Analysis of Price Changes in Socially Important Food Products: Example of Azerbaijan

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Abstract

The aim of the research is to keep the price formation process of socially important food products under control and facilitate timely disclosure of tendencies that are contrary to market relations.

In this paper, some 19 socially important food products have been selected and tried to identify the share/contribution of the factors affecting their price changes in the example of Azerbaijan economy.

Econometric estimation methods are used in the paper. Database of the analysis is based on the official figures of the State Statistical Committee (SSC) of the Republic of Azerbaijan, covering the period from January 2016 to December 2017.

As a result, the methods for determining the contribution of factors in price fluctuations of socially important food products are presented, and the empirical results are interpreted as an example of the Azerbaijani economy.

Keywords

Regression analysis, price volatility, social foods, food prices, food prices determinants

JEL code

C32, C51, C88, Q11

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INTRODUCTION

At the current level of economic development in a globalized world, research on food consumption and nutrition is still relevant. Differences at the level of food supply for the world's population in different countries, as well as the deepening food security problem, increase the relevance of these studies. On the other hand, recent changes in the value of currencies as a result of sharp volatility of hydrocarbon prices in the world market have a significant impact on changes in production costs and import prices.

The fight against poverty and providing people with quality food were the focus of attention not only of countries, but also of influential international organizations. Millennium Development Goals (MDG) have also historically been considered the most successful global challenges against poverty. The second of 17 goals is to end hunger, ensure food security and better nutrition, and promote sustainable agriculture.

By countries, the minimum wage and the cost of living are calculated on the basis of the consumer basket. In the consumer basket there is also a number of products that are considered socially significant food products.

Socially significant food products support the improvement of the population living standards, as well as the implementation of the Sustainable Development Goals. The main characteristics specifying the study is the fact that it considers the pricing process of only socially significant food products, rather than the basket used to calculate the consumer price index. It also serves to improve the living standards of the poor and those of the population whose calorie level is below the minimum, by studying factors that affect the standard of living of this population. The choice of socially significant food products may vary depending on the direction of research. As a factor in the selection of socially significant food products, there are products that play an important role in the daily nutrition of all segments of the population, while maintaining a high level of self-sufficiency, in relation to the minimum consumer basket, and so on.

Taking into consideration the above mentioned, the world market for hydrocarbon prices has changed dramatically, so has the analysis of socially significant food prices from the point of view of non-oil production, including import substitution, support for domestic production and food security, as well as the development of the non-oil sector and econometric assessment is an important area of research.

To this end, the article identifies factors affecting the pricing of social food products and summarizes the methodology for assessing the impact of these factors on price changes by econometric methods.

At the same time, an analysis of socially significant food products in the Azerbaijani economy was carried out and factors affecting price changes were selected and, based on this, the effects were evaluated by econometric methods.

The article was prepared in accordance with the "Methodological Guide to the Rules for the Analysis of Factors of Changes in the Food Market", approved by the Scientific Council of the Institute for Scientific Research on Economic Reforms of the Ministry of Economy of the Republic of Azerbaijan on June 30, 2017 and based on a study conducted by a working group created for this purpose. The results obtained during the study were presented to the Ministry of Economy of the Republic of Azerbaijan in the form of a report.

1 LITERATURE REVIEW

Researchers at the FAO Agricultural Development Economics Division, G. Pierre G., C. Morales-Opazo and M. Demeke, considering that many countries continue to suffer from high food price volatility, studied the three main food products in developing countries (rice, wheat and corn). Thus, using FAO's retail and wholesale databases for 36 developing countries, they measured price volatility using econometric methods. At the same time, they tried to explain price fluctuations between these countries, adding

a few explanatory variables related to economic processes and terms of trade. As a result, they concluded that the poor are net consumers of food and that high price volatility has a significant impact on their purchasing power, which in turn affects the quantity of food consumed and its quality (Pierre, Morales-Opazo, Demeke, 2014).

Erokhin, an employee of the School of Economics and Management at Harbin Engineering University, in his article applied an approach to assessing the sustainability of food supplies in Russia. The purpose of the article is to identify factors affecting sustainability of food supplies and food security. To determine the impact of socio-economic variables on food security at the macroeconomic level, a regression model was evaluated, and on this basis impacts were determined (Erokhin, 2017).

In another article, researchers examined the determinants of price volatility for 6 key foods from January 2001 to March 2013. The main drivers of price volatility were indicators of real economic activity, biofuel production, oil prices and financial markets. The relationship between these macroeconomic and financial factors and products was identified and analyzed in the framework of the Bias multidimensional structure. Further, the impact of each factor in recent years on food volatility has been evaluated. The results show that the last two increases in food prices did not significantly change the dynamics of these prices (Sujithan, Avouyi-Dovi, Koliai, 2014).

Researchers from the Asian Development Bank (ADB) investigated the source of food price fluctuations in 11 developing countries in Asia. The research model is classified by block vector autoregression (VAR) and 10 variables, 3 blocks of the world, region and country depending on origin and nature. Empirical evidence shows that regional shock plays a very important role in explaining changes in local food prices, especially in the medium and long term. The shock of world food prices has no such effect on the dynamics of local food prices in developing Asia. The results show that Asian food markets are more integrated than regional markets. Short-term fluctuations in local food prices are largely due to the shock of the country itself (Huh and Park, 2013).

Apergis and Rezitis on the example of Greece, investigated fluctuations in food prices and their impact on short-term deviations between food prices and macroeconomic factors. The methodology included the use of the GARCH and GARCH-X models, and the results showed a positive effect on relationship between deviations and deviations in food prices (Apergis and Rezitis, 2011).

Researchers at the Pakistan Institute for Economic Development (PIDE) noted that prices are important to macroeconomic policy makers and analyzed the impact of food supply and demand factors on the Pakistani economy. Based on data from the 1970s and 2010s, they determined long-term dependence using an autoregressive model (autoregressive distributed lag model). The results show that cash flow has a significant impact on food prices in the long and short term, but the effect of subsidies is very small. On the other hand, rising world prices will create domestic inflation through imports and, as a result, market forces play a key role in creating long-term equilibrium (Ahsan, Iftikhar, Kemal, 2012).

C. Baumeister, member of the International Economic Analysis Department Bank of Canada, and L. Kilian, researcher at the Department of Economics University of Michigan, Department of Economics, analyzed in their study the impact of rising oil prices of US economy on food prices. The increase in real prices for corn, soybeans, wheat and rice purchased by American farmers was even more significant and allowed for a more detailed analysis and evaluation, partly because they could be associated with higher oil prices (Baumeister and Kilian, 2013).

