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**SECTION 31. Economic research, finance,  
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## ECONOMETRIC MODELING OF GDP CALCULATION BY ULTIMATE CONSUMPTION METHOD

**Abstract:** The gross domestic product will serve as an indicator representing the final results of economic activity in international and national practice. The national accounts system of the Republic of Uzbekistan includes various aspects of reproduction of GDP: its production, formation, distribution and accumulation, and many other goals. The interconnected and mutually exclusive goods and services in GDP are gradually represented in the process of re-generation of revenue streams.

In this regard, the article defines the regression equation based on the effects of factors on gross domestic product and its correlation with gross domestic product consumption. In addition, the effectiveness of the factors selected from the example of the Republic of Uzbekistan through these regression equations is also determined and recommendations are given to ensure sustainable economic growth.

**Key words:** Gross Domestic Product, National Accounts System, Final Consumption, Correlation, Regression, Econometric Model, Statistical Monitoring.

**Language:** English

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### Introduction

GDP shows the final consumption patterns of households, state-owned enterprises, non-profit organizations (households) serving households, the sum of final consumption expenditures on commodities and services, the balance between aggregate savings and exports and imports of goods and services. In general, the local outcome indicators will be integrated into each area of activity, sectors, institutional sectors, forms of ownership, and management information. Therefore, a more objective monitoring of their activities should be conducted statistically, a high level of statistical coverage, and current statistical reports should fully comply with market principles.

This will allow the full range of indicators at the local level to be fully reflected in the quality of information, and will provide an expanded opportunity to study, analyze and assess the national economy on an international basis. The transposition of indicators at the local level to the international standards is of primary importance and today plays an important role in the real evaluation of the economic and social status of each region.

For quantitative assessment of the impact of production factors on the results of economic activity, it is of primary importance that the HDI's economic growth is interrelated and interrelated. At the same time, indicators of gross domestic product, GDP, national income are selected as the final indicator. It should be noted that the concept of factor and outcome indicators is relative, that is, depending on the analysis, these factors are the factor and the resultant indicator.

The use of correlation-regression analyzes for the actual statistical study of the relationships among the SCA's aggregate indicators is also important. If correlation determines the degree of dependence between the factors and the factor and the other factors, regression determines the functional linkage of the factors and factors effectiveness.

### Literature review

In the context of this topic, many scientists are able to do research, including J. Kains [1], V.Leontev [2], R.Stoun [3], J. Marshall [4]. In particular, the English economist J. Kain's macroeconomic theory focuses on the economic analysis of the results of the monetary analysis through the variables that are

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interconnected (common income, consumption, investment, savings). In addition, J. Kaines has formed important theoretical and methodological foundations of the national accounts system.

R. Stoun founded the current system of national accounts. He was one of the first to apply a double accounting principle to a macroeconomic level. In R.Stown's aggregate matrices, the economic structure and processes of its operations are interpreted on the basis of standardized indicators (national output, consumption, trade balance, etc.) and the financial balance is included in the system of national accounts. But in their scientific works, the general methodological issues of the NGO are addressed solely in conjunction with the conditions of the respective countries.

Peter Friedrich Lippe explains how the transition from a planned economy to a market economy and the official statistics are in conformity with market requirements, and the need for a comprehensive study of internationally adopted standards, methods and techniques, and the need to meet the common needs of professionals to eliminate existing deficiencies in the field has been investigated [5].

On the basis of assessment, analysis and forecasting, synergies, crises management and data transfer methods, the specific features of forming the basis of these systems with theoretical and methodological approach to modeling the behavior of different levels of business entities operating in a changing market environment. In the monograph published by Ponomarenko and T. Klebanov [6], Yu. In the textbook published by Ivanova, special attention was paid to key sections of macroeconomic statistics - the system of national accounts, balance of payments, international comparisons of GDP, price and employment statistics and others, taking into account the modern practice of statistical methodology of international standards and Russian statistics [7].

In addition, Yu.Ivanov's research has been designed to broadly explain the theoretical

foundations of national accounts and to explain different ways to compare international macroeconomic indicators [8] N.D.Kremlyov [9], B.I.Bashkatov [10], Economic Balance and models the economist from Uzbekistan, YA.Abdullayev [11], A.Abdugafarov [12], R.A.Alimov [13].

