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On Complex Inflation Targeting and Modified Inflation Indicators (Experience of Georgia)

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ABSTRACT

The paper analyzes inflation targeting which is used in many countries as a tool for the monetary policy of central banks. The study of the experience of inflation targeting over the past quarter century shows a number of shortcomings. The important one is that inflation targeting is powerless in relation to import inflation. This problem is particularly acute for import-dependent countries. The authors summarize the failure of inflation targeting to influence the import of inflation regarding inflation caused by the increase in production costs. The problem is studied by the example of post-communist Georgia (that uses inflation targeting) and its major trade partners. The authors analyze various modifications of the inflation indicator, such as agflation, munflation, and imflation. It is shown that the first two reflect price fluctuations on the nutrition, medical care, medication and utilities. Imflation reflects the dynamics of import prices on the domestic market, in the formation of which the exchange rate of the national currency is of great importance. The indicators of agflation and munflation together with the traditional indicator of inflation should become one of the important macroeconomic indicators for governments that develop economic and social policies. The authors propose a new approach to monetary policy, called complex inflation targeting. In this case, monetary policy targets are not only inflation, but also imflation. As for the exchange rate of the national currency, it should be influenced by the actual level of the imflation indicator.

Keywords: monetary policy; inflation; inflation targeting; exchange rate; demand-pull inflation; cost-push inflation; hybrid inflation targeting; complex inflation targeting; agflation; munflation; imflation

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INTRODUCTION

Monetary policy related issues are among the most discussed ones in the modern economics. They became especially relevant after 2007–2009 global financial crisis (for example, [1–3]).

Currently, inflation targeting (IT) is one of the most common methods of monetary policy[1]. A number of works have been devoted to generalize the experience of the countries using IT (for example, [4]). The experience of the post-communist countries (for example, [5]) and the countries with emerging economies (for example, [6]) is of particular interest.

Considering the IT regime, many researchers are focusing on studying the relationship between the exchange rate and IT (for example, [7–9]). This issue is of particular interest due to the IT regime predecessors were monetary policy systems based either on a "monetary anchor" or on a "exchange rate anchor".

Among the countries where the monetary policy is based on IT, there are those that combine it with currency regulation. For example, in the Czech Republic adhering to the IT regime, concurrently, the exchange rate ceiling of the national currency is set. This results in the so-called dual targeting — that of inflation and exchange rate [5, p. 81]. Such a monetary policy regime, where besides the inflation, the exchange rate is subject to targeting is called **hybrid** (i.e., mixed) IT (HIT) [10, p. 70].

Speaking about IT, it is necessary to note the fact that for countries with different levels of development, the generally accepted inflation indicator does not always accurately reflect the pressing social and economic problems of these countries.

This question is not only related to IT, but has broader roots and equally important consequences. In particular, for poor countries, first of all, the problem is the rise in price of the food, and not the entire consumer basket (for example, [11, 12]). For these countries, changes in prices of medicines and health care services, as well as utilities, are no less important. At the same time, in the countries with a negative trade balance, the price of imported goods is of great importance. On this basis, it is quite natural to "increase" the possibilities of the inflation indicator by developing its modifications (for example, [13, 14]), including for their possible use in the IT system [15].

The aim of this article is to study the issue of using various modifications of the inflation indicator in the IT system, and thereby "expanding" the scope of this system. As an example, these indicators will be considered for Georgia, a post-Soviet country where the IT regime (in its "pure" form) has been used since 2009. At the same time, IT is also used in the countries, the main trade partners of Georgia, for example, Turkey, Russia, Azerbaijan, etc.

ABOUT IT AND SOME OF ITS WEAKNESSES

The first country in the world to switch to the IT regime in the monetary policy was New Zealand which had stably high inflation for over two decades since 1967, when average inflation was 15% and the maximum one was 20% (for example, [16, p. 261]). In 1984, the Reserve Bank of New Zealand decided to abandon the internationally recognized priority of monetary aggregates and to establish control over the maximum level of inflation, as a result of which the monetary policy switched to the IT regime [17; 18, p. 86–114; 19–21]. Later this example was followed by Canada, the United Kingdom, Finland, Sweden, Australia and Spain [22]. The growth dynamics of the number of countries adhering to the monetary policy of the IT regime is significant: by 2006, the number of such countries was 25 [23, p. 1], and by 2018, already 68[2].

Among the issues studied in relation to IT, one associated with the study of its effect on economic growth is clearly highlighted (for ex-

[1] Annual Report on Exchange Arrangements and Exchange Restrictions 2017. International Monetary Fund. 2018(Apr.30). URL: https://www.imf.org/~/media/Files/Publications/AREAER/areaer-2017-overview.ashx (accessed on 22.05.2019).

[2] Inflation Targets. Central Bank News. 2018. URL: http://www.centralbanknews.info/p/inflation-targets.html (accessed on 22.05.2019).

ample, [24–28]). According to the central bank of Canada, the IT regime has contributed to the country's steady economic growth[3].

The generalization of the experience gained over many years of studying this effect does not give a definite answer: earlier publications have not established a positive effect of IT on economic growth, while empirical studies of recent years confirm this effect with a three-year lag [10, p. 64–65].

The fact that the IT regime contributes to a relatively low level of inflation is confirmed by a number of studies for both developed and developing countries (for example, [23; 29, p. 153–175]).

By now, there have been a lot of publications where substantiated "allegations" against the IT regime stemming from its weaknesses are made in a sense.

In particular, according to Jeffrey Frankel, a professor at Harvard University and a member of the economic council under President Bill Clinton, in the currency crises of the 1990s, the IT regime proved to be an effective mechanism to achieve relative stability in the level of inflation. However, later the IT regime "died" and, as a result, central banks could not decide on a new goal for the monetary policy that would ensure the population's sense of stability [30].

The Bank for International Settlements, which, as an international financial institution, promotes cooperation between central banks to facilitate international financial settlements, also opposes the use of the IT regime, since it quite often counters with financial stability [31, 32].

In addition to these weaknesses of the IT regime, it should be noted that this regime does not consider financial cycles. As a result, this leads to excessive expansionist and asymmetric monetary policy [33].

The basic argument in favor of the IT regime, as a rule, was based on the fact that it allegedly contributed to the reduction of inflation since the early 1990s. At the same time, this statement is also criticized. Since the 1980s, the inflationary trend in many more or less problematic countries was already declining. The main merit of this was not the IT regime, but globalization and the integration of China into the world economy [33].

Nobel laureate in economics Joseph Stiglitz believes that the IT regime will have to be abandoned at least in developing countries whose central banks are not able to control inflation, which is not so rarely imported [34].

The issue of imported inflation, in our opinion, can be generalized for a more general case. In particular, what causes inflation is important.

As is known from general economic theory, the causes of inflation can be either an increase in aggregate demand, or an increase in production costs. As a result, there are two types of inflation: *demand-pull inflation* and *cost-push inflation* (for example, [35, p. 164–167]).

Demand-pull inflation is caused by excess demand, when aggregate supply is not able to satisfy it; in the result, prices begin to rise. It is not by chance that this type of inflation is interpreted in the following way: "too much spending chasing too few goods" [35, p. 165]. Central banks are known to have a number of effective tools to influence the money supply, as a result of which it is actually possible to contain demand-pull inflation.

The situation with cost-push inflation is more complicated when rising production costs may cause a decrease in aggregate supply.

The mechanism for reducing aggregate demand through rising production costs is fairly simple. In particular, due to the increase in production costs, firms aiming to obtain unabated profits seek to raise prices, to which the market can react in two ways:

1. If the market "accepts" the increased prices, then there is an increase in inflation.

2. If the market "rejects" the higher prices, then firms are forced to lower these prices by reducing the profits received, which, in turn,

[3] Renewal of the Inflation — Control Target: Background Information — November 2006. Ottawa: Bank of Canada; 2006. 18 p. URL: https://www.bankofcanada.ca/wp-content/uploads/2010/06/background_nov06.pdf, p. 3 (accessed on 22.05.2019).

may force firms to "leave" the market, resulting in a supply decrease and price rise, i.e. in this case, the inflation rate will increase.