F. Taghizadeh-Hesary, E. Rasoulinezhad and N. Yoshino examined in their articles the interconnection between energy and food prices in eight countries of Asia using the Panel-VAR model for 2000–2016. Energy prices here are mainly based on oil prices. As a result, they found that oil prices had a significant impact on food prices. At the same time, oil price inflation posed a threat to the food sector and emphasized the need for optimal use of renewable and non-renewable energy resources, emphasizing food security concern (Taghizadeh-Hesary, Rasoulinezhad, Yoshino, 2019).

A 2011 FAO study analyzed current trends in world food prices in terms of costs and benefits. Channels and parties that influence price volatility are also summarized with examples (FAO, 2011).

Summing up the reviewed literature, we can note that the study of fluctuations in food prices was adequately developed on the example of different countries and different researchers. Research in this area is mainly based on time series using econometric methods that help to obtain more reliable results. The main difficulty in conducting time series research is the monthly collection of data for each product. Another problem is that such studies are more often carried out by international organizations or official bodies of countries. This is reasoned by access to information and the introduction of a theory on the control of food markets at the state level.

2 TASK STATEMENT

In hydrocarbon-rich countries, the major part of the economy is concentrated on the oil and gas sector. Since the end of the 2014, the sharp decline in hydrocarbon prices in the global markets have resulted in serious consequences in oil-rich economies. Devaluation of local currencies against dollar and expensive imports of the goods can be shown as the main examples of these effects.

Food market in such economies is the main market where negative consequences of these processes are explicitly observed. Dependency of domestic consumption on import as well as dependency of local production on imported raw materials have led to a significant increase in food prices because of the devaluation. In the meantime, it can also lead to an artificial price increase, which is not directly related to the devaluation.

Considering this, the paper focuses on the analysis of the prices of the socially important goods in the food market of Azerbaijan through performing econometric evaluation methods and tools.

The major part of the goods export in Azerbaijan is crude oil. In this regard, oil revenues have higher share in the foreign trade turnover of Azerbaijan. At the peak of the oil prices, the national currency was stronger, and one unit of local currency was worth more than one US dollar. However, the sharp fall in hydrocarbon prices after 2014 had a devastating effect on the economy of Azerbaijan through import-export channels and led to the devaluation of the national currency twice.

On the other hand, the dependence on imports and the formation of the raw material base of the food production mainly due to imports has led to an increase in food prices to some extent.

In this regard, the analysis of fluctuations in food prices and the estimation of contributed factors are relevant in terms of taking the necessary steps towards market management and regulation.

3 DESIGN AND METHODOLOGY

Short-term and long-term economic problems are emerging in the market of the socially important food products. This is the same for almost every particular country. However, depending on the stage of development they are manifested in various forms. These problems have been well studied and justified in theory.

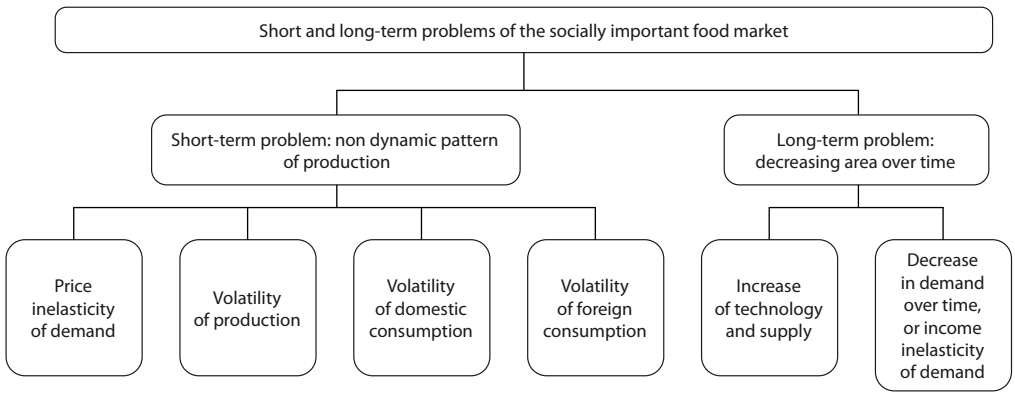
Generally, in economic theory the characteristics of this market for the short-and long-term are grouped as in Figure 1.

Based on the abovementioned information, it is possible to summarize the dependent and explanatory variables in the assessment of socially important food products as follows:

- Dependent variable – Retail price index;
- Explanatory variables – Production price, food expenditures of households, exchange rate, retail price of substitute products (if applicable), import prices, prices of raw materials, prices of utilities such as water, gas and electricity.

As the Azerbaijan's food market is analyzed in the paper, the methodologies have been adapted to the extent of the broadness of the database. In this regard, January 2016 was considered as the beginning

Figure 1 Short- and long-term problems of the socially important food market



Source: Developed by the authors based on McConnell and Brue (2001)

of the time series, and in order to get adequate results of the assessments all values of series were expressed at the price of January 2016 (base year). This ensures comparison of the performance of the dependent and explanatory variables with the single comparable benchmark, base year price.

The assessments were conducted in two ways: (i) a logarithmic valuation model, which allows an assessment of the impact of factors on retail price changes and (ii) a model with standardized time series, which allows assessing the individual contribution of factors to retail price changes.

(i) The coefficients found based on the logarithmic valuation model show a percentage change in the retail price index of the socially important food products due to a single percentage change in explanatory variables.

(ii) The coefficients found based on the standardized time series model allow to estimate the contribution of explanatory variables to the change of the retail price index of socially important food products.

The contribution of the explanatory variables in the change of the retail price index is found based on the construction of an econometric model, whereas time series is normalized through the following mathematical transformations.

Assuming that time series is given as following:

$$P_{2016Jan}, P_{2016Feb}, P_{2016Mar}, \ldots, P_{2017Nov}, P_{2017Dec}. \quad (1)$$

Then, the series is expressed at the price of base year (January 2016):

$$1, \frac{P_{2016Feb}}{P_{2016Jan}}, \frac{P_{2016Mar}}{P_{2016Jan}}, \ldots, \frac{P_{2017Nov}}{P_{2016Jan}}, \frac{P_{2017Dec}}{P_{2016Jan}}. \quad (2)$$

In order to find the contribution of the explanatory factors to the change in the index, the series were first normalized using the standard deviation and the mean.

Assuming that, is the series expressed at the base year price. In this case:

$$\text{Mean}\left(\overline{X}\right) = \frac{\sum_{i=2016Jan}^{2017Dec} X_i}{n}, \quad (3)$$

$$\text{Standard deviation}\left(\sigma\right) = \frac{\sum_{i=2016Jan}^{2017\ Dec} \left(X_i - \overline{X}\right)^2}{n}. \quad (4)$$

When normalizing the series by using mean and standard deviations, the time series used in the model becomes as follows:

$$\frac{X_{2016Jan}-\overline{X}}{\sigma}, \frac{X_{2016Feb}-\overline{X}}{\sigma}, \frac{X_{2016Mar}-\overline{X}}{\sigma},\ldots, \frac{X_{2017Nov}-\overline{X}}{\sigma}, \frac{X_{2017Dec}-\overline{X}}{\sigma}. \quad (5)$$

Thus, all-time series of the dependent and explanatory variables are normalized and standardized. Regression models will be constructed based on these series, and contribution of the factors in the changes of the retail prices index will be estimated.

