Problems Of Statistical Accounting In Russian Price Index Determination

Problemas De La Contabilidad Estadística En La Determinación Del Índice De Precios De Rusia

Elena V. Konvisarova
Candidate of economics sciences, associate professor, professor of the department of «Economics and management»
E-mail: Konvisarova.E.K@gmail.com
ID ORCID: https://orcid.org/0000-0001-5186-1423

Tatiana A. Levchenko
Candidate of economical sciences, associate professor of the Department of Economics and management
E-mail: T.A.Levchenko@gmail.com
ID ORCID: https://orcid.org/0000-0002-9049-2971

Artem A. Pustovarov
Federal State-Funded Educational Institution of Higher Education "Vladivostok State University of Economics and Service", Vladivostok, Russia
E-mail: A.A.Pustovarov@gmail.com
ID ORCID: https://orcid.org/0000-0001-8602-6989

Abstract.

The distortion of statistical data during determination of the price index of Russia can comprehensively affect the development of the entire economy through fiscal and monetary policy, since this indicator is the basic one. Using digital electronics as an example, the article considers the deviation of the dynamics in the consumer price index from the data of retailers. The paper draws attention to the transfer of value to the prices of imported products (exchange rate pass-through), which, given the current supply structure, justifies price increase in the real sector of the economy. They revealed the reason of the statistical sample deviation for the index calculation, which contributed to the formation of deflation in the state statistics within the digital electronics segment. During calculations, the statistical agency operates preliminary unpopular goods that make the sample unrepresentative, which leads to the indicator distortion. They analyzed the aspects of the possible impact of cheap goods on the market, qualitative changes in digital electronics products, and FSSS approaches to international recommendations. The characteristics of smartphones defined by FSSS and consumers' preferences are compared. They considered inflation dynamics in the digital electronics segment. They considered the structure of consumer spending on non-food products, regarded by FSSS to calculate the consumer price index. To solve the problem, they proposed to conduct more frequent sampling adjustments based on market research, as well as update and expand the specifications used.

Keywords: inflation, import, exchange rate, deflation, statistics, consumer prices, digital electronics, exchange rate pass-through.

REICE | 273

Resumen

La distorsión de los datos estadísticos durante la determinación del índice de precios de Rusia puede afectar de manera integral el desarrollo de toda la economía a través de la política fiscal y monetaria, ya que este indicador es el básico. Utilizando la electrónica digital como ejemplo, el artículo considera la desviación de la dinámica en el índice de precios al consumidor de los datos de los minoristas. El documento llama la atención sobre la transferencia de valor a los precios de los productos importados (transferencia de tipo de cambio), lo que, dada la estructura de oferta actual, justifica el aumento de precios en el sector real de la economía. Revelaron la razón de la desviación de la muestra estadística para el cálculo del índice, que contribuyó a la formación de deflación en las estadísticas estatales dentro del segmento de electrónica digital. Durante los cálculos, la agencia estadística opera productos impopulares preliminares que hacen que la muestra no sea representativa, lo que conduce a la distorsión del indicador. Analizaron los aspectos del posible impacto de los productos baratos en el mercado, los cambios cualitativos en los productos electrónicos digitales y los enfoques del FSSS a las recomendaciones internacionales. Se comparan las características de los teléfonos inteligentes definidos por el FSSS y las preferencias de los consumidores. Consideraron la dinámica de la inflación en el segmento de electrónica digital. Consideraron la estructura del gasto del consumidor en productos no alimentarios, que FSSS considera para calcular el índice de precios al consumidor. Para resolver el problema, propusieron realizar ajustes de muestreo más frecuentes basados en estudios de mercado, así como actualizar y ampliar las especificaciones utilizadas.

Palabras Claves: inflación, importación, tipo de cambio, deflación, estadísticas, precios al consumidor, electrónica digital, transferencia de tipo de cambio.

Introduction

Inflation is one of the basic macroeconomic indicators, which serves as a guide both for comparing changes in the price level between the economies of countries, and for domestic economic policy regulation. The effectiveness of both the fiscal and monetary policies, which are currently being conducted in concert, depends on the conformity of this indicator of reality.

