The Effect Of Economic Sectors And Regions In Gross Domestic Product In Uzbekistan

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Abstract: The results of the ongoing large-scale reforms in the Republic of Uzbekistan find their place both in the development of the economy and in improving of living standards of the country's population. The purpose of the survey is to reveal the impact of reforms in the country on the economic development of the country, as well as to study the impact of economic sectors and regions.
In particular, during this study the impact of economic sectors on the gross domestic product of Uzbekistan was studied based on data released by the State Committee of the Republic of Uzbekistan on Statistics in 2010-2021. The descriptive-analytical approach and stepwise multiple regression model used to analyze the economic sectors and regions. The study results showed that the impact factor of the Transportation and storage sector was (0,722) being the least efficient in the economy of Uzbekistan. At the same time, the study calls for starting more investments in the economic sectors, specially the agricultural and industrial one, as they play a vital role in gross domestic product.

Keywords: Action strategy, Economic sectors, Regions, Uzbekistan, Macro indicators, Gross domestic product, Gross regional product, Economic growth rates, Value added, Deflator, Index, Industry, per capita, purchasing power parity, types of economic activity, economic growth rates.

INTRODUCTION

The reforms carried out in our country are aimed at modernizing the country's economy, liberalizing all spheres of society, and democratizing the state and society. Trends emerging in the world economy are also reflected in the economy of Uzbekistan. Taking into account changes in the world economy, for the further harmonious development of the country, in February 2017, the President of the Republic of Uzbekistan approved the "Action Strategy for the Five Priority Areas of Development of Uzbekistan for 2017-2021", which set our country - new goals at a completely new stage of development.

As part of this Strategy, starting from 2017, a new stage of reforms began in the country aimed at implementing profound transformations in all spheres of life and activity of the state and society.

This Strategy includes ensuring macroeconomic stability and high rates of economic growth, increasing the competitiveness of the economy through restructuring and modernizing industries, reducing state participation in the economy, protecting the rights and priority role of private property, encouraging the development of small businesses, comprehensive and complex balanced development of regions.

A state economy is normally divided into different sectors; it starts with the economic resources sector where land is used excessively in agriculture, forestry and fishing. As it is known in the world of economy, extracting various products, such as raw materials and primary food products, from land is in the core of this sector. The secondary economic sector is typically concerned with

finished goods, mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage, waste management and remediation and many others.

The researchers meant to meet the following objectives:

1. Identify the various economic sectors in Uzbekistan and their impact on the rate of growth in the gross development product.

2. Analyze and discuss the relationship between the selected sectors in the study.

3. Set the results of the study and present them to decision makers, to promote the important sectors that may serve the homeland and constitute the main axes in the national economy of Uzbekistan.

The current study is deemed significant for the following considerations:

1. This study enables decision makers to make future plans for the Palestinian economy and help them develop it.

2. The study also explains the economic effects that have led to the growth rate of Gross Development Product in the period 2010-2021.

LITERATURE REVIEW

"Strategy of action in the five priority areas of development of Uzbekistan for 2017-2021" approved by the Decree of the President of the Republic of Uzbekistan in February 2017. Legal framework of the Republic of Uzbekistan. Scientific research of domestic and foreign scientists in this field. And also, information resources of the State Committee of the Republic of Uzbekistan on statistics, the World Bank, etc.

Singariya and Sinha (2015) conducted a study in order to identify the causal relationship between GDP, the agricultural sector and the industrial sector in India. Data were used for the period (1970-2013). The vector error correction model was used. The results of the study showed a long-term relationship between variables and a unidirectional relationship between the industrial sector and GDP on one hand, and the agricultural sector and the domestic output, on the other hand.

Local researchers (Tursunov B., 2022), (Saidova, M.,2021) and others researched features of industrial production dynamics in the research of textile enterprises' financial security and analysis of business processes in digital era. Issues of agriculture in the Republic of Uzbekistan were investigated by (Yuldashev N.K.,2020), human capital researched by (Abdurakhmanova G.,2022) and (Sharipov, K.A.,2021).

Uddin (2015) examined the contribution of agriculture, industry, and services to economic growth in Bangladesh. In this study, the researchers used time series data from 1980 to 2013 and employed both Augmented Dickey-Fuller and Phillips-Perron (PP) unit root tests. The study found that the time series data were stationary at first and indicated that each economic sector has strong, positive and significant linear relationship with economic growth. The results also showed that there is a bi-directional relationship between agriculture and GDP, and between industry and agriculture.

Osman (2014) conducted a study using the autoregressive distributed lag (ARDL) model as an approach to co-integration on annual time series data from (1974 to 2012) to investigate the relationship between private sector credit and economic growth in Saudi Arabia. Six variables were used, mainly GDP, private sector credit (BF), and the rest other four control variables: commercial bank's deposits (DS), government expenditure (G), inflation rate (CPI) and open economy (OPE). The study found that there is a long-run relationship between (BF) and economic growth and that there is a long-term relationship between credit and economic growth.

The study of Hussain and Yik (2012) investigated the contribution of economic sectors to economic growth in India and China using time series data from 1978 to 2007. Three economic sectors were analyzed: Agricultural sector, manufacturing sector and services sector. The researchers indicated that each economic sector has strong, positive and significant linear relationship with economic growth.

Avijit and Roy (2012) analyzed the trend in sectoral shares in state domestic product and inter-sectoral linkages in northeast India for the period 1981-2007. They showed that there exists a bi-directional causality among the sectoral output of northeastern states and that there exists a unidirectional causality running from the agricultural sector and the industrial sector to the services sector.

Chakravarty and Mitra (2009) carried out a study to find whether the industrial sector is the main driver of the economy using time series. The researchers found that manufacturing is clearly one of the determinants of overall growth, but construction and services also turn out to be important, especially for manufacturing growth.

In another study, Garcia (2008) tried to identify the relationship between the transportation sector and the economic growth and activity using the cross sectional data. The study results showed that there is a relationship between the transportation system and the economic growth.

