Impact Factor: 9.2 ISSN-L: 2544-980X

Digitalization and Economic Growth

Bustonov Mansurjon Mardonakulovich [1]

Abstract: Studies of the state of development of the economies of developing countries indicate the need for reforms, the goal of which should be the creation of conditions conducive to ensuring sustainable economic growth based on intensive development factors. The construction of a new economic system requires, on the one hand, consideration of traditional factors of economic growth - the accumulation of material resources, the natural increase in the working-age population, technological progress and the growth of labor productivity, and, on the other hand, ensuring an effective combination of human, natural and physical capital - the main factors of economic development.

Key words: digital economy, economic growth, growth qualities, estimated estimates, scenario options, Uzbekistan, world economy, perspective, capital investments, economic structure.

Introduction.

To assess the degree of digitalization of the economy, researchers use different criteria, giving them different weights in the final assessment. For example, Strategy& experts suggest taking into account 6 indicators: ubiquity (user and business access to digital services and applications, primarily the availability of broadband and mobile communication networks, the number of personal computers and mobile devices), accessibility (the cost of connecting to the Internet, Internet tariffs). providers), reliability (quality of digital services), speed (access to digital services in Mbps in real time), usability (level of development of electronic commerce and public services, number of domains and IP addresses in the country per 100 inhabitants, number of social media users per month), professional skills (number of specialists per 100 inhabitants, percentage of employees with secondary specialized and higher education)[2].

According to some economists, the Network Readiness Index (NRI) developed by the World Economic Forum, which uses three groups of indicators, provides more accurate results: the presence of economic and political conditions, the regulatory framework and infrastructure; readiness of enterprises, government agencies and ordinary citizens to use ICT; economic and social impact[3].

Within the framework of the I-DESI index mentioned above, the analysis takes into account the level of development of communications, human capital, Internet use, the level of adoption of digital technologies and digital services to the population. Studies show that much can be expected from attracting investment in this sector of the economy in the future, although there are currently some positive developments in this regard.

The main task of economic reforms in the Republic of Uzbekistan is to implement structural reforms and ensure sustainable economic growth, taking into account the competitive advantages of the republic. In this regard, it is necessary not only to ensure high growth rates, but also a qualitative change in the economy in favor of manufacturing industries, which means the need to search for new sources of growth. In particular:

growth in the production of non-primary export and import-substituting products;

development of new sectors of the economy and expansion of the scope of innovation;

implementation of priority tasks, such as improving the investment climate and expanding investment attraction;

ensuring stable, high-quality economic growth, studying existing problems and ways to eliminate them.

At the same time, despite the existing potential, it is necessary to create a qualitatively new mechanism to ensure the potential and real opportunities of Uzbekistan in ensuring high rates of economic growth in order to use it in the interests of developing the national economy. Of course, this process also has certain disadvantages and problems. Among the important problems in the development of new strategic directions, their economic aspects have not been sufficiently studied, which requires the use of priorities for the quality of economic growth, its indicators and models of forecasting practice. As the most important factors determining economic growth in Uzbekistan, it is necessary to consider the

[1] Namangan Engineering and Technological Institute, DSc., Associate Professor of the Department of Economics, Uzbekistan

[2] Sabbagh K., El-Darwiche B., Friedrich R., Singh M. Maximizing the Impact of Digitization. Strategy&, 2012. 31 p. URL: https://www.strategyand.pwc.com/media/file/Strategyand_Maximizing-the-Impact-ofDigitization.pdf

[3] Dujmovic J. The 10 Most Digitally Savvy Countries in the World. 19.07.2016. URL: http://www. marketwatch.com/story/the-10-most-digitally-savvy-countries-in-the-world-2016-07-19

beneficial effects of economic growth that meet certain criteria. Most studies do not fully cover the impact of "digital technologies" on the economy, but are limited only to the impact of one or more digital technologies factors.

