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ASSESSMENT OF POTENTIAL GNP IN UZBEKISTAN USING TIME SERIES METHODS

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ABSTRACT **DOI No: 10.36713/epra19435** **Article DOI: https://doi.org/10.36713/epra19435**

The article discusses the importance of potential GDP in macroeconomic analysis and forecasting, as well as its unique role. In particular, the estimation of potential GDP by time series methods will determine the pattern of change of potential GDP over time. Potential GDP estimated based on time series methods can be used mainly to obtain general information about the trend of potential GDP or to compare it with potential GDP based on another approach. The frequency and time interval will partly depend on the purpose of using the potential GDP. At the same time, an econometric analysis of potential GDP was carried out.

KEYWORDS. ***potential GDP, time series, function, econometric model, model parameters, forecast***

INTRODUCTION

Assessment of the current state of the national economy is important in forecasting the state of macroeconomic indicators in the next period. Potential gross domestic product (GDP) is an indicator representing gross supply in the country's economy , through which it is possible to determine whether the real GDP in the economy is deviated from the potential level or is at the potential level. Potential GDP is a theoretical principle that represents the amount of output an economy can achieve. Real GDP determines the final value of goods and services produced in the country in a certain period.

Since potential GDP is an unobservable variable, there is no single definition and estimation method for it. The theoretical basis of potential GDP and its estimation methods is defined as the volume of GDP when the factors of production of potential GDP are used in full or at their natural level [1]. International organizations such as the International Monetary Fund, the World Bank, and the Organization for Economic Co-operation and Development define potential GDP in their research as GDP without pressure on inflation[2]. In this case, it is assumed that the efficiency of the use of production resources is in its equilibrium state.

The use of production resources at the equilibrium point means that the demand for resources in the resource market is equal to the supply and the marginal efficiency of resources is high. The US Budget Office defines potential GDP as the output when the economy reaches full employment or when the economy uses its productive resources at a high level [3].

In the conditions of the pandemic observed in the world in recent years, the growth rate of the world economy slowed down and averaged 2.1 percent. At the same time, the world economy faced 3 major crises in the last 15 years, and global economic growth slowed down from an average of 3.4 percent in 1993-2007 to 2.6 percent in 2008-2022 [4]. In this situation, it is important for the state to "focus on achieving economic growth rates while ensuring macroeconomic stability in the conduct of economic policy", in which assessment of the country's potential gross domestic product (GDP) and identification of the main factors affecting it are of urgent importance.

In the world, many studies have been conducted in the field of macroeconomics to estimate potential GDP and model the factors affecting it. In particular, the International Monetary Fund, the Organization for Economic Cooperation and Development, the European Commission, and the US Budget Office have conducted a number of studies to determine the relationship between potential GDP and the main indicators of the budget-tax, monetary-credit, and balance of payments [5]. However, in developing and transition economies, - there has been insufficient scientific research on estimating potential GDP, econometric modeling of its activating factors, and quantitatively determining the relationship between potential GDP and macroeconomic indicators.

ANALYSIS OF LITERATURE ON THE SUBJECT

Estimating potential GDP using econometric methods, researching the impact of GDP disruption on inflation and unemployment De Massi[6], J. Cotis[7], R. Shackleton[8], Döpke J., Chagny O[9]., A. Guisinger A., Owyang M., Shell H[10], Fedderke JW, Mengisteab DK[11], Jain-Chandra MS, Zhang ML[12], reflected in scientific research.

From the scientists of the Commonwealth of Independent States (CIS) F.S. Kartaev[13], O.A. Klachkova[14], A.A. Petryakov[15], N.P. Goridko [16], M. M. The issues of econometric modeling of inflation and economic growth are highlighted in scientific studies by Tali[17] and others. Research Issues in Estimating Potential GDP at the Potential Value of Unemployment Without Pressure on Inflation D. Orlov, E. Postnikov[18], A. Zubarev[19], D. Averina, T. It was reflected in the scientific works of Gorshkova[20] and others.

As in other countries, the issues of economic-mathematical and econometric modeling of socio-economic processes are reflected in the scientific research of economists of our republic. Including S.S. Gulyamov [21], A. Abdugafarov[22], Yo.A. Abdullaev[23], B.A. Begalov[24], T.Sh. Shodiev[25], N.M. Makhmudov[26], R.Kh. Alimov[27], Sh.S. Nasretdinova[28], B.K. In the researches of Goyibnazarov[29] and others , the main directions of the issues of industry, agriculture, investments, the impact of information technologies on economic growth, and systematic modeling of economic growth were scientifically researched.

Potential GDP and methods of its estimation, as well as issues of interrelationship between inflation and potential GDP R. Ibragimov [30], A. Nabiho'jaev [31], Sh. Shodmonov[32] and V. Researched by Bahriddinov [33].

RESEARCH METHODOLOGY

Being able to estimate the progress of the process in advance is an important factor in determining the value of potential GDP. In this regard, it is appropriate to analyze the process using mathematical and statistical methods, and use forecasting methods using econometric models.

In this process, methods such as systematic analysis, comparative and dynamic analysis, monographic analysis, statistical grouping, economic indices, time series, variation indicators, statistical tables and graphs, questionnaire, expert assessment, econometric analysis and forecasting were used.

