

## THE KEY COMPONENTS IN FORMING A MODERN INNOVATION BASIS OF COMPETITIVENESS IN THE CONTEXT OF GLOBALIZATION TRANSFORMATIONS

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### Skrypnyk N. Y., Sydorenko K. V. The Key Components in Forming a Modern Innovation Basis of Competitiveness in the Context of Globalization Transformations

The article is aimed at substantiating the modern most important components of the innovation base of competitiveness in the conditions of globalization transformations. Features of management of global competitiveness of countries are considered; the key components of formation of a modern innovation base of competitiveness in conditions of globalization transformations are defined; the role and importance of the infrastructure of international airports in the system of socio-economic well-being and increasing the global competitiveness are substantiated; instruments for increasing competitive advantages of the airport infrastructure are defined. The research applied both general scientific and special methods of scientific cognition: descriptive-analytical method, method of analysis and synthesis, methods of quantitative and qualitative comparisons. The information basis of the article are monographic researches and periodical publications by domestic and foreign scholars-economists, materials and analytical reports of the World Economic Forum, the International Institute of Management Development, OECD, International Civil Aviation Organization, International Air Transport Association, aggregated data provided by the International Council of Airports. The main provisions of the article will help to accelerate the solution of issues of identifying modern innovative factors, as well as substantiating the conditions and directions of increasing the global competitiveness of countries. The novelty of the research is the development and substantiation of methodical provisions of scientific provision of global competitiveness of countries in the world-wide economy. This work provides an opportunity for further research into the management of international competitiveness of airport infrastructure and enhancing the global competitiveness of countries.

**Keywords:** International competition, global competitiveness, innovation, investment, infrastructure, international airport.

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### Скрипник Н. Є., Сидоренко К. В. Основні складові формування сучасної інноваційної бази конкурентоспроможності в умовах глобалізаційних перетворень

Мета статті полягає в обґрунтуванні сучасних ключових компонентів формування інноваційної бази конкурентоспроможності в умовах глобалізаційних перетворень. Розглянуто особливості управління глобальною конкурентоспроможністю країн; визначено ключові складники формування сучасної інноваційної бази конкурентоспроможності в умовах глобалізаційних перетворень; обґрунтовано роль та значення інфраструктури міжнародних аеропортів у системі забезпечення соціально-економічного добробуту та підвищення глобальної конкурентоспроможності; встановлено інструменти нарощення конкурентних переваг аеропортової інфраструктури. У дослідженні застосовано як загальнонаукові, так і спеціальні методи наукового пізнання: описово-аналітичний, аналізу і синтезу, методи кількісних та якісних порівнянь. Інформаційною основою є монографічні дослідження та періодичні публікації вітчизняних і закордонних учених-економістів, матеріали й аналітичні звіти Всесвітнього економічного форуму, Міжнародного інституту розвитку менеджменту, ОЕСР, Міжнародної організації цивільної авіації, Міжнародної асоціації повітряного транспорту, агреговані дані Міжнародної ради аеропортів. Основні положення статті сприятимуть прискоренню вирішення питань виявлення сучасних інноваційних факторів, а також обґрунтуванню умов і напрямів підвищення глобальної конкурентоспроможності кра-

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### Скрипник Н. Е., Сидоренко Е. В. Основные составляющие формирования современной инновационной базы конкурентоспособности в условиях глобализационных преобразований

Цель статьи – обосновать современные ключевые компоненты формирования инновационной базы конкурентоспособности в условиях глобализационных преобразований. Рассмотрены особенности управления глобальной конкурентоспособностью стран; определены ключевые составляющие формирования современной инновационной базы конкурентоспособности в условиях глобализационных преобразований; обоснована роль и значение инфраструктуры международных аэропортов в системе обеспечения социально-экономического благополучия и повышения глобальной конкурентоспособности; определены инструменты наращивания конкурентных преимуществ аэропортовой инфраструктуры. В исследовании применены как общенаучные, так и специальные методы научного познания: описательно-аналитический, анализа и синтеза, методы количественных и качественных сравнений. Информационной основой статьи являются монографические исследования и периодические публикации отечественных и зарубежных ученых-экономистов, материалы и аналитические отчеты Всемирного экономического форума, Международного института развития менеджмента, ОЭСР, Международной организации гражданской авиации, Международной ассоциации воздушного транспорта, агрегированные данные Международного совета аэропортов. Основные положения статьи будут способствовать ускорению решения вопросов выявления современных инновационных факторов, а также обоснованию условий и направлений повышения

ІННОВАЦІЙНІ ПРОЦЕСИ  
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ін. Новизна дослідження полягає в розробленні та обґрунтуванні методичних положень наукового забезпечення глобальної конкурентоспроможності країн у світовому господарстві. Дана робота відкриває можливість подальших досліджень у сфері управління міжнародною конкурентоспроможністю інфраструктури аеропортів і підвищення глобальної конкурентоспроможності країн.