In general, regression equation can be expressed in the form of the following indefinite function:

retail price = F (exchange rate, import price, export price, utility prices, food expenditures of households, raw material price).

For specific type of the goods, this equation may vary due to both the availability and appropriateness of the certain explanatory variables. For example, there are some products whose production and sale are formed only at the expense of domestic factors, and external factors such as import prices and exchange rates are irrelevant. From this point of view, the above-mentioned function is of a general nature.

Let us assume that the regression equation of any goods is obtained as follows:

$$y = C_1X_1 + C_2X_2 + C_3X_3 + C_4X_4 + C_5X_5 + C_6X_6 . \quad (6)$$

The approach shows that, the sum of the regression coefficients obtained will be equal to the one if selected explanatory variables fully explain the dependent variable. However, it is impossible to reach this conclusion with full accuracy. The reason is that the multicollinearity of the selected explanatory variables is not fully met, and that not all the explanatory variables are taken into account. In fact, it is practically impossible to take into account all the explanatory variables in the model. At the same time, prices for some goods are influenced by factors that cannot be quantified. From this point of view, we can assume the sum of the coefficients obtained equals 1 with a certain error. In this case:

$$C = \sum C_i \approx 1 . \quad (7)$$

Effects of the explanatory variables:

$$\alpha_i = {C_i}/{C}, \qquad i = \overline{1,n} . \quad (8)$$

Thus, the coefficients represent the contribution of each factor in the change of retail prices over the respective period. If the retail price index of the product y has changed during the period under review by A%, then the share of the i-th factor on this change would be $\alpha_i \times A$.

4 ANALYSIS OF THE CURRENT SITUATION ON SOCIALLY SIGNIFICANT FOOD PRODUCTS IN THE ECONOMY OF AZERBAIJAN

The study analyzed various economic approaches to food pricing, their significance is given separately. Our goal is not to solve theoretical issues related to these problems, but to study these issues using the example of Azerbaijan as a specific country.

The specifics of these problems for Azerbaijan was studied, and it was found that the relative growth rate of food consumption does not exceed the growth rate of food production.

Studied are the mechanisms of supporting food production based on international experience in pricing of socially significant consumer goods. In international practice, the main task of state regulation of the development of the agro-industrial complex is to ensure the profitability of food producers taking into account extensive reproduction (this is the whole economic policy). This is due to the fact that in some developed countries financial support for agricultural production exceeds the cost of production by 1.5–2 times.

In international practice, the agro-industrial complex is directly or indirectly subsidized by the state: direct subsidies are provided for each hectare of arable land or for each unit of production; indirect subsidies include payment of a number of expenses related to rural development.

An analysis of the current situation in the field of agricultural subsidies and policy recommendations to improve this process were made taking into account international best practices.

As the socially significant food in the economy of Azerbaijan are: rice, wheat flour, wheat bread of best quality, pasta, beef meat with bones (minced), lamb with bones, chicken meat, raw milk with cream, brynza, chicken eggs, butterfat, olive oil, sunflower oil, corn oil, onions, potatoes, sugar, granulated sugar, black and green tea.

Rice production is low enough to meet demand in Azerbaijan. In this regard, the amount of rice imported is large. Self-sufficiency in rice is 10%. Thus, the dependence on imports is 90%. In 2016, the main share of rice imports was from India and accounted for 53.9% of total imports. The second major share is in the Russian Federation, which accounts for 29.5% of total imports. Imports from other countries account for 16.6% of total imports.

The level of self-sufficiency in all types of flour in the country is set at 95%, and the dependence on imports is 5%. In 2016, the volume of all flour reserves in the country amounted to 2.1 million tons. 74% of these stocks are produced, and 3.1% is imported. 1.2% of flour is used for livestock and poultry, 41.5% for industrial needs, 32.8% for food and only 0.1% for export. According to the State Statistics Committee, in 2016, 3 658.4 tons of flour or in the amount of 1 226.6 thousand dollars were imported to Azerbaijan. 97% of imported products accounted for the Russian Federation, which is mainly due to lower prices for imported flour from the country.

Self-sufficiency for flour (all types) and fresh bread without syrup, eggs, cheese or fruit is about 99.99%. Flour is considered the most important ingredient in the production of bread, it accounts for 50% of the cost of the product. The product is not imported due to its low shelf life.

The situation with pasta self-sufficiency indicates that this indicator fell to 51% in recent years, while Azerbaijan provided it by 70% only in 2012. The highest level of dependence on imports was recorded in 2013 (65.0%), and in 2016 compared to 2013 it decreased by 12.2%. In 2016, about 8 600 tons of pasta from different countries were imported to Azerbaijan. More than 90% of pasta imported into the country this year falls on Russia and Turkey, as well as the rest of Europe.

In 2016, beef self-sufficiency was 93%. The main share of imports of cattle beef belongs to Ukraine (87% of total imports). The share of other countries is 13%, including India, Brazil, the Republic of Moldova and so on.

Based on the food balance, the production of sheep and goat meat in 2016 amounted to 75 254 tons, which is 6.1% more than in the previous year. The self-sufficiency of domestic consumption of sheep and goat meat has always been high (98.4% on average over the past 5 years). Dependence on imports, such as beef and lamb, is very low in the price of this product, minimizing the risk of external price factors and exchange rate shock.

The second distinctive feature of chicken production in Azerbaijan is that it is produced by specialized enterprises. Thus, according to the statistics committee, only 1% of the production of beef, lamb and goat is accounted for by agricultural enterprises, which is 57% in poultry farming. The level of self-sufficiency in poultry farming peaked since 2013, but in 2016 it amounted to 79.1%.

Milk is not only a socially significant product, but also a raw material for the production of many important products. Since socially important products, such as butter, cheese, are included in the production process, the milk used in the study was used in the models in terms of the influence of milk prices and the price changes of these products. According to the State Statistics Committee, the level of self-sufficiency in Azerbaijan for milk with a fat content of 1–6% and 6% and above is quite high. In 2016, this indicator amounted to 99.5% and 95.4%, respectively. It can also be noted that 17.5% of the total amount of milk and dairy products is used for the production of cheese and 24.2% for butter.

