

Regional Economic Development in The Context of the COVID-19 Pandemic and the Economic Crisis

OLHA A. LUKASHⁱ, YURIY M. DEREV'YANKOⁱⁱ,
DMYTRO V. KOZLOVⁱⁱⁱ, ANNA I. MUKOREZ^{iv}

It is important to analyze the manifestations of the crisis at the regional level, which allows both regional (local) and national authorities to develop effective support tools. From this point of view, it is important to clearly understand which aspects of economic development the crisis has a key impact on, and whether such impact is uniform across different sectors and areas of economic development. Much attention is paid to the problem of assessing the state of the business environment. However, the main disadvantage of most of them is that they are sometimes difficult to conduct in terms of operational analysis and availability of open data. The object of research is the processes of studying the state of the region's economy. The subject of the research is the impact of the COVID-19 pandemic and the current economic crisis on the region's economies. In the process of scientific research, we solved such tasks: identification of key problematic factors in relation to regional economic development, including caused by pandemic and lockdown; reliable, freely available and up-to-date sources of statistical information on regional economic development are identified; a comprehensive method of generalizing the impact of the COVID-19 pandemic and the economic crisis on regional economic development. We proposed to analyze the impact of the COVID-19 pandemic and the current economic crisis on the economic development of the regions of Ukraine on the example of Sumy region. The analysis is based on open data from static authorities, which periodically publish monthly and quarterly information. The study confirmed the serious negative impact of lockdown and pandemic on the economic development of the region in a number of key indicators: the index of industrial production, the volume of industrial products sold, freight turnover and passenger turnover. At the same time, we observe a generally neutral impact of the crisis on such regional indicators of economic development as the volume of commodity export and import transactions and the stability of retail trade.

Keywords: economy, crisis, indicator, industry, pandemic, region, trade.

VJK 332.19

JEL Codes: R11

Introduction. The current economic crisis, mainly due to the onset of the COVID-19 pandemic, certainly play and will play a significant role in the near future. Its manifestations in economic development became apparent in the 1st quarter of 2020. However, in addition to analyzing the general economic impact, it is also important to analyze the manifestations of the crisis at the regional level, which allows both regional (local) and national authorities to develop effective support tools. From this point of view, it is important to clearly understand which aspects of economic development the crisis has a key impact on, and whether such

ⁱ Olha A. Lukash, C.Sc. (Economics), Associated Professor of Department of Economics and Business-Administration, Sumy State University;

ⁱⁱ Yuriy M. Derev'yanko, C.Sc. (Economics), Associated Professor of Department of Economics and Business-Administration, Sumy State University;

ⁱⁱⁱ Dmytro V. Kozlov, Director of Representation "Schneeberger Holding AG", Sumy, Ukraine;

^{iv} Anna I. Mukorez, Student of Educational and Research Institute of Business, Economics and Management, Sumy State University.



impact is uniform across different sectors and areas of economic development.

Problem statement. Much attention is paid to the problem of assessing the state of the business environment. In particular, But V., Vazhynsky F., Kolomiets I., Veselovsky A., Alexandrov O., Orlyk V., Lisova E., Matrosova L., Prudnikova L. and many other experts have focused on the problem of economic development in general and the impact of the coronavirus and lockdown pandemics. However, the main disadvantage of most of these research is that they are sometimes difficult to conduct in terms of operational analysis and availability of open data.

The purpose of the research is the development of a generalized method for assessing the state of economic development of the region, taking into account the impact of the pandemic COVID-19.

Research methods. The theoretical and methodological basis of research and solution of the tasks are the researches of specialists and researchers on the problems of assessing the state of the regional economy. The research used methods of system and structural analysis, economic and mathematical methods, graphical and tabular methods, expert method. The main basis was the official statistical data with a free access.

Results of the research. Many studies are devoted to the problems of regional economic development.

Research (Vyzhynsky, 2004) covers the socio-economic development of regions covering up to 200 different methods. Among all, the most effective are intuitive, analytical and statistical. Structural and quantitative changes do not make it possible to make full use of one of them. The general analysis should take into account the complexity of the object, trends, features of the region, dependence on the national economy, the term of the analysis.

