

## MULTIFACTOR CORRELATION-REGRESSION ANALYSIS OF THE INTERCONNECTION OF ECONOMIC PROCESSES

*Qarshiboyev Xayrullo Qilichovich*

*Samarkand Institute of Economics and Service,  
Head of the Department of "Higher Mathematics",  
Associate Professor, PhD. [karshiboyev@mail.ru](mailto:karshiboyev@mail.ru)*

*Mamatazimov Jaloliddin Sherzod o'g'li*

*Master's degree of the  
Samarkand Institute of Economics and Service*

**Abstract:** The article presents scientific ideas on the practical application of econometric analysis. Using multifactor analysis, the factors affecting bank profits were examined. As a result of the analysis, a model of the relationship between the impact of influencing indicators on the resulting factor was developed and forecasted.

**Key words:** Bank capital, deposit, bank resource, bank profit, banking system assets, total banking system risk assets.

**Introduction.** The banking system is a set of banks and other financial institutions that are engaged in the storage and processing of money, providing loans and other services to their customers. The banking system is a key element of the economic infrastructure, ensuring the smooth functioning of financial transactions.

The banking system in different countries can have a different structure. However, usually the banking system is divided into several levels. At the first level there are Central Banks, which regulate the banking system of the country. The Central Bank can perform functions such as setting interest rates, regulating the money supply, supervising other banks. At the next level there are commercial banks that serve customers and accept deposits, grant loans, etc.

Another level is regional banks, which can operate in a single region or state, providing financial services for local communities. In some countries, there may also be credit unions that provide financial services to members of the union, which may include employees of one enterprise or residents of one community.

Factors affecting profit in the banking system include banking system assets, leveraged assets of the banking system, regulatory capital of the banking system, and bank interest. According to the data in Table 1, we build an econometric model of the following issue and conduct its economic analysis.

Table 1

**Indicators affecting the adequacy of banking system capital (regulatory capital) in billions of soums and percent**

N	Years	y	x1	x2	x3	x4
1	2000	20	28,2	1068	225	39,5
2	2001	39	26,6	2076	276	36,2
3	2002	56	21,6	2966	502	32
4	2003	64	3,8	3367	715	13
5	2004	73	3,7	3860	791	12,2
6	2005	80	7,8	4215	824	16
7	2006	86	6,8	4549	930	15,9
8	2007	102	6,8	5349	1055	15
9	2008	171	7,8	8980	1333	16,6
10	2009	207	7,4	9974	1761	15,9
11	2010	261	7,3	12480	2656	13,8
12	2011	309	7,6	15927	3101	14,3
13	2012	413	7	23251	4220	13,6
14	2013	571	6,8	26347	4662	15,6
15	2014	724	6,1	30967	5655	15,3
16	2015	915	5,6	53252	6320	13,9
17	2016	1153	5,7	57552	8460	13,9
18	2017	1844	14,4	106345	19993	18,5
19	2018	3197	14,3	155328	24231	21,8
20	2019	4675	15,2	223263	52467	24,8
21	2020	4790	13,4	304535	53423	24,1
22	2021	5642	11,1	316098	58162	18,8
23	2022	6346	17,5	426524	61342	25,2

here:

y-bank profit, billion soums;

