

**N. Osadcha,**  
*DrHab (Economics), Associate Professor,*  
ORCID 0000-0001-5066-2174,  
e-mail: nosadcha86@gmail.com,  
*Institute of Industrial Economics of the NAS of Ukraine, Kyiv,*

**V. Zatyshniak,**  
*PHD student,*  
*Director,*  
ORCID 0000-0002-5865-722X,  
interdnipro@gmail.com,  
*Dnipropetrovsk regional investment agency*

## ASSESSMENT OF THE ECONOMIC POTENTIAL AND INVESTMENT ATTRACTIVENESS OF THE DNIPROPETROVSK REGION

### Introduction

After four months of the war, different ideas, opinions and visions are increasingly being heard about how to restore the destroyed infrastructure and economy of Ukraine. "The post-war reconstruction of Ukraine will have been one of the largest projects since the well-known Marshall Plan. Its implementation will be the issue of the entire civilized world, because today we are fighting not only for ourselves, but also for global security," said Yuliya Svyridenko, First Deputy Prime Minister – Minister of Economy of Ukraine [9].

Ukrainian infrastructure and real estate suffered the most from the Russian invasion. The final figures can be specified after the war. It is advisable to conduct an international audit of losses for understanding how to put all this into practice. Ukrainian companies need two things. The first one is a partnership with European and American companies for technology transferring.

The purpose of the present research is to determine priority directions for increasing investment attractiveness of Dnipropetrovsk region and to test the practical possibility of using results of regions investment attractiveness assessment (mostly based on the self-developed/novel approach for their marketing promotion to potential. The novelty of this paper is mostly about the proposed so-called territorial investment marketing, based on the results of a comprehensive monitoring of the regional investment climate of Ukraine. Territorial investment marketing is an assessment of the regions investment attractiveness and the provision of information for investors, indicators for measuring may vary according to the investors' requirements.

### Methods

Research methods: analysis and synthesis, abstraction and generalization, a systematic approach to analysis of economic processes and phenomena, economic, statistical, and mathematical analysis.

The Rasch model transforms measurements made on dichotomous and ordinal scales into linear measurements, and the resulting qualitative data are analysed using quantitative methods.

**Result.** During the full-scale aggression of Russia, the National Bank of Ukraine implements measures in the monetary sphere, which are primarily aimed at ensuring the uninterrupted functioning of the banking system and payments in the economy. In June 2022, the National Bank immediately raised the discount rate by 15 perc. points up to 25%. Therefore, the rate for refinancing loans is equal to the discount rate plus 2 pers. points, and for deposit certificates – the discount rate is minus 2 pers. points.

The National Bank expects that the increasing the discount rate to 25% will be sufficient to ease the pressure on the foreign exchange market and stabilize inflationary expectations, that in the long-term perspective will create the prerequisites for transition to a cycle of the discount rate lowering. But this will lead to increasing of credit rates and risks for entrepreneurs.

The measures of the National Bank had a significant impact, in particular, fixing the hryvnia's exchange rate and limiting its fluctuations on the interbank market, which was primarily reflected in the prices of goods and services of critical import. Also, the government's administrative restriction of the prices inhibited the inflationary processes.

At the same time, production and logistics disrupted by the war are fuelling inflationary processes. High world energy prices also remain a significant pro-inflationary factor and put pressure on consumer inflation both directly and indirectly – through the increasing of enterprises production costs. Inflation rates have reached record levels in the world, in particular, in the countries of the Eurozone and in the USA – more than 8% in annual terms. It also fuels the price growth in the domestic market of Ukraine.

World history has many examples of reconstruction of countries after military actions. After the end of the Second World War, more than 30 major wars and more than 250 military conflicts took place in the world, in which no less than

Dnipropetrovsk region is traditionally known as a powerful industrial, resource, intellectual and cultural centre. As at the beginning of 2022, Dnipropetrovsk region also leads in terms of indicators such as:

- volume of foreign direct investment (\$5,3 bln);
- volume of capital investments (\$2,3 bln);
- volume of goods export (\$12,2 bln);
- volume of goods sold (\$46,5 bln) [18].