As it is known, sources of cost-push inflation can be an increase in wages (for example, due to appropriate pressure from trade unions) and prices for raw materials and energy [35, p. 166–167].

When different types of raw materials and energy are imported, and their prices are rising on international markets, then there is import of inflation.

Another equally important reason for the conditionally called "import" of inflation is the depreciation of the national currency, as a result of which the prices of imported goods naturally rise. In case the market "rejects" these increased prices, the importers must either reduce the profits received or reduce the imports, which will lead to a corresponding reduction in supply, and, as a result, prices will rise.

It is known that in case of demand-pull inflation, central banks have the appropriate tools to restrain it. In contrast, in the context of cost-push inflation (except when these costs are not directly caused by the depreciation of the national currency), central banks do not have more or less effective instruments of influence either on trade unions or on the rise in prices of imported raw materials and energy.

As for cost-push inflation caused by the depreciation of the national currency, the central banks adhering to the IT regime and, thus, voluntarily refusing to regulate the exchange rate will not be able to influence the reduction of inflation. In other words, imported inflation caused either by an increase in international prices for raw materials and energy, or a depreciation of the national currency in the IT system, remains outside the regulation by central banks.

ABOUT "INFLATION EXPERIENCE" IN DEVELOPMENT OF GEORGIA

The experience of post-Soviet Georgia in the so-called "inflationary development" field has not always been positive. Unfortunately, in the first years after the dissolution of the USSR, it got into the hyperinflationary spiral [36–39]. It became possible to overcome hyperinflation by implementing a complex economic reform [40, 41], as a result of which macroeconomic stability was achieved [42–44].

Based on this "hyperinflationary past", as well as considering the main international trends, the monetary policy of Georgia made maintaining price stability a priority [45], and, as noted above, since 2009, the country's central bank, i.e. the National Bank of Georgia (NBG), switched to the IT regime.

By now, for Georgia, as well as for other developing and especially relatively poor, import-dependent countries, the traditional inflation indicator is virtually unable to reflect the economic problems that characterize pricing processes. In particular, Georgia is characterized by the circumstances that:

- in 2018, in the foreign trade balance, imports exceeded exports by more than 2.7 times and exceeded exports by more than 4 times[4].
- imported goods are 80% of the consumer basket [46, p. 53];
- there is a high level of dollarization — more than 60% by the end of 2018[5].

These statistics show how important imports are for the economy of Georgia. In 2018, in the list of foreign trade partners of Georgia in terms of turnover, the top ten countries were Turkey, Russia, Azerbaijan, China, Ukraine, Armenia, USA, Germany, Bulgaria, and France. The total share of these countries in Georgia's entire trade turnover is 66.2%. Among these ten countries, Georgia had a positive trade balance only with Bulgaria, which accounted for only 3.6% of Georgia's total trade[6]. *Table 1*

[4] External Trade. National Statistics Office of Georgia. 2019. URL: https://www.geostat.ge/en/modules/categories/35/external-trade (accessed on 22.05.2019).

[5] Money Aggregates and Monetary Ratios. Statistical Data. National Bank of Georgia. 2019. URL: https://www.nbg. gov.ge/uploads/depozitaricorporeisheniinglisurad/money_aggregates_and_monetary_ratioseng.xlsx (accessed on 22.05.2019).

[6] External Merchandise Trade of Georgia in January-November 2018 (Preliminary Results). National Statistics Office of Georgia. 2018;(Dec.19). 17 p. URL: https://www.geostat.ge/media/23061/sagareo-vachroba-eqspres-relizi-14.01.2019-%28eng%29.pdf, p. 9 (accessed on 22.05.2019).

Table 1

Nature of trade balances of the major foreign trade partners of Georgia in 2017–2018 and the presence of inflation targeting in these countries

Country	2017 (trade balance)[a]	2018 (trade balance)[a]	With Georgia[b]	Inflation targeting[c]
Armenia	–	–	+	+
Azerbaijan	+	+	+	+
Bulgaria	–	–	–	–
China	+	+	+	+
France	–	–	+	–
Germany	+	+	+	–
Russia	+	+	+	+
Turkey	–	–	+	+
Ukraine	+	–	+	+
USA	–	–	+	+

[a] *Source:* Azerbaijan Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/azerbaijan/balance-of-trade (accessed on 22.05.2019); Armenia Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/armenia/balance-of-trade (accessed on 22.05.2019); Bulgaria Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/bulgaria/balance-of-trade (accessed on 22.05.2019); Germany Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/germany/balance-of-trade (accessed on 22.05.2019); China Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/china/balance-of-trade (accessed on 22.05.2019); Russia Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/russia/balance-of-trade (accessed on 22.05.2019); USA Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/united-states/balance-of-trade (accessed on 22.05.2019); Turkey Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/turkey/balance-of-trade (accessed on 22.05.2019); Ukraine Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/ukraine/balance-of-trade (accessed on 22.05.2019); France Balance of Trade. Trading Economics. 2019. URL: https://tradingeconomics.com/france/balance-of-trade (accessed on 22.05.2019).

[b] *Source:* External Merchandise Trade of Georgia in 2018 (Preliminary Results). National Statistics Office of Georgia. 2019. (January 21). URL: http://geostat.ge/cms/site_images/_files/english/bop/saqonlit%20sagareo%20vachroba%20saqartveloshi%2021.01.2019%20(eng).pdf (accessed on 22.05.2019).

[c] *Source:* Inflation Targets. Central Bank News. 2018. URL: http://www.centralbanknews.info/p/inflation-targets.html (accessed on 22.05.2019).

provides information on the deficiency of the trade balances of Georgia's major trade partners.

Out of ten Georgia's main trade partners, only four countries have a stable positive trade balance (Azerbaijan, Germany, China and Russia), although most of the trade partners (i.e. nine countries, except Bulgaria) have a positive trade balance directly with Georgia. As for the IT regime, it is not used only in three out of these ten countries (Bulgaria, Germany and France).

At present, Georgia's economy is virtually unprotected against unforeseen global and regional phenomena that could cause a revaluation or devaluation of Georgia's national currency, the lari. Such a development of the situation can practically nullify any efforts of the NBG, which focuses only on IT.

It should be noted that for its part, the NBG also does not shut its eyes to this problem, as when forecasting inflation, special attention is paid to exogenous factors affecting the market, which contain risks of both devaluation and revaluation of the national currency. These risks can be caused both by changes in the economic situations in the countries — Georgia's major trade partners, and by the global tendency to strengthen the US dollar, as well as by changes in international raw materials and oil prices. As a consequence, the baseline forecast scenario considers possible significant changes in the above factors[7]. Nevertheless, the NBG adhering to the IT regime and ignoring changes in the national currency exchange rate due to the growth of uncertainty have a rather painful effect on both business and the general population [47].

ABOUT MODIFIED INFLATION INDICATORS

Unfortunately, on a global scale the problem of poverty [48], still remains unresolved. In particular, in 2013, about 746 million people (of which 383 million are in Africa and 327 million in Asia) lived in extreme poverty [49]; and in 2014–2016, about 12.9% of the world's population was starving[8]. According to the World Bank, in 2013, 10.7% of the world's population (approximately 800 million people) lived on less than $ 1.9 a day[9].

It is not difficult to understand that the change in the average price level of the consumer basket used for the traditional estimation of inflation, as a rule, says little to this poor part of the world's population, since the main problem for them is the rise in prices, primarily for food, as well as for health services and utilities.

