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Rebasing the Corporate Goods Price Index to the Base Year 2020

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Rebasing the Corporate Goods Price Index to the Base Year 2020

—Main features of the rebasing and price developments in the 2020 base index—

Abstract

The Bank of Japan plans to begin monthly releases of the Corporate Goods Price Index (CGPI) with the base year updated from the current 2015 to 2020, starting on June 10, when a preliminary index for May 2022 is to be published.

The rebasing of the CGPI focused on four themes -- (1) responding to changes in the economic and industrial structures; (2) increasing the efficiency and sophistication of price index compilation; (3) reorganizing aggregate price indexes including introducing the FD-ID price indexes; and (4) examining the impact of COVID-19 -- and reflected the results in the 2020 base index. Consequently, the 2020 base index has maintained high standards, as the 2015 base index did. For example, the number of newly added commodities in the new index is 909 and the number of sample prices is 6,888, while the coverage of the commodities adopted in the Producer Price Index (PPI) is 81.3 percent.

As a result of the rebasing, it will become possible to identify the following price developments of newly added commodities: (1) domestic producer prices and export prices of "Sensor devices," for which demand is growing against the backdrop of electrification of automobiles and increasing use of electronic components in vehicles; (2) export prices of "Catalyst," for which demand is increasing in emerging countries due to growing consciousness about environmental problems; and (3) import prices of "Medical and sanitary rubber products (rubber gloves)," for which the market has rapidly expanded amid the COVID-19 crisis. Moreover, because of periodic publication of the FD-ID price indexes, which are new indexes classified by stage of demand, it will become possible to measure inflationary pressures in the entire Japanese economy, including price trends of both goods and services, and also to track the process of price changes being transmitted from upstream to downstream in the production flow on a stage-by-stage basis.

Both the index level and year-on-year change for all commodities in the 2020 base PPI showed generally similar movements with the 2015 base index. If examined more closely, the rate of year-on-year change in the new index for all commodities was slightly lower than the rate of change in the old index, with the negative difference coming to 0.3

percentage points on average between January 2021 and March 2022. This reflects the effects of the reduction of the weights in the new index of commodity groups whose prices have risen since 2021 in line with increases in international commodity prices, including "Petroleum and coal products," and "Chemicals and related products."

During the process of the rebasing, the Bank received cooperation for its surveys from many companies and valuable opinions from many experts and other knowledgeable people. The Bank will continue to engage in close exchange of opinions with companies and users and constantly consider ways of improving price statistics.

1. Introduction

The Research and Statistics Department of the Bank of Japan (hereinafter, the Bank) has announced the rebasing of the CGPI, updating its base year from the current 2015 to 2020.¹ This article presents an overview of the results of this rebasing. The Bank plans to begin monthly releases of the 2020 base CGPI (“new index”) in lieu of the current 2015 base CGPI (“old index”) from June 10, when a preliminary CGPI for May is to be published.

In preparation for the rebasing, the Bank published the Basic Policy for Rebasing the Corporate Goods Price Index to the Base Year 2020 (available only in Japanese) in March 2021 in order to widely solicit opinions. After taking into account precious opinions and proposals provided from every point of view, the Bank published the Final Draft of Rebasing the Corporate Goods Price Index to the Base Year 2020 (available only in Japanese, hereinafter, the Final Draft) in December 2021. In compiling the new index, the Bank has decided to keep the survey scope and the structure of the basic grouping indexes, which is comprised of the PPI, the Export Price Index (EPI) and the Import Price Index (IPI), unchanged from the old index. Under that premise, the Bank has implemented the rebasing of the index from 2015 to 2020 and updated the weights of commodity groups in the index. At the same time, the Bank has decided focus on four points -- (1) responding to changes in the economic and industrial structures; (2) increasing the efficiency and sophistication of price index compilation; (3) reorganizing aggregate price indexes, including introducing the FD-ID price indexes; and (4) examining the impact of COVID-19 -- and to reflect the results in the new index (Chart 1).

Below, with respect to the CGPI with the new base year, an overview of the number of commodities and weights (Section 2) and trends of newly added and revised commodity indexes (Section 3) will be provided, followed by an analysis of changes in the index for all commodities (Section 4). In addition, trends of the newly introduced FD-ID price

¹ The rebasing of the CGPI, which is conducted once every five years, consists of the following revisions: updating the base year (the year whose index level is 100); updating the weights assigned to commodities and groups of all indexes; amending commodities (e.g., by adopting new commodities; deleting, splitting, and consolidating existing commodities); and revising the commodities surveyed and improving the price survey method.

Price data surveyed from companies are called "sample prices," while the minimum unit of indexes compiled and published based on the data is referred to as a "commodity." "Commodity amendment," including the adoption of new commodities, is conducted at the same time as the five-yearly rebasing of the CGPI. On the other hand, "revision of commodities surveyed" and "improvement of the price survey method" are conducted not only at the time of the rebasing but also at other appropriate times, as these procedures are made mainly through the revision of the composition of sample prices within the scope of existing commodities.

indexes (Section 5) and the publication schedule (Section 6) will be explained.

2. Overview of the 2020 Base Index

This section first provides an overview of the number of commodities and coverage surveyed for the new index and then explains changes from the old index in the terms of weights of commodity groups.

2.1 Number of Commodities and Coverage

As shown in the Final Draft, as a result of the rebasing, five new commodities (one commodity in the PPI, and two commodities in each of the EPI and the IPI) have been adopted (Chart 2) in light of changes in Japan's economic and industrial structures, among other factors. In addition, the number of commodities has increased by two (two commodities in the IPI) due to splitting. On the other hand, mainly because of the revision of the policy for commodity classification, the numbers of deleted and consolidated commodities have increased.² More specifically, 102 commodities (85 commodities in the PPI, 7 commodities in the EPI and 10 commodities in the IPI) have been deleted, while commodity consolidation has reduced the number of commodities by 209 (147 commodities in the PPI, 20 commodities in the EPI, and 42 commodities in the IPI).

As a result of the above commodity amendment, with respect to the 2020 base CGPI, the number of commodities adopted has decreased from 746 in the existing index to 515 in terms of the PPI, from 209 to 184 in terms of the EPI, and from 258 to 210 in terms of the IPI, with the total number of commodities declining from 1,213 to 909.

The total transaction value of all the commodities included as a percentage of the total

² When revising the policy for commodity classification, the Bank took the following two steps: (1) discontinued the existing original classification in principle, consolidated commodities, and changed the composition and scope of commodities in order to make the classification correspond as much as possible to the classifications of the Industrial Statistics and the IO table (SNA six-digit classification under the commodity flow method) output; and (2) raised the threshold for inclusion from the previous "transaction value of 1/10,000th of the Total Transaction Value for the Index" to the "transaction value of 3/10,000th of the Total Transaction Value for the Index" with respect to the PPI.

Regarding the background to and the concept behind the policy revision, see the Basic Policy for Rebasing the Corporate Goods Price Index to the Base Year 2020 (a research paper written by the Bank of Japan and published in March 2021) by the Research and Statistics Department, Bank of Japan, and the Final Draft of Rebasing the Corporate Goods Price Index to the Base Year 2020 (a research paper written by the Bank of Japan and published in December 2021) by the Research and Statistics Department, Bank of Japan.

transaction value for the new index (the coverage of the adopted commodities) has fallen slightly from 82.9 percent in the old index to 81.3 percent in terms of the PPI, mainly due to a decrease in the number of commodities adopted. However, the coverage ratio has remained at a high level because, in the process of commodity classification, every possible effort was made to ensure that price surveys can be continued following commodity consolidation. Likewise, the coverage in terms of the IPI has fallen slightly, from 75.5 percent in the old index to 74.9 percent. On the other hand, in terms of the EPI, although the number of adopted commodities has declined, the coverage has risen from 70.5 percent to 72.3 percent due to an increase in the transaction value of existing adopted commodities and the addition of new commodities.

2-2. Number of Sample Prices

Under the abovementioned policy for commodity classification, the replacement of sample prices, which is essential for the improvement in index accuracy, has steadily been implemented in the rebasing, as was the case in past rebasing work (Chart 3). For the new index, 678 new sample prices have been added. This reflects increased use of alternative data as well as efforts to incorporate new goods into the index in order to respond to changes in the economic and industrial structures, including increasing use of electrical and electronic components in vehicles and growing consciousness about environmental problems.³ On the other hand, the number of sample prices deleted is 2,397. The main reasons for deletion include the adjustment of sample price composition and the discontinuation of sample surveys regarding commodities that were deleted because they failed to meet the threshold for inclusion.⁴ As a result, the number of sample prices adopted has fallen from 8,607 for the old index to 6,888 for the new index. However, the number of sample prices per commodity has increased from 7.1 for the old index to 7.6.

³ The number of newly adopted sample prices is slightly low compared with the numbers in past cases of rebasing. The reasons for that are: (1) that the number of newly adopted commodities was relatively low compared with the numbers in past cases of rebasing; and (2) that the frequency of revision of the composition of sample prices within the scope of commodities at times other than rebasing is increasing.

⁴ In some cases, the Bank adopted new sample prices when ensuring the appropriateness of the composition of sample prices within the scope of integrated commodities. However, existing sample prices were deleted in many cases with due consideration given to the burden on reporting companies.

2-3. Weights

In the year 2020, COVID-19 had a significant impact on prices, and taking that into consideration, the Bank adopted the average figures for 2019-2020 as the weights of commodity groups in the new index, as shown in the Final Draft. The lineup of groups that ranked high in terms of the weight in the new index, including "Transportation equipment" and "Beverages and foods," was similar to that in the old index (the weights in 2015) (Chart 4).

If differences between the weights in the new and old indexes are examined in more detail, in terms of the PPI, the weight of the "Transportation equipment" group in the new index increased compared with the old index, reflecting an uptrend in the transaction value of passenger motor cars resulting from higher unit prices due to increased value added. The weight of "General purpose machinery" increased somewhat, reflecting an increase in the transaction value of commercial air conditioners and some other commodities due to an expansion of demand for construction. On the other hand, the weight of "Electric power, gas and water" declined because of progress made in energy conservation and a decrease in transaction value due to the impact of the spread of COVID-19 in the spring of 2020. The weight of "Petroleum and coal products" also fell, reflecting a decrease in the transaction value of gasoline due to the fuel efficiency improvement of vehicles, among other factors.

In terms of the EPI, the weight of "Chemicals and related products" increased mainly because of an increase in exports of cosmetics to China and robust exports of pharmaceutical products (Chart 5). Meanwhile, the weight of "Transportation equipment" declined, reflecting steep decreases in exports of finished vehicles and motor vehicle parts due to the impact of the spread of COVID-19 in the spring of 2020.

In terms of the IPI, the weight of "Chemicals and related products" increased, reflecting an increase in imports of pharmaceutical products. The weight of "Electric and electronic products" expanded due to an increase in imports of displays and terminal units, mainly tablet terminals. On the other hand, the weight of "Petroleum, coal and natural gas" fell because of a downtrend in imports of liquified natural gas and crude petroleum due to progress made in energy conservation, among other factors.

3. Trends of Newly Added and Revised Commodity Indexes

This section provides explanations about the trends of (1) newly added commodity

indexes and (2) revised existing commodity indexes following the rebasing.

3-1. Newly Added Commodities

The rebasing adopted five new commodities in light of changes in Japan's economic and industrial structures. Specifically, the newly added commodities are "Sensor devices" in the "Electronic components and devices" group in the PPI, "Sensor devices" in the "Electric and electronic products" group and "Catalyst" in the "Chemicals and related products" group in the EPI, and "Medical and sanitary plastic products" and "Medical and sanitary rubber products" in the "Other primary products and manufactured goods" group in the IPI.

(1) "Sensor Devices" in the PPI and the EPI

The rebasing adopted the new "Sensor devices" commodity category, reflecting electrification of automobiles and increasing use of electronic components in vehicles that has come against the backdrop of efforts to adapt to environmental regulations concerning fuel efficiency and technological innovations that enhance vehicle safety in various countries in recent years, among other factors.

