The Use of SPPI
for measuring Real GDP in Korea

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Ⅰ. Introduction

Recently, the demand for service statistics has increased as the share of service industry has grown significantly and the size of external trade in services has expanded fast due to the conclusion of free trade agreement (FTA) between countries.

As the importance of statistics for making policy decisions related to the service industry is emphasized, more and more domestic and foreign people are interested in the accuracy of the related statistics.

Under the present circumstances, many countries are making steady efforts to improve their Service Producer Price Indexes(SPPIs), whose role is emphasized in estimating national income of the service sector.

There are two different methods for estimating output at constant prices: the quantity extrapolation method and the price deflation method. Generally, the quantity extrapolation method is used for industries in which the volume of products is easy to measure, such as Agriculture, Forestry & Fisheries and Electricity, Gas & Water Supply. On the other hand, the price deflation method is applied for other industries such as Services, for which measuring the volume of products is difficult.

In estimating constant price GDP of the service industry, it is essential to have accurate and detailed SPPIs.

The Voorburg Group has played an important role in the development of SPPIs, as it has lead the debate on the methodology and has introduced the best example of SPPIs in the world.

This paper introduces the SPPIs in Korea and deflators applied to measure the constant price output of the service industry. And then, it discusses the issues of compiling the SPPIs and the way of improving them.

Ⅱ. Service Producer Price Indexes(SPPIs) in Korea

The Producer Price Indexes(PPIs) for base year 2000 consist of 923 items. Of this, there are 77 service items, about 8.3% of the total.

The weight of the service sector in transaction amount is 294.2, assuming a total 2000 base year weight of 1000.

The sub-sectors of the Service sector include Real Estate Activities, Transportation, Post and Telecommunications, and Professional, Scientific and Technical Services, in order of weight.

Present Status of PPI Compilation

Classification	Items	Weight
Total	923	1,000.0
Goods	846	705.8
Services	77	294.2
Transportation	23	52.9
Post and Telecommunications	13	42.8
Financial Services	11	21.6
Real Estate Activities	4	90.8
Leasing and Renting	5	15.5
Advertising	4	14.4
Professional, Scientific and Technical Services	11	41.7
Other Services	6	14.5

Although the service industry is very important in GDP, SPPIs used for the estimation of constant output are relatively insufficient in Korea. In 2005, even though the gross value added of the service sector at current prices is 57.2 % of GDP at basic prices, the number of commodities of SPPIs comprises only about 8.3 % of the total number of commodities.

The goods sector can be explained by its PPIs up to 93.6%, whereas the degree of explanation of the service sector is quite low (35.7%). This means

that 93.6% of the goods sector has suitable price indexes, but only 35.7% of the service sector has relevant price indexes.

This is because the service sector includes ① non-market services such as Public Administration & National Defense and Social Welfare Services which don't have market prices, ② services such as Wholesale & Retail Trade, for which surveying prices is difficult, and ③ services such as Finance, R&D and Broadcasting, for which application of the concept of price is difficult.

Detailed Classification of SPPI

	Code	Code Name	Weight
Transportation	5011101	Railroad Passenger Fares	3.0
	5011201	Express Bus Fares	2.5
	5011202	Interurban Bus Fares	4.8
	5011203	Taxicab Fares	10.0
	5011301	Coastal Waters Passenger Fares	0.3
	5011401	Domestic Air Passenger Fares	1.5
	5011402	International Air Passenger Fares	2.7
	5012101	Railroad Freight Charges	0.5
	5012201	Scheduled Road Freight Charges	0.5
	5012202	Local Road Freight Charges	8.8
	5012203	Special Road Freight Charges	4.4
	5012301	Coastal Waters Freight Charges	1.1
	5012302	Transoceanic Water Freight Charges	4.6
	5012401	Air Freight Fares	0.9
	5013101	Road Tolls	3.2
	5013102	Charges For Vehicle Parking Facilities	1.0
	5013201	Harbor & Terminal Dues	0.2
	5013301	Air Terminal Facilities Charges	0.4
	5014101	Railroad Loading & Unloading Charges	0.3
	5014102	Harbor Loading & Unloading Charges	1.1
	5015101	General Warehousing	0.6
	5015102	Refrigeration & Cold Storage Warehousing	0.4
	5015103	Farm Product Warehousing	0.1
Post and Tele-communications	5021101	Postage	1.7
	5021102	Courier Charges	0.6
	5022101	Basic Charges For Fixed Lines	1.3
	5022102	Local Area Charges	3.9
	5022103	Domestic Long Distance Charges	2.5
	5022104	International Long Distance Charges	1.2
	5022105	Public Phone Charges	0.4
	5022106	Leased Line Charges	3.1
	5022107	LM Charges	4.4
	5022201	Mobile Phone Charges	18.7
	5023101	Special Telecom (telephone) Charges	1.3
	5023201	Internet Access Charges	2.4
	5023202	Information Service Charges	1.3
Financial Services	5031101	Fees on Domestic Banking Services	3.4
	5031102	Fees on L/C Transactions	0.9
	5031103	Fees on Foreign Exchange Transactions	1.0
	5031104	Guaranty Fees	0.6