Thanks to the decentralization reform, 86 territorial communities were created in the region, which are united into 7 districts. Local communities are points of economic growth and centres of investment attraction. Dnipropetrovsk region systematically works to promote a positive image of the region on foreign markets. In February 2022, the Dnipropetrovsk Region entered the TOP-10 of the international ranking of the FDI Intelligence magazine "European Cities and Regions of the Future 2022/23" for the second time, increasing its position in the "Strategy of attracting FDI" category (Fig. 1).

TOP 10 MID-SIZED EUROPEAN REGIONS OF THE FUTURE 2022/23 – FDI STRATEGY		
RANK	REGION	COUNTRY
=1	Brabant	Netherlands
=1	Northern Ireland	UK
3	Glasgow	UK
4	Lower Austria	Austria
5	Greater Zurich Area	Switzerland
6	Manchester	UK
7	Pomorskie Voivodeship	Poland
8	Dnipro Region	Ukraine
9	The Basque Country	Spain
=10	The Canary Islands	Spain
=10	Tuscany	Italy

Fig. 1. Rating of FDI Intelligence magazine "European cities and regions of the future 2022/23" [6]

The investment attractiveness of Dnipropetrovsk region is ensured by the availability of appropriate resources, in particular, skilled workforce. Dnipropetrovsk region is one of the main labour markets in the South-East of Ukraine, with 1.5 million economically active people. The region leads in terms of employment of the working age population – 73%. At the same time, the unemployment rate for 2021 year was only 7.7%.

The average salary for the past year was \$470. The highest wages were in the service sector – more than \$600 and industry – \$514 [18].

In addition, Dnipropetrovsk region is one of the leading academic centres of Ukraine. In 2021, higher educational institutions of the region of various accreditation levels, including vocational and technical educational institutions, will train almost 40,000 specialists.

Since the beginning of the war, the Dnipropetrovsk region has given a shelter for more than 280,000 internally displaced persons (IDPs). Almost 70 thousands of them are children and more than 100 thousands are women. Residents from Donetsk and Luhansk regions mostly settled in Dnipropetrovsk

region. More than half of which are highly qualified personnel.

It should be noted that the Dnipropetrovsk region is one of the richest in minerals among other regions of Ukraine. On the balance of the territory, there are 145 deposits (as of 2021) of non-metallic minerals, of which 63 are being developed, that is 44%. Development of the mineral and raw material base of building materials does not exceed 50%.

Brown coal and gas are mined as combustible materials. The following metals are mined: iron, manganese, titanium ores, nickel, aluminium, dolomite, gold, uranium. Among the non-metallic materials there are talc, paint raw materials; flux limestone, kaolin, clay, granite, staurolite, molding sand; cement raw materials, building sand, facing stone; building stone; sawn stone; expanded clay and brick and tile raw materials. There is also mineral water in the region.

The availability of minerals, skilled labour, industrial infrastructure, transport and logistics infrastructure affect its investment attractiveness and the development of export potential.

The results of the Dnipropetrovsk region's foreign economic activity in 2021 indicate the strengthening of the integration of its economy into the world economy and an increase in demand for domestic goods and services.

The largest trade partners of the region in 2021 were the USA, Poland, Turkey, Germany and China.

The export of goods increased by 60.22% compared to 2020, due to the increase in the volume of export of the main types of goods: ferrous metals – export amount to \$4,8 billion, increased by 69.7%; ores, slag – \$4,7 billion, increased by 66.7%.

In turn, import increased by 26.72%. The business of the region was most interested in the following goods: oil and products of its processing – import is \$1,2 billion, increased by 50.2%; machinery and equipment – \$1 billion, increased by 15.9%; chemical products – \$0,9 billion, increased by 23.6%.