**Ключові слова:** міжнародна конкуренція, глобальна конкурентоспроможність, інновації, інвестиції, інфраструктура, міжнародний аеропорт.

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глобальної конкурентоспроможності стран. Новизна исследования заключается в разработке и обосновании методических положений научно обеспечения глобальной конкурентоспособности стран в мировом хозяйстве. Данная работа открывает возможность дальнейших исследований в области управления международной конкурентоспособностью инфраструктуры аэропортов и повышения глобальной конкурентоспособности стран.

**Ключевые слова:** международная конкуренция, глобальная конкурентоспособность, инновации, инвестиции, инфраструктура, международный аэропорт.

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Under today's conditions of the dynamic development of the world economy, spread of globalization processes and intensification of the involvement of countries in them, active use of information and communication technologies, their total penetration into all spheres of public life lead to an increase in the processes of transformation of national economic systems and the global economy as a whole. The methods and mechanisms for acquiring and retaining competitive advantages and properties of the determinant factor of socio-economic growth are changing, innovations gaining the global leadership. An indicator of innovative development of national economies is degree of development of the aviation sector, since aviation accumulates advanced information and innovation technologies. Therefore, in the context of global innovation and rapid development of the world aviation market, the formation of a competitive airport infrastructure able to fully meet the needs and requirements of the global aviation market is of particular importance.

A great contribution to the development of the conceptual foundations of innovation development and competitiveness in the context of globalization transformations is made by a number of scientists, namely: V. Budkin [3], V. Gryshkin, A. Simakhova [6], O. Dzhusov [7; 30], N. Duchynska [8], Ya. Zhalilo, Ya. Bazyluk, Ya. Belinska, S. Davydenko, V. Komarov [10], I. Taranenko, L. Katan [11], D. Lukianenko, A. Poruchnyk, L. Antoniuk, V. Chuzhykov [17], N. Stukalo [22], S. Khaminich [23], T. Tsyhankova [25], N. Meshko, D. Shitov [40], I. Steblianko [46].

However, today, considerable attention of researchers, including: O. Arefieva, A. Shtangret [1], N. Bondar [2], M. Butko [4], V. Heyets [5], N. Ivanova [9], A. Kulyk

[12], M. Grygorak, L. Savchenko [13], O. Lozhachevska [14], Yu. Orlovska [18], A. Rybchuk [19], S. Sardak, V. Dzhyndzhoian [20], S. Sidenko [21], A. Khakliuk [24], O. Shevtsova [26], M. Jouanjan, D. Velde, N. Balchin [37], O. Morrissey, R. Lopez, K. Sharma [41], B. Shepherd [45], is concentrated around solving problems of the formation of innovative infrastructure as an endogenous factor of long-term socio-economic growth and ensuring global competitiveness of countries.

At the same time, despite the existence of deep and thorough research works of domestic and foreign scientists of different years, the issue of raising the level of international competitiveness of countries is not sufficiently developed and needs to be improved. In particular, mechanisms for the development of competitive advantages and formation of a modern innovation basis of competitiveness in the context of globalization transformations need further specification.

The *purpose* of the research is to identify and substantiate the key components of the formation of a modern innovation basis of competitiveness in the context of globalization transformations.

The methodological basis of the research comprises both general scientific and special methods of scientific knowledge: descriptive analysis, analysis and synthesis, methods of quantitative and qualitative comparisons. The information base of the article is monographic researches and periodical publications of Ukrainian and foreign economists, materials and analytical reports of the World Economic Forum, International Institute for Management Development, OECD, International Civil Aviation Organization, International Air Transport Association, aggregated data of the Airport Council International.