This question is relevant in Georgia too, where the problem of poverty is most significant for 30% of the population[10]. In 2016, 13.8% of the population of Georgia had an income below the subsistence minimum [50, p. 17]. In other words, this part of the population was in extreme poverty.

To reflect the level of price change for the relatively poor segments of the population more accurately, an indicator of agrarian inflation was developed, i.e. agflation, characterizing the growth of average prices for agricultural products. With due time, the development of this indicator was associated with a significant increase in prices for fruits, eggs, grain and other goods in 2006–2007 [12, p. 139]. The agflation indicator is primarily used in developing, relatively poor countries, characterized by a rise in prices for basic foods in certain periods of time (for example, in India) [11].

[7] For example, Monetary Policy Report. National Bank of Georgia. 2017;(Feb.). 37 p. URL: https://www.nbg.gov.ge/ uploads/publications/inflationreport/2017/150217publish_MPR_February.pdf, p. 7 (accessed on 22.05.2019).

[8] 2018 World Hunger and Poverty Facts and Statistics. World Hunger Education Service. 2018. (September). URL: https://www.worldhunger.org/world-hunger-and-poverty-facts-and-statistics/#hunger-number (accessed on 22.05.2019).

[9] Poverty and Shared Prosperity 2016: Taking on Inequality. Washington, DC: The World Bank; 2016. 170 p. URL: https://openknowledge.worldbank.org/bitstream/handle/10986/25078/9781464809583.pdf, p. 36 (accessed on 22.05.2019).

[10] NDI Poll: Economy Still Top Concern for Georgians; Support for NATO and EU Stable. National Democratic Institute. 2017;(Jan.17). URL: https://www.ndi.org/publications/ndi- poll-economy-still-top-concern-georgians-support-nato-and-eu-stable (accessed on 22.05.2019).

The fact that for economically less developed countries food products, as a rule, take at least half of the consumer baskets in these countries, also testifies to the special value of the agflation indicator. For example, in Russia food makes up 50% of the consumer basket [51], in Azerbaijan — 50%, in Armenia — 50%, in Tajikistan — 57%, in Turkmenistan — 60%[11]. Despite the fact that in terms of economic development, Georgia is more in line with its post-Soviet neighbours, this figure is clearly underestimated and is only 30%[12].

Economically this figure is significantly lower in more developed countries. For example, in the USA it is less than 10%[13], and in the EU — 18%[14]. Nevertheless, agflation as such is not a problem only in developing countries. In particular, the new EU member states faced the problem of agflation (ten countries of Eastern Europe are implied — Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia)[15]. Rising prices for some products, such as dairy products, vegetables and sugar, is not at all uncommon for the EU[16].

For families with relatively low incomes, in addition to food prices, prices for medicines, health care and utilities (water, electricity, sewage, gas and other types of heating) are of particular importance. To comprehensively measure price changes for all these products and services, a statistical indicator was introduced — *munflation* [52]. This term comes from the first letters of the English words — medication, utilities and nutrition.

To calculate the indicator of munflation, the appropriate groups of products and services from the consumer basket should be used, such as treatment, utilities and food products. At the same time, all three groups of products and services require some adjustment. In case of Georgia, in the subgroup "food products and non-alcoholic beverages", lemonade and drinks like coke can be removed, since they, as a rule, are not consumed by the poorest segments of the population.

From the "health care" subgroup, for example, thermometers (despite poverty, a thermometer can be found almost in every family) and maternity services which in Georgia are funded by the government, can be removed. From the "utilities" group, building materials should be removed as they are not usually used by people with low incomes.

In the countries where imports exceed (sometimes several times) exports, it is obvious that price level dynamics should be calculated not only with the traditional inflation indicator, but also based on the part of the consumer basket consisting exclusively of imported goods and services.

The value of the level of import prices is essential for both Georgia and most of its major foreign trade partners. To make it clear, let us consider the ratio of indicators of the level of import prices and inflation for these countries. It should be noted that there is no information about the level of import prices for some countries (in particular, for Russia and Azerbaijan). There is information on the monthly changes in these prices for every remaining country except Bulgaria, with the available data only on the quarterly changes.

For Georgia, the monthly ratio of import price and inflation rates in 2017–2018 is shown in the diagram *(Fig. 1)*.

In the following diagrams (*Fig. 2–9*), the ratio of the level of import prices and inflation is given for Georgia's major trade partners in 2017–2018.

[11] Inflation in Georgia — Causes and Cures. Economic Policy Research Center Issue in Focus, 5th Report. 2012;(June). 36 p. URL: https://www.eprc.ge/admin/editor/uploads/files/Report_Eng-%20Inflation.pdf, pp. 12, 32 (accessed on 22.05.2019).

[12] Ibid., p. 32

[13] Ibid.

[14] Comparative Price Levels of Consumer Goods and Services. Eurostat, Statistics Explained. 2018. (December). URL: https://ec.europa.eu/eurostat/statistics-explained/index.php/Comparative_price_levels_of_consumer_goods_and_services (accessed on 22.05.2019).

[15] Agflation in the New Member States — Some Stylized Facts. International Monetary Fund. 2008. 6 p. URL: https://www.imf.org/external/CEE/2008/120107.pdf (accessed on 22.05.2019).

[16] Commodity Price Dashboard, No 78. European Commission. 2018;(Nov.). 9 p. URL: https://ec.europa.eu/agriculture/sites/agriculture/files/markets-and-prices/price-monitoring/dashboard/food11–2018_en.pdf (accessed on 22.05.2019).

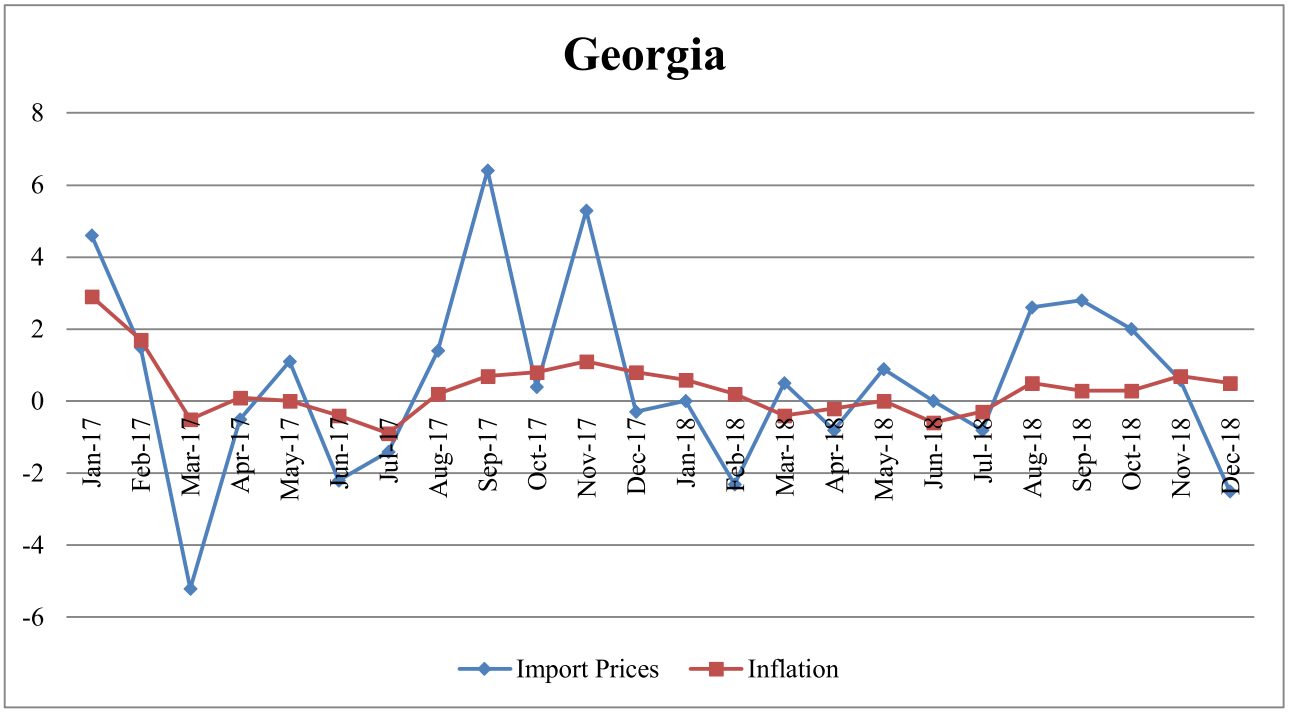

Fig. 1. **Ratio of monthly indicators of the level of import prices and inflation in Georgia in 2017–2018**

Source: complied by the authors based on: Georgia Import Prices. Trading Economics. 2019. URL: https://tradingeconomics.com/georgia/import-prices (accessed on 22.05.2019); Georgia Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/georgia/inflation-rate-mom (accessed on 22.05.2019).