In Dnipropetrovsk region, 153,200 subjects of economic activity are registered: 30,800 enterprises and 122,400 individual entrepreneurs. Among them: 63 large enterprises (12.3% of Ukrainian enterprises), 1,437 medium enterprises (8%) and 29,327 small and micro enterprises (8.2%).

Enterprises provide 92.8% of all products sold in the region. Individual entrepreneurs account for 7.2%. Trade enterprises (42.4%) and industrial enterprises (41.9%) are dominating among the types of enterprise activity in the region. As for individual entrepreneurs, trade (48.1%) and services (42.7%) are the most developed.

By the beginning of 2022, foreign direct investments (FDI) in Dnipropetrovsk region were made by 1,380 companies from 58 countries of the world, amounting to \$5,3 billion (accumulated since 1993).

According to this indicator, the region has been leading in Ukraine for 10 years in a row. During 2021, foreign investors put \$110,6 million in direct investments in the economy of Dnipropetrovsk region, which was 9.3% of the all-Ukrainian figure.

Last year, enterprises and institutions of all forms of ownership made capital investments in the amount of \$2,3 billion – this is 12.4% of the all-Ukrainian indicator. Such indicators allowed the region to retain first place in the rating of capital investments among the regions of Ukraine and testify to the massive investment activity of existing enterprises. Annual volumes of capital investments make up almost half of foreign direct investments, which are calculated from the beginning of investing in Ukraine.

After February 24, 36 enterprises from Donetsk, Luhansk, Zaporizhzhia and Kharkiv regions relocated to Dnipropetrovsk region. 12 enterprises have already started to work. Among them are a factory for special fasteners, production of paper packaging and polyethylene film, logistics and sewing companies. Two large machinery factories are currently assembling production lines. Another 28 enterprises have placed

their warehouses on the territory of Dnipropetrovsk region.

The war in Ukraine fundamentally changed the conditions of economic development and investment attractiveness of regions; some of them are either completely destroyed or occupied. Provided the situation stabilizes and risks are minimized, the regions will continue to compete for resources for recovery and further development. An important factor in the development of both territories and business will again be investment attractiveness, the components of which are the presence of economic potential, resource base, infrastructure and operating enterprises as reliable partners.

In the Development Strategy of the Dnipropetrovsk region until 2027, the following strategic vision is formed: Dnipropetrovsk region is a smart region, attractive for investment and environmentally safe, with high-tech industrial and agricultural complexes, strong export, educational and scientific potential, with European level of service, where residents of all settlements will be provided with comfortable living conditions, self-realization and personal development.

At the same time, the Focus of the Strategy does on ensuring an investment-attractive and ecologically correct image of the territory through the introduction of a cluster model of development and effective using of the innovative potential of the region.

Priority industries in which it is advisable to invest for the Dnipropetrovsk region were determined according to the concept of start-specialization, which involves productive interaction between regional authorities, business, science and the public. The sectoral priorities chosen by the Dnipropetrovsk region demonstrate the desire to transform the economy through the development of high-tech industries and types of economic activity with high added value. The strategic goal of the Dnipropetrovsk region is innovative development based on smart specialization, and its sectoral priorities are the chemical complex, mechanical engineering, and the production of building materials.

Dnipropetrovsk region is the leader among other regions of Ukraine in production and sale of industrial products. In 2021, the volume of industrial production of the region was 18% (\$23,9 bln) of the Ukrainian volume (\$128,5 bln). It should be noted that 50% of Ukraine's exports are given by the Dnipropetrovsk region (Fig. 2).

In the Fig. 3 it is illustrated the region is led by the extractive industry that accounts for 41.2% of the all-Ukrainian volume of extractive industry and the metallurgical industry that accounts for 35.8%.

Products of the metallurgical and mining industry are mainly exported; in 2021 the export indicators of the metallurgical and mining industries were 68.8% and 55.3%, and those of the chemical industry and engineering – 23.1% and 10.3% (Fig. 4).

