the «American» one, the «European»-type innovation model includes more sufficient interference of government into nearly all institutional forms of high-tech development, the same as in the U.S. It is vividly displayed as to research parks and technopolises. Thus, in the EU countries, expenditures on research and developments make up to 2.5% of GDP (gross domestic product), and for separate research projects state expenditures reach 30-50%. Besides, the peculiar feature of the EU countries is wide use of international cooperation in the research and technology sphere. As a rule, EU assigns up to 50% of general allotments on scientific and technological research [2, p. 69-70].

Another centre of active innovation policy unites countries which import innovation: Japan, Taiwan, Hong Kong, the Republic of Korea, Singapore, Malaysia and other «Asian tigers», India, China, Vietnam [2, p. 70].

The U.S. is the world leader in manufacturing products in the branches defined as «based on knowledge and intensive technologies» (knowledge – and technology – intensive industries). The overall share of high-tech sector in the U.S. economy in 2010 amounted to 40%. The second and the third positions in high-tech industries concentration were occupied by the European Union (27 countries) and Japan – 32 and 30% respectively. The share of such industries in China made 20% [6, p. 7].

The trend of technological leadership still maintained in 2011, when the U.S. exported goods up to 1.5 trillion USD, 90.8% of which being high-tech products [7, p. 32].

It is largely due to the fact, that the U.S. government strongly supports fundamental research and commercialization of the results. Besides, in the U.S., an efficient governmental financial support program called «Small Enterprises Innovative Activity» is in effect. It has helped to recover 8 USD per each 1 USD invested by the government for the period of 20 years [14, p. 23].

Also, nowadays, in the U.S. one of the highest levels of the employed population involvement in research is being observed (the number of researchers per 10 thousand employees makes 10-95). It is comparable with those of leading industrialized countries: Germany (77), France (89) Japan (104), and Sweden (105) [15, p. 9].

However, the main competitive advantage of the U.S. in the world high technology markets is the efficient institutional system of implementing scientific developments into mass manufacturing of high-tech products and their entrance into the world markets. Practical realization of the American innovation model has raised the export of aerospace equipment in 2010 exceeding 80 billion USD. The export of information and communication equipment from the United States exceeded 77 billion USD the same year. To evaluate the innovation efficiency of business models in different countries UNCTAD has developed the Innovation Capacity Index. As to this indicator, the U.S. occupies one of the highest positions in the world (index – 0.750). The EU innovation leader is Germany. As to its innovative capacity it occupies the 20-th position with the index equal to 0.650. China is currently ranking the 40th position [16, p. 9].

One of the U.S. competitors is China accounting for 40% of the world economy growth in 2012 [17, p. 16]. China in its rival-

ry with the United States has a major competitive advantage in the processing industry – manufacturing of the traditional labor-intensive products, the costs of which are considerably lower due to still much cheaper manpower resources. Meanwhile, China is ramping up production of relatively simple high-tech products, whose share is rapidly growing. However, despite the fact that spending on research studies in China are rapidly increasing (from 149 billion USD in 2010 to almost 200 billion USD in 2012), China's share in the world expenditures on science and their share in the country's GDP is markedly below the corresponding U.S. indices (14.2 and 31.3% and 1.6 and 2.8%). But the most important is absolute leadership of the United States in the number of scientific schools, in the ability to generate new ideas and to produce new research products [6, pp. 7-8].

The peculiar tendency of the modern world innovation sphere growth is active participation of developing countries.

At the beginning of the XXI century, the active growth of the developing countries' economies started. This process has changed the balance of forces in the world economy. The average annual GDP growth of these countries in 2001-2011 reached 6.3%, the growth of goods and services export – 8.1%, which is several times faster than in the developed countries, accounting respectively for 1.6% and 4.2% [4, p. 3].

Leaders of the developing countries groups (Argentina, Brazil, China, Hungary, India, Indonesia, Malaysia, Mexico, Poland, Russia, Turkey, Thailand, South Africa) using their financial and investment potential growth, started active strengthening of their national research and technology complexes. At the same time the share of developing countries in the total global costs of research has increased in the 2000s from 17% to 24% [4, pp. 4-6].