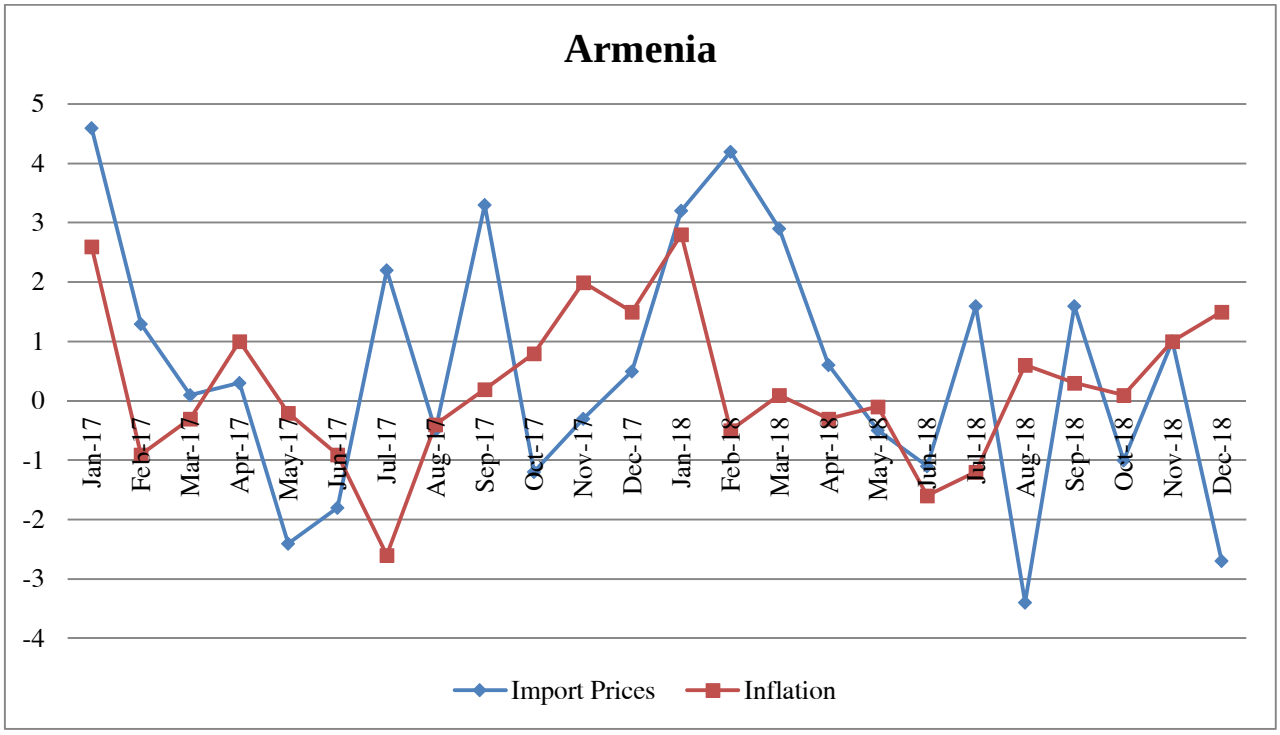

Fig. 2. **Ratio of monthly indicators of import prices and inflation in Armenia in 2017–2018**

Source: complied by the authors based on: Armenia Import Prices. Trading Economics. 2019. URL: https://tradingeconomics.com/armenia/import-prices (accessed on 22.05.2019); Armenia Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/armenia/inflation-rate-mom (accessed on 22.05.2019).

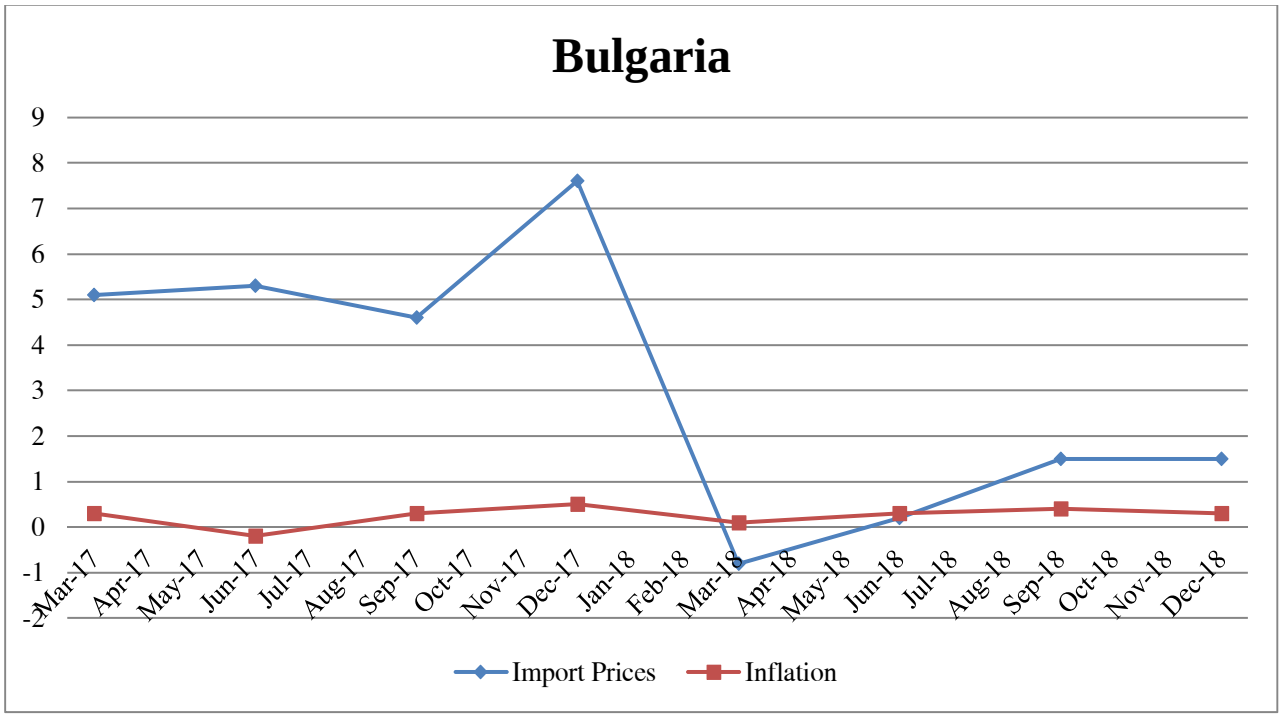

Fig. 3. **Ratio of quarterly indicators of import prices and inflation in Bulgaria in 2017–2018**

Source: complied by the authors based on: Import price indices by quarters. National Statistical Institute, Republic of Bulgaria. 2019. URL: http://www.nsi.bg/en/content/7999/import-price-indices-quarters (accessed on 22.05.2019); Bulgaria Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/bulgaria/inflation-rate-mom (accessed on 22.05.2019).