Haiss and Sümegi (2006) used a cross-country panel data from 29 European countries over the 1992-2004 period to find out the impact of the insurance sector on the growth of the GDP. The researchers revealed that life insurance has more impact on the economic growth of European countries compared with other kinds of insurances and that the insurance sector, in general, does not significantly affect the economic growth.

Alfaro et al. (2003) investigated the relationship between the foreign direct investments, the financial markets and the economic growth using cross country data over the 1975-2010 period. The results of this study showed that foreign direct investment plays an important role in economic growth in countries with good financial markets. Alfaro (2003). This study aimed at identifying the impact of foreign direct investment on industrial and agricultural sectors as well as the benefits of foreign direct investment (FDI) on growth in the primary, manufacturing, and services sectors. The researcher argued that FDI can have great advantages to hosting countries. She employed an empirical analysis using cross-country data for the period 1981-1999. The study results suggested that total FDI exerts an ambiguous effect on growth. Foreign direct investments in the primary sector, however, tend to have a negative effect on growth, while investment in manufacturing a positive one.

According to a study Sastry et al. (2003) agriculture contributed to industrial growth through production channel during 1960's, but by 1990's it contributed greatly through the demand channel. The researchers studied the correlation between industry, agriculture and services. The results of this study showed that the agricultural sector continues to play a major role in economic growth, in addition to its relationship with other sectors.

SITUATION ANALYSIS

The ongoing reforms are already bringing very good results, confirmed by macroeconomic indicators. In accordance with a preliminary assessment, in 2021, the gross domestic product (hereinafter referred to as GDP) of the Republic of Uzbekistan at current prices amounted to **734 587.7** billion soums and, compared to 2020, increased in real terms by **7.4%** (tables 1 & 2).

Over the past five years (2017-2021), the country's GDP increased in real terms by **27.2%**, while the average annual economic growth for 2017-2021 was **5.0%**.

Table 1: GDP by type of economic activity for 2017-2021
(at current prices calculated by the production method, trillion soums)

	Years				
	2017	**2018**	**2019**	**2020**	**2021**
GDP	**317.5**	**424.7**	**529.4**	**602.2**	**734.6**
including:					
gross value added of industries	**282.7**	**379.1**	**484.1**	**557.8**	**681.4**
agriculture, forestry and fisheries	91.0	113.7	130.3	151.3	183.5
industry	59.6	95.8	136.1	153.2	189.6
construction	15.2	22.1	30.6	37.5	45.8
services	116.9	147.6	187.1	215.8	262.5
net taxes on products	**34.8**	**45.6**	**45.3**	**44.4**	**53.2**

When calculated in US dollars at the average exchange rate for 2021, nominal GDP amounted to **69.2 billion US dollars**. According to World Bank estimates, the GDP of the Republic of Uzbekistan at purchasing power parity (PPP) for 2021 amounted to **297.6 billion US dollars**.

For reference: according to the World Bank[1], in the CIS countries, GDP at PPP for 2020 was: in the Russian Federation – 4 133.1 billion US dollars; in Ukraine -544.8 billion US dollars; in Kazakhstan - 501.6 billion US dollars; in Uzbekistan - 264.7 billion US dollars; in Belarus - 189.8 billion US dollars; in Azerbaijan - 146.1 billion US dollars; in Armenia - 39.4 billion US dollars; in Tajikistan - 36.8 billion US dollars; in Moldova - 34.1 billion US dollars; in Kyrgyzstan - 32.7 billion US dollars.

Table 2: GDP growth rates by type of economic activity for 2017-2021
(in % to the previous year)

	Years					2021 compared to 2016, %
	2017	2018	2019	2020	2021	
GDP	**104,4**	**105,4**	**105,7**	**101,9**	**107,4**	**127,2**
including:						
gross value added of industries	**104,3**	**105,3**	**105,8**	**101,9**	**107,5**	**127,3**
agriculture, forestry and fisheries	101,2	100,3	103,1	102,9	104,0	111,8
industry	105,2	110,8	105,0	100,9	108,7	134,3
construction	106,0	114,3	122,9	109,5	106,8	174,2
services	106,0	105,2	106,0	100,7	109,2	129,9
net taxes on products	**105,7**	**105,9**	**104,7**	**101,6**	**106,7**	**127,0**

In 2021, GDP per capita at current prices amounted to **21.0 million soums** and, compared to 2020, increased by **5.3%.** For 2017-2021 GDP per capita increased by **16.1%** (average annual growth for 2017-2021 - 3.0%).
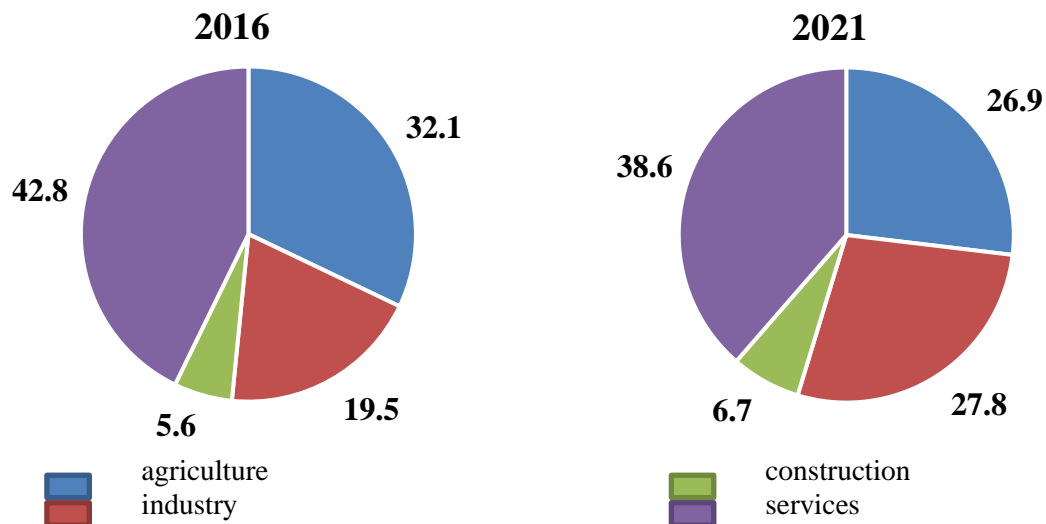
In 2021, GDP per capita at the average annual exchange rate of the Central Bank of the Republic of Uzbekistan amounted to **1 983 US dollars**, at PPP – **8 525 US dollars**.

