Specific Features of Investment in the Branches and Its Evaluation Methodology

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Abstract- **In the article proposes the role of investments in the economy and the modeling of their allocation, based on computer technology, and the results of their implementation on the example of the Republic of Uzbekistan and the scientific conclusions and recommendations on econometric modeling.**

***Keywords*:** Direct investment, action strategies, econometric and economic-mathematical models, distribution states, linear scale.

1. INTRODUCTION

The development of the country's economy and its integration into the world community are directly reflected in the economic cooperation and cooperation with foreign countries. This is especially apparent in today's globalization. In the process of globalization, integration with the leading countries of the world is important for integration into the world community, harmonization of state policy in the socio-economic and political spheres on the mutually beneficial basis.

Globalization combines economic liberalization, accelerated scientific and technological progress, increased competition and a number of other conditions. As noted above, investment activity and globalization of the world economy are important for today's world economy. Increasingly the role of developing countries and market economies in the international division of labor also has a positive impact on it.

The Republic of Uzbekistan today has an investment climate with all the economic, political and legal bases for becoming one of the largest foreign investors. However, this does not mean that Uzbekistan has created all necessary conditions for attracting foreign investors. Therefore, it is necessary to develop mechanisms for attraction of investments, effective use, and proper organization of directions and distribution of investments on the basis of abovementioned principles.

According to international experience, the role and weight of foreign investments in the country's economy determine how favorable the investment climate in that country is. This is largely attributed to the government's policy in relation to foreign investments, the specifics of government regulation of investment and foreign economic activity.

At present it is possible to say that the investments attracted and mastered in the economy of Uzbekistan are directed at the purchase of new equipment, technical and technological modernization of the enterprises, and the allocation of new enterprises.

In the world economy, the attraction of investments in the economy and its effective utilization is important for the supply of new equipment and technologies, to gain a foothold in the international market, and to produce competitive and high-quality products. According to the United Nations, "The total FDI inflows in the world declined from $ 1.47 trillion in 2017 to 19 percent in 2018 and amounted to $ 1.2 trillion. Investment in Asia increased by 5% and 6% in Africa" [1]. This, in turn, requires taking into account the risk factors in the assessment of the effectiveness of investment in the volatility and uncertainty of the global market, the proper regulation of investments and the distribution between regions and economic sectors.

The development of scientifically-based measures, sustainable growth of global business, global growth, global economic growth, the ability to prevent the full operation of the production process due to inefficiency of investments in the world economy or uncertainty of the risks and risks of effective use of investments Ensuring competitiveness - An in-depth and comprehensive analysis of factors affecting investment efficiency the work, and the quantitative links between them.

In order to develop the economy of the Republic of Uzbekistan, in 2017 enterprises and organizations of all forms of ownership will receive 60719.2 billion soums. or 107.1% of 2016 capital investments. The "Strategy of Action for the Five Priorities of Development of the Republic of Uzbekistan for 2017-2021" [2] and tasks for active attraction of foreign investments into the sectors and regions of the economy through the improvement of the investment climate, effective use of attracted foreign investments and loans. These tasks include active investment policy aimed at implementation of investment projects on modernization, technical and

technological renovation of production, development of production and social infrastructure, improvement of methods of econometric modeling of distribution and direction of economic inter-sectoral investments, determination of investment efficiency, risks and risks models.

2. LITERATURE REVIEW

R. P. Mohanty [3], L. Dimova [Multiple Indicator Assessment of Investment Projects based on Uncertain Financial Indicators [3], Net Present Value of Investment Project and Indicator Rate Indicator Rate on Obtaining Indicators of Investment Project in Uncertain Quantities 4], Mohamed S., K McCowan [5], P. Samuelson [6], Sharp U [7], Lawrence J. Gitman [8], K.R. McConnell and S.L. Bruce [9] carried it.

Theoretical aspects of investment flow management, including industry, in the CIS countries by EV Mikhaylova [10], ND Guskova [11], OS Suarev [12], VV Mishchenko [13]. Work on attraction of investments for development.

