



# ***BOJ***

## ***Reports & Research Papers***

October 2014

## **Rebasing the Services Producer Price Index to the Base Year 2010**

**Research and Statistics Department, Bank of Japan**

Please contact below in advance to request permission when reproducing or copying the content of this paper for commercial purposes.

Research and Statistics Department, Bank of Japan

P.O. BOX 30, Tokyo 103-8660, Japan

e-mail: [post.rsd3@boj.or.jp](mailto:post.rsd3@boj.or.jp)

Please credit the source when quoting, reproducing, or copying the content of this paper.

## [Summary]

The Research and Statistics Department of the Bank of Japan (hereinafter, "the Bank") has recently completed its rebasing of the Services Producer Price Index (re-referencing the index to the year 2010=100 from its previous base of 2005=100).

As part of this process, the Bank first has incorporated new services consistent with the transition towards a more service-oriented economy. Second, the Bank has reviewed pricing methods with the aim of reducing noise (such as errors associated with the unit value method), expanded the application of quality adjustments, and reduced the reporting burden through the utilization of other statistics and databases. Third, the Bank has changed the markets covered by the Basic grouping index from "domestic and import" to "domestic" only. Finally, the Bank has renamed the Corporate Services Price Index (CSPI) to the Services Producer Price Index (SPPI) in English (the Domestic Corporate Goods Price Index has also been similarly renamed to the Producer Price Index).

The number of Items in the 2010 base index has been increased to 147 from 137 for the 2005 base index. Furthermore, the coverage (transaction value of business-to-business services covered in the SPPI / total transaction value of business-to-business services) has increased to 50.5% from 48.8% for the 2005 base index.

The 2010 base index has generally followed the same trend as the 2005 base index. However, there is a small divergence between the 2010 and 2005 base indexes reflecting differences in market coverage, meaning that the Basic grouping index of the 2010 base index covers only the "domestic" market, although that of the 2005 base index covers the "domestic and import" markets. The 2005 base index (domestic base), which is recalculated by separating out imported services from the 2005 base index, moves in the same fashion as the 2010 base index. Finally, the 2010 base index successfully reduces noise by comparison with the 2005 base index (domestic base).

A survey of wholesale services prices was also conducted on a trial basis. The Bank would like to have more in-depth discussions on the survey of wholesale services prices with the relevant counterparties while continuing to accumulate data.

The Bank would like to continue the discussions with users and companies cooperating with surveys to improve our price statistics.

## **I. Introduction**

The Research and Statistics Department of the Bank of Japan (hereinafter, "the Bank") has conducted its rebasing of the Services Producer Price Index (SPPI) in accordance with the "Final Draft of the Rebasing of the Corporate Services Price Index to the Base Year 2010 (available in Japanese only)" (hereinafter, "Final Draft") published in February.<sup>1</sup>

This document explains the main features of the rebasing of the index to the base year 2010 (Section II), presents an outline of the 2010 base index (Section III), summarizes price developments of the 2010 base index (Section IV), and discusses the introduction of wholesale services price survey and various steps to be taken in the future (Section V). Section VI ends.

## **II. Main features of the rebasing of the index to the base year 2010**

This section explains the main features of this rebasing: incorporation of new services; reviews and improvements of pricing methods and quality adjustment methods for existing Items; changes in the index structure and renaming of certain statistical titles; and improving the usability of the statistics.

### **A. Incorporation of new services**

In this rebasing, the Bank incorporates services that have grown to a certain market size in recent years or those that are expected to grow in the future in line with the transition towards a more service-oriented economy.

#### **1. Advance in information and communication technology**

Dramatic advances in information and communication technology (IT) have had significant impacts on Japan's economy. The 2010 base index newly incorporates Items "ASP" (Application Service Provider) and "Internet data centers," which are services

---

<sup>1</sup> See the "Basic Policy of the Rebasing of the Corporate Services Price Index to the Base Year 2010 (available in Japanese only)" (published on May 16, 2013 by the Research and Statistics Department of the Bank of Japan; hereinafter referred to as "Basic Policy") for the basic policy behind the rebasing and the "Final Draft of the Rebasing of the Corporate Services Price Index to the Base Year 2010" (published on February 7, 2014 by the Research and Statistics Department of the Bank of Japan) for the "Final Draft."

utilizing cloud computing technology, in addition to "Mobile data communications services," which are high-speed communications services accessed through mobile devices such as portable broadband modems. Services related to electronic settlements of online payments, those providing electronic money payment methods to merchants, and voice and data communication services via smartphones have also been newly incorporated into certain existing Items.<sup>2</sup>

As an example, Chart 1 (1) shows the price development of Item "ASP," which follows a gradual downtrend. The quality of an ASP generally improves over time via upgrades, for which reason the Bank performs quality adjustments based on upgrade costs.<sup>3</sup> The declining trend of the Item index indicates that on average, increases in prices are relatively small compared to the improvements in quality achieved via upgrades. A similar trend has also been observed for Item "Prepackaged software." This downward trend in the price index is indeed a known characteristic of IT services, where technological advancements occur rapidly.

## **2. Increased reliance on outsourcing**

Japanese companies have outsourced more of their business activities to enhance their competitiveness both at home and abroad. To capture such changes in corporate behavior, three new Items are introduced in the 2010 base index: "Employment services," "Warehouse space rental," and "Meal services for schools, hospitals, and nursing homes."

For example, the price index of Item "Employment services" has been increasing gradually (Chart 1 [2]). This is due to an increase in agent commission rates as demand increases for "general registration type" services that comprise a large portion of the

---

<sup>2</sup> These make up part of Items "Internet based services," "Interchange fees for credit card and electronic money payments" (supplementing the 2005 base index Item "Credit card interchange fees"), and "Cellular phone services and PHS services," respectively.

<sup>3</sup> The SPPI is concatenated when there is a difference in the qualities of old and new services by eliminating the "price difference due to quality difference" from the price difference between old and new services. This process is called "quality adjustment." For Item "ASP," the first step is to ask companies about the cost required for the expansion of functions, for example, when upgrading a service covered by the survey. Upgrade costs are calculated for one usage unit and eliminated from the difference in the price before and after the upgrade in order to make the quality adjustment.

market.<sup>4</sup>

### **3. Heightened awareness of environmental issues and disaster risks**

In recent years, there has been an increase in demand for safety testing of food and other goods as consumers become increasingly aware of various safety and security issues. There has also been greater demand for measurement of environmental conditions as social attitudes evolve. Moreover, since the Great East Japan Earthquake of March 2011, companies have taken greater precautions against various disaster-related risks. Taking such changes into account, the 2010 base index introduces two new Items in the form of "Commodity inspection services" and "Environmental surveying certification." The Bank, in addition, includes the "Safety confirmation services" for confirming the safety of employees by e-mail in the event of a disaster as part of Item "ASP."

For example, Chart 2 indicates developments in the index for "Commodity inspection services" and "Environmental surveying certification." Price indexes have declined as a result of excess supply stemming from capital investment made in anticipation of growing demand.

### **4. Enhancement of price deflator function**

The SPPI is used as a price deflator when calculating the real values of services for purposes such as the estimation of the *National Accounts* (the Cabinet Office). With the aim of enhancing this price deflator function, the 2010 base index introduces two new Items: "Services relating to water transport" and "Airport & air traffic control and services relating to air transport" as indicated in the "Final Draft."

## **B. Reviews and improvements of pricing methods and quality adjustment methods for existing Items**

In this rebasing, the Bank reviews and improves the pricing methods and the quality adjustment methods used for existing services.

---

<sup>4</sup> Sample prices of Item "Employment services" include both "general registration type" services that involve arranging employment contracts at the request of both job seekers and companies seeking workers, and "re-employment support type" services that involve supporting and arranging re-employment of employees and former employees of companies.

## **1. Adjustment aimed at reducing noise in the Item indexes**

First, an adjustment of several Items using the unit value method<sup>5</sup> is conducted with the aim of reducing errors associated with the unit value method in the Item indexes. Specifically, an attempt is made to reduce such errors of the respective Item indexes by reviewing the grouping in the average prices of Items "Civil engineering design services" and "Custom software,"<sup>6</sup> and by increasing the number of prices surveyed for "Plant engineering" (Chart 3).

## **2. Responding to greater diversification in pricing**

The Bank applies the model pricing method for Item "Cellular phone services and PHS services" and Subgroup "International air passenger transportation." The model pricing method is designed to efficiently capture the pricing of services for which pricing plans are significantly diversified by terms of conditions. In this rebasing, the Bank carefully modifies details of the model pricing method in order to promptly replicate recent price setting and observed developments in prices.<sup>7</sup>

For Item "Cellular phone services and PHS services," the 2005 base index assumed two types of customers: the "typical type" who select the most popular price plan and the "cheapest type" who select the cheapest price plan. In this rebasing process, the Bank finds through interviews with carrier companies that the cheapest plans have lost their appeal to customers and that most corporate customers have been classified into the "typical type." Thus, the Bank assumes only the "typical type" in the 2010 base index. When comparing trends in the two indexes, however, there are no significant differences in the developments of the 2005 and 2010 base indexes (Chart 4 [1]).

---

<sup>5</sup> Surveys using the unit value method enable the construction of an index by surveying the average price of a number of services with similar qualities in cases where it is difficult to continually survey the price of the same service, such as for order-made transactions. An advantage of this method is the ability to determine actual trends by incorporating many transactions. However, it could have significant errors if the scope of the grouping is too broad.

<sup>6</sup> For example, errors in the average price of Item "Civil engineering design services" are reduced by surveying prices of services which are grouped by contract format types. In addition, errors in Item "Custom software" are reduced by taking measures such as limiting the grouping of customers from "non-manufacturing" to "merchandising only."

<sup>7</sup> See Section 4-2 of the "Final Draft" for further information on the review of Subgroup "International air passenger transportation."

### **3. Applying quality adjustment in advertising**

In Major Group "Advertising services," quality is defined as an effect of advertising, which is generally considered to be proportional to the number of people who view advertising. Therefore, quality adjustments are necessary when the number of advertising viewers changes over time.

The 2010 base index newly introduces quality adjustment to Item "Newspaper advertising."<sup>8</sup> Specifically, to adjust for quality change due to a decline in number of copies sold, the "advertising price per copy" is adopted as the sample price by dividing advertising fees by the number of copies sold. As a result of this adjustment, the 2010 base index has shifted upwards somewhat compared to the 2005 base index (Chart 4 [2]).

### **4. Reducing the reporting burden**

In this rebasing, the Bank newly adopts databases for some Items such as "Advertising in traffic facilities" and "Underwriting services" alternatively. This is to reduce the reporting burden on companies.<sup>9</sup>

In Item "Advertising in traffic facilities," the introduction of prices from dedicated databases not only reduces the reporting burden but also significantly expands the scope of services surveyed. As a result, the 2010 base index successfully tracks actual price developments such as the seasonality of poster advertising prices and an upward trend in prices of digital signage (Chart 4 [3]).

## **C. Changes in the index structure and renaming of certain statistical titles**

As proposed in the "Final Draft," coverage of the Basic grouping index in the 2010 base SPPI has been changed from "domestic and import" markets (service products produced by domestic businesses and imported service products provided to other domestic businesses) to "domestic" markets (service products provided by domestic businesses to other domestic

---

<sup>8</sup> The six Items for which quality adjustments are made in the 2010 base index using the number of advertising viewers are "Television advertising (spot advertising)," "Newspaper advertising," "Leaflet advertising," "Direct mail," "Internet advertising," and "Free newspaper and magazine advertising."

<sup>9</sup> Fourteen Items in the Basic grouping index of the 2010 base index utilize prices from other statistics and databases.

businesses) only, complying with the approach of the Producer Price Index (PPI), the de facto global standard in corporate price statistics (Chart 5 [1]). Furthermore, the Bank renames the Corporate Services Price Index (CSPI) to the Services Producer Price Index (SPPI) in English starting with the 2010 base index. The Domestic Corporate Goods Price Index (DCGPI) is also renamed to the Producer Price Index (PPI) because the current index structure is consistent with the concept of the Producer Price Index<sup>10</sup> (Chart 5 [2]).

#### **D. Improving the usability of the statistics**

In the 2010 base index, the Services Import Price Index has been published as the Reference index separated from the Basic grouping index to meet user needs.

The Bank continues to publish linked indexes of the Basic grouping index that link the 2010 base index to each past base index in order to enable the use of long-term time series data. Coverage of the past indexes is adjusted to "domestic" markets for the particular Subgroups in which imported services accounted for a large percentage of sample prices.<sup>11</sup>

Finally, the breakdowns of existing Items and the indexes are published for certain Items for which sufficient sample prices can be obtained. First, "Television advertising" is published as two different indexes for program sponsorships and spot advertising (Chart 6 [1]). Next, indexes "for private sectors" and "for public sectors" are published as the Reference indexes for Items "Building cleaning services," "Facility management services," and "Security services (except Alarm monitoring services)." For example, Chart 6 (2) indicates that the indexes for private sectors and for public sectors for "Building cleaning services" follow quite different trajectories.

---

<sup>10</sup> No change is made to the English title of the Corporate Goods Price Index.

<sup>11</sup> Because the 2010 base index and past base indexes cover different markets, linked indexes were created for five Subgroups for which imported services accounted for a large percentage of sample prices — "International air passenger transportation," "Ocean freight transportation," "Ship chartering services," "Marine cargo handling," and "International air freight transportation" — by recalculating the upper level indexes such as All items and Groups by separating out the imported portion from the weight in each of the past base indexes. Hence, the movements of the linked indexes published here differ slightly compared to each of the past base indexes such as the indexes for All items and certain Groups in December 2009 and earlier.



### **III. Outline of the 2010 base index**

#### **A. Number of Items and sample prices**

The number of Items in the 2010 base index has increased to 147 from 137 in the 2005 base index<sup>12</sup> (Chart 7 [1]). This is a result of the removal of the two Items "Safe deposit box services" and "Oceangoing ship chartering services," the addition of new Items (+8 Items), and splitting of Items (4 Items → 8 Items: +4 Items) due to the incorporation of new services. In addition, the number of sample prices has increased by 70 prices compared to the 2005 base index to 3,533 prices<sup>13</sup> (Chart 7 [2]).

#### **B. Coverage and weights**

The value of business-to-business transactions used in the calculation of weights in the 2010 base index are estimated by primarily based on the *2010 Updated Input-Output Table* (the Ministry of Economy, Trade and Industry) and complemented by the utilization of the *2012 Economic Census for Business Activity* (the Ministry of Internal Affairs and Communications and the Ministry of Economy, Trade and Industry) and various other industry statistics.

The total transaction value used in the calculation of weights in the 2010 base index has decreased by 15 trillion yen compared to the 2005 base index (Chart 8 [1]). Looking at the breakdown, the separation of imported services (coverage of the Basic grouping index in this rebasing has been changed from "domestic and import" to "domestic" markets only) resulted in a reduction of 7 trillion yen, while a decrease in domestic transactions resulted in a reduction of 8 trillion yen. The decrease in domestic transactions is attributable to the decreases in Major Groups of "Leasing and rental" and "Finance and insurance." These are considered to reflect decreases in capital investment and financial transactions after the so-called "Lehman Shock."