Methods and types of regional forecasting and programming are considered in (Stetsenko, 2009). Certain forecasts should be used to solve the current problems of the regions. This approach allows to cover the social spheres of the territory, scientific and technical, economic and environmental. We can use 5 main forecasts: demographic, scientific and technical, technical and economic, socio-economic and natural resources forecasts.

A wide range of tools, principles and methods are used to analyze the regional economy by (Todosiychuk, 2008). The main ones are general scientific, special and computational. With the help of data, we can determine the most appropriate. Depending on object, it is possible to carry out the analysis or synthesis.

It is accurate to use analytical and mathematical methods to transfer data in tabular form. The balance method helps to maintain balance between regions. No less useful are the cartographic method and the optimization method, which fully allow you to track the features of the location and shape of the object.

The solution of regional economic problems (Rehional, 2010) is carried out under the influence of modern social standards. For the development of the economy of the regions, two directions are used: the expansion and deepening of the content of regional research and the deepening of the methodological foundations of the regional economy. For this purpose, such methods are used as: general scientific, interdisciplinary, specific scientific, or special.

The author (But, 2014) believes that cognitive modeling can be considered the optimal method in the study of the region. The software system analyzes the behavior of a multicomponent system. It is impossible to study the object without the use of such important scientific methods as the systemological approach (Trunina, 2015), organizational approach, subject-functional approach, systematization method, balance method and a number of others.

Undoubtedly, the coronavirus pandemic (COVID-19) has played an important role in the research since the beginning of 2020. The impact of the COVID-19 pandemic on the development of global processes of development of the system of international relations is

analyzed in the paper (Veselovsky, 2020). The United States, the European Union and China have become major regions in a deadly game during the pandemic. The oil market began a price war, a decline in business activity, the global economic crisis, and a reduction in economic activity. Despite global quarantine, shelling in hotspots has not stopped. Tensions in US-Russian relations are not easing. The European Union has made budget decisions and set up a fund for the world's poorest countries. European countries began to close borders sharply, without agreeing with neighboring countries. During the pandemic, the region did not show its effective economic activity, which led to a decline in authority among neighboring regions. The PRC (China) was able to successfully overcome the peak of the coronavirus and provided assistance when there was an outbreak in the European Union. China only benefited from this, as they made the regions dependent on their own production. The authors analyzed the situation and predicted the near future for these regions of the world.

The COVID-19 pandemic caused a large-scale crisis in the health and economy of the region, which was exacerbated by social unrest and conflict. In mid-2020, the incidence did not stabilize, but in the fourth quarter it rose sharply, forcing governments to maintain or reintroduce measures to mitigate the severity of the crisis. GDP in the region is estimated to have declined by 2.9 % last year, with a decline in almost all countries, and about two-thirds of them are expected to face a more severe downturn than during the global financial crisis. The countries most affected by the pandemic are those that have strong trade or financial ties with the euro area and are heavily dependent on services and tourism (Kosovo, Croatia, Montenegro).

The most vulnerable in a pandemic were countries with strong trade or financial ties to the euro area or dependent on services and tourism. Developing countries have faced an outflow of investment, which has seriously affected their confidence among other countries. Almost all countries in Europe and Central Asia have faced sad consequences. Millions of jobs have been lost in Central Europe and Russia.

Given the analysis of publications, we found a significant variety of ways (approaches) to analyze economic and regional development, and assess the impact of the coronavirus pandemic.

We propose to analyze the regional state of economic development in the following basic areas of analysis on the example of Sumy region:

- 1) Industrial production (using the industrial production index)
- 2) Incomes of citizens (using the real wage index)
- 3) Domestic trade (through indicators of industrial production turnover and retail turnover)
- 4) Foreign trade (due to the volume of export-import commodity transactions and trade balance)
- 5) Territorial movement (through passenger and freight turnover)
- 6) COVID-19 factor (using the ratio of the number of deaths from COVID-19 relative to the total number of deaths in the region)

Such an analysis in order to identify trends caused by the pandemic COVID-19 and the economic crisis, we conducted a comparative index analysis for the period 2018-2020. The initial data are given in Table 1 (composed by (The main, 2021)).

