



Improving the Processes of Calculating the Inflation Rate in the Republic of Uzbekistan

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Abstract

The implementation of the Action Strategy in five priority areas of development of the Republic of Uzbekistan in 2017-2021 was reflected in large-scale reforms aimed, among other things, at improving and modernizing public administration. The system of national statistics was no exception. Recent years have been marked by a number of cardinal changes in this area, there has been a rethinking and awareness of the socio-economic significance of statistical data as one of the key indicators of the effectiveness of the reforms being carried out in the country. Legislative acts adopted by the President of the Republic of Uzbekistan, as well as regulatory government documents, have laid a powerful foundation for the implementation of measures to improve the national statistical system. The approval of the National Strategy for the Development of Statistics made it possible to identify key vectors for further development, served as a guarantee that the process of modernizing national statistics in Uzbekistan is irreversible and sustainable.

Keywords: *Processes of Calculating; Inflation; Uzbekistan*

Analysis and Results

As a result, the statistical authorities were tasked with informing the general public with relevant, popular, open statistical data, and the process of collecting and processing them should be as transparent as possible and harmonized with the recommendations of international standards in the field of statistics in order to ensure full integration into the international statistical community.

Thus, in the system of consumer price statistics for this period, the list of open data was expanded and at present the total number of indicators published in open access has exceeded 1900. Uzbekistan's accession to the Enhanced Data Dissemination System (e-GDDS) has provided all users, including the IMF, the World Bank, rating agencies and other international financial institutions, with access to up-to-date data on price statistics. In addition, the State Committee on Statistics began to

actively cooperate with the CIS Statistical Committee, including in the issues of publishing indicators in the statistical collections it produces.

Currently, the study of international standards, as well as the practice and experience of developed countries in compiling indicators in the field of price statistics, continues. With the technical assistance of IMF experts, the work on further improvement of the national methodology has moved into an active phase.

As a result of activities in this direction, fundamental changes took place in the system of consumer price statistics during this period. In particular:

The list of goods and services for which consumer price monitoring is carried out was expanded (from 350 in 2017 to 510 in 2021), and the sample of territories for monitoring prices was optimized, taking into account the latest data on the socio-economic situation of the regions;

Since 2018, the statistical authorities have moved to the formation of the CPI based on fixed specific weights for the entire set of goods and services. Previously, variable specific weights were used for goods of the fruit and vegetable group;

As part of the implementation of the “Roadmap” for the implementation of the National Strategy for the Development of Statistics of the Republic of Uzbekistan in 2020-2025, from January 2021, the State Committee Statistics on Statistics was the first among the CIS countries to completely switch to the formation of the CPI based on the Classification of Individual Consumption by Purposes 2018 (COICOP 2018), which is based on UN international standard - Classification of Individual Consumption According to Purpose (COICOP) 2018. Based on COICOP 2018 Republic of Uzbekistan, all 510 goods and services selected for consumer price monitoring and CPI calculation in 2021 are grouped into 13 major sections;

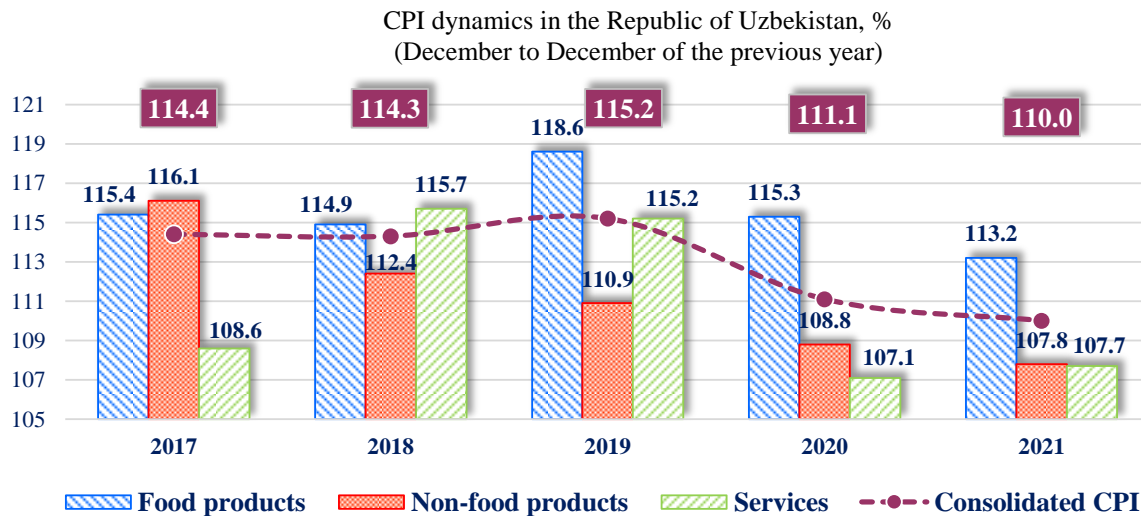
Methodological provisions on the Organization of monitoring of Consumer Prices (tariffs) for Goods and Services and Calculation of Consumer Price Indices were revised and approved in a new edition, which were developed taking into account the recommendations of the “Guidelines on the Consumer Price Index: Theory and Practice” (IMF, OECD, Eurostat, UNECE, World Bank and ILO), as well as international experts.