R.A.Alimov's doctoral research has been studied economically from the methodological point of view of the introduction of RIA in the Republic of Uzbekistan [13]. However, this study did not aim to statistically study statistical analysis of main macroeconomic indicators of the SCO in the Republic, improvement of information supply, statistical modeling and forecasting of macroeconomic indicators. B.K.Goyibnazarov [14] has not studied statistical studies of the methodological problems of the development of MDGs in the Republic of Uzbekistan, although the calculations have not been studied for econometric models, and this is a topical issue in the scientific justification of the selected topic.

### Research Methodology

In the course of the research were used such methods as economic-statistical analysis, mathematical statistics, correlation-regression analysis, statistical observation, grouping, econometric modeling.

### Analysis and results

In the ongoing study, the qualitative analysis of the processes and phenomena that is being studied in the context of the survey is usually based on the concept of a particular political economy, and is based on the key factors such as GDP, national income, savings, etc., as GDP and the factors influencing: cost of final consumption - X<sub>1</sub>, investment in fixed capital - X<sub>2</sub>, stock redemption - X<sub>3</sub>, and the balance of export and import of services X<sub>4</sub> products were selected.

The correlation between the resulting factor and the factors influencing the correlation is assessed and the result is shown in Table 1 (Table 1):

**Table 1**

### Correlation link results

	<b>Gross Domestic Product</b>	<b>Expenses for final consumption</b>	<b>Basic capital expenditure</b>	<b>Backups</b>	<b>Export-import balance of goods and services</b>
Gross Domestic Product	1				
Expenses for final consumption	0,998817692	1			
Basic capital expenditure	0,999537136	0,798431767	1		
Backups	0,869976071	0,787203441	0,786460867	1	
Export-import balance of goods and services	0,316028078	0,282425044	0,308676657	0,221475587	1

Source: author's work on the basis of the data from the State Statistics Committee of the Republic of Uzbekistan

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According to the table data, the Gross Domestic Product is exempted from the export-import balance of goods and services (0.316028), including the cost of final consumption (0.88177), fixed capital (0.99954) and reserves replacement (0, 86997) have strong density links. It should be noted that among the selected factors  $|r_{x_1, x_2}| < 0,8$  It was found out that multicollinearity is not available because of the fulfillment of the requirements. This indicates that all factors can be involved in the creation of a regression equation representing the observed process.

To make the regression equation, it is best to use the most useful Eviews software. According to him, the following regression equation was

determined using the statistical indices of the dynamics of changes in 1997-2017,:

$$Y_{GDP} = 192,6 + 0,56 * X_1 + 2,2 * X_2 + 0,6 * X_3 + 0,71 * X_4 \quad (1)$$

Here:  $Y_{GDP}$ - gross domestic product volume;  
 $X_1$  - cost of final consumption;  
 $X_2$  - investment in fixed capital;  
 $X_3$  - change reserves;  
 $X_4$  - export-import balance of goods and services.

At the same time it is necessary to check on the reliability and adequacy of definite regression equations on criteria.

**Table 2**

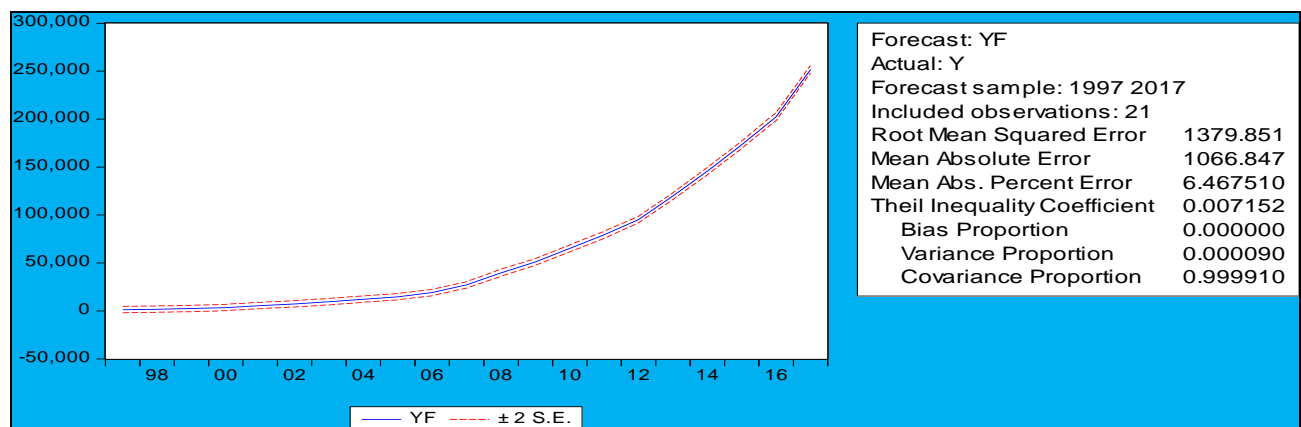
**(1) the reliability and adequacy of the equation of the equation**