In the today's global economy the trend of mutual innovative sectors influence in national economies is being formed, both in the developing and in the industrially developed countries. This interaction is often expressed through the activities of transnational corporations.

Now, under the globalization conditions, the role of multinational corporations (MNC) has grown significantly. MNCs are typical subjects of the global economy. For example, the United States is the world's largest direct investor (over 3.3 trillion USD), which advance-guard is represented by 133 U.S. companies among the total of 500 largest world MNCs [7, p. 33]. Simultaneously, significant investments made by transnational corporations are directed to research and development activities and their results commercialization. Therefore, MNC are often called the core of innovation. MNCs often organize research centers and venture companies independent of their parent companies in the regions possessing research growth potential. South-East Asia is having the highest potential and the fastest growing market. Therefore, at the beginning of the XXI century, only in India 60 foreign MNCs (including «General Electric», «Intel», «Microsoft», etc.) founded their research centers [8, pp. 10-11].

It is necessary to emphasize, that in their home countries MNCs contribute to the development of innovative economy because they often become the performers of government orders for innovation products manufacturing, mainly in the military industrial fields. For example, in 2011 the U.S. government has concluded the contract with «Lockheed Martin Corp.» (USA) worth 789.8 million USD with the purpose of creating the defense system for the U.S. National Missile Defense Agency. Early in 2012 «Lockheed Martin Corp.» and «Space System» (USA) received a contract from the U.S. Department of Defense worth 238 million USD for producing spacecraft for the term up to 2016 [9, p. 17].

However, significant potential in the innovative economy development lies in the activity of small and medium enterprises.

Currently, the U.S. small and medium-sized businesses create 55% of technological innovations. Their share in the export of innovative products in Germany and the Netherlands is 40%, in Italy – 25%, in the U.S. and Japan – to 15%. Small and medium-sized enterprises account for 50% of licenses sold in the U.S. [10, p. 39]. According to the data of the U.S. National

Bureau of Economic Research, for the 20 years period small companies have created four times more research technology innovations per 1 USD, than large companies (to 1000 employees) and 24 times more, than large corporations (over 10 thousand employees) [11, p. 90].

Therefore, governments around the world have developed and implemented state programs for concessional loans and guarantees to small and medium innovative enterprises: Enterprise Finance Guarantee (UK), ERP Innovation Program (Germany), OSEO Agency Program (France), Centro para el Desarrollo Tecnológico Industrial Agency Program (Spain), SME Credit Guarantee Scheme (Netherlands), SIDBI Bank and CGTMSE Guarantee Fund programs (India) and others. These programs include concession loans to small and medium innovation enterprises, as well as bank credit and venture funds investments guarantees, etc. [3, p. 26]. As a result, the small innovative sector can form companies reaching the level of Microsoft, Oracle, Intel, Google, which have turned into large world market entities due to the timely venture capital support [12, p. 41].

In general, most of the economists analyzing small and medium enterprises activity, emphasize, that they possess great innovation capacity necessary for survival under severe conditions of competition, particularly in the innovation spheres of economy [10, p. 44].

Conclusions. Thus, the science and technology progress has stipulated the innovation nature of the present day economy and determined the following trends of its development:

- elaboration and implementation of national programs for the science and technology development in countries with well-functioning economy;
- formation of the two major variants of innovation policy: active and passive. The active variant is represented by North American, West European and Japanese- East Asian types of innovation policy. They are characterized by the generation and export of innovations together with their most active implementation into production. The passive variant is represented by Latin American, Central European and the post-Soviet types of innovation policy. They are characterized by the predominant use of the modern innovations transferred by more developed countries to less technologically developed countries;
- formation of the two main groups of countries in the world innovations transfer. One of them includes the most technologically advanced countries (such as USA, Germany), which are exporters of innovations, while the other group is the majority of countries importing them;
- growing participation of developing countries in the world innovation activity (China, India, Brazil and others);
- expansion of mutual influence of innovative sectors in the national economies of the developed countries and those with developing economies;
- significant increase in the role of transnational corporations in the science research activity and commercialization of its results;
- development of innovation activity at small and medium-sized enterprises.

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