The creation of a favorable business environment and increased investment ensured not only an increase in economic growth rates, but also important qualitative changes in the structure of the economy. As a result of the consistent implementation of the policy of structural reforms, the country's economy has been diversified.

In the period for 2016-2021, the structure of the economy has significantly improved towards the production of products with higher added value. Thus, compared to 2016, the value added of **industry** increased by 34.3% (average annual growth for 2017-2021 - by 6.1%) and its share in the sectoral structure of GDP increased from 19.5% in 2016 to 27.8% in 2021 (Diagram 1).

Diagram 1: Change in the sectoral structure of GDP
(in % of gross value added)

2016

2021

32.1

42.8

5.6

19.5

26.9

38.6

6.7

27.8

agriculture
industry

construction
services

The main increase is in the manufacturing industry, whose share in GDP increased from 15.0% in 2016 to 21.5% in 2021. The share of mining and quarrying in GDP increased from 2.6% to 4.2%, the share of other industries - from 2.0% to 2.1%.

At the end of 2021, industrial production increased by 8.7%. The positive growth of the industry is due to the growth in the following sectors:

- production of crude oil and natural gas - by 8.5% (share in GVA of industry - 10.8%);
- production of textile products - by 19.1% (share -7.9%);
- production of chemical products - by 5.7% (share -5.9%);
- production of non-metallic mineral products - by 6.4% (share - 4.9%);
- metallurgical industry - by 8.1% (share - 29.4%);
- electricity supply - by 12.1% (share - 7.0%).

Over the past five years, the trend towards a gradual reduction in the share of **agriculture** in the structure of GDP has continued from 32.1% in 2016 to 26.9% in 2021. At the same time, the decrease in the share of agriculture in GDP occurred against the background of positive average annual growth rates (by 2.3%) of agricultural products. Compared to 2016, the added value of this industry in real terms increased by 11.8%.

At the end of 2021, in agriculture, forestry and fisheries, the growth rate was 4.0%. The positive dynamics in this industry is due to the growth of livestock production by 4.1% and crop production - by 3.9%.

In 2021, production growth:

- meat amounted to 4.8% (share in agriculture - 30.7%);
- milk - 2.8% (share - 12.4%);
- eggs - 3.5% (share - 1.9%);
- vegetables - 4.1% (share - 13.3%);
- potatoes - 4.7% (share - 2.9%).

As a result of the implementation of large-scale work in the country on the construction of residential complexes, the construction and overhaul of social and engineering infrastructure facilities, as well as the implementation of investment projects for the modernization of enterprises in basic industries, the volume of **construction work**, compared to 2016, increased by 74.1% (average annual growth for 2017-2021 - 11.9%), and the share of construction in the structure of GDP increased from 5.6% to 6.7%.

In 2021, in construction, the growth rate was 6.8%, which is due to the growth of construction work carried out by:

- large enterprises - by 7.4% (share in construction work - 24.9%).
- small enterprises and microfirms - by 4.8% (share - 54.7%);
- individuals - by 11.8% (share - 20.4%).

The development of the **service sector** is the most important factor

in the growth of the country's economy, increasing employment and increasing the income of the population. As a result of the implementation of consistent measures to reform the services sector, this industry has become one of the dynamically developing sectors of the economy. Despite the decline in the share of services in the structure of GDP from 42.8% in 2016 to 38.6% in 2021, its value added increased by 29.9% compared to 2016 (average annual growth for 2017-2021 - 5.4%.

At the end of 2021, in the service sector, an increase in value added by 9.2% was noted, which was due to an increase in the value added of the following main sectors:

- trade	– 12,5 %
- accommodation and catering services	– 18,3 %
- transportation and storage	– 15,7 %
- information and communication	– 22,0 %
- real estate transactions	– 4,9 %
- public administration	– 0,4 %
- education	– 9,6 %
- healthcare	– 4,8 %
- art, entertainment and recreation	– 19,1 %
- provision of other types of services	– 20,3 %

The deterioration of the economic situation in the world as a result of the global epidemic of covid-19 had a negative impact on the economy of Uzbekistan.

The negative impact was primarily experienced by such sectors of the economy as foreign trade, tourism, investment, the service sector, the money transfer system, etc.

Despite a notable downturn in the global economy and the ongoing crisis, the positive economic growth observed in Uzbekistan in 2020 should be seen as the result of carefully considered targeted measures and coordinated macroeconomic policies.

Based on the adoption of important presidential and government decisions aimed primarily at protecting and supporting entrepreneurs and the public during the global pandemic, providing social support for vulnerable segments of the population, conducting a well-thought-out monetary and flexible fiscal policy to maintain macroeconomic stability in the country, it became possible ensuring positive economic growth.

As a result of the measures taken, GDP growth in the I quarter of 2020, compared to the same period in 2019, increased by 4.5%, according to the results of the first half of the same year, economic growth slowed to 1.2%, and in 9 months – to 0.8%. By the end of 2020, economic growth was recorded at the level of 1.9%.

At the same time, in the conditions of a pandemic, a negative trend was noted in terms of GDP per capita. Timely anti-crisis measures, in particular strengthening the healthcare system, strengthening social protection measures, as well as the implementation of a coordinated macroeconomic policy, served to mitigate the negative consequences of the pandemic.