	Code	Code Name	Weight
Financial Services	5032101	Credit Card Member-shop Commissions	2.4
	5033101	Fire Insurance Premiums	0.3
	5033102	Marine Insurance Premiums	0.4
	5033103	Motor Insurance Premiums	6.6
	5033104	Bond Insurance Premiums	0.6
	5033105	Casualty Insurance Premiums	1.1
	5034101	Security Brokerage Commissions	4.3
Real Estate Activities	5041101	Rents of Business Offices	38.2
	5041102	Rents of Stores	47.0
	5041201	Real Estate Appraisal Fees	0.6
	5041202	Real Estate Management Fees	5.0
Leasing and Renting	5051101	Domestic Produced Machinery Lease Fees	5.5
	5051102	Imported Machinery Lease Fees	3.6
	5052101	Rental Charges For Heavy Construction Equipment	1.3
	5052102	Rent-a-car Charges	0.1
	5052103	Rental Charges For Office Machinery & Equipment	5.0
Advertising	5061101	Radio Advertising Fees	0.8
	5061102	TV Advertising Fees	6.9
	5061201	Newspaper Advertising Fees	6.2
	5061202	Magazine Advertising Fees	0.5
Professional, Scientific and Technical Services	5071101	Judicial Scrivener Fees	1.7
	5071102	Customs Broker Remunerations	0.9
	5071103	Patent Attorney Fees	0.9
	5071201	Fees on Certified Public Accounting Services	0.8
	5071202	Fees on Taxation Services	1.9
	5072101	Land Surveying Fees	1.0
	5072102	Building Design & Supervision Fees	4.4
	5072201	Engineering Service Fees	11.4
	5073101	Data Processing Fees	0.3
	5073102	Computer Programming Fees	14.5
	5073103	Computer Repairing Charges	3.9
Other Services	5081101	Guard Service Charges	2.2
	5081201	Fees on Building Cleaning Services	3.1
	5082101	Human Waste Collection & Disposal Fees	2.2
	5082102	Industrial Waste Collection & Disposal Fees	4.5
	5083101	Hotel Charges	1.2
	5083102	Inn Charges	1.3

III. Deflators by Kind of Service Industry

Overview

PPIs are used to calculate constant prices output of the service industry. For certain services produced and consumed simultaneously, CPIs can be used to calculate constant prices output.

In the case of non-market services which don't have market prices, the outputs at constant prices are calculated by application of the relevant price indexes for the input cost items, i.e., fixed capital consumption, intermediate consumption, etc. This includes Public Administration & National Defense and some parts of Education Services, Health & Social Welfare Services and Cultural Services.

Price Indexes are not compiled for services which are traded in market but don't have the explicit prices. Their deflators are obtained by using the nominal and the real value of outputs respectively. These services include Wholesale & Retail Trade and Financial Intermediation Services.

Present Status of Usage of Deflators

The service sector is classified into 10 industries: Wholesale & Retail Trade, Restaurants & Accommodation, Transport, Storage & Communications, Finance & Insurance, Real Estate, Business Services, Public Administration & National Defense, Education Services, Health & Social Welfare Services and Other Services.

In the national accounts in Korea, these 10 industries are sub-classified into 280 basic items to estimate the value of the service sector, and the real prices of these items are in practice measured by using 72 PPIs and 100 CPIs.

Basic Items and Deflators by Kind of Industry

(unit: numbers)

	Industry	Basic items	Deflator		Reference
			PPI	CPI	
1	Wholesale and Retail Trade	6	–	–	deflators are derived after obtaining nominal and real data from other industries
2	Restaurants and Accommodation	45	–	45	
3	Transport, Storage and Communications	56	25	9	
4	Finance and Insurance	9	3	1	financial intermediation service deflators are derived after obtaining nominal and real data
5	Real Estate	4	2	1	
6	Business Services	55	16	1	some are non-market services
7	Public Administration and National Defense	1	22	3	non-market services
8	Education Services	15	–	12	some are non-market services
9	Health and Social Welfare Services	23	–	4	some are non-market services
10	Other Services	66	4	24	some are non-market services
	Total	280	72	100	

Transport, Storage and Communications

Transport, Storage and Communications is composed of 56 basic items, and the relevant price indexes (25 PPIs, 9 CPIs) are used to estimate output at constant prices.