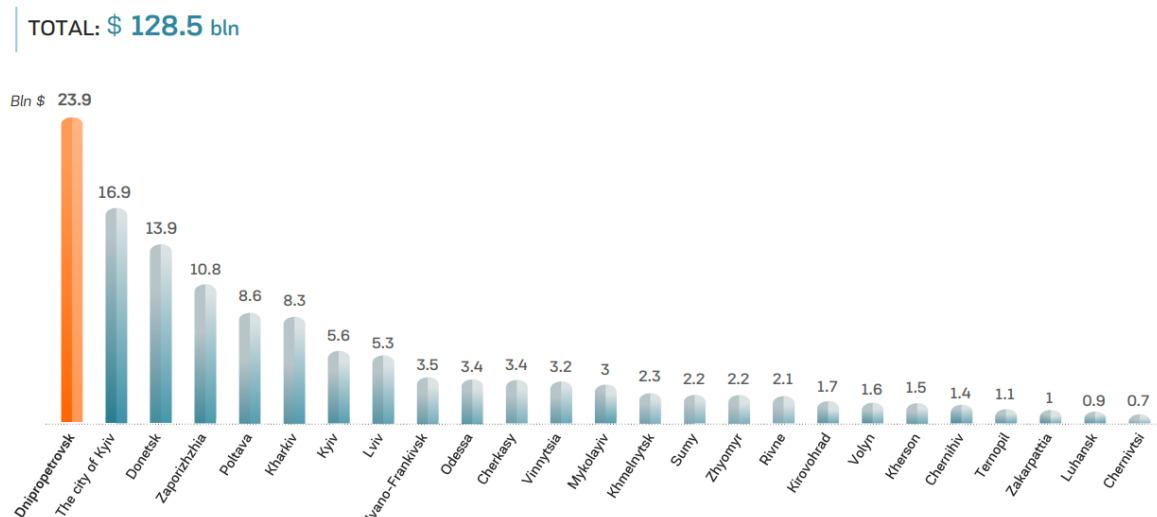


Fig. 2. Volumes of sold industrial products by regions of Ukraine, 2021

Source: data compiled by the authors from [18].



Fig. 3. Volumes of sold industrial products in 2021

Source: data compiled by the authors from [18].

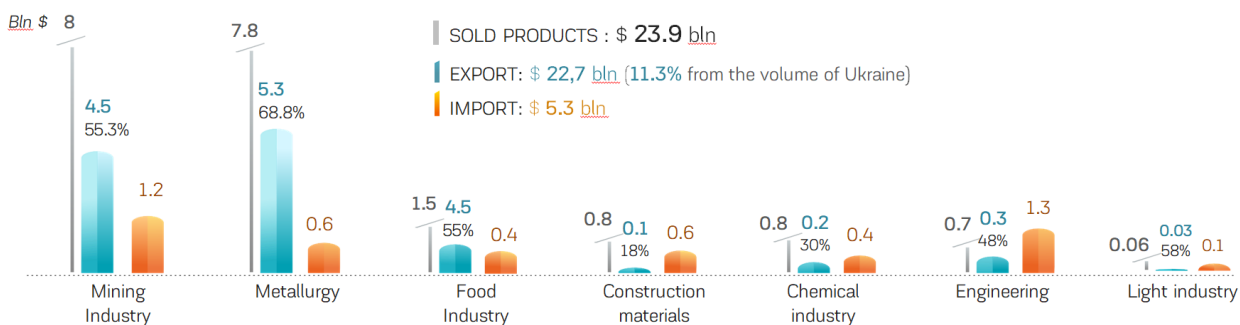


Fig. 4. Volumes of sold industrial products by types of activity, 2021

Source: data compiled by the authors from [18].

In the structure of the goods export of the Dnipropetrovsk region in 2021, the largest share was the export of ferrous metals -39.4% and the export of ore -

38.5% (Table 1). That is, the export of Dnipropetrovsk oblast has a raw material nature.

