A STUDY ON IMPROVEMENT OF PRICE STATISTICS RELIABILITY

By

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ABSTRACT

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The consumer price index is an index that measures the average price change of goods and services purchased by households for their daily lives. The Korea's consumer price index is based on a monthly survey across the country and indexed them on a weighted arithmetic average basis (Laspeyres Index). Korea's consumer price index has been revising the index every five years, with the year ending at 5 and 0.

However, in recent years, many environments have changed, the present consumer price index has been questioned about their reliability due to changes in the survey environment, such as society and the economy. In particular, the prolonged low inflation situation, creates a gap between the level of prices felt by consumers and the level of prices from the CPI.

This research was conducted to find out the learning outcomes on how to increase the representativeness and reliability of the consumer price index. Discussion on introducing of new data sources is also reviewed as one solution to the improvements of Korea’s CPI.

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I. INTRODUCTION

1. Introduction of Consumer Price Index

I was in charge of Korea's consumer price index production at the National Statistical Office(Statistics Korea) for one year and eight months from December 2017 to July 2019. The consumer price index is an index that measures the average price change of goods and services purchased by households for their daily lives. The consumer price index began to be produced by the Economic Planning Board in 1966, and has been produced by Statistics Korea since 1990.

Types of statistics related to prices include: 1) the consumer price index measuring the price changes of goods and services purchased by consumers(CPI); 2) the producer price index measuring the price changes of goods and services supplied by producers(PPI); 3) the purchasing power parity for comparison of price levels between countries or regions(PPP); 4) the GDP deflator required to convert nominal GDP into real GDP (GDP deflator).

Among them, the consumer price index is the most representative indicator that provides an average measure of inflation in the overall economy as a macroeconomic indicator. In addition, the consumer price index is closely related to the people's lives, as it is used to adjust public service charges by the government and as a reference for social welfare funds such as various pensions.

Since the concept of a consumer price index was first created, price statistics have continued to develop. Today, the consumer price index of most countries is being drawn up in accordance with the International Manual jointly published by the ILO and the United Nations to increase comparability between countries. Korea also draws up basic principles in accordance with the International Manual, but it carries out some level of coordination to reflect national specificity.

The Korea's consumer price index is based on a monthly survey of 480 items of goods and services in 38 cities across the country and indexed them on a weighted arithmetic average basis (Laspeyres Index), where the weights used are calculated based on the proportion of the average expenditure consumed by individual households based on the annual household expenditure survey.

Table 1. Korea's CPI Index formula (Laspeyres Formula)

$$L_{2015,t}^{2015=100} = \frac{\sum(P_i^t Q_i^{2015})}{\sum(P_i^{2015} Q_i^{2015})} \times 100 = \sum W_i^{2015}(P_i^t / P_i^{2015}) \times 100, \quad W_i^{2015} = \frac{(P_i^{2015} Q_i^{2015})}{\sum(P_i^{2015} Q_i^{2015})}$$

* L: price relative, *P*: price, Q: quantity, W: weight, t: time of survey, i: item

Korea's consumer price index has been revising the index every five years, with the year ending at 5 and 0, modifying survey items, survey cities and survey methods. Separately, the weight revision is carried out to update the aforementioned weights to the latest weights every year ending in 2 and 7.

The number of disseminated indices is 7 ; the composite index, index excluding food and energy(Core inflation), living cost index , fresh food index, index of the classification of consumption by purpose, index by the attribution of goods and services , index including owner-occupied housing

The consumer price index chooses a significant sample survey method to properly select and survey the companies and products sold for which goods and services are sold so that they can adequately represent the consumption of ordinary households. In addition, 'Quality Adjustment' is carried out to measure and reflect how much price changes are recognized as a result of quality changes when changes such as discontinuation of products or new releases are made to reflect only pure price changes.

2. Learning object

The methodology of the Korea Consumer Price Index, as mentioned above, is based on common international standards to reflect Korea's special conditions.

However, in recent years, many environments have changed that are a prerequisite for this methodology.

Unlike the period of mass production of small items in the past, various kinds of goods are sold in modern society, especially in the case of services, a growing

trend of personalized services. Under these circumstances, the present consumer price index, which is compiled by surveying and calculating price flows by selecting representative sample goods and services that can represent the purchase of the entire consumer, has been questioned about their reliability due to changes in the survey environment, such as society and the economy. In particular, the prolonged low inflation situation, which is usually seen in developed countries, creates a gap between the level of prices felt by consumers and the level of prices from the CPI.

Therefore, through this SRP, it is first intended to study efficient ways to expand the survey of goods and services under the constraints of budget and human resources to enhance the representation of the consumer price index.

Second, I want to research how to improve indicators that can be used to reduce the gap between the level of prices felt by the general public and the actual officially announced consumer price index.

And, as a person in charge of the production of price statistics, through the SRP research and the acquisition of relevant knowledge, I intend to obtain the necessary skills and knowledge from actual statistical administration and use them to improve the reliability of Korea's price statistics.

In particular, the changes in the survey environment have made changes in the

existing consumer price survey system necessary, and the use of new sources of data, such as scanner data, is a sufficient and prompt consideration at this point.

Therefore, this SRP aims to achieve learning outcomes on how to increase the representativeness and reliability of the consumer price index by utilizing various sources of data.

II.LITERATURE REVIEW

1. Major literature reviewed

For the literature review, I focused mainly on studies related to the improvement of the consumer price index. Since the consumer price index is usually produced by government statistical bodies, several methodologies are proposed and discussed at international conferences organized by international organizations such as the United Nations. In addition, city groups such as Ottawa Group share various academic findings to develop the consumer price index.