Before adopting this new commodity, the Bank identified the market sizes of the types of products to be included in the scope of the commodity, i.e., pressure sensor, inertial force sensor, magnetic field sensor, and ultrasonic sensor, based on industry statistics and collected sample prices with cooperation from companies that manufacture representative products (Chart 6). Regarding applications, the Bank strived to collect a sufficient number of sample prices by including in the scope of this commodity not only sensor devices for mounting on vehicles, which is the mainstream application, but also those for industrial use (for social infrastructure facilities) and for communication equipment (cellular phones). As all commodities included in the scope of "Sensor devices" go through a complex trade flow during the manufacturing process, great care was taken in selecting sample prices in order to exclude commodities outside the scope.⁵

As for the trends of the newly adopted indexes, although the indexes generally stayed flat until the middle of 2021, price hikes have recently been implemented in terms of the EPI

⁵ For example, ultrasonic sensors for mounting on vehicles are included in the "Sensor devices" commodity category if they are not equipped with an electronic control unit (ECU) but are assigned to the "Control units" category if they are. In actual surveys, the Bank routinely conducts deliberations on detailed points like this with cooperation from reporting companies.

in line with a rise in semiconductor prices. As the market size of "Sensor devices" is expected to expand further amid the electrification of automobiles and increasing use of electronic components in vehicles, the Bank will continue to strive to appropriately track price movements.

(2) "Catalyst" in the EPI

The rebasing adopted "Catalyst" as a new commodity category in the EPI due to increasing demand for this commodity in emerging countries in recent years amid growing consciousness about environmental problems, including climate change (Chart 7).

The index for "Catalyst" in the EPI has remained relatively stable, as this category includes many products for use at overseas chemical plants. On the other hand, in terms of the PPI, "Catalyst," which was already an existing commodity in the PPI, includes many products for exhaust gas purification, and their prices are rising steeply because their raw materials contain large quantities of platinum and palladium, whose prices have recently been surging. It should be kept in mind that there are differences between "Catalyst" for domestic trade and "Catalyst" for export in the product composition and price trend.

(3) "Medical and Sanitary Rubber Products" in the IPI and "Medical and Sanitary Plastic Products" in the IPI

As a result of the rebasing, "plastic gloves" and "rubber gloves" have been newly adopted under the "Medical and sanitary plastic products" and "Medical and sanitary rubber products" commodity categories, respectively, in the IPI in light of the rapid expansion of the markets for these products amid the COVID-19 crisis.

The indexes for both of these commodities rose from the second half of 2020 onward due to rapid growth in demand amid the COVID-19 crisis, but since then, there have been signs that the tightness of the supply-demand balance has eased.

3-2. Revised Existing Commodities

With respect to existing commodities, new goods have been adopted in response to changes in the economic and industrial structures. For some commodities, alternative data (data available from statistics compiled by other organizations and from databases

developed by other organizations) were used.

(1) Adoption of New Goods

In order to respond to changes in the economic and industrial structures, the rebasing adopted new goods, focusing on several key phrases, such as electrification of automobiles and increasing use of electronic components in vehicles, growing consciousness about environmental problems, the impact of COVID-19, sophistication and digitalization of ICT, aging of society, and manpower shortages. In this process, the Bank not only adopted new commodities but also increased the number of sample prices regarding existing ones.

Below, explanations are provided about commodities for which the number of sample prices has been increased and whose price trends showed distinctive change (Chart 8). First, regarding "Control units" in the PPI, in response to electrification of automobiles and increasing use of electronic components in vehicles, drive systems for hybrid vehicles have been adopted. The new index for this commodity has stayed lower than the old index. This reflects price cuts following the spread of the products, which has made it possible to recover research and development cost.

Second, with respect to "Cellular phones" in the IPI, in response to sophistication and digitalization of ICT, 5G-capable smartphones have been adopted. As for the price trend, the new index has stayed lower than the old index. That is attributable to the effects of effective price cuts resulting from quality improvement amid the spread of 5G-capable smartphones.

Third, regarding the "Medical and sanitary textile products" in the PPI, non-woven face masks, for which production is expected to continue on a certain scale due to the effects of COVID-19, have been newly adopted. The new index for this commodity showed some fluctuations when the supply-demand balance was not stable, but it has stayed slightly higher than the old index due to robust demand for face masks.

(2) Use of Alternative Data

For the rebasing, the Bank considered further use of alternative data with respect to some commodities, in order to reduce the burden on reporting companies. As a result, as shown in the Final Draft, alternative data have been newly adopted with respect to 12 commodities (2 commodities in the PPI, and 5 commodities in each of the EPI and the IPI), including "Concrete blocks" in the PPI, "Methyl methacrylate" in the EPI, and "Rape

seeds" in the IPI. When adopting an alternative data, the Bank checked the following points, as it did in past rebasing work: (1) whether the adoption of alternative data will bring benefits commensurate with the adoption cost (whether the reporting burden and the burden of survey-related administrative work can be reduced); (2) whether the quality of alternative data is the same as or higher than the quality of sample prices collected through surveys on reporting companies.

As for the price trends of the indexes for commodities for which alternative data have been adopted, the new and old indexes showed similar movements with respect to many commodities, including "Toluylene diisocyanate " in the EPI, " Hot rolled steel strips" in the IPI and "Rape seeds" in the IPI (Chart 9). With respect to "Concrete products for roads" in the PPI, the new index captured the same trend and showed smaller fluctuations than the old index. This is presumably attributable to the fact that the newly adopted alternative data ("Web Kensetsubukka," compiled by the Construction Research Institute) cover a larger number of samples and a wider area than the previous data. As explained above, following the adoption of alternative data, index accuracy has been kept at the same level or a higher level compared with the level obtained when sample prices collected through surveys on reporting companies were used. In addition, as the adoption of alternative data has led to the discontinuation of use of some sample prices, the reporting burden has been reduced.

4. Analysis of Changes in the Index for All Commodities

This section analyzes factors of changes in the trend of the new index for all commodities between January 2020 and March 2022 through comparison with the old index.

4-1. Producer Price Index (PPI)

The new and old indexes for all commodities in the PPI showed generally similar movements in terms of both the index level and year-on-year change (Chart 10). If examined more closely, the rate of year-on-year change in the new index for all commodities was slightly lower than the rate of change in the old index. The new index's negative difference compared with the old index was 0.3 percentage points on average between January 2021 and March 2022.

Below, the breakdown of factors of differences between the new and old indexes for all commodities in terms of year-on-year change (January 2021 to March 2022) will be

described. The factors of differences between the new and old indexes can be broken down into the following effects according to the specifics of the rebasing: (1) the weight effect (the effect due to the updating of the weights), (2) the reset effect (the effect due to the reset of the index level in the new base year at 100), (3) the commodity amendment effect (the effect of addition or deletion of commodities), and (4) the commodity index revision effect (the effect due to differences between the new and old indexes in terms of year-on-year change resulting from the revisions of sample prices of existing commodities) (Chart 11).

With respect to the PPI, the breakdown of factors of differences shows that the rate of year-on-year change in the new index for all commodities was dragged down by 0.3 percentage points on average between January 2021 and March 2022 mainly because of the negative contribution of the weight effect (minus 0.4 percentage point) (Chart 12). It should be noted that the commodity amendment effect made a negative contribution (minus 0.1 percentage point), while the reset effect and the commodity index revision effect made small positive contributions (plus 0.1 percentage points each).

According to a group-by-group breakdown of the weight effect, which was the main factor of the lower rate of the year-on-year change in the new index, "Petroleum and coal products" and "Chemicals and related products" made significant contributions (Chart 13). With respect to both of these groups, significant positive year-on-year changes were recorded between January 2021 and March 2022 as a result of a rise in international commodity prices. However, because of the reduction of their weights due to the rebasing, these groups' positive contributions to the index for all commodities declined steeply.

As for the commodity amendment effect, which made a negative contribution, "Chemicals and related products" and "Nonferrous metals" made negative contributions. This reflects the effects of the deletion of "Para-xylene" and "Unwrought copper alloys," whose prices were showing year-on-year increases due to a rise in international commodity prices.

On the other hand, regarding the reset effect, which raised the rate of year-on-year change, "Petroleum and coal products" made a positive contribution. The old index for this group was below 100 in 2020 and showed positive year-on-year changes between January 2021 and March 2022. As a result, the resetting of the index level in 2020 at 100 made a positive contribution.

With respect to the commodity index revision effect, which raised the rate of year-on-year change, "Iron and steel" and "Production machinery" made positive contributions.

However, the contributions by these groups were relatively small, at 0.02 to 0.03 percentage points.

4-2. Export Price Index (EPI)

The new and old indexes for all commodities in the EPI showed mostly similar movements in terms of both the index level and year-on-year change (Chart 14). If examined more closely, the rate of year-on-year change in the new index for all commodities was slightly lower than the rate of change in the old index, with the negative difference (on a yen-basis) coming to 1.0 percentage point on average between January 2021 and March 2022.

According to a breakdown of factors of differences between the new and old indexes in terms of the EPI, the rate of year-on-year change in the new index for all commodities was dragged down by 1.0 percentage point on average between January 2021 and March 2022 mainly because of the negative contribution of the weight effect (minus 1.4 percentage point), as is the case with the PPI (Chart 15). It should be noted that the commodity amendment effect made a small negative contribution (minus 0.2 percentage points), while the reset effect and the commodity index revision effect made positive contributions (plus 0.2 percentage points and plus 0.4 percentage points, respectively).

A group-by-group breakdown of the weight effect, which was the main factor of the lower rate of year-on-year change in the new index, shows that "Chemicals and related products" and "Other primary products and manufactured goods" made significant contributions. The positive contribution by "Chemicals and related products" to the index for all commodities declined steeply because the rebasing reduced the weights of commodities that showed significant positive year-on-year changes between January 2021 and March 2022, such as "Vinyl chloride monomer." In the "Other primary products and manufactured goods," "Carbon and graphite products" suffered year-on-year declines despite an increase in the weight due to an uptrend in exports, because the price has fallen back since 2021 due to the expansion of supply capacity for this commodity in emerging countries, and this affected the price trend of the group.

4-3. Import Price Index (IPI)

The new and old indexes for all commodities in the IPI showed generally similar movements in terms of the index level and year-on-year change (Chart 16). If examined

more closely, the rate of year-on-year change in the new index for all commodities was slightly lower than the rate of change in the old index, with the negative difference (on a yen basis) coming to 1.4 percentage points on average between January 2021 and March 2022.

According to a breakdown of factors of differences in terms of the IPI, the rate of year-on-year change in the new index for all commodities was dragged down by 1.4 percentage points on average between January 2021 and March 2022 mainly because of the negative contribution of the weight effect (minus 1.9 percentage points) (Chart 17). It should be noted that the commodity amendment effect made a small negative contribution (minus 0.1 percentage points), while the reset effect and the commodity index revision effect made positive contributions (plus 0.3 percentage points and plus 0.4 percentage points, respectively).

A group-by-group breakdown of the weight effect, which was the main factor of the lower rate of year-on-year change in the new index, shows that "Petroleum, coal and natural gas" made a significant contribution. This group showed significant positive year-on-year changes between January 2021 and March 2022 due to a rise in international commodity prices. However, the group's positive contribution to the index for all commodities declined steeply because the rebasing reduced its weight.

As for the reset effect, "Petroleum, coal and natural gas" made a significant positive contribution. The old index for this group was significantly below 100 in 2020 and showed positive year-on-year changes between January 2021 and March 2022. As a result, the resetting of the index level in 2020 at 100 made a positive contribution.

4-4. Paasche Check

Regarding the Laspeyres index with fixed weights, which fixes weights at the base year, including the CGPI, it is theoretically known that the further away the price and transaction volume deviate from the levels in the base year, the less well the index reflects the reality. If the price of a good drops (rises) while the transaction volume increases (decreases), since the impact of dropping (rising) of the price of the good will be smaller (larger) than the actual situation, the Laspeyres index for all commodities with fixed weights, which fixes weights at the base year, overstates the index level compared with the reality.