---

<sup>12</sup> See Reference 1 and Reference 2 for a breakdown of the revision and removal of Items in the 2010 base index and an overview of the classification of Items.

<sup>13</sup> When rebasing the SPPI to the base year 2010, 1,324 sample prices accounting for almost 40% of the total have been replaced or newly incorporated. Furthermore, the number of sample prices may change in the future in line with a flexible review of sample prices not only when rebasing but also during base periods to reflect the spread of new services and changes in actual transaction conditions.

Coverage of the 2010 base index (transaction value of business-to-business services covered in the 2010 base index / total transaction value of business-to-business services) has increased to 50.5% from 48.8% for the 2005 base index (domestic base) after separating out imported services<sup>14</sup> (Chart 8 [2]). This is mainly due to the incorporation of Items "Commodity inspection services" and "Meal services for schools, hospitals, and nursing homes" as new services.

Finally, looking at the weights of each Major group, the weights of "Other services" and "Information and communications" have increased due to the increased reliance on outsourcing and the advancement in IT respectively (Chart 8 [3]). Comparing the old and new indexes, the weight of Major Group "Other services" has increased, while those of "Leasing and rental" and "Finance and insurance" have decreased.

## **IV. Price development of the 2010 base index**

### **A. All items: comparison with the 2005 base index**

In this section, the Bank briefly reviews the price development of the 2010 base index from January 2010 to December 2013. Chart 9 (1) shows that the index for All items falls during 2010 to 2012 but gradually increases in 2013. This trend is generally similar to that of the 2005 base index.

Looking at Chart 9 (1) more closely, the 2010 base index drops below the 2005 base index from 2013 onwards. This is due to the separation of imported services from the Basic grouping index in the 2010 base index, which mitigates the positive effect from the yen depreciation since the end of 2012. In other words, the difference between the new and old base indexes stems mainly from changes to the index structure, i.e. the separation of imported services from the Basic grouping index in this rebasing. This is consistent with the aforementioned interpretation that the 2010 base index moves almost in tandem with the 2005 base index after separating out imported services (domestic base) (Chart 9 [2] and [3]).

---

<sup>14</sup> Because the coverage of the Basic grouping index is altered to include only "domestic" markets in this rebasing, the scope of business-to-business transactions used in the calculation of weights is also changed to include only "domestic" markets. This paper provides a comparison of the old and new figures by calculating the coverage of the domestic base also for the 2005 base index.

Finally, when comparing the 2010 base index and the 2005 base index (domestic base), it is found that the 2010 base index contains less noise than the 2005 base index. This is a result of the aforementioned adjustment to reduce noise in several existing Items.

## **B. Decomposition of the difference in year-on-year changes of the index for All items between the old and new indexes**

In this subsection, the Bank compares the year-on-year changes of the index for All items between the 2010 base index and the 2005 base index (domestic base),<sup>15</sup> and decomposes their difference. The difference can be attributed to four factors: (1) the weight-change effect; (2) the index-level reset effect; (3) the new service incorporation effect; and (4) the Item index revision effect (Chart 10 [1]).

### **1. Weight-change effect and index-level reset effect**

The weight-change effect means that the contribution of changes in absolute value is larger (smaller) when the weight increases (decreases) compared to the old base index. The index-level reset effect means that the contribution of changes in absolute value is larger (smaller) when resetting the index level of individual Items to the 2010 level at 100 when the level of each Item index is lower or higher; further from 100 (nearer to 100) in the 2005 index.<sup>16</sup>

Chart 10 (2) indicates the decomposition of the difference of the year-on-year changes from January 2011 to December 2013 between the new index and the old index. This chart shows that the weight-change effect makes a positive contribution and the index-level reset effect makes a negative contribution to the annual average. By Item, the "Leasing of computer and related equipment" and "Cellular phone services and PHS services" contribute significantly via both the weight-change effect and index-level reset effect (Chart 11). This is a reflection of the significant declining trend in the price indexes for both

---

<sup>15</sup> Because International transportation accounts for a large portion of imported services separated from the Basic grouping index, the year-on-year comparison between the 2010 base index and the 2005 base index (domestic base) is almost the same as the year-on-year comparison of the index of All items (excluding International transportation) under the old and new index.

<sup>16</sup> The weight-change effect and the index-level reset effect tend to cancel each other out. For example, when a decrease (increase) in the weight of a certain Item is completely explained by a decrease (increase) in Item's relative price, the weight-change effect and the index-level reset effect completely cancel out each other.

Items from 2005, hence the decrease in the weights for both Items in the 2010 base index (Chart 12 [1]).

## **2. New service incorporation effect**

The new service incorporation effect is the change in the index for All items stemming from the incorporation of new services. While new services such as "Employment services" and "Warehouse space rental" have increasing trends in their price indexes, there are more Items such as "ASP," "Environmental surveying certification," and "Commodity inspection services" whose trends are decreasing. Thus, the new service incorporation effect lowers the year-on-year change of the index for All items throughout the period (Chart 12 [2]).

## **3. Item index revision effect**

The Item index revision effect tracks changes caused by revisions to the pricing methods or the quality adjustment methods for existing Items. The Item index revision effect pushes up the year-on-year change of the index for All items throughout the entire period in the annual average base (Chart 13 [1]). In Major Group "Advertising services," Items "Newspaper advertising" and "Advertising in traffic facilities" contribute to pushing up the index for All items. In Major Group "Information and communications," Items "System management and operation services" and "Custom software" also contribute positively to the index for All items (Chart 13 [2]). On the other hand, Items "Office equipment leasing" and "Leasing of computer and related equipment" in Major Group "Leasing and rental" contribute negatively to the index for All items.<sup>17</sup>

## **V. Implementation and discussion of wholesale services price survey**

Wholesale services account for the largest weight of those services not covered in the SPPI. Until this rebasing, the Bank had not conducted price surveys on wholesale services because the concept of its price is generally disputable and it is difficult in practice to conduct price surveys to compile a quality-adjusted price index. However, the "Final Draft" proposed to start the feasibility examination of a price survey for wholesale services.

---

<sup>17</sup> In these Items, the inflators are changed from the 2005 base index to the 2010 base index of the Corporate Goods Price Index going back to January 2010, and this also has a lowering effect.

As a result of this examination, the Bank computes price indexes on a trial basis for "Food and beverages wholesale services," "Plastics wholesale services," and "Electronic parts and devices wholesale services" (see Appendix for details). The Bank expects these preliminary results will facilitate further discussion on price surveys for wholesale services.

It is necessary to review the validity of pricing methods while accumulating data on price surveys for wholesale services. The Bank considers that it is appropriate to conduct price surveys for wholesale services separated from the survey for the SPPI at the present time. The Bank would like to properly review pricing methods for wholesale services including whether the survey results on a trial basis can be updated yearly, while continuing discussion with the relevant statistical departments of government, companies, and experts.

## **VI. Closing**

In this rebasing, the Bank has received much cooperation from relevant companies and industry groups, academics and economists, and the relevant statistical departments of government. The Bank would like to take this opportunity to express its gratitude for this cooperation.

In recent years, statistics have played an increasingly important role as economic conditions change significantly both in Japan and abroad. The Bank will continue its unremitting efforts to review sample prices and improve price survey procedure to provide highly reliable statistics.

The Bank would also like to properly examine medium- to long-term issues. The Bank therefore asks for your continued cooperation and comments from a variety of perspectives concerning the statistics it provides.

## **Appendix : Results of examination of the introduction of wholesale services price survey**

### **I. Introduction**

Wholesale services account for the largest weight of those services not covered in the SPPI (Appendix Chart 1 [1]). Until this rebasing, the Bank had not surveyed prices of such services in the SPPI. The reasons for this can be summarized as follows.

First, the definition of the price of wholesale services is disputable and the price is not necessarily observable. Assuming that real output of wholesale services is proportional to the volume of products handled, prices of wholesale services is equal to the margin per unit (the difference between the sale price and the purchase price of a product).<sup>18</sup> However, this definition of price may not be easy to understand. Moreover, if a company does not keep track of margins for individual products and transactions, the margin per unit cannot be directly observed.

Second, it is difficult in practice to conduct price surveys and calculate a price index for wholesale services. As mentioned above, companies do not necessarily keep track of margins for individual products and transactions. If rebates fulfill a substantial price adjustment function, it is necessary to take fluctuations in such rebates into account. Furthermore, it is not easy to conduct price surveys with quality held constant for wholesale services, because the nature of wholesale services varies between companies.

On the other hand, some concrete progress is required to facilitate further discussion with the relevant parties about price surveys of wholesale services. This led the Bank to conduct a preliminary examination of actual situation of the wholesale industry and exchange opinions with companies, industry groups, economists and statisticians with the aim of commencing price surveys for wholesale services. As a result, price indexes have been recently computed on a trial basis for the three groups of "Food and beverages wholesale services," "Plastics wholesale services," and "Electronic parts and devices wholesale services."

---

<sup>18</sup> At present, the predominant approach is to use gross profit — that is, the difference between the sale price and the purchase price — to measure nominal output (gross production) of wholesale services. This is the underlying premise of the pricing method for wholesale services.

## **II. Pricing methods**

In wholesale services, products handled, suppliers, customers, and services provided vary for each transaction. In this price survey, the Bank obtained cooperation from leading companies in each group, asked each company how margins were registered for accounting purposes, and surveyed the margin per unit according to the actual accounting method. Specifically, the first step involves identifying typical "products" or "product groups" that serve as the units used for margin accounting in each of the companies surveyed. The next step is to pick up "one company" or a "group of several similar companies" as representative supplier(s) and customer(s) for each product or product group. The margin to be surveyed is defined as the margin for a typical product (a single product or a group of several similar products) in transactions between suppliers and customers (companies or a group of similar companies). A surveyed company is asked the margin amount per product if it registers the margin as the margin amount (difference between sales value and purchases value), and the margin ratio if it registers the margin as the margin ratio (gross profit ratio = margin amount / sales). When the margin ratio is surveyed from companies, the weighted average of the Item index of the PPI corresponding to the product or product group is used as an inflator to calculate the margin per unit.

Our approach places relatively small reporting burden on companies, because the pricing method is consistent to the accounting practices of each company. Meanwhile, for that reason, the degree of fixation of services surveyed varies depending on the company in our approach.

The survey frequency is quarterly so as to be consistent with accounting customs and to minimize the reporting burden. The price indexes for each group are calculated as an arithmetic mean with equal weights on survey prices.

## **III. Food and beverages wholesale services**

"Food and beverages wholesale services" covers wholesale services handling food and beverages. In comparison with other two groups whose price indexes are calculated in this paper, three characteristics of "Food and beverages wholesale services" can be pointed out. First, the product groups covered are made up of a large number of products. Second, the supplier is not generally fixed, while the customer groups are fixed as several companies in the same business category such as for supermarkets and for convenience stores. This is in

line with the "Food and beverages wholesale services" business model of purchasing products in bulk from a variety of suppliers and selling products with smaller portion sizes responding to customers' demand. Third, many companies in "Food and beverages wholesale services" manage the profitability of transactions based on the margin ratio by roughly grouping products. This observation implies that there is no significant divergence in the margin level for each customer if in the same business category.

The price index for "Food and beverages wholesale services" has declined slightly since 2012 (Appendix Chart 2 [1]). This suggests that the degree of competition among wholesalers has intensified against the backdrop of the expansion of direct purchasing by major retailers and the oligopoly of manufacturers.

#### **IV. Plastics wholesale services**

"Plastics wholesale services" covers wholesale services handling various synthetic resins that are chemical products. "Plastics wholesale services" has the feature that the scope of products handled is relatively small and that most of companies control margins by fixing customer groups for groups of products with similar functions. This industry practice is consistent with the comment that "The margin level is determined according to product functions and the business category of the customer, and there is no significant difference in individual margins in transactions for similar products and business categories."

The price index compiled on a trial basis has been gradually increasing since 2010 (Appendix Chart 2 [2]). The wholesale margin gradually increases in line with the price increase of naphtha — a raw material used to produce plastics — while the margin ratio remains stable.

#### **V. Electronic parts and devices wholesale services**

"Electronic parts and devices wholesale services" covers wholesale services handling electronic parts and devices such as integrated circuits and connectors. In many cases, the margin ratio in "Electronic parts and devices wholesale services" is accounted by specifying one supplier and customer for each product.

This price index has declined gradually since 2010 (Appendix Chart 2 [3]), which is consistent with the comment that "The margin for related electronic parts and devices is decreasing because the markets for smartphones and tablets have matured."



## **VI. Closing**

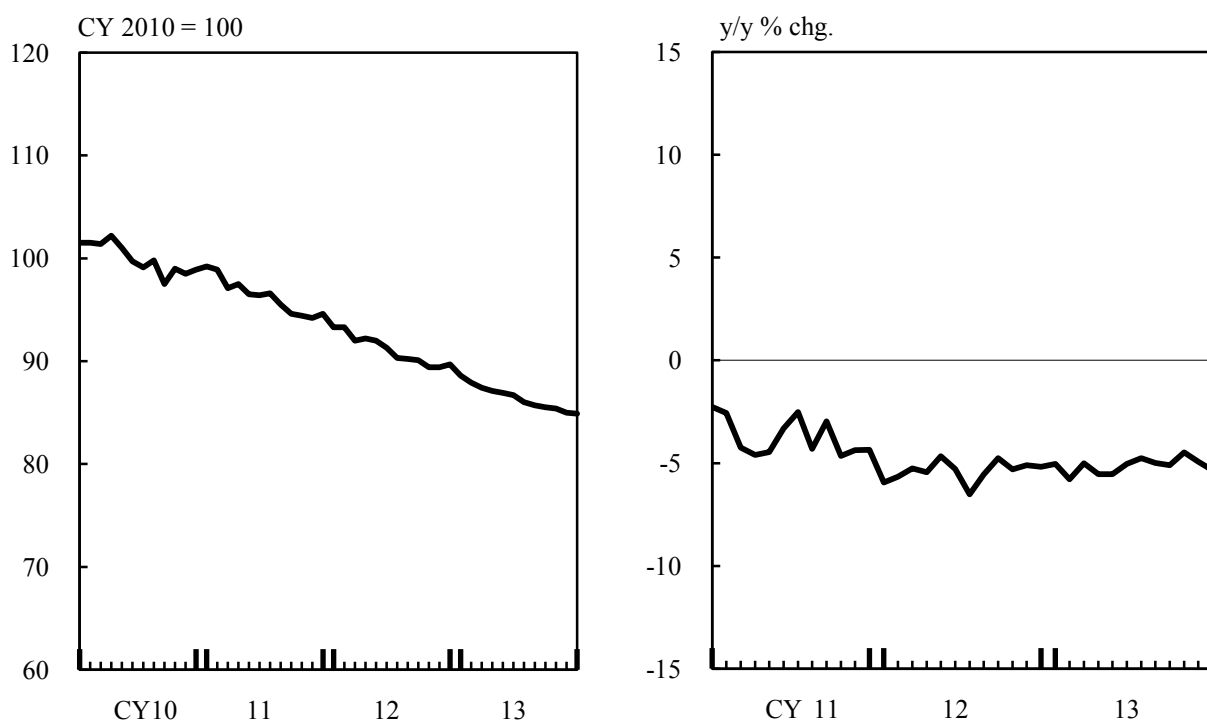
Price surveys on wholesale services could contribute as a deflator to the *National Accounts* and analysis of the productivity of the service industry. However, these price surveys have only been conducted on a trial basis to date. It is also necessary to examine their characteristics while continuing to accumulate data. Moreover, wholesale services consist of a wide range of groups, meaning that our price surveys are not completely comprehensive (Appendix Chart 1 [2]). It would be preferable to perform price surveys in detail on a wider range of groups. However, this would place an enormous burden on reporting companies. It is therefore necessary to take into account a balance between the survey burden and index precision.