According to the results of 2021, the economy of Uzbekistan, despite the ongoing challenges of coronavirus infection, returned to pre-pandemic growth. Thus, the country's GDP, compared with 2020, increased by 7.4% in real terms. High economic growth in 2021 is largely due to low growth in 2020, i.e. the effect of a low base (Diagram 2).
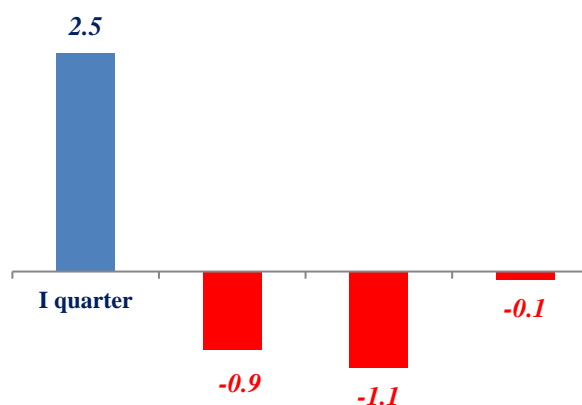
Diagram 2: Growth rates by main macroeconomic indicators in 2020
(in % to the corresponding period of 2019)

GDP
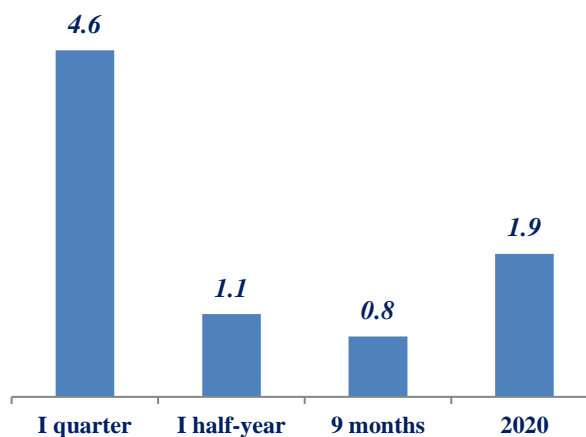
GDP per capita

I half-year   9 months   2020

The GDP deflator index, in relation to prices in 2020, amounted to 113.6%. At the end of 2021, in the structure of produced GDP, the gross value added of the production of goods amounted to 418 927.4 billion soums, services – 262 496.3 billion soums, and net taxes on products – 53 164.0 billion soums.
Gross value added created by all sectors of the economy amounted to 92.8% of the total GDP and increased by 7.5% (contribution to GDP growth - 6.9 percentage points). Net taxes on products in the structure of GDP amounted to 7.2% and, compared to the same period in 2020, increased by 6.7% (contribution to GDP growth - 0.5 p.p.) (Diagram 3).
In 2021, a positive contribution to GDP growth was made by the sectors of agriculture, forestry and fisheries - 1.0 p.p., industry - 2.2 p.p., construction - 0.4 p.p. and services -3.3 p.p.

Diagram 3: The impact of industries on GDP growth for 2017-2021
(in % of the total)
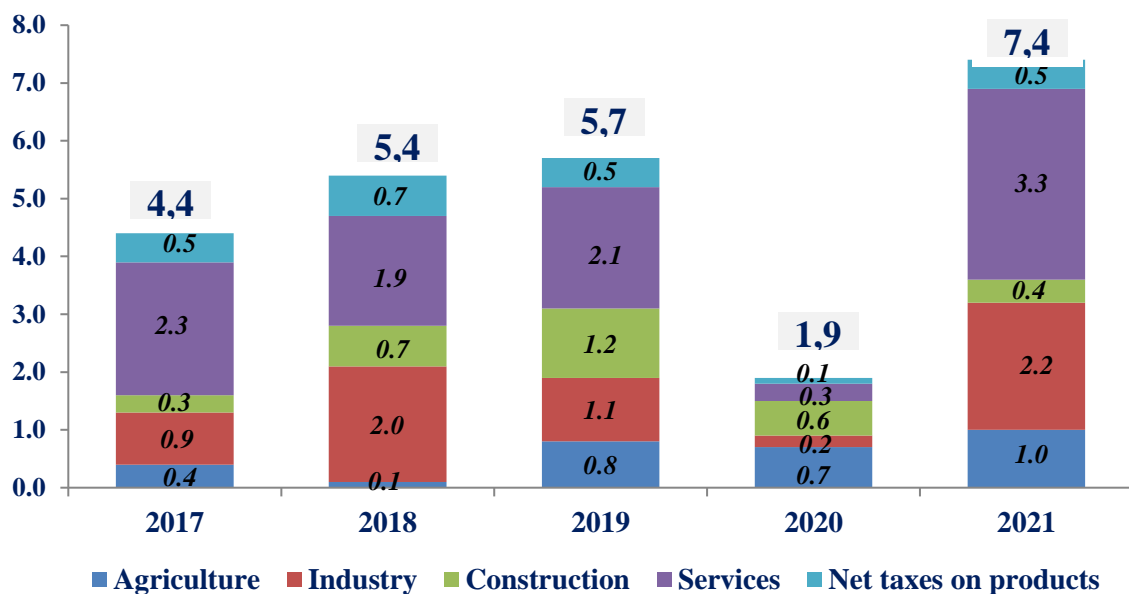
Ensuring the territorial balance of the national economy and reducing regional imbalances are priorities of the state policy of Uzbekistan.
In recent years, the role of regions in the country's structural transformations has increased signifi- cantly. A number of measures were taken to in- crease the economic potential and competitive- ness of the regions (Table 3).