In 2016, the self-sufficiency level for all types of cheese was 88.3%, and the dependence on imports was 11.7%. Looking back on previous years, it becomes clear that these percentages are not accompanied by significant changes. The fact that the production of all types of cheese has been growing since 2012 indicates a growing trend. In 2016, the largest share in the import of cheese and cottage cheese to Azerbaijan was made by cheese exporters, such as Germany (26.4%), the Russian Federation (25.8%) and Denmark (11.8%).

Eggs in the country are provided from 99 to 100% of eggs in all years of the country's population due to domestic production. Some of the imported eggs belong to some breeds of domesticated poultry. But in general, it is obvious that egg production has completely covered the domestic market. In addition, it should be noted that egg production was carried out by both households and farmers.

The highest level of butter production over the past 6 years was recorded in 2016 (25 604 tons). Domestic production is the basis for the consumption of butter in the country. According to the Statistics Committee, the level of self-sufficiency in the consumption of butter in domestic production in 2016 amounted to 75.6%, which is 6.4% more than in the previous year. In general, New Zealand is the world's largest producer and exporter of butter, accounting for 21% of world butter exports. In 2016, $ 28.4 million worth of butter was imported to Azerbaijan from various countries. New Zealand has the highest concentration of butter in the import structure. This year, New Zealand accounted for 74% of butter (6 210 tons, or $ 20.5 million).

From the food balance of vegetable oils it is clear that imports are quite high. The level of self-sufficiency in vegetable oils in 2016 amounted to 36.9%. This figure has fallen sharply compared to previous years. The level of dependence on imports is 68.9%. From the table of vegetable oils and consumption it can be seen that in 2016, stocks amounted to 254 300 tons, more than half of which was formed through imports. However, vegetable oil exports have fallen sharply compared to previous years.

Statistical data on the use and consumption of dried onions in the country in 2012–2016 is presented. As can be seen from the table, in 2016 the production of dry onions increased by 7.2% compared to 2012 and by 0.5% compared to 2015. Despite the decline in production, imports grew 4.2 times. On the whole, onion stocks have decreased since 2014 to 210 800 tons. It should be noted that in 2016 there was a decrease in onion cultivation compared to the previous year (2015 – 12 065 ha, 2016 – 11 953 ha).

Despite an increase in potato production in 2016, the dependence on potato imports among the country's population was 18.1% (3.1 percentage points more than in 2015), and the level of self-sufficiency was 85.5% (3.6 percentage points less than in 2015) due to an increase in domestic consumption. The natural climate and geographical conditions of Azerbaijan allow growing potatoes in many regions of the country. In 2016, about 183 thousand tons of potatoes were imported from different countries to Azerbaijan. More than 90% of the potatoes imported into the country this year are from neighboring countries and this is mainly due to the price of potatoes imported from these countries is more than two times lower than the prices of potatoes imported from other countries, and close to the distance.

The world produces 94–97 million tons of sugar (raw sugar), of which 56–60 million tons of sugar cane and 36–38 million tons of sugar beets. According to the Statistics Committee, sugar self-sufficiency is 114.4%, and dependence on imports is 15.3%. At the same time, the self-sufficiency of stocks of raw materials for sugar production is 5.9%, and the dependence on imports is 94.1%. High demand for raw

materials in the production process is one of the factors affecting sugar prices. Although the level of self-sufficiency in sugar production is high, the food balance for the production of raw sugar suggests that sugar used in sugar production is quite high. The import of raw sugar and sugar in 2016 was mainly from Brazil (92.5%). Compared to other countries, importing raw sugar and sugar from Brazil is cheaper.

According to the Statistics Committee, tea self-sufficiency in 2016 is 44.9%, and dependence on imports is 60.6%. According to the tea balance, we can say that the amount of imported tea is quite large. Import volume decreased by 6.6% in 2016 compared to 2015, which can be explained by changes in the manat rate. Tea imports in 2016 were mainly from Sri Lanka (91.5%). The average cost of one kilogram of tea imported from Sri Lanka is $ 3.47, which is lower than the prices in other imported countries. Other countries with sufficient imports are the Russian Federation (2.1%) and India (1.9%).

Changes in price indices for socially significant food products in January–December 2017 compared to the corresponding period of the previous year based on an analysis of the current situation and data of the Statistics Committee are presented in Table 1.

Table 1 Change in price indices of socially significant food products in January–December 2017 compared to the same period last year

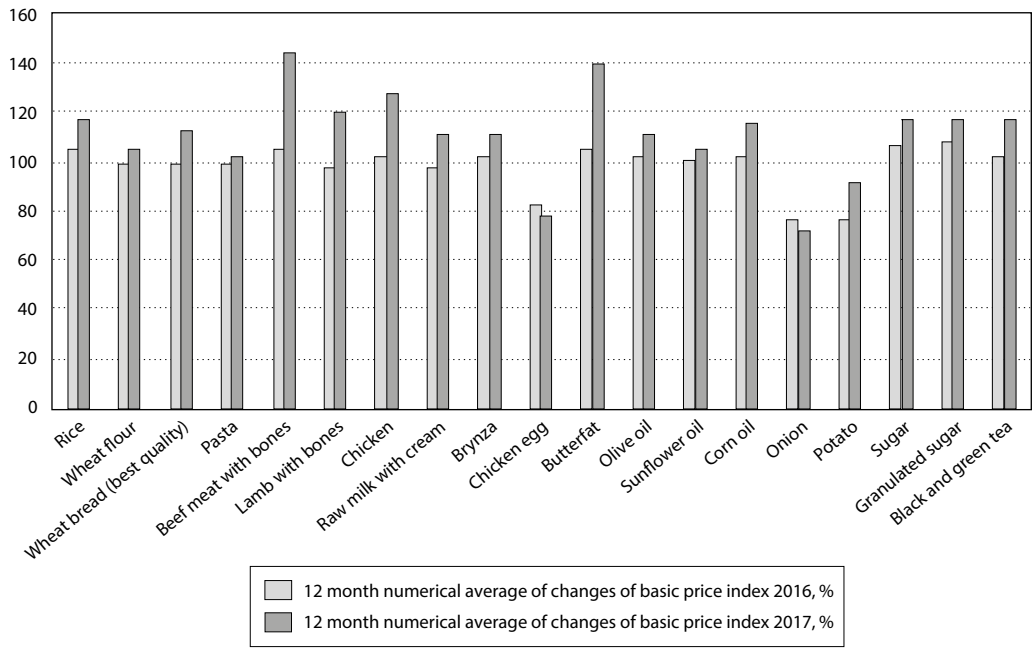
Name of socially significant products	12 month numerical average of changes of basic price index, %	12 month numerical average of changes of basic price index, %	Change (+) increase (–) decrease, %
	2016	2017	
Rice	105.61	117.77	11.51
Wheat flour	99.63	106.51	6.90
Wheat bread (best quality)	100.11	113.76	13.64
Pasta	100.12	103.25	3.12
Beef meat with bones	106.29	145.66	37.04
Lamb with bones	99.08	121.98	23.11
Chicken	102.56	128.42	25.21
Raw milk with cream	98.94	111.63	12.83
Brynza	103.02	113.04	9.72
Chicken egg	83.58	78.60	–5.96
Butterfat	105.96	140.52	32.62
Olive oil	103.10	111.91	8.54
Sunflower oil	102.25	106.96	4.60
Corn oil	103.72	116.55	12.38
Onion	77.43	73.59	–4.96
Potato	77.84	92.46	18.78
Sugar	107.21	118.76	10.76
Granulated sugar	109.53	118.96	8.61
Black and green tea	102.79	119.03	15.79

Source: The State Statistical Committee (SSC) of the Republic of Azerbaijan

As can be seen from Table 1, in the products under consideration there were significant price fluctuations. To this end, the econometric regression equations were established based on factors selected in the EViews statistical software according to the methodology.