The Bank thus considers that it is appropriate to keep price surveys on wholesale services separating from the SPPI for the time being, and to spend time on establishing a consensus by discussing the validity of pricing methods with the relevant parties. The Bank will take time to carefully consider a range of issues pertaining to the price survey for wholesale services.

## Incorporation of new services (1)

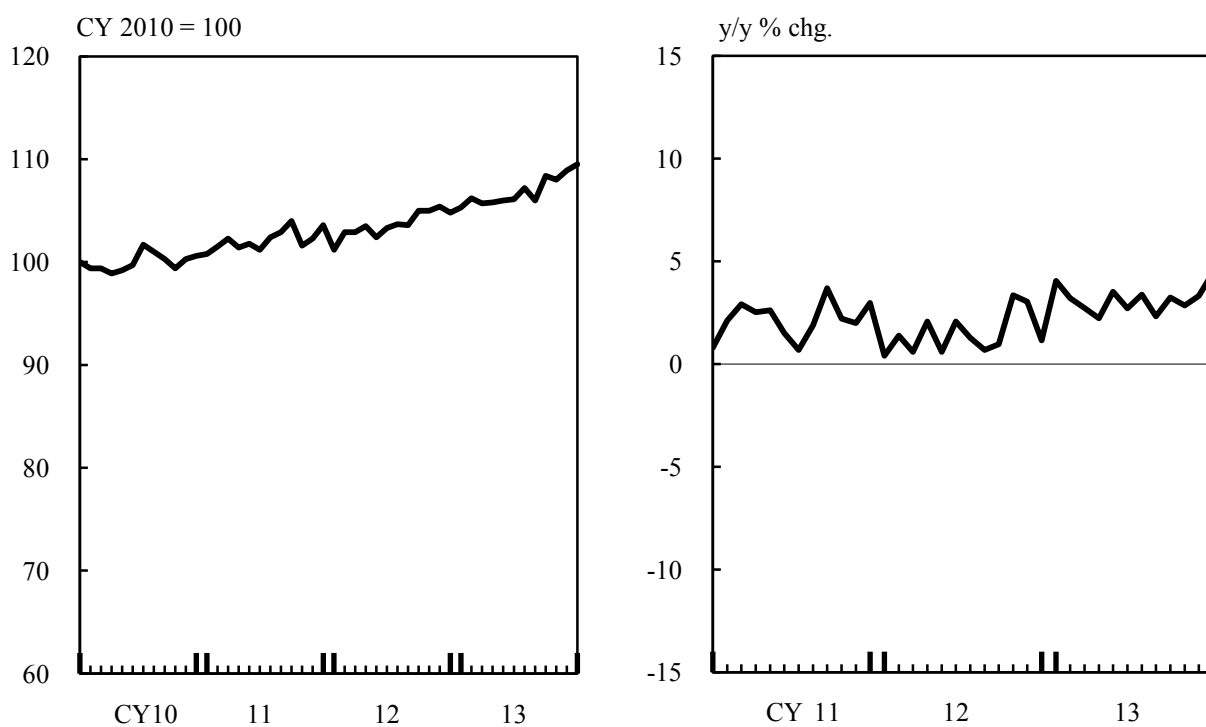
### (1) Advance in information and communication technology

"ASP" (Application Service Provider) (weight: 2.8)



### (2) Increased reliance on outsourcing

"Employment services" (weight: 3.1)

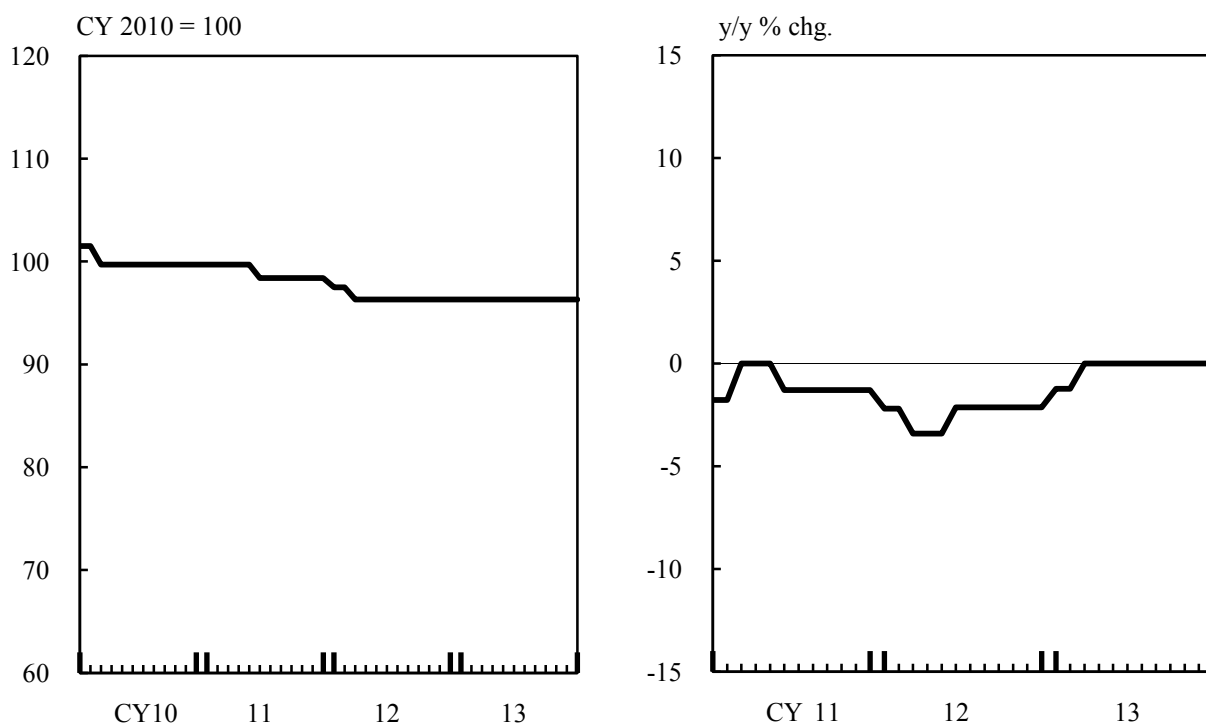


Note: The weight is the rate per thousand. The same applies to the following figures.

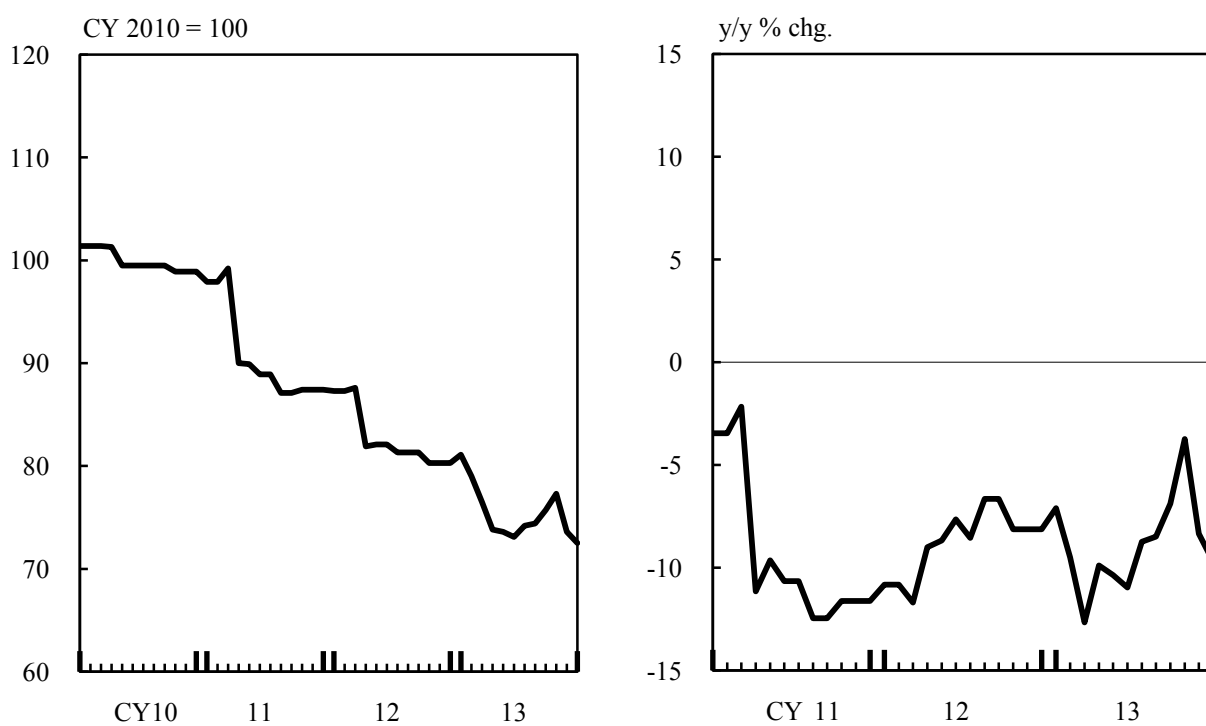
## Incorporation of new services (2)

Heightened awareness of environmental issues and disaster risks

"Commodity inspection services" (weight: 5.1)



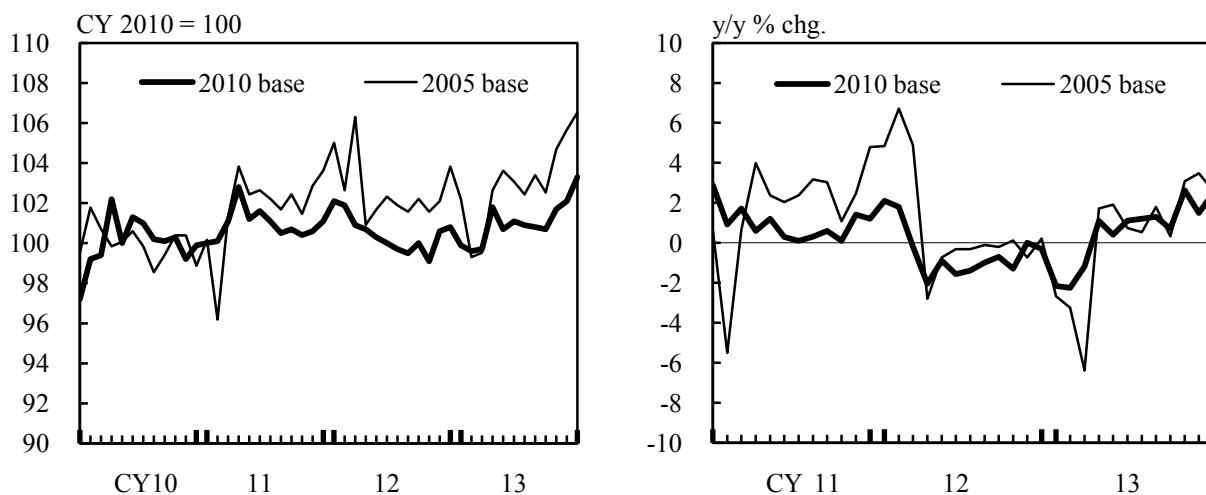
"Environmental surveying certification" (weight: 0.8)



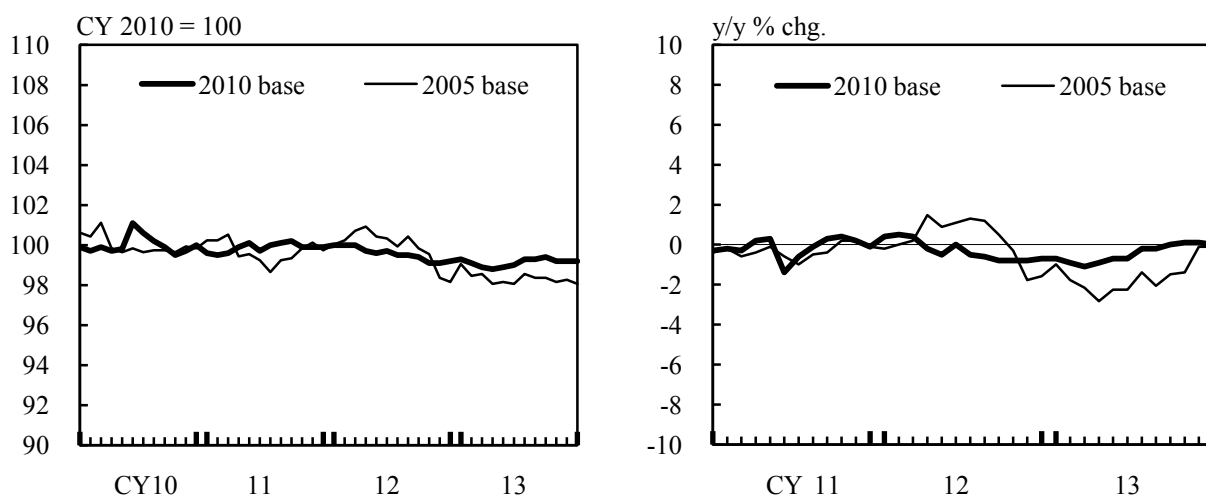
## Reviews and improvements of pricing methods and quality adjustment methods for existing Items (1)