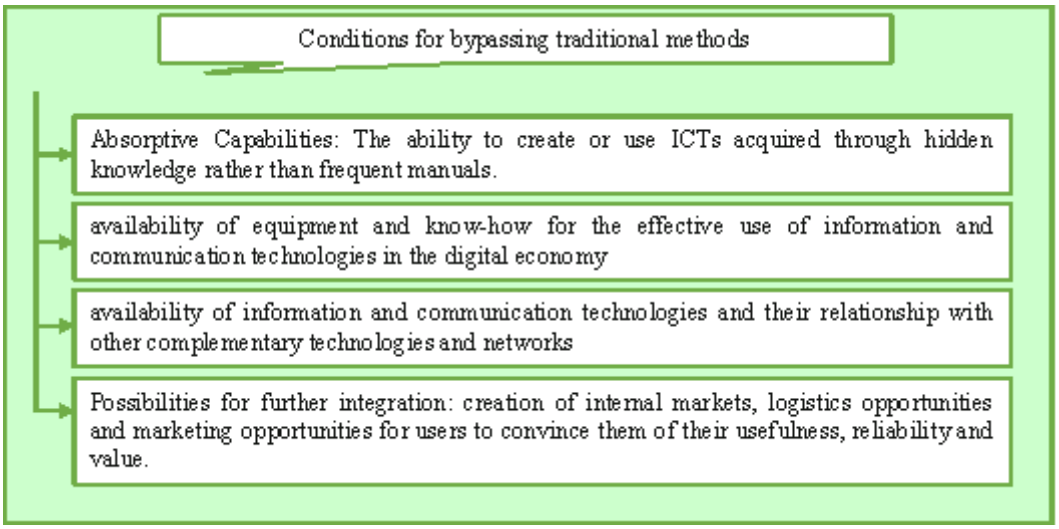

Fig.1. Conditions for Bypassing Traditional Methods for Assessing the Impact of Digital Technologies on Economic Growth[4]

On fig. 1 shows that one of the main mechanisms by which digital technologies can lead to economic growth is cascading. W. Steinmüller[5] and others provide scientific conclusions that digital technologies can provide developing countries with ways to "bypass" traditional methods of increasing the scale of production. There are four conditions for bypass.

The main criterion for dividing economic growth into components is the overspending of resources that can arise when comparing current production costs with projected costs. It can be seen that intensive growth in such conditions is not ensured by the introduction of new technologies in production or the service sector and the modernization of existing technologies. Therefore, it would be correct to consider this period as growth without ensuring the strengthening or maintenance of the influence of many factors. The extensive component of economic growth $YaIM_{komp}$ is defined as the difference between the potential gross domestic product generated by the minimum input of resources for the production of costs $YaIM_{mincost}$ and the reported $YaIM_{UM}$.

$$YaIM_{komp} = YaIM_{mincost} - YaIM_{UM} \quad (1)$$

where $YaIM_{komp}$ is the extensive component of GDP economic growth;

$YaIM_{mincost}$ is the minimum cost of GDP;

$YaIM_{UM}$ - total GDP or potential GDP.

$YaIM_{SIF}$ - qualitative economic growth is defined according to the residual principle by the intensive component of GDP, that is, as the difference between the reported gross domestic product and the extensive component of economic growth.

$$YaIM_{SIF} = YaIM_{UM} - YaIM_{komp} \quad (2)$$

The following formulas are calculated by specifying $YaIM_{min}$ and $YaIM_{UM}$ as the difference between the actual costs spent on production - X_{real} and the theoretical costs of resources for the supply of products and services - X_{min}.

$$YaIM_{lomp} = X_{real} - X_{min} \quad (3)$$

The calculations reflect the division of the $YaIM_{komp}$ indicators and the sum of $YaIM_{UM}$, the formation of $YaIM_{UM}$ into extensive and intensive factors. The quality of economic growth $\Delta YaIM_{SIF}$ is analyzed by changing the ratio between $YaIM_{SIF}$ and $YaIM_{komp}$.