Inflation targeting is one of the primary goals of the Central Bank, which focuses on its level when setting a key rate in accordance with its strategy. The reduction of the key rate as the reaction to the deflationary process through the transmission mechanism of monetary policy will affect the entire market comprehensively. Its reflection at an unreliably low level can lead to even greater real monetary inflation growth.

The paper considers the dynamics of consumer prices for digital electronics and its accounting during consumer price index calculation. The purpose of the work is to determine the essence of the deflationary process in the structure of the consumer price index in the digital electronics segment and the degree of its influence on the indicator.

To achieve this goal, it is necessary to determine the totality of influencing factors on price dynamics, accounting features, correlate counter data from different sources, identify possible causes, consider international practice, and work out possible solutions to the problem.

The complex of macroeconomic indicators and the influence of financial participants in the transmission mechanism of monetary policy are examined in detail in the works by N.P. Barida (2014), Z.V. Eyubov (2014), A.N. Moghylat (2017), and L.A. Yudintsev (2017). First of all, when the key rate is reduced, the money market reacts through an immediate reduction of interbank lending rates. In turn, this contributes to credit stimulation of economic entity consumption. Among other things being equal, it can help strengthen inflationary trends.

The close relationship between the dynamics of imported product prices and the exchange rate is considered in the works by I. Salitsky (2010), G.I. Idrisov (2010), Yu.Yu.

Ponomarev, P.V. Trunin, A.V. Ulyukaev (2014), O. Berezinskaya (2015), and Yu.Yu Ponomarev (2016). The authors agree that exchange differences are laid in the prices of goods: the value is transferred to the prices of imported products.

The problems of distortions in the consumer price index and the methods of its calculation were described in the works by Cherkashnev R.Yu. (2010; 2011), Gordievich T.I. (2011), Paltsev G.N. (2015), and Kaukin A. (2017). The issue of methodology in the field of statistical research remains open, since each developed proposal can bring a new interpretation. The results obtained during the study can be the basis for further scientific research on the impact of approaches during the consumer price index calculation of both a complex indicator and its components.

The influence of the price index on the development of the country economy from investment activities to the functioning of individual industries is considered in the works by Terentyeva T.V., Korneyko O.V. (2017), Latkin A.P. (2019), Khvan A.A., Konvisarova E.V. (2017), Levchenko T.A. (2017), Kornia A.V., and Pustovarova A.A. (2018), which confirms the need for research in the field of state statistics methodology, which ensures the accuracy of the consumer price index calculation.

Methods and materials

The basis of the study was the use of mainly theoretical scientific methods, including:

- collection, grouping, comparison, analysis and synthesis, a systematic approach - when they study the structure of consumer spending on non-food products, consider the characteristics of smartphone models, and price dynamics;

- abstraction - during the interpretation of identified deviations;

- induction and deduction, generalization and formalization - during making up of their own conclusions.

Results and Analysis

Most of the domestic market electronics is imported, so the prices are dependent on the exchange rate. And this connection has been directly inherent in the Russian economy since the transition from planned to market economy.

Currently, there is the discrepancy between the dynamics of prices for smartphones and the USD/RUB rate. At the same time, no significant changes in the supply structure and comparable discrepancies in the dynamics of other types of digital electronics were observed during the time under consideration. Especially this relationship has noticeably weakened in the smartphone segment, since the second half of 2019.

The identified trend is less related to the appearance of cheaper models on the market. So, the average phone price increased by 4% during the first half of 2019. This indicator value is potentially the smallest due to the possible Gershenkron effect.

Particular attention should be paid to FSSS's approach to a consumer price index compilation to determine the impact of new models. To perform calculations, FSSS is guided by the UN Practical Guide to producing consumer price index.

According to the clause 5.10, the total sample is representative of the entire set of goods and services offered for sale and purchase. The sample should reflect price levels and, in particular, price dynamics, etc. According to the clause 5.44, price registrars select the most popular type of each of the goods at each outlet that people usually buy in this area from all products that meet the specifications of each category for which a price will be set at that outlet. To do this, the registrar can find out from the seller which brands are the most popular and which are regularly stocked.

From the abovementioned it follows that to track the dynamics of prices for a certain type of product (or service), a statistical agency needs to select a representative specification. And it is preferable that popular and representative products are identified in market research or inquiries from price registrars at retailers.

To assess the choice of smartphone specifications by consumers and FSSS, as well as its representativeness, it is convenient to use the data of the Euroset company, which has a leading retail network in the electronics market. Table 1 presents the cross-matching of data.