The intensification of integration processes as well as the processes of globalization of economic relations, diversification, and internationalization of various types of economic activity are accompanied by increased mobility of the population, technologies, and information and open up significant opportunities for socio-economic development of countries and formation of long-term competitive advantages. The competition for the right to acquire new knowledge and dissemination of innovations, for the ability to control and regulate the resource base, information and financial flows, share and leadership in world markets is intensifying [43]. The role and importance of air transport, which is characterized by the ability to quickly move over long distances in a relatively short period of time is increasing. Air transport becomes the basis for global networking of society. Therefore, in order to create and sustain competitive advantages in the context of globalization transformations, countries need to address the issue of increasing and modernizing airport infrastructure capable of producing innovative highly competitive services which are in demand in the global aviation market.

Thus, according to the most popular indicators of competitiveness of countries, calculated by the International Institute for Management Development [33] and the World Economic Forum [47], one of the key elements of socio-economic development of countries in the world economy is the proper level of infrastructure. This is due to the fact that infrastructure networks reduce the effect of distance, help integrate markets, providing the necessary connections, and facilitating international trade. In particular, a reliable, innovative airport infrastructure is one of the key factors in enhancing countries' capacity for real economic growth both in the short and long term.

As can be seen from Fig. 1, the basis for compiling the World Competitiveness Rankings by the International Institute for Management Development is the calculation of factors and subfactors in correspondence

to which countries manage their competitive environment. The key factors of competitiveness are economic performance, government efficiency, business efficiency, and infrastructure.

In turn, according to the structure of the Global Competitiveness Index (GCI), developed by the experts of the World Economic Forum, high-quality and modern air transport infrastructure is considered as one of the factors determining global competitiveness of countries, without which the national economy cannot be transformed from factor-oriented to efficiency-oriented, not to mention innovation orientation.

As can be seen from *Tbl. 1*, GCI consists of twelve pillars, which are grouped in four categories: enabling environment, human capital, markets, and innovation ecosystem. In turn, the pillars are broken down into indicators of a lower level.

Every year the World Economic Forum publishes The Global Competitiveness Report and ranks countries by the general index and its individual components. A country's rank in terms of a separate pillar is the expression of its competitive advantage (disadvantage) relative to other countries in the global dimension and may indicate obstacles to its development, the need to initiate and implement reforms to increase the productivity of the economy [15, p. 146].

As can be seen from *Tbl. 2*, countries with innovative potential and competitive air transport infrastructure are also leading in terms of the Global Competitiveness Index. This dependence is explained by the fact that innovative infrastructure of international airports plays an important role in the formation of dynamic global supply chains, establishment of effective logistics schemes for business, provision of air links between markets, and the national and world economies take advantage of airports as integral elements of economic development [16, p. 23].

The assertion that airport infrastructure affects the location of airports in the world air transport market and also is a necessary (but not sufficient) precondition for

|            |   |  |  |  |
|------------|---|--|--|--|
| Factors    | <b>Economic Performance</b>   | <b>Government Efficiency</b>   | <b>Business Efficiency</b>   | <b>Infrastructure</b>  |
|            | <ul style="list-style-type: none"> <li>• Domestic Economy</li> <li>• International Trade</li> <li>• International Investment</li> <li>• Employment</li> <li>• Prices</li> </ul> | <ul style="list-style-type: none"> <li>• Public Finance</li> <li>• Fiscal Policy</li> <li>• Institutional Framework</li> <li>• Business Legislation</li> <li>• Societal Framework</li> </ul> | <ul style="list-style-type: none"> <li>• Productivity and Efficiency</li> <li>• Labor Market</li> <li>• Finance</li> <li>• Management Practices</li> <li>• Attitudes and Values</li> </ul> | <ul style="list-style-type: none"> <li>• Basic Infrastructure</li> <li>• Technological Infrastructure</li> <li>• Scientific Infrastructure</li> <li>• Health and Environment</li> <li>• Education</li> </ul> |
| Subfactors |   |  |  |  |

**Fig. 1. Place of infrastructure in the system of ensuring the global competitiveness (in accordance with the methodology of the International Institute for Management Development)**

Source: developed by the authors based on [34].