As you know, statistics should cover almost all the main spheres of the life of the state and signal problems or achievements in each of them. Over the past five years, measures have been taken in our country to liberalize the foreign exchange market, including ensuring free conversion of the national currency, the transition to market pricing in key areas of the country's economy, including industrial and agricultural production, the residential real estate market is actively developing, comprehensive steps have been taken to transition to the mechanism of inflation targeting.

One of the key indicators in price statistics that characterize inflationary processes in the consumer sector is the consumer price index (CPI). For information: The CPI characterizes the change over time in the general level of prices and tariffs for goods and services purchased by the population for non-productive consumption, and measures the ratio of the cost of a fixed set of goods and services in the current period to its value in the previous period.

The CPI is also used to implement the state financial policy, analyze and forecast price processes in the economy, regulate the real exchange rate of the national currency, revise minimum social guarantees, and resolve legal disputes.

Over the past five years, the CPI in our republic has been formed under the influence of a number of factors.



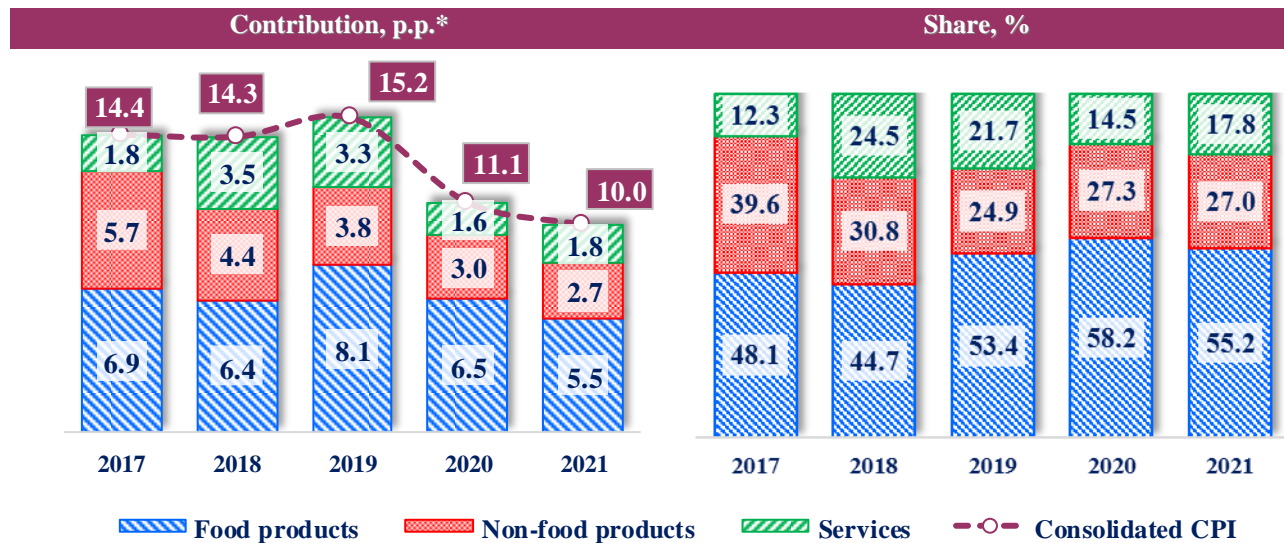
In particular, the devaluation and the policy of liberalizing the national currency pursued in 2017 led to acceleration in inflation and influenced the overall increase in prices for goods and services (14.4% in 2017 against 5.7% a year earlier).