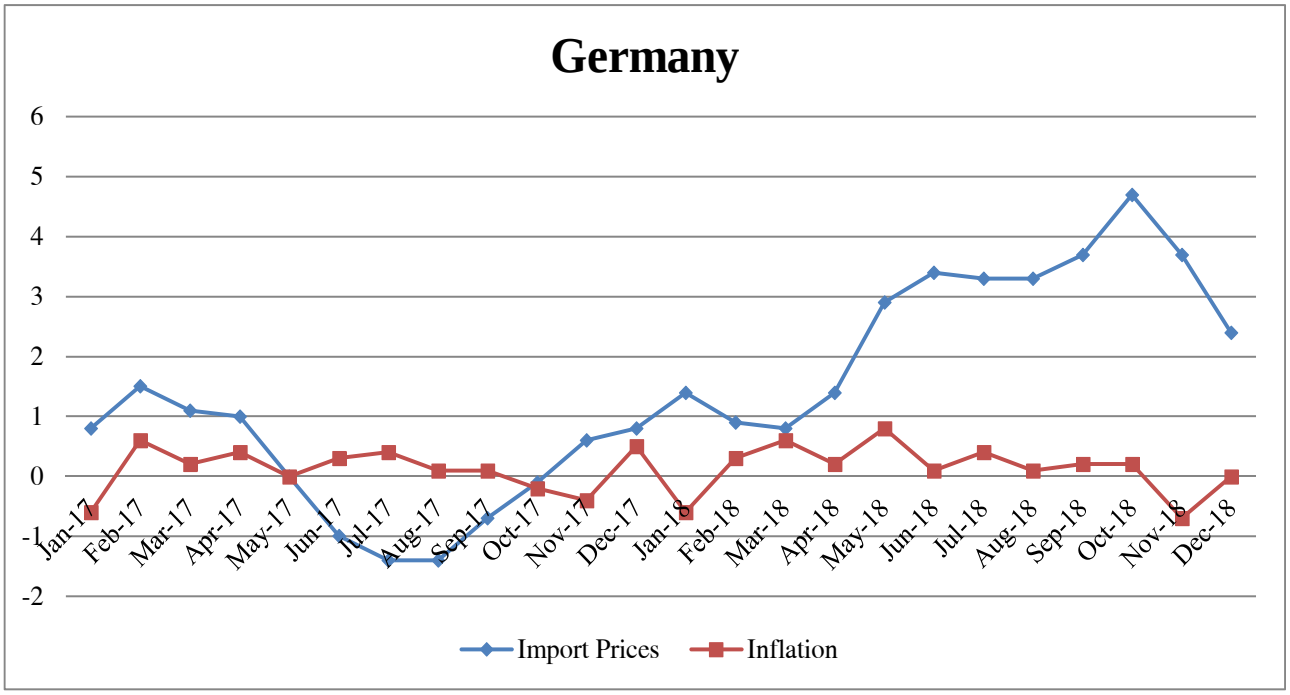

Fig. 4. **Ratio of monthly indicators of import prices and inflation in Germany in 2017–2018**

Source: complied by the authors based on: Germany Import Prices. Trading Economics. 2019. URL: https://tradingeconomics.com/germany/import-prices (accessed on 22.05.2019); Germany Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/germany/inflation-rate-mom (accessed on 22.05.2019).

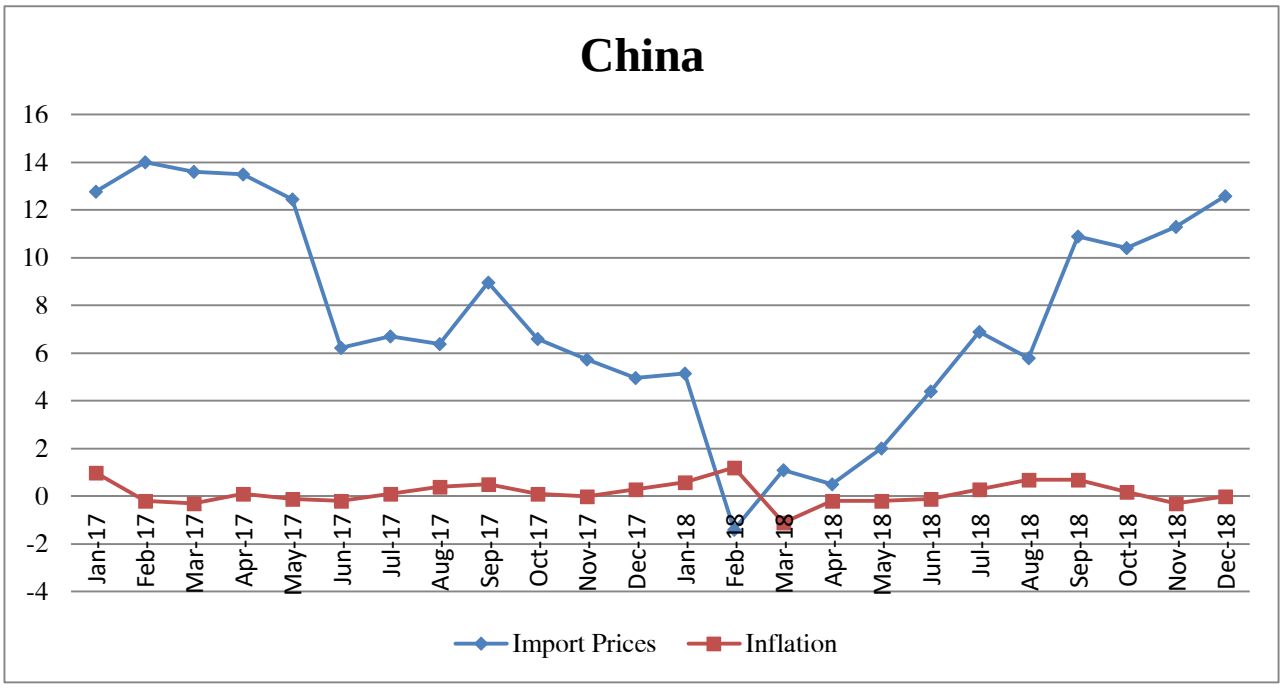

Fig. 5. **Ratio of monthly indicators of import prices and inflation in China in 2017–2018**

Source: complied by the authors based on: China Import Prices. Trading Economics. 2019. URL: https://tradingeconomics.com/china/import-prices (accessed on 22.05.2019); China Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/china/inflation-rate-mom (accessed on 22.05.2019).