Table 1

**Dnipropetrovsk region – the volume of goods exports in 2021**

Name of goods	% from total exports	Export, \$
Iron and steel	39.4	4 792,910,000
Ores, slag and ash	38.5	4 688,100,000
Articles of iron or steel	6.2	764,150,000
Animal or vegetable fats and oils and their cleavage products	4.1	500,300,000
Railway locomotives	1.7	217,710,000
Fertilisers	1.4	179,180,000
Cereals	1,1	144,910,000
Mineral fuels, mineral oils and products of their distillation	0.7	97,080,000
Plastics and articles thereof	0.7	94,760,000
Nuclear reactors, boilers, machinery	0.6	76,360,000
Others	5.05	614,270,000

Source: data compiled by the authors from [18].

Potential growth points for the Dnipropetrovsk region are the industries of producing of building materials and rubber and the chemical industry. Because of, approximately 60 percent of these industries

products are imported. It is advisable to carry out import substitution and cover the demand for these types of goods at the expense of domestic production (Table 2).

Table 2

**Dnipropetrovsk region – the volume of goods imports in 2021**

Name of goods	% from total imports	Import, \$
Mineral fuels, mineral oils and products of their distillation	20.0	1 178,590,000
Nuclear reactors, boilers, machinery	9.9	582,470,000
Pharmaceutical products	8.7	512,970,000
Electrical machinery	7.7	456,020,000
Plastics and articles thereof	6.1	358,590,000
Iron and steel	5.5	327,050,000
Vehicles other than railway rolling stock	4.3	257,870,000
Rubber and articles thereof	2.5	149,160,000
Articles of iron or steel	2.4	145,880,000
Essential oils	1.7	100,090,000
Others	30.76	1 806,320,000

Source: data compiled by the authors from [18].

However, the largest demand in the domestic market is in the field of mechanical engineering.

First of all, it is necessary to pay attention to this when concluding international contracts for the purchase of mechanical engineering products for infrastructure projects that must contain the conditions with a localization percentage of more than 50%. This practice is generally accepted in the developed countries of Europe and America. Therefore, the points of growth chosen by the expert community in the pre-war period are still relevant today and demonstrate sustainable potential for development. In the period of economic recovery after the war, it will be necessary to conduct an audit of losses and make appropriate adjustments to the Regional Development Strategy.

An international conference held on July 4-5, 2022 in the city of Lugano (Switzerland) was devoted to the post-war reconstruction of Ukraine and its regions. According to the recovering plan presented by the Government of Ukraine, the country needs \$750 bln in investments, two-thirds of which should be supported by partners – grants, loans and equity capital. At the same time, the needs for financing priorities in 2022 amount to about \$60-65 billion, excluding defence and security sector expenditures. The plan declares the desire to achieve sustainable economic growth of more than 7% by 2032, the accumulation of \$750 bln in foreign investments, Ukraine's entry into the TOP-25 in the ranking of countries in terms of human capital and economic development, and a 65% reduction in CO<sub>2</sub>

emissions compared to 1990. It is planned to focus on the development of economic sectors in the context of Ukraine's competitive advantage and the Green Deal, declared the intentions to launch "catalyst projects" to unlock private investment in priority sectors. As well as ensuring competitive cost of capital in the context of military risks.

The lion's share of investments, as evidenced by the "investment menu", until 2032 is planned in energy (\$177,4 bln) and logistics (\$122,5 bln), much less in military industry (\$43 billion) and agricultural industry (\$33,9 bln). By contrast, investments in mechanical engineering (\$15,8), furniture and woodworking (\$4,6 bln) and even metallurgy and metalworking (\$26,3 bln) over a 10-year horizon are quite insignificant. And the mining industry is generally limited to \$1 bln [2].

It is advisable to allocate investments taking into account the priorities and growth points of the regions.

Further, we sum up the criteria by year and evaluate the criteria according to the created model and

get an indicator that will reflect the investment attractiveness of the regions. Based on the received data, we present a table of investment attractiveness of the regions of Ukraine/.