Table 1

**Place of air transport infrastructure quality in the system of competitiveness (in accordance with the methodology of the Global Competitiveness Index)**

|   |  |  |
|---|--|--|
| Enabling Environment                      | Pillar 1: Institutions (8.3%)            |  |
|   | Pillar 2: Infrastructure (8.3 %)         | A. Transport infrastructure (50 %) <ol style="list-style-type: none"> <li>1. Road (25 %)</li> <li>2. Rail (25 %)</li> <li><b>3. Air (25 %)</b></li> <li>– <b>airport connectivity;</b></li> <li>– <b>efficiency of air transport services*</b></li> <li>4. Sea (25 %)</li> </ol> |
|   |  | B. Utility infrastructure (50 %) <ol style="list-style-type: none"> <li>1. Electricity (50 %)</li> <li>2. Water (50 %)</li> </ol>  |
|   | Pillar 3: ICT adoption (8.3 %)           |  |
| Pillar 4: Macroeconomic stability (8.3 %) |  |  |
| Human Capital                             | Pillar 5: Health (8.3 %)                 |  |
|   | Pillar 6: Skills (8.3 %)                 |  |
| Markets                                   | Pillar 7: Product market (8.3 %)         |  |
|   | Pillar 8: Labour market (8.3 %)          |  |
|   | Pillar 9: Financial system (8.3 %)       |  |
|   | Pillar 10: Market size (8.3 %)           |  |
| Innovation Ecosystem                      | Pillar 11: Business dynamism (8.3 %)     |  |
|   | Pillar 12: Innovation capability (8.3 %) |  |

**Note:** \* – the indicator shows the overall level of airport infrastructure of the country and its compliance with international standards, using the global overview.

**Source:** developed by the authors based on [47].

Table 2

**The ranking of countries by the Global Competitiveness Index, its innovative and infrastructure components**

| Country        | Global Competitiveness Index |          |           | Innovation capability |          |          | Efficiency of air transport services |          |           |
|----------------|------------------------------|----------|-----------|-----------------------|----------|----------|--------------------------------------|----------|-----------|
|                | 2016                         | 2017     | 2018      | 2016                  | 2017     | 2018     | 2016                                 | 2017     | 2018      |
| <b>1</b>       | <b>2</b>                     | <b>3</b> | <b>4</b>  | <b>5</b>              | <b>6</b> | <b>7</b> | <b>8</b>                             | <b>9</b> | <b>10</b> |
| USA            | 3                            | 2        | <b>1</b>  | 4                     | 2        | 2        | 9                                    | 9        | 8         |
| Singapore      | 2                            | 3        | <b>2</b>  | 9                     | 9        | 14       | 1                                    | 1        | 1         |
| Germany        | 5                            | 5        | <b>3</b>  | 5                     | 5        | 1        | 12                                   | 16       | 16        |
| Switzerland    | 1                            | 1        | <b>4</b>  | 1                     | 1        | 3        | 8                                    | 7        | 4         |
| Japan          | 8                            | 9        | <b>5</b>  | 8                     | 8        | 6        | 24                                   | 26       | 6         |
| Netherlands    | 4                            | 4        | <b>6</b>  | 7                     | 6        | 9        | 4                                    | 4        | 3         |
| Hong Kong      | 9                            | 6        | <b>7</b>  | 27                    | 26       | 26       | 3                                    | 2        | 2         |
| United Kingdom | 7                            | 8        | <b>8</b>  | 13                    | 12       | 7        | 18                                   | 28       | 15        |
| Sweden         | 6                            | 7        | <b>9</b>  | 6                     | 7        | 5        | 22                                   | 15       | 11        |
| Denmark        | 12                           | 12       | <b>10</b> | 10                    | 10       | 12       | 17                                   | 8        | 10        |
| Finland        | 10                           | 10       | <b>11</b> | 3                     | 4        | 10       | 5                                    | 5        | 3         |
| Canada         | 15                           | 14       | <b>12</b> | 24                    | 23       | 13       | 16                                   | 12       | 30        |
| Taiwan, China  | 14                           | 15       | <b>13</b> | 11                    | 11       | 4        | 33                                   | 43       | 25        |
| Australia      | 22                           | 21       | <b>14</b> | 26                    | 27       | 18       | 37                                   | 36       | 32        |
| Korea, Rep.    | 26                           | 26       | <b>15</b> | 21                    | 18       | 8        | 20                                   | 13       | 9         |
| Norway         | 11                           | 11       | <b>16</b> | 12                    | 14       | 20       | 15                                   | 10       | 20        |

| 1           | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
|-------------|----|----|----|----|----|----|----|----|----|
| France      | 21 | 22 | 17 | 17 | 17 | 11 | 13 | 18 | 22 |
| New Zealand | 13 | 13 | 18 | 23 | 20 | 27 | 23 | 22 | 26 |
| Luxembourg  | 20 | 19 | 19 | 16 | 15 | 19 | 27 | 23 | 21 |
| Israel      | 24 | 16 | 20 | 2  | 3  | 16 | 30 | 30 | 27 |

Source: developed by the authors based on [47].

competitiveness of the airport sector, the economic region and the national economy as a whole, is supported by a number of basic researches. For example, economists N. Itani, J. O'Connell and K. Mason [36, p. 129] argue that a competitive airport infrastructure is one of the main factors of air transport system competitiveness at the national level and affects the overall competitiveness of countries.