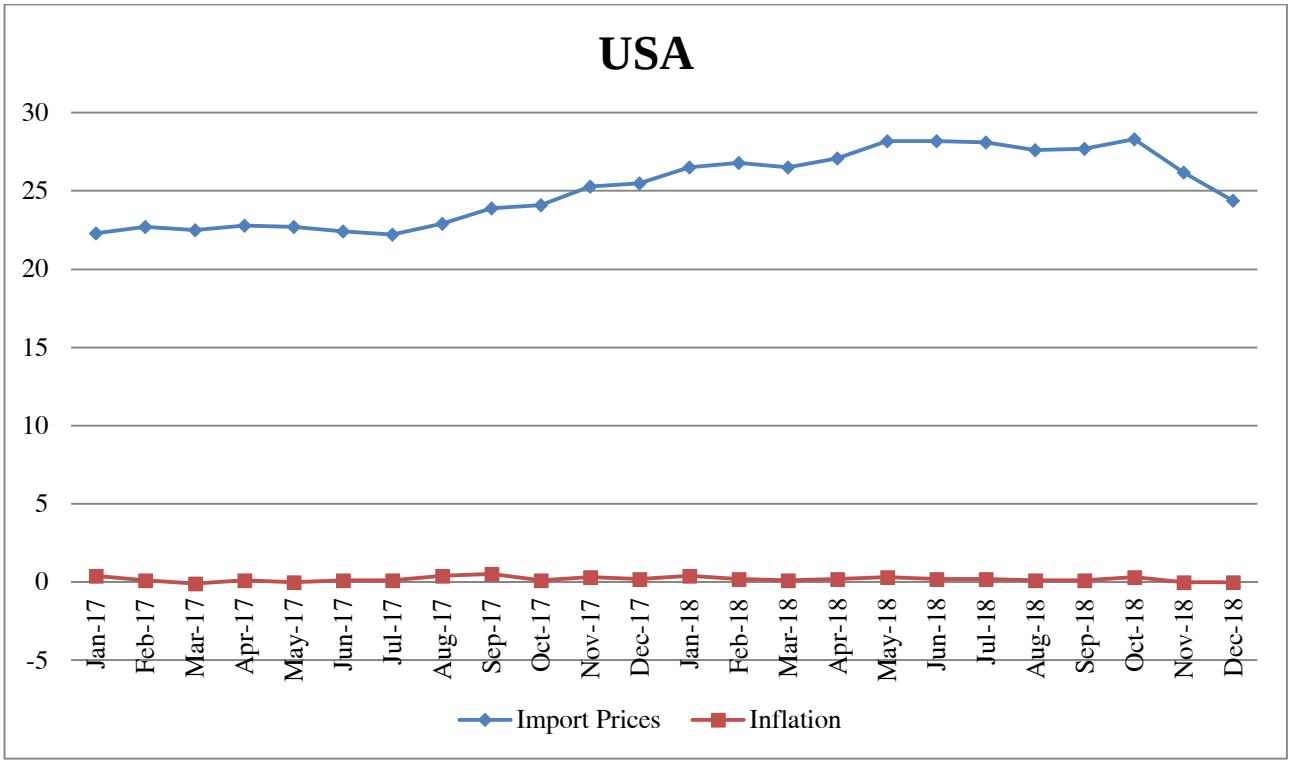

Fig. 6. **Ratio of monthly indicators of import prices and inflation in the USA in 2017–2018**

Source: complied by the authors based on: United States Import Prices. Trading Economics. 2019. URL: https://tradingeconomics.com/united-states/import-prices (accessed on 22.05.2019); United States Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/united-states/inflation-rate-mom (accessed on 22.05.2019).

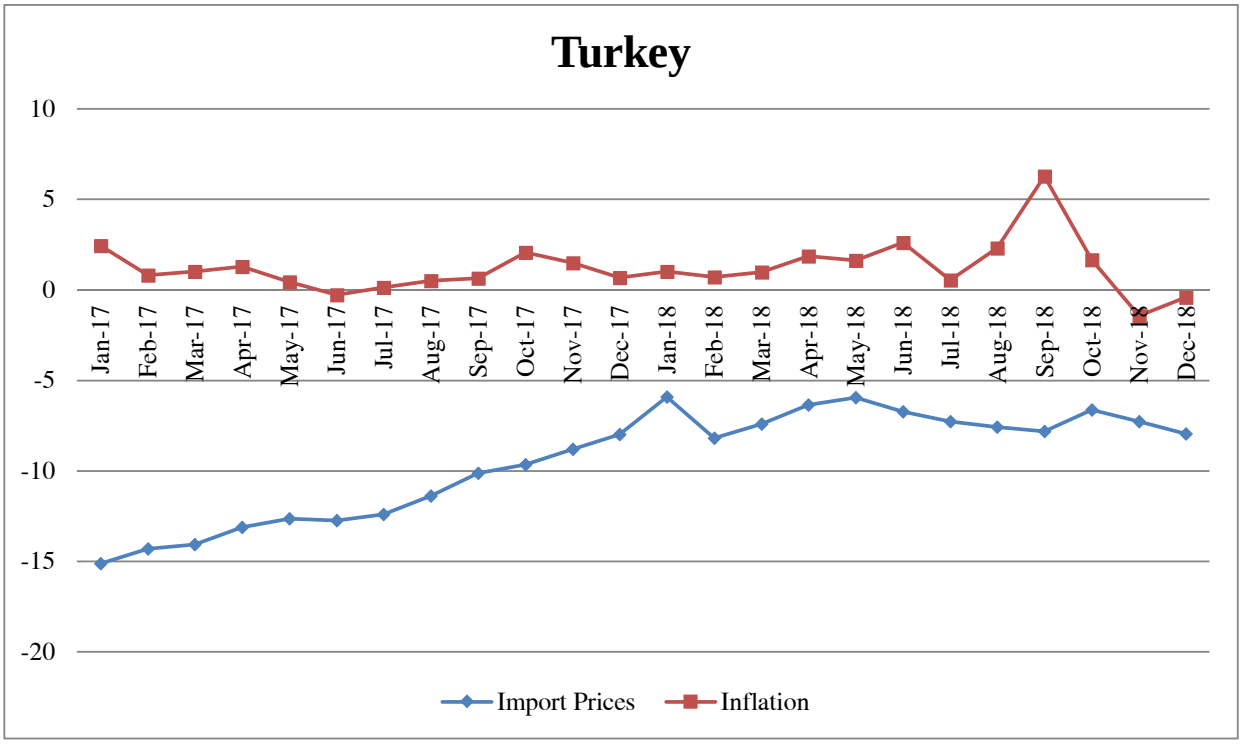

Fig. 7. **Ratio of monthly indicators of import prices and inflation in Turkey in 2017–2018**

Source: complied by the authors based on: Turkey Import Prices. Trading Economics. 2019. URL: https://tradingeconomics.com/turkey/import-prices (accessed on 22.05.2019); Turkey Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/turkey/inflation-rate-mom (accessed on 22.05.2019).

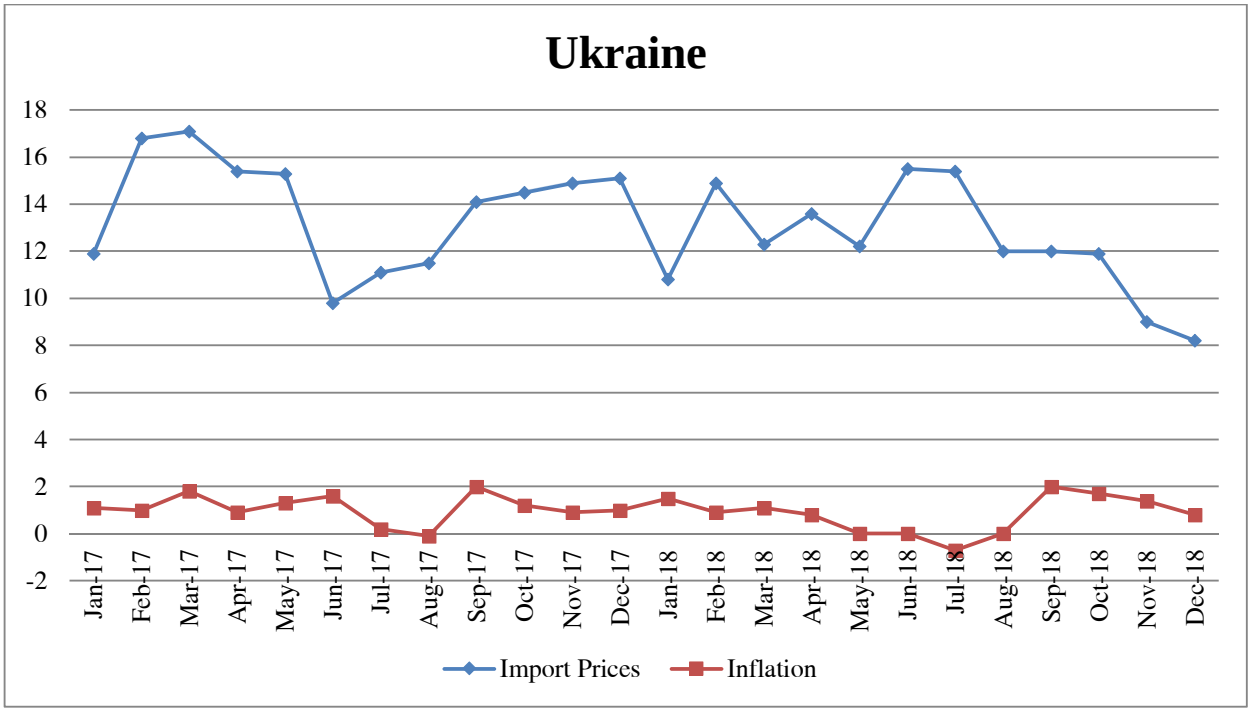

Fig. 8. **Ratio of monthly indicators of import prices and inflation in Ukraine in 2017–2018**