In order to identify the magnitude of this problem of the Laspeyres index with fixed

weights, the Paasche check has been conducted in the rebasing work.⁶ As a result of the Paasche check conducted with respect to the index for all commodities in 2020, it was found that the rate of difference ((Paasche index - Laspeyres index with fixed weights) / Laspeyres index with fixed weights) in the PPI has remained small, minus 0.5 percent, indicating that the problem of the Laspeyres index with fixed weights that was observed in the rebasing to 2020 is not very significant compared with past cases of rebasing (Chart 18). Moreover, the rates of differences in the EPI and the IPI (minus 1.3 percent and minus 2.5 percent, respectively) were also smaller than the rates observed in the several past cases of rebasing. These results are considered to be consistent with the fact that significant differences have not arisen between the new and old indexes following the rebasing, as was explained in the previous section.

4-5. Chain-Weighted Producer Price Index

For the rebasing, the Bank has adopted the average figures for 2019-2020 as the weights of basic grouping indexes. That is mainly because it has been confirmed by hard data that economic activity changed significantly in 2020, the new base year, in Japan and abroad due to the impact of COVID-19. To verify the validity of the average figures for 2019-2020, it is necessary to continue checking data in relation to changes in the weights. In this respect, regarding the PPI, the Bank publishes the Producer Price Index using the chain-weighted index formula (hereinafter, "chain-weighted index") as a reference index. The chain-weighted index is distinctive in that the weights are updated every year, and it is considered to be useful to look at it at the same time.⁷

At this time, the weights for the chain-weighted index in 2020 were calculated and reflected in the figures for the period from 2021 onwards.⁸ By group, the weight increased for "Beverages and foods" (144.6→148.2, plus 3.6 percentage points) and "Agriculture,

⁶ The Paasche check compares the Laspeyres index with fixed weights under the old index with the index compiled using weights at the time of comparison (called Paasche index).

⁷ As shown in the Final Draft, with respect to chain-weighted price indexes, the average figures for 2019-2020 were used as the weights in the base year 2020 (2020, t=0) in order to make comparison with the basic grouping indexes easy, as has so far been the case. The year of weight calculation for the period from 2021 onwards should be the year prior to the year of index calculation (the year of index calculation = t; year of weight calculation = t-1), as has so far been the case. For example, the year 2020 should be used as the year of weight calculation for the index in 2021 and the year 2021 should be used for the index in 2022.

⁸ When updating is delayed due to a data availability problem, the weights in the year two years prior to the year of index calculation (t-2) should be used for a while on a provisional basis. Later, when relevant data have become available, the provisional weights should be replaced by the weights in the year prior to the year of index calculation and the index should be retroactively corrected.

forestry and fishery products" (40.3→42.8, plus 2.5 percentage points). On the other hand, the weight declined for "Petroleum and coal products" (52.8→46.9, minus 5.9 percentage points) and "Transportation equipment" (150.9→148.8, minus 2.1 percentage points) (Chart 19).

The rate of year-on-year change in the chain-weighted index for all commodities between January 2021 and March 2022 was dragged down by 0.6 percentage points on average compared with the basic grouping index. This is because the weight of "Petroleum and coal products," which showed a significant year-on-year increase (plus 30.3 percent) during the same period, declined in 2020 amid the COVID-19 crisis.

5. Trends of the FD-ID Price Indexes

5.1 Reorganization of Aggregate Price Indexes

As shown in the Final Draft, the aggregate price indexes for price statistics have been reorganized in conjunction with this revision (some existing indexes have been deleted while some new ones have been introduced) (Chart 20). More specifically, while the Final Demand-Intermediate Demand price indexes (FD-ID price indexes)⁹, which are new indexes by stage of demand that integrate prices of goods and services, have been newly introduced as satellite series, the compilation and publication of existing indexes such as the Index by Stage of Demand and Use in the CGPI and the Input-Output Price Index of the Manufacturing Industry by Sector (IOPI) will be discontinued. To be more specific, the Index by Stage of Demand and Use in the CGPI will not be updated following the release of a preliminary index for April 2022 published on May 16, 2022. The Input-Output Price Index of the Manufacturing Industry by Sector (IOPI) will not be updated following the release of data for April published on May 30. In this respect, the Investment Goods Index, which is among the indexes within the Index by Stage of Demand and Use in the CGPI, is scheduled to continue to be compiled and published as a reference index of the 2020 base CGPI because the presence of strong user needs has been confirmed by the mention of this index in several cabinet orders and ministerial ordinances related to laws, such as the Expropriation of Land Act. Following the rebasing, if the user needs

⁹ For more details, see Moegi Inoue, Atsushi Kawakami, Ayako Masujima, Ichiro Muto, Shogo Nakano, Izumi Takagawa (2021), "Final Demand-Intermediate Demand Aggregation System of Japan's Producer Price Index" Bank of Japan Working Paper Series (No. 21-E-6).

have been judged to have declined after future revisions of those cabinet orders and ministerial ordinances, the Bank will consider discontinuing the updating of this index before the next rebasing.

The newly introduced FD-ID price indexes will be published for the first time in June (June 28), when the rebasing of the CGPI to 2020 is scheduled to come into force. Thereafter, the FD-ID price indexes are scheduled to be published around the 20th business day of each month in principle on the website of the Bank.

The commodity classification (e.g., classification of component items for publication) of the FD-ID price indexes is as shown in the Final Draft. Specifically, regarding the basic series, a total of 109 component indexes, classified by type of goods/services and by domestic trade or export, are compiled with respect to the price indexes by stage of intermediate demand (ID indexes) and the final demand price index (FD index). In addition, regarding the special series, three final goods-related indexes within the Index by Stage of Demand and Use ("Final goods," "Final goods/capital goods," and "Final goods/consumer goods," all of which cover commodities for domestic trade) will be published as linked indexes. In total, 112 indexes will be compiled and published. As the FD-ID price indexes are secondary data that undergo a high degree of processing, the Bank may flexibly consider revising the classification and publication method of the FD-ID price indexes in light of revisions of the underlying statistics, such as the Input-Output table, and changes in future user needs.

5-2. Trends of the FD-ID Price Indexes

Below, the trends of the newly introduced FD-ID price indexes will be explained (Charts 21 and 22).

Regarding the trends of the price indexes for Stages 1 to 4 of intermediate demand and the FD all commodities index (2015=100) for the period from 2021 onwards, the price index for Stage 1, which is the most upstream stage in the production flow, showed the largest rise, reflecting a rise in international commodity prices, among other factors. On the other hand, the price indexes for downstream stages and the FD index showed moderate rises, with the pace of rise becoming slower in more downstream stages. This indicates that the price shock in upstream stages have been absorbed as the goods moved through the production flow. However, looking at the movement of the FD index, it can be seen that price pass-through is progressing, with the increase in prices of goods contributing, although more slowly than the increase in upstream prices.

Meanwhile, according to a breakdown of contributions by type of goods/services to year-on-year changes in the price indexes for Stages 1 to 4 and the FD composite price index, although energy made the greatest contributions in upstream stages, such as Stages 1 and 2, its effects declined in downstream stages, such as Stage 4. On the other hand, services made progressively larger contributions during the production flow, with the contributions becoming larger in downstream stages, including Stage 4 and the FD (final demand) stage.

As explained above, the FD-ID price indexes are expected to provide more useful information than before for the purpose of identifying the supply-demand environment of the entire Japanese economy and the process of price changes being transmitted through the production flow. The Bank hopes that analyses based on and knowledge gained from the FD-ID price indexes will deepen as data accumulation progresses following the start of the compilation and publication of the new price indexes.

5-3. Comparison with the Index by Stage of Demand and Use in the CGPI

As was mentioned earlier, the Bank will publish three indexes related to final goods within the existing Index by Stage of Demand and Use ("Final goods," "Final goods/capital goods," and "Final goods/consumer goods," all of which cover commodities for domestic trade), which are characterized as the special series of indexes within the FD-ID price indexes, as linked indexes. This is because of the presence of strong user needs and also because indexes within the FD-ID price indexes may serve as substitutes.

Strictly speaking, the FD-ID price indexes are different in price concept and in coverage from the Index by Stage of Demand and Use. For example, the aggregation for the FD-ID price indexes covers not only goods but also services. Even so, the FD-ID price indexes may substitute for the existing Index by Stage of Demand and Use in some respects. For example, goods in Stage 1 in the FD-ID price indexes are those which are used as inputs into the most upstream stage in the production flow, so they are similar in concept to "Raw materials" in the Index by Stage of Demand and Use and the relevant indexes in the FD-ID price indexes and the Index by Stage of Demand and Use show similar movements (Chart 23).¹⁰ In addition, the index for "Intermediate materials" in the Index by Stage of Demand and Use is similar in concept to the indexes for Stage 2 to 4,

¹⁰ "Raw materials" in the Index by Stage of Demand and Use refers to unprocessed materials and fuels manufactured in the primary industry for use or consumption in production activity. "Intermediate materials" refers to processed products, including materials, fuels, and driving power for secondary use in production, and expendables consumed in production activity.

which are midstream and downstream intermediate stages of demand. The average of prices of goods in Stages 2 to 4 show movements similar to the ones observed for the index for "Intermediate materials" in the Index by Stage of Demand and Use. Therefore, depending on the analysis needs, it may be possible to compare long-term trends by using them as linked indexes.

6. Publication Schedule

At the same time as the publication of this research paper (June 3), "Rebasing the Corporate Goods Price Index to the Base Year 2020," time-sequential data of the new index for the past period (from January 2020 to April 2022) are being published (Chart 24).

Starting with the publication of a preliminary CGPI in May, scheduled for June 10, the new index will be published in place of the old index. Starting on June 28, the FD-ID price indexes will be published.¹¹

7. Final Remarks

The Bank is deeply grateful to the companies cooperating in the collection of price data, to academic experts and economists for valuable comments, and to the government and industrial associations for their suggestions regarding the rebasing of the CGPI.

After the rebasing, the Bank will continue to conduct deliberations in order to improve price indexes through the replacement of sample prices and constant reviews of methods for price survey and quality adjustment. The Bank would appreciate it if you could continue providing opinions from various perspectives on the Bank's compilation of statistics.

¹¹ Preparations, including various adaptations to computer systems, are underway for starting by the end of FY2022 online surveys using the "Portal Site of Official Statistics Online Survey" (using the same method as the one used for the "tankan" report), which was explained in the Final Draft.

Rebasing the Corporate Goods Price Index to the Base Year 2020

June 2022
Research and Statistics Department
Bank of Japan

1.Introduction

Contents

1. Introduction
2. Overview of the 2020 Base Index
3. Trends of Newly Added and Revised Commodity Indexes
4. Analysis of Changes in the Index for All Commodities
5. Trends of the FD-ID Price Indexes
6. Publication Schedule

Main Features of the Rebasing of Corporate Goods Price Index (Chart1) to the Base Year 2020

Responding to changes in the economic and industrial structures

Changes in the circumstances surrounding companies, such as [electrification of automobiles and increasing use of electronic components in vehicles](#) and [growing consciousness about environmental problems](#).

➔ Incorporated goods for which demand is growing into the index (adopted new commodities and increased the number of sample prices for existing commodities).

Increasing the efficiency and sophistication of price index compilation

Growing difficulty of maintaining a sufficient number of reporting companies and sample prices for securing index accuracy amid the increasing oligopolization of domestic production.

➔ Held down the reporting burden and maintained and improved index accuracy at the same time through [the revision of the policy for commodity classification and use of alternative data](#).

➔ Efficiently constructed a more sophisticated price index through [the revision of the hedonic regression method and a shift of price surveys to the online format](#).

Reorganizing aggregate price indexes

[Introduction of the FD-ID price indexes](#) and the deletion of the Index by Stage of Demand and Use in the CGPI and the IOPI.

➔ Reorganized aggregate price indexes (added some new indexes while deleting some old ones) while taking into consideration a broad range of user needs.

Examining the impact of COVID-19

How to reflect changes in the economic and industrial structures brought by COVID-19 in the price index

➔ Conducted examination regarding [the commodities covered by surveys](#) and the [calculation of the weights](#).

