

Comparative Analysis of International Methods for Assessing Financial Potential

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Annotation: The article deals with the analysis of foreign experience of methodology of financial potential assessment of developed countries based on aspects of methodology and approaches, which includes complex analysis, use of indices and ratings and spatial analysis models, as well as tools and technologies including big data analysis and analytics, econometric models and scenario analysis. The application of certain methodologies for assessing the financial potential, progressiveness and development in foreign countries has been analyzed. In conclusion, it is necessary to improve the methodology of financial potential assessment in Uzbekistan in order to determine the state of the economy, living standards, innovation potential and other key aspects.

Keywords: financial potential, assessment methodology, index, rating, spatial analysis, big data, analytics, econometric models, scenario analysis.

Introduction. Financial capacity and the methodology of its calculation are widely used in the world practice to determine the financial condition allowing regulators to supervise the financial system and conduct stabilization economic policy, investors to assess the overall riskiness of investments in financial instruments of the country or region, and researchers - to analyze the phenomena that depend on the mode of operation of the financial system.

The analysis of foreign experience in the methodology of assessing the financial potential of the region includes consideration of various approaches and techniques used in different countries. They are aimed either at an operational assessment of the actual level of financial support, or at identifying the existing potential of stable functioning united regions, or in order to increase the financial potential taking into account the current state of national and regional economic development. As the main aspects of the methodology of financial potential assessment we can emphasize methods and approaches, which include complex analysis, use of indices and ratings popular in the USA, European countries and China, and models of spatial analysis with the use of geoinformation systems and spatial models allowing to assess more accurately the financial potential of the region. In addition, tools and technologies that include Big Data analysis, analytics that take into account a huge number of indicators and factors, data on transactions, population movement, resource consumption and other influencing factors on the financial potential of the region are emphasized as the main aspects. This includes econometric analysis of widely used econometric models for forecasting and scenario analysis that assesses various options for the region's development and their impact on financial potential. This helps to take into account uncertainties and risks, as well as to develop strategic plans (Figure -1).

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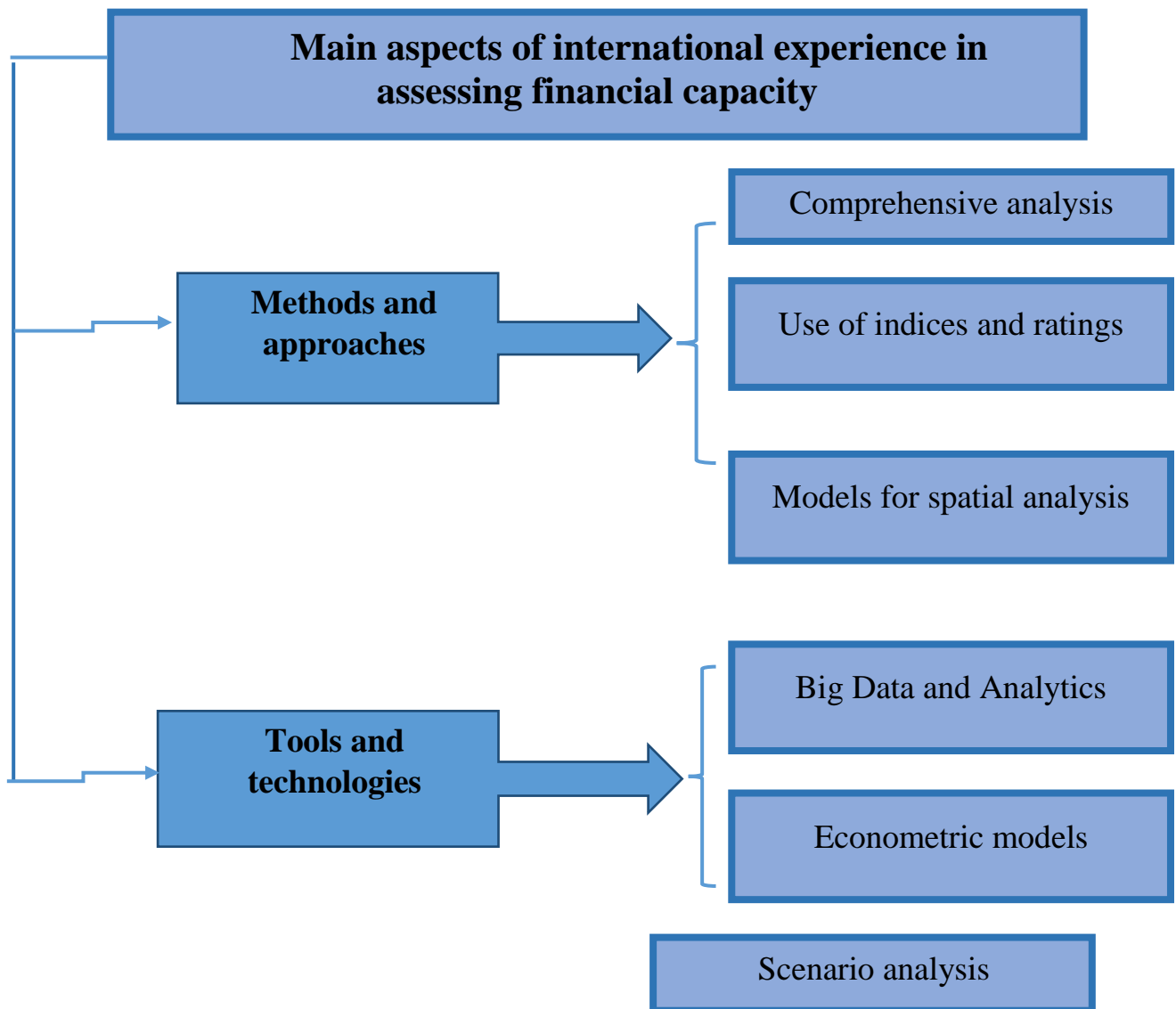