From the Table 2 data we can conclude that the decline in industrial production began before the pandemic and the global crisis – in 2019. During 2020, the decline continued at a fairly high rate throughout the year.

From the Table 3 data it can be concluded that over the past 3 years, real wages have continued to grow. Moreover, growth rates in 2020 even exceeded pre-crisis 2019. In our opinion, this is primarily due to rising minimum wages and slowing inflation.

At the same time, based on the Table 1 data the situation in domestic trade is interesting. If the volume of industrial production in the region in 2020 showed a stable and quite significant decline of 5-20 % (although the decline did not stop near the end of 2020, but at least slowed to -5% as of December 1, 2020 compared to the same period last year 2019). At the same time, the dynamics of retail trade was positive and the volume increased by almost 6 % on 01.12.2020.

Table 1 – Comparative regional index analysis for the period 2018-2020, Sumy region during 2018-2020

Indicator	I quarter			II quarter			III quarter			IV quarter		
	January-February			January-May			January-August			January-November		
	2020	2019	2018	2020	2019	2018	2020	2019	2018	2020	2019	2018
Industrial production index, %	98.2	93.4	113.2	94.6	105.9	107.2	97.6	101.5	109.5	95.4	98.1	111.8
Real wage index, %	113.3	108.4	111.0	110.4	107.7	111.1	109.8	107.9	111.4	110.5	108.3	111.3
Volume of industrial products sold, UAH million	7917.8	8,715.8	7,776.0	17624.5	22,031.2	19,301.6	28,933.5	32 010.7	30,799.2	41,510.7	43,395.6	43,767.6
Turnover in retail trade, UAH million	3,406.9	3,108.7	2,769.3	8,241.3	8 141.9	7,298.5	14,187.8	15,422.6	12,238.5	20,313.2	19,193.1	17,023.5
Exports of goods, USD million	159.8	148.2	133.9	363.0	352.4	331.5	567.8	527.4	485.8	828.0	795.1	707.7
Imports of goods, USD million	116.4	95.2	92.7	317.7	258.8	269.2	544.8	405.8	434.4	776.2	596.4	662.3
External balance on goods trade, USD million	43.4	53.0	41.2	45.3	93.6	62.3	23.0	121.6	51.4	51.8	198.7	45.4
Freight turnover, million tkm	1,025.1	1,076.3	1 136.7	2,761.2	3,044.9	2,946.9	4,510.7	5,796.2	4,603.4	6,316.1	7,396.6	7,771.1
Passenger turnover, million passenger-km	324.5	337.6	341.3	459.4	931.6	948.6	658.3	1,732.7	1,597.5	872.4	2,063.0	2,414.9
COVID-19 factor, %	0.00	-	-	0.05	-	-	0.20	-	-	2.38	-	-

Table 2 – Real wage index Sumy region 2018-2020

Real wage index, %	Year		
	2020	2019	2018
January-February	113.3	108.4	111.0
January-May	110.4	107.7	111.1
January-August	109.8	107.9	111.4
January-November	110.5	108.3	111.3

The situation in the region's foreign trade in goods is also quite indicative. While in fact the volumes of both imports and exports have been growing almost constantly and continue to grow, the positive balance of foreign trade began to decline significantly, and decreased by almost 4 times in 2020.

Along with the reduction in the foreign trade balance and the volume of industrial products sold, there was a relatively synchronous reduction in freight turnover (by almost 15 % in January-November, see Table 3).

Table 3 – Freight turnover,
Sumy region 2018-2020

Freight turnover, million tkm	Year			Change, 2020/2019
	2020	2019	2018	
January-February	1,025.1	1,076.3	1 136.7	-4.76%
January-May	2,761.2	3,044.9	2,946.9	-9.32%
January-August	4,510.7	5,796.2	4,603.4	-22.18%
January-November	6,316.1	7,396.6	7,771.1	-14.61%

It is expected that the most negative impact on regional development was caused by the decline in passenger turnover, which fell by almost 60 % (Table 4).

