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TRANSPORT INFRASTRUCTURE: CURRENT STATUS AND DEVELOPMENT

Halyna Kryshtal
Interregional Academy of Personnel Management,
Kyiv, Ukraine
ORCID: 0000-0003-3420-6253

Author email: gkryshtal@ukr.net

Abstract. The **purpose** of the article is to identify approaches to understanding transport infrastructure and the level of human development, to determine the mechanisms of the impact of transport infrastructure on human development, to determine the mechanisms of the impact of human development on the state of transport infrastructure. The state of transport infrastructure of Ukraine is considered in detail in the article. According to the results of the study, the directions of the development of countries in terms of transport infrastructure and the level of welfare of the population are determined. The relationship between transport infrastructure and human development through the pricing mechanism has been studied. The study found out that the relationship is characterized by micro- ("transport infrastructure - pricing - human development") and macroeconomic ("pricing - transport infrastructure - human development") effects, which allowed to link this vector with the political sphere of society.

Methodology: The theoretical and methodological basis of the study is represented by the scientific works of leading scientists in the field of human development, as well as the author's concept of structural and infrastructural socio-economic development. The research used such methods as analysis and synthesis, the method of historical and logical modeling. The method of formalization, the method "from the abstract to the concrete", as well as the historical method, the method of economic interpretation are used as theoretical methods in the work. From a practical point of view, the study also included the method of grouping statistical data, statistical and econometric analysis. The **results** of the study can be used in the field of economic policy adjustment, in the courses of economic policy, state regulation, as well as in **practice** for the development of socio-economic and transport policy of the state.

Keywords: infrastructure, transport infrastructure, development, economy, economic growth.

JEL Classification: G1, L9.

INTRODUCTION

The relevance of the study is due to the fact that after 2008-2009, many countries to overcome the crisis and further stimulate economic growth have resorted to new infrastructure projects and modernization of the transport system and, in particular, transport infrastructure. However, the problem of "insufficient" transport infrastructure is becoming more acute in many countries, including Ukraine. The state of transport infrastructure can be one of the key factors hindering the

development of the country's economy. However, the negative consequences of underinvestment and backwardness of transport infrastructure are not limited to economic effects, but also negatively affect the level of human development.

LITERATURE REVIEW

The impact of transport infrastructure on the country's economy and the well-being of citizens is presented in the work of Say (2001). However, the assessment presented in the analyzed works is not based on the features of the effect of the transport system as a whole and the transport infrastructure. As a result, civil structures or transport network of canals are not the subject of study, as an example of the implementation of the proposed principles of utility assessment, although the authors do not define the term "infrastructure".

Another approach is revealed in Tunen (1926) "Isolated State", exploring the role of spatial indicators in economic activity ("concept of the zone of influence of the city"), considers in his analysis of infrastructure, expressed in distance from the city and transport costs. Tunen (1926) gave infrastructure a significant role in determining the economic behavior of a given locality, while he did not focus on infrastructure and did not define it.

In this regard, it is important to note that determining the role of transport infrastructure in economic processes is directly related to the concepts of structure and infrastructure. There is no single concept of infrastructure in economics, which is due to the practical orientation of scientists on this term and in its separate consideration from what is called structure.

In his work, the concept of infrastructure was explored by Rogenstein-Rodan (1957), who treated infrastructure as part of social (public) non-productive capital and the required minimum level of resources needed to operate as an individual company and the economy as a whole. According to the author, social non-productive capital is characterized by "indirect" productivity, which is achieved through a long period and includes basic industries (energy, transport, communications), which should be based on these characteristics to precede faster and more profitable investments focused on real products (real "productivity). The concept of infrastructure is represented through social non-productive capital.

This concept of infrastructure was developed in the works of Tinbergen (1962), in particular, in his work "The formation of the world economy. Proposals of international economic policy ". The author clearly separated the infrastructure from the structure, in fact presenting the former as a public good, but does not give a clear definition. Tinbergen (1962) is convinced that support at the appropriate level and further development of infrastructure is a task at the state level, as the fee for the use of state infrastructure innovations at the population level is not set. The factor of large amounts of investment required for further infrastructure development - limits the actions of the private sector in the possible participation in various public infrastructure projects. The structure, which includes production, agricultural industry, mining, in the future may be implemented by the private sector.