Consumption of basic service items is by a mixture of households and corporations. Where the portions of service use by households are high, application of the suitable CPIs are used. Where the portions of corporate consumption are high, the appropriate PPIs are applied.

But this application needs to be improved. If corporations and households have considerable weight in use of the services, CPI and PPI should be applied to the usages by corporations and by households, respectively.

This includes, for example, Railroad Passenger Transport, Air Passenger Transport, Wire Telecommunication, Postage, Courier Charges, Coastal Waters Passengers, Parking Facility Operation, and so on.

For some items without their own price indexes, correspondingly similar price indexes are used. It is therefore required in the future to develop new price indexes for them.

This includes, for example, Chartered Buses, Hearse Operation, Oceangoing Foreign Passengers, Ship Piloting, Ship Cleaning Services, Road Loading & Unloading, Travel Agencies, Land Freight Forwarding, Compound Freight Forwarding, and so on.

Finance and Insurance

Finance and Insurance comprises 9 basic items. The relevant price indexes (3 PPIs, 1 CPI) are used to estimate output at constant prices.

The deflator of Financial Intermediation Services Indirectly Measured (FISIM) is derived after both nominal and real FISIM are estimated.

Real FISIM is calculated by extension using the rates of change of real interest-bearing assets and liabilities, which are derived by deflating nominal interest-bearing assets and liabilities with the all-item PPI.

There are no appropriate price indexes related with Life Insurance Corporations, the service fees of Other Depository Corporations and Other Financial Intermediaries. Therefore we use the Services CPI to estimate the outputs of these items at constant prices.

It is therefore required that we develop per-item CPI for financial services (For Other Banks, Other Credit Corporations, and Securities Corporations, etc.) and to make a new price index for Life Insurance Corporations, which doesn't have any relevant applicable price indexes.

Business Services

Business Services comprises 55 basic items, and the relevant price indexes (16 PPIs, 1 CPI) are used to estimate output at constant prices.

Adequate PPIs are mainly used as deflators for most of business services. However, for services related to research, such as Research Institution, In-company Research & Development, all-item PPI or the Services CPI are used due to lack of relevant price indexes. For Business & Management Consulting, Human Resource Supply & Employment Agency Services, Business-Intermediation Services, all-items or the Services CPI are applied because they don't have their relevant price indexes.

It is necessary to newly survey prices for these services, even though an indirect survey method such as the cost approach will have to be used.

Owing to the difficulty in finding standard specifications of samples, PPIs for Leasing and Renting are obtained by the indirect method using PPI of General Machinery & Equipment, and economic variables such as exchange rate and interest rates.

Also, owing to the difficulty of applying the direct method (survey method), the PPI for Architectural and Other Engineering-Related Services is obtained by the indirect method, using wage data of the price indexes for the relevant raw & intermediate materials of construction.

Other Services

Other Services are composed of 66 basic items. The relevant price indexes (4 PPIs, 24 CPIs) are used to estimate output at constant prices.

As to most of other services, appropriate CPIs and PPIs are applied as deflators. All-item CPI and the Services PPI are used for several basic items of services, due to lack of relevant price indexes. These include Program Supply, Distribution of Movies, Program Production, Manufacturing

of Movies, Independent Arts, Professional Athletes, Ceremony Halls, Matrimonial Agencies, Individual Sick Nurses, Carpenters, Tips, etc.

To improve the accuracy of constant prices of services, it is necessary to newly compile survey price indexes for services which don't have appropriate price indexes.

IV. Concluding Remarks

To estimate the constant price output of the service sector in Korea, the items of SPPIs are insufficient compared with those of the goods sector. In this regards, more new items of SPPIs are required to develop.

Non-market services such as Government Services have no explicit price indexes. The outputs at constant prices are calculated by application of the relevant price indexes for the input cost items. These services are more than 20 % of total services. It is necessary to develop SPPIs of non-market services.

The users of the services consist of both corporations and households, and each sector has considerable weight in use of the services, CPI and PPI should be applied to the usages by corporations and by households, respectively.

<Reference>

Deflators by Kind of Service Industry

Wholesale and Retail Trade

Present Status

Wholesale and Retail Trade is estimated as a single industry, not as two sub-industries by the reason that:

It is difficult to obtain source data on Wholesale and Retail Trade by sub-industry, because there are many firms carrying out both wholesale and retail trade in Korea, and they consist of small-scale businesses.