The models proposed by these scientists do not take into account the uncertainty, risk and risk limits of investments in industries and enterprises, and the conditions for modernization. The author's proposed system of econometric and economic-mathematical models, along with the above, is of particular interest in the development of the current state and prospects of national economy development, modernization and technical and technological re-equipment of enterprises.

3. ANALYSIS AND RESULTS

Economic processes are complex, and computer technology is now a free-of-charge assistant for analyzing and making scientific conclusions. The author has developed an algorithmic program to analyze the state of intersectoral distribution of investments in the EXSEL computer program, using mathematical and statistical models to improve performance and achieve greater accuracy. For the use of the developed algorithm, first of all, the statistical data of the selected objects in the same period is determined, placing them in the EXSEL program with a value of 0 [1;

According to the State Statistics Committee of the Republic of Uzbekistan, investment in agriculture and construction was 10-15 times less than in industry and services. The average annual value of investment in economic sectors for the period 2000-2018 is 88,528.1 billion. It is necessary to clarify a number of indicators.

Table 1: Value of computed mathematical and statistical indicators

Indicators and their designation	**Calculated values**	**Indicators and their designation**	**Calculated values**
Average -$\bar{X}$	0.2	Minimum value -X_{min}	0,008
Standard deviation - y	0.2	Maximum value -X_{max}	1,0
Coefficient of variation -V	103 %	The number of intervals calculated in the stereo-formula -n	5

Source: Author's development based on data from the State Statistics Committee of the Republic of Uzbekistan.

Based on the data presented in the table, a linear scale map of the periodic distribution of investments in the economic sectors is drawn. For this purpose, first of all, on the basis of the annual dynamic indexes of the intersectional distribution of investments

$$\bar{X}_1 = \frac{1}{4}\sum_{i=1}^{4} x_i,\ \bar{X}_2 = \frac{1}{4}\sum_{i=1}^{4} x_i, \ldots, \bar{X}_{17} = \frac{1}{4}\sum_{i=1}^{4} x_i; \quad (1)$$

They are grouped by the threshold values using the mean values determined by the formula. The purpose of this is to calculate each of the conditions and definitions that have been established in the program "EVIEW 9".

In this case, the names of columns 1 and columns 2 and 3 are set by the following conditions:

0,008≤“ Too bad”<0,159; 0,159≤“bad”<0,318; 0,318≤“middle”<0,477; 0,477≤“good”≤0,637; 0,637≤“very good”<0,80;

In column 4:

$$x_{31} = \text{ТЕКСТ}(x_{21};”0{,}00”)\&” – “\&\text{ТЕКСТ}(x_{31};”0{,}00”),$$
$$x_{32} = \text{ТЕКСТ}(x_{22};”0{,}00”)\&” – “\&\text{ТЕКСТ}(x_{32};”0{,}00”)$$
$$x_{33} = \text{ТЕКСТ}(x_{23};”0{,}00”)\&” – “\&\text{ТЕКСТ}(x_{33};”0{,}00”)$$
$$x_{34} = \text{ТЕКСТ}(x_{24};”0{,}00”)\&” – “\&\text{ТЕКСТ}(x_{34};”0{,}00”)$$
$$x_{35} = \text{ТЕКСТ}(x_{25};”0{,}00”)\&” – “\&\text{ТЕКСТ}(x_{34};”0{,}00”) \quad (2)$$

algorithm. Using the developed algorithm, the values obtained from the average squared column are reflected

in each case by the boundaries.