Changes in the 2016–2017 retail price index for 19 socially significant food products selected for the Azerbaijani economy are presented graphically in Figure 2. As you can see, retail prices for all products except chicken eggs (–5.96%) and onions (–4.96%) rose.

Figure 2 Comparison of changes in the price index for socially significant food products (January 2016 = 100%)



Source: The State Statistical Committee (SSC) of the Republic of Azerbaijan

5 DATA ANALYSIS

Researches on food consumption and nutrition are always used as the primary source of information for determining the cost of goods and services necessary for the population, consumption structure, ratio of food and non-food products, and quantitative and qualitative indicators of living standards. The SSC regularly maintains statistics and researches on food consumption and consumption expenditures, which must meet the following requirements.

Researches must cover:

1. Different groups of food products;
2. Origin of food products;
3. Cost of the food products;
4. Food consumption tradition;
5. Households, its inhabitants and different groups of the population;
6. Nutrition value of food products;
7. Level of calories in nutrition;
8. Food loss;
9. The study of anthropometric indicators.

Information on items numbering from one to five is studied during food consumption surveys, and an expert determines the information on number 6. Based on this data, food balances are compiled, and per capita daily food consumption is calculated by using these balances through national, geographical and regional units. After determining food consumption by individual regions, the country average is calculated.

The database of the research was formed based on the official data of the SSC and the Central Bank of the Republic of Azerbaijan (CBAR) on a monthly basis, covering the period from January 2012 to December 2017. The sampling period was selected from January 2016 to December 2017. The data used is derived from the following sources, and some of the information is adapted based on official figures as well:

- Average Producer Prices – form 1-SQ of the SSC (Producer prices of industrial products, prices of industry-related services and raw materials used for the production of industrial products) is used;
- Food Price Index – prices and price indices bulletins were used in Price Statistics of the SSC;
- Import prices and import volumes – the bulletins of the foreign trade relations of Azerbaijan were used in the Trade Statistics of the SSC. Since the prices of imported products are expressed in US dollars, the official exchange rate of the CBAR has been used to convert them into manat;
- Production volume – form 1-Production report of SSC (Production and distribution of goods and delivery of services), and production of agricultural livestock products report were used;
- Household consumption expenditures – data were derived from consumer expenditure section in the household budget statistics of the SSC;
- Exchange Rate – exchange rate information is available on the official website of the CBAR on a monthly basis.

6 RESULTS

Estimates on socially important food products in the Azerbaijani economy were made using econometric models based on monthly historical data, starting from January 2016 to December 2017.

Table 2 describes the indicators used for each product's evaluation in the EViews model. Note that, in the model, if the variable has the notion "USD", it is the price expressed in US dollar.

Table 2 Name and description of indicators in EViews software package

İQ_USD_MƏHSULUN ADI	Import price of goods in USD
İSTQ_MƏHSULUN ADI	Average producer price of goods
XQİY_ MƏHSULUN ADI	Price of raw materials
BİNDEX_ MƏHSULUN ADI	Retail price index of goods
TECHİZAT_ELEKTRİK	Electricity price
TECHİZAT_QAZ	Natural gas price
EV_TES_İSTXERC	Food expenditures of households
MEZENNE	USD/AZN exchange rate

Source: Own construction

The results of the regression equations performed are given in the Appendix. Based on these results, the calculations were made on the basis of the abovementioned methodological approach. Thus, the contribution of factors affecting changes in the price indexes of socially important food products in 12 months of 2017 compared to the same period of the previous year is presented in Table 3.

Table 3 Contribution of factors affecting retail price indices of 19 socially important food products

No.	Socially important food products	12-month retail price change,%	Contribution of factors						
			Exchange rate	*Food expenditures of households*	*Utility costs*	*Import price*	*Export price*	*Producer price*	*Price of raw materials*
1	Long rice	11.51	5.72	4.83					0.96
2	Wheat flour	6.90	3.34	0.74	0.47	0.76			1.60
3	Bread	13.64	7.07	4.38	2.89				–0.71
4	Macaroni	3.12	1.23	0.01	0.16	–0.44			2.16
5	Beef	37.04	6.55	3.64		1.43		25.42	0.00
6	Mutton	23.11	2.30	–0.71				21.52	0.00
7	Chicken	25.21	1.74	13.86	3.70	9.74		–3.83	
8	Unpasteurized milk	12.83	3.26	–0.77					10.33
9	Bryndza cheese	9.72	1.58	1.36	0.04	1.24			5.50
10	Chicken egg	–5.96							
11	Butter	32.62	4.36	2.63	0.46	10.48			14.69
12	Olive oil	8.54	1.29	1.07	0.18		4.37		1.62
13	Sunflower oil	4.60	2.54	1.75				0.20	0.10
14	Corn oil	12.38	4.67	3.44	1.00	0.03	1.41		1.82
15	Onion	–4.96					–2.44	–0.91	–1.61
16	Potato	18.78	10.29	–0.49		–1.49	2.50		7.97
17	Sugar	10.76	3.43	2.78	3.41	–2.87			4.02
18	Castor sugar	8.61	3.39	4.88	0.06	–1.32			1.60
19	Black and green tea	15.79	3.21	–0.82		2.16	1.52		9.73

Source: Constructed by the authors based on the results of the research

According to Table 3, the increase in retail prices was mainly due to the exchange rate. This might be explained by the double devaluation of the national currency in the period under review. At the same time, changes in import prices have also led to an increase in retail prices, as more products are imported. The presence of import prices in dollars takes into account the processes occurring in countries of origin, that is, the increase in production prices. For example, major contribution of the some 32.62% price increase in butter came from the increase in import prices (+10.48%).

Among 19 socially important food products, price change of chicken egg was also assessed, however, the results were inadequate. The reason for this may be official regulation of prices for chicken eggs, as well as other products. At the same time, the capacity of chicken eggs to be traded by individual households also hindered the natural pricing process. From this point of view, evaluations on chicken eggs have not produced adequate results.