Rogenstein-Rodan (1957), Tinbergen (1962) tried to define the definition of infrastructure by distinguishing the difference from another phenomenon or process occurring in the state economy. In fact, it is a matter of finding the location of the infrastructure in relation to its structure. But Tinbergen (1962) avoids the material base of infrastructure, considering the latter as a possible indicator of the level of development of socio-economic relations.

Jochimsen, R., Ed. (1966) proposed the following interpretation of infrastructure as a set of material, own and institutional resources, combined with information resources, which will increase profits in the case of appropriate allocation of resources, namely the full integration and maximization of economic activity. The author mainly allocates material infrastructure, limiting the latter to such assets as: transportation, communication, energy supply, storage, activities of educational and medical institutions.

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Buhr (2003) considered infrastructure from the standpoint of functional characteristics, namely through material, institutional and personal components. Buhr (2003) pays special attention to the conditions under which a company, society or individual works and develops, in particular. The author tries to propose the definition of infrastructure in the context of socio-economic development and highlight the role of infrastructure in the economic system.

Since the definition of infrastructure is considered by scientists in this way and given the complexity of assessing social processes in the relationship that arises, the concept of infrastructure has been further developed exclusively in the material direction and in different contexts. As a result, the analysis of each type of infrastructure or the allocation of these types contributes to the creation of new definitions of infrastructure. For example, Gadgieva (2010) understands social infrastructure as projects that include "buildings and / or other infrastructure facilities needed to provide socially significant services to the population - medical and educational institutions, housing"; market infrastructure - "as institutions, centers that help the market to perform its functions"; and economic infrastructure is called "projects that provide and manage the infrastructure needed by a country or region to support economic growth" (Infrastructure Definition).

The concept of infrastructure, on the one hand, is constantly expanding, due to the growing interest of scientists in understanding the mechanisms of certain processes; on the other hand, economic thought increasingly avoids understanding the essence of infrastructure, which is the reason for the large number of definitions of this definition. The latter is largely due to the fact that against the background of increasing the number of private definitions related to specific objects, there is no general concept in economics that would reflect the economic understanding of infrastructure.

PAPER OBJECTIVE

The purpose of the article is to identify approaches to understanding transport infrastructure and the level of human development, to determine the mechanisms of the impact of transport infrastructure on human development, to determine the mechanisms of the impact of human development on the state of transport infrastructure.

METHODOLOGY

The theoretical and methodological basis of the study is represented by the scientific works of leading scientists in the field of human development, as well as the author's concept of structural and infrastructural socio-economic development.

The research used such methods as analysis and synthesis, the method of historical and logical modeling. The method of formalization, the method "from the abstract to the concrete", as well as the historical method, the method of economic interpretation are used as theoretical methods in the work. From a practical point of view, the study also included the method of grouping statistical data, statistical and econometric analysis.

RESULT AND DISCUSSION

The following discussion positions can be identified that reflect the problems in understanding the infrastructure at the stage of development of economic thought:

1. The proposed definition of infrastructure is static: the interaction of structure and infrastructure is not considered, in particular, the process of transformation into one is almost completely ignored.

2. Regarding the economy, the infrastructure and structure are not clearly defined.

Some authors equate the economic structure to the economic system, which is reflected in educational materials. Buhr (2003), Gadgieva (2010) consider in their works the economic system as "a set of interdependent economic elements that form a certain integrity, the economic structure of society." It can be seen that according to the proposed understanding of the economic system, it, according to the authors, has all the necessary characteristics of the structure. Analyzing this definition, it can be noted that the authors consider the economic system as a set of economic structure and economic infrastructure. However, due to the uncertainty of the boundaries of the analyzed structure, it is not clear what is its element: the subjects of economic activity, their relationships (they put the author in the status of the element), means and forms of production and distribution. Considering "elements" as separate structures combined into a more complex system, a large number of criteria that characterize the elements, we can not ultimately compare them. The reason for this phenomenon is that in this understanding of the economic system, the elements may be unbalanced for the system, and there may be a one-way relationship between the elements. Then the element may lose the "driving force" that actually determines the relationships that arise in the structure. Thus, we can say that the elements of the structure in order to create a structure must be comparable in nature to one degree or another; for it is this compatibility that determines the relationship between the elements (for example, rivalries or cooperatives, buying or selling).

We can conclude that the problem of correlation of infrastructure - structure - and the system is not solved. Moreover, in economics this problem is not realized and, as a consequence, is not studied.