According to calculations, Dnipropetrovsk, Kyiv, Kharkiv and L'viv regions are the most promising for investments. After the end of the war, indicators of security, destruction, damage, and energy independence should be added to the model. At the moment, the war continues and these figures cannot be calculated.

### Conclusions

According to the assessment of regions, using the Rasch model, the most attractive for investors are Dnipropetrovsk, Kyiv, Kharkiv and L'viv regions.

These data may be recalculated in the future depending on the situation at the front and changes in the structure of each region's economy.

After the war, it is necessary to assess the losses of each region and carry out an international audit. In order to restore the economy of Ukraine, it is necessary to use the experience of countries which had military events.

### References

1. Analytical agency "Dragon-Capital". Retrieved from <http://www.dragon-capital.com>.
2. Bandurka, A. A., Bandurka, A. M., Nosova, O. V. (2004). Inostrannyye investitsii v ekonomiku Ukrainy [Foreign investments in the Ukrainian economy]. Kharkiv, Publishing House of the National University. internal affairs [in Russian].
3. Barkalov, S., Kireev, Y., Kobelev, V., & Moiseev, S. (2014). Model' otsenivaniya privilekatel'nosti al'ternativ v podkhode Rash-analiza [A model for evaluating the attractiveness of alternatives in the Rash analysis approach]. *Sistemy upravleniya i informatsionnyye tekhnologii – Control systems and information technologies*, 57(3.2), pp. 209-213 [in Russian].
4. Boone, W. J., Staver, J. R., & Yale, M. S. (2014). Rasch Analysis in the Human Sciences. Dordrecht, Springer. DOI: <https://doi.org/10.1007/978-94-007-6857-4>.
5. Dnipropetrovsk region and Kyiv city are the most attractive to the foreign investors. Retrieved from <http://www.dia.dp.ua/en/news/648/>.
6. European cities and regions of the future 2022/2023 – winners. Retrieved from <https://www.fdiintelligence.com/content/rankings-and-awards/european-cities-and-regions-of-the-future-20222023-winners-80707>.
7. Global economic prospects. (2021). *The World Bank*. Retrieved from <http://www.worldbank.org/en/publication/global-economic-prospects>.
8. International Monetary Fund. (2021). Retrieved from <http://www.theglobaleconomy.com>.
9. Sviredenko, Yulia. (2022). Yaku ekonomiku my buduiemo? [What kind of economy are we building?]. Retrieved from <https://www.pravda.com.ua/columns/2022/07/8/7357131/> [in Ukrainian].
10. Kanischenko, O. L. (2004). Mizhnarodny Marketing: teoriya i gospodarski situatsii [International marketing: theory and economic situations], Kyiv, Politehnika [in Ukrainian].
11. Proekt Natsionalnoi stratehii rozvytku eksportu Ukrainy [Draft of the National Strategy of Export Development of Ukraine]. (2021, May 25). *Ministry of Economic Development and Trade of Ukraine*. Retrieved from: <http://ukrexport.gov.ua/ukr/zed/strategy/ukr/4589.html> [in Ukrainian].
12. Navrotska, N. H., Marharytina, O. B. (2006). Spetsialna statystyka dlia yurystiv ta ekonomistiv. Instruktsiia [Custom statistics for lawyers and economists. Manual]. Dnipropetrovsk. Ukrainian Academy of Customs [in Ukrainian].
13. Ukraina i Kot-d'Ivuar dogovorilis' aktivizirovat' torgovo-ekonomicheskoye sotrudnichestvo [Ukraine and Côte d'Ivoire have agreed to intensify trade and economic cooperation]. (2017, February 28). *pressorg24.com*. Retrieved from <http://pressorg24.com/news?id=319438> [in Russian].
14. Rasch, G. (1960/1980). Probabilistic models for some intelligence and attainment tests. Chicago, The University of Chicago Press.
15. Safarov, R., Panishchev, O. (2012). Chislennoye modelirovaniye invariantnosti otsenki znaniya otnositel'no trudnosti testovykh zadaniy v ramkakh modeli G. Rasha [Numerical simulation of the invariance of the knowledge assessment with respect to test tasks within the framework of G. Rash's model]. *Obrazovatel'nyye tekhnologii i obshchestvo – Educational Technology & Society*, 15(1), pp. 424-435. Retrieved from [http://ifets.ieee.org/russian/depository/v15\\_i1/pdf/3.pdf](http://ifets.ieee.org/russian/depository/v15_i1/pdf/3.pdf) [in Russian].
16. Smotrova, T., Moiseev, S. (2015). Marketingovaya model' otsenki privilekatel'nosti torgovykh tsentrov [Marketing model for evaluating the attractiveness of shopping centres]. *Naukovedenie*, 7(6). Retrieved from <https://naukovedenie.ru/PDF/21EVN615.pdf> [in Russian].
17. Afryka – odyn z vazhlyvykh partneriv Ukrainy [Africa is one of Ukraine's important partners]. (2016). *Segodnya.ua*. Retrieved from <https://www.segodnya.ua/economics/enews/afrika-odin-iz-vazhnyh-partnerov-ukrainy-766895.html> [in Ukrainian].
18. Derzhavna sluzhba statystyky Ukrainy [State Statistics Service of Ukraine]. (n.d.). *ukrstat.gov.ua*. Retrieved from <http://www.ukrstat.gov.ua/> [in Ukrainian].