Thus, in the first half of 2017, consumer prices increased by 5.2%, and only in the last four months of the year (from September to December 2017) the price increase amounted to 7.6%. This is largely due to an increase in prices for imported goods, as well as an increase in production costs and prices of domestic producers supplying their products to the domestic market. A good example is the increase in retail prices for cars produced in the country, which, on average, became 1.5 times more expensive in 2017. It is important to note that, in order to neutralize the negative consequences of the devaluation of the national currency, starting from September 5, 2017, changes were made to the pricing policy of GM Uzbekistan JSC, according to which the cost of cars was no longer linked to the US dollar.

Other key inflationary factors in 2017 include an increase in gasoline prices from November 2017 by 39.7% (direct inflationary contribution of 0.05 p.p.), as well as tariffs for housing and communal services by 7.1% (direct contribution 0.4 p.p.). It should also be noted that, as practice shows, the rise in prices for fuel and utilities indirectly affects the rise in price of other goods and services due to an increase in the costs of their production and transportation. A separate item in this list is the expectations of the population and enterprises regarding the upcoming price increase, which also served as a kind of “inflationary driver”. Subsequently, as a result of the measures taken to strengthen control over price stability in the domestic market, it was possible not only to prevent further sharp acceleration of inflationary processes, but also to slightly reduce the level of consumer inflation in 2018 to 14.3%.

Analysis of the structure of the impact of price changes on the consolidated CPI indicator for each month of 2018 showed that the prevailing influence was exerted by food price trends, with the exception of April and May, when the emphasis shifted towards services, as well as August, when the ratio of influence was in equal proportions. As for the consolidated CPI indicator as a whole for 2018, the leadership in terms of contribution to its growth belonged to food products (6.4 p.p.), followed by non-food products (4.4 p.p.) and services (3.5 p.p.). For information: the devaluation of the Russian ruble by almost 2 times in 2014 led to an increase in the inflation rate in Russia, which reached 11.4% at the end of the year (in 2013 this figure was 6.5%), and in Kazakhstan the processes of devaluation of the national currency in 2015 reflected in the growth of consumer prices by 13.6% per year (for comparison, in 2014, inflation in the country was recorded at 7.4%).

The structure of the contribution of price growth for the main groups of goods and services to the growth of the annual consolidated CPI for the Republic of Uzbekistan



*) here and further – percentage points.

One of the most important factors in price growth in 2018 was the gradual liberalization of electricity and gas tariffs for the population, which were increased by the decision of the Ministry of Finance from April 1, 2018. Also, based on the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated December 29, 2017 No. 1033 “On the phased introduction of a single retail price of liquefied gas sold to the population for household consumption”, the price level for liquefied gas has increased by an average of 20.0% since April 2018 and by 36.3% since August. The third stage of the price increase took place in November 2018, when, according to the Decree of the Cabinet of Ministers of the Republic of Uzbekistan dated November 1, 2018 No. 897, increased prices for gas, electricity and gasoline were introduced.

In addition, according to the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated December 28, 2017 No. 1025 “On measures to further improve the system of supply and sale of natural gas and electricity”, from January 1, 2018, increasing coefficients to tariffs for natural gas and electric energy were approved for enterprises engaged in the production of certain types of building materials (brick, cement, gypsum and others). This, along with an increase in investment activity on the part of consumers, also affected inflationary processes in the republic and manifested itself in an increase in prices for basic materials for construction. Since the second half of 2018, the situation on the building materials market has relatively stabilized. Thus, if in the first half of the year consumer prices for building materials increased by 17.3%, then in the second half of the year this figure was only 1.1%.