$$\Delta YaIM_{SIF} = \frac{YaIM_{SIF}}{YaIM_{UM}} \quad (4)$$

In our opinion, ensuring economic growth is expressed in three main models. In particular:

First, extensive - assumes that the development of the country's economy occurs on the basis of a quantitative increase in production. The latter means that the growth rate of resource consumption in a country with a low level of processing will outpace the volume of output of their consumer industries. This model is typical for industrial-type countries that are in a

[4] Compiled by the author

[5] Steinmueller W. (2001). ICTs and the possibilities for leapfrogging by developing countries. International Labour Review, 140(2), 193–210.

systemic and technological crisis, actively borrowing technologies aimed at a limited number of sectors of the economy (mainly export-oriented). The quality of economic growth in this model is low;

Secondly, intensive - mainly indicates the formation of economic growth based on $YaIM_{SIF}$, created in the service sector. States of this type carry out the transfer of resource-intensive industries to countries with low production costs, which creates a certain price advantage. Focus on innovation and development of intellectual property allows us to maintain a leading position in the market of high-tech products. According to this model, the volume of $YaIM_{SIF}$ dominates the gross domestic product, which improves the quality of economic growth;

Thirdly, selective - within the framework of this option, the economic growth model changes from intensive to extensive and vice versa. The basis for changing the economic growth model is the change in the mechanisms of state management of the country's socio-economic development from a planned economy to a market economy, the country's specialization from industrial to post-industrial, etc. This growth model is characterized by approximately the same distribution of gross domestic product between the $YaIM_{SIF}$ and Y $YaIM_{komp}$ components. In this case, the quality of economic growth is average.

Econometric modeling of the economy is complex not only in organizational and technical, but also in its methodological and theoretical aspects. It requires the creation of a new concept based on international standards, effective use of existing concepts, critical study and development of proposals for their modernization, forecasting. Much attention is paid to the method of correlation and regression analysis in the construction of statistical models, which are an assessment between events.

However, in this study, we will first conduct an econometric analysis of extensive growth using statistical data on the economy of the Republic of Uzbekistan for 2000-2020. To do this, we will conduct an econometric analysis of changes in the volume of the gross domestic product of the Republic of Uzbekistan as a result of the influence of factors - investments in fixed capital - AKI, the cost of fixed assets in sectors of the economy - AFQ, the number of people employed in the economy - IBS, the number of enterprises and organizations operating in the economy of the Republic Uzbekistan - KS and income from existing natural resources - TRD. In this regard, the correlation coefficients between the influencing factors are determined to make sure that they are chosen correctly.

According to the values determined by the results of the calculation, it can be seen that in relation to the volume of the gross domestic product of the Republic of Uzbekistan - YaIM investments in fixed capital - AKI (rYIM,AKI=0.97429), the value of fixed assets in sectors of the economy - AFQ (rYIM,AFQ =0.974436), the number of employed in the economy - IBS (rYIM,IBS=0.81908), the number of operating enterprises and organizations - KS (rYIM,KS=0.97429) in strong, and income from existing natural resources - TRD (rYIM,AKI=-0.20284) in a weak inverse correlation.

There is a weak inverse correlation between all factors and the number of operating enterprises and organizations, and since there is no multicollinearity between existing factors under the condition rx1,x2<0.8, the determination of the regression equation between the observed correlation can be continued using the EViews program. Due to the fact that the units of measurement of the factors chosen for this are different, the factor indicators are logarithmized to create a non-linear equation and checked against quality criteria (Table 2).