Figure-1. Main aspects of international experience in assessing financial capacity.

Research methodology. During the experience of foreign countries on the methodology of financial potential assessment the research was formed on the basis of fundamental methodology of scientific cognition with the use of methods of scientific abstraction, data analysis and synthesis, statistical, dynamic analysis, intersubjectivity of theory and practice, comparison and analogy. In the course of the research of the methodology of financial potential assessment the methodology of complex analysis, the use of indices and ratings, models of spatial analysis, tools of scenario analysis technology, econometric analyses, as well as big data and analytics were used.

Analysis of the study. The most important component of the conceptual apparatus of the methodology of financial potential assessment is the concept of financial potential itself, which allows us to compare financial capabilities, assess financial security, determine the financial self-sufficiency of enterprises at the micro level, industries at the meso level, as well as different regions and the country as a whole at the macro level of financial resources in the form of a totality of accumulated, attracted and formed in the conditions of economic activity, which take part in the processes of production, distribution and distribution of financial resources.

In developing the methodology of financial potential assessment, researchers proceed from the definition of the boundaries of an economic system. Many researchers consider financial potential as the sum of financial potentials of its residents. Thus, D. Gaynanov [4] in his study of financial potential notes that financial potential consists of three structural components: budgetary potential, financial potential of enterprises and financial potential of the population. Zh. Golodova [5] adheres to

a similar point of view, supplementing the financial potential of credit institutions, insurance companies, investment potential and non-state pension funds.

Many economists E.Verbienko[6], V.Dorzhieva, L.Lazareva and B.Karpushev[7] propose to estimate the value of financial potential based on the value of Gross Regional Product or Gross Domestic Product, including certain elements of value:

- Net profit and mixed income;
- Consumption of fixed capital;
- Net taxes on production and imports;
- Labor remuneration.

A.Zaitsev, D.Radionov[3], E.Sidorova, D.Tatarkin, who propose to define the financial potential as a set of all financial flows of the territory, adhere to a similar position:

- Current and investment costs of economic entities;
- Current consumption and savings of households;
- Budget income of the region.

Domestic researchers M. Faizieva, G. Abdurakhmanova, M. Eshov, S. Kurbanov, S. Goipnazarov and others[2,4], S. Khudoykulov[2,3,4], H. Kabulov[3], U.Otazhonov[2] note that the assessment of financial potential is determined by the total amount of financial resources created in the territory, in the most general form is manifested as gross regional product, which is further distributed and redistributed between economic entities and organizations, households and the state, taking into account the specifics of their functioning.

