

Specification of Inflation Definition with Consideration of Product Quality Change

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Abstract. This work discusses traditional definition of inflation, widely accepted in economic theory, which describes it as an increase in the general price level. In our opinion, it would be desirable to add more clarity in the structure of definition of economic concept or economic process, with respect to the substance of the phenomenon. Such concretization allows understanding of true nature of the process from the outset. Clear definitions ensure correct formulation of expectations for the households and business sector, as well as development of the adequate economic policies. The research aims to establish more precise definition of inflation that integrates the role of product quality changes in calculation of the real inflation rate. To achieve this, we relied on the studies dealing with inflation adjustments, focusing on the problems of inflation rate adjustment, taking into account the changes in products quality and its role in calculation of real inflation rate. We also relied on seeking of the logical evidence of the cause-and-effect relationships. The analysis of the role of net growth of the general price level and quality changes for increase of general price level is given. In adjustment of inflation rate and calculation of its precise (real) value, exclusion of the effect of product quality changes was regarded reasonable to specify traditional definition of inflation. Hence, the definition according to which “inflation is an increase in general price level” is specified as follows: inflation is the net increase in the general price level at given level of the products and services quality, i.e. “given quality of products”, together with term “net” is regarded as necessary component of the inflation definition structure. © 2025 Bull. Georg. Natl. Acad. Sci.

Keywords: inflation, change of products quality, net inflation

Introduction

The precise calculation of the inflation rate and its effective regulation depend on the adequacy of its definition. This study is focused on the significance of considering the worsening of the products quality, for both inflation adjustment and calculation of its real level and more accurate definition.

In economic theory, inflation is generally defined as an increase in the prices of goods and services. It serves as an indicator of price growth, ex-

pressing the rate of general price level change. It reduces purchasing capacity of the households (Montevirgen, Update 2025). According to the definitions of the Bureau of Labor Statistics, Board of Governors of Federal Reserve System and the European Central Bank, inflation is growth of the general price level for goods and services for certain period of time (Parsons, 2020; Henderson, 2007).

Thus, according to the consensus in the academic literature, inflation is defined as an increase

in the general price level. As the product quality changes affect the real value of the products, necessitating adequate adjustment of inflation rate, we regard reasonable to add record about the product quality into the structure of inflation formulation and thus provide more accurate definition of inflation. To achieve this, we rely on the works dealing with inflation adjustment with due regard of change of the product quality (Bils, 2009), where the emphasis is made on the issues related to adjustment and role of adjustment in calculation of actual inflation rate. Relying on seeking of the logical evidences, we regard that the work about inflation rate modifications discussing elaboration of such modifications that would allow more thorough analysis and forecasting the economic phenomena would be of great significance (Papava & Charaia, 2017).

Impact of the product quality change on price level. In calculation of the inflation rate, if the change of the products quality is not taken into consideration, distortion of the real level of inflation should be expected. For example, if the quality decay is not taken into account in calculation of inflation rate, reduction of the inflation rate to the minimal level should be expected and in this way, it would be artificially stabilized.

In addition, distortion of the inflation rate calculated based on the consumer prices index should be expected even where in estimation-adjustment of the inflation rate directly takes into consideration change of the products quality (Ha et al., 2019).

In the calculation of inflation rate, the causes of gaps are as follows: First, in inflation rate adjustment, it is impossible to adequately take into consideration the changes in the quality of all products (both deteriorations and improvements). In the research by European Central Bank, in precise calculation of inflation of the consumer prices within European Union, as the key challenges the following recognized: a) adequate recording of the changes of product qualities and quantities and

taking them into account in calculation of consumer price index (CPI); b) with due regard of both quality assurance practices and quality change, further harmonization of inflation adjustment in the member states (Jan-Oliver Menz et al., 2023).

The difficulty of quality change identification and quantitative assessment results in the adjustment of prices of relatively small part of the goods included into the consumer basket – taking into account the quality change. For example, the above mentioned research of the European Central Bank, based on the annual report of Sweden Statistics Service admits that about 27% of the goods included into the consumer basket were adjusted regarding quality changes. Prices of these groups would be 1.2% higher without quality adjustment, resulting in 0.3 percentage point increase of general inflation rate (Jan-Oliver Menz et al., 2023). In Australia, approximately 2-3% of goods and service items are adjusted, taking into account the quality changes (Bils, 2009).

According to the data of National Statistics Office of Georgia, in calculation of CPI inflation in Georgia, only 5 items are subject to the adjustment by quality (new vehicles, used vehicles, computers, mobile phones and rent). Their joint weight in total value of the consumer basket is 4.5%. In addition, in precise calculation of inflation, food products are subject to adjustment by quantities, with the aggregate weight of 30.4% in total value of consumer basket as of 2024.