I classified the studies into three categories, regarding the three aspects that I wanted to learn more about : Improvement of calculation method of consumer price index, utilization of new data source for consumer price index, improvement of method of consumer price survey and dissemination. Then I

chose 12 of the studies that provided meaningful insights to my subthemes to be included in the summary of the literature.

2. Summary of the Literature

2-1) Improvement of calculation formula of consumer price index

Quality Adjustment and Hedonics: A Unified Approach (Diewert, 2019)

The report, released at the 2019 Ottawa Group meeting, suggests a variety of examples of the Hedonic index, one of the measures of quality adjustment that accounts for an important area in the consumer price index. In particular, as transaction data, such as scanner data, have recently become available and can be used to calculate the consumer price index, this report provides various academic examples of the Hedonic index, a method to use these transaction data.

The Hedonic Index is an index calculated by analyzing the effects of changes in the quality characteristics of a product on prices through a econometric method (regression analysis). With the frequent emergence and disappearance of new products, it has become an important duty of statistical authorities to make proper quality adjustments. By using the Hedonic Index method, statistical authorities can reduce the workload on these quality adjustments and have a descriptive and consistent index system.

However, the use of the Hedonic Index for real work requires a number of conditions. This report first introduces the simplest model of the Hedonic index, and proposes indices that can be used for each case, such as when scanner data is missing, when sales information is available, and when quality information is included. Based on this, it also introduces the Hedonic Index that can be used in general situations.

The Nature of Chain Drift (Auer, 2019)

This paper deals with the causes and alternatives of the chain drift problem caused by the use of the chain index. "Chain drift" means a situation where "if it is an entirely different price change, even though the practices and requirements in the current period have been reversed back to their levels of the base period."

The reason for the chain drift is that the change in the sales volume of the goods does not occur simultaneously with the change in price. Due to the nature of the scanner data-based chain index, which uses product sales information as a weight for index calculation, the problem of this chain drift is exacerbated by excessive volatility in product sales due to price changes(pendular quantity reaction), or the rigidity of the quantity of product purchases(Sticky quantity reaction).

The paper states that the pendular quantity reaction causes downward drift and the sticky quantity reaction causes upward drift, resulting in a chain drift in combination with the two effects. It also proposes the Rolling Window GEKS index, which limits the period of time that reflects the weight based on sales, as a way to address these chain drives.

2-2) utilization of new data source for consumer price index

Integrating big data in the Belgian CPI (Loon et al., 2018)

The report was released at a meeting of experts on the consumer price index organized by UNECE in 2018. Statistics Belgium has been using scanners data from supermarkets in the calculation of the CPI since 2015. Belgium has modified its ‘Unweighted chained Jevons’ index and used it in its consumer price index.

In addition, the CPI for scanner data use is being tested and calculated using various multilateral methods (GEKS-Törnqvist, Time Product Dummy, Gear-Khamis and applied Lehr index) and is planning to introduce the most suitable method by 2020.

Apart from using scanner data, Statistics Belgium has also been web scraping data for a number of consumption segments such as consumer electronics,

footwear, hotel reservations, second-hand cars, renting of student rooms. The use of web-scraping data will also be integrated into the CPI by 2020. To this end, various multilateral methods such as the Hedonic index are being tested.

Scanner Data in the CPI: The Imputation CCDI Index Revisited (Haan et al., 2019)

The Netherlands has been using scanner data from big supermarket chains since the early 2000s to calculate consumer price indices for food and other items. Introduced in this report, "imputation CCDI index" combines "the multilateral GEKS-Törnqvist" and "CCDI," previously used by the Netherlands' Statistics Office, by matching newly released or discontinued products to each other through a hedonic imputation.

The index is free from chain drifts and can be applied in a wide range of data types. The Netherlands National Statistical Office tried the calculation by applying the imputation CCDI index to TV items, and it was determined that the price change behaviors were similar to that of other indices (Törnqvist, Time dummy hedonic)