It should be noted that the accounting of financial potential proceeds from the need of the territory to finance reproductive processes in the region using subsidies, subventions and grants, which is due to the peculiarities and limitations of the current budget legislation.

Our research on the assessment of the financial potential of the region is based on the following elements based on the integration method:

- Local budget revenues;
- Financial potential of enterprises and organizations registered in the region;
- Financial potential of banking and financial organizations in the region;
- Monetary incomes of the population of the region.

In order to form and expand the financial potential, to ensure sustainable socio-economic development, to reduce inequality between regions, it is necessary to improve the methodology for assessing the financial potential, for which it is necessary to study the experience of foreign countries.

Analysis and results. As noted above, the international experience in assessing financial potential consists of two main aspects:

1. Methodologies and approaches. As we have already published in our studies, different methodologies and approaches are used in assessing financial potential.

1.1 In developed countries, a **comprehensive approach** to assessing the financial capacity of a region is often used. This includes analyzing various aspects such as economic activity, investment attractiveness, employment rate, population income and other financial indicators. The methodology of comprehensive assessment of financial potential usually includes indicators: gross domestic product (total and per capita), inflation rate (the rate of growth of prices for goods and services, which reflects the stability of the economy and purchasing power), unemployment rate, public debt and budget deficit, investment level (the volume of foreign direct investment, domestic investment in fixed assets



and infrastructure), financial markets, banking sector, foreign economic activity (the volume of exports and imports, the trade balance

Many developed countries use a comprehensive analysis to assess their financial capacity as they strive for sustainable economic growth in order to effectively manage resources and attract investment. The United States uses integrated financial capacity assessment analysis to analyze financial markets, develop policies, and forecast economic growth. Canada uses an integrated approach to assess economic and social indicators, including wealth and sustainability indices. Germany, as Europe's largest economy, also uses integrated analysis to analyze economic activity, financial stability, and innovation capacity, as does China. By integrating these various components, a comprehensive assessment of financial capacity at the macro level can be achieved, providing valuable information to policymakers, investors and other stakeholders.

1.2. The use of indices and rankings provides multifaceted information on various aspects of financial capacity and the overall level of development of developed countries. Foreign countries use such indices as: Human Development Index (HDI)-evaluates the standard of living, education and life expectancy, Global Competitiveness Index (GCI)-evaluates the competitiveness of countries based on factors affecting productivity and prosperity, Index of Economic Freedom (IEF)-measures the degree of economic freedom in the country, Global Innovation Index, Ease of Doing Business Index (Ease of Doing Business Index)-evaluates the regulatory environment and ease of doing business in the country, Corruption Perceptions Index (CPI), Ease of Doing Business Index (EBDI), Ease of Doing Business Index (EBDI), and Ease of Doing Business Index (EBDI).

For example, in the U.S. and Canada, the indices of economic freedom and entrepreneurial activity, which take into account a wide range of factors, are popular.

1.3. The use of spatial analysis models allows using geographic information systems (GIS) to assess the financial potential of the region, taking into account territorial features and distribution of resources. In developed countries such as the USA, Canada, Germany, Great Britain, Scandinavian countries, China use such models as: Spatial Data Analysis model (Spatial Data Analysis) - reveals spatial dependencies and patterns of geographically linked data, Spatial Autocorrelation Models (Spatial Autocorrelation Models) - uses indicators such as Moran's I and Getis-Ord statistic, Spatial Regression Models (Spatial Regression Models)-considers spatial relationships in the data, including Spatial Lag Model and Spatial Error Model, Spatial Equilibrium Models-analyzes the distribution of economic activity and population in space, taking into account factors such as resource availability, transportation costs, and population preferences, Gravity Models-analyzes trade and investment flows between regions based on the size of economies and the distances between them, Spatial Interaction Models-examines interactions between regions, such as flows of goods, services, people, and capital. Hansen and Wilson models are examples of such models, Spatial Clustering Models-uses cluster analysis techniques to identify groups of regions with similar economic characteristics. The k-means and DBSCAN methods are often used in these models, Spatial Growth Models estimate the dynamics of economic growth of regions, Spatial Systems Analysis Models look at the economy as a system of interconnected regions, analyzing the impact of changes in one region on other regions, New Economic Geography Models examine the factors contributing to the concentration of economic activity in certain regions, such as agglomeration effects and scale of production. These models help to analyze and understand complex spatial dependencies and interactions, allowing for a more accurate assessment of the financial potential of countries and regions, as well as the development of more effective economic strategies and policies.