Second, it should be also taken into consideration that the governments of the developing and transition economies frequently tend to underrepresent inflation rate, compared with the actual value, they achieve this through statistics offices controlled by them. In such case, their plans hardly can include adequate consideration of the products' quality deterioration in calculation and adjustment of inflation rate, as this would result in increase of this indicator (Salwati & Wessel, 2021).

Third, in developing and transitional economies, the problem is that the nomenclature-elite

importers state their products at reduced prices, to reduce customs expenses (with the aim of reduction of total of VAT, customs duties, property tax), overall, allowing the importers to sell the mentioned products at relatively low prices. Seemingly, this is beneficial for the population, as such manipulations contribute to the reduction of CPI level; though, this adversely affects activities of local producers. Competition of the imported products artificially cheapened actually excludes efforts of local producers' efforts to improve the quality, overall, resulting in artificial reduction and stabilization of the price levels.

In the event of price level stabilization or even their relatively slight growth, worsening of the products' quality indirectly indicates presence of inflation and particularly covered inflation. Even where the inflation is adjusted with regard of products quality deterioration, for at least three above causes, covered inflation still persists: firstly, in adjustment, it is hard to include quality deterioration for all products, secondly, the trend of understating inflation rate by the governments should be also taken into consideration, at least, to positively affect inflation expectations in this way. Thirdly, in imports administration, registration of imported products at a reduced price negatively affects the quality of competing local goods.

It should be also admitted that inflation rate calculation without taking into account change of the products quality (both, deterioration and improvement), results in distortion of not only inflation rate but also real variables: real outputs, real incomes and real interest rates, as the mentioned variables are obtained from their nominal values, excluding inflation effect.

Results

The research shows that accurate estimation of the products quality change is essential for adjusting the inflation rate and for adequate estimation of the inflation level. Inflation adjustment taking into consideration the products quality and calculation

of the precise value is significant for accurate evaluation of the cost of living, formation of adequate expectations for the households and businesses and implementation of effective socioeconomic policies.

According to the conducted studies of inflation rate measurement taking into account the quality changes, consumer price inflation is the measure of net change in the value of a fixed bundle of goods and services procured by the households (Parsons, 2020). In other words, the CPI inflation rate is intended to record only the net price change of goods and services procured by the households, excluding price change resulting from quality change, i.e., an increase of the price level can be caused by both quality improvement and net growth of the price level.

Thus, change of general price level (increase or decrease) results from the net change of general prices level (increase or decrease) and change of the products' quality (deterioration or improvement). Mathematically, this can be expressed by the following formula:

$$P^* = P \times PQ, \quad (1)$$

where P^* is an indicator of change of general prices level before adjustment, P – is the indicator of net change of general price level and PQ is an indicator of product quality improvement or deterioration.

$$\text{Or: } P = P^* / PQ. \quad (2)$$

For example, suppose general price level increase was 21%, or 1.21 times before adjustment, then $P^* = 1.21$. If product quality improvement was 10% or 1.1 times, then $PQ = 1.1$. Hence, net change (net growth) of general prices level is: $P = P^* / PQ = 1.21 / 1.1 = 1.1$. General prices level adjusted for quality change has increased 1.1 times, i.e. net inflation rate is 10%.

Application of equations (1-2) is reasonable at the micro level, in particular, for calculation of net price change for the specific products. Irrespective of accuracy of mathematical record, we regard that

it can be used at the macro level only for calculation of average of quality change for all products, this is related to difficulty of its calculation by the other methods.

Regarding the above, it is logical to conclude that we should distinguish between change of the price level caused by quality change that does not imply inflation and change of the prices level reflecting net increase of the price level, implying the presence of inflation. Cause of the prices level change resulting from product quality change is change of the inherent value of the goods while cause of the net inflation is change of the value of money, i.e. a net increase in the general price level, or net inflation implies a reduction in the value of money. While increase of prices due to improvement of the product quality does not reduce the value of money, on the contrary, increases it.

Thus, as the prices can grow as a result of improvement of the goods and services quality, classic definition of inflation, according to which “inflation is an increase of general price level”, requires certain clarification. Inflation is net increase of general price level – in the conditions of given quality of the goods and services. Similarly, deflation is net reduction of the general price level in the condition of given quality of goods and services. Thus, we regard that “given quality of goods”, together with the term “net” comprise necessary structural component of inflation definition.

In conditions of the given price level, in case of deterioration of the qualitative characteristics of the products, hidden inflation takes place. Hence, in the conditions of given price level, improvement of the qualitative characteristics of the products, there is hidden deflation.

Both open and hidden inflation have socio-economic costs, frequently identical outcomes. First of all, in both cases, standards of living of the population fall dramatically: as a result of net increase of the products prices in the former case and as a result of deterioration of the qualitative

characteristics of the products in the latter. In the former case, the consumers suffer losses, because they cannot procure desired quantities of the desired products because of high prices. In the latter case the consumers can procure necessary product supplies, though with worse qualitative characteristics, thus undermining their wealth.