2. Overview of the 2020 Base Index

Number of Commodities and Coverage

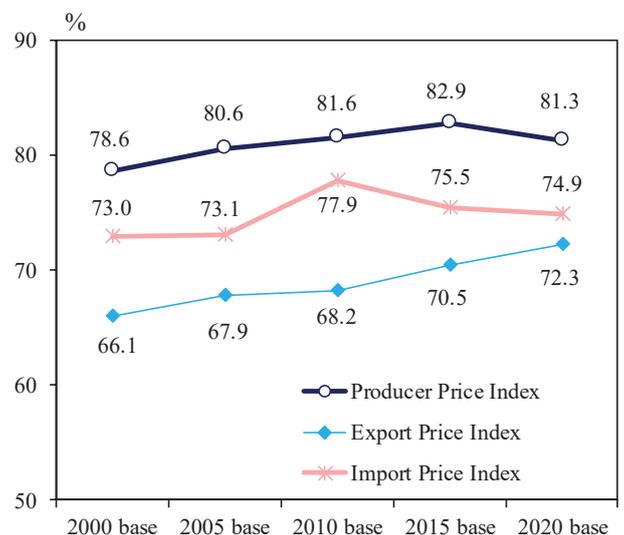
(Chart2)

- ✓ Adopted five new commodities in light of changes in the economic and industrial structures, among other factors. On the other hand, the number of deleted and consolidated commodities increased mainly due to the revision of the policy for classifying commodities. As a result of the commodity amendment, the number of commodities in the 2020 base index came to 909.
- ✓ However, the coverage of the adopted commodities in the PPI remained high, 81.3 percent, because in the classification of commodities, every possible effort was made to ensure that price surveys can be continued following commodity consolidation, among other reasons.

(1) Number of Commodities

	Total	Producer Price Index	Export Price Index	Import Price Index
2020 base (A)	909	515	184	210
2015 base (B)	1,213	746	209	258
Changes in the number of commodities (A-B)	-304	-231	-25	-48
Newly added	+5	+1	+2	+2
Split	+2	+0	+0	+2
Deleted	-102	-85	-7	-10
Consolidated	-209	-147	-20	-42

(2) Changes in Coverage



Number of Sample Prices

(Chart3)

- ✓ As a result of incorporating new goods into the new index in response to electrification of automobiles and increasing use of electronic components in vehicles, 678 new sample prices were adopted, while 2,397 existing sample prices were deleted due to commodity consolidation, among other factors. Consequently, the number of sample prices declined from 8,607 for the old index to 6,888 for the new index.
- ✓ However, the number of sample prices per commodity increased from 7.1 for the old index to 7.6 for the new index.

(1) Replacement of Sample Prices



(2) Number of Sample Prices

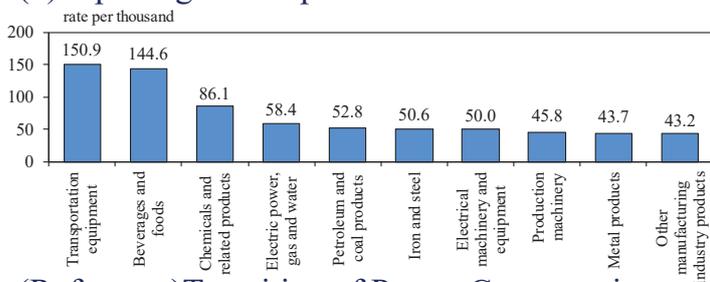
	Number of sample prices	Number of sample prices per commodity
2020 base (A)	6,888	7.6
2015 base (B)	8,607	7.1
Difference (A-B)	-1,719	

Weights(1): Producer Price Index(PPI)

(Chart4)

- ✓ Taking it into consideration that in 2020, COVID-19 had a significant impact on prices, the average figures for 2019-2020 were adopted as the weights for the new index.
- ✓ The lineup of groups that ranked high in terms of the weight in the PPI, including "Transportation equipment" and "Beverages and foods," remained almost unchanged compared with the old index. The weights of "Transportation equipment" rose because of an increase in the transaction value of passenger motor cars resulting from higher unit prices due to increased value added. On the other hand, the weight of "Electric power, gas and water" declined because of progress made in energy conservation and a decrease in transaction value due to the impact of COVID-19 in the spring of 2020.

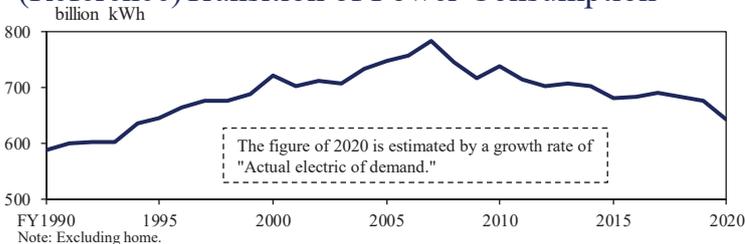
(1) Top Weight Groups



(2) Changes in Group Weights(PPI)

Major group	Weights (rate per thousand)		
	2015 base	2020 base	Difference
Total (All commodities)	1,000.0	1,000.0	—
Manufacturing industry products	888.3	892.3	+4.0
Beverages and foods	141.6	144.6	+3.0
Textile products	9.6	9.4	-0.2
Lumber and wood products	9.2	9.6	+0.4
Pulp, paper and related products	27.7	28.8	+1.1
Chemicals and related products	89.2	86.1	-3.1
Petroleum and coal products	59.5	52.8	-6.7
Plastic products	38.2	41.0	+2.8
Ceramic, stone and clay products	23.3	23.4	+0.1
Iron and steel	51.7	50.6	-1.1
Nonferrous metals	27.1	26.7	-0.4
Metal products	40.0	43.7	+3.7
General purpose machinery	27.2	33.3	+6.1
Production machinery	41.1	45.8	+4.7
Business oriented machinery	16.2	14.9	-1.3
Electronic components and devices	24.5	19.3	-5.2
Electrical machinery and equipment	52.7	50.0	-2.7
Information and communications equipment	20.8	18.2	-2.6
Transportation equipment	140.7	150.9	+10.2
Other manufacturing industry products	48.0	43.2	-4.8
Agriculture, forestry and fishery products	35.8	40.3	+4.5
Minerals	3.9	3.7	-0.2
Electric power, gas and water	67.1	58.4	-8.7
Scrap and waste	4.9	5.3	+0.4

(Reference) Transition of Power Consumption



Weights(2) : Export Price Index/Import Price Index (EPI/IPI)^(Chart5)

- ✓ In terms of the EPI, the weight of "Chemicals and related products" increased mainly because of an increase in exports of cosmetics to China and robust exports of pharmaceutical products. Meanwhile, the weight of "Transportation equipment" declined, reflecting steep decreases in exports of finished vehicles and auto parts due to the impact of the spread of COVID-19 in the spring of 2020.
- ✓ In terms of the IPI, the weight of "Chemicals and related products" increased, reflecting an increase in imports of pharmaceutical products. The weight of "Electric and electronic products" expanded due to an increase in imports of tablet terminals, among other commodities. On the other hand, the weight of "Petroleum, coal and natural gas" fell because of a downtrend in imports of liquified natural gas and crude petroleum due to progress made in energy conservation, among other factors.

(1) Changes in Group Weights(EPI)

Group	Weights (rate per thousand)		
	2015 base	2020 base	Difference
Total (All commodities)	1,000.0	1,000.0	—
Textiles	13.8	9.2	-4.6
Chemicals and related products	98.4	117.5	+19.1
Metals and related products	108.5	103.5	-5.0
General purpose, production and business oriented machinery	189.4	196.5	+7.1
Electric and electronic products	205.5	210.2	+4.7
Transportation equipment	285.2	269.9	-15.3
Other primary products and manufactured goods	99.2	93.2	-6.0

(2) Changes in Group Weights(IPI)

Group	Weights (rate per thousand)		
	2015 base	2020 base	Difference
Total (All commodities)	1,000.0	1,000.0	—
Beverages and foods and agriculture products for food	80.4	85.1	+4.7
Textiles	61.3	58.6	-2.7
Metals and related products	95.8	101.6	+5.8
Lumber and wood products and forest products	17.3	16.6	-0.7
Petroleum, coal and natural gas	252.3	213.6	-38.7
Chemicals and related products	94.7	108.4	+13.7
General purpose, production and business oriented machinery	68.1	75.9	+7.8
Electric and electronic products	196.6	206.7	+10.1
Transportation equipment	49.5	51.2	+1.7
Other primary products and manufactured goods	84.0	82.3	-1.7

3. Trends of Newly Added and Revised Commodity Indexes

Newly Added Commodities(Sensor Devices)

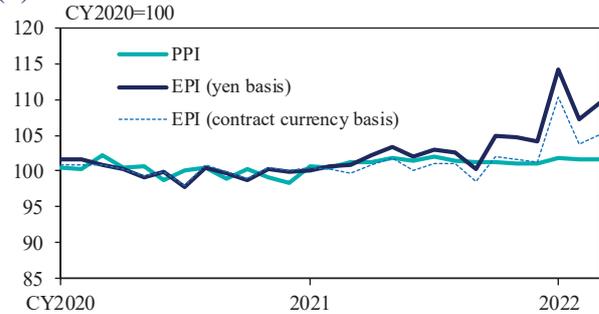
(Chart6)

- ✓ "Sensor devices" was adopted as a new commodity category in the PPI and the EPI, reflecting electrification of automobiles and increasing use of electronic components in vehicles. A sufficient number of sample prices was secured by including various types of products and products for various applications in the scope of this commodity category. As this commodity goes through a complex manufacturing process, the Bank took great care in selecting sample prices while receiving cooperation from reporting companies.
- ✓ Although the index for this commodity has stayed almost flat until the middle of 2021, price hikes have recently been implemented in terms of the EPI in line with a rise in semiconductor prices. As the market size is expected to expand further, the Bank will continue to appropriately track price movements.

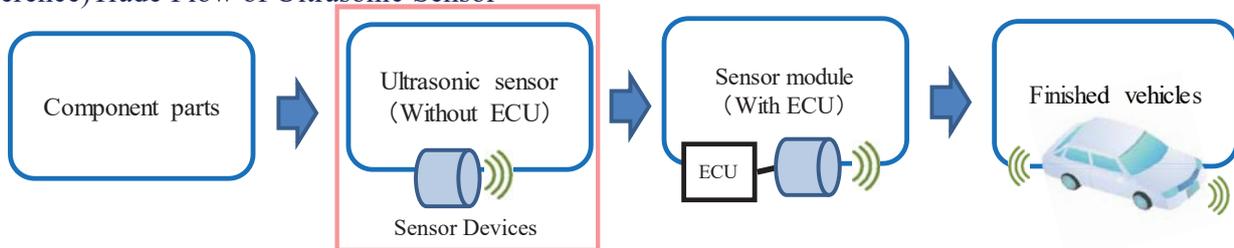
(1)Type and Main Purpose

Type	Main purpose
Pressure sensor	Automotive , industrial use
Inertial force sensor	Automotive
Magnetic field sensor	Generic use , automotive , communication equipment
Ultrasonic sensor	Automotive

(2)Trends of Indexes



(Reference)Trade Flow of Ultrasonic Sensor

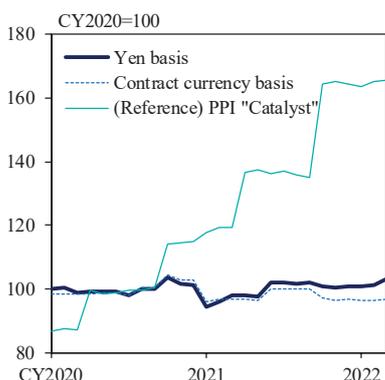


Newly Added Commodities(Catalyst, etc.)

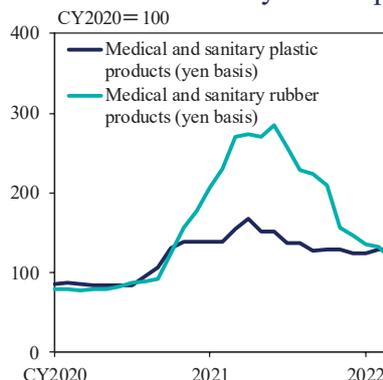
(Chart7)

- ✓ "Catalyst" was newly adopted in the EPI in response to growing consciousness about environmental problems, including climate change. The index for this commodity has remained relatively stable, as many products for use at overseas chemical plants are included. On the other hand, in terms of the PPI, "Catalyst," which was already an existing commodity in the PPI, includes many products for exhaust gas purification, and their prices are rising steeply because their raw materials contain large quantities of platinum and palladium, whose prices have been surging. It should be kept in mind that "Catalyst" includes products with different product composition and different price trends.
- ✓ "Plastic gloves" and "rubber gloves" were newly adopted under the "Medical and sanitary plastic products" and "Medical and sanitary rubber products" commodity categories, respectively, in the IPI in light of the rapid expansion of the markets for these products amid the COVID-19 crisis. Although prices rose from the second half of 2020 onward due to rapid growth in demand, there have been signs that the tightness of the supply-demand balance has eased.