1-Table Progressivity and sophistication of spatial models [10]

№	Direction of transformation	Researchers	Countries	Features
1	Classical models of the XIX-XX century	I. von Thünen, W. Launhardt, A. Weber, B. Christaller, A. Loesch,	Germany Sweden USA	Linear models, location



		T. Palander, G. Hotelling		models
2	Multiregional spatial models of the XX - XXI century	И. Fischer, R. Frisch, Я. Tinbergen, Ё. Schumpeter, O. Anderson, H. Bos, W. Izard, A.J. Wilson, Y. Alonso, A.G. Granberg, V.I. Suslov, A.A. Tsyplakov, N.M. Ibragimov, V.S. Kostin, D.D. Domozhirov, L.V. Melnikova.	U.S. Netherlands USSR Russia	Linear-program models
3	Continuous end space models twentieth century	Beckman, Puu, Anderson, Zang, A. Dixit, J. Stiglitz, Paul Krugman	U.S.	Macroeconomic models
4	GIS systems late XX-early XXI century	Gitis V.G., Zhurkin I.G., Karpik A.P., Koshkarev A.B., Kulagin V.P., Mayorov A.A., Materukhin A.V., Pyankov S.V., Rosenberg I.N., Savinykh V.P., Tikunov B.C., Tsvetkov V.Y., Goodchild M.F., Hoel E., Knoblock C.A., Shekhar S., Worboys M.F..	Russia U.S.	Geographic software models
5	Digital spatial models of the 21st century	During the research process.	During the research process.	2D, 3D

Based on the data in Table-1, we can see the main directions of spatial models, their transformation trajectories, and the need for additional research on the topic of modern digital spatial models.

2. Tools and Techniques.

2.1. Defining a methodology for assessing financial potential using *big data analysis and analytics* in developed countries uses parameters that help identify key trends, interrelationships and predict future forecasts of economic conditions. The key parameters are economic, financial, investment, social, innovation and infrastructure indicators. The methods used are Big Data Analytics (Big Data Analytics)-which collects, processes and stores financial and economic databases based on ETL (Extract, Transform, Load) technologies, machine learning and artificial intelligence-including forecasting models, classification and clustering and sentiment analysis to assess investor and consumer sentiment, econometric, geospatial and network analysis using modeling and simulation. This includes data on transactions, population movement, resource consumption and others.

2.2. *Econometric models are* widely used in developed economies to forecast and analyze the financial potential of regions. These models take into account macro- and microeconomic indicators and allow building complex forecasts.

1. **Regression models.** Linear and multiple regression is used to analyze the relationship between one or more independent variables. used to assess the impact of factors such as inflation, unemployment and government spending on GDP.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon \quad (1)$$



Where, Y-performance factor

$\beta_0, \beta_1, \beta_2, \beta_n$ - unknown parameters of the multifactor econometric model

X_1, X_2, X_n - influencing factors

ϵ - random error

2. **Time series models** a relevant tool used in predicting stock prices, business planning, resource allocation.

a) **ARIMA (Autoregressive Integrated Moving Average)** - used for time series forecasting by accounting for autocorrelation and moving average, e.g. forecasting GDP based on previous values.

b) **GARCH (Generalized Autoregressive Conditional Heteroskedasticity)**- is used for modeling the volatility of financial time series, an example of which is the estimation of stock market volatility or exchange rates.

c) **VAR (Vector Autoregression)** - a model that takes into account the interdependence of several time series, for example, the mutual influence of inflation, interest rates and GDP.