Table 2. Parameter and quality criteria of the model of extensive change in the volume of gross domestic product of the Republic of Uzbekistan

Dependent Variable: LNYaIM				
Method: Least Squares				
Date: 10/08/21 Time: 17:35				
Sample: 2000 2020				
Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNAKI	-0.38635	0.267137	-1.44627	0.0049
LNAFQ	0.474321	0.142377	3.331438	0.0046
LNIBS	8.45557	1.249186	6.768864	0.0000
LNKS	1.046709	0.399382	2.620823	0.0193
LNTRD	0.067062	0.057822	1.159788	0.0043
C	-75.44575	12.04991	-6.261104	0.0000
			t=2.13145	
R-squared	0.998570	Mean dependent var		10.99539
Adjusted R-squared	0.998094	S.D. dependent var		1.614075
S.E. of regression	0.070469	Akaike info criterion		-2.232339
Sum squared resid	0.074488	Schwarz criterion		-1.933904
Log likelihood	29.43956	Hannan-Quinn criter.		-2.167571
F-statistic	2095.525	Durbin-Watson stat		1.962872
Prob(F-statistic)	0.000000	F=4.618759		

Using the coefficients presented in the table, a linear-logarithmic equation is first determined, which is expressed as follows:

$$LnYaIM = -0.38635173LnAKI + 0.474LnAFQ + 8.456LnIBS + 1.05LnKS + 0.067LnTRD - 75.45 \quad (5)$$

To simplify the mathematical rules and calculation processes and to achieve the accuracy of the results, the regression-6 equation created above is potentiated and, in accordance with it, the following equation is compiled:

$$YaIM = \frac{AFQ^{0.474} * IBS^{8.456} * KS^{1.05} * TRD^{0.067}}{AKI^{0.38635173} * e^{75.45}} \quad \textbf{(6)}$$

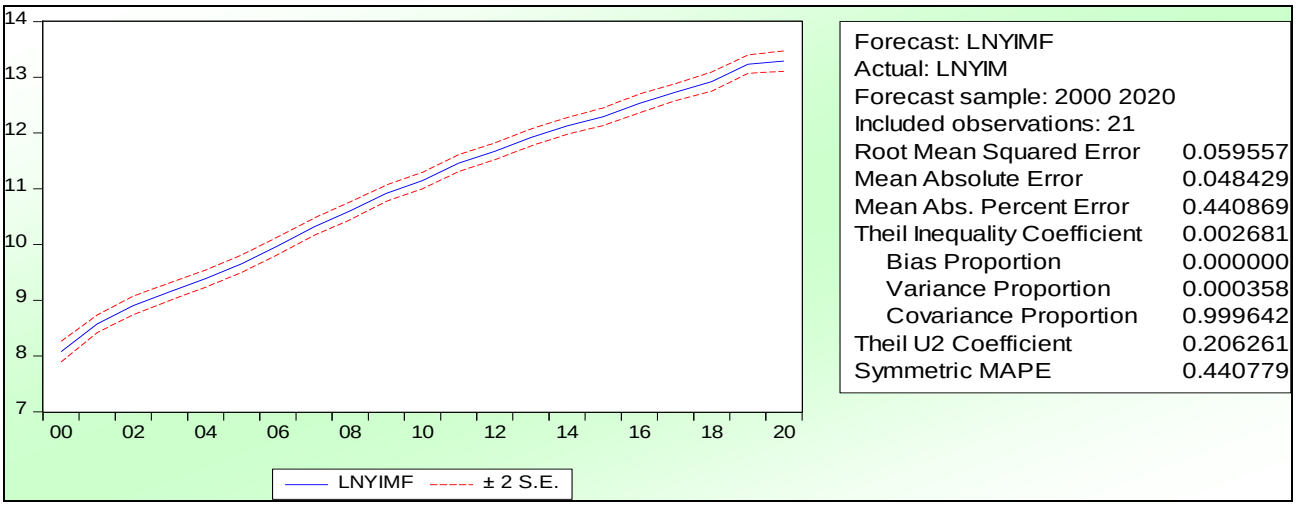

Fig.2. Retrospective quality criteria for the parameters of the extensive growth model

If we focus on the significance of the parameters of the identified regression-6 equation in accordance with the t-Statistic criteria, from the equality natural resources TRD(tTRD=1.159788) according to the condition txis>tzhad are insignificant, and to check it, you can use the retrospective quality criteria MAPE (Mean Absolute Percentage Error - Average absolute percentage error) and TIC (Tayl inequality coefficient - an alternative indicator of the accuracy of the Theil forecast) (Figure 2).