(1)EPI "Catalyst"



(2)IPI "Medical and sanitary plastic products" and IPI "Medical and sanitary rubber products"



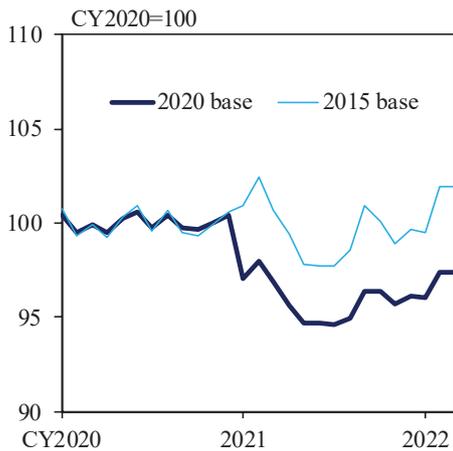
(Reference)Transaction Value

Newly added commodities		2020 base transaction value (100 million yen)
PPI	Sensor devices	1,409
EPI	Sensor devices	1,612
	Catalyst	1,733
IPI	Medical and sanitary plastic products	861
	Medical and sanitary rubber products	988

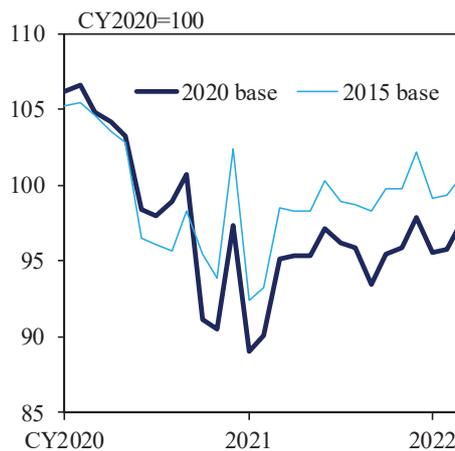
Revised Existing Commodities(1):Adoption of New Goods (Chart8)

- ✓ Regarding "Control units" in the PPI, drive systems for hybrid vehicles were newly adopted. The spread of the products has made it possible to recover research and development cost, resulting in price cuts.
- ✓ With respect to "Cellular phones" in the IPI, 5G-capable smartphones were newly adopted. Quality improvement resulted in effective price cuts amid the spread of 5G-capable smartphones.
- ✓ Regarding "Medical and sanitary textile products" in the PPI, non-woven face masks were newly adopted due to the impact of COVID-19. Although prices showed some fluctuations, the new index has stayed slightly higher than the old index due to robust demand.

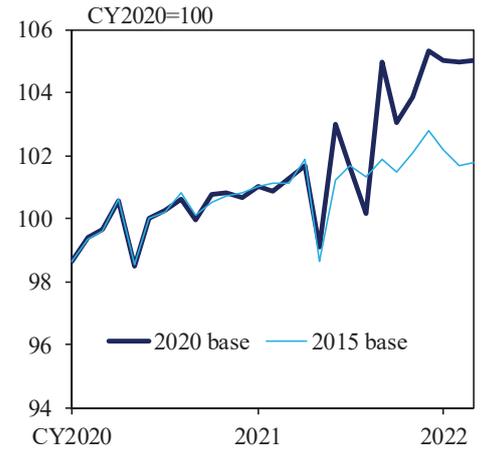
(1)PPI "Control units"



(2)IPI "Cellular phones"



(3)PPI "Medical and sanitary textile products"



Note: The data in (2) is on a yen basis.

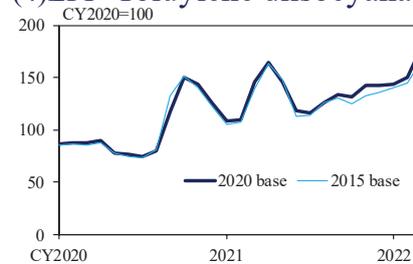
Revised Existing Commodities(2):Use of Alternative Data (Chart9)

- ✓ Alternative data were introduced with respect to 12 commodities, in order to reduce the burden on reporting companies.
- ✓ With respect to many commodities, the new and old indexes showed similar movements. With respect to "Concrete products for roads" in the PPI, the new index captured the same trend and showed smaller fluctuations than the old index because alternative data cover a larger number of samples and a wider area. Following the introduction of alternative data, index accuracy has been kept at the same or a higher level compared with the level obtained when surveys on reporting companies were used. The reporting burden has also been reduced.

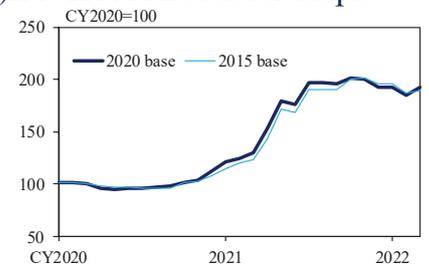
∇ Added Alternative Data

Index	Group	Commodity
PPI	Ceramic, stone and clay products	Concrete blocks
		Concrete products for roads
EPI	Chemicals and related products	Caustic soda
		Methyl methacrylate
		Polycarbonates
		Toluylene diisocyanate
		Methyl diphenyl diisocyanate
IPI	Beverages and foods and agriculture products for food	Rape seeds
	Metals and related products	Hot rolled steel strips
		Cold rolled steel strips
		Stainless steel sheets
	Lumber and wood products and forest products	Wooden logs

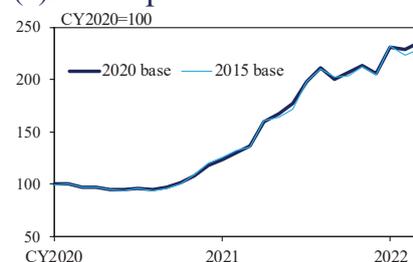
(4)EPI "Toluylene diisocyanate"



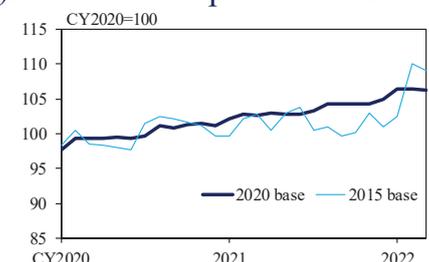
(5)IPI "Hot rolled steel strips"



(6)IPI "Rape seeds"



(7)PPI "Concrete products for roads"



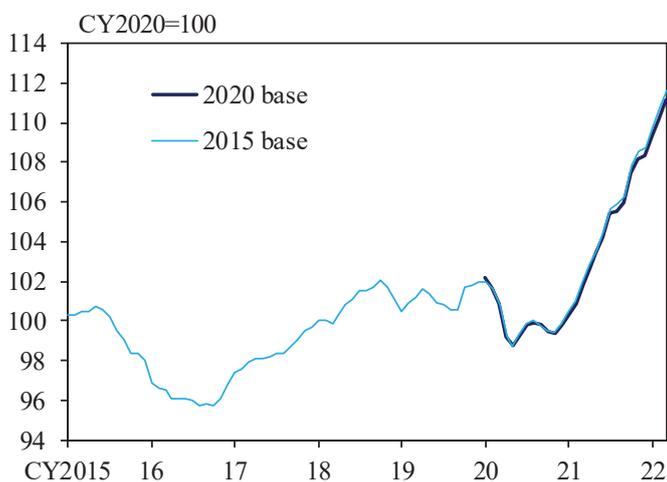
Note: The data in (4), (5) and (6) are on a yen basis.

4. Analysis of Changes in the Index for All Commodities

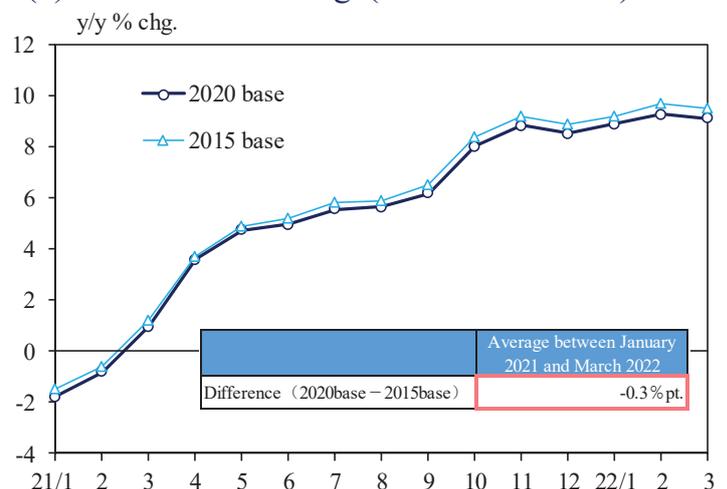
Comparison between the New and Old Indexes in the PPI (Chart10)

- ✓ The new and old indexes for all commodities in the PPI showed generally similar movements in terms of both the index level and year-on-year change.
- ✓ If examined more closely, the rate of year-on-year change in the new index for all commodities was slightly lower than the rate of change in the old index, with the negative difference coming to 0.3 percentage points on average between January 2021 and March 2022.

(1) Level (All Commodities)

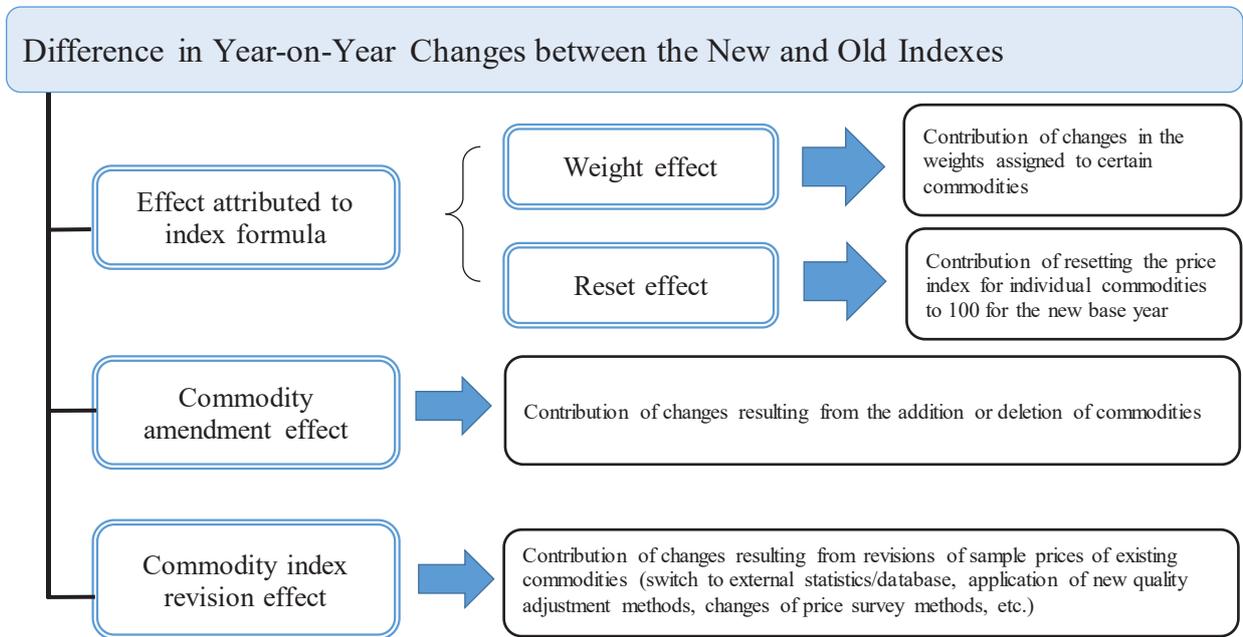


(2) Year-on-Year Change (All Commodities)



Factors of Differences between the New and Old Indexes

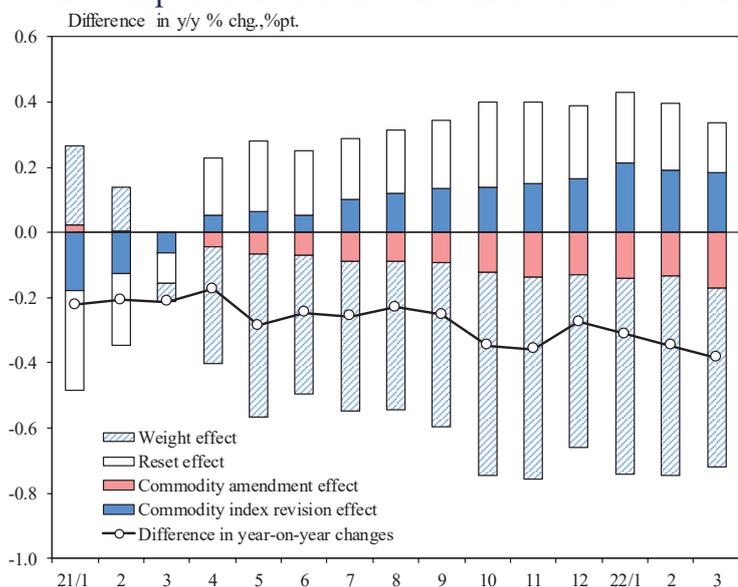
- ✓ The chart shows a breakdown of differences between the new and old indexes for all commodities in terms of year-on-year change (January 2021 to March 2022).
- ✓ The factors of differences between the new and old indexes can be broken down into the following four effects: (1) the weight effect, (2) the reset effect, (3) the commodity amendment effect, and (4) the commodity index revision effect.