In 2019, the inflation rate was already slightly higher than in 2018, and reached 15.2%. At the same time, in the structure of the contribution of price changes for the main groups of food products to the growth of the consolidated CPI as a whole for the year, the most significant share fell on meat, poultry and fish (2.49 p.p. out of 8.1 p.p., or 30.7% of the total impact of food products). This was followed by bread products (2.00 p.p., or 24.6%) and fruit and vegetable products (1.17 p.p., or 14.4%). The increase in prices for dairy products, as well as sugar, tea and other food products added 1.22 p.p. to the consolidated CPI for the year.

It is important to note that the relatively high inflation rates in 2018-2019 are also associated with the fact that the prices previously regulated by the state were liberalized for such socially significant food products as flour, bread, vegetable oil, and also, as noted above, with an increase in tariffs in the housing

and communal sector. For information: based on the Decree of the Cabinet of Ministers of the Republic of Uzbekistan dated September 13, 2018 No. 731 “On measures to reliably provide the population of the country and sectors of the economy with grain, flour and bread based on competition and the introduction of market mechanisms”, the wholesale selling price for grade I flour was increased, and free prices for bread sold to the population have also been introduced. Up to this point, bread prices had remained fixed for four years.

The increase in prices for bread from flour of the first grade for 2018-2019 amounted to 2.4 times, from flour of the highest grade - by 2.0 times, flour of the first grade and the highest grade - by 1.5 times. Based on the Price List of wholesale prices for fluff, cotton seeds and cotton cleaning industry waste No. 40-03-04-2018 approved by the Ministry of Finance of the Republic of Uzbekistan, increased prices for cotton seeds of the 2018 harvest were introduced, which was manifested in the increase in costs for the production of cotton oil.

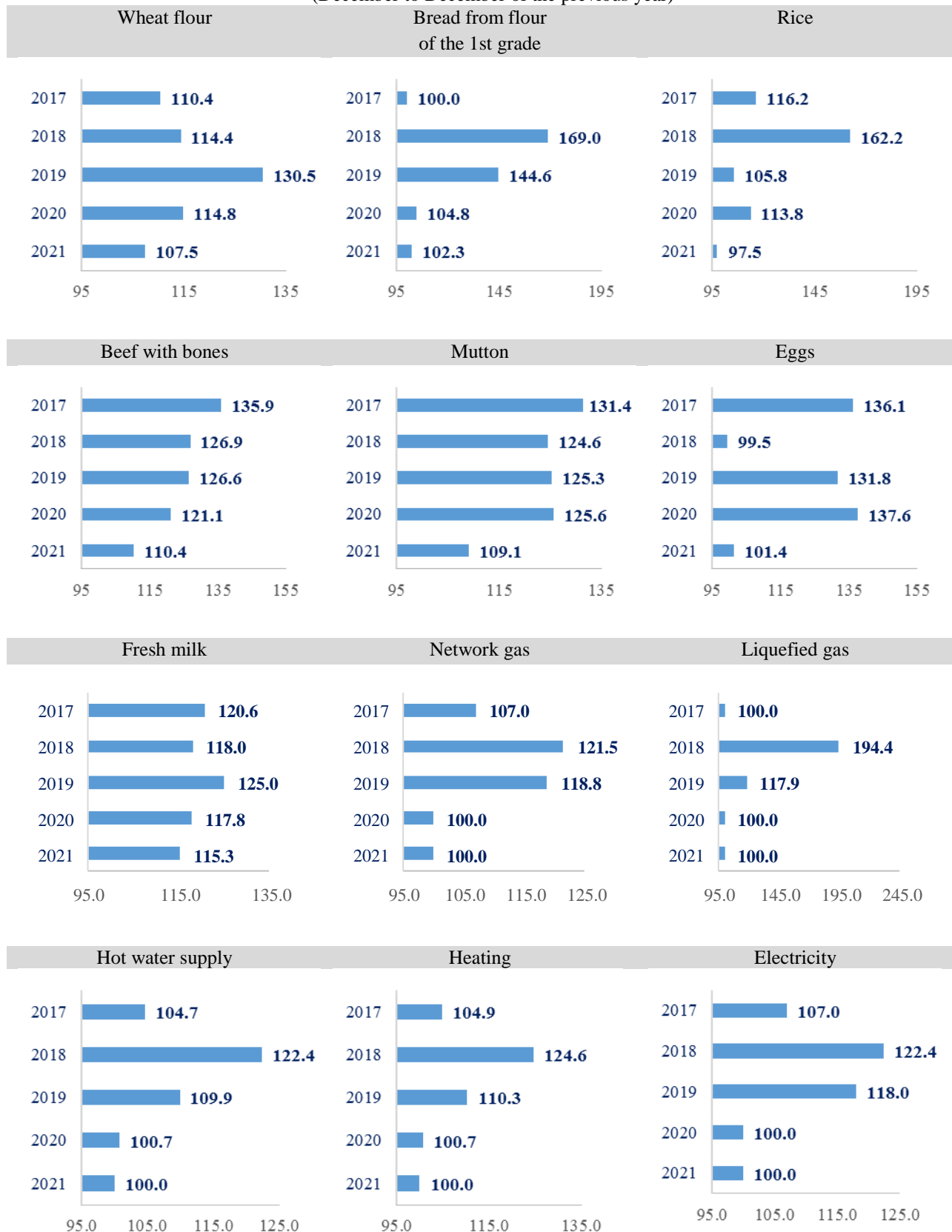
In 2018, cottonseed oil became more expensive by 11.1%, in 2019 - by another 4.1%. At the same time, the adoption of a set of measures to further improve exchange trading made it possible to completely switch to market mechanisms when selling cottonseed oil on the domestic market. In 2018-2019, a significant increase in utility tariffs was recorded. Thus, during this period, network gas has risen in price by 44.3%, liquefied gas - by 2.3 times, hot water supply - by 34.5%, heating - by 37.4%. Electricity tariffs for two years have increased by 44.4%. In 2020, our country, like many others, faced the negative impact of the coronavirus pandemic, which had both social and economic consequences. All this posed new challenges for price statistics and required both a rapid revision of the methodology for the formation of the main indicators, and an expansion of the list of indicators themselves.