Based on the data presented in Figure 2, it can be noted that MAPE=0.4409, which in turn means that MAPE=0.4409<10% has a high forecast accuracy, and the larger the coefficient TIC=0.0027<1 tends to zero, the higher the prediction accuracy. This proves the significance of all parameters of the regression equation-6. Now, taking into account the significance of the regression equation-6 with α=0.05 and k1=15; k2=5 and the equality Fzhad=4.618759, since the calculated Fisher value Fhis=2095.5 and based on the equality Fhis=2095.5 according to the condition Fzhad<Fhis, the regression equation-6 is significant and DW=1.96, the absence of autocorrelation implies reliability and the adequacy of the equation.

Model of extensive change in the volume of gross domestic product of the Republic of Uzbekistan:

$$YaIM = \frac{AFQ^{0.474} * IBS^{8.456} * KS^{1.05} * TRD^{0.067}}{AKI^{0.38635173} * e^{75.45}} \quad \textbf{(7)}$$

If we give an economic explanation of the identified regression equation-8, then with an increase in the value of fixed assets of economic sectors and the volume of income from existing natural resources by 1 billion soums, the volume of gross domestic product will additionally increase by 0.3 billion soums and 1481.4 billion soums, respectively, and with an increase in the number of people currently employed in the economy and the number of operating enterprises and organizations by a thousand units, the volume of gross domestic product will additionally increase by 45.8 billion soums and 1560.2 billion soums. It should be noted that at the moment the country is saturated with investments, a reduction in investment in fixed assets by 1 billion soums will lead to an increase in the country's gross domestic product to 1.3 billion soums.

In addition to extensive growth, the study also identified economic growth models in an intensive and digital economy, the results of which are presented in the table below.

Table 3. Economic Growth Models in an Intensive and Digital Economy[6]

№	situations	Выражение модели	Criteria Check Results				
			R^2	t-statistica $t_{жад}$=2,12	MAPE<10, TIC<1	F	DW
1	intensive	$YaIM = \frac{MU^{1.4031} * KU^{0.04} * e^{1.332}}{ITX^{0.03412024} * OMS^{0.06}}$ (12)	0,999	t_{MU}=6,31 t_{KU}=-2,55 t_{ITX}=-1,52 t_{OMS}=-1,55	MAPE=0,102; TIC=0,0061	54529,1	1,98
2	Digital	$YaIM = \frac{IFJ^{0.45} * IUK^{0.85} * PIK^{0.11}}{MAE^{0.0488028} * e^{2.09}}$ (13)	0,997	t_{IFJ}=4,278 t_{MAE}=-1,18 t_{IUK}=4,31 t_{PIK}=2,295	MAPE=0,355; TIC=0,002	1336,1	1.99

If we give an economic explanation of the revealed regression-7 equation of intensive growth, then with an increase in labor productivity in the Republic of Uzbekistan today by a thousand soums and capital productivity by 1 million soums, the volume of gross domestic product will increase by an additional 15.2 thousand soums and 40, 3 million soums, respectively, and with an increase in spending on research and development by 1 billion soums, the volume of gross domestic product will increase by 15.5 billion soums. This situation, in turn, can be explained by the low level of implementation of research developments in the country and, as a result, low indicators of their effectiveness (it is necessary to develop measures to maximize the commercialization of existing developments and measures for their implementation).

Let us give an economic explanation of the regression equation (7), determined by economic growth in the digital economy. According to him, with an increase in the number of Internet users in the Republic of Uzbekistan by 1,000 people, the country's gross domestic product will additionally increase by 10.5 billion soums, and a decrease in the number of mobile communication subscribers by one thousand will further increase the gross domestic product by 1,160.4 billion soums. This situation can be appropriately explained by the decrease in Internet speed as a result of improper use of the Internet by mobile subscribers.