Table 3: GDP Growth Rate (GRP)

	In % to the previous year					2021 in % to 2016	Average an-nual growth rates for 2017-2021
	2017	2018	2019	2020	2021		
Republic of Uzbekistan	**104,4**	**105,4**	**105,7**	**101,9**	**107,4**	**127,2**	**105,0**
Republic of Karakalpakstan	106,1	105,8	107,0	102,0	107,4	131,7	105,7

	In % to the previous year					2021 in % to 2016	Average annual growth rates for 2017-2021
	2017	2018	2019	2020	2021		
regions:							
Andijan	104,1	109,6	105,8	102,7	104,7	129,9	105,4
Bukhara	102,4	105,4	106,3	102,8	106,2	125,3	104,6
Jizzakh	104,1	103,9	108,3	104,8	107,0	131,5	105,6
Kashkadarya	103,5	102,0	101,8	102,7	107,6	118,9	103,5
Navoi	101,5	104,8	105,2	106,6	107,2	127,8	105,0
Namangan	103,4	104,1	107,5	105,1	109,1	132,6	105,8
Samarkand	101,5	100,7	105,6	101,8	108,8	119,5	103,7
Surkhandarya	103,4	104,6	103,7	104,4	107,8	126,1	104,8
Syrdarya	95,5	103,4	109,5	101,8	110,2	121,2	104,1
Tashkent	101,0	106,8	107,3	102,9	110,7	131,9	105,8
Fergana	98,9	107,4	104,4	104,9	108,0	125,7	104,7
Khorezm	104,5	103,0	105,7	101,4	109,2	126,0	104,8
Tashkent city	110,8	111,1	108,4	102,4	114,1	156,0	109,4

As a result of the implementation of targeted regional programs, over the past five years, outstripping growth rates of gross regional product (hereinafter referred to as GRP) have been ensured in Tashkent city (in comparison with 2016, an increase of 56.0%), the Republic of Karakalpakstan (by 31.7%), Namangan (by 32.6%), Tashkent (by 31.9%) and Jizzakh (by 31.5%) regions.

At the same time, for the period under review, the average annual growth rate of GRP in Tashkent city amounted to 9.4%, the Republic of Karakalpakstan - 5.7%, Namangan - 5.8%, Tashkent - 5.8%, Jizzakh - 105.6% regions.

Low average annual growth rates of GRP, compared with the national average (105.0%), for 2017-2021 were observed in Kashkadarya (103.5%), Samarkand (103.7%), Syrdarya (104.1%), Bukhara (104.6%), Fergana (104.7%), Surkhandarya (104.8%) and Khorezm (104.8%) regions.

The inequality of the regions of Uzbekistan in terms of the level of socio-economic development and economic growth rates is determined by a number of objective reasons - the level of regional development in the initial period of market reforms, the investment attractiveness of the region, economic and geographical development, the degree of infrastructure development, innovative potential and many other factors (Diagram 4).

Diagram 4: The role of regions in the formation the country's GDP
(2021, share of regions in percentage)
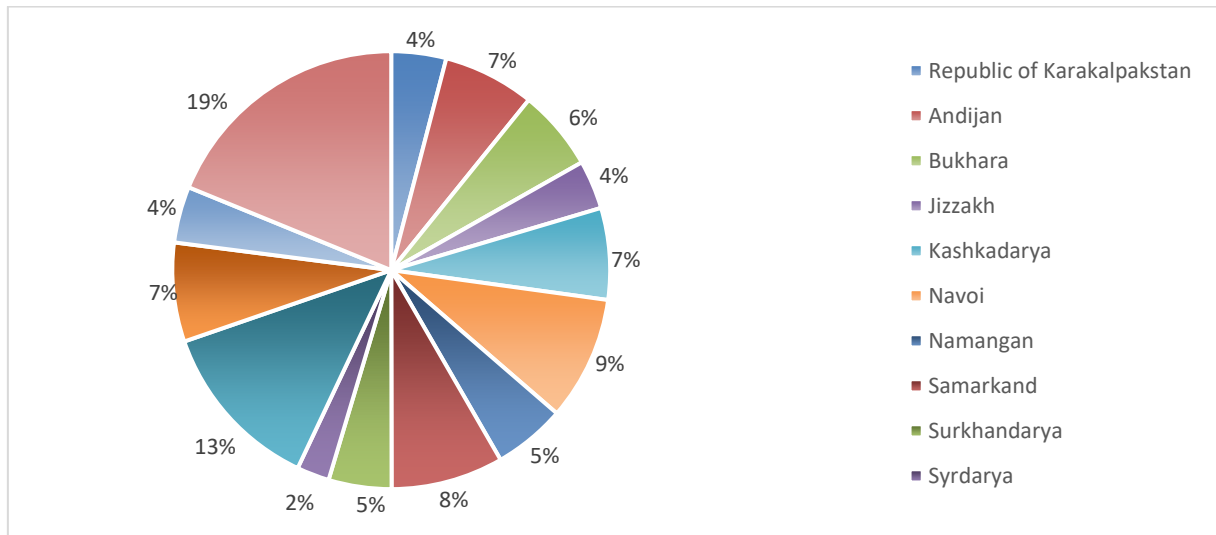
In terms of the share of GRP in the formation of the republic's GDP for 2021, the city of Tashkent leads with 16.6%. Tashkent and Navoi regions occupy the next places with indicators of 11.2% and 8.1%, respectively (Diagram 4).

Syrdarya (2.1%), Jizzakh (3.2%), Khorezm (3.7%) regions and the Republic of Karakalpakstan (3.6%) have the smallest share in the formation of the republic's GDP for 2021.

Compared with 2016, the share of GRP in the formation of the country's GDP increased in the following regions: Navoi region – from 4.7% to 8.1%, Tashkent – city from 14.6% to 16.6%, Tashkent region – from 9.3 to 11.2%, the Republic of Karakalpakstan - from 3.4% to 3.6%, Jizzakh region - from 3.0% to 3.2%.

In the following regions, a decrease in this indicator was noted: Kashkadarya region - from 7.9% to 6.0%, Samarkand region - from 9.0% to 7.3%, Surkhandarya region - from 4.8% to 4.1%, Fergana region - from 7.1% to 6.4%, Khorezm region - from 4.0% to 3.7%, Bukhara region - from 5.6% to 5.3%, Andijan region - from 6.3% to 6.0%, Namangan region - from 5.0% to 4.7% and Syrdarya region - from 2.4% to 2.1% (Table 4).