The coronavirus pandemic has made its own adjustments to the life of the country. In a number of areas, activities were practically suspended (entertainment centers, sports complexes, etc.), others were forced to change their nature (for example, to change their profile from passenger transportation to the provision of courier services), and the potential of electronic commerce expanded. The government, in order to provide social support to the population, decided to “freeze” tariffs for electricity and gas until the end of 2021, as well as provide targeted support to residents of the republic during the lockdown period. In addition, one of the important directions of reforms in Uzbekistan was the use of the inflation targeting regime in monetary policy, which is designed to ensure price stability. All this, as well as a favorable situation in the fuel and lubricants market, allowed the inflation rate to drop to 11.1%.

An assessment of the contribution of price changes, taking into account the share of each enlarged group, showed that food inflation also played a dominant role in the growth of the consolidated CPI for 2020. The contribution from price changes for food products from January to April gradually increased from 0.4 percentage points to 3.3 percentage points, from May to July, inflationary pressure from food products decreased and in July reached 2.1 percentage points, retaining, despite this, leadership in influence. Starting in August, the impact of price trends on food products began to increase again and by the end of the year it was fixed at 6.5 percentage points. The contribution of rising prices for non-food products and paid services to the population in the growth of the composite indicator for 2020 was less pronounced. Thus, for non-food products, this indicator increased from 0.1 p.p. to 3.0 p.p., and for services - from 0.1 p.p. to 1.6 p.p.

In the structure of the growth of the consolidated CPI for 2020, the most significant share of food products belonged to meat, poultry and fish (1.85 p.p.), as well as bakery products (1.04 p.p.). In total, they provided over 44% of the total impact of food products and over 25% of the increase in the consolidated CPI for the year. Due to the increase in prices for fruit and vegetable products, the consolidated CPI additionally increased by 0.92 p.p., butter and fats - by 0.80 p.p., sugar, tea and spices - by 0.70 p.p., dairy products - by 0.40 p.p., eggs - by 0.32 p.p., catering - by 0.28 p.p., alcoholic beverages - by 0.10 p.p.