In addition, if we increase the number of enterprises and organizations connected to the Internet by one unit, and the number of those who have access to broadband Internet by one thousand people, then there is the possibility of an additional increase in the gross domestic product of the Republic of Uzbekistan by 3.93 billion soums and 11.8 billion soums, respectively.

References

1. Bustonov M.M. Quality of Growth: Analysis, Trends, Characterization and Modelling Process. LAMBERT Academic Publishing, 2021y. Monograph.
2. Bustonov M.M. Uzbekiston Republic sining extensive, intensive va raqamli iqtisodiyot sharoitida iqtisodiy ushishining econometrician takhlili // Toshkent davlat iqtisodiyot of the university "Itisodiyot va talim" ilmiy journaling. T., 2021. 5-sleep. https://cedr.tsue.uz/index.php/journal/article/view/213
3. Bustonov M.M. Raqamli iqtisodiyotga ўtish sharoitida iqtisodiy ўsishning fundamental nazariy va services tahlili// Biznes-Expert. 2021.No. 10.
4. Bustonov M.M. Digital economy in improving the quality of economic growth// European Journal of Molecular & Clinical Medicine. ISSN 2515-8260 2020.Vol 07, Issue 07. https://www.scopus.com/results/authorNamesList.uri?sort=count-f&src (SCOPUS).
5. Bustonov M.M. Macroeconomic Trends and Patterns of SustainableEconomic Growth and its Quality// Test Engineering & Management. 2019. November-December. http://www.testmagzine.biz/index.php/testmagzine/article/view/221
6. Bustonov M.M. The Firm Aspects and conditions Providing the Qualities of Economic Growth in Uzbekistan //International Journal of Economic Theory and Application. 2017, 4(4): 32-39 http://www.aascit.org/journal/archive2?journalId=918&paperId=4704
7. Bustonov M.M., Ensuring Long-Term Economic Growth in the World and Econometric Analysis of Economic Growth of the Republic of Uzbekistan in the Context of Extensive, Intensive and Digital Economy. Miasto Przyszłości Kielce 2022, ISSN-L: 2544-980X. https://miastoprzyszlosci.com.pl/index.php/mp/article/view/406

[6] Author's development

8. Bustonov M.M., Analysis of Economic Growth in the Juglyar Cycle in World Countries. Web of Scholars: Multidimensional Research Journal (MRJ) Volume: 01 Issue: 03 | 2022 ISNN: (2751-7543) http://innosci.org/index.php/wos/article/view/53/37
9. Bustonov M.M., The Firm Aspects and Conditions Providing the Qualities of Economic Growth in Uzbekistan // International Journal of Economic Theory and Application 2017; 4(4): 32-39 http://www.aascit.org/journal/ijeta.
10. Bustonov M.M. Digital Economy In Improving The Quality Of Economic Growth. European Journal of Molecular & Clinical Medicine ISSN 2515-8260 Volume 07, Issue 07, 2020.
11. Bustonov M.M. The firm aspects and conditions providing the qualities of economic growth in Uzbekistan. International Journal of Economic Theory and Application. 2017/ http:www.aascit.org/journal/I jeta
12. Bustonov M.M. Macroeconomic Trends and Patterns of Sustainable Economic Growth and its Quality. // Test engineering & Management November-December 2019.
13. Bustonov M.M. Digital Economy In Improving The Quality Of Economic Growth. European Journal of Molecular & Clinical Medicine ISSN 2515-8260 Volume 07, Issue 07, 2020.
14. Ishimbaev R.N. Competitiveness of small business. Science and innovation. International scientific journal volume 1 ISSUE 8 | ISSN: 2181-3337 p 90-96
15. Ishimbaev R.N. Criteria and principle of capability. Miasta Przyslosci. Vol. 29 (2022) November P 334-337