In column 5:

$$x_{51} = \text{СУММ}((\text{Хисоб} >= x_{21}) * (\text{Хисоб} < x_{31}));$$
$$x_{52} = \text{СУММ}((\text{Хисоб} >= x_{22}) * (\text{Хисоб} < x_{32}));$$
$$x_{53} = \text{СУММ}((\text{Хисоб} >= x_{23}) * (\text{Хисоб} < x_{33}));$$
$$x_{54} = \text{СУММ}((\text{Хисоб} >= x_{24}) * (\text{Хисоб} < x_{34}));$$
$$x_{55} = \text{СУММ}\big((\text{Хисоб} >= x_{25}) * (\text{Хисоб} < x_{35})\big) \quad (3)$$

By the algorithm, the unit values of the distribution of cases are placed. Column 6 shows the number of periods invested in the sector by percentage:

For Case 1: $x_{61} = x_{51} \div \sum_{i=1}^{5} x_{5i}$;
For Case 2:$x_{62} = x_{52} \div \sum_{i=1}^{5} x_{5i}$;
For Case 3:$x_{63} = x_{53} \div \sum_{i=1}^{5} x_{5i}$
For Case 4:$x_{64} = x_{54} \div \sum_{i=1}^{5} x_{5i}$
For Case 5:$x_{65} = x_{55} \div \sum_{i=1}^{5} x_{5i}$ (4)

is determined by the algorithm, and finally column 7, which represents the rate of return on investment, is calculated using the following algorithmic model:

$$x_{71} = \text{НОРМРАСП}(x_{31};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1) - \text{НОРМРАСП}(x_{21};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1),$$
$$x_{72} = \text{НОРМРАСП}(x_{32};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1) - \text{НОРМРАСП}(x_{22};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1),$$
$$x_{73} = \text{НОРМРАСП}(x_{33};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1) - \text{НОРМРАСП}(x_{23};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1),$$
$$x_{74} = \text{НОРМРАСП}(x_{34};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1) - \text{НОРМРАСП}(x_{24};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1),$$
$$x_{75} = \text{НОРМРАСП}(x_{35};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1) - \text{НОРМРАСП}(x_{25};\text{СРЗНАЧ}(X_1 : X_{18});\text{СТАНДОТКЛОНП}(X_1 : X_{18});1).$$

(5)

Reliability of the defined model $X_n^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$; (6)

In Pearson [14], that is, in MS EVIEW 9, $x_{77} = \text{ХИ2ТЕСТ}(x_{61}:x_{65};x_{71}:x_{75})$ is tested by the xi-square. In order to integrate these methods and reach a general conclusion, it is advisable to place the calculations on the results of the above-linear and logarithmic normal distributions, which in turn will increase the likelihood of conclusions.

Models based on the theory of uncertain aggregate economic distribution of proposed investments allow quantitative indicators to be quantified without experts, performing transactions on uncertain input data, modeling complex dynamic systems and comparing them with the given accuracy, eliminating the disadvantages and limitations of existing investment risk assessments. [15]. This, in turn, will ensure the development of effective investment programs based on the current situation.

The development of the country's economy and its integration into the world community are directly reflected in the economic cooperation and cooperation with foreign countries. This is especially apparent in today's globalization. In the process of globalization, integration with the leading countries of the world is important for integration into the world community, harmonization of state policy in the socio-economic and political spheres on the mutually beneficial basis.

In the first case of the study, it is important to distinguish between periods when capital investment exceeds the threshold. At the same time, increased investment in fixed assets will, of course, increase GDP, but given the degree of constraint or saturation, excess investment will be useless. Therefore, the comparison of investment in fixed assets with GDP can provide a scientifically sound conclusion (Table 2).