Decomposition of Difference in Year-on-Year Changes between the New and Old Indexes in the PPI

- ✓ With respect to PPI, a breakdown of differences shows that the rate of year-on-year change in the new index for all commodities was dragged down by 0.3 percentage points on average between January 2021 and March 2022 mainly because of the negative contribution of the weight effect (minus 0.4 percentage points).
- ✓ The commodity amendment effect made a negative contribution (minus 0.1 percentage point), while the reset effect and the commodity index revision effect made positive contributions (plus 0.1 percentage point each).

∇ Decomposition of Difference in Year-on-Year changes (All Commodities)



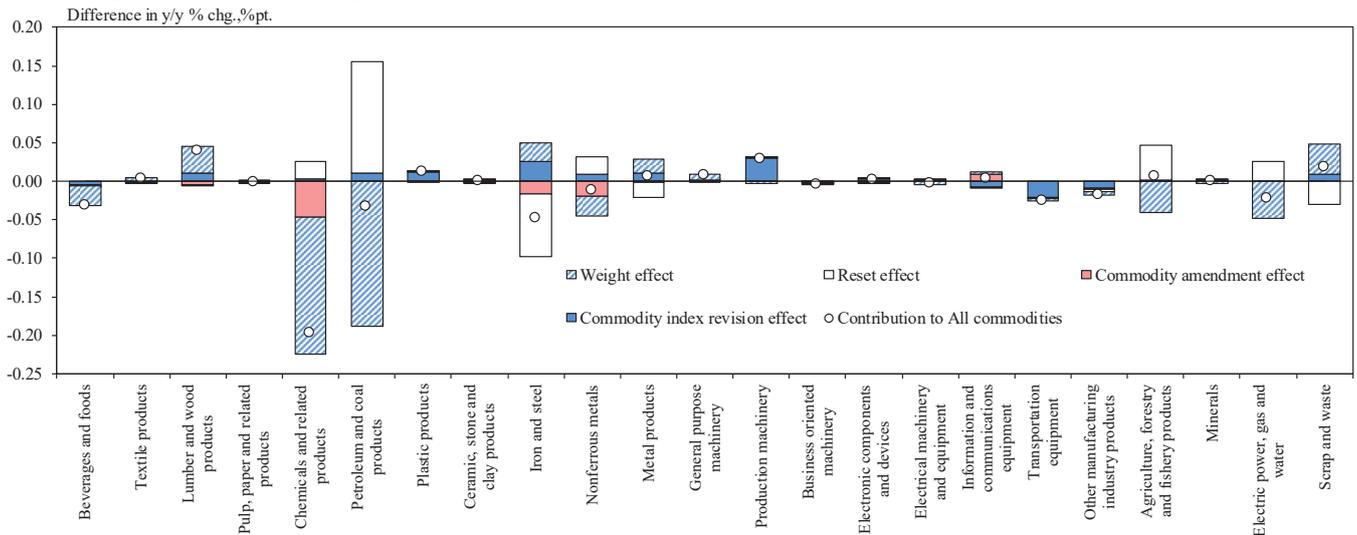
Factors	Average between January 2021 and March 2022
Difference in y/y % chg.	-0.3
Weight effect	-0.4
Reset effect	+ 0.1
Commodity amendment effect	-0.1
Commodity index revision effect	+ 0.1

Decomposition of Differences by Groups

(Chart13)

- ✓ According to a group-by-group breakdown of the weight effect, which was the main factor of the lower rate of change in the new index, "Petroleum and coal products" and "Chemicals and related products" made significant contributions. These groups showed significant positive year-on-year changes between January 2021 and March 2022 as a result of a rise in international commodity prices. However, because of the reduction of their weights due to the rebasing, these groups' positive contributions declined steeply.
- ✓ As for the commodity amendment effect, "Chemicals and related products" and "Nonferrous metals" made negative contributions. This reflects the effects of the deletion of "Para-xylene" and "Unwrought copper alloys," whose prices were showing year-on-year increases due to a rise in international commodity prices.

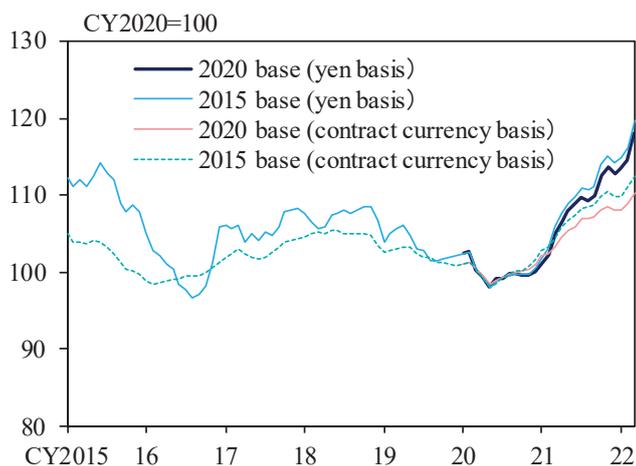
▽Decomposition by Groups



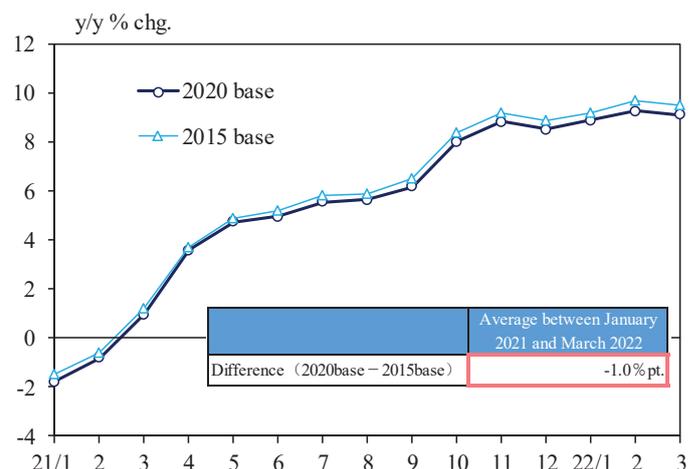
Comparison between the New and Old Indexes in the EPI (Chart14)

- ✓ The new and old indexes for all commodities showed generally similar movements in terms of both the index level and year-on-year change.
- ✓ If examined more closely, the rate of year-on-year change in the new index for all commodities was slightly lower than the rate of change in the old index, with the negative difference (on a yen-basis) coming to 1.0 percentage point on average between January 2021 and March 2022.

(1)Level(All Commodities)



(2)Year-on-Year Change (All Commodities, Yen Basis)



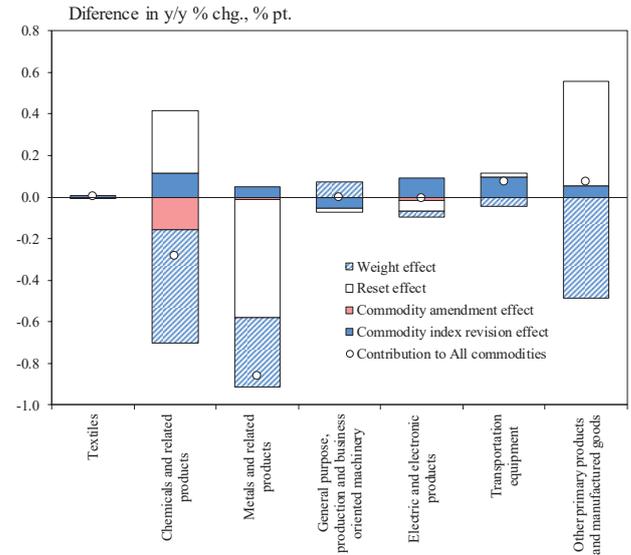
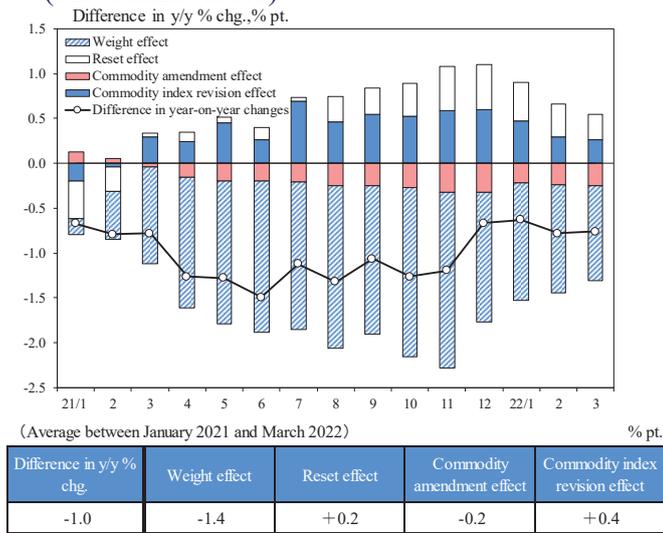
Decomposition of Difference in Year-on-Year Changes between the New and Old Indexes in the EPI

(Chart15)

- ✓ The breakdown shows that the rate of year-on-year change in the new index for all commodities was dragged down by 1.0 percentage point on average between January 2021 and March 2022 mainly because of the negative contribution of the weight effect (minus 1.4 percentage points), as is the case with PPI.
- ✓ A group-by-group breakdown of the weight effect, which was the main factor of the lower rate of year-on-year change in the new index, shows that "Chemicals and related products" made significant contributions. In the "Chemicals and related products" group, the rebasing reduced the weights of commodities that showed significant positive year-on-year changes between January 2021 and March 2022, such as "Vinyl chloride monomer."