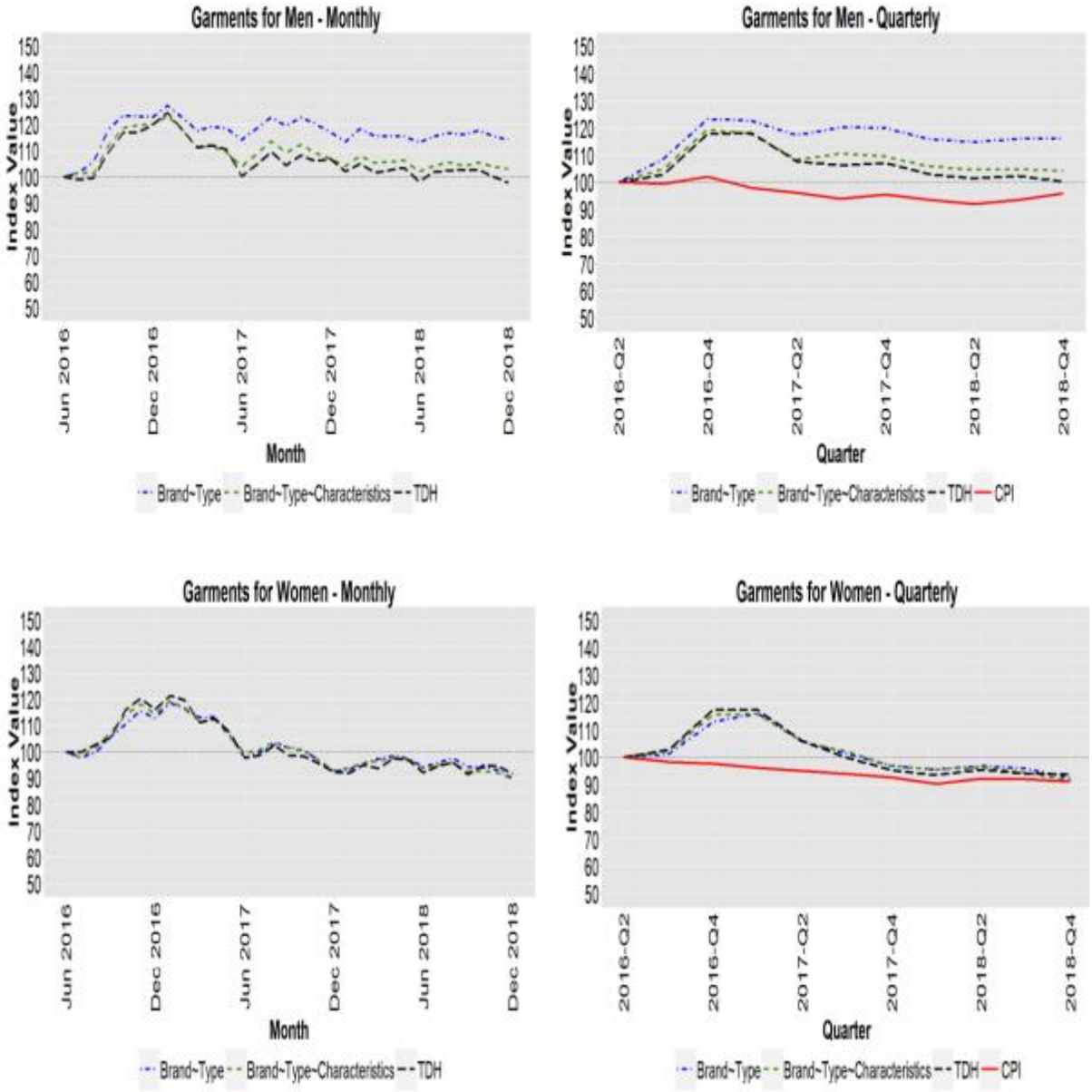
Experimental clothing indexes using Australian web scraped data (Glassock et al,. 2019)

The Australian Bureau of Statistics (ABS) has attempted to transform statistical administration to calculate economic statistics using big data. Accordingly, the use of scanner data was introduced to CPI in Australia from 2014, and the multilateral index method was introduced and used in CPI from 2017 due to the increased number of transaction data.

In addition, ABS began work in 2017 on the use of web-scraped data to reflect online transaction prices, such as the Internet, and to collect more price information efficiently. This paper shared the results of the study of "Webscrap-based price index calculation" on clothing items to study the utilization of webscraped data.

The ABS calculated the GEKS index, Time Dummy Hedonic index, and compared the results with the existing consumer price index. As a result, the long-term trend of prices for clothing items was found to be similar.

Table 2. A Comparison of Web Scrap-Based Price Index and Actual Australian Price Index



As a result, we saw that webscraped data could be an appropriate alternative to reflect changes in the 'dynamic' commodity market. However, the paper noted that despite these advantages, techniques to classify thousands of products into one "item" unit are critical and that appropriate computations are applied according to the characteristic of the data.

Online Price Index with Product Replacement: The Closest-Match Approach (Bertolotto, 2018)

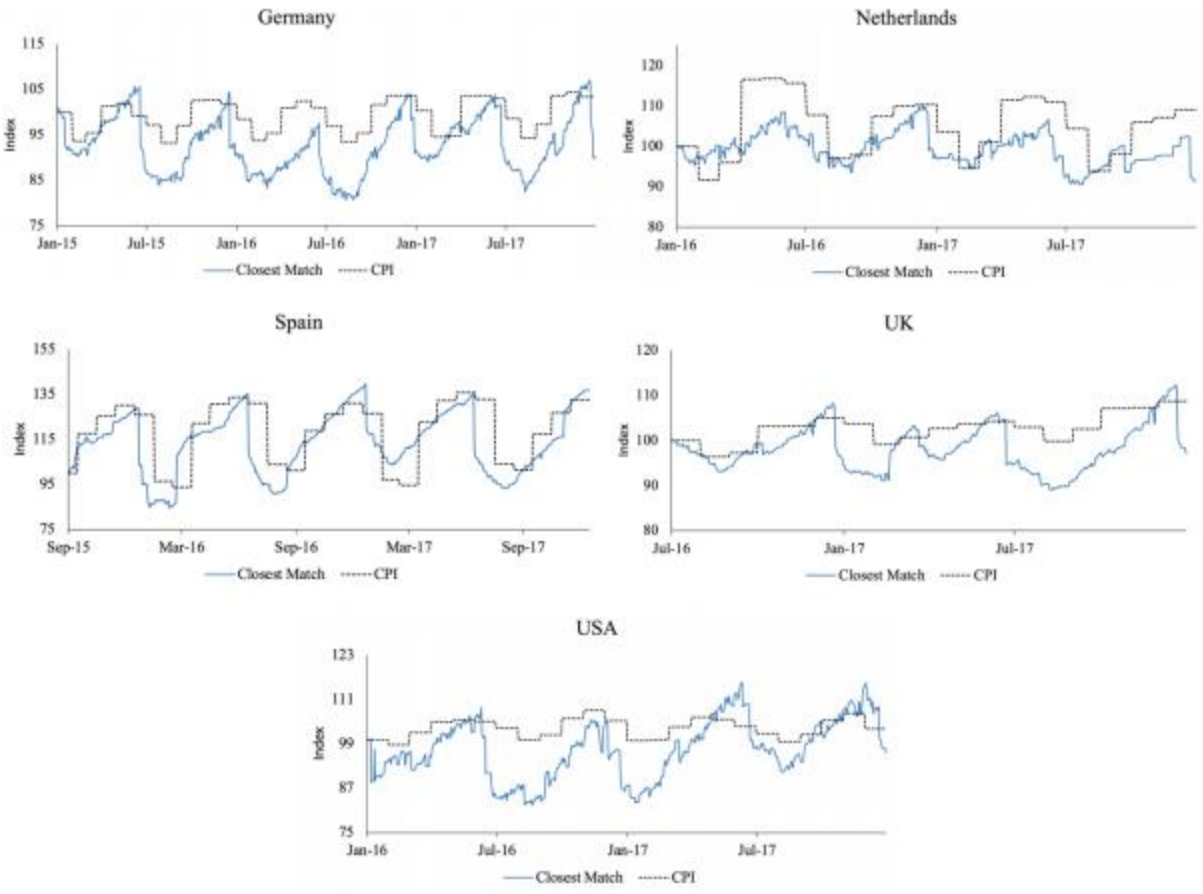
Pricestat, the author's agency, was the first to come up with the concept of a consumer price index based on online prices. However, this online price-based consumer price index is showing an abnormal downward trend, regardless of the country