Hence, if the general price level increases n times, as a result of improvement in product quality no inflation takes place but rather – higher prices – as a result of switching to the new, better models. Consequently, real output and real incomes also increase n times, leading to improvement in living standards.

At the same time, with given price level, worsening of the quality n times indicates that there is hidden inflation, as at the initial stage, i.e., before quality deterioration, value of such low quality products would be n times lower. Vice versa, with given price level, quality improvement n times indicates hidden deflation, as at the initial stage, i.e. before quality improvement, price of such high quality products would be n times higher (Boskin et al., 1996).

Monetary policy should take into consideration expected rise of prices, as a result of quality improvement. Thus, 2-times growth of the prices is expected. In such case, the cause of price increase would be not net inflation but rather quality improvement, which is identical to increase of products real output. In such case, where all other conditions are equal, if supply of money is not proportionally increased, this can cause money deficiency, hidden deflation, growth of real interest rate and decrease of output.

In case of net inflation, the goals of monetary policies are quite clear: inflation prevention, elimination of its causes, ensuring stability of price level, reduction of inflation rate, management of inflation expectations, etc.

Conclusion

Definition of the economic concepts and processes should ensure better clarity, with respect of their substance. Due to significance of taking into account the product quality for inflation adjustment and calculation of real inflation, it is reasonable to

refine definition of inflation. Hence, based on the logical considerations, the work justifies that inflation is net increase of general price level at given quality of goods and services, while deflation is net reduction of general price level at given quality of goods and services.

ეკონომიკა

ინფლაციის განმარტების დაზუსტება პროდუქციის ხარისხის ცვლილების გათვალისწინებით

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** საქართველოს ტექნიკური უნივერსიტეტი, საინჟინრო ეკონომიკის დეპარტამენტი, თბილისი, საქართველო

წინამდებარე ნაშრომში განხილულია ეკონომიკურ თეორიაში საყოველთაოდ მიღებული ინფლაციის ტრადიციული განმარტება, რომლის თანახმადაც, ინფლაცია არის ფასების საერთო დონის ამაღლება. ეკონომიკური ცნების, ან ეკონომიკური პროცესის განმარტების სტრუქტურაში, ჩვენი აზრით, სასურველია მეტი სიცხადე მოვლენის არსთან დაკავშირებით, ვინაიდან მსგავსი კონკრეტულობა შესაძლებელს ხდის მისი, როგორც პროცესის ჭეშმარიტი არსის იმთავითვე გაცნობიერებას. განმარტების სიცხადე უზრუნველყოფს შინამეურნეობებისა და ბიზნეს სექტორის წარმომადგენლების მოლოდინების სწორ ფორმირებას, აგრეთვე ეკონომიკური პოლიტიკის შემუშავებლების მიერ ადეკვატური პოლიტიკის შემუშავებას. კვლევის მიზანია ინფლაციის განმარტების დაზუსტება – ინფლაციის რეალური მნიშვნელობის დადგენაში პროდუქციის ხარისხის ცვლილების ფუნდამენტური როლის გათვალისწინებით. ამ მიზნის მისაღწევად ვეყრდნობით ინფლაციის კორექტირების შესახებ შესრულებულ კვლევებს, რომლებშიც ყურადღება გამახვილებულია პროდუქციის ხარისხის ცვლილების გათვალისწინებით ინფლაციის კორექტირებასთან დაკავშირებულ პრობლემებსა და მის მნიშვნელობაზე რეალური ინფლაციის დადგენაში. საკითხის შესწავლისას, ასევე ვეყრდნობით მიზეზ-შედეგობრივი დამოკიდებულებების აზრობრივ-ლოგიკური მტკიცებულებების ძიებას. ნაშრომში გაანალიზებულია ფასების საერთო დონის წმინდა ზრდისა და ხარისხის ცვლილების როლი ფასების საერთო დონის ამაღლებაში. ინფლაციის დონის კორექტირებისა და მისი ზუსტი (რეალური) სიდიდის განსაზღვრისას, პროდუქციის ხარისხის ცვლილების ეფექტის გამორიცხვის მნიშვნელობის გათვალისწინებით, მიზანშეწონილად მიჩნეულია ინფლაციის ტრადიციული განმარტების დაზუსტება, რომლის თანახმადაც „ინფლაცია არის

ფასების საერთო დონის ამაღლება“. განმარტება დაზუსტებულია შემდეგი სახით: ინფლაცია არის ფასების საერთო დონის წმინდა ამაღლება - პროდუქციისა და მომსახურების ხარისხის მოცემული დონის პირობებში. ე. ი. „პროდუქციის ხარისხის მოცემულობა“, ტერმინ „წმინდასთან“ ერთად, მიჩნეულია ინფლაციის განმარტების სტრუქტურის აუცილებელ კომპონენტად.

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