19. 5 istorii ekonomichnoho uspihu pislia viiny: svitovy dosvid dlia Ukrainy [5 economic success stories after the war: world experience for Ukraine]. Retrieved from [https://rus.lb.ua/economics/2022/04/13/513199\\_5\\_istoriy\\_ekonomicheskogo\\_uspihu\\_pislya.html](https://rus.lb.ua/economics/2022/04/13/513199_5_istoriy_ekonomicheskogo_uspihu_pislya.html) [in Ukrainian].

**Осадча Н. В., Затишняк В. В. Оцінка економічного потенціалу та інвестиційної привабливості Дніпропетровської області**

У статті аналізуються напрями відновлення української економіки після війни. Досліджено історії успіху країн, які відновили свою економіку після війни. У результаті кращий досвід Ізраїлю видається найбільш придатним для України. Також описано та прийнято методи оцінки інвестиційної привабливості регіонів для оцінки інвестиційного потенціалу Дніпропетровської області. Нині Дніпропетровська область як і раніше є лідером серед регіонів України з виробництва промислової продукції та менш постраждала від війни, ніж інші регіони. Для оцінки інвестиційної привабливості регіонів для інвесторів ми пропонуємо використовувати модель Раша. У рамках дослідження проведено таку оцінку Дніпропетровської, Київської, Харківської та Львівської областей.

*Ключові слова:* інвестиції, інвестиційний потенціал, модель Раша, галузь, методи, оцінка.

**Osadcha N., Zatyshniak V. Assessment of the Economic Potential and Investment Attractiveness of the Dnipropetrovsk Region**

The article analyzes the directions for Ukrainian economic recovery after the war. The successes stories of the countries, that restored their economies after the war, were explored. As a result the best practices of Israel seem most suitable for Ukraine. The methods of assessing the regions investment attractiveness are also described and adopted to evaluate the investment potential of the Dnipropetrovsk region. Nowadays, Dnipropetrovsk region is still the leader among the other Ukrainian regions in the production of industrial products and less suffered from the war than the other regions. We propose to use the Rasch model for the assessment of the regions' investment attractiveness for investors. Such assessment of Dnipropetrovsk, Kyiv, Kharkiv and Lviv regions was held within the framework of the study.

*Keywords:* investments, investment potential, Rasch model, industry, methods, assessment.

Creative Commons Attribution 4.0  
International (CC BY 4.0)



Received by the editors 18.11.2022