3. **Panel data**, widely used in econometrics, which take into account the time-invariant characteristics of the observed objects and assume that the individual effects of objects are random and independent, are Fixed Effects Model and Random Effects Model. In the European Union, it is used to analyze institutional factors on economic growth as well as the impact of R&D investment on productivity.

4. **Systems of simultaneous equations:**

a) **2SLS (Two-Stage Least Squares)**-resolves endogeneity problems in simultaneous equation models, so it is used in analyzing the mutual influence of household income and expenditures.

b) **3SLS (Three-Stage Least Squares)** is a study of the relationships between different sectors of the economy.

5. **Logit and Probit models** consist of Logistic Regression (Logit Model) used to model probabilities of events, such as the probability of default of a company, and Probit Model - similar to logistic regression, but uses a normal distribution, such as the probability of making an investment decision.

Table-2 Application of econometric models in developed countries

<i>Country</i>	<i>Regression models</i>	<i>Time series models</i>	<i>Panel data</i>	<i>Systems of simultaneous equations</i>	<i>The logit and probit models</i>
<i>U.S.</i>	Used by the Federal Reserve (Fed) to analyze the impact of interest rates on economic growth and inflation	VAR models: Used to estimate the relationships between macroeconomic variables such as GDP, inflation and unemployment rates.			
<i>UK</i>		GARCH models: Used by the Bank of England to	Panel data: used to investigate the impact of		



		analyze volatility in financial markets ARIMA models: used for forecasting inflation and other macroeconomic indicators	various factors on regional economic growth		
<i>Germany</i>			Fixed and random effects models: used to analyze the impact of institutional factors on the economic development of regions.	2SLS and 3SLS: used to investigate the interrelationships between different sectors of the economy and to address the endogeneity problem	Probit and logit models: used to estimate the probability of various economic events such as company bankruptcies
<i>France</i>		ARIMA: used to forecast macroeconomic indicators such as GDP and inflation	Panel data: used to analyze the impact of government spending on economic growth and employment		
<i>Japan</i>		VAR and VECM (Vector Error Correction Models), GARCH models: They are used to analyze volatility in currency and stock markets.	Panel data: used to examine regional differences in economic development		
<i>Canada</i>	Regression models	ARIMA			
<i>Australia</i>		Time series models GARCH models	Panel data		

2.3. *Scenario analysis* allows assessing various options for the region's development and their impact on the financial potential. It helps to take into account uncertainties and risks, as well as to develop strategic plans. Scenario analysis to assess the financial capacity for a certain period of time is considered in three scenarios: basic (basic), optimistic and pessimistic (Figure -2).



Scenario analysis involves several steps to model various possible future states and their impact on financial capacity. The *first step* consists of defining objectives and analyzing the main issues. The objectives must be clear and precise in order to proceed with the next steps of the study. The *second step*, data collection and analysis, is a critical step because reliable sources must be used to obtain reliable and relevant data. In developed countries, the main sources of data are: government agencies, international organizations, rating agencies, research and think tanks. In addition, data from commercial sources can be used. Next, it is necessary to make sure that the data are correct and complete, eliminate errors and omissions, and combine data from different sources to build time series to get a holistic picture. This is the third step of data processing and model building. The *fourth step is* data *visualization* using graphs, charts, and cartograms. The *fifth step is* model evaluation and interpretation of results. It is carried out by checking the adequacy and accuracy of models using the coefficient of determination (R^2), tests for autocorrelation and heteroscedasticity Durbin-Watson and Breusch-Pagan, cross-validation (division of data into training and test samples).

