THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY
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ANALYSIS OF THE IMPACT OF INDIRECT TAXES ON THE FORMATION OF BUDGET REVENUES IN MULTIFACTOR ECONOMETRIC MODELING

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Abstract*:* The importance of indirect taxes in the formation of state budget revenues plays a significant role. As a result of the reforms carried out in our country, it can be seen that today we have made a step forward in all areas. Of course, this good news does not exclude news in the tax field. This article describes in detail the factors influencing the effect of indirect taxes on state budget revenues through multifactor econometric modeling.

In developed countries, indirect taxes are relatively less important in their tax structure. In these countries, on average, indirect taxes make up less than 40 percent of total tax revenue. The purpose of indirect taxes in developed countries is to keep the general public in the tax net. Indirect taxes are basically taxes that can be transferred to another legal entity or individual. They are usually charged to the manufacturer or supplier, who then pass the tax on to the consumer. The most common example of an indirect tax is the excise tax on cigarettes and alcohol. Indirect taxes and direct taxes differ in many ways. In our country, the share of indirect taxes in the state budget is more than 40%.

Key words*:* state budget, tax, indirect taxes, MOLS(EKKU) method, multifactor econometric model, correlation matrix.

Аннотация*:* Значение косвенных налогов в формировании доходов государственного бюджета играет значительную роль. В результате реформ, проведенных в нашей стране, видно, что сегодня мы сделали шаг вперед во всех сферах. Конечно, эта хорошая новость не исключает новостей в налоговой сфере. В данной статье подробно описаны факторы, влияющие на влияние косвенных налогов на доходы государственного бюджета посредством многофакторного эконометрического моделирования.

В развитых странах косвенные налоги играют сравнительно меньшую роль в их налоговой структуре. В этих странах в среднем косвенные налоги составляют менее 40 процентов совокупных налоговых поступлений. Целью косвенных налогов в развитых странах является удержание населения в налоговой сети. Косвенные налоги – это, по сути, налоги, которые могут быть переданы другому юридическому или физическому лицу. Обычно они взимаются с производителя или поставщика, которые затем перекладывают налог на потребителя. Наиболее распространенным примером косвенного налога является акциз на сигареты и алкоголь. Косвенные налоги и прямые налоги во многом различаются. В нашей стране доля косвенных налогов в государственном бюджете составляет более 40%.

Ключевые слова*:* государственный бюджет, налог, косвенные налоги, метод ЭККУ, многофакторная эконометрическая модель, корреляционная матрица.

ENTER.

In the global tax practice, it is possible to assess the level of development of the economy of a country depending on the ratio of direct and indirect taxes in the structure of state budget revenues. For example, in the USA, the weight of real taxes in the structure of budget revenues is

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-4, ISSUE-4

close to 90%, which indicates that this country's economy is highly developed. Indirect taxes include value-added tax, excise tax, customs duty, taxes on the use of gasoline, diesel fuel and gas by individuals for vehicles. The fact that the state budget of the Republic of Uzbekistan has a tendency to increase the social expenses requires the continuous increase of the state budget revenues. As a result of this, it is necessary to ensure a high weight of the budget income from stable sources of income, such as value added tax and excise tax. As mentioned above, direct and indirect taxes form a single tax system and are interconnected. The role of indirect taxes in European countries is higher than in the USA, Japan, Canada and Australia. In European countries, indirect taxes account for more than 40 percent of the total tax revenue, and in some countries it is 50 percent. The group of countries with this indicator above 50 percent includes Mexico, Turkey and Korea. In the USA, Japan, Canada and Australia, this figure is 25-30 percent. [2]

It is known that taxes are directly related to the emergence of the state, that is, the state uses taxes as a financial source to fulfill its tasks. The application of taxes is an objectivity, because not all subjects of society operate in the real sector, that is, in the production sector. There are also sectors in society that are rejected by others or whose activities are economically ineffective, which require the objective application of taxes. More precisely, the division of society into non-profitable (defense, medicine, science, education, culture, etc.) and profitable sectors and the natural necessity of financing the non-profitable sector make it necessary to apply taxes objectively, although the social services of the non-profitable sector are mainly provided by the state are carried out, so that the taxes that arise as a way of financing them will also directly belong to the state.