Table 1. Bestsellers among smartphones in quantitative and cost terms

Bestsellers by quantity	Bestsellers by cost
Samsung Galaxy A50	Samsung Galaxy A50
Samsung Galaxy J2 Core	Apple iPhone XR 64Gb
Samsung Galaxy A10	Apple iPhone XR 128Gb
Honor 7A	Samsung Galaxy A30
Honor 10 lite	Apple iPhone 8 64Gb

To answer the question about the degree of the most popular smartphone sample compliance with FSSS specifications, GSMArena data on specifications and Yandex.Market data on phone price ranges were used.

Among five models of smartphones - the bestsellers in quantitative terms - only two, in our opinion, can be considered representative by FSSS criteria, and the rest should be excluded. The sizes of their screens exceed the upper threshold of 6 inches. Among the top five sales leaders in cost terms, none of the models is representative, since they work on the iOS operating system not included in the list of FSSS, have a larger screen size or internal memory of more than 16 GB (Table 2).

If we pay attention to the average selling prices of mobile phones and smartphones sold in the Euroset and FSSS data on prices and weights, we will see a discrepancy in price levels. This may be due to different samples, and not a divergence in trends, on the basis of which the retailer data do not show a noticeable discrepancy with the exchange rate.

Table 2. Comparative characteristics of smartphones identified by FSSS and consumer preferences

|	Deviations by specifications						Memory card support	Operation system
	Screen size		Internal memory		Price, rub.			
	minimum	maximum	minimum	maximum	minimum	maximum		
FSSS	3,5	6	3,5	16	8 642	Нет	Yes	Android or Windows
Samsung Galaxy A50	+2,9	+0,4	+60,5	+112	+4 318	+18 290	Yes	Yes (Android)
Samsung Galaxy J2 Core	+1,5	-1	+4,5	0	-3 172	+7 490	Yes	Yes (Android)
Samsung Galaxy A10	+2,7	+0,2	+28,5	+16	-1 285	+10 740	Yes	Yes (Android)
Honor 7A	+2,2	-0,3	+12,5	+16	-3 516	+7 585	Yes	Yes (Android)
Honor 10 lite	+2,71	+0,21	+28,5	+112	+2 148	+16 880	Yes	Yes (Android)
Apple iPhone XR	+2,6	+0,1	+60,5	+240	+27 848	+76 800	No	No (iOS)
Samsung Galaxy A30	+2,9	+0,4	+28,5	+48	+1 712	+18 590	Yes	Yes (Android)
Apple iPhone 8	+1,2	-1,3	+60,5	+240	+13 648	+71 970	No	No (iOS)

Besides, according to the Euroset report, the average selling price increased by 4% during the first half of 2019, up to 15.7 thousand rubles, while FSSS estimated growth of 2.8%, up to 8.6 thousand rubles. Figure 1 shows the dynamics of digital electronics inflation since 2010. An interesting fact is that the Paasche price index used by the Euroset is usually lower than the Laspeyres index used by FSSS.
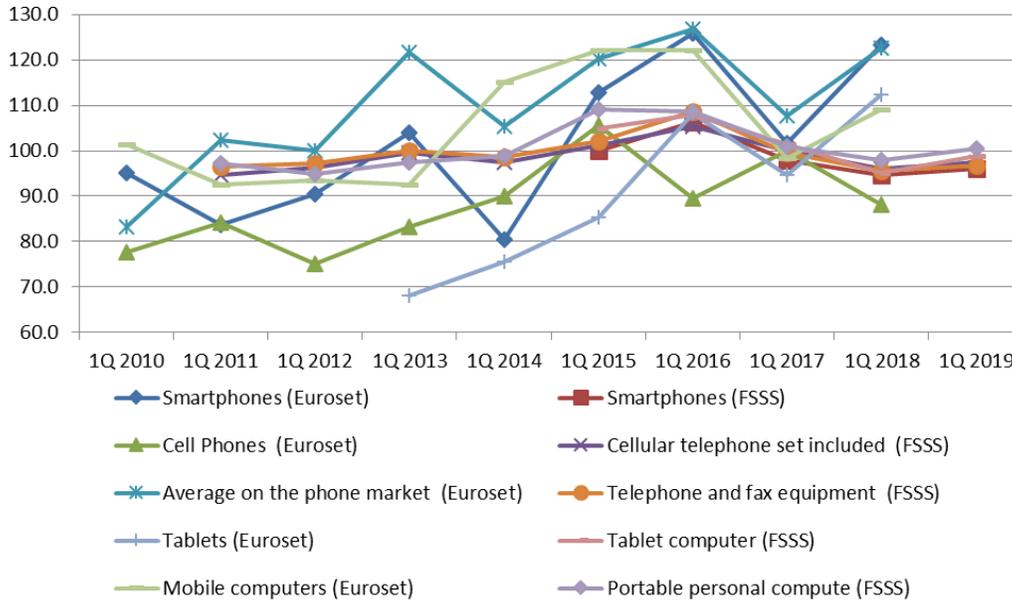
Figure 1. Digital Electronics Inflation Trends According to the Russian Federation Sources in 2010-2019