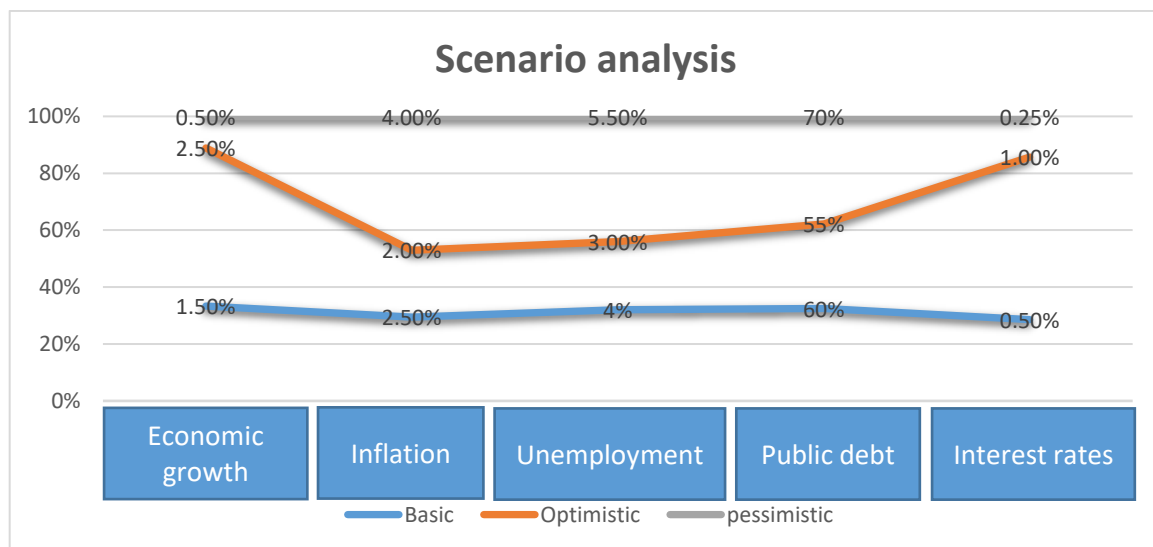


Figure-2. Scenario analysis for assessing the financial capacity of developed countries.

Interpretation of the results is based on the analysis of key indicators by scenarios.

- Baseline scenario: continuation of current trends
- Optimistic scenario: improved economic situation
- Pessimistic scenario: deterioration of the economic situation

Scenario analysis allows assessing uncertainties and modeling various options for the future development of the region. This helps to adopt more flexible and adaptive capacity management strategies, make informed decisions and better prepare for possible changes in the economy.

Foreign experience of financial potential assessment methodology provides steps and tools that can be used in other countries, including Uzbekistan, for a holistic view of the state of the economy, living standards, innovation potential and other key aspects. Based on the analysis of foreign experience it is possible to conduct a comparative analysis and identify leading and lagging countries, strengths and weaknesses of each country, to develop recommendations for the application of the methodology of assessment of financial potential of leading countries in a particular country or to improve the financial potential.

For example, we can compare the countries of the United States, Germany, Japan, France and China on key indicators for 2023.



2-table. Key indicators for assessing the financial capacity of the United States, Germany, Japan, France and China

Indicator	U.S.	Germany	Japan	France	China
GDP per capita (USD)	76,000	46,000	42,000	44,000	12,000
Economic growth rate (%)	2,1	1,8	1,5	1,2	5,1
Inflation rate (%)	3,0	2,0	0,8	4,5	2,3
Unemployment rate (%)	3,6	3,4	2,4	7,1	5,3
Public debt (% of GDP)	128	60	240	112	71
HDI	0,921	0,947	0,919	0,903	0,768
Global Competitiveness Index (GCI)	83,7	82,8	82,3	78,8	73,9

To compare the financial potential of foreign countries by key indicators, we can use macroeconomic and financial indicators such as GDP per capita, economic growth rate, inflation, unemployment rate, public debt, human development index, global competitiveness index. The sources of data were national statistical services, international organizations (IMF, World Bank). Based on the data in Table 2, the United States has the highest GDP per capita, indicating high economic power. It is followed by Germany, France, Japan and the last place is occupied by China. In terms of economic growth rate, the U.S. is second to China and ranks second. In general, the study and evaluation of the financial potential of these countries on key parameters shows that these countries have the highest financial potential.

Conclusion. The analysis of foreign experience shows that successful assessment of the region's financial potential requires the use of a comprehensive approach, modern technologies and consideration of many factors.

The article considered various aspects of the methodology of financial potential assessment of foreign countries. In the author's opinion, the international experience of financial potential assessment is based on two aspects of methodology and approaches, as well as on tools and technologies. These aspects are aimed at identifying the main levels of financial potential of the countries, either for an operational assessment of the actual level of financial provision, or to identify the existing potential of stable functioning united regions, or for the purpose of the possibility of building up the financial potential taking into account the current state of development of national and regional economies. This experience can be useful for the development of methodologies in other countries, including Uzbekistan.