The reason for this downward trend is due to the environmental characteristics of online commerce itself. This is because 1) numerous products are newly released and discontinued, and 2) new products are released at high prices and then discontinued at very low prices as prices gradually go down.

As a way to solve this problem, the paper suggests replacing discontinued products with the closest product group. To this end, numerous products were filtered according to the criteria and scored according to the characteristics of the products, thus applying a technique to regard the highest score as an alternative.

The price indices calculated through this method were applied to Germany, the Netherlands, Spain, the United Kingdom and the United States, and found to have a variable trend similar to the official consumer price indices. Therefore, 'closest match approach' may be an appropriate alternative to solving the downward issue of the online price index.

Table 3 . Closest-Match Index versus countries' CPI



Measuring price dynamics of package holidays with transaction data (Henn, 2019)

In Germany, holidays package, which consist of a bundle of flight and accommodation services, are an important item of consumer prices. Currently, the prices offered by each travel agency are collected through a sample survey.

However, as a possible alternative, transaction price data from the commercial booking system "Amadeus" are analysed in this study. The data used in this

study include a wide range of information, including the characteristics of travel packages purch**a**sed by individuals, by combining online and offline.

The paper analyses the chances and challenges in compiling a price index out of transaction data for flight package holidays. The data set raises a number of methodological issues. The result showed a price dynamic similar to the existing travel product price index and the new price index calculated using the transaction data.

Table 4. Comparison of transaction-based price indices with German CPI (international package holidays)

Source: Destatis; Bundesbank calculations on the basis of booking data from TravelTainment GmbH. For each transaction-based method, the elementary indices on six holiday regions were aggregated together with the official (confidential) elementary indices "city trips" and "cruises" by using the official fixed-weighting scheme.

Deutsche Bundesbank

6 Mai 2019, 15:29:13, S3PR0477.Chart

Rentals for housing: A model-based estimator of inflation from administrative data (Bentley, 2018)

This paper presents result of study on developments to the estimation of CPI rent price statistics in New Zealand. This report covers two areas. ; 1) Using government administrative data to replace the need for a sample rent survey, 2) a multilateral model to improve estimates of ‘pure price’ inflation.

The utilization of administrative data can achieve the efficiency of public services by reducing survey costs and response burden, and ensure the accuracy of price statistics by expanding the number of samples. New Zealand estimated changes in rent prices through ‘fixed-effects regression models’, and also confirmed that it is easy to adjust the quality by calculating the multilateral index method, and it is possible to write an index that does not require 'revision'. This ensured that administrative data was clearly superior in terms of cost and efficiency compared to the Survey data.

2-3) improvement of method of consumer price survey and dissemination.

Webscraping laptop prices to estimate hedonic models and extensions to other predictive methods (Zafar et al., 2019)

The report describes the study of building a hedonic model using webscraped data studied by the French National Statistical Office (INSEE).

When a certain item is missing and has been replaced, the difference of quality between the old product and the new one must be taken into account in the CPI for comparability. Hedonic regressions can be used to estimate this difference. However, the quality of the models can be unsufficient due to the small size of samples.

This paper explores the use of webscraping in order to gather bigger volumes of information on prices and characteristics, in particular for electronic goodsThe French National Statistical Office collected webscraping data through machine learning techniques and analyzed the quality variables to produce a higher-quality Hedonic model.

This article shows the application of webscraping for hedonic model estimation, for electronic goods and more specifically laptops. Automatic data collection can be used at the basis month for extracting complete information on models and technical characteristics, permitting us to use machine learning algorithms to select most relevant variables.

Measuring consumer inflation in a digital economy (Reinsdorf et al., 2018)

As the digital economy grows, such as the expansion of online commerce, needs and efforts are growing to capture these digital economies in statistics. In the consumer price index sector, efforts are also being made to capture such

environmental changes as the digital economy.

The effect of the possible sources of error in capturing digital products on the price index for household consumption depends in part on the weights of the affected products in the consumption basket. To calculate upper bounds for the impact on the household consumption price index, this paper classified products by level of possible bias and assume a maximum plausible overstatement of price change for each affected product category and then apply weights based on an average structure of household consumption in OECD countries.