(1) Decomposition of Difference in Year-on-Year changes (All Commodities)

(2) Decomposition by Groups

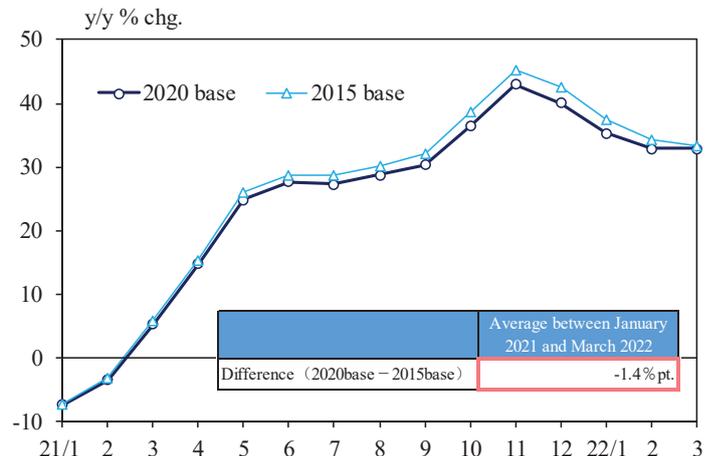
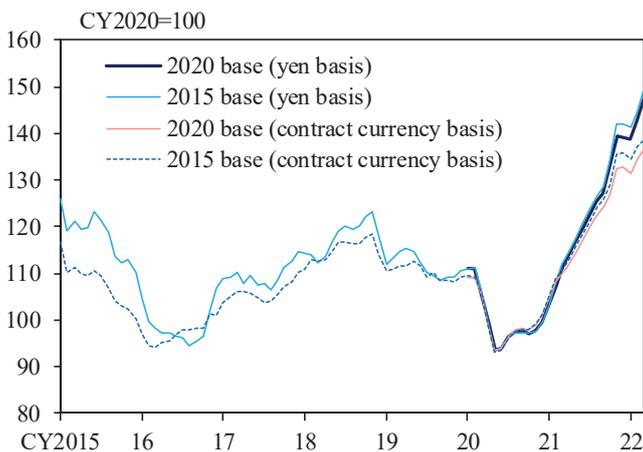


Comparison between the New and Old Indexes in the IPI (Chart16)

- ✓ The new and old indexes for all commodities showed generally similar movements in terms of both the index level and year-on-year change.
- ✓ If examined more closely, the rate of year-on-year change in the new index for all commodities was slightly lower than the rate of change in the old index, with the negative difference (on a yen basis) coming to 1.4 percentage points on average between January 2021 and March 2022.

(1) Level (All Commodities)

(2) Year-on-Year Change (All Commodities, Yen Basis)



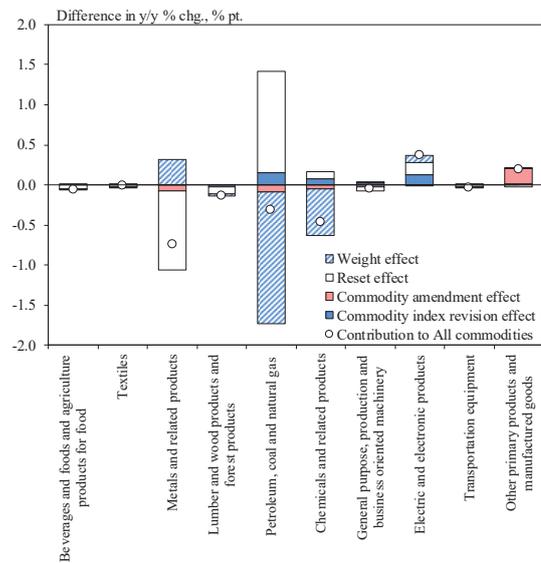
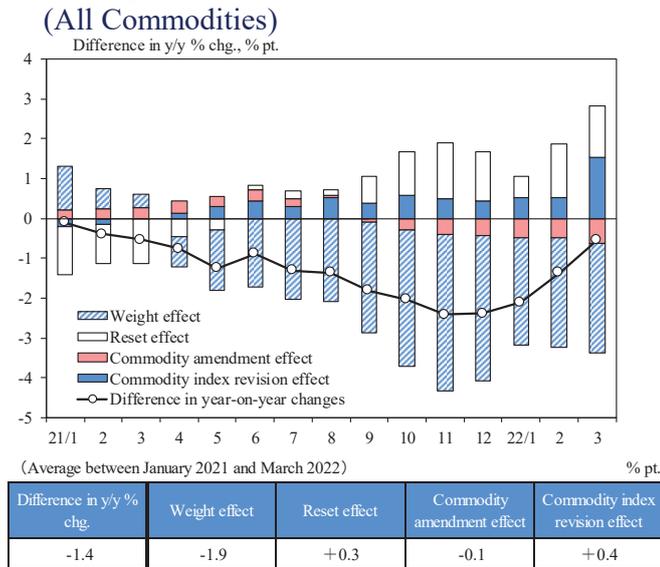
Decomposition of Difference in Year-on-Year Changes between the New and Old Indexes in the IPI

(Chart17)

- ✓ The breakdown shows that the rate of year-on-year change in the new index for all commodities was dragged down by 1.4 percentage points on average between January 2021 and March 2022 mainly because of the negative contribution of the weight effect (minus 1.9 percentage points), as it the case with the PPI.
- ✓ A group-by-group breakdown of the weight effect, which was the main factor of the lower rate of year-on-year change in the new index, shows that "Petroleum, coal and natural gas" made a significant contribution. This group showed significant positive year-on-year changes between January 2021 and March 2022 as a result of a rise in international commodity prices. However, the group's positive contribution declined steeply because the rebasing reduced its weight.

(1) Decomposition of Difference in Year-on-Year changes

(2) Decomposition by Groups



Results of the Paasche check

(Chart18)

- ✓ Regarding the Laspeyres index with fixed weights, which fixes weights at the base year, it is theoretically known that the further away the price and transaction volume deviate from the levels in the base year, the less well the index reflects reality.
- ✓ As a result of the Paasche check conducted with respect to the index for all commodities in 2020, it was found that the rate of difference regarding the individual indexes has remained small, indicating that the problem of the Laspeyres index with fixed weights is not very significant compared with past cases of rebasing. These results are consistent with the absence of significant difference between the new and old indexes.

▽ Difference of Rates between the Paasche Index and the Laspeyres Index

$$\frac{(\text{Paasche index} - \text{Laspeyres index with fixed weights})}{\text{Laspeyres index with fixed weights}} * 100$$

Year	Base year for weight calculation of fix-weighted Laspeyres index	Base year for weight calculation of Paasche index	Difference (%)		
			Producer Price Index	Export Price Index	Import Price Index
2000	1995	2000	-3.5	-3.1	-5.3
2005	2000	2005	-4.2	-5.4	-9.9
2010	2005	2010	-3.6	-1.7	-5.1
2015	2010	2015	-0.0	-1.5	-3.1
2020	2015	Average of 2019-2020	-0.5	-1.3	-2.5

Notes: 1. Paasche index is calculated by applying the 2020 base weights to the 2015 base commodity indexes. It is calculated using simplified methods, such as:

- (1) Deleted commodities in the 2020 base index are given 0 weight and not included in the calculation of the Paasche index;
 - (2) the 2020 base weights are consolidated for split (consolidated) commodities in the 2020 base index (split using the ratios of 2015 weights) so that the scope of commodities is consistent with that of the 2015 base; (3) the 2020 base weights are directly used for expanded, declined, and relabelled commodities.
2. The figures for the EPI and IPI are on a yen basis.

Producer Price Index using the Chain-weighted Index Formula

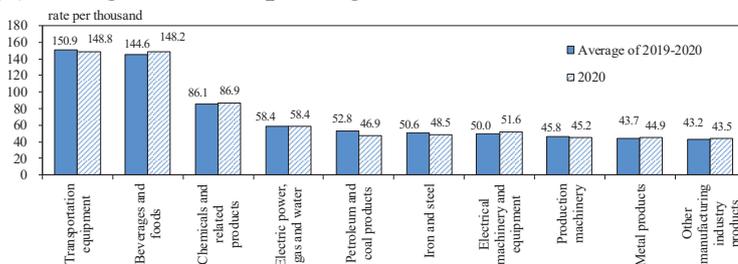
(Chart19)

- ✓ The average figures for 2019-2020 were adopted as the weights of basic grouping indexes. To verify the validity of those figures, it is necessary to continue checking changes in the weights. In this respect, as the chain-weighted index is distinctive in that the weights are updated every year, it is considered to be useful to look at it at the same time.
- ✓ When the weights in 2020 were reflected in the chain-weighted indexes in the period from 2021 onwards, the rate of year-on-year change in the index for all commodities was dragged down by 0.6 percentage points on average between January 2021 and March 2022 compared with the basic grouping indexes. This is mainly because the weight of "Petroleum and coal products," which showed a significant year-on-year increase during the same period, declined amid the COVID-19 crisis.

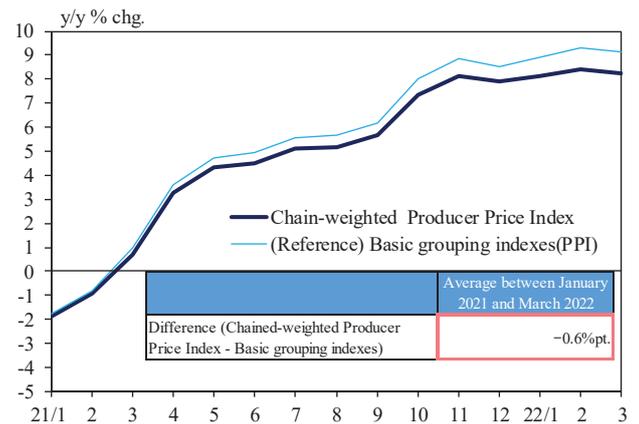
(1) Year of Weight Calculation

2000 base	Index	00	01	02	03	04
	Weight	00	00	01	02	03
2005 base	Index	05	06	07	08	09
	Weight	05	05	06	07	08
2010 base	Index	10	11	12	13	14
	Weight	10	10	11	12	13
2015 base	Index	15	16	17	18	19
	Weight	15	15	16	17	18
2020 base	Index	20	21	22	23	24
	Weight	Average of 2019-20	20	21	22	23

(2) Changes in Group Weights



(3) Year-on-Year Change (All Commodities)



5. Trends of the FD-ID Price Indexes

Reorganization of Aggregate Price Indexes

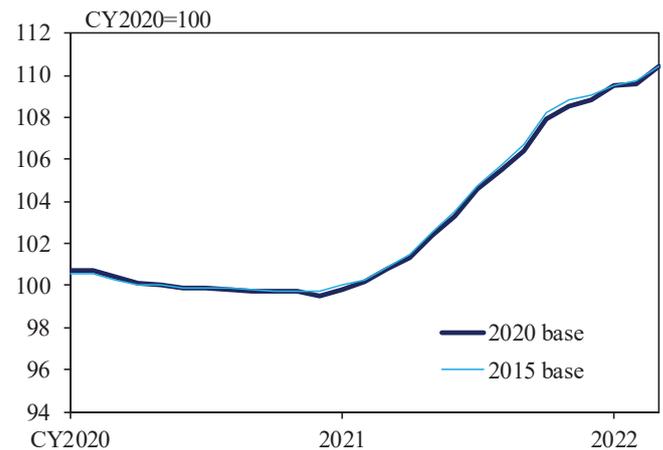
(Chart20)

- ✓ While the Final Demand-Intermediate Demand price indexes (FD-ID price indexes), which are new indexes by stage of demand, have been newly introduced as satellite indexes, the compilation and publication of the Index by Stage of Demand and Use in the CGPI, the Input-Output Price Index of the Manufacturing Industry by Sector (IOPI), and some other existing indexes will be discontinued.
- ✓ The investment goods index, which is among the indexes within the Index by Stage of Demand and Use in the CGPI, is scheduled to continue to be compiled and published as a reference index of the 2020 base CGPI because the presence of strong user needs has been confirmed by the mention of this index in several cabinet orders and ministerial ordinances related to laws such as the Expropriation of Land Act.