Table 4 – Passenger turnover,
Sumy region 2018-2020

Freight turnover, million tkm	Year			Change, 2020/2019
	2020	2019	2018	
January-February	324.5	337.6	341.3	-3.87%
January-May	459.4	931.6	948.6	-50.69%
January-August	658.3	1,732.7	1,597.5	-62.01%
January-November	872.4	2,063.0	2,414.9	-57.71%

In addition, to analyze how significant the impact of the COVID-19 pandemic factor was, we calculated the relative mortality rate of the disease relative to the total number of deaths in the region. As a result, we observe its constant growth during 2020, and as of 01.12.2020 it reached 2.38% (see Table 1) (Number, 2021).

Thus, drawing the results of the study, it should be noted that our analysis confirmed the expectations of many about the serious negative impact of lockdown and pandemic on the economic development of the region (we see it in terms of industrial production index, volume of industrial products sold and usually cargo and passenger turnover). At the same time, we observe a generally neutral impact of the crisis on such indicators as the volume of commodity export and import transactions and the retail trade stability.

Conclusions. Among the main conclusions of the research are:

1. Methods of studying the state of economic development of the region are very diverse. They even contradict each other to some extent often. However, the main disadvantage of most of them is that they are sometimes difficult to conduct in terms of operational analysis and availability of open data.
2. All researchers of the impact of the COVID-19 pandemic on economic development certainly emphasize its negative impact, however, given that the pandemic itself continues and the economic crisis has not ended, it is difficult to draw definitive conclusions.

3. We proposed to analyze the impact of the COVID-19 pandemic and the current economic crisis on the economic development of the regions of Ukraine on the example of Sumy region. The analysis is based on open data from static bodies, which periodically publish monthly and quarterly information. This method certainly has disadvantages, but gives an idea of the events course of regional economic development.
4. The research confirmed the serious negative impact of lockdown and the pandemic on the economic development of the region in a number of key indicators: the industrial production index, volume of industrial products sold, freight and passenger turnover.
5. At the same time, we observe a generally neutral impact of the crisis on such regional indicators of economic development as the of export and import commodity transactions volume and the stability of retail trade.