And the they found that the products concerned account for about 35 percent of household expenditure in 2005, declining to 32 percent in 2015. Total plausible upper bound effects on the growth rate of the consumption deflator amount to somewhat less than -0.6 percentage points in 2015. Although significant, this figure would not have a large enough impact on real consumption growth to change the picture of low GDP growth and slowing productivity growth in many advanced economies. Also, upper bound effects have declined over time.

And this report does not include broader welfare effects from free digital products. However, it is suggested that efforts should be made to measure the impact of these free digital products (such as YouTube).

Monitoring Inflation : a new tool for official statistics (Kazemier et al,. 2018)

The report, released at the 2018 meeting of UN consumer price index experts, explains how the Statistics Netherland the consumer price index, as well as various requirements for the consumer price index due to environmental changes.

The consumer price index was developed to measure the cost of living for households, but its role has been extended over time to an indicator that represents the overall price level of the economy. Accordingly, the Netherlands National Statistics Office has also expanded the concept of inflation, beginning in 2017 to publish indicators subdivided by sector so that inflation can be used for various purposes.

The Netherlands National Statistics Office has created an 'inflation dashboard' to publish 17 indicators related to inflation. The 17 indicators are largely comprised of four categories (consumption, production, capital market and fixed assets) and are provided visualized to provide an overall picture of the price level of the economy.

Population Subgroup Price Indexes: Evidence of Heterogeneity or Measurement Error? (Cage et al., 2018)

To understand and meet different user needs, CPI officials have made various efforts. Users of the CPI are policymakers, government agencies, contract-related workers and the general public. In general, the consumer price index is prepared by viewing the entire population as a group. In the case of the U.S., the consumer price index is divided into four categories according to the groups surveyed so that policymakers and others can use the necessary information in a timely manner. : Wage workers (CPI-W), elderly consumers (CPI-E), all urban consumers (CPI-U), and all urban consumer chain index (Chained CPI-U).

The U.S. Bureau of Labor Statistics (BLS) is creating subgroup price indexes by weighing items differently according to the Survey group. However, differences in inflation often occur among these indices, which could cause confusion about what information policymakers should use. In particular, CPI-E has a significant impact on the design of social security systems. Thus, the BLS is conducting studies to harmonize and aggregate these indices to produce price indices for income brackets so that they can provide more appropriate information to policy-makers.

III. Discussion

Various reports on the improvement of the consumer price index have been reviewed so far. In recent years, Korea has seen low levels of inflation, and thus the gap between the price level that the general public actually feels and the price level announced by the National Statistical Office has grown. This gap undermines not only the consumer price index but also the overall credibility of official statistics. Therefore, after this, I would like to discuss ways to enhance the reliability of the consumer price index.

3-1) Improving the calculation formula of the consumer price index: introduction of a chain index

Currently, Korea's consumer price index makes a base-year revision every five years, and a weight revision two years after the index's. However, the basic data for index and weighting revisions are obtained on the basis of household expenditure surveys, so the actual index revisions and weights are made one year later than the year ending with 0, 2, 5 and 7. Because of this situation, eight years of the 10-year period, including 1, 3, 6, and 8 for the actual revision of the index and the revision of the weights, create the problem of retroactively revising the consumer price index to match the new index and weight.

Table 5. Years of retroactive correction according to index and weighting revisions

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
retroactive revision	retroactive revision	retroactive revision	retroactive revision		retroactive revision	retroactive revision	retroactive revision	retroactive revision	
	Base year revision		Weight revision			Base year revision		Weight revision	

This retroactive correction undermines confidence in the consumer price index and creates anxiety about policies based on the consumer price index. Therefore, it is necessary to introduce a chain index that do not require retrospective modification of these consumer price indices. A chain index is an index method in which the weights are calculated from the previous year's expenditure without the based year being defined and the weights are reflected in the following year. As we saw in earlier reports, the United States, Australia and European countries have introduced a chain index into the consumer price index, changing the weighting of the consumer price index every year without a base year. Such a chain index could add to the stability of the consumer price index by making it free of retrospective corrections. The Korea's consumer price index also needs to consider introducing a chain of indices to enhance the reliability and stability of the consumer price index.

3-2) Utilization of new data sources

3.2.a Scanner Data

Scanner data generally means transaction data that contains both price and sales information of a product at the same time. These data are named scanner data because it was collected through scanning based on bar codes assigned to each product. Scanner data is collected today from a variety of retail types. Since almost all industrial products are bar-coded, scanner data can be said to contain most commodity trading information. The biggest advantage of introducing scanner data to the consumer price index is that it can increase the representation of the consumer price index by securing a larger number of samples from the current significant sample method. By collecting the price at which most goods actually traded, we can secure a higher representation than the current consumer price index.

In addition, scanner data can produce more realistic weights because it contains information about the quantity of goods sold. As in previous reports, there are very many countries that are introducing scanner data into the consumer price index. Eurostat has issued a manual for the use of scanner data in 2017, providing guidelines to member states.

Korea also needs to secure scanner data at various types of retail outlets to reflect it in the consumer price index. Currently, Korea's consumer price index

is looking into shelf prices written on shelves, rather than those actually traded. The introduction of scanner data will not only allow prices actually being traded to be applied to the consumer price index, but also enhance the reliability of the consumer price index by providing a more realistic weight.

To fully use scanner data in the CPI, it is necessary to change the calculation formula of the consumer price index from the current Laspeyres index to various multilateral methods. Using scanner data, more "realistic" consumption expenditure weights can be obtained. This allows statistics institutions to more closely calculate price indices that are similar to the price levels actually felt by consumers. However, there are some things that must be considered for this to happen.