R-squared	0.999641	Mean dependent var	63213.14	t-Statistic	
Adjusted R-squared	0.999552	S.D. dependent var	74666.10		
S.E. of regression	1580.818	Akaike info criterion	17.77353	X1	3.974043
Sum squared resid	39983789	Schwarz criterion	18.02223	X2	5.796430
Log likelihood	-181.6221	Hannan-Quinn criter.	17.82750	X3	1.256014
F-statistic	11150.57	Durbin-Watson stat	1.838203	X4	3.578180
Prob(F-statistic)	0.000000			C	0.379941

Source: author's work on the basis of the data from the State Statistics Committee of the Republic of Uzbekistan

The criteria for the Akaike, Schwarz, and Hannan Quinn (1), which are identified in the model evaluation, can be considered reliable, but it is desirable to eliminate misunderstandings on the t-statistics criteria given in Table 2. Table t-criterion for the Student distribution  $\alpha = 0,05$  value ratio and  $df = 21$  the value of freedom levels by

number  $t_{\text{жкдвал}} = 2,0796$  e,  $t_{x_3} = 1,256$  equality  $t_{x_3} < t_{\text{жкд}}$  the significance of the equation defined by the MAPE (Mean abs. percent error)  $< 10\%$  and  $0 \leq \text{TIC}$  (Theil inequality coefficient)  $\leq 1$  criteria should be checked.



Source: The author's research on the results of the research

**Picture 3. Retrospective graph of GDP change forecast**

The change in GDP predetermines the quality of the projection model  $\text{MAPE} < 10\%$  and  $0 \leq \text{TIC} \leq 1$  and is shown in Figure 3  $\text{MAPE} = 6,468 < 10\%$  as well as the  $\text{TIC} = 0.0072$  in this process, the quality

of the forecast is very high, and (1) the equation of accuracy is adequate and adequate.

$$Y_{GDP} = 192,6 + 0,56 * X_1 + 2,2 * X_2 + 0,6 * X_3 + 0,71 * X_4 \quad (1)$$

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The cost of final consumption, the export-import balance of goods and services, and the unbundling of 10 units of revaluation will increase the GDP by adding 5.6 units, 7.1 units and 6 units respectively. Given this process, an increase in gross domestic product (GDP) in comparison with all factors is an investment in this capital, and if this factor is multiplied one, GDP can be increased by an additional 2,2 times.

If we change the volume of gross domestic product, households  $-X_1$ , public administration bodies  $-X_2$ , Nonprofit organizations serving households  $-X_3$ , gross accumulation  $-X_4$  and export-import balance of goods and services  $-X_5$ , we will definitely be able to change from a certain angle. This, of course, affects the factors that determine the gross domestic product.

**Table 4**

**Factor correlation of GDP**

	$Y_{GDP}$	$X_1$	$X_2$	$X_3$	$X_4$	$X_5$
$Y_{GDP}$	1					
$X_1$	0,998821463	1				
$X_2$	0,998662982	0,79987976	1			
$X_3$	0,996113413	0,79618068	0,7966743	1		
$X_4$	0,999287556	0,99828169	0,698533443	0,697484294	1	
$X_5$	0,316028078	0,28305186	0,279472904	0,298649578	0,305162	1

Source: author's work on the basis of the data from the State Statistics Committee of the Republic of Uzbekistan

The table data suggests that factors affecting GDP are properly selected. But the gross savings  $-X_4$  households  $-X_1$  between  $|r_{x_1, x_4}| < 0,8$  one of the factors in the normalized regression equation, which

is determined by the existence of multicolinguishability on condition (the general accumulation of research  $-X_4$  option) and we will continue the work. According to him:

$$Y_{\text{НИМ } 1} = 382,2 + 1,3 * X_1 + 1,5 * X_2 + 4,5 * X_3 + 1,3 * X_4 \quad (2)$$

normalized regression equation.