The issue of the impact of transport infrastructure and price as two separate factors on human development in economics Khandker (2009), Stifel (2015) is considered at the present stage rather a priori as a proven fact, and is studied indirectly. At the same time, this problem is considered by the scientific community mainly in one direction. Thus, the positive effect of transport infrastructure on human development is determined through increased mobility and availability of resources, increased trade and, consequently, economic growth, which leads to higher living standards and human development.

Considering the connection between the process of pricing and transport infrastructure as a set of basic structures and systems that provide passenger and / or freight, many authors limit themselves to analyzing the level of prices for transport services and / or transportation or considering the transport component in the price of goods. stimulates lower prices in the economy with economic growth and leads to an increase in real per capita income Dubrovskaya (2015).

The high complexity of the analysis of prices and their components only at the level of the economy as a whole, due to the great differentiation of different products, is the main limitation of empirical confirmation of macroeconomic impact of price, determined by the level of human development in society. This problem is largely determined by the dominant microeconomic view of price in the economy, as a result of which the macroeconomic effect of the latter is almost completely ignored outside the analysis of command-and-control economics.

The question of the impact of the development of the transport system as such and the transport infrastructure on the price of a product is the subject of many studies and discussions. For example, Bougheas (1999) showed that the availability of infrastructure helps reduce transport costs and, consequently, lower product prices, leading to increased trade.

Staal (2000) on the example of Kenya demonstrated the impact of the presence / absence of paved roads, as well as their quality on the volume and price of milk sold. The author was able to show that in hard-to-reach areas of Kenya from a transport point of view, the price per liter of milk can be five or more times higher than in areas with a higher level of transport infrastructure. At the same time, areas were identified where the terrible condition of the roads caused farmers to refuse to supply and sell their products there.

The opposite effect - the development of transport infrastructure and the resulting reduction in prices due to reduced company costs for logistics and transportation - is described in Scherbanin

(2011). Thus, the presence of the vector of influence "transport infrastructure - price" is a scientifically proven fact in economics.

The identified one-sided effect also occurs at the macroeconomic level. The impact of the development of transport infrastructure and the reduction of transport costs in price is not limited to any product or group of these products. Considering the transport system as a public good, the positive effect of its development will spread to all spheres of society, including the economy.

Transport infrastructure, despite the unambiguous interpretation of this term, is characterized by many different indicators, each of which is related to the activities of a particular mode of transport. This fact significantly complicates the process of analysis and assessment of the level of development of transport infrastructure.

Preysner (2016) uses several different indicators of transport infrastructure, including the length of roads, their density per capita, investment in the development of transport infrastructure. Popova (2017) in its study to assess the level of development of transport infrastructure takes the following indicators: freight traffic, road length, road density (km per 100 sq. Km). Popova (2017) in analyzing the relationship between transport infrastructure and economic growth in China refers to the total density of the transport network per person (including the calculation of water, rail and road modes of transport).

Popova (2017) in her work analyzed the transport infrastructure "in stages" - for each of the analyzed characteristics, which include the number of public transport lines, the area of roads, traffic jams, speed. An interesting option for determining the level of transport infrastructure is presented by Ziadah (2018) in the process of analyzing the development of transport infrastructure in Dubai. He suggested using a containerization rate for each mode of transport, explaining this not only by the global trend towards "seamlessness" by reducing downtime and reducing the effort required to move cargo from one mode of transport to another, but also by saying that the use of containers in freight about the high level of technological development of a particular mode of transport.

In theoretical terms, the impact of transport infrastructure development on the level of human development in the form of the human development index is determined by the following mechanisms: 1) indirect impact achieved through economic growth, as transport infrastructure development 2) increasing the mobility of capital and population, which has a positive impact on citizens' access to education, medicine, jobs, cultural facilities, etc .; 3) pricing.

The direct impact of the positive effect of the development of transport infrastructure on human development may be due to its impact on education and health of citizens. Road construction leads to an increase in the number of children attending school. The positive impact of transport infrastructure on citizens' health has been demonstrated by many authors, with the example of Ethiopia showing that improving transport infrastructure, leading to increased market access, has a positive effect on people's nutrition and, consequently, on their health.

These studies show that the development of transport infrastructure not only contributes to the increasing availability of many resources (educational, medical, etc.) for the population, but also determines the volume and intensity of trade and, consequently, production and employment.