First of all, it is representative of scanner data. Multilateral index methods that extract the weights of products from the scanner data may distort the consumer price index produced from the scanner data if the scanner data used does not adequately represent the overall market. In Europe, where scanner data was first used to calculate the consumer price index, sequential research was conducted on items (such as food items) in which scanner data could represent market situations sufficiently. Korea should also consider introducing scanner data in light of these factors.

The following is the stability of data acquisition. The consumer price index shall

provide the appropriate information on a regular basis every month or year. In many cases, scanner data is not owned by statistical bodies. Therefore, when statistics institutions consider introducing scanner data to the consumer price index, it is necessary to form a friendly and legitimate relationship with the owner of the data to enable stable data acquisition in the long term.

3.2.b Online price

The increase in online transactions represented by Amazon has had a significant impact not only on prices but also on the entire industrial structure, including employment. In Korea, online commerce accounted for up to about 25 percent of retail sales in 2018 from about 8 percent in 2008(Statistics Korea, 2018). Accordingly, the consumer price index needs to reflect online sales prices. Currently, Korea's consumer price index reflects prices sold online, with items with a large number of online transactions.

The reports mentioned earlier suggest "web-scraping" as a useful way to collect prices sold online. Web scraping is a method of automatically collecting prices of goods sold in online shopping malls using computer programs. Web scraping allows statistical authorities to easily collect tens of thousands of price information every day. The tens of thousands of price information collected through web scraping not only reflects online prices in the consumer price index,

but also has the effect of expanding the number of samples. Reflections of online prices collected through Web-scraping will further enhance the reliability of the consumer price index.

3.2.c Administrative data

The items that make up the largest weight of Korea's consumer price index are rent. Currently, the consumer price index is looking into monthly rent payments for "jeon se (housing rental made up of deposit only)" or monthly rentals. However, with the passage of an act requiring home rental transactions to be registered in 2018, the basis for the use of administrative data on home rental transactions was created Such administrative data could replace on-site surveys to compile the consumer price index. There are many countries, including Canada, that use administrative data in the housing rental sector. The use of administrative data will reduce respondents' response burden to the rent survey and produce a more accurate consumer price index.

Currently, the country's consumer price index is already actively using administrative data in medical costs, gasoline prices, education costs and electricity charges. However, if the survey in the housing sector, which currently raises the administrative burden of conducting the survey, can be replaced with

administrative data, the quality and reliability of the consumer price index can be improved based on the reduced administrative and survey burden.

3-3) Other improvements in consumer price surveys

3.3.a subgroup Price index

In order to increase the reliability of the consumer price index and improve the gap between the price felt, it is necessary to draw up a consumer price index according to the subgroup. Currently, Korea's consumer price index looks at the entire population as a group and calculates the average level of fluctuation in prices.

On the other hand, it is not appropriate to directly compare price levels between regions through regional consumer price indices, since price changes are measured based on the same year by region (now 2015).

Therefore, it is necessary to produce a price index based on income or the number of household members, rather than to view the people as the same group. For this to happen, an entity must be able to calculate the weights of expenditures based on income or the number of households. Currently, Korea's household spending survey is scheduled to be conducted in conjunction with households' income from 2020, so it can produce weights by linking income to

expenditure. Therefore, it is necessary to calculate the price index by income bracket in time for the 2020 reshuffle.

On the other hand, to compare price levels by region, purchasing power parity methods for comparison of current price levels between countries could be reviewed. In fact, countries with large land areas such as Canada and Brazil are conducting purchasing power parity among regions because of the wide gap in price levels between regions. However, since Korea is relatively small in land and the price level gap between regions is not large, a regional purchasing power parity survey that increases the workload burden from the development of new statistics needs careful consideration of the need.

3.3.b Open of price information researched to the public

Currently, the consumer price index does not provide price information that is actually surveyed to the outside world, but only the indexed comprehensive consumer price index is made public However, it is necessary to consider providing price information that is actually collected to enhance public confidence in the consumer price index. Currently, price information is not provided because items included in the consumer price survey may remain the same and only change prices of other items if the information on the goods being surveyed by the National Statistical Office is known outside. In doing so,

the consumer price index can be separated from the actual daily consumption of consumers by keeping the price index from rising high. That's why the disclosure of price information collected by the consumer price survey needs to be prudent.

Today, however, as online commerce becomes more active and consumer information exchanges become more active, price information for numerous products is being disclosed to the public. Therefore, it is believed that by disclosing prices collected in the consumer price survey, it could further enhance the public's confidence in the general public.

In addition, the disclosure of the aforementioned scanner data by region would not only increase the sample size of the consumer price index but also enhance reliability.

3.3.c Improvements in the way the consumer price index is published

Currently, Korea's consumer price index is only announcing a rise or decrease in the overall price index. However, this approach is likely to feel alienated from the prices it feels if it is not someone who has a deep understanding of the system of the consumer price index.