Table 4 Share of factors affecting retail price indices of 19 socially important food products based on the model with monthly observations in 2016–2017 (in %)

No.	Socially important food products	Share of factors, in %							Sum
		Exchange rate	*Food expenditures of households*	*Utility costs*	*Import price*	*Export price*	*Producer price*	*Price of raw materials*	
1	Long rice	49.71%	41.93%					8.36%	100%
2	Wheat flour	48.39%	10.72%	6.74%	11.02%			23.13%	100%
3	Bread	51.86%	32.10%	21.22%				–5.18%	100%
4	Macaroni	39.39%	0.26%	5.19%	–14.07%			69.23%	100%
5	Beef	17.69%	9.82%		3.87%		68.63%		100%
6	Mutton	9.97%	–3.06%				93.09%		100%
7	Chicken	6.89%	54.99%	14.69%	38.63%		–15.19%		100%
8	Unpasteurized milk	25.44%	–5.97%					80.53%	100%
9	Bryndza cheese	16.26%	13.95%	0.39%	12.79%			56.61%	100%
10	Chicken egg								
11	Butter	13.37%	8.05%	1.42%	32.14%			45.02%	100%
12	Olive oil	15.16%	12.58%	2.16%		51.17%		18.93%	100%
13	Sunflower oil	55.23%	38.10%				4.46%	2.21%	100%
14	Corn oil	37.74%	27.78%	8.08%	0.27%	11.39%		14.74%	100%
15	Onion					49.24%	18.35%	32.40%	100%
16	Potato	54.81%	–2.61%		–7.95%	13.31%		42.44%	100%
17	Sugar	31.83%	25.81%	31.70%	–26.65%			37.31%	100%
18	Castor sugar	39.41%	56.75%	0.67%	–15.38%			18.56%	100%
19	Black and green tea	20.31%	–5.20%		13.66%	9.65%		61.58%	100%

Source: Constructed by the authors based on the results of the research

CONCLUSION

In recent years, along with the change in hydrocarbon prices in the world market, certain economic problems occurred in countries whose economy is largely dependent on the oil and gas sector. Following the drop in oil prices, the volume of foreign currency inflow decreased in oil-exporting countries, and the value of the local currencies started to fall, resulting in their devaluation. The devaluation

of the local currencies led to the rise in import prices as well. Retail prices increased for imported products and/or local products that indirectly depends on import. This resulted in high inflation rate, especially in countries whose export widely consists of hydrocarbon resources and domestic food market is vulnerable to the import prices.

As an oil exporting country, the sharp drop in oil prices had a serious negative impact on the economy of Azerbaijan as well. The depreciation of the national currency (AZN) and the increase in import prices led to an increase in prices in both wholesale and retail food market. Under these conditions, the analysis of the retail price fluctuations and determination of the main contributors of the inflation rate in food products have become an essential task for both academic community and policymakers in Azerbaijan. Therefore, the main purpose of the research in this paper is to find the determinants of the price increases in foods especially after the two times devaluation of AZN in 2015 following the double drop in oil prices. Despite some stabilization in oil prices, psychological pressure to the AZN after devaluations kept momentum and gradual depreciation continued in 2016 and 2017 as well, where headline inflation rates reached 12.4% and 12.9%, respectively. Therefore, we take specifically the data from 2016 to 2017 to capture the price changes and their determinants in this period specifically.

Identification and assessment of the factors has been carried out empirically based on the given methodology. Thus, 19 types of food products that are of the highest socially importance were selected, and the effect of the exogenous factors on the retail prices of these products was evaluated econometrically. As a result, it was concluded that, price increases in food products analyzed were largely due to the increase in import prices, and this relationship is statistically significant as well. This has shown itself in both the devaluation of local currency and the rise in selling prices of imported products in country of origin. Since import prices are modeled in foreign currency, this factor only reflects the effects of the changes in country of origin of import products.

Analyzing and evaluating price increases is important also from the point of view of pursuing economic policy. The results of the study were formally submitted to the Ministry of Economy of the Republic of Azerbaijan. At the same time, the results can play an important role in future economic policy decisions aimed at reducing the dependence of certain products on import and maintaining the exchange rate stability of the national currency.

Further improvement of the research, that is, inclusion of the prices of wider range of raw materials to the model, will help to explain the results more profoundly. In addition, further expansion of the time-series is important for controlling food price fluctuations in general, not just analyzing them for specific period.

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APPENDIX

Dependent Variable: BINDEX_DUYU
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
XQIY_XAMDUYU_USD	0.083198	0.116084	0.716702	0.4815
EV_TES_ISTXERC	0.417308	0.158618	2.630910	0.0156
MEZENNE	0.494702	0.153327	3.226451	0.0040
R-squared	0.742874	Mean dependent var		3.86E-15
Adjusted R-squared	0.718385	S.D. dependent var		1.000000
S.E. of regression	0.530674	Akaike info criterion		1.687130
Sum squared resid	5.913905	Schwarz criterion		1.834386
Log likelihood	–17.24556	Hannan-Quinn criter		1.726197
Durbin-Watson stat	0.350698			

Dependent Variable: BINDEX_BUGDAUNU
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_BUGDAUNU	0.132123	0.116500	1.134101	0.2716
XQIY_BUGDAYUMSAQ_USD	0.071479	0.101960	0.701056	0.4922
XQIY_YUMSAQBUGDA_AZN	0.205766	0.148233	1.388130	0.1820
DUMMY	0.080793	0.142134	0.568426	0.5768
EV_TES_ISTXERC	0.128543	0.173576	0.740557	0.4685
MEZENNE	0.580180	0.134510	4.313268	0.0004
R-squared	0.862890	Mean dependent var		6.15E-16
Adjusted R-squared	0.824804	S.D. dependent var		1.000000
S.E. of regression	0.418565	Akaike info criterion		1.308347
Sum squared resid	3.153535	Schwarz criterion		1.602861
Log likelihood	–9.700167	Hannan-Quinn criter		1.386482
Durbin-Watson stat	0.937053			

Dependent Variable: BINDEX_COREK
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ISTQ_BUGDAUNU_ELANOV	–0.128445	0.094046	–1.365762	0.1880
XQIY_MAYA	0.071888	0.094524	0.760519	0.4563
TECHIZAT_QAZ	0.231508	0.081398	2.844156	0.0104
EV_TES_ISTXERC	0.350183	0.117324	2.984740	0.0076
MEZENNE	0.565753	0.102391	5.525400	0.0000
R-squared	0.912527	Mean dependent var		–1.02E-16
Adjusted R-squared	0.894111	S.D. dependent var		1.000000
S.E. of regression	0.325406	Akaike info criterion		0.775564
Sum squared resid	2.011888	Schwarz criterion		1.020992
Log likelihood	–4.306764	Hannan-Quinn criter		0.840676
Durbin-Watson stat	1.126075			