References

1. But V. The choice of methods for diagnosing the development of the region's economy. *Derzhavne Budivnytstvo*. 2014, № 1. URL: http://nbuv.gov.ua/UJRN/DeBu_2014_1_15
2. COVID-19 foresight: transformation of the world after the COVID-19 pandemic, European context; Scientific project supervisor M.Z. Zghurovskiy. 2020. URL: <http://wdc.org.ua/uk/covid19-transformation-after-pandemic-europe/#%D0%9A%D0%BE%D0%BC%D0%B0%D0%BD%D0%B4%D0%B0>
https://ir.kneu.edu.ua/bitstream/handle/2010/13228/region_economy.pdf?sequence=1
3. Indices of industrial production by type of activity in Sumy region. Main Department of Statistics in Sumy region. 2021. URL: <http://sumy.ukrstat.gov.ua/?menu=383&level=3>
4. Lisova E.V. Black swan theory in the context of regional economy. *Mezhdunarodnyi Nauchno-Yssledovatel'skiy Zhurnal*. 2020. №5 (95). Pp. 75-77. DOI: <https://doi.org/10.23670/IRJ.2020.95.5.050>
5. Matrosova L.M., Prudnikova L.O. Analysis of methods for assessing the socio-economic development of regions. *Ekonomichni Visnyk Donbasu*. 2008. №3. URL: http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_D OWNLOAD=1&Image_file_name=PDF/ecvd
6. Nominal growth / decrease rates and real wage index in Sumy region in 2020 in Sumy region. Main Department of Statistics in Sumy region. 2021. URL: http://sumy.ukrstat.gov.ua/?menu=361&article_id=11862
7. Number of deaths due to certain causes of death in Sumy region. Main Department of Statistics in Sumy region. 2021. URL: http://sumy.ukrstat.gov.ua/?menu=1014&article_id=11950
8. Orekhov A.M. *Methods of economic research*, Moscow: INFRA-M. 2009. 392 p. URL: <https://pravo.studio/ekonomicheskij-analiz/metod-ekstrapolyatsii-problema-38278.html>
9. Pandemic of COVID-19 in the EU: selfishness, solidarity or spreading influence? Analytical note. / Vdovychenko V. and others. 2020. URL: <http://prismua.org/wp-content/uploads/2020/05/COVID19EU.pdf>
10. Petrunia V.Y., Gerashchenko S.O. Indicators for assessing the state of the business environment in Ukraine. *Naukovyi pogliad: ekonomika ta upravlinnia*. 2017. № 1 (57). P. 76–81.
11. Prykhodchenko T.A. Methodology of regional development research. *Prychornomorski Ekonomichni Studii*. 2017. Issue 16. pp. 115-120.
12. Regional economy: lectures / Olshanskaya A.V., etc. ; ed. N.I. Fashchevsky, A.V. Olshanskaya. Kyiv: KNEU, 2010. 187 p. URL:
13. Stadnyk M. The impact of COVID-19 on the world economy. *Visnyk MSFZ*. 2020. №03. URL: https://msfz.ligazakon.ua/ua/magazine_article/FZ002118
14. Stetsenko T.O., Tishchenko O.P. *Management of regional economy*. Kyiv: KNEU, 2009. 471 p.
15. The main indicators of socio-economic development of Sumy region. Main Department of Statistics in Sumy region. 2021. URL: <http://sumy.ukrstat.gov.ua/?menu=30&level=3>

16. Todosiychuk V.L. Regional Economics: Textbook. Vinnytsia: VSAU, 2008. 434 p. - URL: http://socrates.vsau.org/method/getfile.php/2249.pdf?card_id=1301
17. Trunina I.M. Analysis of the environment of entrepreneurial activity in Ukraine. *Visnyk KrNU imeni Mykhaila Ostrohradskoho*. 2015. Issue 3 (92). P. 171–177.
18. Vazhynsky F.A., Kolomiets I.F. The main methods of forecasting the socio-economic development of the region. *Naukovyi Visnyk*. 2004. Vol. 14.7. Pp. 166-170. URL: <https://cyberleninka.ru/article/n/osnovni-metodi-prognozuvannya-sotsialno-ekonomichnogo-rozvitku-regionu/viewer>
19. Veselovsky A.I., Alexandrov O.S., Orlyk V.V. The impact of the COVID-19 pandemic on the development of global processes in the development of the system of international relations. 2020. 4 p. URL: <https://niss.gov.ua/sites/default/files/2020-05/covid-i-globalni-procesy-1.pdf>
20. World Bank, 2020. COVID-19 and human capital. Report on the region economy of Europe and Central Asia, autumn 2020. World Bank, Washington, DC. DOI: 10.1596 / 978-1-4648-1643-7. URL: <https://openknowledge.worldbank.org/bitstream/handle/10986/34518/211643EN.pdf?sequence=5&isAllowed=y>

Manuscript received 20 January 2021

Mechanism of Economic Regulation, 2021, No 1, 99–107
ISSN 1726-8699 (print)

**Регіональний економічний розвиток у контексті
пандемії COVID-19 та економічної кризи**

ОЛЬГА АНАТОЛІЙВНА ЛУКАШ^{*},
ЮРІЙ МИКОЛАЙОВИЧ ДЕРЕВ'ЯНКО^{},**
ДМИТРО ВАЛЕРІЙОВИЧ КОЗЛОВ^{*},**
АННА ІГОРІВНА МУКОРІЗ^{**}**

^{*} кандидат економічних наук, доцент,
старший викладач кафедри економіки та бізнес-адміністрування,
Сумський державний університет,
вул. Р.-Корсакова, 2, м. Суми, 40007, Україна,
тел.: 00-380-542-332223, e-mail: olha.lukash@econ.sumdu.edu.ua