Adjustment aimed at reducing noise in the Item indexes

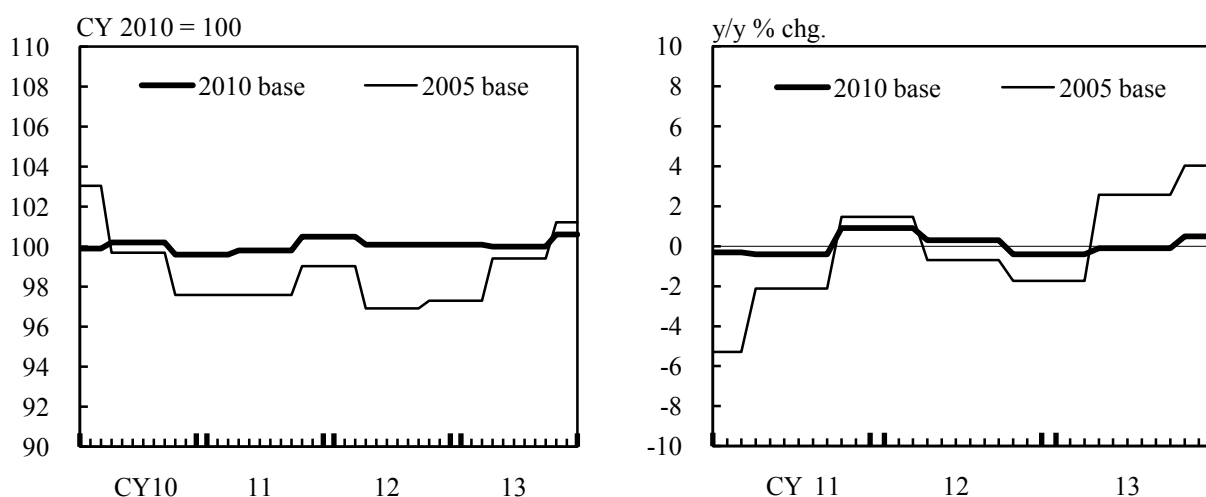
"Civil engineering design services" (weight: 13.6 to 7.6)



"Custom software" (weight: 62.3 to 71.1)



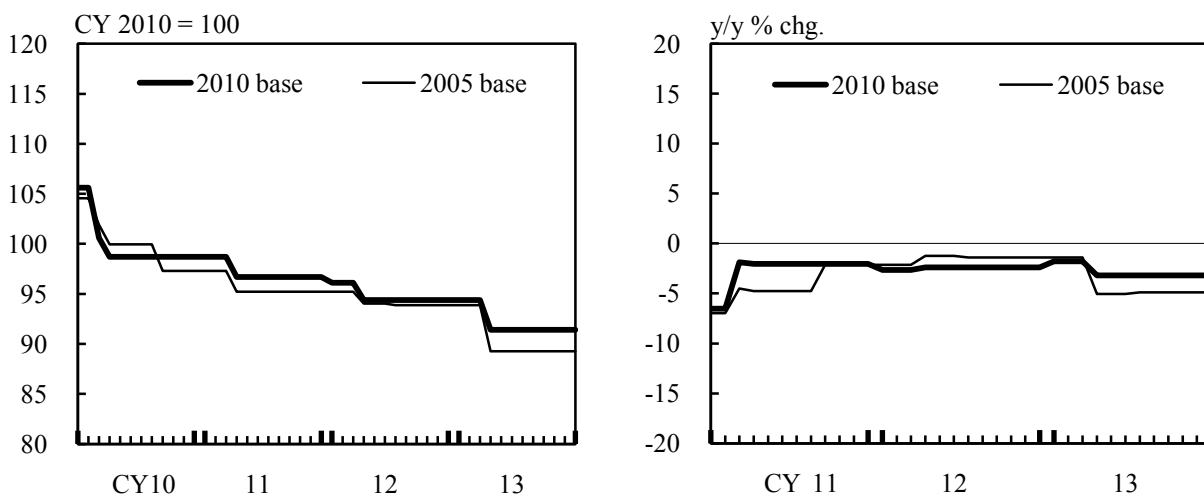
"Plant engineering" (weight: 19.7 to 19.2)



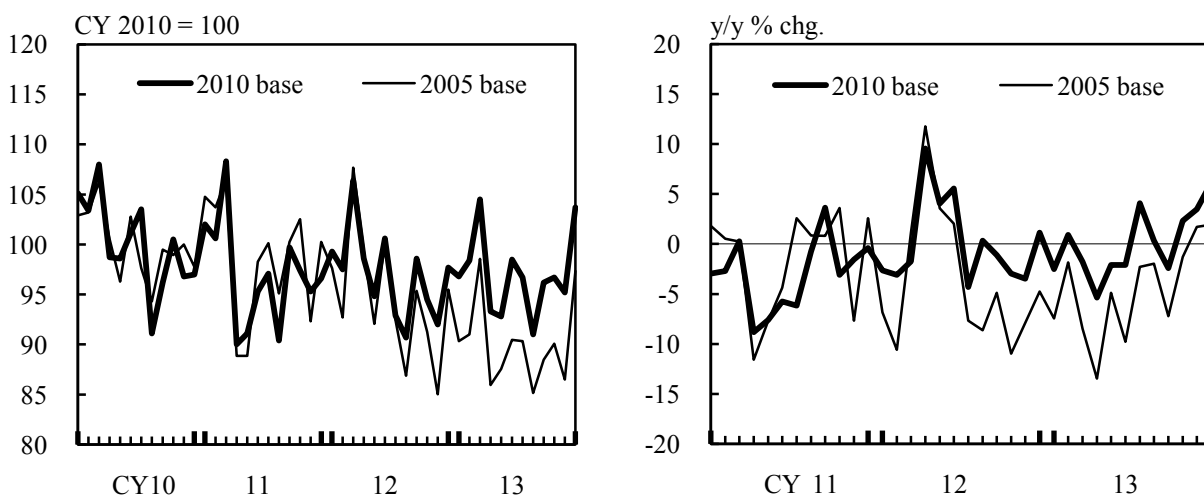
## Reviews and improvements of pricing methods and quality adjustment methods for existing Items (2)

(1) Responding to greater diversification in pricing:

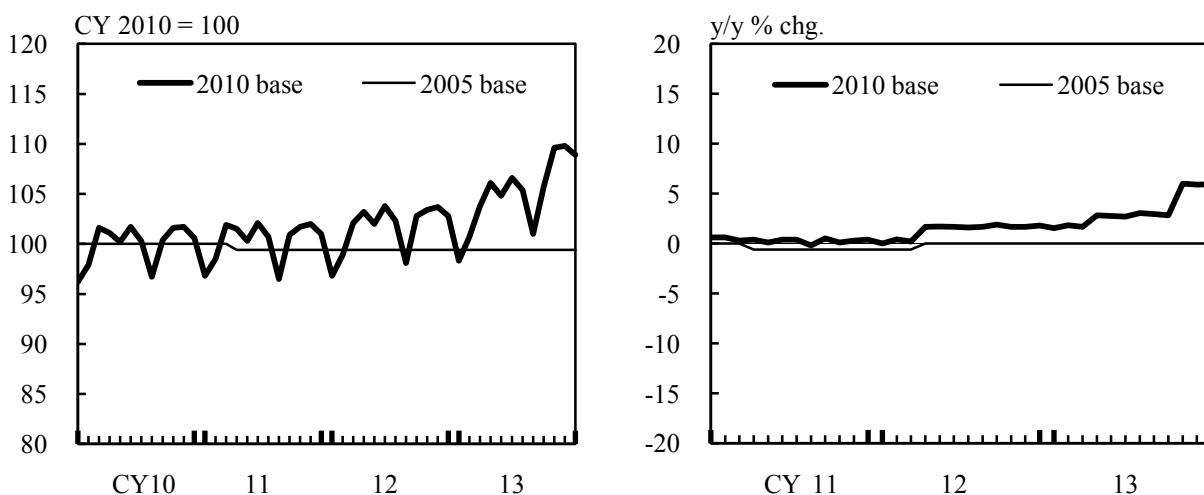
"Cellular phone services and PHS services" (weight: 24.2 to 17.3)



(2) Applying quality adjustment in advertising: "Newspaper advertising" (weight: 13.0 to 8.7)



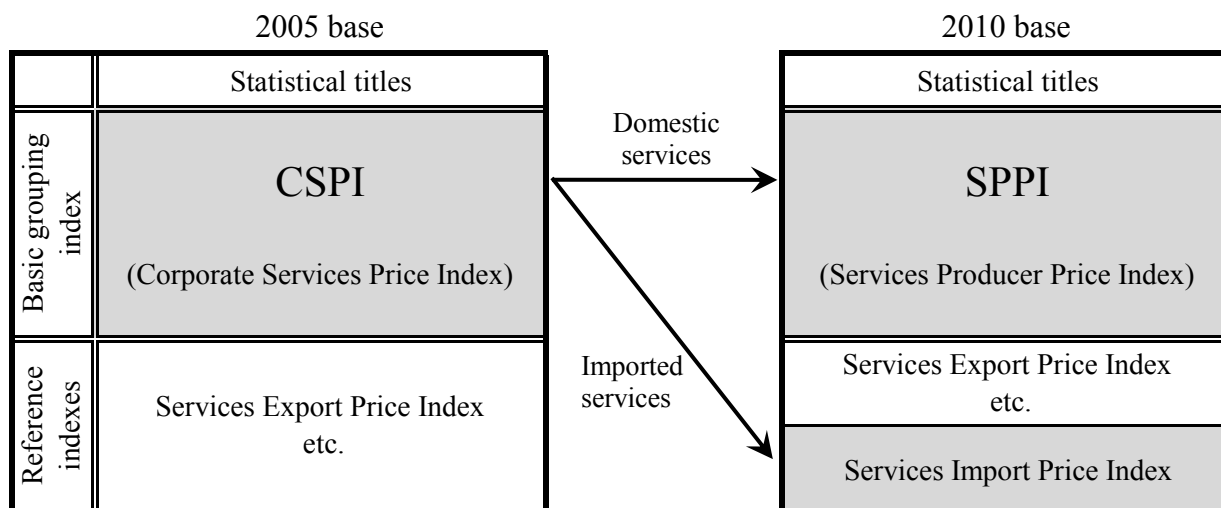
(3) Reducing the reporting burden: "Advertising in traffic facilities" (weight: 4.3 to 4.2)



## Changes in the index structure and renaming of certain statistical titles

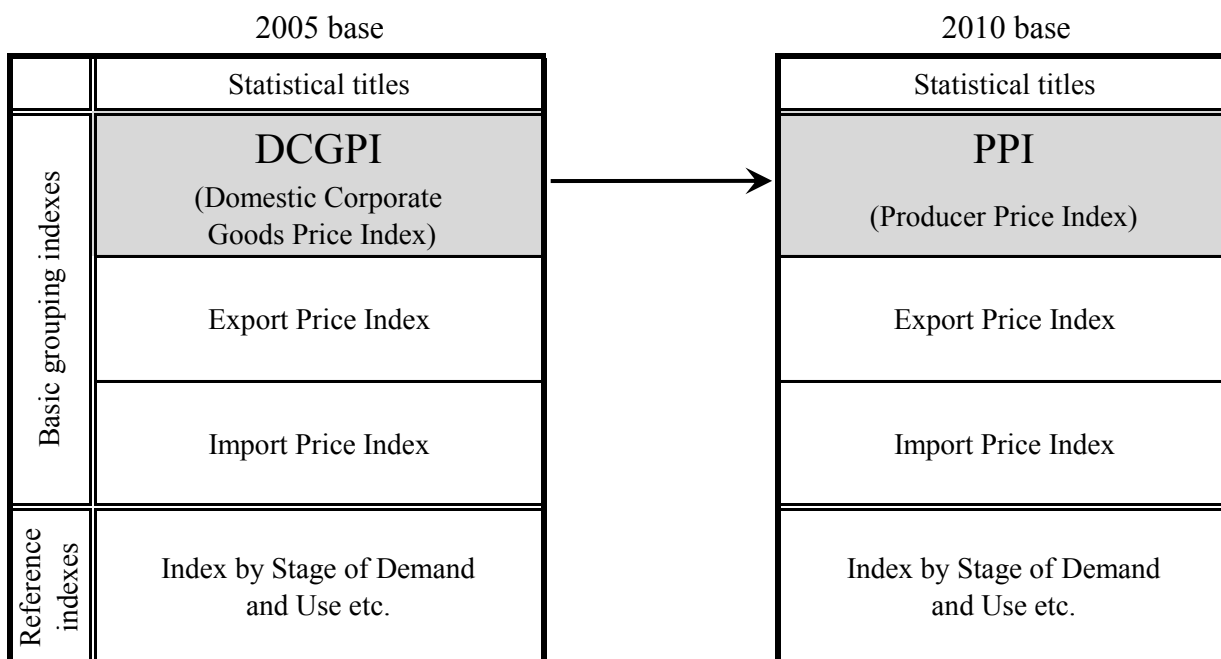
### (1) Services Producer Price Index

- The markets covered by the Basic grouping index has been changed to only "domestic."
- The English title of the index has been renamed.



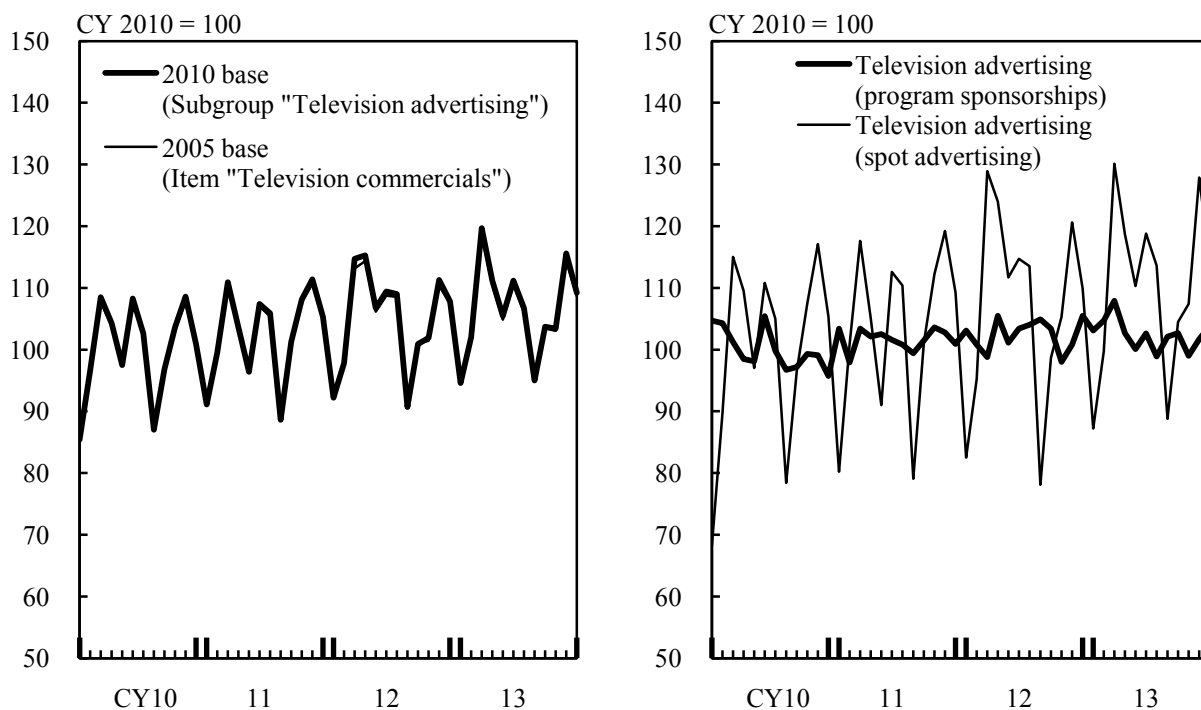
### (2) Corporate Goods Price Index

- The English title of the index has been renamed, while the index structure is unchanged.