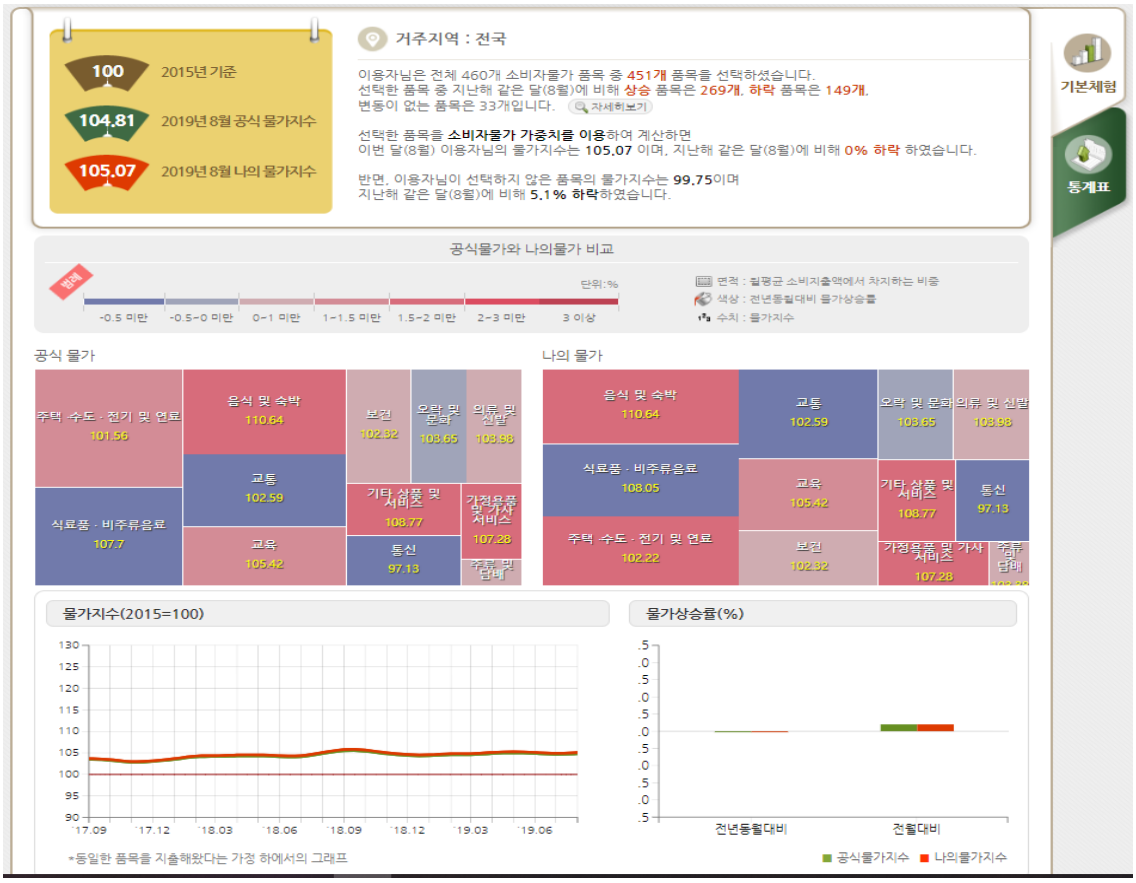
Therefore, when the price index is published in the future, it is necessary to

inform how many of the 460 items have increased and how many items have decreased. In addition, it is necessary to calculate and publish what percentage of the consumer price index has risen because of the increased items and how much the decreased items have contributed to the fall of the price index. The above measures are not required to impose additional work burdens because they can be derived incidentally in the process of calculating the consumer price index. The improvement in the above-mentioned method of public announcement will enhance people's understanding of the consumer price index and enhance reliability.

3.3.d Providing price statistics to suit the needs of the consumer

For the general public, the inflation rate at a lower level than the price level they feel is questionable. However, due to the nature of the consumer price index, which measures the overall change in price levels for all goods and services, such a perceived gap in prices is inevitable. Therefore, it is necessary to improve services that allow consumers to calculate or feel the price levels they feel themselves. Currently, the Korea National Statistical Office is offering a "experience my prices" service so that individual households can calculate the price level to match their spending. Through the service, the gap between the price and official prices can be reduced by reflecting greater changes in the prices of items that he thinks have a high share of spending.

Table 6. example of experience my prices service



In addition, what I would like to suggest is to visualize price information by building a kind of "price map." In addition, in the future, data such as scanner data and online prices could be used to display information on the map how much each product is being sold by actual companies.

The Korea Consumer Agency is announcing the prices information of products that are actually being sold in large discount stores, convenience stores, supermarkets and traditional markets across the country through a website service called "True Price (Cham Ga-gyeok)." If commodity prices collected in

the NSO's consumer price survey can be expressed not only in the same way as the Korea Consumer Agency, but also on the actual map, it could increase consumer understanding of the price index and boost confidence in the consumer price index.

Table 7. example of True Price (Cham Ga-gyeok) service

전체(311) | 대형마트 (307) | 백화점 (4)