^{**} кандидат економічних наук, доцент,
доцент кафедри економіки та бізнес-адміністрування,
Сумський державний університет,
вул. Р.-Корсакова, 2, м. Суми, 40007, Україна,
тел.: 00-380-542-332223, e-mail: yurii.derevianko@econ.sumdu.edu.ua

^{***} Голова Представництва «Шнеебергер Холдінг АГ», м. Суми
вул. Петропавлівська, 57, м. Суми, 40000, Україна,
тел.: 00-380-542-332223, e-mail: kozloff1976@gmail.com

^{****} студентка Навчально-наукового інституту бізнесу, економіки та менеджменту
Сумського державного університету,
вул. Р.-Корсакова, 2, м. Суми, 40007, Україна,
тел.: 00-380-542-332223, e-mail: anyamykorez@gmail.com

Важливо аналізувати прояви кризи на регіональному рівні, що дає змогу як регіональним (місцевим) органам влади, так й загальнодержавним розробляти дієві інструменти підтримки. 3

даної точки зору важливо чітко розуміти на які саме аспекти економічного розвитку кризи має ключовий вплив, та чи є такий вплив рівномірним за різними галузями та сферами економічного розвитку. Проблемі оцінювання стану бізнес-середовища приділяється значна кількість уваги. Однак, основним недоліком більшості з них можна назвати те, що їх часом складно провести з точки зору оперативного аналізу та доступності відкритих даних. Об'єктом дослідження є процеси дослідження стану економіки регіону. Предметом дослідження є вплив пандемії COVID-19 та поточної економічної кризи на економіку регіону. В процесі виконання наукової роботи вирішено завдання щодо: визначення ключових проблемних факторів щодо регіонального економічного розвитку, в т.ч. зумовлених впливом пандемії та локдауну; визначено достовірні, вільно доступні та актуальні джерела статистичної інформації за регіональним економічним розвитком; запропоновано комплексний метод узагальнюючої оцінки впливу пандемії COVID-19 та економічної кризи на регіональний економічний розвиток. Ми запропонували зробити аналіз впливу пандемії COVID-19 та поточної економічної кризи на економічний розвиток регіонів України на прикладі Сумської області. Аналіз ґрунтується на відкритих даних статистичних органів, які періодично публікують щомісячну та щоквартальну інформацію. Дослідження підтвердило серйозного негативного впливу локдауну та пандемії на економічний розвиток регіону за рядом ключових показників: індекс промислової продукції, обсяг реалізованої промислової продукції, вантажообіг та пасажирообіг. Водночас, ми спостерігаємо в цілому нейтральний вплив кризи на такі регіональні показники економічного розвитку, як обсяг експортно-імпорتنих товарних операцій та стабільність обороту роздрібної торгівлі.

Ключові слова: економіка, криза, пандемія, показник, промисловість, регіон, торгівля.