The development of transport infrastructure contributes to the increase of mobility, expressed, in particular, in the time spent transporting the product.

It can be assumed that in addition to the direct link between transport infrastructure and mobility, there is also an indirect link, which is determined by the institutional environment or the institutional system that develops in the territory. As a result, the construction of new railways is expanding the institutional system, which has a positive impact on the efficiency of self-development of territories (for example, in single-industry towns), the volume of investment, employment growth in the economy of the country / region and more.

If the direct and indirect impact of transport infrastructure development on the human development index: due to increased mobility of population and capital and economic growth, in

general, of course, requires special consideration of the third mechanism of transport infrastructure on the human development index - through pricing.

The last mechanism - the impact through pricing - is because the development of transport infrastructure contributes to the reduction of the transport component in the price, which generally stimulates the downward trend in prices with economic growth. In principle, we can say that the first and last mechanism are continuously interconnected. Thus, the development of transport infrastructure, by reducing the final price of goods, leads to an increase in transportation, more efficient use of labor, to economic growth, which is expressed, inter alia, in the form of accelerated growth of per capita income. The development of transport infrastructure also determines the speed of transfer and dissemination of technology and innovation - a factor that determines the stability and prospects of both business and social environment. In this way, we can present one of the vectors of the impact of transport infrastructure on the human development index through pricing: Transport infrastructure - Pricing - Economic Growth - Human Development Index.

The problem of pricing as a factor determining the effectiveness of both individual enterprises and the industry as a whole is the subject of research by many scientists. At the same time, in foreign practice, the concepts of pricing at the enterprise level (pricing) and pricing as a result of economic, political and social processes at the market, industry and / or country (price formation) level are clearly divided. There is no such terminological division in Russian practice. Due to the predominance of market relations in many countries around the world, it is of great interest to study pricing at the company level, which determined the direction of the previously described vector (transport infrastructure - pricing - economic growth).

Despite the interest and practical value of pricing research at the company level, they not only do not reflect the general state of the market, but also neglect the impact of macroeconomic factors on pricing and, consequently, different categories of economic agents, including companies and individuals. The macroeconomic approach to pricing analysis allows us to assess the impact of many institutional factors on the process of price formation and, consequently, on living standards.

From the standpoint of pricing because of economic, political and social processes, many scholars focus on analyzing the impact of individual processes and / or institutions on pricing. Thus, the impact of pricing on the level of human development is due to the contribution of institutional and macroeconomic factors operating within the existing social relations in the process of price formation. As a result, we can say that the level and features of existing socio-economic relations, determining the pricing process at the state level, determine the level and development of the human factor in the country through the development (or inhibition) of transport, culture, science and more.

Then the second vector of the impact of transport infrastructure on the human development index through pricing is as follows: Pricing - Transport infrastructure - Human Development Index. This connection is the subject of many studies today. The reverse effect - the level of human development on the state of transport infrastructure, can be represented by two main vectors: 1) the human factor; and 2) economic growth. The idea of the ability of the individual to influence the level of development of transport infrastructure is the position that any infrastructure is the result of human activity.

The human factor suggests that further stimulation of intellectual activity contributes to scientific and technological progress, which has a positive impact on the quality of infrastructure. This impact is largely due to increased productivity and efficiency of human labor, the emergence of creative and ideological capital, as well as increasing the level of culture and awareness of social responsibility.

The most important aspect of the impact of the human factor on transport infrastructure is participation in the creation of knowledge and, as a consequence, intellectual value, which contributes to the development of technology. The second vector - economic impact - is also determined by the growing relationship of economic growth and scientific and technological progress with man and his development. In this way, human development determines the transformation of "atoms" into "bits". Based on this understanding of the role of human

development in the economy, many authors propose to define economic growth not only as a process of quantitative change, but also as qualitative and structural changes that have a positive impact on the economy and living standards, thus laying the foundation for human development, economic growth. Economic growth, in turn, affects the development of transport infrastructure in accordance with macroeconomic policies, the amount of funding allocated by the state for the construction / modernization of the existing transport system, for example, opening opportunities for new infrastructure projects.

CONCLUSION

As a result, three main vectors of the impact of transport infrastructure on the level of human development were identified: 1) through mobility; 2) through economic growth and 3) through pricing. The reverse effect - the level of human development on the state of transport infrastructure can be represented by two vectors: 1) the human factor; and 2) economic growth.