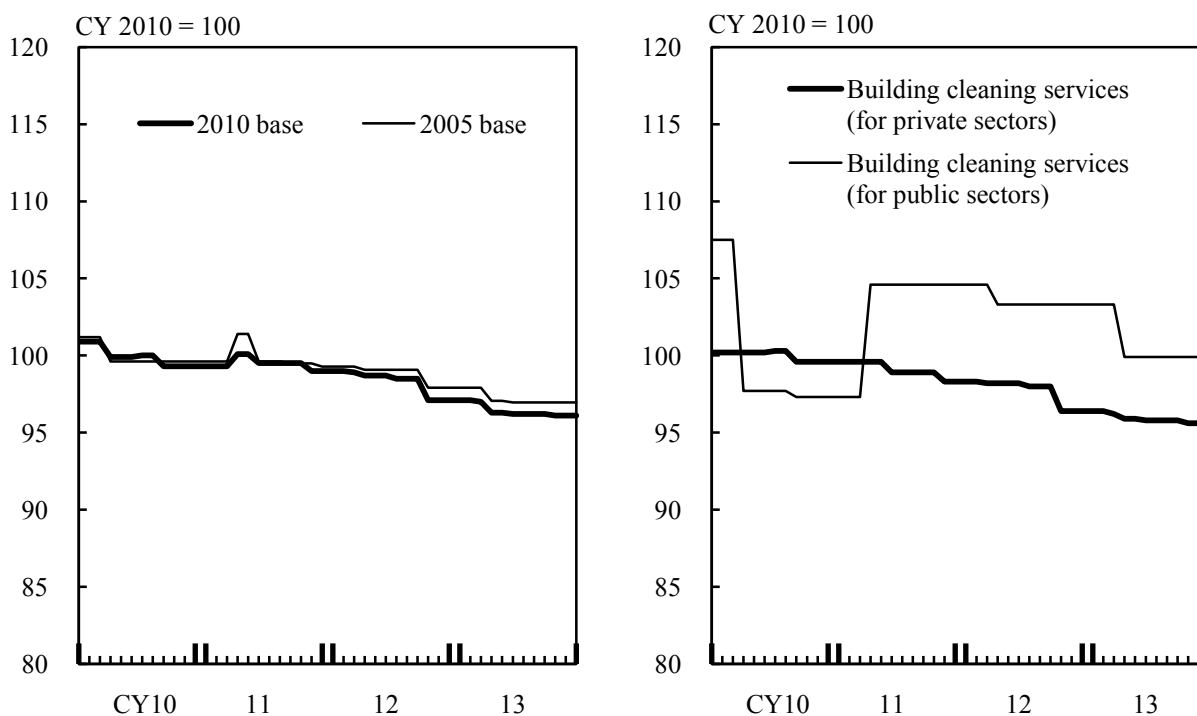


## Improving the usability of the statistics

- (1) "Television advertising" is published as two different indexes  
(weight: 23.4 to 9.5 <program sponsorships> and 10.7 <spot advertising>)



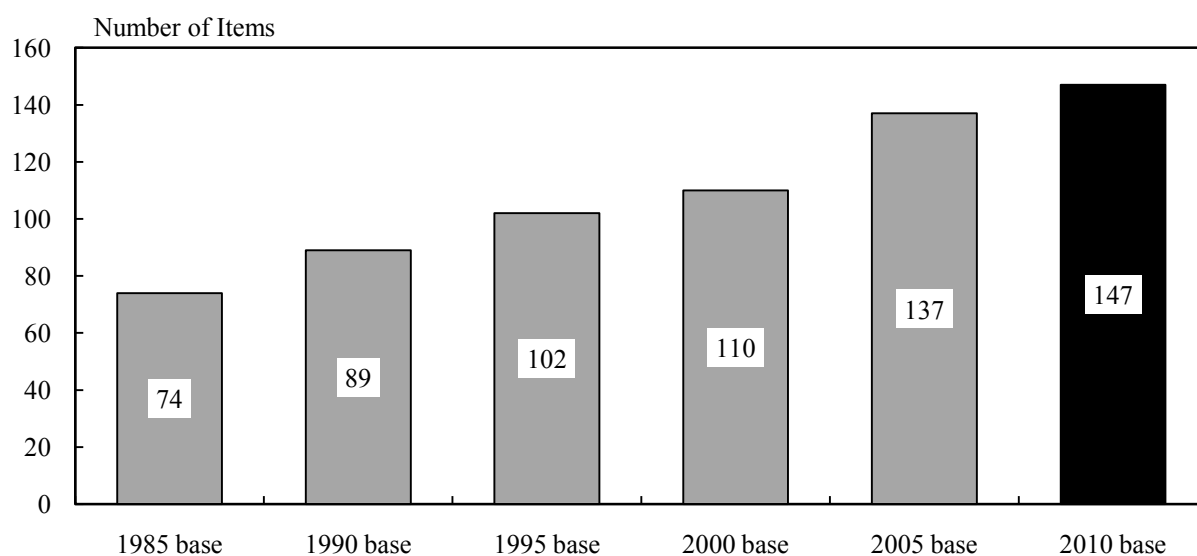
- (2) Indexes "for private sectors" and "for public sectors" are published:  
"Building cleaning services" (weight: 21.7 to 23.8)



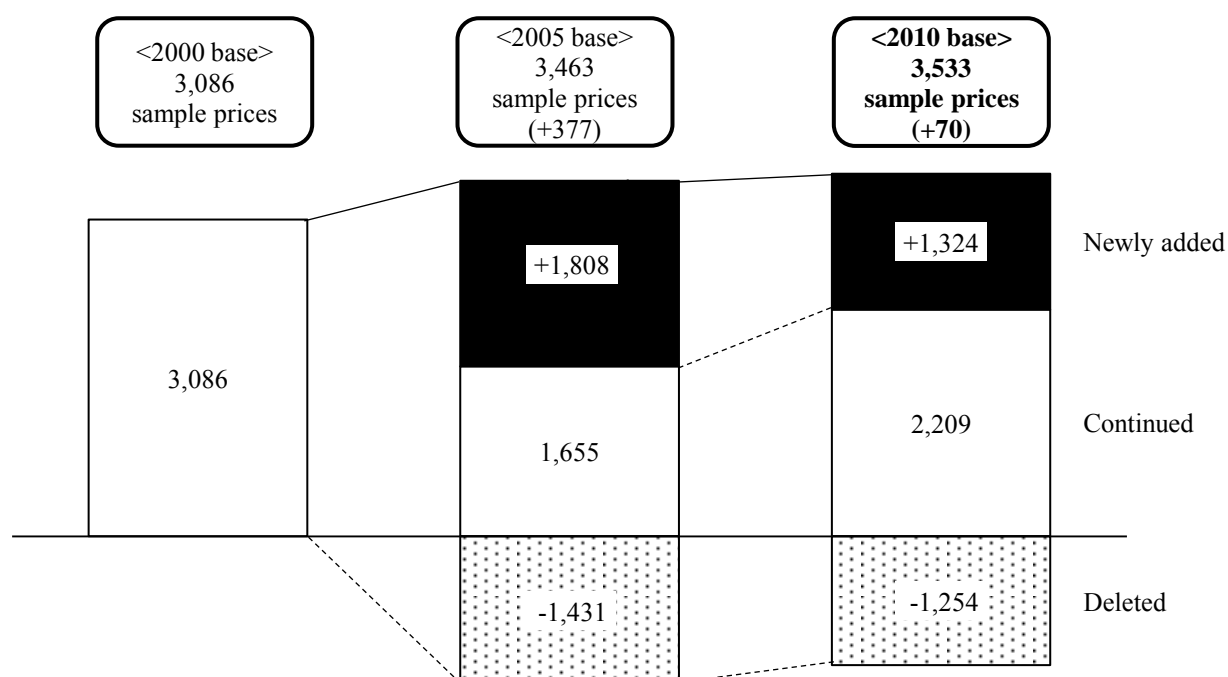
## Number of Items and sample prices

### (1) Number of Items

2010 base (a)	2005 base (b)	Change in the number of Items (a-b)	Breakdown			
			Newly added	Split	Deleted	Consolidated
			8	4	-2	0
147	137	10				0



### (2) Number of sample prices



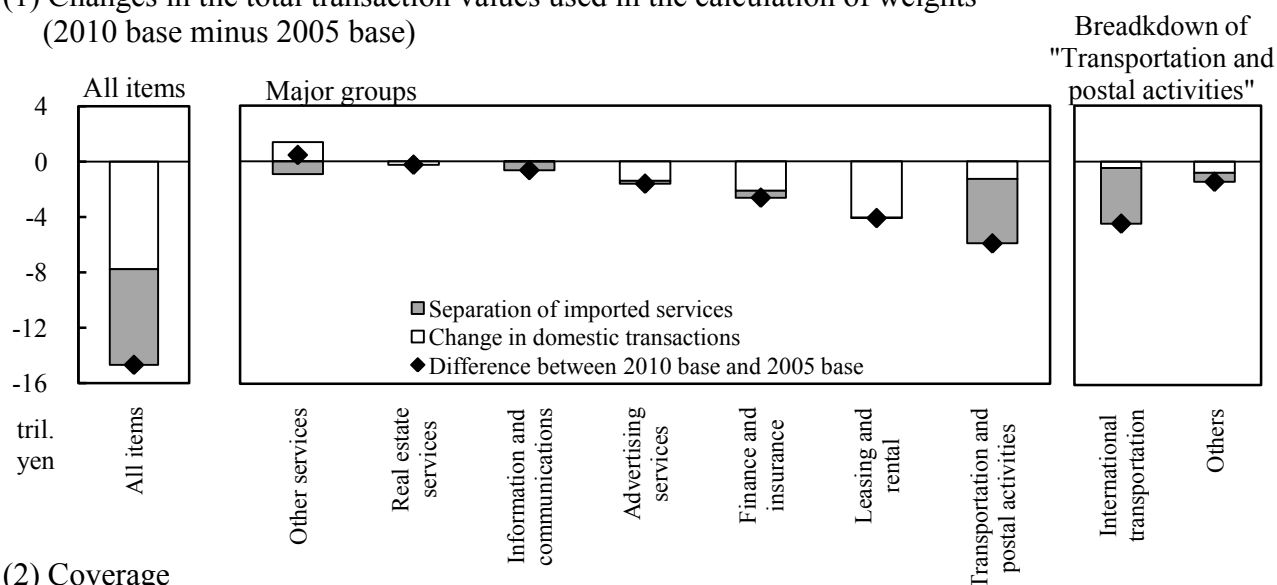
Notes: 1. (1) is based on the Basic grouping index.

2. The numbers of sample prices in (2) are all based on the Basic grouping index and the Reference indexes.

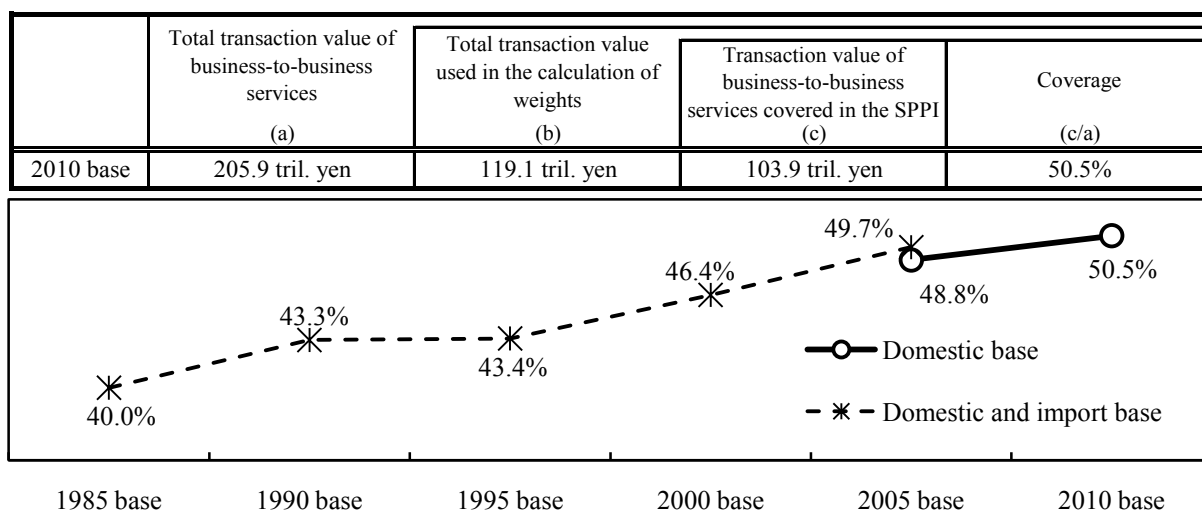


## Coverage and weights

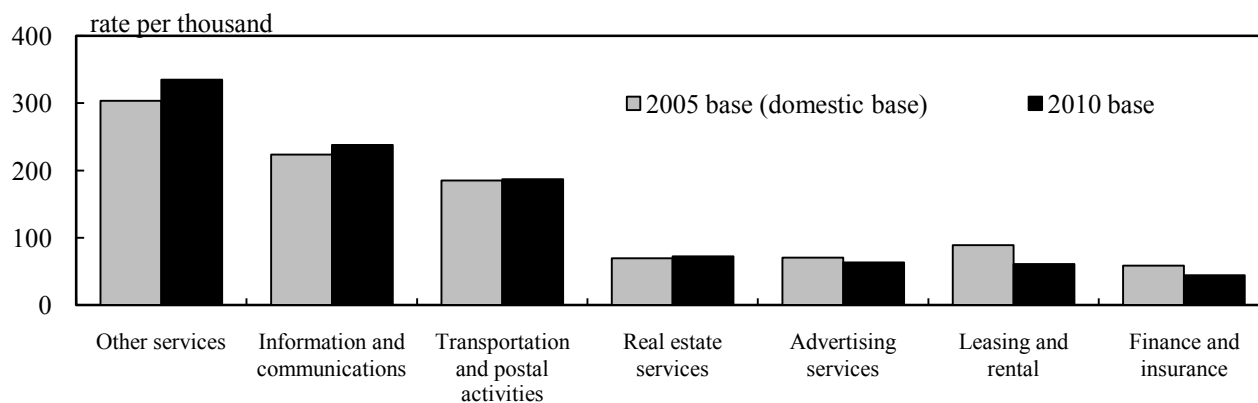
### (1) Changes in the total transaction values used in the calculation of weights (2010 base minus 2005 base)