Table 4: GDP (GRP) per capita

	Million sum					In % to the previous year				
	2017	2017	2018	2019	2020	2021	2018	2019	2020	2021
Republic of Uzbekistan	**9.80**	**12.89**	**15.76**	**17.59**	**21.04**	**102.7**	**103.5**	**103.7**	**99.9**	**105.3**
Republic of Karakalpakstan	5.93	8.46	10.46	11.45	13.56	104.6	104.3	105.4	100.6	106.0
regions:										
Andijan	6.61	8.93	10.91	12.14	13.60	102.3	107.8	103.8	100.8	102.7
Bukhara	9.26	11.66	14.74	16.32	19.75	100.9	104.1	104.7	101.4	104.8
Jizzakh	7.37	9.55	11.81	13.30	16.36	102.2	101.9	106.1	102.6	104.8
Kashkadarya	6.92	8.35	9.98	10.76	13.00	101.5	100.0	99.7	100.8	105.6
Navoi	15.45	23.35	37.10	50.33	57.98	99.9	102.6	103.4	104.8	105.2
Namangan	5.72	6.94	8.60	9.89	11.89	101.5	102.2	105.3	103.0	106.8
Samarkand	7.34	8.74	10.17	11.09	13.47	99.7	98.8	103.4	99.8	106.7
Surkhandarya	5.79	7.35	8.61	9.33	11.10	101.2	102.4	101.4	102.2	105.5

	Million sum					In % to the previous year			
	2017	2017	2018	2019	2020	2021	2018	2019	2020	2021
Syrdarya	8.40	10.44	14.26	15.15	17.92	94.0	101.7	107.5	99.9	108.1
Tashkent	10.22	13.97	18.94	22.12	28.16	99.8	105.5	105.8	101.9	112.0
Fergana	5.77	7.57	8.81	9.92	12.27	97.3	105.7	102.6	103.0	105.9
Khorezm	6.71	8.78	10.39	11.42	14.09	102.8	101.4	104.0	99.8	107.6
Tashkent city	20.15	25.94	33.90	36.76	43.22	109.2	109.2	106.1	98.5	106.9

The analysis of GDP (GRP) per capita shows that the highest rates in Tashkent city, Navoi and Tashkent regions. In particular, when the average of GDP (GRP) per capita, for the republic is 21.04 ml. soums at the end of 2021, in the Navoi region this figure amounted to 57.98 million soums (2.8 times more compared to the republican indicator), in Tashkent city 43.22 million soums (2 times more) and in the Tashkent region 28.16 million sum (134%). This, in turn, is due to the high industrialization of these regions (Table 4).

The lowest indicators are observed in Surkhandarya (11.10 million soums, less than the republican value by 9.94 million soums), Namangan (11.89 million soums, less than the republican value by 9.15 million soums) and Fergana regions (12.27 million soums). soums, less than the republican value by 8.77 million soums).

The reason for the low rates is due to the number and density of the population living in them. Namangan region - share in the country's GDP 4.7%, population share 8.3%, density 385.4 person km^2., Fergana region - share in the country's GDP 6.4%, population share 11.1%, density 565.1 person km^2. Surkhandarya region - the share in the country's GDP is 4.1%, the share of the population is 7.8%. In this regard, the government of the country pays special attention when drawing up targeted programs for the development of the regions, taking into account the above features (population, geographical location, level of industrialization, natural resources and other specific features of the region).

RESEARCH METHODOLOGY OF IMPACT OF ECONOMIC SECTORS AND REGIONS ON THE GROSS DOMESTIC PRODUCT OF UZBEKISTAN

This study is based on the empirical approach which includes: (1)Adopting the descriptive-analytical approach to demonstrate the development of the GDP of Uzbekistan over the period 2010-2021,and (2) adopting the quantitative analytical method based on theuse of standard methods in building a standard model in order to interpret the various indicators or indexes of the GDP of Uzbekistan.

To determine the effect of the different sectors that constitute the main indicators or sources of the GDP, simple regression analysis was used on available data.

The simplest of probabilistic model is the straight line model:

$$y = \beta_0 + \beta_1 x + \varepsilon$$

where
- y = Dependent variable
- x = Independent variable
- ε = random error component
- β_0 = intercept
- β_1 = Coefficient of x

To find out the most effective sectors in the GDP, the stepwise multiple regression model was used. Stepwise linear regression is a method of regressing multiple variables while simultaneously removing those that aren't important.

To standardize each dependent and independent variable that is subtracted from the mean and divided by the standard deviation of a variable, it will get the standardized regression coefficients. Below is the formula that illustrates it:

$$b_{j.std} = b_j \left(\frac{Sx_j}{S_y} \right)$$

Where Sy and Sxj are the standard deviations for the dependent variable and the corresponding jth independent variable

The percentage change in the square root of mean square error, which will occur if the specified variables are added to, or deleted from the model, is called as RMSE. This value is used by the Min MSE method. This percentage change in Root Mean Square Error (RMSE) is calculated as below:

Percent change

$$= \left[\frac{\text{RMSE}_{\text{previous}} - \text{RMSE}_{\text{current}}}{\text{RMSE}_{\text{current}}} \right] 100$$

The researchers used secondary data obtained through the publications issued by the State Committee of The Republic of Uzbekistan on statistics, concerning economic indicators and GDP. The ready-made Statistical Packages for the Social Sciences was also used.

Research Hypothesis

The research is based on the premise that "economic indicators have an important role to play in achieving growth and economic prosperity for the economy of the country through their significant contributions and strong impact on GDP."

ESTIMATING STANDARD RESEARCH MODELS/SECTORS

To determine the effect of the different sectors that constitute the main indicators or sources of the GDP, simple regression analysis was used on available data. The results of the models are presented in Table 5.