Based on the above analysis, we can say that each of these areas focuses on different areas of society, but is not limited to it. Thus, the mobility factor and / or the human factor is more focused on the social sphere with indirect impact on the economy. The vector of "economic growth" is mainly related to the economic sphere of society. The relationship between transport infrastructure and human development through the pricing mechanism, as the study showed, is characterized by micro- ("transport infrastructure - pricing - human development") and macroeconomic ("pricing - transport infrastructure-human development") effects, which allows to connect this vector with the political sphere of society.

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ТРАНСПОРТНА ІНФРАСТРУКТУРА: СУЧАСНИЙ СТАН ТА РОЗВИТОК

Кришталь Галина Олександрівна
Міжрегіональна академія управління персоналом,
Київ, Україна

Мета статті полягає в виявленні підходів до розуміння транспортної інфраструктури та рівня розвитку людського потенціалу, визначенні механізмів впливу транспортної інфраструктури на людський розвиток, визначенні механізмів впливу рівня розвитку людського потенціалу на стан транспортної інфраструктури. У статті детально розглянуто стан транспортної інфраструктури України. За результатами дослідження визначено напрямки розвитку країн щодо транспортної інфраструктури та рівня добробуту населення. Досліджено взаємозв'язок транспортної інфраструктури та людського розвитку за допомогою механізму ціноутворення. Врезультаті дослідження виявлено, що взяємозвязок характеризується мікро- («транспортна інфраструктура – ціноутворення – людський розвиток») та макроекономічним («ціноутворення – транспортна інфраструктура-людський розвиток») ефектами, що дозволило пов'язати цей вектор з політичною сферою життя суспільства.

Теоретична та методологічна база дослідження представлена науковими працями провідних учених у галузі вивчення людського розвитку, а також авторською концепцією структурно-інфраструктурного суспільно-економічного розвитку. У процесі дослідження використовувалися такі методи, як аналіз та синтез, метод історичного та логічного моделювання. Як теоретичні методи в роботі застосовуються метод формалізації, метод «від абстрактного до конкретного», а також історичний метод, метод економічної інтерпретації. З практичної точки зору в дослідженні також були задіяні метод угруповання статистичних даних, статистичний та економетричний аналіз. Результати дослідження можуть бути використані в частині коригування економічної політики, у навчальних курсах економічної політики, державного регулювання, а також практично для розробки соціально-економічної та транспортної політики держави.

Ключові слова: інфраструктура, транспортна інфраструктура, розвиток, економіка, економічне зростання.

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ТРАНСПОРТНАЯ ИНФРАСТРУКТУРА: СОВРЕМЕННОЕ СОСТОЯНИЕ И РАЗВИТИЕ

Кришталь Галина Александровна
Межрегиональная академия управления персоналом,
Киев, Украина

Цель статьи состоит в выявлении подходов к пониманию транспортной инфраструктуры и уровню развития человеческого потенциала, определении механизмов влияния транспортной инфраструктуры на человеческое развитие, определении механизмов влияния уровня развития человеческого потенциала на состояние транспортной инфраструктуры. В статье подробно рассмотрено состояние транспортной инфраструктуры Украины. По результатам исследования определены направления развития стран по транспортной инфраструктуре и уровню благосостояния населения. Исследована взаимосвязь транспортной инфраструктуры и человеческого развития посредством механизма ценообразования. В результате исследования выявлено, что связь характеризуется микро- («транспортная инфраструктура – ценообразование – человеческое развитие») и макроэкономическим («ценообразование – транспортная инфраструктура-человеческое развитие») эффектами, что позволило связать этот вектор с политической сферой жизни общества.

Теоретическая и методологическая база исследования представлена научными трудами ведущих ученых в области изучения человеческого развития, а также авторской концепции структурно-инфраструктурного общественно-экономического развития. В процессе исследования использовались такие методы как анализ и синтез, метод исторического и логического моделирования. В качестве теоретических методов в работе применяются метод формализации, метод «от абстрактного к конкретному», а также исторический метод, метод экономической интерпретации. С практической точки зрения в исследовании также были задействованы метод группировки статистических данных, статистический и эконометрический анализ. Результаты исследования могут быть использованы в части коррекции экономической политики, в учебных курсах экономической политики, государственного регулирования, а также практически для разработки социально-экономической и транспортной политики государства.

Ключевые слова: инфраструктура, транспортная инфраструктура, развитие, экономика, экономический рост.