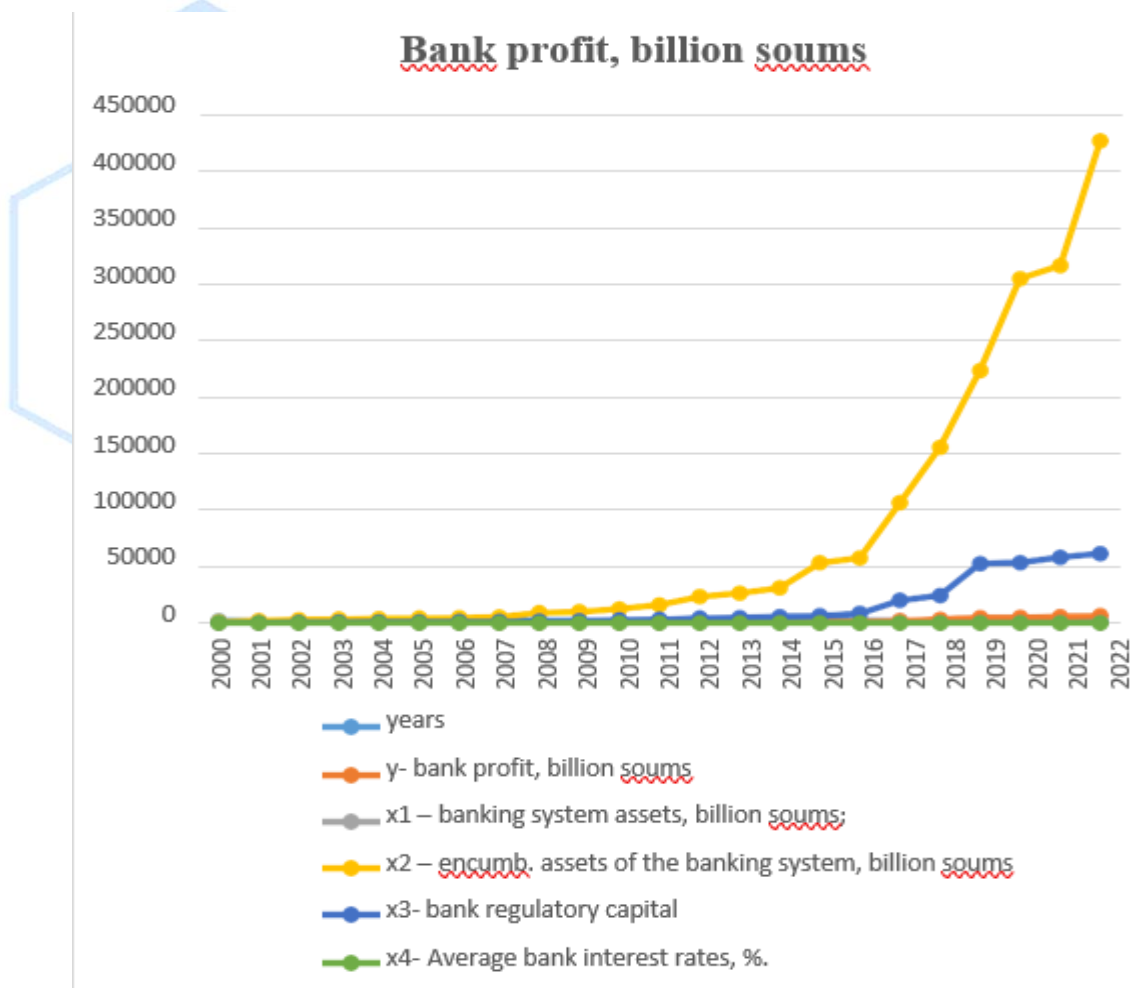
x1 –banking system assets, billion soums;

x2 –banking system leveraged assets, billion soums;

x3-bank regulatory capital (regulatory capital structure, authorized capital, additional capital, reserve capital, distributed profit), billion soums;

x4-bank interest rate average, %.

Based on the data in Table 1, we consider the factors affecting bank profit in the graph.



**Figure 1. Factors affecting bank profits**

According to the data on bank turnover in the republic in 2021-2022, bank profits increased by 704 billion soums compared to 2021, including an increase in banking system assets by 6.4 billion soums, an increase in the banking system's attracted assets by 146426 billion soums, a decrease in bank regulatory capital by 92835 billion soums, and a decrease in banking system interest by 6.4% (Figure 1).

#### Research methodology

Based on the method of scientific abstraction, observation, comparison, correlation-regression analysis.

#### Analysis of relevant literature

As a result of the reforms being implemented in our country, market mechanisms for providing services are being introduced in the banking system, their types are being expanded, and financial openness for entrepreneurs and the population is increasing.