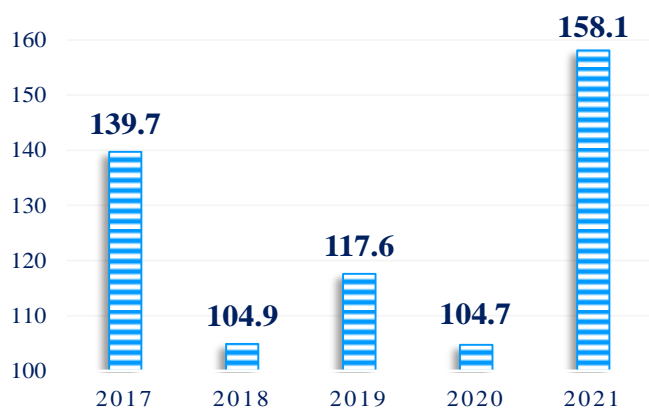
Dynamics of CPI for certain socially significant goods and services in the Republic of Uzbekistan, %
(December to December of the previous year)



Of non-food products, the most significant contribution to the growth of the consolidated CPI in annual terms was made by the increase in prices for clothing and footwear (0.91 p.p. in total). Of the services, the leaders in terms of contribution were household services (0.62 p.p.), passenger transport services (0.36 p.p.) and medical services (0.31 p.p.). In total, they provided over 79% of the total impact of services and about 11.6% of the growth in the consolidated CPI for the year.

As for 2021, according to its results, the inflation rate was fixed at around 9.98% with an annual target of 10%. The key inflationary factor, as in previous years, was the rise in prices for food products, as well as for fuels and lubricants, which, to a large extent, is a reflection of global market trends.

CPI dynamics in the Republic of Uzbekistan for gasoline for 2017-2021, %
(December to December of the previous year)



For information: An important factor that influenced the price dynamics in the production of crude oil in our republic was the current situation at the exchange auction and the linkage of intra-industry prices to BRENT oil quotes on world markets.

Brent (*Brent Crude Oil*) — brand of oil produced in the North Sea. The name of the variety comes from the field of the same name. It is one of the main brands of oil traded on international oil exchanges, mainly on ICE (Intercontinental Exchange). Since 1971, the price of Brent oil has been the basis for the pricing of about 40% of all world grades of oil. Brent is the world standard of “black gold” in terms of quality, properties and composition. This grade is optimal in terms of processing and production of petroleum products.

The dynamics of prices for Brent oil according to the RBC investment website, US dollars
(<https://quote.rbc.ru/ticker/181206>)



As of February 1, 2021, Brent oil quotes at auction exceeded \$89 per barrel.

In its December issue, the International Energy Agency (IEA) suggested that the oversupply in the first quarter of 2022 could be 1.7 million barrels per day (b/d), in the second quarter - up to 2 million b/d. The reason for the excess supply will be the restoration of oil production.

Due to the growth in food prices, the composite indicator for 2021 increased by 5.5 p.p. The increase in prices for non-food products added 2.7 p.p. to the consolidated indicator. The increase in the cost of services was reflected in the growth of the consolidated CPI by another 1.8 p.p.

Thus, the contribution of the increase in food prices to the total increase in the consolidated CPI for 2021 accounted for 55.2% of the total increase in the consolidated CPI (against 58.2% in 2020 and 53.4% in 2019). The share of the contribution of non-food products reached 27.0% (against 27.3% in 2020 and 24.9% in 2019) of services – 17.8% (against 14.5% in 2020 and 21.7% in 2019) of the total contribution of all goods and services covered by price change monitoring.

Considering 2021 through the prism of inflation, it is no exaggeration to say that the most pronounced increase was in gasoline prices. Over the year, it has become 1.6 times more expensive.

“If this trend continues in 2022, then the US, Canada and Brazil will produce at the highest levels in history. Thus, the total production of non-OPEC countries in 2022 will increase by 1.8 million b/d,” experts say. In total, world oil production in 2022, in their opinion, may increase by 6.4 million b/d, while in 2021 this growth amounted to only 1.5 million b/d. (<https://www.iea.org/reports/oil-market-report-december-2021>).