Wholesale and Retail Trade comprises 6 basic items (Agriculture, Livestock, Forestry, Fisheries, Mining & Manufacturing, and Export Goods), and deflators for those basic items are derived after nominal and real data on them are obtained in the process of GDP accounting.

Results of Review

In Korea, output of Wholesale and Retail Trade is estimated indirectly by using the margin ratios of the basic items and the trade amounts obtained in the process of GDP accounting, not by using survey data by type of business.

In this method, relevant price indexes are not required for estimating output at constant prices.

Restaurants and Accommodation

Present Status

Restaurants and Accommodation comprise 45 basic items, and the relevant 45 CPIs are used for estimating real output.

In the case of Restaurants, detailed price indexes corresponding to the basic items (for example Seoleongtang, Tangsuyuk, Hamburgers, etc.) are provided and therefore constant upper item prices are derived using the deflators weighted by these price indexes.

In the case of Accommodation, the relevant price indexes for Hotels, Inns and Condominiums are used to derive the constant prices for these items, and Accommodation CPI is applied to the Other Accommodation.

Results of Review

The classification of price indexes for Restaurants is very detailed and the indexes are easily surveyed, so there is no particular problem.

Although the Accommodation CPI is used as the deflator for Other Accommodation, it is judged that the Accommodation CPI plays a sufficient role as an appropriate deflator because the proportion of Other Accommodation (300 billion won at 2005 current prices) among Accommodation is quite small.

Transport, Storage and Communications

Present Status

Transport, Storage and Communications is composed of 56 basic items. The relevant price indexes (25 PPIs, 9 CPIs) are used to estimate output at constant prices.

The appropriate deflators (PPIs or CPIs) are used, in consideration of the properties of the service products and the availability of price indexes.

CPIs are applied where most of the relevant services are used by final consumers, and PPIs are used where there is intermediate use by corporations.

Present Status of Usage of Transport, Storage and Communications Deflators

Classification	Basic Items	Price Indexes
Transport (45 items)	Railroad Passengers, Railroad Freight, Road Freight, Coastal Waters Passengers, Coastal Waters Freight, Domestic Air Passengers, International Air Passengers, Air Freight, Operation of Passenger Bus Terminals, Operation of Freight Terminals, Operation of Highways and Related Facilities, Parking Facility Operation, Water Transport Support Activities, Airport Runway Fees, Building Rents, Harbor Loading & Unloading, etc.	relevant PPIs
	Subway Passengers, Intracity Buses, Intercity Buses, Express Buses, Taxicabs, Air Terminal Facilities Charges, etc.	relevant CPIs
Storage (5 items)	General Warehouses, Refrigeration & Cold Storage Warehouses, Farm Product Warehouses, Dangerous Goods Warehouses, Other Warehouses	relevant PPIs
Communications (6 items)	Postal Services, Courier Services, Wire Telecommunications , On-line Access Services	relevant PPIs
	Wireless Telecommunication, Telecommunication Reselling	relevant CPIs

Results of Review

Problem of choosing PPI or CPI

If the users of the services consist of both corporations and households, and each sector has considerable weight in use of the services, CPI and PPI should be applied to the usages by corporations and by households, respectively.

Examples of such basic items include Railroad Passenger Transport, Air Passengers, Wire Telecommunications, Postage, Courier Charges, Coastal Waters Passengers, Parking Facility Operation, etc.

For basic items which have no appropriate price index, it is necessary to develop new price indexes.

Improvements in Applying Transport, Storage and Communications Deflators

Basic Items	Current Status	Needed Improvement
Road Passenger Transport	Railroad Passenger Fares PPI	Railroad Passenger Fares CPI for household use
Domestic Air Passengers	Domestic Air Passenger Fares PPI	Domestic Air Passenger Fares CPI for household use
International Air Passengers	International Air Passenger Fares PPI	International Air Passenger Fares CPI for household use
Wire Telecommunications	Wire Telecommunications PPI	weighted price index of Local Area Charges CPI and Domestic Long Distance Charges CPI for household use
Postage, Courier Charges, Coastal Waters Passengers, Parking Facility Operation, etc.	relevant PPIs	relevant CPIs for household use

Items using price indexes of similar items

For items such as Chartered Buses, Hearse Operation, Oceangoing Foreign Passengers, Ship Piloting, Ship Cleaning Services, Road Loading & Unloading,

Travel Agencies, Land Freight Forwarding and Compound Freight Forwarding, price indexes for similar items are used to estimate constant prices, as there are no relevant price indexes for those items.

To improve the reliability of GDP at constant prices, it is required to develop new price indexes for items having over 500 billion won in output at current prices and which do not have the relevant price indexes.