At the same time, the share of problem loans in the credit portfolio of banks is increasing. The scientific research of our domestic economists U.A. Tukhtaboyev and K.A. Mukhamedjanov on the reduction of problem loans has provided definitions.

U.A. Tukhtaboyev defines problem loans as follows: problem loans are the result of the actual manifestation of credit risks and refer to loans that, due to objective and subjective reasons, have been classified as “unsatisfactory”,

“doubtful” and “hopeless” loans due to violation of the terms of the loan agreement.

According to K.A. Mukhamedjanov, the source of credit risk is the borrower’s improper activities, which may lead to his inability to repay the loan debt in full and on time.

### Materials and Methods

We will analyze the problem of bank profits using regression-correlation. For this, we will use one of the computer programs, Microsoft Excel, an electronic processor.

The regression equations are processed in the following form:

$$\bar{y}_1 = a_0 + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4; (1)$$

$$\bar{y}_2 = b_0 + b_1 \ln(x_1) + b_2 \ln(x_2) + b_3 \ln(x_3) + b_4 \ln(x_4); (2)$$

$$\bar{y} = c_0 \cdot c_1^{x_1} \cdot c_2^{x_2} \cdot c_3^{x_3} \cdot c_4^{x_4}; (3)$$

where:

y-bank profit, billion soums;

x1 –banking system assets, billion soums;

x2 –banking system’s leveraged assets, billion soums;

x3-bank regulatory capital, (regulatory capital structure, authorized capital, additional capital, reserve capital, distributed profit), billion soums;

x4-bank interest rate average, %.

### Analysis and results

We select the most important of the three regression equations in the problem under consideration.

To do this, according to the evaluation results

$$\tilde{y}_1 = 269,9352 + 22,9664x_1 + 0,006483x_2 + 0,058724x_3 - 23,1316x_4$$

regression equation  $a_0 = 269,93$   $a_1 = 22,97$ ;  $a_2 = 0,006$ ;  $a_3 = 0,059$ ;  $a_4 = -23,14$  The parameters are significant if the Student's t-test is used to evaluate

$t_0 = 1,08$ ;  $t_1 = 0,66$ ;  $t_2 = 3,48$   $t_3 = 5,49$ ;  $t_4 = -0,74$ .

In this case, since the Table value  $= \text{СТЮДЕНТ.ОБР.2X}(0,05;8) = 2,306004 > t_{a_i}$  ( $i=0,1,2,3,4$ )

$a_0$ ;  $a_1$ ;  $a_2$  parameters are not significant and  $a_3$ ;  $a_4$



parameters are significant. According to Fisher criterion,  $F_{acc} > F_{tab}$ , it follows that the regression equation is significant  $F=523,7804$ .

The regression equation is important since the table value  $=F_{0.05;5;18}=2,7728$ .

### Conclusions and suggestions

In conclusion, using the econometric analysis obtained above,

$$1) \tilde{y}_1 = 269,9352 + 22,9664x_1 + 0,006483x_2 + 0,058724x_3 - 23,1316x_4$$

$$2) \tilde{y}_2 = -17311,9 - 4446,9 \ln(x_1) - 1608,29 \ln(x_2) + 4172,25 \ln(x_3) + 11952,97 \ln(x_4)$$

$$3) \tilde{y}_3 = 0,0302 \cdot x_1^{-0,037} \cdot x_2^{0,849} \cdot x_3^{0,139} \cdot x_4^{-0,003}$$

the most important of the

models

$$-0,003 \cdot x_4 \cdot 0,139 \cdot x_3 \cdot 0,849 \cdot x_2^{-0,037} \cdot 0,0302 \cdot x_1 \sim y = \cdot x \cdot x \cdot x \cdot x$$

it was found  $\tilde{y}_3 = 0,0302 \cdot x_1^{-0,037} \cdot x_2^{0,849} \cdot x_3^{0,139} \cdot x_4^{-0,003}$  that.

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