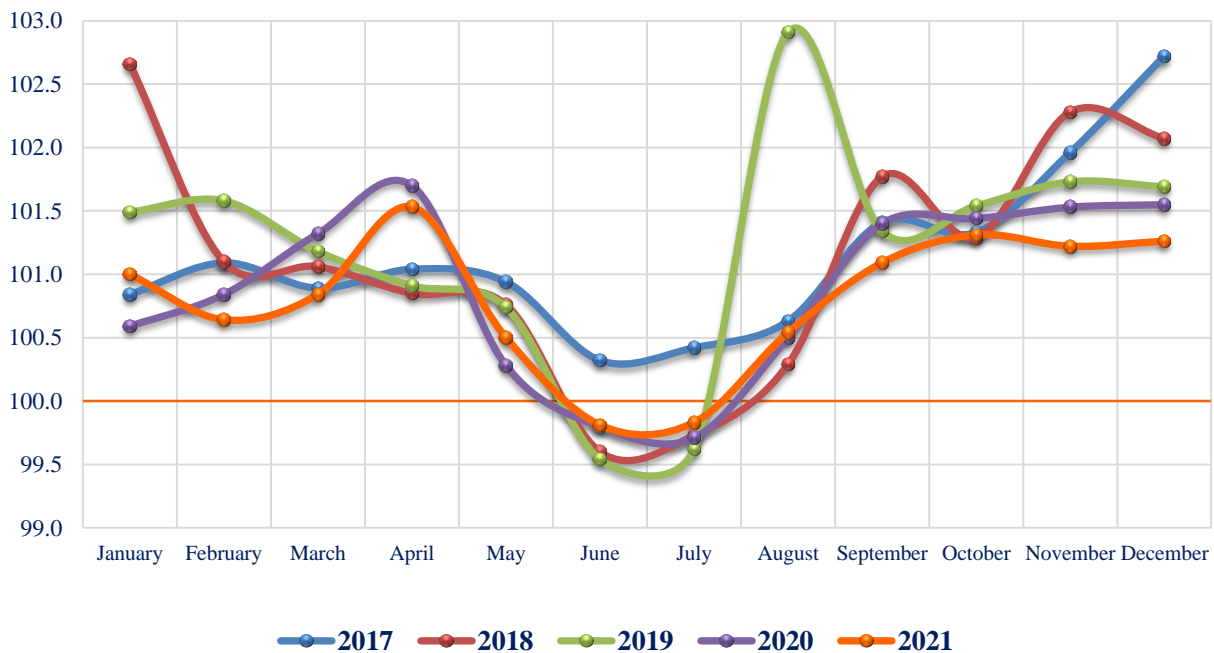
At the same time, an important factor that made it possible to contain inflationary processes in the country in 2021 was a less significant depreciation of the national currency against the US dollar compared to previous years. As noted in the “Summary of the Domestic Foreign Exchange Market for 2021” prepared by the Central Bank of the Republic of Uzbekistan, the dynamics of the exchange rate of the national currency in 2021 was formed based on supply and demand factors in the domestic foreign exchange market, as well as under the influence of external conditions. In particular, the growth in demand as a result of the acceleration of economic and investment activity in the republic was balanced by an increase in the volume of supply from business entities and the population against the backdrop of favorable external economic conditions, as well as rising world prices for the main export goods. As a result, the exchange rate of the national currency against the US dollar depreciated by 3.4% in 2021.

For information: in 2019 and 2020, the depreciation of the national currency against the US dollar was 13.9% and 10.1%.

Summarizing the above, it should be noted that over the past five years, food inflation has dominated the structure of the consolidated CPI. At the same time, the general trend for these years remains a characteristic slowdown in inflation rates in the summer months, which is mainly due to the seasonal factor and the saturation of the market with new crop fruits and vegetables.

According to calculations, the average monthly increase in the consolidated CPI in 2017 and 2018 was 1.1%, in 2019 it increased to 1.2%, in 2020 it took a downward course, amounting to 0.9%, in 2021 it decreased further by 0.1 points, reaching 0.8%.

Dynamics of short-term consolidated CPI
for the Republic of Uzbekistan, %



As for the correlation-regression analysis, using this method it is possible to assess the relationship between the main features and their impact on the summary indicator.

As a performance indicator (Y), we will take the consolidated CPI for goods and services for the period from 2017 to 2021, %.