Table 5: Results of simple linear regression models of the GDP of Uzbekistan sources during the period 2010-2021

Sources/Sectors of GDP Impact	Impact Rates	R^2	t-value	Significance
Agriculture, forestry and fishing	4,128	0,994	41,394	0,000
Industry	3,542	0,990	31,052	0,000
Construction	15,352	0,991	33,092	0,000
Trade, accommodation and food services	16,453	0,995	43,670	0,000
Transportation and storage	22,007	0,986	26,373	0,000
Information and communication	64,200	0,987	28,053	0,000
Other branches of services	4,447	0,998	66,330	0,000
Net taxes on products	13,550	0,929	11,479	0,000

The results show that there is a significant effect for each source/sector of the GDP at a significant level (1%). This is based on the moral levels of the t-test values, which were all lower or equal to (0,001) as follows:

Agriculture, forestry and fishing sector: Growth of this sector with a unit determines an increase of the domestic production, on average, with 4,128 billion soums. 99,4 % of the variation in GDP can be explained by the Agriculture, forestry and fishing sector.

Industry: Growth of this sector with a unit determines an increase of the domestic production, on average, with 3,542 billion soums, 99,0 % of the variation in GDP can be explained by Industry.

Construction sector: Growth of this sector with a unit determines an increase of the domestic production, on average, with 15,352 billion soums, 99,1 % of the variation in GDP can be explained by the construction sector.

Trade, accommodation and food services sector: Growth of this sector with a unit determines an increase of the domestic production, on average, with 16,453 billion soums, 99,5 % of the variation in GDP can be explained by the Trade, accommodation and food services sector.

Transportation and storage sector: Growth of this sector with a unit determines an increase of the domestic production, on average, with 22,007 billion soums, 98,6 % of the variation in GDP can be explained by the Transportation and storage sector.

Information and telecommunications sector: Growth of this sector with a unit determines an increase of the domestic production, on average, with 64,200 billion soums, 98,7 % of the variation in GDP can be explained by the Information and telecommunications sector.

Other branches of services: Growth of this sector with a unit determines an increase of the domestic production, on average, with 4,447 billion soums, 99,8 % of the variation in GDP can be explained by other branches of services.

Net taxes on products: Growth of this sector with a unit determines an increase of the domestic production, on average, with 64,200 billion soums, 92,9 % of the variation in GDP can be explained by Net taxes on products.

To find out the most effective sectors in the GDP, the stepwise multiple regression model was used. The results of this stepwise regression analysis are illustrated in the following table:

Table 6: Results of the stepwise multiple regression model for the sources/sectors of the GDP of Uzbekistan sources during the period 2010-2021

Sources/Sectors of GDP Impact	Impact Rates	R^2	t-value	Significance
Other branches of services	1,059		20,297	0,000
Net taxes on products	1,121		25,792	0,000
Construction	1,123		5,240	0,006
Trade, accommodation and food services	1,386	1,000	11,001	0,000
Industry	0,948		33,006	0,000
Agriculture, forestry and fishing	0,956		21,640	0,000
Transportation and storage	0,722		8,716	0,001

The results show that there is a significant effect of the sectors shown in the table on the overall GDP of Uzbekistan. According to stepwise multiple regression model the most influential sector in GDP is the Trade, accommodation and food services sector with impact of 1,386 billion soums. This means or leads to the stabilization the rest of the other sectors. The increase in the GDP is 1,386 billion soums when the income from the Trade, accommodation and food services sector increases, while the Construction sector has an average impact of 1,123 on the GDP. This means that the amount of the increase in the GDP is 1,123 billion soums when the income is increased by this sector. The results showed that the sector with the lowest impact on the GDP compared with the other sectors is the Transportation and storage sector. The sector has an impact rate of 0,722, indicating that this sector leads to an increase in the GDP of 0,722 billion soums. All these sectors contribute 100% to the GDP of Uzbekistan.
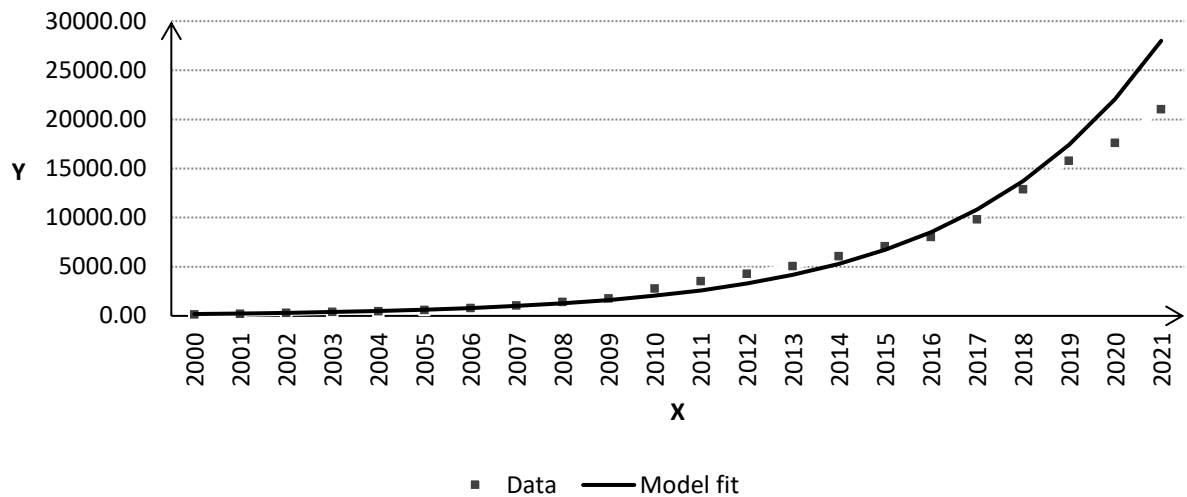
REGRESSION ANALYSIS OF GDP PER CAPITA

According to the results of the regression analysis, the model of GDP change per capita in the Republic of Uzbekistan is as follows:

$$Y=\exp(-470,19655+0,2377*X)$$

where Y-GDP per capita, X-years.