옛날국수소면

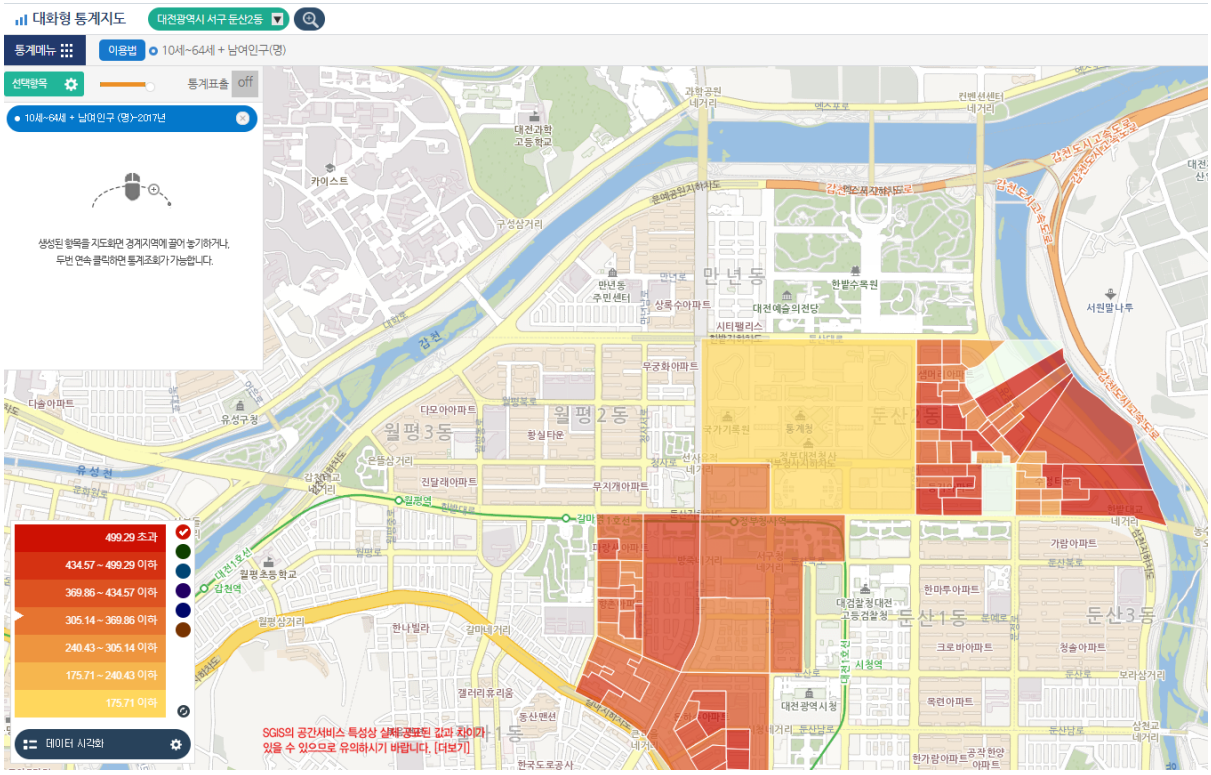
전국 전체 판매점 평균						
구분	전체	대형마트	백화점	기업형슈퍼	전통시장	편의점
평균가격	2,397	1,977	2,790	2,262	2,560	
최고가격	4,000	1,980	2,800	2,990	4,000	
최저가격	1,480	1,480	2,780	1,780	1,950	

지역	판매점	상품명	가격	1주전	1개월전	6개월전	1년전	차트보기
부산광역시	이마트사상점	옛날국수소면	1,480원/900g 164원/100g	1,480 (0%)	1,480 (0%)	1,480 (0%)	1,480 (0%)	
광주광역시	이마트동광주점	옛날국수소면	1,780원/900g 198원/100g	1,780 (0%)	1,780 (0%)	1,780 (0%)	1,780 (0%)	
경기도	이마트의왕점	옛날국수소면	1,880원/900g 209원/100g	1,880 (0%)	1,880 (0%)	1,880 (0%)		
광주광역시	농협광주유통센터	옛날국수소면 할인	1,980원/900g 220원/100g			1,890 (4.8%)	1,950 (1.5%)	
경상남도	농협김해유통센터	옛날국수소면 할인	1,980원/900g 220원/100g		1,980 (0%)	1,950 (1.5%)	1,950 (1.5%)	
대구광역시	농협달성유통센터	옛날국수소면 할인	1,980원/900g 220원/100g		1,980 (0%)	1,890 (4.8%)	1,950 (1.5%)	
경기도	농협유통고양점	옛날국수소면 할인	1,980원/900g 220원/100g		1,980 (0%)		1,950 (1.5%)	

Currently, since the Statistics Korea provides "Statistical Geographic Information Service(SGIS)" that combine various statistical information with geographical information, it may be possible to provide price index

information if only the appropriate content to be displayed on the map is provided.

Table 8. example of Statistical Geographic Information Service (SGIS)



IV. Conclusion

So far, I have looked at reports and debate topics with various proposals to enhance confidence in the consumer price index. The reason the reliability of the consumer price index is degraded is because price changes felt by the actual consumer are inconsistent with changes in the consumer price index. Therefore, proposals to address these issues include:

The first is an improvement in the calculation of the consumer price index. With the current “Laspeyres index”, four index revisions over a decade create confusion among the general public as they require retroactive corrections to the price index. Therefore, it is necessary to reduce this confusion by introducing methods such as a chain index. Therefore, it is likely that research will be needed in the future.

Second, in order to reduce the problem of significant sampling, various sources of data are acquired to increase the number of samples and to make fieldwork more efficient. The more samples there are, the higher the accuracy of the consumer price index. However, more samples would require more fieldwork, which would lead to an increase in human resources and budgets, resulting in inefficiency in statistics administration. Therefore, it is required to obtain data that can replace on-site surveys such as scanner data and online price data, thereby making consumer price surveys more accurate and efficient. Currently,

Korea's consumer price index does not have enough alternative data, such as scanner data. Therefore, it is required to improve the institutional environment such as law revisions so that various sources of data for the advancement of the consumer price index can be obtained smoothly. The more sources such as these are acquired, the more accurate the consumer price index will become and easier to win the trust of the general public.

Third, it is about public services, including the announcement of the consumer price index. The current consumer price index is making various efforts to raise the understanding of the general public. However, it still takes considerable effort for the general public to understand the consumer price index. Therefore, a mechanism is needed to enable the general public to understand the consumer price index intuitively. Improvements in the aforementioned methods of public announcement, disclosure of price data, and improvement in statistical services using maps will enhance the general public's understanding of the consumer price index and increase the confidence of the consumer price index by making the actual price change felt.

However, the introduction of these proposals could lead to drastic changes in the consumer price index. Thus, such a change in the system requires a prudent approach. This is because the reliability of statistical indicators is paramount to produce and publish statistics stably. Therefore, the Korea's consumer price

index will need to further enhance the reliability of the price index in the future by carefully considering the above proposal.

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