Table 2: Comparison table of actual economics and investments in fixed assets with the results of econometric model (in bln. Soums)

Cases	Year	Gross domestic product	Investment in fixed assets	The value of GDP determined by the developed model	Defined investment value	The difference between actual and determined GDP values	The difference between actual and net total capital
1-case	2005	15923,4	3165,3	15005,7	3466,4	-917,7	301,1
	2006	21124,9	4041,0	20870,5	4825,7	-254,4	784,7
	2011	78764,2	17953,4	78403,2	18744,6	-361	791,2
	2012	97929,3	22797,3	96875,0	23306,8	-1054,3	509,5
	2015	171369	40 737,3	169624,0	41 460,2	-1745	722,9
2- case	2001	4925,3	1 321,0	4050,3	1091,0	-875	-230
	2002	7450,2	1527,0	5291,7	1326,6	-2158,5	-200,4
	2003	9844,0	1978,1	7405,4	1767,4	-2438,6	-210,7
	2004	12261,0	2629,0	10580,4	2463,8	-1680,6	-165,2
	2008	38969,8	9556,0	37674,6	8817,2	-1295,2	-738,8
	2009	49375,6	12532,0	48992,1	11550,4	-383,5	-981,6
	2013	120861,5	28694,6	118109,7	28579,7	-2751,8	-114,9
	2014	144867,9	35233,3	142296,3	34614,0	-2571,6	-619,3
	2017	249136,4	60719,2	234458,7	57790,8	-14677,7	-2928,4
3- case	2000	3255,6	745,0	3492,1	1009,8	236,5	264,8
	2007	28 190,0	5903,5	28363,8	6592,5	173,8	689
4- case	2010	62388,3	15 338,7	62505,3	14 842,7	117	-496
	2016	199325,1	49476,8	200281,8	49 169,0	956,7	-307,8

Source: Author's development based on data from the State Statistics Committee of the Republic of Uzbekistan.

According to Table 5, in total 1, 78012.1 billion. or UZS 11,144.6 bln. sums were really distributed. The estimated cost of the model is $ 10,662.4 billion. soums, which is a total of 74,636,9 billion soums. soums. This means that the difference between the actual situation and the cost of the model is 3375.2 billion. It means that it is worthless. The second case is the years when investment in fixed assets is less than normal: in 2006 (UZS 4,441 bn.) It was UZS 741.8 bn. In 2012 (UZS 17,953.4 billion), UZS 771.1 billion. and 229.7 billion soums in 2013 (22797.3 billion soums). As a result, additional GDP could increase by 6.2%.

The third case is that in both cases the above-mentioned results can be expected to have an effect of 14.8 billion sums in 2005 (3165.3 billion soums). The total volume of gross domestic product (15,923.4 billion UZS) is estimated at 357 billion soums. soums.

The fourth case is the amount of 147.8 billion dollars of the estimated (1) -model value of investments made in 2002 (1,527 billion soums). UZS 7275.3 bn., despite a small investment in fixed assets UZS 7450.2 bn. soums.

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The Republic of Uzbekistan today has an investment climate with all the economic, political and legal bases for becoming one of the largest foreign investors. However, this does not mean that Uzbekistan has created all necessary conditions for attracting foreign investors. Therefore, it is necessary to develop mechanisms for attraction of investments, effective use, proper organization of directions and distribution of investments on the basis of abovementioned principles. Using the aforementioned methodology, we carry out the survey using

statistical data on investment in fixed assets of the Republic of Uzbekistan, 2000-2018. The results of the survey can be seen in Table 2 below.

Table 2: Periodic distribution of investments by sectors on a linear scale

№	Frequency of investment (billion soums)			Number of cycles		Distribution Rate
T / R	≥	<	"from - to"	y.e.	%	%
Too bad	0,008	0,159	0,01 -0,16	10	52,6%	20,9%
Bad	0,159	0,318	0,16 -0,32	3	15,8%	26,4%
Medium	0,318	0,477	0,32 -0,48	3	15,8%	20,7%
Good	0,477	0,637	0,48 -0,64	1	5,3%	10,4%
Very good	0,637	0,796	0,64 -0,80	2	10,5%	3,4%
Total by periods				19	100%	81,8%
The chi-square test of comparison of actual and normative distribution of investments						95,0%

Source: Author's development based on data from the State Statistics Committee of the Republic of Uzbekistan.