### (2) Coverage



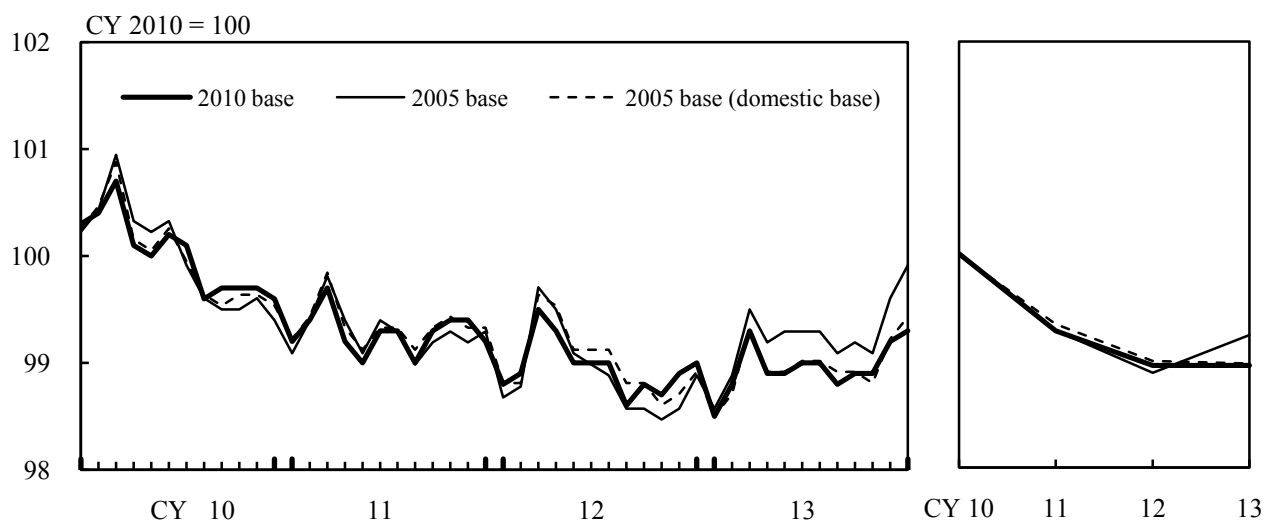
### (3) Weights of Major groups (comparison of 2010 base and 2005 base <domestic base>)



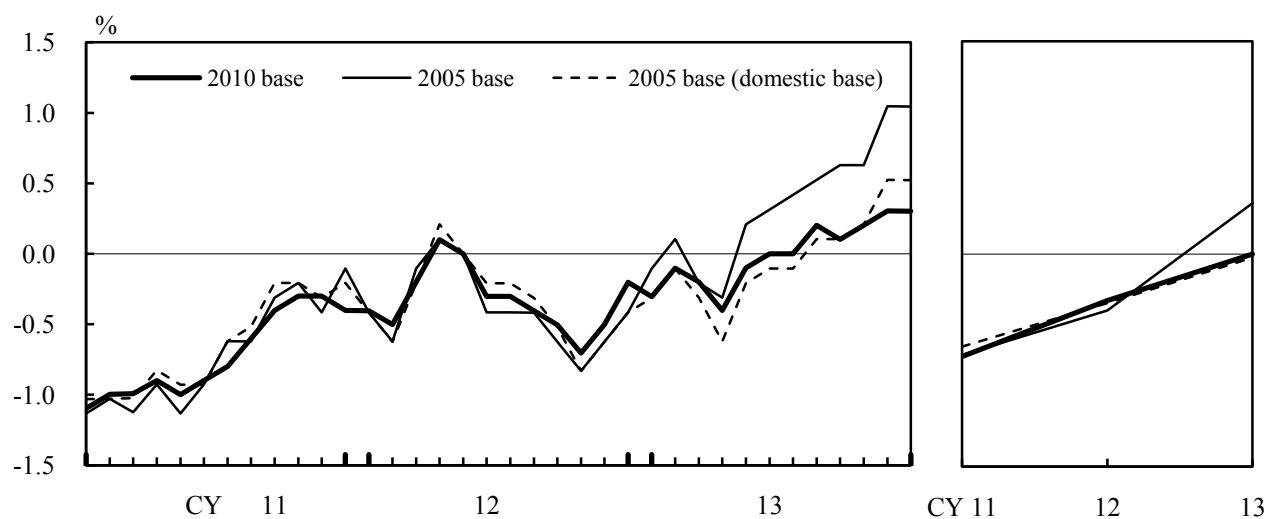
- Notes: 1. The total transaction value used in the calculation of weights in (1) is the total value of transactions for services covered in the SPPI (services included, and those services not included for which it is deemed possible to substitute using the price trends of included Items).
2. The domestic base and the domestic and import base are calculated using the "domestic" and "domestic and import" scope of business-to-business transactions in the calculation of weights. The same applies to the following figures.
3. International transportation is made up of a combination of Items consisting of international transportation services provided across national borders.

## All items: comparison with the 2005 base index

### (1) Indexes



### (2) Year-on-year changes



### (3) Differences in the year-on-year changes

	y/y % chg.			Differences (% pt.)	
	2010 base (a)	2005 base (b)	2005 base (domestic base) (c)	(a-b)	(a-c)
2011	-0.7	-0.7	-0.7	0.0	0.0
2012	-0.3	-0.4	-0.3	0.1	0.0
2013	0.0	0.4	0.0	-0.4	0.0
2011 to 13	-0.4	-0.3	-0.3	-0.1	-0.1

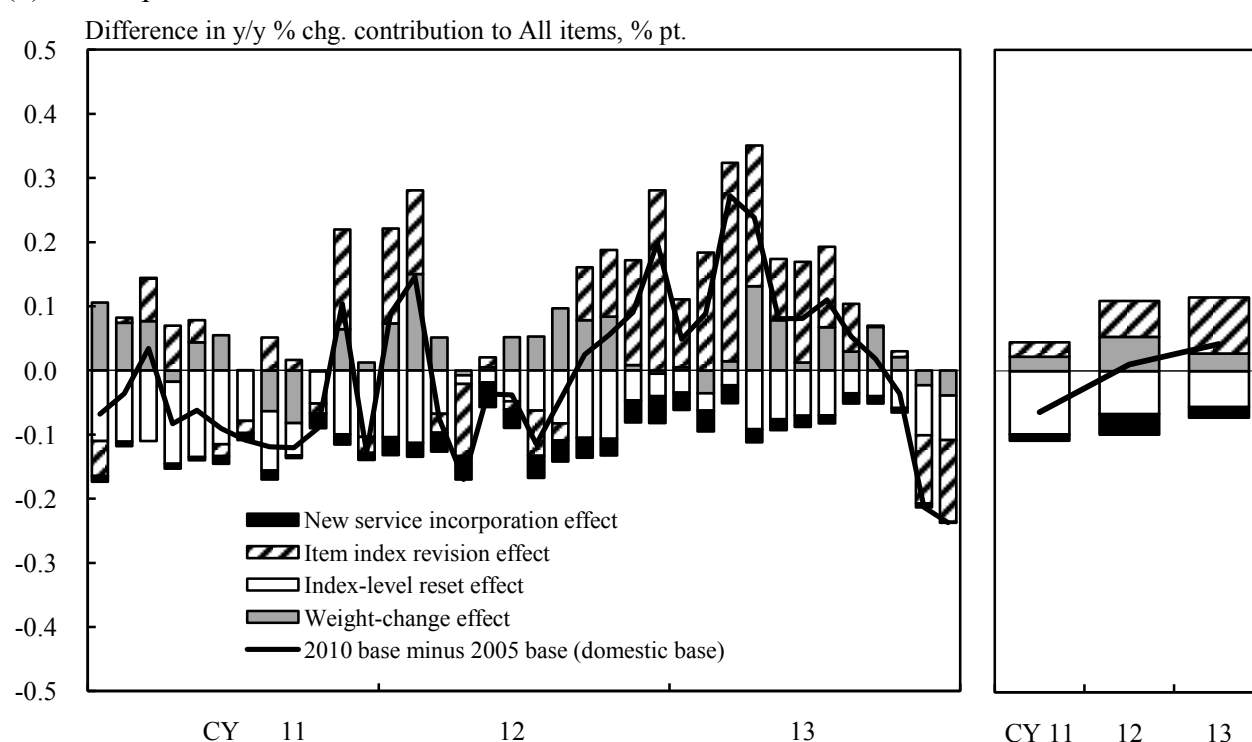
Note: The indexes and the year-on-year changes for calendar years are the simple averages of the monthly values. The same applies in the following figures.

## Decomposition of the difference in year-on-year changes of the index for All items between the old and new indexes

### (1) Overview of decomposition

Weight-change effect	The effect of changes in the weights assigned to certain Items due to rebasing
Index-level reset effect	The effect of resetting the price index for individual Items to the 2010 level at 100
New service incorporation effect	The effect of including new services as new Items or as a result of splitting existing Items
Item index revision effect	The effect of differences in year-on-year changes resulting from review of existing Items

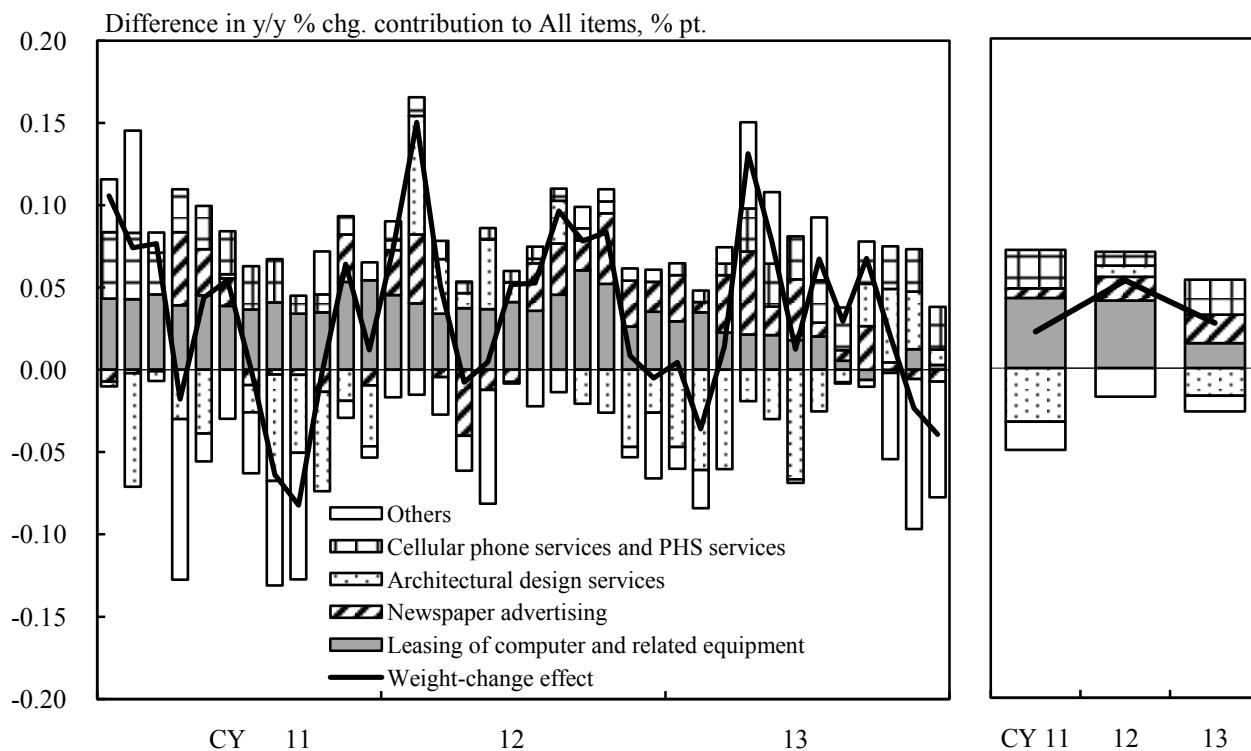
### (2) Decomposition



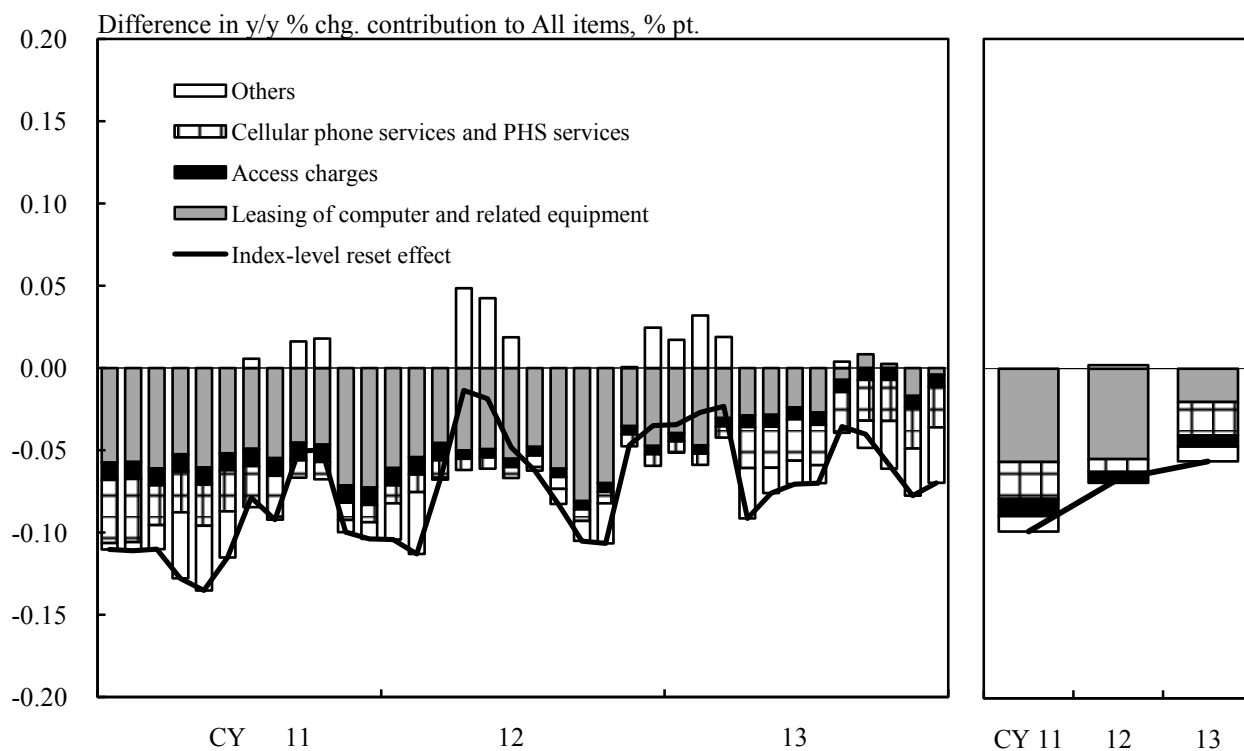
- Notes: 1. The new service incorporation effect includes new Items "ASP" and "Internet data centers" in which new services were incorporated and Items were split.
2. Because the upper levels such as the index for All items are calculated by aggregating the Item indexes in (2), the published figures rounded to one decimal place may not match. Furthermore, the annual contribution is calculated as the simple average of the monthly contribution during the relevant period. The same applies to subsequent analysis of contributions.