Here:  $X_1$  - households;

$X_2$  public administration bodies;

$X_3$  - Nonprofit organizations serving households;

$X_4$  - export-import balance of goods and services.

Of course, the definitive (2) model needs to be tested on criteria that is reliable and adequate, and is done through EVIEWS 9. The results are shown in Table 5 below (Table 5).

**Table 5**

**(2) The result of an assessment of the adequacy of the model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	1.271123	1.116987	1.137993	0.2719
X2	1.537810	0.465838	3.301169	0.0884
X3	4.518587	1.673157	2.700635	0.0038
X4	1.260972	0.330069	3.820333	0.0015
C	382.1809	897.6777	0.425744	0.6760
R-squared	0.998897	Mean dependent var		63213.14
Adjusted R-squared	0.998621	S.D. dependent var		74666.10
S.E. of regression	2773.059	Akaike info criterion		18.89755
Sum squared resid	1.23E+08	Schwarz criterion		19.14624
Log likelihood	-193.4242	Hannan-Quinn criter.		18.95152
F-statistic	3620.922	Durbin-Watson stat		1.897772
Prob(F-statistic)	0.000000			

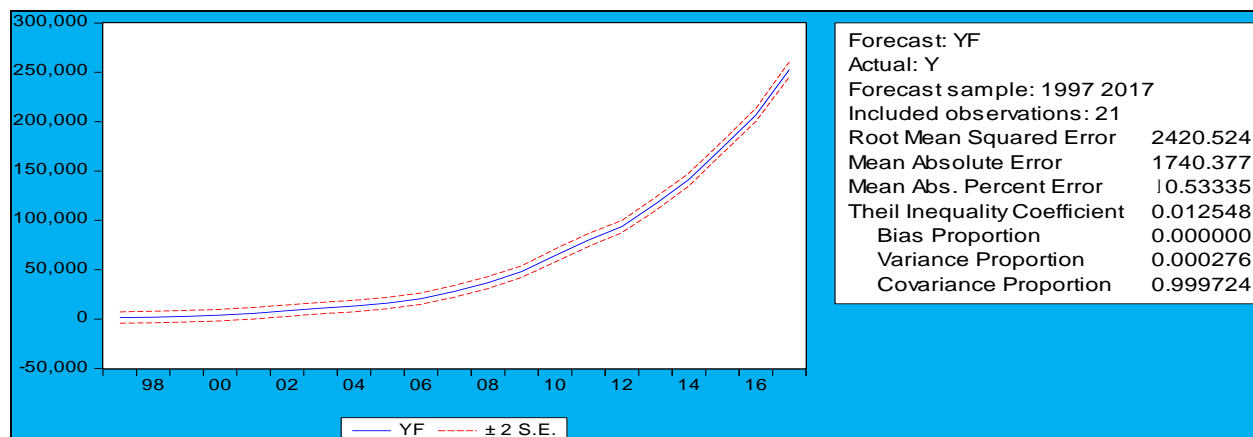
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As the table shows,  $X_1$  parameter  $t_{X_1} < t_{жад}$  was found to be negligible. However, it is desirable to verify that this parameter is significant or

insignificant by measuring another criterion, ie  $MAPE < 10\%$  and  $0 \leq TIC \leq 1$ , which determines the quality of the prognosis model (Figure 6).



Source: The author's research on the results of the research

As you can see from Figure 6, all the parameters selected for the particular model are significant, as measured by the criterion (2) of  $MAPE = 0.53335 < 10\%$  and  $0 \leq 0.0126 \leq 1$ , which determines the quality of the model, and (2) the model is reliable and adequate you can say.

$$Y_{ИМ1} = 382,2 + 1,3 * X_1 + 1,5 * X_2 + 4,5 * X_3 + 1,3 * X_4 \quad (2)$$

In the case of the model, if an increase in the share of households, public authorities, non-profit organizations serving households and the export-import balance of goods and services, the gross domestic product of the country will increase by 1.3%, 1.5% 4.5% and 1.3% respectively.