As can be seen from the data in Table 2, the last column represents the values we expect above. It can be seen that these determined values were disproportionately invested in fixed assets of the Republic of Uzbekistan in 2000-2018. In general, it was found that 81.8% of investments were required, with the required 81.8% investment. In this regard, it is advisable to compare the above table with the results of the logarithmic normal distribution.

All columns except the second and third columns on the logarithmic normal distribution are determined by the methods described above. The first column of the second column is chosen for 10,00000 (0.0001), and the first column of the third column is set accordingly until the fifth threshold is reached. In the study, the first column was the first line (0.00015), with the first threshold increasing by 15 times. The limits of the second column to the fifth boundary are determined by multiplying the corresponding limits in the second column to the value of the periodic investment, and the value of the periodic distribution is calculated by the following formula:

$d = 10000^{\frac{1}{i-1}}$ $here, i = \frac{X_{max} - X_{min}}{n}$; Where i is the number of intervals calculated in the Stereocyte formula (Table 3).

Table-3: Periodic distribution of investments in fixed assets of the Republic of Uzbekistan on the logarithmic scale d = 8.74

№	Frequency of investment (billion soums)			Number of cycles		Distribution Rate
T / R	≥	<	"дан -гача"	Бирликда	%	%
Too bad	0,0000	0,0001	0,00001-0,01	0	0,0%	0,00%
Bad	0,0001	0,0010	0,00012-0,01	0	0,0%	0,04%
Medium	0,0010	0,0092	0,00105-0,01	6	31,6 %	1,04%
Good	0,0092	0,0802	0,00917-0,11	8	42,1 %	9,74%
Very good	0,0802	0,7009	0,08017-0,71	5	26,3 %	32,27%
Total by periods				19	100%	43,1%
The chi-square test of comparison of actual and normative distribution of investments						75 %

Given that life expectancy increases with logarithmic normal distribution, it is common that, according to the table, 6 years in case 3, 8 in case 4, and 5 in case 5 are all 100% of the investment. It was found that 30.54% and 33.8% of investment were distributed, which is 5.95% less than the norm. A total of 56.9% of investments were distributed over the period 2000-2018. From these cases it can be concluded that the logarithmic normal distribution is more accurate than the linear normal distribution.

In fact, when we receive investments in fixed assets over the years, the level of inflation will change and the investment will change with respect to price changes. This results in an increase in investment over time compared to the base year, which, in turn, shows a low performance over the past period with a decrease in the

amount of investment (the same is shown in Table 3 on a linear scale).

It should be noted that these distribution models used in the study have been verified and adequately met with the xi criteria. The xi squared criterion is the most common criterion for comparing the hypothesis that the observed rows belong to a known theoretical distribution law. The use of the xi-square criterion does not require competing hypotheses as a rule, but rather an example of a particular law. The chi-square test is any statistical test of the hypotheses, where the null hypothesis is correct, with a standard distribution of the criterion. The null hypothesis-observed random variable is considered to be subject to a certain theoretical distribution law.

4. CONCLUSIONS

The problem of organization and formation of investment processes is within the scope of optimization under uncertainty. The apparatus of probability theory is involved to solve these problems. However, in a number of cases, the application of probability theory is sufficiently clear and unjustified. Under these circumstances, the use of approaches that are different from theories of probability, that is, to assess the current uncertainty, enables accurate and complete evaluation of the process.

The use of uncertain sets of methods allows you to include qualitative variables in the analysis, the presence of transactions on uncertain data, and the use of linguistic criteria, and rapid modeling and comparison of complex dynamic systems, and the disadvantages and limitations of existing methods for assessing investment risks.

In the implementation of the investment distribution, it is necessary to determine the attractiveness of the investment climate, region, sector or enterprise, and the extent of the investment volume and the level of risk and risk. This implies the use of a comprehensive econometric model of the distribution of investments.

Econometric methods do not exclude simple traditional methods, but also contribute to their further development and the specific analysis of objective variables by other indicators. This enables the scientifically based forecasting and management of production results and the national economy at tens of industries and thousands of enterprises.

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