Dependent Variable: BINDEX_MAKARON
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_MAKARON	–0.140392	0.115551	–1.214979	0.2410
XQIY_BUGDA_AZN	0.281810	0.177443	1.588176	0.1307
ISTQ_SUD	0.168897	0.149324	1.131078	0.2737
ISTQ_YUMURTA	0.239855	0.145331	1.650404	0.1172
DUMMY	0.051799	0.166910	0.310340	0.7601
EV_TES_ISTXERC	0.002592	0.166079	0.015608	0.9877
MEZENNE	0.392913	0.179782	2.185501	0.0431
R-squared	0.821877	Mean dependent var		2.73E-16
Adjusted R-squared	0.759011	S.D. dependent var		1.000000
S.E. of regression	0.490907	Akaike info criterion		1.653367
Sum squared resid	4.096818	Schwarz criterion		1.996966
Log likelihood	–12.84041	Hannan-Quinn criter		1.744524
Durbin-Watson stat	0.940168			

Dependent Variable: BINDEX_MAL
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_MAL	0.041992	0.049504	0.848264	0.4063
ISTQ_MAL	0.745600	0.058620	12.71925	0.0000
EV_TES_ISTXERC	0.106659	0.039746	2.683507	0.0143
MEZENNE	0.192194	0.043600	4.408154	0.0003
R-squared	0.984391	Mean dependent var		6.29E-16
Adjusted R-squared	0.982050	S.D. dependent var		1.000000
S.E. of regression	0.133977	Akaike info criterion		–1.031287
Sum squared resid	0.358996	Schwarz criterion		–0.834944
Log likelihood	16.37544	Hannan-Quinn criter		–0.979197
Durbin-Watson stat	1.602695			

Dependent Variable: BINDEX_QOYUN
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ISTQ_QOYUN	0.932575	0.050109	18.61089	0.0000
EV_TES_ISTXERC	–0.030703	0.048295	–0.635742	0.5318
MEZENNE	0.099887	0.055355	1.804482	0.0855
R-squared	0.975456	Mean dependent var		–5.55E-17
Adjusted R-squared	0.973118	S.D. dependent var		1.000000
S.E. of regression	0.163957	Akaike info criterion		–0.661961
Sum squared resid	0.564517	Schwarz criterion		–0.514704
Log likelihood	10.94353	Hannan-Quinn criter		–0.622894
Durbin-Watson stat	1.195291			

Dependent Variable: BINDEX_TOYUQ
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_TOYUQ	0.374480	0.144685	2.588250	0.0180
ISTQ_TOYUQ	–0.147255	0.130982	–1.124243	0.2749
DUMMY	0.142372	0.189080	0.752972	0.4607
EV_TES_ISTXERC	0.533117	0.171754	3.103947	0.0058
MEZENNE	0.066781	0.191474	0.348771	0.7311
R-squared	0.735311	Mean dependent var		–3.24E-16
Adjusted R-squared	0.679588	S.D. dependent var		1.000000
S.E. of regression	0.566050	Akaike info criterion		1.882783
Sum squared resid	6.087836	Schwarz criterion		2.128210
Log likelihood	–17.59339	Hannan-Quinn criter		1.947895
Durbin-Watson stat	0.826507			

Dependent Variable: BINDEX_SUD
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
XQIY_BUGDAKEP	0.774400	0.122620	6.315461	0.0000
EV_TES_ISTXERC	–0.057364	0.109880	–0.522056	0.6071
MEZENNE	0.244628	0.130220	1.878576	0.0743
R-squared	0.874974	Mean dependent var		4.81E-16
Adjusted R-squared	0.863067	S.D. dependent var		1.000000
S.E. of regression	0.370045	Akaike info criterion		0.966084
Sum squared resid	2.875599	Schwarz criterion		1.113341
Log likelihood	–8.593011	Hannan-Quinn criter		1.005151
Durbin-Watson stat	0.751663			

Dependent Variable: BINDEX_BRINZA
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_BRINZA	0.144594	0.052882	2.734270	0.0132
ISTQ_SUD	0.639769	0.065043	9.836124	0.0000
DUMMY	0.004379	0.043553	0.100533	0.9210
EV_TES_ISTXERC	0.157625	0.038325	4.112882	0.0006
MEZENNE	0.183806	0.045630	4.028222	0.0007
R-squared	0.986379	Mean dependent var		1.74E-15
Adjusted R-squared	0.983512	S.D. dependent var		1.000000
S.E. of regression	0.128406	Akaike info criterion		–1.084180
Sum squared resid	0.313276	Schwarz criterion		–0.838752
Log likelihood	18.01016	Hannan-Quinn criter		–1.019068
Durbin-Watson stat	1.665517			

Dependent Variable: BINDEX_YUMURTA
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
XQIY_BUGDAKEP	–0.428908	0.299120	–1.433902	0.1679
XQIY_BUGDADENI	–0.453735	0.194411	–2.333894	0.0307
DUMMY	–0.021886	0.281185	–0.077835	0.9388
EV_TES_ISTXERC	–0.030584	0.249809	–0.122428	0.9038
MEZENNE	0.728386	0.299963	2.428251	0.0253
R-squared	0.437019	Mean dependent var		–1.39E-15
Adjusted R-squared	0.318496	S.D. dependent var		1.000000
S.E. of regression	0.825532	Akaike info criterion		2.637475
Sum squared resid	12.94857	Schwarz criterion		2.882903
Log likelihood	–26.64970	Hannan-Quinn criter		2.702587
Durbin-Watson stat	0.845166			

Dependent Variable: BINDEX_KEREYAGI
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_KEREYAGI	0.360930	0.058455	6.174535	0.0000
ISTQ_SUD	0.505631	0.068974	7.330773	0.0000
TECHIZAT_ELEKTRIK	0.015979	0.100795	0.158530	0.8757
EV_TES_ISTXERC	0.090440	0.047462	1.905512	0.0720
MEZENNE	0.150146	0.065603	2.288707	0.0337
R-squared	0.987349	Mean dependent var		–1.94E-15
Adjusted R-squared	0.984685	S.D. dependent var		1.000000
S.E. of regression	0.123753	Akaike info criterion		–1.158013
Sum squared resid	0.290979	Schwarz criterion		–0.912586
Log likelihood	18.89616	Hannan-Quinn criter		–1.092901
Durbin-Watson stat	1.422975			