(1) Reorganization of Aggregate Price Indexes

<p>The Index by Stage of Demand and Use in the CGPI 【Deletion】</p>	<p>It will not be updated following the release of a preliminary index for April 2022 published on May 16, 2022. —— The investment goods index is scheduled to continue to be compiled and published as a reference index of the 2020 base CGPI.</p>
<p>The Input-Output Price Index of the Manufacturing Industry by Sector (IOPI) 【Deletion】</p>	<p>The Input-Output Price Index of the Manufacturing Industry by Sector (IOPI) will not be updated following the release of data for April published on May 30.</p>
<p>The Final Demand-Intermediate Demand price indexes (FD-ID price indexes) 【Addition】</p>	<p>It will be published for the first time in June (June 28). Thereafter, the FD-ID price indexes are scheduled to be published as satellite series on the website of the Bank.</p>

(2) Investment Goods Index

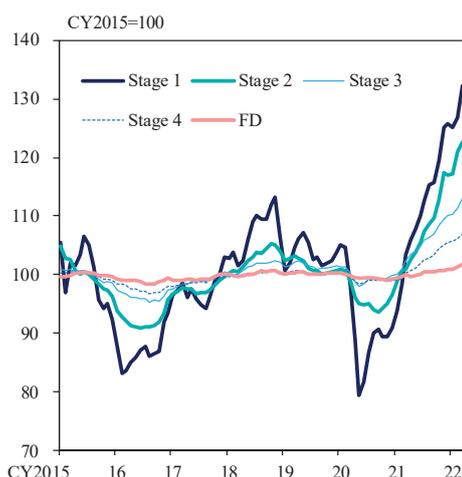


Level of the FD-ID Price Indexes and Decomposition of Year-on-Year Changes(1)

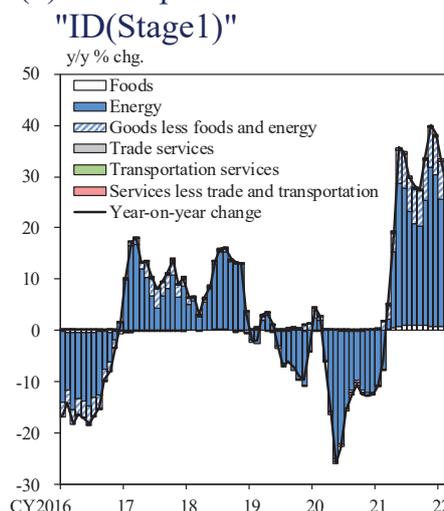
(Chart21)

- ✓ Regarding the trends of the price indexes for Stages 1 to 4 of intermediate demand and the FD all commodities index (2015=100) from 2021 onwards, the price index for Stage 1, which is the most upstream stage in the production flow, showed the largest rise, reflecting a rise in international commodity prices, among other factors. On the other hand, the price indexes for downstream stages and the FD index showed moderate rises, with the pace of rise becoming slower in more downstream stages. This indicates that the price shock in upstream stages has been absorbed as the goods moved through the production flow. However, looking at the movement of the FD index, price pass-through is progressing, with the increase in prices of goods contributing, although more slowly than the increase in upstream prices.

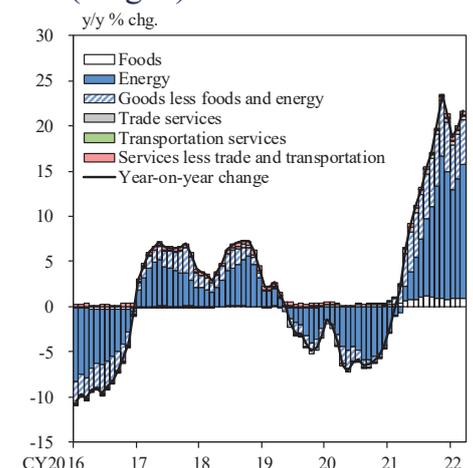
(1) Level



(2) Decomposition of Year-on-Year Changes



"ID(Stage2)"

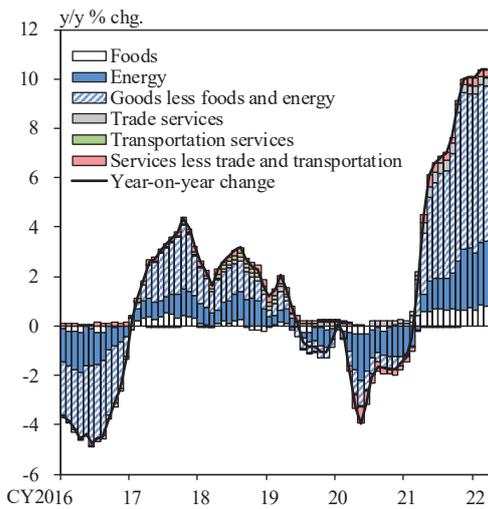


Level of the FD-ID Price Indexes and Decomposition of Year-on-Year Changes(2)

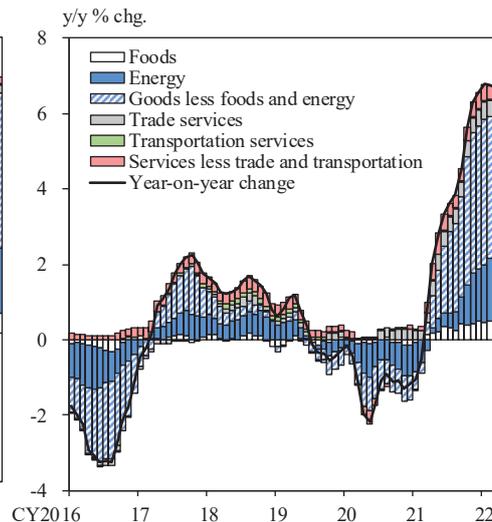
(Chart22)

- ✓ According to a breakdown of contributions by type of goods/services to year-on-year changes in the price indexes for Stages 1 to 4 and the FD composite price index, although energy made the greatest contributions in upstream stages, such as Stages 1 and 2, its effects declined in downstream stages, such as Stage 4.
- ✓ On the other hand, services made progressively large contributions during the production flow, with the contributions becoming larger in downstream stages, including Stage 4 and the FD (final demand) stage.

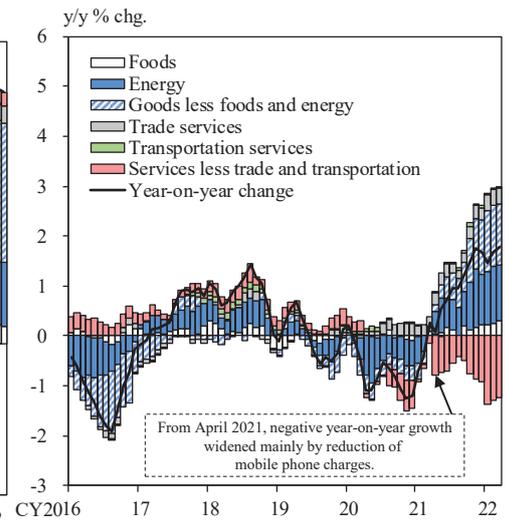
"ID(Stage3)"



"ID(Stage4)"



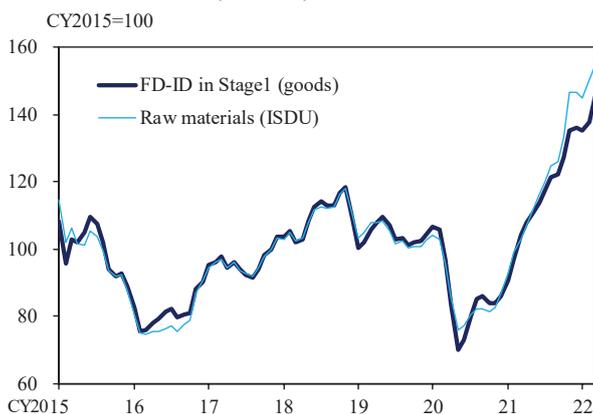
"FD"



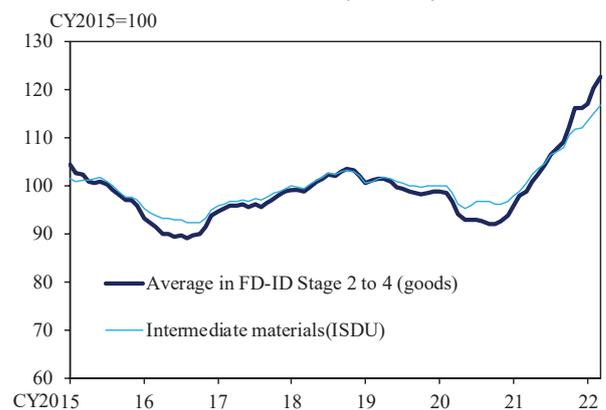
Comparison between the FD-ID Price Indexes and the ISDU (Chart23)

- ✓ Strictly speaking, the FD-ID price indexes are different in price concept and in coverage from the Index by Stage of Demand and Use (ISDU). For example, the aggregation for the FD-ID price indexes covers not only goods but also services. Even so, the FD-ID price indexes may substitute for the Index by Stage of Demand and Use in some respects.
- ✓ Goods in Stage 1 in the FD-ID price indexes are those which are used as inputs into the most upstream stage in the production flow, so they are similar in concept to "Raw materials" in the Index by Stage of Demand and Use and the relevant indexes in the FD-ID price indexes and the Index by Stage of Demand and Use show similar movements. The index for "Intermediate materials" in the Index by Stage of Demand and Use is similar in concept to the indexes for Stage 2 to 4, which are midstream and downstream intermediate stages of demand, so the average of prices of goods in Stages 2 to 4 show movements similar to the ones observed for "Intermediate materials."

(1) FD-ID Stage1 (goods) and Raw Materials(ISDU)



(2) Average in FD-ID Stage 2 to 4 and Intermediate Materials(ISDU)

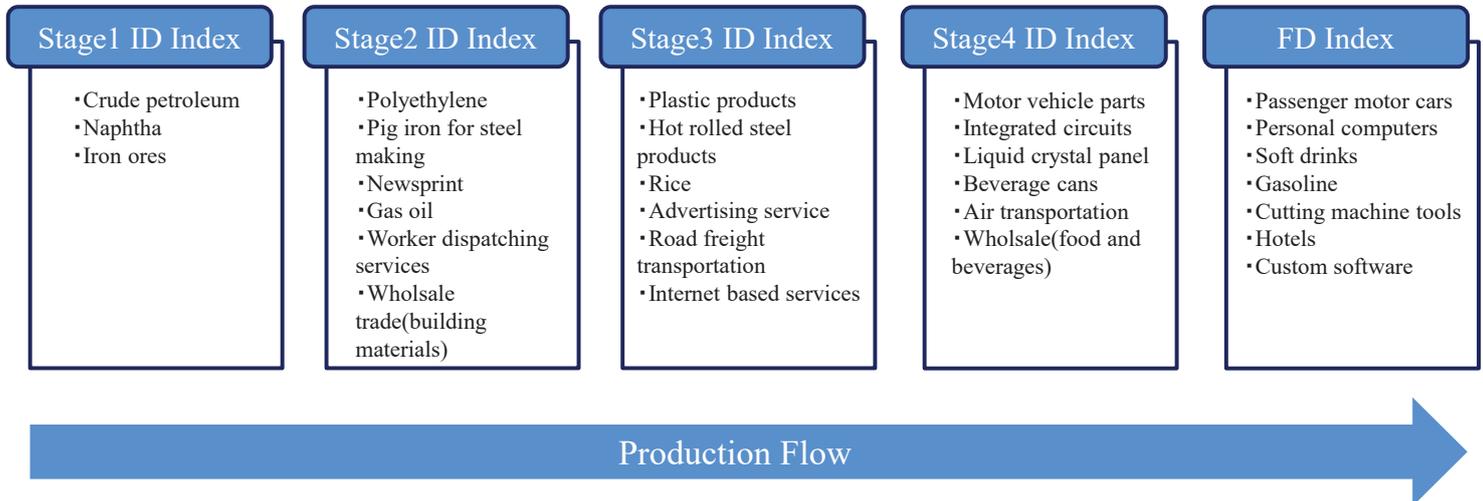


Overview of the FD-ID Price Indexes

(Reference)

- ✓ The Final Demand-Intermediate Demand price indexes (FD-ID price indexes) are price indexes by stage of demand that are comprised of a single final demand index (FD index) and four intermediate demand indexes (ID indexes).

▽Main Sectors Making Up Each Index



6.Publication Schedule

Publication Schedule

(Chart24)

Date	Published Items
March 2021	<ul style="list-style-type: none"> • "Basic Policy for Rebasing the Corporate Goods Price Index to the Base Year 2020," a research paper written by the Bank —— Solicited public opinions until June 21, 2021.
December 2021	<ul style="list-style-type: none"> • "Final Draft of Rebasing the Corporate Goods Price Index to the Base Year 2020," a research paper written by the Bank —— Compiled and published in light of the public opinions collected.
June 2022	<p>June 3</p> <ul style="list-style-type: none"> ▪ "Rebasing the Corporate Goods Price Index to the Base Year 2020," a research paper written by the Bank ▪ 2020 base index: January 2020 to April 2022
	<p>June 10</p> <ul style="list-style-type: none"> • 2020 base indexes: preliminary indexes in May
	<p>June 28 (two business days after the publication of the SPPI)</p> <ul style="list-style-type: none"> ▪ FD-ID price indexes: indexes in May