ANALYSIS AND RESULTS

Estimation of potential GDP by time series methods reveals the pattern of change of potential GDP over time. Potential GDP estimated based on time series methods can be used mainly to obtain general information about the trend of potential GDP or to compare it with potential GDP based on another approach. The frequency and time interval will partly depend on the purpose of using the potential GDP.

In order to determine the long-term trend of potential GDP, potential GDP was estimated using time series methods of potential GDP based on long-term data and annual data. Time series methods include trend model, HP filter and *S F* filter was used. The trend model was used because there was no structural shift in the dynamics of GDP change over time in Uzbekistan. Dickey – Fuller's one-root test found that real GDP is trend-stationary over time. This showed that the results of the trend model constructed for estimating potential GDP are reliable. According to the trend model, it was determined that the potential GDP in Uzbekistan had an average annual growth rate of 6.2 percent.

Table 1
Potential GDP trend model result [34]

Variables	ln(GDP)	t-statistics
t	0.062	24.2***
Constant	6.280***	6.101***
Observations	25	
R-squared	0.981	

Standard errors are given in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In addition to estimating potential GDP with a trend model, potential GDP *HP* filter and *CF* was also evaluated with filters. The values of potential GDP determined on the basis of the *HP* filter and trend model were smaller than the actual GDP values in 1997–2000. In particular, in 1997, the potential GDP estimated by the *HP filter and the trend model* was 172.2 and 165.3 trillion, respectively . soums, and in 2000 their value approached the value of real GDP, 200.6 and 200.3 trillion, respectively. made up soum.

However, the potential GDP estimated based on *the SF filter* was found to be higher than the real GDP in 1997–2000, the values estimated by the *HP filter and the trend model.* In the remaining periods, the potential GDPs estimated by all three methods showed almost the same pattern. In 2020-2021, it was found that there are differences in the estimated potential GDP values. The main reason for this can be explained by the problem of *the HP* filter in estimating the last period and the change in the trend of real GDP in 2020.

The temporary movement of real GDP around the potential level is expressed by the GDP gap. In 1997, the GDP gap was 7.1% according to the trend model and 3.2% according to *the HP* filter. In 1998–2000, it was observed that the GDP gap determined by the trend model and *the HP* filter approached zero. In 199–2000, the gap between the estimated potential GDP and the actual value was negative based on *the CF* filter. In particular, in 1997, the GDP gap was found to be -3.1%, and in subsequent years, it was found to be -3.14% on average.

There are statistical data on the cumulative quarterly nominal GDP of the economy of Uzbekistan and the cumulative growth rates of real GDP compared to the corresponding period of the previous period. Real GDP net quarterly growth rates are only available from official statistics from the first quarter of 2020. But data from this time period are not considered sufficient number of observations to construct econometric models. Therefore, estimated values of net real GDP quarters for 2015–2022 are used to estimate potential GDP according to the econometric model. After calculating cumulative real GDP on the basis of available statistical data, we estimate the value of real GDP by net quarters according to the formula below:

$$RGDP_{Qt} = RGDP_{Qc,t} - RGDP_{Qc,t-1} \qquad (1)$$

In this:

$RGDP_{Qt} - i$ - net real GDP in the quarter;

$RGDP_{Qt}$ – Cumulative real GDP in quarter *i*

It was found that potential GDP has almost a regularity according to the frequency of information used in the estimation by time series methods. In particular, it was observed that in the period 2016Q1-2019Q3 it was mostly positive , and in 2019 the GDP intercept was close to zero and negative in the fourth quarter. In this period, it was determined that the potential GDP disruption, estimated on the basis of annual data, was positive and approached zero in 2019. In the 2020Q1-2021Q period , GDP growth was negative and positive in the second half of 2021. It was also observed that the GDP intercept estimated by the trend and *HP* filter based on annual data was negative.

Investigating potential GDP through time series methods allows for general conclusions about its trend. In order to determine the dynamics of GDP deviation and the reasons for its origin, it is necessary to evaluate the potential GDP with structural approaches. Therefore, in the next paragraph, by estimating potential GDP with a production model, potential GDP activating factors will be investigated and the causes of GDP deviation will be investigated.

CONCLUSIONS AND SUGGESTIONS

Since potential GDP is correlated with macroeconomic indicators, its statistical evaluation provides a number of possibilities. In particular, the economy is used in managing inflation levels, forecasting the state budget, and taking effective macroeconomic measures based on current account balance forecasts , which allows defining the main directions of the country's macroeconomic policy. At the same time, it serves as a convenient tool for determining whether it is possible to stimulate demand while ensuring macroeconomic

stability in the country, and for developing short- and medium-term macroeconomic programs.

The GDP intercept is used to determine the relationship between potential GDP and macroeconomic indicators. A positive GDP intercept means that demand exceeds supply, and a negative one means that there is an opportunity for overproduction. The GDP intercept estimates the temporal movement of real GDP around its potential value.

Gross factor efficiency was forecasted for 2024-2026 on the basis of forecast values of factors activating potential gross factor efficiency. According to the forecast values, it is expected that the implementation of systemic reforms in our country and the increase in the number of researchers in the field of scientific research, foreign investments and loans, and the increase in investments in information and communication will have a tendency to increase the productivity of potential gross factors in 2024-2026. In particular, in 2026, gross factor efficiency was predicted to be 4.6 times higher than the potential level in 2021 and 1.25 times higher than the actual level.

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