Dependent Variable: BINDEX_ZEYTUNYAGI
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IXRAC_USD_ZEYTUNYAGI	0.596478	0.115551	5.162021	0.0001
XQIY_ZEYTUN_EMALSIZ_USD	0.220682	0.107847	2.046256	0.0548
DUMMY	0.025170	0.157819	0.159488	0.8750
EV_TES_ISTXERC	0.146586	0.138335	1.059650	0.3026
MEZENNE	0.176765	0.147682	1.196927	0.2461
R-squared	0.818548	Mean dependent var		–1.70E-15
Adjusted R-squared	0.780348	S.D. dependent var		1.000000
S.E. of regression	0.468671	Akaike info criterion		1.505220
Sum squared resid	4.173397	Schwarz criterion		1.750648
Log likelihood	–13.06264	Hannan-Quinn criter		1.570332
Durbin-Watson stat	1.677640			

Dependent Variable: BINDEX_GUNEBAXANYAGI
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ISTQ_GUNEBAXANYAGI	0.048497	0.089540	0.541619	0.5941
XQIY_XAMGUNYAGI_USD	0.024050	0.085413	0.281574	0.7812
EV_TES_ISTXERC	0.414696	0.106846	3.881249	0.0009
MEZENNE	0.601116	0.101522	5.921023	0.0000
R-squared	0.902437	Mean dependent var		–8.99E-16
Adjusted R-squared	0.887802	S.D. dependent var		1.000000
S.E. of regression	0.334959	Akaike info criterion		0.801397
Sum squared resid	2.243956	Schwarz criterion		0.997739
Log likelihood	–5.616761	Hannan-Quinn criter		0.853486
Durbin-Watson stat	1.086155			

Dependent Variable: BINDEX_QARGIDALIYAGI
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_QARGIDALIYAGI	0.003340	0.101572	0.032883	0.9742
IXRAC_USD_QARGIDALIYAGI	0.138571	0.108148	1.281308	0.2173
XQIY_XAMQARGYAGI_USD	0.192203	0.098150	1.958252	0.0668
XQIY_SODA_KAUSTIK_USD	–0.012855	0.095271	–0.134935	0.8942
DUMMY	0.098288	0.136552	0.719783	0.4814
EV_TES_ISTXERC	0.338122	0.133414	2.534385	0.0214
MEZENNE	0.459302	0.146424	3.136790	0.0060
R-squared	0.877709	Mean dependent var		–1.07E-15
Adjusted R-squared	0.834548	S.D. dependent var		1.000000
S.E. of regression	0.406758	Akaike info criterion		1.277298
Sum squared resid	2.812689	Schwarz criterion		1.620897
Log likelihood	–8.327571	Hannan-Quinn criter		1.368454
Durbin-Watson stat	0.936959			

Dependent Variable: BINDEX_SOGAN
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IXRAC_USD_SOGAN	0.484341	0.217128	2.230666	0.0367
ISTQ_SOGAN	0.180533	0.215469	0.837859	0.4115
XQIY_AZOT_USD	0.318699	0.183386	1.737856	0.0969
R-squared	0.311163	Mean dependent var		1.24E-15
Adjusted R-squared	0.245560	S.D. dependent var		1.000000
S.E. of regression	0.868585	Akaike info criterion		2.672567
Sum squared resid	15.84325	Schwarz criterion		2.819823
Log likelihood	–29.07080	Hannan-Quinn criter		2.711634
Durbin-Watson stat	0.886533			

Dependent Variable: BINDEX_KARTOF
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_KARTOF	–0.070698	0.203673	–0.347113	0.7323
IXRAC_USD_KARTOF	0.118347	0.196951	0.600893	0.5550
XQIY_KARTOFTOX_USD	0.377279	0.206859	1.823843	0.0839
EV_TES_ISTXERC	–0.023207	0.256685	–0.090408	0.9289
MEZENNE	0.487188	0.255437	1.907276	0.0717
R-squared	0.366789	Mean dependent var		1.90E-16
Adjusted R-squared	0.233481	S.D. dependent var		1.000000
S.E. of regression	0.875510	Akaike info criterion		2.755033
Sum squared resid	14.56385	Schwarz criterion		3.000460
Log likelihood	–28.06039	Hannan-Quinn criter		2.820145
Durbin-Watson stat	0.634546			

Dependent Variable: BINDEX_SEKER
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_SEKER	–0.222347	0.176667	–1.258559	0.2252
XQIY_QAMISCUG_QIY	0.175983	0.133279	1.320413	0.2042
XQIY_XAMSEKER_USD	0.135325	0.094048	1.438889	0.1683
TECHIZAT_QAZ	0.057178	0.111800	0.511428	0.6156
TECHIZAT_ELEKTRIK	0.207266	0.297958	0.695622	0.4961
EV_TES_ISTXERC	0.215329	0.196691	1.094758	0.2889
MEZENNE	0.265567	0.220082	1.206672	0.2441
R-squared	0.920058	Mean dependent var		–2.22E-15
Adjusted R-squared	0.891843	S.D. dependent var		1.000000
S.E. of regression	0.328872	Akaike info criterion		0.852194
Sum squared resid	1.838661	Schwarz criterion		1.195793
Log likelihood	–3.226329	Hannan-Quinn criter		0.943351
Durbin-Watson stat	1.079757			

Dependent Variable: BINDEX_SEKERTOZU
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_SEKERTOZU	–0.130105	0.181522	–0.716744	0.4823
XQIY_XAMSEKER_USD	0.156948	0.136960	1.145940	0.2660
TECHIZAT_ELEKTRIK	0.005641	0.344930	0.016355	0.9871
EV_TES_ISTXERC	0.479896	0.212396	2.259443	0.0358
MEZENNE	0.333323	0.314087	1.061245	0.3019
R-squared	0.794127	Mean dependent var		1.21E-15
Adjusted R-squared	0.750786	S.D. dependent var		1.000000
S.E. of regression	0.499214	Akaike info criterion		1.631486
Sum squared resid	4.735070	Schwarz criterion		1.876914
Log likelihood	–14.57784	Hannan-Quinn criter		1.696598
Durbin-Watson stat	0.636087			

Dependent Variable: BINDEX_CAY
Method: Least Squares
Sample: 2016M01 2017M12
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IQ_USD_CAY	0.129767	0.142927	0.907931	0.3753
IXRAC_USD_CAY	0.098048	0.120507	0.813625	0.4259
XQIY_CAY_QABSIZ	0.773242	0.211089	3.663107	0.0017
EV_TES_ISTXERC	–0.067085	0.181224	–0.370178	0.7153
MEZENNE	0.047883	0.174033	0.275141	0.7862
R-squared	0.806622	Mean dependent var		–2.55E-15
Adjusted R-squared	0.765911	S.D. dependent var		1.000000
S.E. of regression	0.483827	Akaike info criterion		1.568873
Sum squared resid	4.447684	Schwarz criterion		1.814301
Log likelihood	–13.82648	Hannan-Quinn criter		1.633985
Durbin-Watson stat	0.777361			