E. W. Schamp in his work [44, p. 131] analyzes the processes of deregulation, commercialization and privatization in the EU airport sector and concludes that "the indivisibility of physical infrastructure (of airports) with increased use causes significant economies of scale". The scientist considers expanding the physical infrastructure of airports as a driver of sustainable development and socio-economic growth.

A number of scientific studies [28; 29; 38; 48] examine the relationship between the global airport infrastructure and its surrounding regional space. The researches have developed a concept of aeroregionalism, the essence of which is that the imperatives of globalization and neo-liberalization intensify the regionalization of the airfield space, and the development of large-scale airport infrastructure affects the competitiveness of the surrounding regional space.

Several scholars [31; 32; 39; 42] also note the interdependence between the development of the airport infrastructure network of countries and the socio-economic welfare. The conceptual approach proposed by

the scientists is that airport infrastructure is seen as an economic generator, combining local and international markets, linking regions on a global scale.

The level of airport infrastructure development directly and indirectly influences economic growth of regions (Fig. 2). Direct economic impact on the local economy is manifested as a result of economic activity of airports and enterprises, the existence of which depends on the viability of the airport. This includes airport security, immigration services, airport administration, air traffic control, meteorological services, aircraft maintenance and repairs, ground handling, aircraft refuelling, commercial services at the airport, concessionaires and tenants of airport infrastructure, airlines, etc.

Indirect impact is due to money coming into economy from individuals, enterprises and organizations located outside the airport but related to the airport business. For example, companies which are included in the supply chain of the airport sector and are generators of indirect employment:

- ✦ suppliers of aviation fuel;
- ✦ construction companies that build infrastructure facilities at the airport;
- ✦ manufacturers of goods sold at the retail halls of the airport;
- ✦ wide range of activities in the business services sector (legal, accounting, information, etc.).

Induced impact is the result of the multiplicative effect of direct and indirect influences [35, p. 9]. It is im-

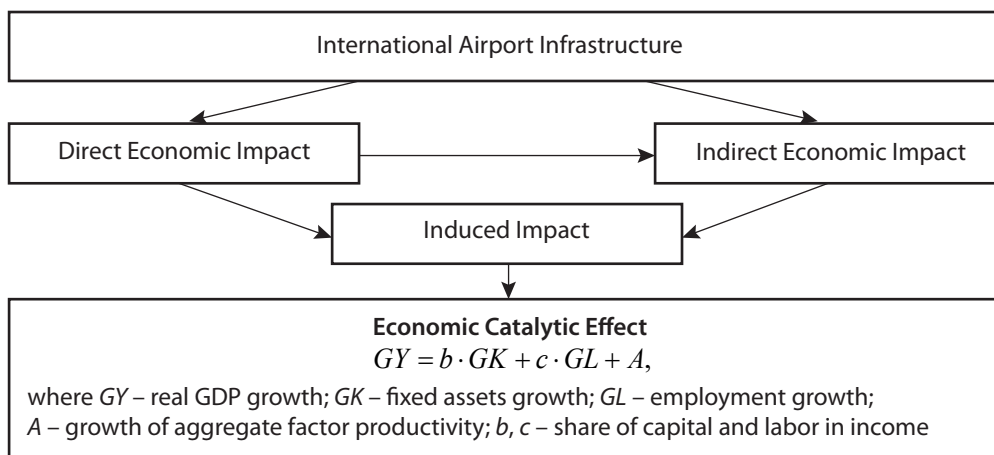


Fig. 2. The influence of airport infrastructure on the economy of a region

Source: developed by the authors based on [35].

portant to consider induced impact only in a local or regional context, since some of these effects will influence other adjacent regions.