Diagram 5: Graphical representation of the correspondence between the values of GDP per capita and the values of the Growth model in Uzbekistan in 2010-2021*

■ Data —— Model fit

*-developed by the authors

For complex statistical and econometric analyzes, SPSS.24 and MINITAB programs which are convenient to perform regression analysis were used.

Models of GDP per capita for the administrative-territorial units of the Republic of Uzbekistan:

Republic of Karakalpakstan, Andijan, Bukhara, Jizzakh, Kashkadarya, Navoi, Namangan, Samarkand, Surkhandarya, Syrdarya, Tashkent, Fergana, Khorezm regions and the city of Tashkent were identified (Table 7).

Table 7: Models of GDP per capita changes identified for the regions of the Republic of Uzbekistan *

№	Name of the Regions	Name of the Model	Type of the Model	R^2	F	Sig
1	Republic of Karakalpakstan	Exponential	$Y=1043,305*\exp(0,223*t)$, t=1,2,3,…	0,995	1982,9	0,0
2	Andijan	Exponential	$Y = 1538,496*\exp(0,191*t)$, t=1,2,3,…	0,993	1243,5	0,0
3	Bukhara	Exponential	$Y = 2422,882*\exp(0,174*t)$, t=1,2,3,…	0,996	2472,0	0,0
4	Jizzakh	Exponential	$Y = 1728,411*\exp(0,187*t)$, t=1,2,3,…	0,995	1761,0	0,0
5	Kashkadarya	Exponential	$Y= 2438,066*\exp(0,138*t)$, t=1,2,3,…	0,993	1201,9	0,0
6	Navoi	Cubic	$Y = 6157,138*t - 1426,606*t^2 + 116,825*t^3 - 603,414$, t=1,2,3,…	0,994	364,5	0,0
7	Namangan	Cubic	$Y = 546,596*t - 35,083*t^2 + 5,433*t^3 + 949,297$, t=1,2,3,…	0,999	1642,8	0,0
8	Samarkand	Square	$Y = 1703,513 + 267,819*t + 55,798*t^2$, t=1,2,3,…	0,999	3228,0	0,0
9	Surkhandarya	Square	$Y = 1618,112 + 212,451*t + 45,492*t^2$, t=1,2,3,…	0,991	422,6	0,0
10	Syrdarya	Cubic	$Y = 870,980*t - 75,788*t^2 + 10,221*t^3 + 1637,559$, t=1,2,3,…	0,987	172,7	0,0

11	Tashkent	Cubic	$Y = 1875{,}937 * t - 310{,}632 * t^2 + 28{,}701 * t^3 + 1257{,}189$, t=1,2,3,…	0,991	259,6	0,0
12	Fergana	Square	$Y = 1715{,}172 + 135{,}37 * t + 55{,}423 * t^2$, t=1,2,3,…	0,992	496,5	0,0
13	Khorezm	Square	$Y = 1816{,}982 + 115{,}139 * t + 70{,}655 * t^2$, t=1,2,3,…	0,994	671,8	0,0
14	Tashkent city	Cubic	$Y = 7{,}786 * t + 159{,}041 * t^2 + 10{,}779 * t^3 + 4868{,}199$, t=1,2,3,…	0,993	327,1	0,0

*-developed by the authors

To do this, common and effective criteria were used to confirm that the identified models are most suitable for the existing values and statistical significance of the estimated parameters - R-squares for reliability and adequacy testing, statistical significance, including residual analysis and, hypothesis testing were performed using a common F-Fisher's criterion.

Recall that the Fisher F-test is usually used to determine the overall level of significance of the independent variables included in the regression model, and the use of R-squares checks the compliance of the introduced independent variables with the regression model. Based on the positive results of these indicators, the most suitable models were selected.

CONCLUSIONS

In a market economy, the key priorities of the country's socio-economic development are diversification, which implies a reduction in dependence on raw materials, the development of industries with a high share of value added, as well as the development of high-tech industries.

Thus, measures aimed at improving the territorial organization of the economy contribute to overcoming the raw material orientation, the formation of a production and technological base and smoothing out disproportions in the socio-economic development of regions.

RESULTS AND RECOMMENDATIONS

1. The results in Table 5 show that the sectors analyzed in the current study proved to have led to an increase in the GDP, but this increase varied according to the sector under scrutiny. The results, in the table, also indicate that the most influential sector in the GDP is the Information and communication sector.

2. There is a significant effect for each sector in the GDP, as indicated by the results of the simple regression, at the level of significance (1%) as shown in Table 6.

3. When looking at the results of gradual regression, it is noted that some sectors had a significant effect on the mean slope started has no effect at all when other sectors exist such as Information and communication sector. Due to the existence of other sectors which have higher impact which, consequently has led to the exclusion of this sector in this study.

4. The results of the stepwise multiple regression indicate that the most influential sectors that have the highest coefficient influence on the GDP is the Trade, accommodation and food services sector. The impact factor for this sector is 1,386, while the least influential sector in GDP is the Transportation and storage sector with impact as 0,722.

Recommendations

1. Very few studies and applied economic researches, concerning the economy of the State of Uzbekistan, in general, have been conducted; the majority of what has been achieved is mostly descriptive studies that do not deal with or employ advanced statistical methods; consequently, the researchers recommended prospective scholars to deepen their horizons and conduct future studies and research using statistical and quantitative methods that have an effective role in the analysis of economic variables and indicators scientifically, efficiently and effectively for the sake of predicting future plans and developments, thus enabling decision-makers to develop their sound plans.

2. The researchers recommended the need to pay attention to investment in the industrial and agricultural sectors due to their higher share of the total but lower significance or effect on the GDP of Uzbekistan.

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