Source: complied by the authors based on: Ukraine Import Prices. Trading Economics. 2019. URL: https://tradingeconomics.com/ukraine/import-prices (accessed on 22.05.2019); Ukraine Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/ukraine/inflation-rate-mom (accessed on: 22.05.2019).

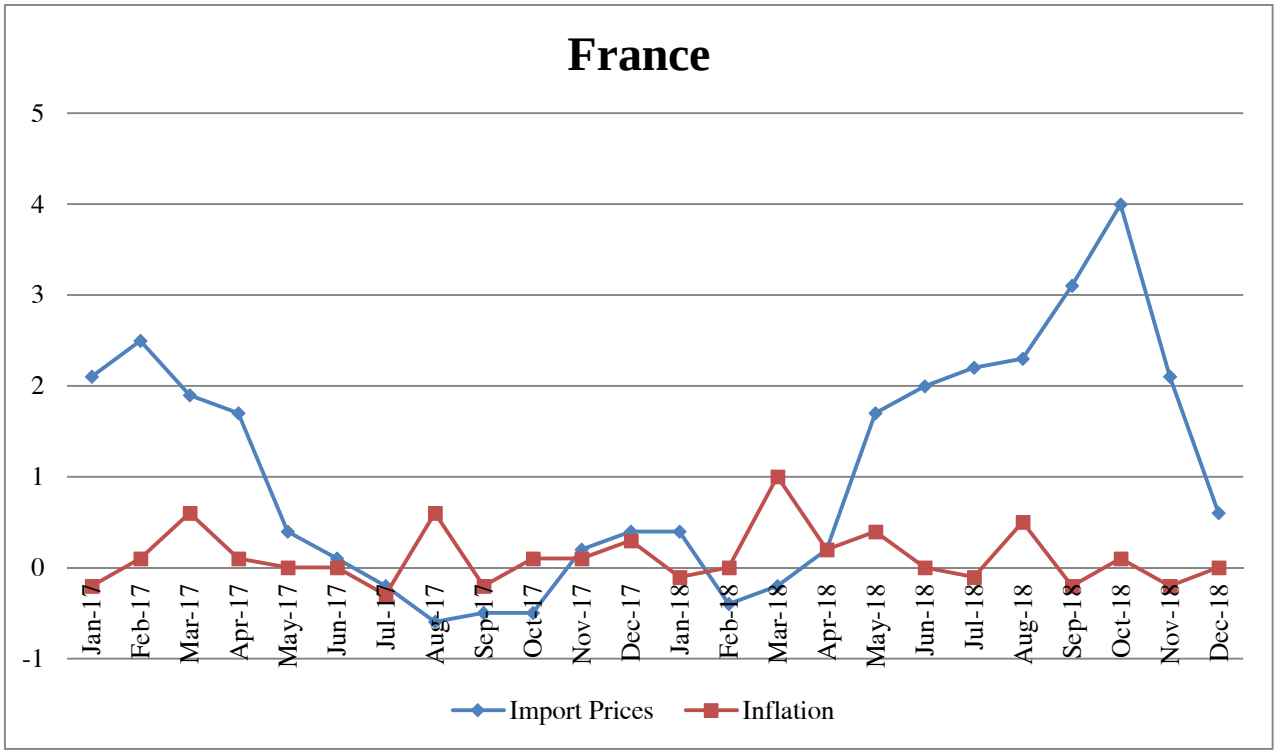

Fig. 9. **Ratio of monthly indicators of import prices and inflation in France in 2017–2018**

Source: complied by the authors based on: France Import Prices. Trading Economics. 2019. URL: https://tradingeconomics.com/france/import-prices (accessed on 22.05.2019); France Inflation Rate Mo M. Trading Economics. 2019. URL: https://tradingeconomics.com/france/inflation-rate-mom (accessed on 22.05.2019).

According to *fig. 1–9,* in almost all countries, both in Georgia and in its main foreign trade partners, except Turkey (*Fig. 7*), the level of import prices, as a rule, exceeds the level of inflation. Despite the fact that Turkey uses the IT regime, the inflation rate significantly exceeds the target indicator[17], which is caused by more political than economic problems (for example, [53–56]). At the same time, it should be considered that the inflation rate in Turkey is largely sensitive to changes in the price of imported goods[18] [57].

It is equally important to consider both average prices of imported goods and changes in the exchange rate of the national currency (for example, [58]), since the prices for these imported goods in the domestic market of the country are in the national currency. Consequently, for buyers in the domestic market of these imported goods it matters how much they cost in the national currency. Whether a possible reason for the price rise of these goods is the level of import prices or the depreciation of the national currency, or both, is a matter for the study of specialists. The indicator that can simultaneously reflect both the average level of changes in import prices and the change in the exchange rate of the national currency is called imflation [52]. It is a combination of two terms — "import" and "inflation".

We suggest to calculate the imflation indicator as follows:

$$I_t^m = \frac{E_t}{E_{t-1}} P_t^m,$$

where: I_t^m is the imflation index in period t;

E_t is the average nominal exchange rate of the national currency to foreign currency in

[17] Turkey Overview 2018. OECD Economic Surveys. 2018;(July). 68 p. URL: http://www.oecd.org/eco/surveys/Turkey-2018-OECD-economic-survey-overview.pdf, p. 9 (accessed on 22.05.2019).

[18] Ibid., p. 42.

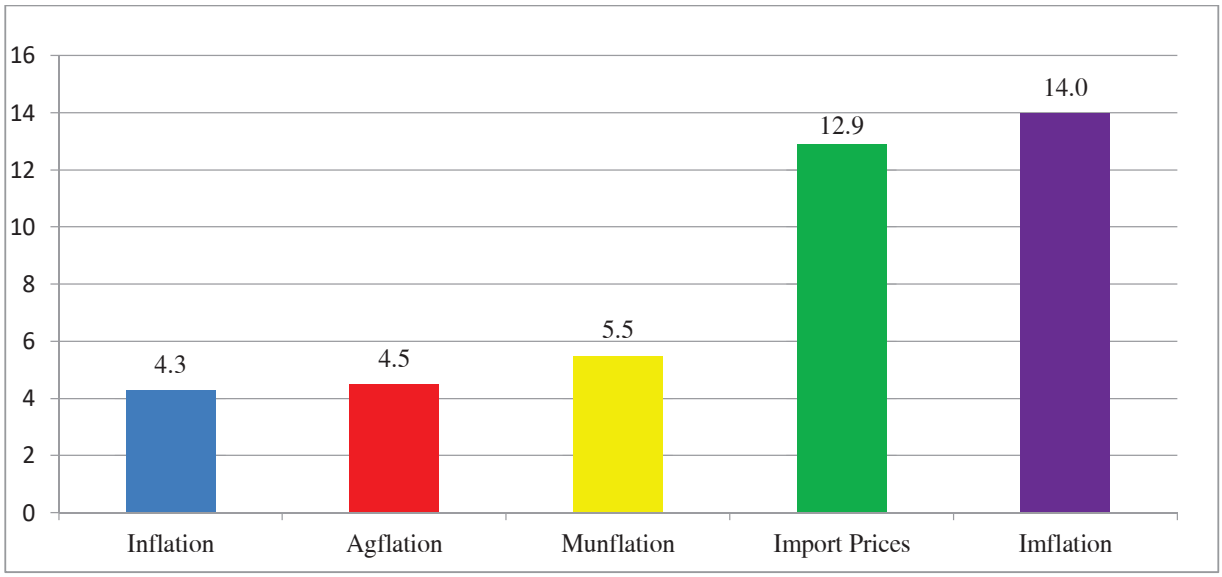

Fig. 10. **Average inflation, agflation, munflation, and imflation for 2017–2018 (in percents)**