Items for which Price Indexes of Similar Items are used

Items	Price indexes
Chartered Buses	arithmetic average of CPIs for Local Bus Fares, Cross Country Bus Fares and Express Bus Fares
Hearse Operation	Road Freight Transportation PPI
Oceangoing Foreign Passengers	Transoceanic Water Freight Charges PPI
Ship Piloting	Sea Transportation Support Activities PPI
Ship Cleaning Services	Sea Transportation Support Activities PPI
Road Loading & Unloading	Railroad Loading & Unloading Charges PPI
Travel Agencies, Land Freight Forwarding, Compound Freight Forwarding, Other Transport Support Activities, Railway Transport Support Activities, Operation of Harbour and Marine Terminal Facilities, etc.	Transportation PPI

Items in bold letters are those having over 500 billion won in output at current prices.

Finance and Insurance

Present Status

Finance and Insurance comprise 9 basic items, and the relevant price indexes (3 PPIs, 1 CPI) are used as deflators to estimate constant prices.

Nominal FISIM (Financial Intermediation Services Indirectly Measured) and Real FISIM are calculated by different methods, and the deflator of FISIM is estimated by dividing Nominal FISIM by Real FISIM.

Real FISIM is obtained by extrapolation with the rates of change of real interest-bearing assets and liabilities, which are derived by deflating nominal interest-bearing assets and liabilities with the all-item PPI.

For Life Insurance Corporations and financial service fees of Other Depository Corporations and Other Financial Intermediaries, which don't have the relevant deflators, we use the Services CPI for our deflators.

Present Status of Usage of Finance and Insurance Deflators

Basic items	Price index
Central Bank (non-market output)	all-item PPI (applied by kind of cost)
FISIM of Other Depository Corporations, Other Financial Intermediaries and Financial Auxiliaries	all-item PPI
Life Insurance Corporations, Service Fees of Other Depository Corporations and Other Financial Intermediaries	Services CPI
Financial Auxiliaries	weighted average of Services CPI and Security Brokerage Services PPI
Non-life Insurance Corporations	Non-life Insurance PPI

Results of Review

Relevant indexes required for some basic items

There are no appropriate price indexes related with Life Insurance Corporations , the financial service fees of Other Depository Corporations and Other Financial Intermediaries, so we use the Services CPI to estimate output for each item at constant prices.

It is necessary to develop the existing CPI on financial service fees by compiling CPI for three sub-items (Depository Corporations, Credit Card Companies and Securities Companies) and to make a new CPI for Life Insurance Corporations, which doesn't have an appropriate price index.

Real Estate

Present Status

Real Estate is composed of 4 basic items, and the relevant price indexes (2 PPIs, 1 CPI) are used as deflators to estimate constant prices for each item.

Present Status of Usage of Real Estate Deflators

Basic items	Price index
Real Estate Leasing, Real Estate Development	Real Estate Rental PPI
Real Estate-related Services	Real Estate Agencies & Appraisal Services PPI
Housing Services	House Rental CPI

Results of Review

Relevant indexes required for some basic items

For Housing Services, Real Estate Leasing and Real Estate-related Services, the suitable price indexes are used. However, for Real Estate Development, the Real Estate Rental PPI, the same deflator used for Real Estate Leasing, is used as a deflator, despite the essential differences between Real Estate Leasing and Real Estate Developments.

Although the size of nominal output of Real Estate Development is only 200 billion won, it is necessary to develop a PPI for this item to meet statistics demand associated with its future potential growth.

Business Services

Present Status

Business Services comprises 55 basic items*. Constant price estimates of output are obtained by using 16 PPIs and 1 CPI as deflators.

* Research Institutions (National Institutions) is a part of Business Services; however, it will be explained with the government sector.

For Business Services, the relevant PPIs are mainly used as deflators.

However, for services related to research, such as Research Institution, In-company Research & Development, all-item PPI or the Services CPI are used due to lack of relevant price indexes. For Business and Management Consulting, Human Resource Supply & Employment Agency Services, Business-Intermediation Services, all-items or the Services CPI are applied because they don't have their relevant price indexes.

Present Status of Usage of Business Services Deflators

Basic items	Price indexes
34 items such as Advertising, Legal Services, Accounting Services, Software Development & Supply, etc.	PPIs of relevant items
In-Company Research and Development (R&D)	all-item CPI
Research Institutions (Industry and Non-Profit Organizations) including 5 items such as Natural Sciences and Social Sciences; Other Business Services including 15 items such as Human Resource Supply & Employment Agency Services, Business Intermediation Services, and so on	arithmetic average of all-item CPI and Services PPI

Results of Review

Needs for new compilation of relevant price indexes

Relevant price indexes for some items, such as Research Institutions (Industry & Non-Profit Organizations), In-Company Research & Development, Business &

Management Consulting, Human Resource Supply & Employment Agency Services, and Business Intermediation Services, have not been estimated until now.