## Weight-change effect and index-level reset effect (1)

### (1) Weight-change effect

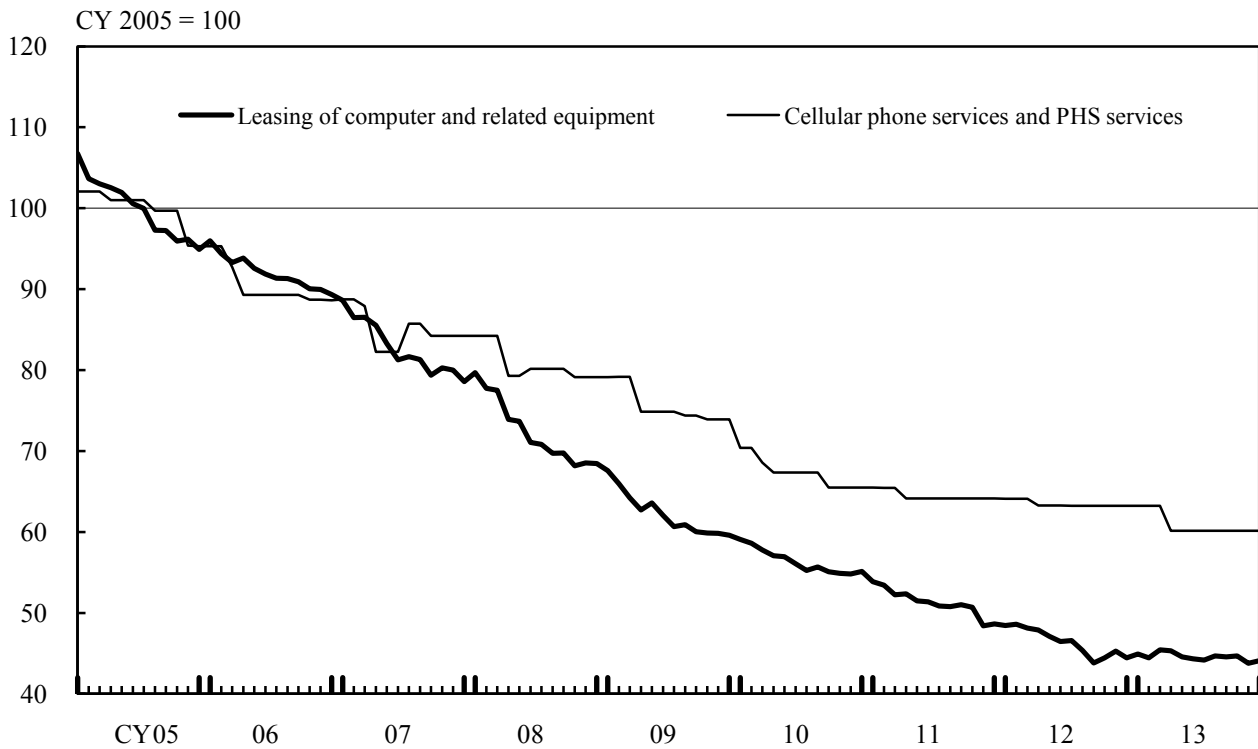


### (2) Index-level reset effect

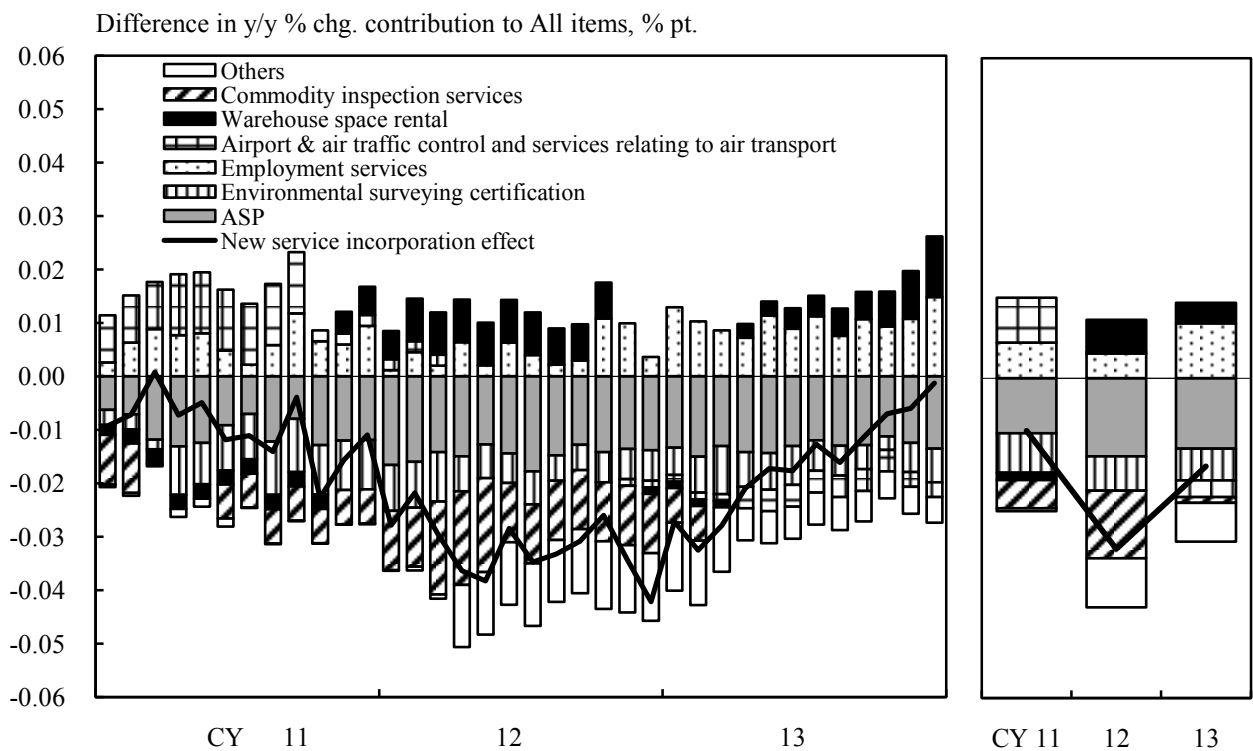


## Weight-change effect and index-level reset effect (2) / new service incorporation effect

(1) Item indexes with the significant contributions of the weight-change effect and the index-level reset effect (2005 base)

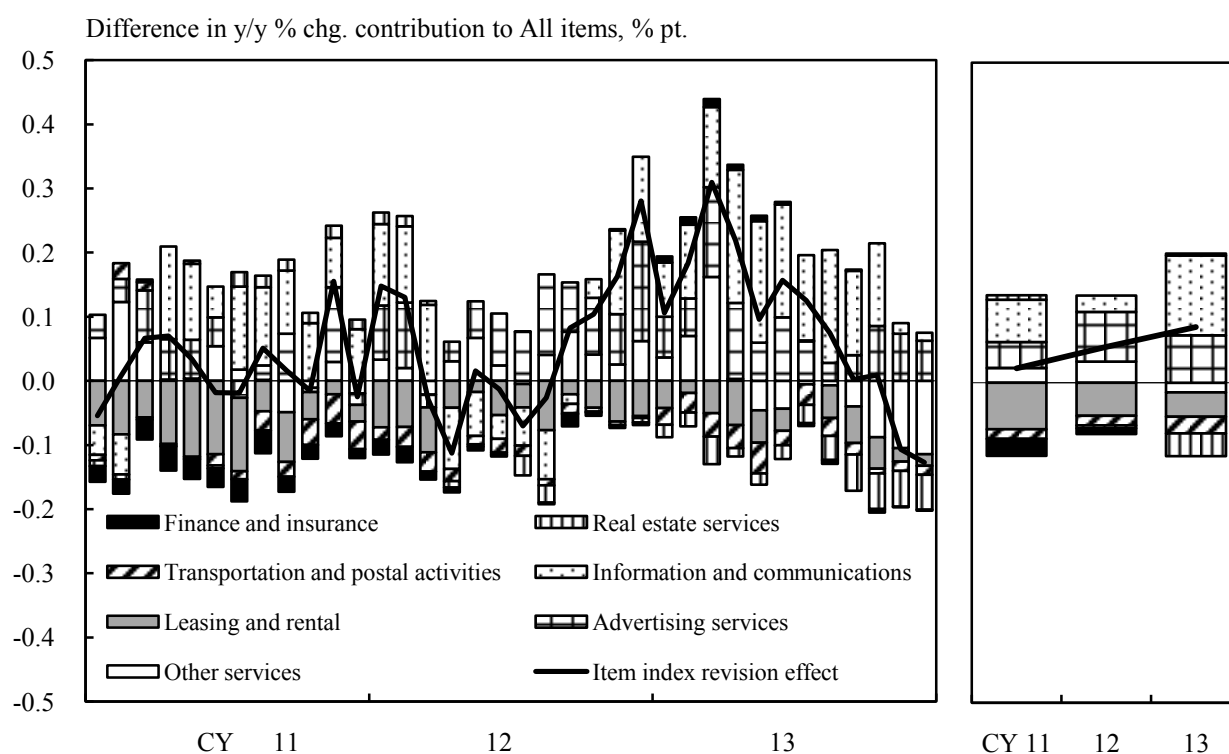


(2) New service incorporation effect



## Item index revision effect

### (1) Decomposition by Major group



### (2) Major groups and Items with significant contributions

	Major groups	Items
Raising	Advertising services	Newspaper advertising (CY12, CY13)
		Advertising in traffic facilities
	Information and communications	Custom software (CY11, CY13)
		System management and operation services
		Cellular phone services and PHS services (CY11, CY13)
	Other services	Plant engineering (CY11, CY12)
		Domestic waste disposal
Lowering	Leasing and rental	Office equipment leasing (CY11)
		Leasing of computer and related equipment
		Temporary material rental
	Transportation and postal activities	Ocean tramp steamers

## Breakdown of the revision and removal of Items

### Newly added Items

Major groups	Items
Real estate services	Warehouse space rental
Transportation and postal activities	Services relating to water transport
	Airport & air traffic control and services relating to air transport
Information and communications	Mobile data communications services
Other services	Commodity inspection services
	Environmental surveying certification
	Employment services
	Meal services for schools, hospitals, and nursing homes

### Split Items

	2005 base	2010 base
Major groups	Items	Items
Information and communications	Data processing services	Data processing services (except ASP)
		ASP
	System management and operation services	Internet data centers
		System management and operation services
Advertising services	Television commercials	Television advertising (program sponsorships)
		Television advertising (spot advertising)
Other services	Machinery repair and maintenance (except Electric & electronic products)	Machinery repair and maintenance (except Electric & electronic products)
		Plant maintenance

### Deleted Items

	2005 base	
Major groups	Items	
Finance and insurance	Safe deposit box services	
Transportation	Oceangoing ship chartering services	moved to the Services Import Price Index (Reference index)

### Expanded Items

	2005 base	2010 base
Major groups	Items	Items
Finance and insurance	Credit card interchange fees	Interchange fees for credit card and electronic money payments
Leasing and rental	Event equipment rental	Communications & office equipment rental and machinery & equipment rental for service industries

### Reduced Item

	2005 base	2010 base
Major group	Item	Item
Transportation and postal activities	International air passenger transportation (Arrival region: Asia and Oceania)	International air passenger transportation (to/from Asia)

### Renamed Item

	2005 base	2010 base
Major group	Item	Item
Transportation and postal activities	Stevedoring services	Marine cargo handling

Note: Major group "Transportation and postal activities" was referred to as "Transportation" in the 2005 base (renamed).

# Classification and weights

## 1. Basic grouping index

Major group				Weights	
All items	Group	Subgroup	Item		
All items				1000.0	
	Finance and insurance			44.3	
	Financial services			33.0	
		Financial services		33.0	
			Domestic money transmission and receipt	4.3	
			International money transmission and receipt	0.7	
			Account services	4.6	
			Securities brokerage services	3.5	
			Underwriting services	1.7	
			Securities selling services	8.4	
			Securities issuance, transfer and related services	1.5	
			Financial agency services	0.5	
			Credit guarantee	4.0	
			Interchange fees for credit card and electronic money payments	2.5	
			ATM interchange fees	1.3	
		Insurance services		11.3	
			Property and casualty insurance services	11.3	
			Fire insurance	1.8	
			Voluntary motor vehicle insurance	6.9	
			Compulsory motor vehicle insurance	1.5	
			Marine and other transportation insurance services	1.1	
	Real estate services			72.1	
		Real estate rental		72.1	
			Office space rental	43.8	
				Office space rental (Tokyo area)	32.0
				Office space rental (Nagoya area)	2.1
				Office space rental (Osaka area)	6.4
				Office space rental (other areas)	3.3
		Other space rental	28.3		
			Sales space rental	10.7	
			Hotel rental	0.8	
			Warehouse space rental	11.1	
			Parking space rental	5.7	
Transportation and postal activities			186.7		
	Passenger transportation		38.6		
		Railroad passenger transportation	19.9		
			Shinkansen bullet train	7.3	
			Railroad passenger transportation (except Shinkansen bullet train)	12.6	
		Road passenger transportation	10.6		
			Route bus	1.9	
			Chartered bus	1.4	
			Hired car and taxi	7.3	
		Water passenger transportation	0.4		
			Coastal and inland water passenger transportation	0.4	
		International air passenger transportation	1.8		
			International air passenger transportation (to/from North America)	0.3	
			International air passenger transportation (to/from Europe)	0.6	
			International air passenger transportation (to/from Asia)	0.9	
		Domestic air passenger transportation	5.9		
			Domestic air passenger transportation	5.9	
	Overland freight transportation		77.1		
		Railroad freight transportation	0.9		
			Railroad freight transportation	0.9	
		Road freight transportation	76.2		
			Less-than-truckload freight	9.2	
			Door-to-door parcel delivery	10.6	
			Drops off deliveries in postboxes	3.2	
			Truckload freight	39.2	
			Freight by special truck	14.0	
	Marine freight transportation		20.6		
		Ocean freight transportation	6.7		
			Ocean liners	0.9	
			Ocean tramp steamers	4.5	
			Ocean tankers	1.3	
		Coastal and inland water freight transportation	5.3		
			RORO ships	0.6	
			Coastal and inland water freighters (except RORO ships)	2.1	
		Coastal and inland water ferries (motor vehicle carriers only)	1.1		
		Coastal and inland water tankers	1.5		
	Marine cargo handling	8.6			
		Marine cargo handling	8.6		