Source: calculated by the authors.

period t in which imports are measured (usually in the US dollars);

P_t^m is the indicator of the level of import prices (usually in the US dollars) in period t.

Table 2 shows the annual inflation and its modifications (agflation, munflation and imflation) in Georgia for 2016–2018. Since the National Statistics Office of Georgia did not calculate the dynamics of average prices for 2006–2016 for the part of the consumer basket that covered the imported products, therefore, in *table 2* the imflation indicators are also given only for 2017 and 2018.

Table 2 clearly shows the quantitative differences noted by the inflation indicators and its modifications. It is the fact that with rare exceptions, the indicators of agflation and munflation exceed that of the the inflation. Much more significant is that the indicators of the level of import prices and imflation exceed those of the inflation (*Fig. 10*).

The diagram in *fig. 10* clearly shows how important it is for import-dependent Georgia to consider the dynamics of not only the inflation indicator, but also the imflation indicator, while preparing certain decisions. At the same time, it is noteworthy that the imflation indicator slightly exceeds the level of import prices.

To obtain more reliable information on the price dynamics, it is advisable to calculate the agflation, munflation and imflation indicators along with the traditional inflation indicator. This approach will make a real basis for a more adequate assessment of the current situation in the economy of a country.

ABOUT POSSIBILITIES AND RELEVANCE OF USING MODIFIED INFLATION INDICATORS IN THE SYSTEM OF COMPLEX IT

The agflation and munflation indicators are of great importance for assessing the economic situation of a particular country, especially the social situation of families with relatively low incomes (for example, [13]). However, they will not be able to completely replace the inflation indicator or to be used along with it in the IT system. The fact is that the IT regime is a method of the monetary policy of central banks, and therefore they do not have the tools to influence prices on a limited range of goods and services.

This does not downplay the importance of the agflation and munflation indicators; they should become significant indicators for governments that develop certain aspects of economic and social policy.

Table 2

Annual inflation and its modifications in Georgia (2006–2018)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Inflation	9.2	9.2	10.1	1.7	7.1	8.7	–0.9	–0.5	3.1	4.0	2.2	6.0	2.6
Agflation	13.2	12.4	12.3	1.6	11.7	16.8	–0.9	–0.7	5.1	4.2	1.6	6.8	2.2
Munflation	15.4	11.3	16.7	1.5	6.9	7.2	1.0	0.9	5.7	8.0	1.8	7.2	3.8
Import price level	–	–	–	–	–	–	–	–	–	–	–	18.1	7.7
Imflation	–	–	–	–	–	–	–	–	–	–	–	19.1	7.8

Source: complied by the authors based on: "Personal Inflation Calculator." National Statistics Office of Georgia. URL: http://geostat.ge/personalinflation/?lang=en (accessed on 22.05.2019).

This is fundamentally different with respect to imflation, since the level of this indicator is directly related to the exchange rate of the national currency whose regulation tools are owned outright by central banks.

As noted above, the rise in import prices in the domestic market or, in other words, the rise in imflation, can be caused by three reasons: a) rise in prices of imported goods in the international markets; b) devaluation of the national currency; c) simultaneous rise in prices of imported goods and depreciation of the national currency.

In this context, the imflation indicator can directly fit into the IT system, when the targets of the monetary policy of central banks, especially for import-dependent countries, will be used the imflation target along with the inflation one.

Precisely this IT regime, based not on the single inflation indicator, but on two indicators — inflation and imflation — will provide a *complex* approach to the monetary policy of central banks; with the tools at their disposal, they will be able to regulate the dynamics of prices in the domestic market. For example, if the level of import prices increases, central banks will be able to "mitigate" this price increase as necessary by a corresponding change in the exchange rate of the national currency. If the rise in the prices of imported goods in the domestic market will be caused by the devaluation of the national currency, then central banks will be able to directly affect the exchange rate of the national currency as necessary.

Let us call the IT regime based on the inflation and imflation targets **complex IT** (CIT).

CIT differs from HIT in that if in the HIT system, the exchange rate of the national currency is the target indicator along with inflation, in the CIT system, the target indicators are inflation and imflation, and the exchange rate of the national currency acts as an effective tool to maintain the target imflation indicator.

For Georgia, replacing the IT regime with the CIT regime is of primary importance, considering the fact how much the level of imflation exceeds the level of inflation (*Fig. 10*).

Thus, if the CIT system includes the imflation indicator along with the traditional inflation indicator, then central banks will have to respond to the devaluation of the national currency in order to prevent a rise in prices of imported goods in the domestic market.

CONCLUSION

As is known, among the main macroeconomic indicators the indicator of inflation takes the important place. For over a quarter of a century, in various countries of the world the inflation indicator has been used as a target indicator in the monetary policy system.

Numerous studies are devoted to summarizing the experience of central banks in various countries using the IT regime. They focus not only on studying the positive aspects of the IT regime, but also on a critical analysis of its weaknesses.

In some countries, the IT regime is "expanded" by the fact that the exchange rate ceiling of the national currency is set along with the inflation target. This dual targeting regime — that of the inflation and exchange rate — is called HIT.

One of the weaknesses of the IT regime is that in the countries that mainly depend on imports and where inflation is also imported with imported goods, this regime does not have a proper effect. This case is subject to generalization. In particular, the IT regime can effectively cope with rising inflation only if it is the result of an increase in aggregate demand. If the source of inflation is an increase in production costs, the IT regime is almost helpless.

Post-communist Georgia has accumulated the sufficient experience of "inflationary" development, as a result of which the IT regime has been used since 2009.

The inflation indicator does not always reflect the important features of price dynamics, which is why some modifications of this indicator are used. In particular, over ten years, in many countries of the world they measure the agflation indicator, essential mainly for the countries where the problem of nutrition is particularly acute.

For developing relatively poor countries, the dynamics of average prices for treatment and utilities are also important. For this, the munflation indicator is used reflecting the dynamics of average prices for the product groups that are considered most important for the poor.

For import-dependent countries, the imflation indicator reflecting both the dynamics of import prices and changes in the exchange rate of the national currency is of particular importance.

The agflation or munflation indicators may not be of primary importance for central banks as they do not have relevant tools to regulate them. These modifications of the inflation indicator should be the main indicators for governments while developing economic and social policies.

As for the imflation indicator, it can be subject to regulation by central banks along with the inflation indicator. When the import prices are raised on the domestic market, central banks will be able to control this rise by regulating the exchange rate.

In the CIT regime, both inflation and imflation should become the target indicators for central banks. The fundamental difference between HIT and CIT is that while the exchange rate ceiling of the national currency is one of the target indicators (together with the inflation indicator) for HIT, then for CIT, the exchange rate of the national currency is a tool for regulating the target imflation indicator (used together with the inflation indicator in the CIT regime).

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