Nowadays, there are increases not only in the degree of interest in such service items, but also in their weights in the national income statistics.

There has been concern about the accuracy of the estimates of their constant value, since there are no relevant price indexes for them despite their having their own product structures and characteristics. Estimates are therefore made using the all-item CPI or the Services PPI as deflators.

To improve the reliability of constant prices in the national accounts, it is necessary to newly develop price indexes for the items which don't have appropriate prices, and whose current outputs are in excess of 500 billion won.

It might be possible to use an indirect survey method, such as the cost approach.

Basic items for which surveys of new deflators are necessary

Classification	Basic items
6 related Research Services items	Research Institutions (Industrial Institutions: Natural Sciences and Social Sciences), Research Institutions (Non-Profit Organizations: Natural Sciences, Social Sciences and Others), and **In-Company Research & Development (R&D)**
12 items of Other Business Services	**Technology Test Inspection**, Geological Surveys & Exploration, Market & Public Opinion Surveys, News Supply, **Business & Management Consulting**, Credit Surveys, **Human Resource Supply & Employment Agency Services, Business-Intermediation Services, Organizations of Businesses & Business Managers**, Professional Organizations, **Entertainer Representation, Free Lance Professions**

Items in bold letters are those having over 500 billion won in output at current prices.

Compilation of price indexes using the indirect method

Owing to the difficulty in finding standard specifications of samples, PPIs for Leasing & Renting are obtained by the indirect method using PPI of General Machinery & Equipment, and economic variables such as exchange rate and interest rates.

Also, owing to the difficulty of applying the direct method (survey method), the PPI for Architectural & Other Engineering-Related Services is obtained by the indirect method, using wage data of the price indexes for the relevant raw & intermediate materials of construction.

When the price indexes related to Leasing & Renting are estimated, it is necessary in addition to reflect the trends of lease prices of representative samples and cost factors. For estimating the PPI on Architectural & Other Engineering-Related Services, it is also required to reflect the actual market-based data.

Items for which selecting representatives is difficult

It is difficult to choose the representatives for the price surveys of Legal and Accounting Services, because those services have such a variety of composition items.

The composition items include cancellation of real estate registrations, registrations of incorporation, registration records, patents, trademarks, licenses, auditing, consulting (premium rate per hour), labor cost per hour, taxation adjustment, bookkeeping fees, and so on.

Also, price indexes related to Attorney Services have not existed, due to the difficulty in accurate estimation because fees are made up in accordance with the conventional practice of each industry, rather than any fixed premium rates.

It is necessary to consider estimating the Attorney Services PPI newly. To improve the accuracy of GDP estimation, more intensive research is also required concerning the price indexes already estimated for some items, such as Judicial Scrivener Fees, Customs Broker Remunerations, Patent Attorney Fees, Fees for Certified Public Accounting Services, and Fees for Taxation Services.

Public Administration, National Defense and Compulsory Social Security

Present Status

Although the size of the Public Administration, National Defense and Compulsory Social Security sector is quite large, it is regarded as one basic item because it produces non-market services and its sub-items have very similar production structures.

Constant price estimates of output are calculated by dividing input expenses (i.e., fixed capital consumption, intermediate consumption and so on) by their respective deflators.

The compensation of employees deflator is derived by dividing compensation of employees at current prices by compensation of employees at constant prices (which is estimated by multiplying compensation of employees at constant prices in the same period of the previous year by the rate of change in the number of public servants for the period concerned).

The fixed capital consumption deflator is determined by using the relevant price indexes for 12 basic items.

The intermediate consumption deflator is determined by using the relevant price indexes for 24 basic items.

Results of Review

Compensation of employees at constant prices, which is estimated by using rates of change in the number of public servants, has a defect in that it cannot consider changes in productivity.

It is necessary to devise a new means of calculating the deflator for compensation of employees at constant prices.

Education Services

Present Status

Education Services are composed of Education (Industry), Education (Non-Profit Organizations), and Education (National Institutions)*. They comprise 15 basic items. Constant price estimates of output are obtained by using 12 CPIs as deflators of these basic items.

* Education (National Institutions) is a part of Education Services; however, it will be covered with the government sector.

For Education Services, the relevant CPIs are mainly used.
For some items, however, such as Primary Educational Institutions, Education for the Handicapped Institutions, Vocational & Technology Education Institutions, which don't have their own appropriate CPIs, the CPIs of similar items or the all-item CPI are used.