# Classification and weights

Major group			Weights
	Group		
	Subgroup		
	Item		
	Air freight transportation		1.5
	International air freight transportation		1.0
	International air freight transportation		1.0
	Domestic air freight transportation		0.5
	Domestic air freight transportation		0.5
	Warehousing and other transportation services		38.1
	Warehousing and storage		15.0
	Ordinary warehousing and storage		11.9
	Refrigerated warehousing and storage		3.1
	Packing for freight		8.0
	Packing for freight		8.0
	Toll roads		10.3
	National expressways		6.8
	Urban expressways		2.1
	Other toll roads		1.4
	Services relating to water transport		0.3
	Services relating to water transport		0.3
	Airport & air traffic control and services relating to air transport		4.5
	Airport & air traffic control and services relating to air transport		4.5
	Postal activities		10.8
	Postal activities		10.8
	Letters		5.6
	Postal cards		3.2
	Special mail services		1.4
	International mail services		0.6
	Information and communications		237.8
	Communications services		57.2
	Fixed telecommunications services		33.3
	Fixed telephone services		14.9
	Leased circuit services		3.1
	Internet connection services		10.4
	WAN (Wide Area Network) services		4.2
	Internet data centers		0.7
	Mobile telecommunications services		17.9
	Cellular phone services and PHS services		17.3
	Mobile data communications services		0.6
	Access charges		6.0
	Access charges		6.0
	Broadcasting services		3.3
	Broadcasting services		3.3
	Public broadcasting		0.8
	Private broadcasting		1.1
	Cable broadcasting		1.4
	Information services		150.3
	Software development		79.8
	Custom software		71.1
	Prepackaged software		8.7
	Other information services		70.5
	Data processing services (except ASP)		31.6
	ASP		2.8
	System management and operation services		20.0
	Database provision services		12.3
	Market research and public opinion polling		3.8
	Internet based services		9.2
	Internet based services		9.2
	Internet based services		9.2
	Newspapers and publishing		17.8
	Newspapers		4.9
	Newspapers		4.9
	Publishing		12.9
	Book publishing		7.3
	Monthly magazine publishing		4.4
	Weekly magazine publishing		1.2

# Classification and weights

Major group	Group	Subgroup	Item	Weights
	Leasing and rental			60.7
	Leasing and rental			60.7
	Leasing			48.7
		Industrial machinery leasing		6.7
		Leasing of machinery and equipment for metalworking		1.3
		Medical equipment leasing		2.9
		Leasing of machinery and equipment for commercial and other services		6.9
		Communications equipment leasing		3.6
		Leasing of machinery for civil engineering and construction		1.3
		Leasing of computer and related equipment		15.0
		Office equipment leasing		4.6
		Transportation equipment leasing		6.4
	Rental			12.0
		Construction machinery and equipment rental		4.5
		Temporary material rental		2.8
		Computer rental		1.5
		Motor vehicle rental		2.2
		Communications & office equipment rental and machinery & equipment rental for service industries		1.0
	Advertising services			63.4
	Advertising services			63.4
		Television advertising		20.2
		Television advertising (program sponsorships)		9.5
		Television advertising (spot advertising)		10.7
		Newspaper advertising		8.7
		Newspaper advertising		8.7
		Magazine advertising		3.9
		Magazine advertising		3.9
		Leaflet advertising		7.2
		Leaflet advertising		7.2
		Internet advertising		6.8
		Internet advertising		6.8
		Other advertising services		16.6
		Radio advertising		1.4
		Outdoor advertising		1.9
		Advertising in traffic facilities		4.2
		Direct mail		5.6
		Free newspaper and magazine advertising		3.5
	Other services			335.0
	Sewage and waste disposal			25.8
		Sewage disposal		7.4
		Sewage disposal		7.4
		Waste disposal		18.4
		Domestic waste disposal		7.0
		Industrial waste disposal		11.4
	Motor vehicle & machinery repair and maintenance			63.8
		Motor vehicle repair and maintenance		25.5
		Periodic and regular motor vehicle inspection & general maintenance		19.8
		Motor vehicle maintenance (accident repair)		5.7
		Machinery repair and maintenance		38.3
		Electric & electronic product repair and maintenance		11.8
		Machinery repair and maintenance (except Electric & electronic products)		26.5
	Professional services			46.7
		Legal and accounting services		43.7
		Attorney services		4.5
		Patent attorney services		4.1
		Judicial scrivener services		1.5
		Certified public accountant services		10.6
		Licensed tax accountant services		23.0
		Other professional services		3.0
		Certified social insurance and labor specialist services		1.1
		Certified real estate evaluation services		0.8
		Certified administrative procedures specialist services		0.5
		Certified real estate assessor services for registration		0.6
	Technical services			59.4
		Civil engineering and architectural services		27.6
		Architectural design services		8.7
		Civil engineering design services		7.6
		Surface surveying		5.5
		Subsurface surveying		5.8
		Plant engineering		19.2
		Plant engineering		19.2

## Classification and weights

Major group			Weights
	Group		
		Subgroup	
		Item	
		Other technical services	12.6
		Commodity inspection services	5.1
		Environmental surveying certification	0.8
		Plant maintenance	6.7
		Employment and worker dispatching services	50.0
		Employment services	3.1
		Employment services	3.1
		Temporary employment agency services	46.9
		Clerical support supply services	20.7
		Help supply services (except Clerical support)	26.2
		Other services not included elsewhere	89.3
		Training and development services	3.0
		Employee training and development services	3.0
		Building maintenance	35.9
		Building cleaning services	23.8
		Facility management services	6.8
		Sanitation services	5.3
		Security services	14.9
		Security services (except Alarm monitoring services)	10.7
		Alarm monitoring services	4.2
		Telemarketing	5.2
		Telemarketing	5.2
		Hotels	13.9
		Hotels	13.9
		Meal services for schools, hospitals, and nursing homes	8.0
		Meal services for schools, hospitals, and nursing homes	8.0
		Laundry services	8.4
		Ordinary laundry services	1.1
		Linen supply	7.3

## Classification and weights

[Reference] Contract currency basis

Reference: Contact currency: Euro						
Major group				Weights		
Group						
Subgroup						
Item						
Transportation and postal activities					186.7	
Marine freight transportation					20.6	
	Ocean freight transportation				6.7	
		Ocean liners				0.9
		Ocean tramp steamers				4.5
		Ocean tankers				1.3
	Air freight transportation				1.5	
	International air freight transportation				1.0	
		International air freight transportation				1.0

[Reference] All items (excluding International transportation)

Item	Weights
All items (excluding International transportation)	989.9
Transportation and postal activities (excluding International transportation)	176.6
International transportation	10.1

### 2. Reference indexes

Item used for calculating the Basic grouping index

Item	
Leasing	Lease rate
Building maintenance	Building cleaning services (for private sectors)
	Building cleaning services (for public sectors)
	Facility management services (for private sectors)
	Facility management services (for public sectors)
Security services	Security services (except Alarm monitoring services) (for private sectors)
	Security services (except Alarm monitoring services) (for public sectors)

Services Export Price Index

Item	
Yen basis	Ocean freight transportation (Yen basis)
	International air freight transportation (Yen basis)
Contract currency basis	Ocean freight transportation (Contract currency basis)

Services Import Price Index

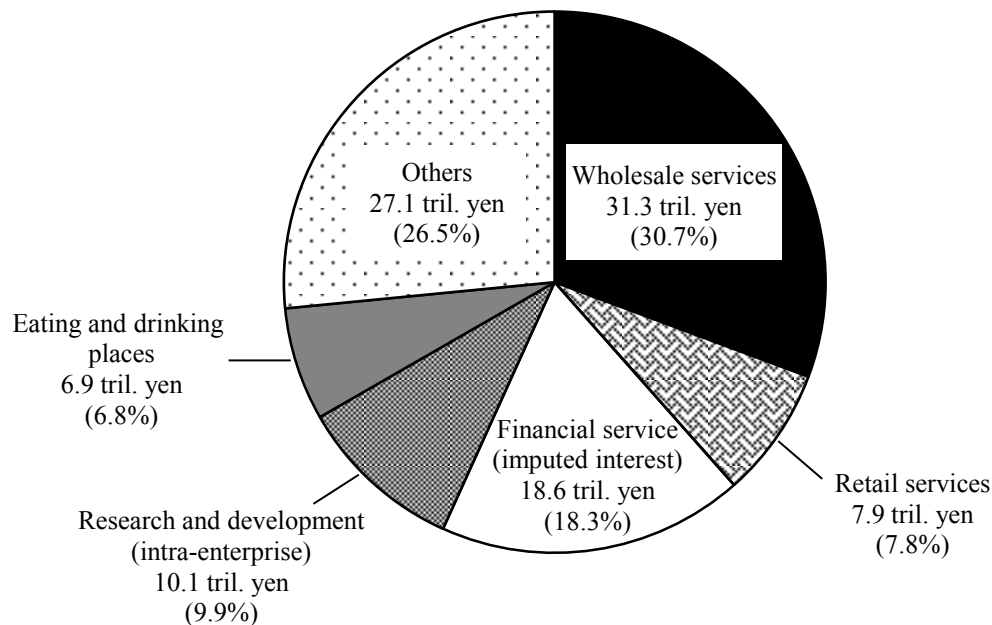
Item	
Yen basis	International air passenger transportation (to/from North America) (Yen basis)
	International air passenger transportation (to/from Europe) (Yen basis)
	International air passenger transportation (to/from Asia) (Yen basis)
	Ocean freight transportation (Yen basis)
	Oceangoing ship chartering services (Yen basis)
Contract currency basis	Ocean freight transportation (Contract currency basis)
	Oceangoing ship chartering services (Contract currency basis)

Services Producer Price Index excluding Consumption Tax

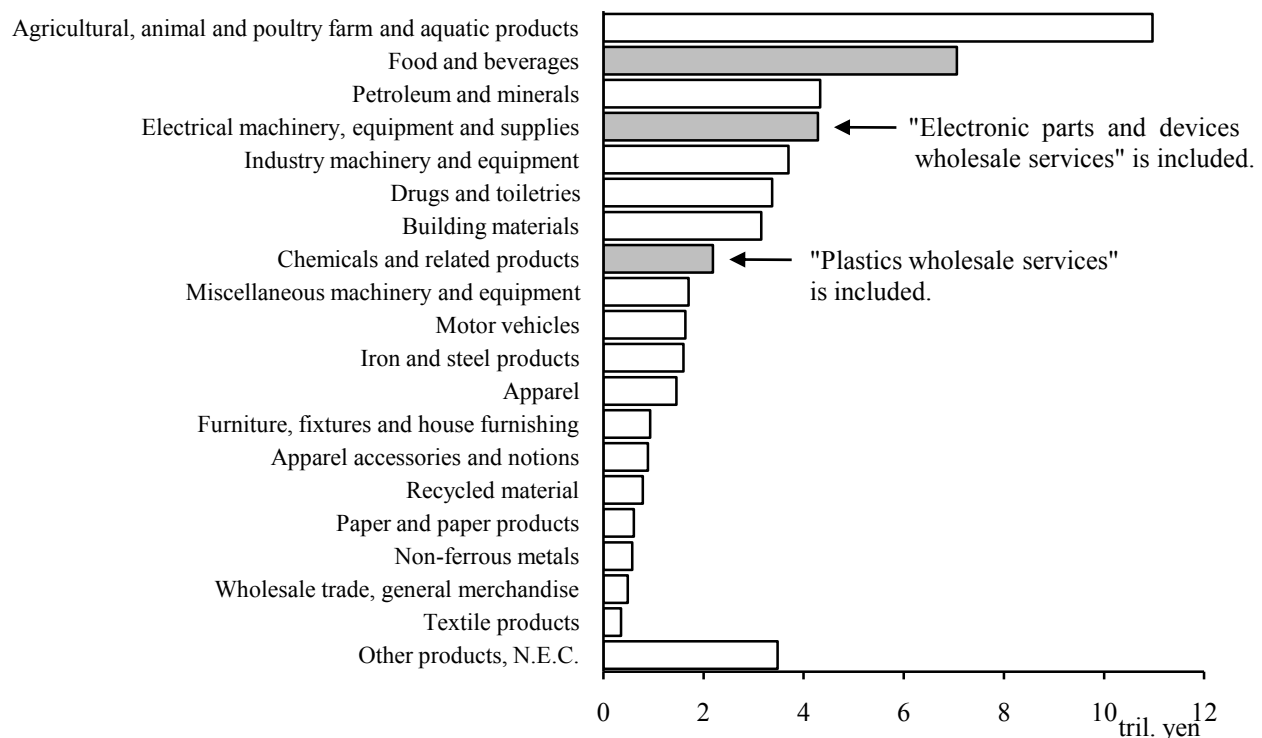
The structure, classification, and weights are identical to those of the Basic grouping index (except [Reference] Contract currency basis).

## Market size and surveyed industries of wholesale services

### (1) Services not covered in the SPPI (2010 base)



### (2) Nominal margin of wholesale services (CY 2011)



Notes: 1. The value in (1) is that of business-to-business transactions in the "2010 Updated Input-Output Table" and the figure in the brackets is the percentage of the total which is not covered in the SPPI.

2. Nominal margin in (2) is amount of sales minus cost of sales.

Sources: Ministry of Economy, Trade and Industry, "2010 Updated Input-Output Table"; Ministry of Internal Affairs and Communications and Ministry of Economy, Trade and Industry, "2012 Economic Census for Business Activity."

---

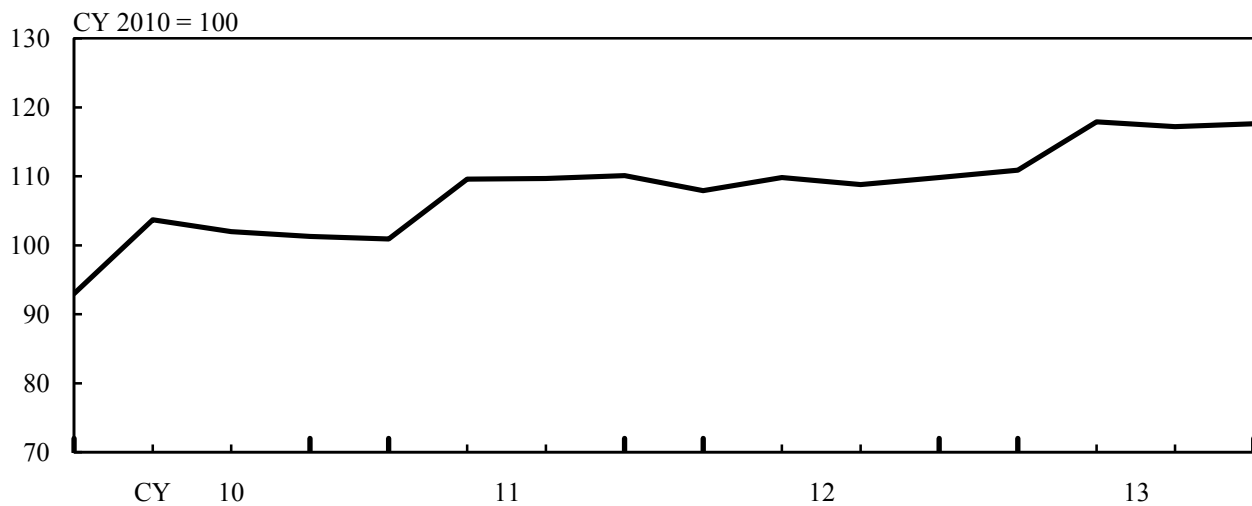
## Price indexes for wholesale services (on a trial basis)

---

### (1) "Food and beverages wholesale services"



### (2) "Plastics wholesale services"



### (3) "Electronic parts and devices wholesale services"