Factor signs will be:

X_1 — CPI for food products, %;

X_2 — CPI for non-food products, %;

X_3 — CPI for paid services to the population, %.

$$Y = -1,29 + 0,434 X_1 + 0,366 X_2 + 0,213 X_3$$

Relationships between features can be measured using a matrix of paired correlation coefficients. To build it, we will use the capabilities of the SPSS analysis package. As a result of the implementation of the correlation analysis procedure, a matrix of paired correlation coefficients was obtained (Table 1).

We will check the obtained values of paired correlation coefficients using the table Pearson's Pairwise Correlation Coefficients Matrix. At the significance level $\alpha = 0.01$, they are statistically significant.

Table 1. Matrix of paired correlation coefficients

	Consolidated CPI	Food products	Non-food products	Services
Consolidated CPI	1	0,921**	0,486**	0,406**
Food products	0,921*	1	0,197	0,12
Non-food products	0,486*	0,197	1	0,243
Services	0,406*	0,12	0,243	1

To construct a regression equation, we select those factors that have the highest correlation coefficient with the effective feature [3].

In our case, all factors are the values of the coupling coefficients. The indicated values of the coefficients are positive, which indicates a close direct relationship between the features.

The results of the regression analysis are presented in Table 2.

Table 2. Regression statistics

Indicators	Values
Multiple R	1,00
R -square	1,00
Normalized R -square	1,00
Standard error	0,0126
Observations	56

Indicators	DF	SS	MS	F	Significance F
Regression	3	34,765	11,588	73258,615	0,00
Remains	56	0,009	0		
Total	59	34,774			

	Coefficients	Standard error	t - statistics	P - value
Y - intersection	-1,291	0,327	-3,944	0,00
Variable X_1	0,434	0,001	385,418	0,00
Variable X_2	0,366	0,003	117,104	0,00
Variable X_3	0,213	0,002	109,555	0,00

The multiple correlation coefficient $R=1.00$, which indicates a direct close relationship of features in the equation. Determination coefficient $R^2=1.00$. It shows that 100% of the variation in consumer prices for goods and services in Uzbekistan is due to variation in the factors included in the model.

The value of Fisher's F -test is 73258.615. The significance of the F -test indicates the probability that the multiple R will be equal to zero. It is extremely small (significance $F < 0.01$), therefore, the regression equation is statistically significant with a probability of 100% (Table 2).

The regression equation will take the form:

$$Y = -1,29 + 0,434 X_1 + 0,366 X_2 + 0,213 X_3$$

Analysis of the parameters of the regression equation gave the following results.

With an increase in the CPI for food products by 1%, the composite CPI for goods and services in Uzbekistan increases by an average of 0.434%. With an increase in the CPI for non-food products by 1%, the consolidated CPI for goods and services in the republic becomes higher by an average of 0.366%.

A one percent increase in the CPI for services entails an increase in the composite CPI by an average of 0.213%. As for 2022, the annual inflation target is planned at 9.0%. Additional inflationary drivers may include tariff increases in the utility sector, changes in energy prices, consumer expectations regarding a possible acceleration of inflation, risks associated with climatic factors, inflationary processes among major foreign trade partners, trends in world food prices, as well as the unpredictable situation with the coronavirus pandemic.

Modern realities require the statistical authorities to maximize the introduction of advanced information technologies in the process of collecting and processing data. Since 2020, when monitoring prices and their changes in the consumer market, statistical authorities have completely switched to CAPI (Computer Assisted Personal Interviewing) technology using tablet devices and specially developed software. The results of this move were appreciated during a period of strict quarantine restrictions on movement, when the collection of price information could not be carried out using standard procedures.

Conclusions

In conclusion, I would like to note that, despite the tremendous progress achieved by price statistics in our country, much remains to be done in the direction of further development. In particular, active work is underway to improve the accounting of prices for seasonal goods and services, a mechanism for adjusting prices is being introduced subject to changes in the qualitative characteristics of goods and services, to improve the mechanism for reflecting inflationary processes in the provision of certain types of services (for example, mobile communications), which should be based on the recommendations of international standards and the best practices of other countries. It is also important that the processes of improving price statistics affect not only the consumer sector, but also extend to other types of activity (industrial and agricultural production, the service sector, the housing market, etc.).

Like any branch of human knowledge, statistics cannot be "ossified", it must evolve with the times. And this statement can be fully attributed to price statistics.

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