Present Status of Usage of Education Services Deflators

Basic items	Price indexes
mostly basic items related to education (10 items such as Middle Schools, High Schools, and so on)	CPIs of relevant items
Elementary Schools	Middle Schools CPI
4 items including Special Education Institutions, Vocational & Technology Education Institutions, and Educational Foundations	all-item CPI

Results of Review

There are suitable CPIs to match with most of the basic items of Education Services. On the other hand, Some items, such as Primary Educational Institutions, Education for the Handicapped Institutions, and Vocational & Technology Education Institutions, don't have appropriate price indexes. But, these items are of relatively low importance since their current outputs are below 500 billion won, so it is reasonable to estimate constant output for them by the current method using the all-item CPI or the CPIs of similar items as deflators.

Health and Social Welfare Services

Present Status

Health and Social Welfare Services are composed of 23 basic items*. Constant price estimates of output are obtained by using 42 CPIs as deflators of these basic items.

* Health Services (National Institutions) and Social Welfare Services (National Institutions) are parts of Health and Social Welfare Services; however, they will be explained with the government sector.

For Health and Social Welfare Services, the suitable CPIs are mainly used as the deflators. But, in the cases of the related non-profit services, such as Social Welfare Services (Children) and Health Services, the same CPI as for the relevant for-profit organizations or the all-item CPI are used, owing to lack of relevant CPIs for them.

Present Status of Usage of Health & Social Welfare Services Deflators

Basic items	Price indexes
15 items such as Privately-Established General Hospitals & Clinics, Dental Hospitals & Clinics, Drugs & Pharmaceuticals, and so on	CPIs of relevant items
8 non-profit items such as Social Welfare Services (Children, the Elderly, Women, the Disabled), Health Services, and so on	all-item CPI or the price indexes related to the relevant for-profit businesses

Results of Review

Development of price indexes related non-profit services required

Nowadays there is increased interest in non-profit services such as Social Welfare Services (Children, the Elderly, Women, the Disabled), Health Services, and so on. Despite their importance increased, there are no relevant CPIs for them.

The same CPIs as those for the related for-profit items or the all-item CPI are therefore used as the deflators.

It is necessary to newly develop price indexes for these non-market services, to reflect the economic situation correctly. Use of an indirect method such as the expense approach might be possible.

Other Services

Present Status

Other Services comprise 66 basic items[*]. Constant price estimates of output are obtained by using 4 PPIs and 24 CPIs as deflators for these basic items.

* Sewage & Refuse Disposal, Sanitation & Similar Activities (National Institutions) and Cultural Services (National Institutions) are parts of Other Services; however, they will be explained with the government sector.

For Other Services, the relevant CPIs are mainly used as the deflators. But, in cases where there are no appropriate price indexes, such as Program Supply, Distribution of Movies, Independent Arts, and Recording Business, the all-item CPI or the Services PPI are used.

Present Status of Usage of Other Services Deflators

Basic items	Price indexes
3 items : Local Public Corporation Proceeds from Sewage Usage Fees, General Broadcasting, Auto-Repair Services	PPIs of relevant items
38 items such as Cable & Satellite Broadcasting, Screening Businesses, and so on	CPIs of relevant items
3 items : Program Supply, Distribution of Movies, Program Production	Services PPI
22 items such as Manufacturing of Movies, Independent Arts, Professional Athletes, Ceremony Halls, Matrimonial Agencies, Fortune Telling, Checkrooms, Massage Parlors, Individual Sick Nurses, Carpenters, Tips, Religious Organizations, Political Organizations, Labor Organizations, Sports Organizations, Cultural Scholarship Foundations, etc.	all-item CPI

Results of review

Relevant indexes required for some basic items

There are some basic items for which price indexes do not exist, despite their having their own distinguishing features. Examples include Program Supply, Distribution of Movies, Program Production, Manufacturing of Movies, Independent

Arts, Professional Athletes, Ceremony Halls, Matrimonial Agencies, Individual Sick Nurses, Carpenters, Tips, etc. The all-item CPI or the Services PPI are used as deflators for these items.

To improve the accuracy of constant output in the national income statistics, it is necessary to newly survey price indexes for such items which don't have appropriate indexes, and whose current outputs are in excess of 500 billion won.