Taxes, which are the main source of budget revenues for the state, are of great importance. The effectiveness of taxes in the transition to a market economy can be expressed in two cases: firstly, the need to provide funds for a number of tasks of the state, and secondly, they are the rules of the market economy.

State budget revenues in 2023 will amount to 231 trillion soums, this figure has increased by 14.4% compared to 2022 and reached 29 trillion soums. In particular, receipts from taxes to the state budget amounted to 184.5 trillion soums. Indirect taxes made up the main part of the income from taxes, this amount was 83 trillion or 36% of the total revenues of the State budget. This situation ensured an increase of 11 trillion soums or 15.3% compared to 2022. In these indicators, the growth of indirect taxes did not show very sharp quantitative indicators.
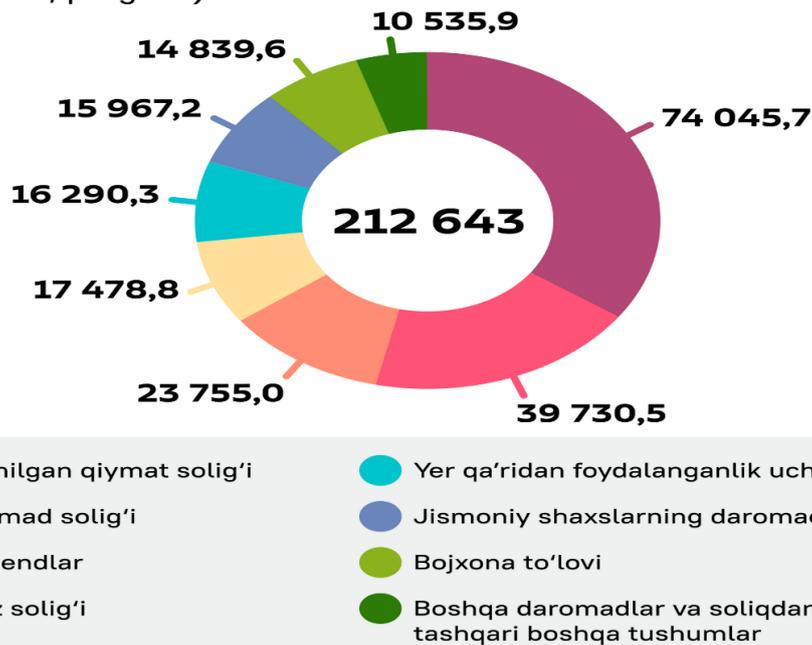

2023 ЙИЛ ДАВЛАТ БЮДЖЕТИ ДАРОМАДЛАРИ ПРОГНОЗИНИНГ ТАРКИБИ, МЛРД СЎМ

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY
VOLUME-4, ISSUE-4

Figure 1. Composition of the state budget revenue forecast, billion soums[1]

The reason is that in 2023, the rate of excise tax on some products was set at 34,500 soums per liter of ethyl alcohol without added water in the excise goods. Starting from February 1, 2023, the excise tax rates on oil products and manufactured alcohol and tobacco products were indexed to 10%. Starting from January 1, 2023, the excise tax rates on the import of rectified ethyl alcohol from food raw materials, alcohol and tobacco products from January 1, 2023 have been reduced

O'zbekistonning 2024-yilgi respublika byudjeti daromadlari tarkibi
(mlrd so'm, prognoz)

10 535,9
14 839,6
15 967,2
16 290,3
17 478,8
23 755,0
74 045,7
39 730,5
212 643

- Qo'shilgan qiymat solig'i
- Daromad solig'i
- Dividendlar
- Aksiz solig'i
- Yer qa'ridan foydalanganlik uchun soliq
- Jismoniy shaxslarning daromad solig'i
- Bojxona to'lovi
- Boshqa daromadlar va soliqdan tashqari boshqa tushumlar

by 5%.

Figure 2. The composition of the revenues of the 2024 republican budget of Uzbekistan [2]

As a result, the reduction of the tax burden did not lead to a very high increase in the share of these indirect taxes in the state budget. In addition, the reduction of the tax burden of VAT from 15% to 12% showed that the tax payments of entrepreneurs who pay this indirect tax, that is, VAT tax, will decrease.

The share of indirect taxes in the state budget revenues for 2024 is expected to increase by 20.3% compared to the share of indirect taxes in budget revenues in 2023. This means that our tax-paying enterprises that create additional value have increased, and changes in indirect taxes in our new tax code also have a positive effect on this.