If truth be told, one should note that FSSS does not make adjustments for changes concerning the quality of goods during settlements. But statistical services can account for changes in quality by building hedonic regressions. This allows you to evaluate how changes compensate for the average price increase, for example, in respect of screen resolution or the number of cameras.

In international practice, the introduction of such amendments in calculations is already the norm. For example, according to the US Department of Labor Statistical Office (BLS), "smartphones are the only product (in the category "Telephone equipment, calculators, and other consumer information products") that is subject to quality adjustment due to the rapid pace of technical progress and quality improvements for consumers." This practice appeared recently, as BLS began to publish quality-adjusted data on smartphone price increase only in January 2018. Figure 2 presents the structure of consumer spending used to calculate the consumer price index. According to the data it follows that inflation of digital technology has a low proportion during consumer price index calculation.
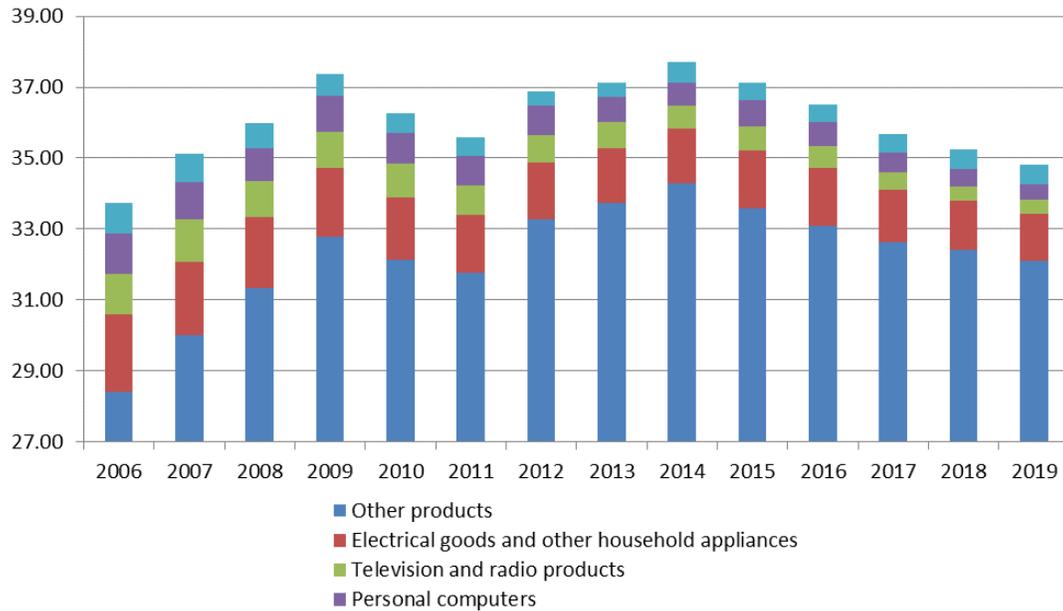
Figure 2. The structure of consumer spending on non-food products to calculate the consumer price index for the corresponding year

It is reasonable to assume that the price inflation for popular phone models roughly corresponds to the price inflation for other non-food products. Figure 3 shows quarterly consumer price indices since 2005.

In this case, inflation in the non-food segment (excluding digital electronics) is at least 0.2 pp lower than the inflation in the non-food segment as a whole.