Basic items for which survey of new deflators is necessary

Basic items	Needed new deflators
Program Supply, **Manufacturing of Movies**, Distribution, Program Production	PPIs
Ceremony Halls, Matrimonial Agencies, **Fortune Telling**, Checkrooms, Massage Parlors, Rental of Theaters, Entertainer Membership Organizations, **Independent Arts**, Recording Business, Professional Athletes, Sporting Organizations & Support Organizations, Sporting Operation Business, Gyms, Tennis Courts, Table Tennis Halls, Baduk Rooms, **Gambling Rooms**, etc.	CPIs

Items in bold letters are those having over 500 billion won in output at current prices.

Deflation of Government Services in Korea

Definition and Coverage

Government Services in the national accounts in Korea mean all services produced by the general government. This is estimated by using the budget and settlement report of the general government.

Government Services consist of various services not only in the Public Administration, National Defense & Compulsory Social Security, but also in the National Institutions sub-classifications in the Business, Education, Health & Social Welfare and Other Services sectors.

This sector comprises 7 basic items – Public Administration, National Defense & Compulsory Social Security; Research (National Institutions); Education (National Institutions); Health Services (National Institutions); Social Welfare Services (National Institutions); Sewage & Refuse Disposal, Sanitation & Similar Services (National Institutions); and Cultural Services (National Institutions).

Constant Prices and Deflators

Constant price estimates of output for the general government are calculated by combining constant price value added and constant price intermediate consumption after their respective real values are estimated.

First, value added of General Government Services at constant prices is estimated by adding the constant price values of compensation of employees and fixed capital consumption.

Compensation of employees: nominal compensation of employees / real compensation of employees
(Nominal value is estimated by using the fiscal performance results of the Ministry

of Planning & Budget and local administrative departments. Real value is estimated using the rates of change in personnel numbers for public servants, data that can be obtained from the Ministry of Government Administration & Home Affairs and the National Health Insurance Corporation.)

After the constant price indexes for 12 basic items are estimated, fixed capital consumption deflators are distributed by item using the ratios by type of capital goods during the base year.

Present Status of Usage of Fixed Capital Consumption Deflators

Classification	Price indexes
1-1. Buildings (Residential)	Construction Industry Building Construction Residential CT deflator
1-2. Buildings (Non-Residential)	Construction Industry Building Construction Non-Residential CT deflator
2. Shipping, Vehicles, Transport Tools	Transportation PPI
3-1. Machinery and Fixtures (Assembled Metals)	Assembled Metals PPI
3-2. Machinery and Fixtures (Machinery)	Machinery PPI
3-3. Machinery and Fixtures (Electric Machines)	Electric Machines PPI
3-4. Machinery and Fixtures (Precision Machines)	Precision Machines PPI
4. Software	Computer Programming Fees PPI
5. Social Overhead Capital	Construction Industry Civil Engineering CT deflator
6-1. Defense Assets (Buildings)	Buildings CT deflator (1.1 and 1.2)
6-2. Defense Assets (Structures)	Construction Industry Civil Engineering CT deflator
6-3. Defense Assets (Machinery Fixtures)	Machinery and Fixtures deflator (3.1 ~ 3.4)

Intermediate consumption is distributed by item using the I/O intermediate ratios at the base year after the respective constant price indexes of 24 basic items are estimated.

Present Status of Usage of Intermediate Consumption Deflators

Classification	Price indexes
Agriculture, Forestry and Fisheries	Agriculture, Forestry and Fisheries PPI
Mines	Mines PPI
Foodstuffs	Foodstuffs PPI
Textiles and Clothes	Textiles and Clothes PPI
Leathers and Shoes	Leathers and Shoes PPI
Wood	Wood PPI
Pulp, Paper and Publications	Pulp, Paper and Publications PPI
Coke and Petroleum	Coke and Petroleum PPI
Chemicals	Chemicals PPI
Rubber and Plastic	Rubber and Plastic PPI
Nonmetals	Nonmetals PPI
Metals	Metals PPI
Assembled Metals	Assembled Metals PPI
Machinery	Machinery PPI
Electric Machines	Electric Machines PPI
Electronic, Imaging, Sound and Telecommunication Equipment	Electronic, Imaging, Sound and Telecommunications Equipment PPI
Precision Machines	Precision Machines PPI
Transportation Equipment	Transportation Equipment PPI
Furniture, etc.	Furniture, etc. PPI
Electric Power, Water and Gas	Electric Power, Water and Gas PPI
Others	All-item PPI
Maintenance and Repair of Dwellings	Maintenance and Repair of Dwellings CPI
Transportation	Transportation CPI
Post and Communications	Communications CPI

Results of Review

There are some arguments about the appropriateness of estimating compensation of employees at constant prices using the rates of change in the number of public servants for the relevant quarter, because this method assumes that the compensation system including wages is constant.

It is necessary to revise how compensation of employees at constant prices is estimated, by using the public servants' wage index.