Results and analysis. As part of our research, we will study the influence of various factors on the volume of indirect taxes. Based on logical thinking, we have selected several factors and assumed that they will affect the size of the resulting sign curve taxes. [3]. These factors are:

Factors affecting indirect taxes (trln, soum)[3]   1-Table

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[1] https://api.mf.uz/media/document_files/Budjet_23_uz.pdf

[2]

[3] https://stat.uz/uz/

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-4, ISSUE-4

Years	Indirect taxes	Wholesale trade	Retail	Export	Import
n	y	x_1	x_2	x_3	x_4
2013	31,2618	22,001	46,863	175,4525	170,8499
2014	39,6737	25,512	51,033	165,9354	171,3081
2015	46,0905	29,156	63,027	153,2154	152,1039
2016	50,422	35,396	81,278	148,1594	148,6852
2017	61,9395	38,799	95,952	153,7833	171,6516
2018	94,6427	57,481	113,971	171,3866	238,131
2019	112,8193	86,538	141,385	213,8689	297,5809
2020	112,009	128,741	168,649	185,0029	259,1337
2021	134,0484	183,112	216,694	204,1194	312,4695
2022	175,637	258,444	270,687	236,348	376,905
2023	196,1008	1675,712	295,319	298,9	466,725

To verify the correctness of this hypothesis, we conducted a multi-factor correlation analysis. (Table 1). The results are presented in Table 2. For this we used MS Excel's Analyz dannyx package.

Correlation matrix of our analysis [4]

	y	x_1	x_2	x_3	x_4
y	1				
x_1	0,705024	1			
x_2	0,987968	0,704558	1		
x_3	0,899872	0,862998	0,882529	1	
x_4	0,976434	0,784276	0,957462	0,968882	1

According to Table 2, we evaluate the 1st condition of creating a multifactor model according to the connection between y (resulting factor sign) and x (influencing factor sign). x_2, x_3, x_4 are closely connected with y, that is, they satisfy the condition $r_{yx_i} \geq 0,8$. And since x_1 is

[4] Author development

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY
VOLUME-4, ISSUE-4

denser than average with y, we exclude it from the analysis. Also, according to the 2nd condition of creating a multifactor model, that is, the x's should not be closely related to each other. Therefore, we get the following values:

1. x_1 va x_2 $r_{x_1 x_2} = 0,7$
2. x_1 va x_4 $r_{x_1 x_4} = 0,78$

The above values are not mutually multicollinear and they can participate in the model at the same time, so the following models can be created according to the results of the correlation analysis.

1. $y = a_1 + b_1 * x_1 + + b_2 * x_2$
2. $y = a_2 + b_2 * x_1 + + b_4 * x_4$

First, we identify the first model. For this we use EKKU (Least Squares Method).

$$na + b_1 \sum x_1 + b_2 \sum x_2 = \sum y$$
$$a \sum x_1 + b_1 \sum x_1^2 + b_2 \sum x_1 x_2 = \sum y x_1$$
$$a \sum x_2 + b_1 \sum x_1 x_2 + b_2 \sum x_2^2 = \sum y x_2$$

First, we calculated the value of the indicators required in the formula. (Table 3).

Some calculations [5]

n	y	x_1	x_2	x_1^2	x_2^2	yx_1	yx_2	$x_1 x_2$
1	31,2618	22,001	46,863	484,0704	2196,141	687,809	1465,021	1031,061
2	39,6737	25,512	51,033	650,893	2604,397	1012,18	2024,679	1301,993
3	46,0905	29,156	63,027	850,084	3972,417	1343,823	2904,951	1837,631
4	50,422	35,396	81,278	1252,909	6606,157	1784,76	4098,212	2876,963
5	61,9395	38,799	95,952	1505,415	9206,892	2403,233	5943,252	3722,929
6	94,6427	57,481	113,971	3304,176	12989,56	5440,248	10786,593	6551,32
7	112,8193	86,538	141,385	7488,872	19989,75	9763,187	15950,969	12235,22
8	112,009	128,741	168,649	16574,433	28442,5	14420,232	18890,21	21712,17
9	134,0484	183,112	216,694	33530,107	46956,56	24545,908	29047,568	39679,45
10	175,637	258,444	270,687	66793,321	73271,53	45392,335	47542,678	69957,48
11	196,1008	1675,712	295,319	2808012,718	87213,71	328608,581	57912,425	494870,9
Jami	1054,644	2540,898	1544,862	2940447,002	293449,618	435402,301	196566,564	655777