List of references used.

1. Fayzieva, M., Abdurakhmanova, G., Eshov, M., Khudoykulov, S., Kurbonov, S., Goyipnazarov, S., & Irmatova, A. (2023, December). The Role of Digital Development in the Reinforcement of the Government Social Protection System of Uzbekistan. In Proceedings of the 7th International Conference on Future Networks and Distributed Systems (pp. 42-50).
<https://dl.acm.org/doi/abs/10.1145/3644713.3644720>
2. Zaitsev, A., Rodionov, D., Khudaykulov, S., Tuxliev, B., Stetsyunic, Y., Konnikov, E., & Dmitriev, N. (2023, December). Modeling the Impact of the Quality of the Political and Economic Environment on Population Migration. In Proceedings of the 7th International Conference on Future Networks and Distributed Systems (pp. 139-156).
<https://dl.acm.org/doi/10.1145/3644713.3644732>
3. Fayzieva, M., Abdurakhmanova, G., Khudoykulov, S., Kurbonov, S., Rakhmatullaeva, S., Kholiyorova, S., & Okmullaev, R. (2023, December). The Potential Impact of Digital



Technologies on Poverty Reduction in the Case of Uzbekistan. In Proceedings of the 7th International Conference on Future Networks and Distributed Systems (pp. 663-673). <https://dl.acm.org/doi/10.1145/3644713.3644825>

4. Otazhonov U. Uzbekiston Respubliki Ўzbekiston Respubliki xududlarining budget va moliya salohiyatini baxolash.// Business Expert No. 2. - 2020
5. Kobulov H.A. Ensuring financial sustainability of local budgets by improving the financial potential of the region. Modern science: topical issues, achievements and innovations. XIII Xalkaro ilmiy - amaliy conference materialari. Penza 2020
6. Gaynanov D.A. Assessment and mechanism of management of financial potential of municipal education // Bulletin of Bashkir Institute of Social Technologies.-No.2.-2009.-p.98-120
7. Golodova J.G. Formation and management of financial potential of the region in order to ensure its economic growth. // Author abstract. // Moscow. - 2010.-c.13-21
8. Verbinenko E.A. Financial potential of the region: essence and approaches to assessment // Bulletin of the Kola Scientific Center of the Russian Academy of Sciences. 2011. - №4. URL: [https://cyberleninka.ru/article/n/finansovyy_-_potentsial_-_regiona_-_suschnost_-_i_-_podhody_-_k_-_otsenke_\(date_of_reference:_16.11.2021\).p.64-66](https://cyberleninka.ru/article/n/finansovyy_-_potentsial_-_regiona_-_suschnost_-_i_-_podhody_-_k_-_otsenke_(date_of_reference:_16.11.2021).p.64-66)
9. Dorzhieva V.V., Lazareva L.D., Karpushev Some approaches to the assessment of regional financial potential // Proceedings of the Irkutsk State Academy of Economics.- № 1.-2010.- pp.24-27
10. Vakhobov A.V., Juraev A.S. Soliqlar va soliqqa tortish.-T.: "Iqtisod-moliya", -2019.
11. L.V.Buranova Financial potential as a basis for assessing the financial independence of the region. Collection of scientific works of the conference "Priority directions, modern tendencies and prospects of development of the financial market".-2023g.-182-185str.
12. Buranova L.V. Increasing the efficiency of small business subjects in the sphere of public procurements through the digitalization of business processes. Iqtisodiyot va zamonaviy texnologiya Journal. - 2023
13. Buranova L.V. Problems of strengthening local budget revenues by assessing the financial potential of the region (on the example of Surkhandarya region). Monograph 2022g -180str
14. Buranova L.V. System of indicators determining the financial potential of Surkhandarya region and its peculiarities. Economics and entrepreneurship. Journal. 2021 -598-606str.
15. <https://www.imf.org> - International Monetary Fund
16. <https://www.worldbank.org> - World Bank