Given the share of the non-food segment in the total consumer basket, we obtain the value of this effect at the level of 0.1–0.2 percentage points.
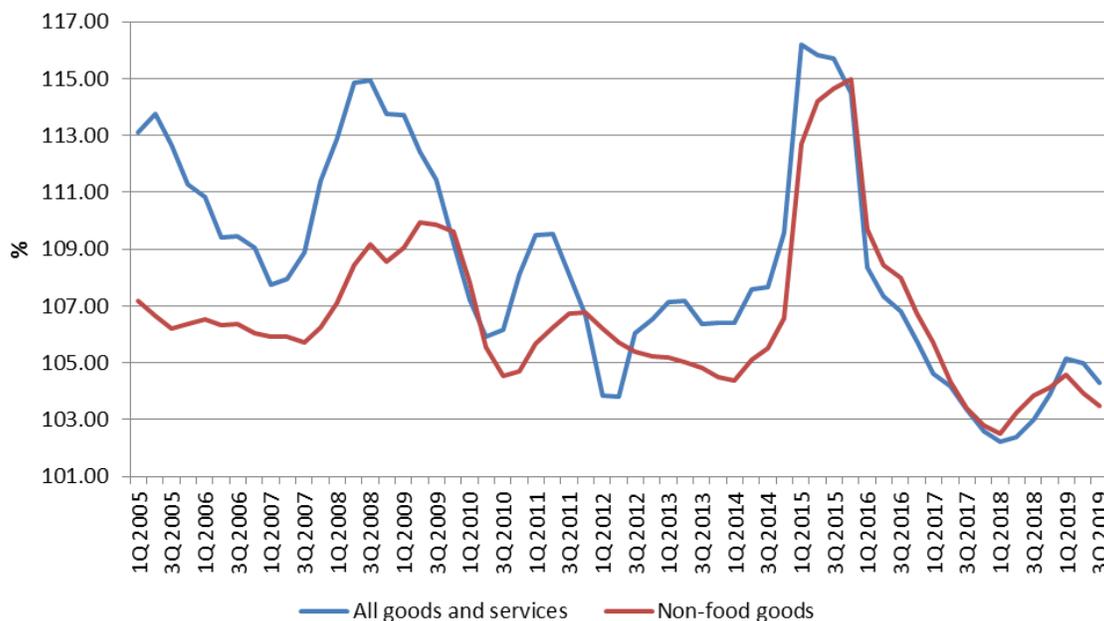
Figure 3. Quarterly consumer price indices for goods and services in the Russian Federation (2005-2019)

Obviously, to track price dynamics in this category, FSSS uses a too narrow sampling that does not include any of the most modern and popular smartphone models. Not having time to adjust its sample in accordance with the changing preferences of customers, FSSS has relied for too long on data relating to devices that have long ceased to be popular among consumers (Kotelkin & Kotelkin, 2007; Nureyev & Sapyan, 2010; Mindlin et al., 2017). The decrease in demand for such models leads to their price decrease, which in fact is fixed by FSSS and differs from the real market situation.

Thus, the use of irrelevant samples leads, firstly, to inflation volatility level decrease among smartphone prices, and secondly, it reduces its sensitivity to currency fluctuations. Using a wider representative sample of digital electronics items, the total annual consumer price index in Russia could be higher by about 0.1-0.2 percentage points per year. It is possible to make a more accurate statement only with reliable long-term dynamics from a wide number of sources.

Conclusions

The dynamics of prices for smartphones and other electronics and the exchange rate differ according to official statistics. Along with this, currency parity and retailer sales data are interconnected. Deflation in the digital electronics segment is conditioned by the peculiarities of FSSS calculation approaches and is limited to relevant information. The revealed underestimation of the inflation rate fits into the level of statistical error. On the other hand, if you extrapolate the identified problem to the price of other imported goods, the result may be more significant. The results obtained form the basis for further research in this direction.

The best way to make the indicator more realistic is to use international practice. Follow the recommendations contained in the UN-published guidelines: a representative sample of products must be based on extensive market research that can identify changes in consumer preferences and habits. And this, in turn, leads to the need to adjust the sample (as BLS does).

A less effective, but also less costly way to improve the quality of the sample is the proposal to expand the specifications used to include the devices with a larger screen diagonal, a large amount of internal memory, iOS devices and other quality characteristics.

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