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[5] Author development

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-4, ISSUE-4

O'rtacha	95,877	230,991	140,442	267313,364	26677,238	39582,027	17869,688	59616,1

We get the function of the econometric model in the form $y = a + b_1 x_1 + b_2 x_2$. To find the unknown parameters a, b_1, b_2, we create a system of equations:

$$\begin{cases} na + b_1 \sum x_1 + b_2 \sum x_2 = \sum y \\ a \sum x_1 + b_1 \sum x_1^2 + b_2 \sum x_1 x_2 = \sum yx_1 \\ a \sum x_2 + b_1 \sum x_1 x_2 + b_2 \sum x_2^2 = \sum yx_2 \end{cases}$$

$$\begin{cases} 11a + 2540,898 b_1 + 1544,862 b_2 = 1054,644 \\ 2540,898a + 2940447,002 b_1 + 655777 b_2 = 435402,301 \\ 1544,862a + 655777 b_1 + 293449,618 b_2 = 196566,564 \end{cases}$$

Δ - we find the determinant of the system of equations:

$$\Delta = \begin{vmatrix} 11 & 2540,898 & 1544,862 \\ 2540,898 & 2940447,002 & 655777 \\ 1544,862 & 655777 & 293449,618 \end{vmatrix}$$

=(11· 2940447,002 · 293449,618+2540,898 · 655777 · 1544,862+2540,898 · 655777 · 1544,862) − (1544,862 · 2940447,002 · 1544,862+2540,898 · 2540,898 · 293449,618+ 655777 · 655777 ·11)= **997598384727,04**

Determinants of the system$\Delta a, \Delta b_1, \Delta b_2$ are obtained by replacing the corresponding column of the matrix with the information on the left side of the system:

$$\Delta a = \begin{vmatrix} 1054,644 & 2540,898 & 1544,862 \\ 435402,301 & 2940447,002 & 655777 \\ 196566,564 & 655777 & 293449,618 \end{vmatrix} = \mathbf{7315460782778,1}$$

$$\Delta b_1 = \begin{vmatrix} 11 & 1054,644 & 1544,862 \\ 2540,898 & 435402,301 & 655777 \\ 1544,862 & 196566,564 & 293449,618 \end{vmatrix} = \mathbf{1419587463562,7}$$

$$\Delta b_2 = \begin{vmatrix} 11 & 2540,898 & 1054,644 \\ 2540,898 & 2940447,002 & 435402,301 \\ 1544,862 & 655777 & 196566,564 \end{vmatrix} = \mathbf{623885838073,47}$$

We find the parameters of the equation:

$$a = \frac{\Delta a}{\Delta} = \frac{7315460782778,1}{997598384727,04} = \mathbf{7,33}$$

$$b_1 = \frac{\Delta b_1}{\Delta} = \frac{1419587463562,7}{997598384727,04} = \mathbf{1,42}$$

$$b_2 = \frac{\Delta b_2}{\Delta} = \frac{623885838073,47}{997598384727,04} = \mathbf{0,63}$$

Thus,   the   general   appearance   of   our   model   was   as   follows:
$$y = \mathbf{7,33} + \mathbf{1,42}x_1 + \mathbf{0,63}x_2$$

Conclusion: If other factors remain unchanged, increasing the volume of x_1 wholesale trade by 1 trillion soums will increase indirect taxes to the republic's budget by 1.42 trillion. An increase in the volume of retail trade by 1 trillion soums leads to an increase in y, i.e., the indirect tax, by 0.63 trillion soums, if the effects of other factors remain unchanged.

When we evaluated the second model in this way, it looked like this:

$$y = \mathbf{0,362} + \mathbf{2,065}x_1 + \mathbf{0,36}x_4$$

Conclusion: If other factors remain unchanged, increasing the volume of x_1 wholesale trade by 1 trillion soums will increase indirect taxes to the republic's budget by 2,065 trillion. An increase in the volume of imports by 1 trillion soums will lead to an increase in y, i.e., the indirect tax by 0.36 trillion soums, if the effects of other factors remain unchanged. Therefore, increasing the volume of wholesale and retail trade in order to increase the amount of indirect taxes falling into the budget will lead to a positive result for our state budget.

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