JEL Codes: R11

Tables: 4; References: 20

Language of the article: English

Література

1. Бут В. Вибір методів діагностування розвитку економіки регіону. *Державне будівництво*. 2014. № 1. – URL: http://nbuv.gov.ua/UJRN/DeBu_2014_1_15
2. Важинський Ф.А., Коломієць І.Ф. Основні методи прогнозування соціально-економічного розвитку регіону. *Науковий вісник*. 2004. Вип. 14.7. С. 166-170. – URL: <https://cyberleninka.ru/article/n/osnovni-metodi-prognozuvannya-sotsialno-ekonomichnogo-rozvitku-regionu/viewer>
3. Веселовський А.І., Александров О.С., Орлик В.В. Вплив пандемії COVID-19 на розвиток глобальних процесів розвитку системи міжнародних відносин. 2020. 4 с. – URL: <https://niss.gov.ua/sites/default/files/2020-05/covid-i-globalni-procesy-1.pdf>
4. Всемирный банк, 2020 год. COVID-19 и человеческий капитал». Доклад об экономике региона Европы и Центральной Азии, осень 2020 года. Всемирный банк, Вашингтон, округ Колумбия. DOI: 10.1596/978-1-4648-1643-7. – URL: <https://openknowledge.worldbank.org/bitstream/handle/10986/34518/211643RU.pdf?sequence=5&isAllowed=y>
5. Індекси промислової продукції за видами діяльності у Сумській області. Головне управління статистики у Сумській області. 2021. – URL: <http://sumy.ukrstat.gov.ua/?menu=383&level=3>
6. Кількість померлих за окремими причинами смерті у Сумській області. Головне управління статистики у Сумській області. 2021. – URL: http://sumy.ukrstat.gov.ua/?menu=1014&article_id=11950
7. Лисова Е.В. Теория черного лебедя в контексте региональной экономики. *Международный научно-исследовательский журнал*. 2020. №5 (95). С. 75-77. DOI: <https://doi.org/10.23670/IRJ.2020.95.5.050>
8. Матросова Л.М., Пруднікова Л.О. Аналіз методик оцінки соціально-економічного розвитку регіонів. *Економічний вісник Донбасу*. 2008. №3. – URL: http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/ecvd_2008_3_12.pdf

9. Орехов А.М. Методы экономических исследований : учеб. пособие. – Москва : ИНФРА-М. 2009. – 392 с. – URL: <https://pravo.studio/ekonomicheskij-analiz/metod-ekstrapolyatsii-problema-38278.html>
10. Основні показники соціально-економічного розвитку Сумської області. Головне управління статистики у Сумській області. 2021. – URL: <http://sumy.ukrstat.gov.ua/?menu=30&level=3>
11. Пандемія COVID-19 в ЄС: егоїзм, солідарність чи поширення впливу? Аналітична записка. / Вдовиченко В. та ін. 2020. – URL: <http://prismua.org/wp-content/uploads/2020/05/COVID19EU.pdf>
12. Петруня, В. Ю. Показники оцінювання стану бізнес-середовища в Україні / В. Ю. Петруня, С. О. Герашенко // Науковий погляд: економіка та управління. – 2017. – № 1(57). – С. 76–81.
13. Приходченко Т.А. Методологія дослідження регіонального розвитку. *Причорноморські економічні студії*. 2017. Вип. 16. С. 115-120.
14. Стадник М. Вплив COVID-19 на світову економіку. Вісник МСФЗ. 2020. №03. – URL: https://msfz.ligazakon.ua/ua/magazine_article/FZ002118
15. Стеценко Т.О, Тищенко О.П. Управління регіональною економікою. Київ : КНЕУ, 2009. – 471 с.
16. Темпи зростання/зниження номінальної та індекс реальної заробітної плати у Сумській області у 2020 році у Сумській області. Головне управління статистики у Сумській області. 2021. – URL: http://sumy.ukrstat.gov.ua/?menu=361&article_id=11862
17. Тодосійчук В.Л. Регіональна економіка : Підручник. – Вінниця : ВДАУ, 2008. – 434 с. – URL: http://socrates.vsau.org/method/getfile.php/2249.pdf?card_id=1301
18. Региональная экономика : тексты лекций / Ольшанская А. В. и др. ; под общ. ред. Н. И. Фашевского, А. В. Ольшанской. – Київ : КНЭУ, 2010. – 187 с. – URL: https://ir.kneu.edu.ua/bitstream/handle/2010/13228/region_economy.pdf?sequence=1
19. Труніна, І. М. Аналіз середовища підприємницької діяльності в Україні / І. М. Труніна // Вісник КрНУ імені Михайла Остроградського. – 2015. – Випуск 3(92). – С. 171–177.
20. Форсайт COVID-19: трансформація світу після пандемії COVID-19, європейський контекст ; наук. керівник проекту М.З. Згуровський. 2020. – URL: <http://wdc.org.ua/uk/covid19-transformation-after-pandemic-europe#%D0%9A%D0%BE%D0%BC%D0%B0%D0%BD%D0%B4%D0%B0>