### Conclusion/Recommendations

Usually it is necessary to increase income from reducing costs in the economy. However, if we come from today's demands and scientific research, all reforms must first of all serve human interests. According to the results of the research, the cost of final consumption, the export-import balance of goods and services and the volume of 10 units of replacement will increase the GDP by 5,6 units, 7,1 units and 6 times respectively.

As a result of this process, an increase in the Gross Domestic Product (GDP) in comparison with

all factors is an investment in this capital, and if this factor is multiplied, GDP can be increased by an additional 2,2 times, and (2) the share of households, public administration bodies, non-profit organizations serving households and the export-import balance of goods and services, the gross domestic product of the country increased by 1,3% , 1.5%, 4.5% and 1.3% respectively.

To do that, it is necessary to carry out a number of tasks, including:

- Improving the statistical database of macroeconomic indicators applied in the national economy;
- to study the best practices of international practice on calculation of macroeconomic indicators, to justify their use in the country;
- Determine the statistical characteristics of macroeconomic indicators and their calculation, taking into account international standards for MHT-2008;
- Improve the method of calculation of gross domestic product by final consumption method.

This, in turn, creates new productions, equips existing ones with new equipment and technology, and requires a sense of responsibility from employees. As a result, if we deal with the work of the employees, we need to increase the cost of the services provided.

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## References:

1. Keynes, D.M. (1978) General theory of amusement, interest and deng. Trans. with eng. Moscow: Progress, 1978.- 469 p .
2. Leontiev V.V. (1997) Interbranch economy. / Transl. from the English; Author. prefaces, scientific. Ed. A.G. Granberg. - Moscow: Economics, 1997.- 415 p.
3. Stone. R. (1964) The "Cost-Release" method and national accounts / Trans. with eng.E.V. Detnevoy; Ed. B.L. Isayeva. M .: UN, 1964. - 205 p.
4. Matveeva T. Yu. (2007) Subject and Methodological Principles of Macroeconomics // Introduction to Macroeconomics - SU-HSE Publishing House, 2007. - P. 13.
5. Marchal G. (1987) New elements of the French system of national accounts. - M .: 1987. - 143 p.
6. (2002) Economic statistics. 2-е изд., Доп .: Учебник / Under the editorship of. Yu.N. Ivanova. - M.: INFRA-M, 2002. - 480 p. - (Series "Higher Education").
7. (2016) Modeling the behavior of economic entities in a changing market environment / Ed. Doct. econ. Sciences, prof. VS Ponomarenko, Doctor of Science. econ. Sciences, prof. TSKlebanova.-Berdyansk, Publisher Tkachuk AV, 2016. -392 p.
8. Lippe, Peter von der: (1995) Ekonomifceskaja statistika / Peter fon der Lippe. Izdat Federal'noe Statistiöeskoe Upravlenie Germanii. - Stuttgart: Metzler-Poeschel, 1995.
9. Ivanov Yu.N. (1997) The system of national accounts is a tool for macroeconomic analysis. Ucheb.posobi.M .: Finstatinform, 1997.- 256 p.
10. N.D. Kremlyov. (2011) System of National Accounts: Proc. Allowance. 3rd edition-Kurgan. Publishing house of LLC "Dummy", 2011. -14 p.
11. Bashkatov B.I., Ryabushkin B.T. (2004) Workshop on national accounting. Moscow: Finance and Statistics, 2004. - 319 p.
12. Abdullaev YA (1998) Macroeconomic Statistics .- T.: Mehnat, 1998.
13. Abdugafarov A., et al. (2002) National Accounts System. Curriculum T: Finance, 2002.
14. Alimov R.A. (1993) Metodologicheskie problemy postroeniya sistema natsionalnyx schyotov. Doc. diss.T .: TGU, 1993. - p.280.
15. Goyibnazarov B.K. (2006) Scientific and methodological bases of national accounts system development in the Republic of Uzbekistan (statistical aspect). I'm sorry. fan dock science narrow u-n diss -T .: 2006. - 325 p.
16. (2017) Information from the State Statistics Committee of the Republic of Uzbekistan for 1997-2017.