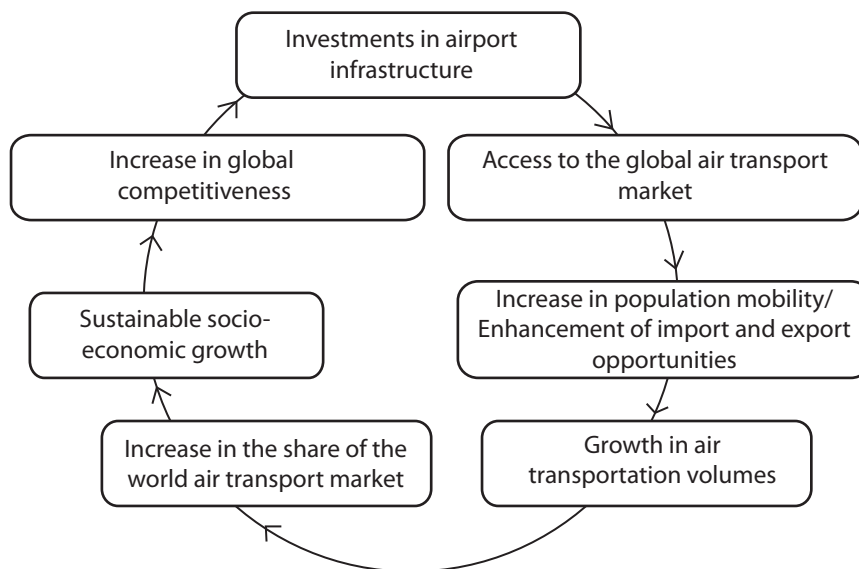
Economic catalytic impact results from the influence of air transport infrastructure development, which is not directly related to development of the air transport industry, on a country's economy.

Thus, innovative airport infrastructure is an important tool of national socio-economic prosperity and a key component of the modern innovation basis of competitiveness in the context of globalization transformations (Fig. 3).

economy as a whole, may serve as an incentive to provide such assistance for various reasons, including the desire to promote trade and cultural relations among countries.

Developing countries can benefit from special programs adopted by some governments to promote economic and social growth in different regions of the world.

The most important sources of foreign aid to developing countries in the field of airport infrastructure financing are international banks and funds created to facilitate the implementation of projects aimed at the development of national economies. The most famous banks and funds are the International Bank for Recon-



**Fig. 3. Linkage between the development of international airport infrastructure and global competitiveness**

Source: developed by the authors.

However, the acquisition and maintenance of long-term competitive advantages of countries requires producing and implementing knowledge and new technologies in a favourable institutional environment and investment climate. Furthermore, it should be noted that airport infrastructure is characterized by significant capital intensity, which, despite considerable positive economic consequences, reduces the ability of many governments to meet the financing needs of large-scale projects, causing a significant gap in the infrastructure in the global airport sector.

Historically, the most widespread practice of financing airport infrastructure development is government sources (grants, subsidies). Government sources include funds provided directly by governments as well as government financial institutions, including export promotion agencies. The funding can be provided either only by the national government or with the involvement of one or more foreign governments. Moreover, one or more international government institutions or agencies – bilateral institutions, banks, development funds – may participate [27]. Any airport infrastructure development project, which will eventually benefit the national

construction and Development and its subsidiaries – the International Development Association and the International Finance Corporation (although the purpose of the latter is to encourage development by providing loans to the private sector), as well as various regional banks and development funds.

In recent years, dependence on state funding has declined significantly with the continued increase in the number of autonomous structures that operate infrastructure of airports. The investment in the airport sector through public-private partnerships is becoming more widespread. The involvement of the private sector has become a further step towards the liberalization of property rights and the management of international airports and is part of the overall globalization process of the world economy.

Thus, under the current conditions of dynamic development and strengthening of networking of the world economy, one of the tools for increasing the global competitiveness of countries is management of airport facilities and development of a competitive innovative infrastructure capable of meeting the needs and requirements of the global air transport market.

## CONCLUSIONS

A thorough analysis of the concepts associated with enhancing competitiveness has made it possible to conclude that the effect of infrastructure development as an investment in the future is one of the conditions for ensuring social welfare and economic growth of countries. Moreover, infrastructure of international airports is one of the main structural elements in forming a modern innovation basis of competitiveness of national economies in the context of globalization transformations. Since airport infrastructure is characterized by considerable capital intensity, the government of each country chooses an individual optimal way for its development and financing with consideration to a number of factors, including the local geographical conditions, political situation, structural changes in the world economy, the nature of foreign economic relations, technological development level. ■

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