Bank of Japan Review 2023-E-2

Firms' Recent Price-Setting Stance: Evidence from the *Tankan*

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February 2023

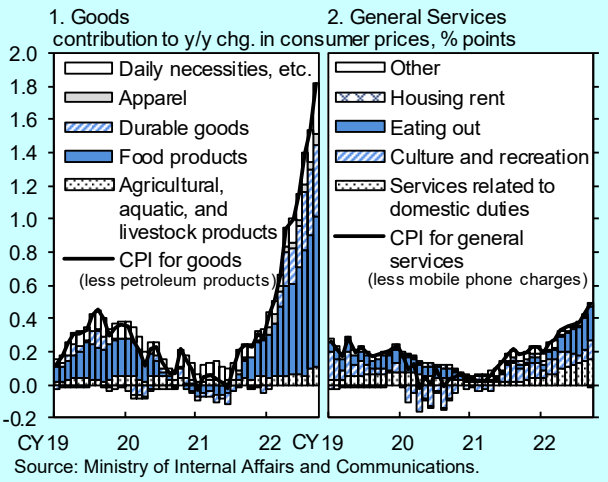
With raw material costs increasing significantly due to high commodity prices and the yen's depreciation, firms' moves to pass on the rise in costs to selling prices have become widespread. This paper examines this recent price-setting stance of firms using microdata from the *Tankan* surveys. The analysis finds that in the current phase, moves to raise selling prices have been spreading even among business types and firms that were cautious about changing such prices. In addition, the results suggest the possibility that, with many firms facing significant cost increases, firms' price-setting stance has been affected by a situation in which their competitors are also forced to consider raising prices.

Introduction

Japanese firms have been facing a significant rise in input costs such as of raw materials mainly due to high commodity prices and the yen's depreciation. Under these circumstances, firms' moves to pass on the rise in costs to selling prices have been spreading from business-to-business (B to B) transactions to business-to-consumer (B to C) transactions, and the year-on-year rate of increase in the consumer price index (CPI, all items less fresh food and energy) has accelerated. For goods, prices such as of food products and daily necessities, as well as those of durable goods, which are highly influenced by the exchange rate due to a high share of imported goods, have risen significantly (Chart 1).[1,2] Although the pace of increase in services prices has been relatively moderate, the rates of increase in prices have accelerated for dining-out and housework-related services (e.g., services related to housing repairs and maintenance), which have a high share of material costs in their overall costs.

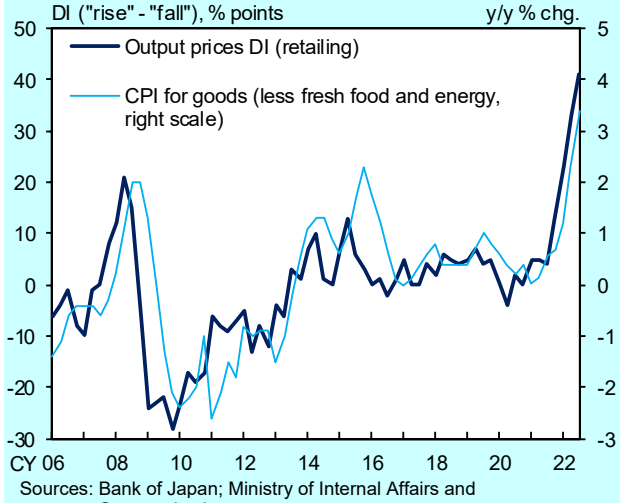
Against this backdrop, this paper examines the recent price-setting stance of firms, focusing on consumption-related industries, which have a close relationship with the CPI. A key feature of this paper is that it uses microdata from the Bank of Japan's Short-Term Economic Survey of Enterprises in Japan (*Tankan*), which continuously surveys firms' output and input prices.[3] The output prices DIs for consumption-related industries in the *Tankan* have seen similar developments with the corresponding subgroups in the CPI — for example, "retailing" in the *Tankan* corresponds to "goods, less fresh food and energy" in the CPI (Chart 2).[4] Thus, it is beneficial to analyze the

[Chart 1] CPIs for Goods and Services



Source: Ministry of Internal Affairs and Communications.

[Chart 2] CPI and Output Prices DI



Sources: Bank of Japan; Ministry of Internal Affairs and Communications.

Note: Figures for output prices DI are for all enterprises.

characteristics of the price-setting stance of consumption-related industries using microdata from the *Tankan* surveys in order to examine the background to changes in the CPI.

Firms' Recent Price-Setting Stance

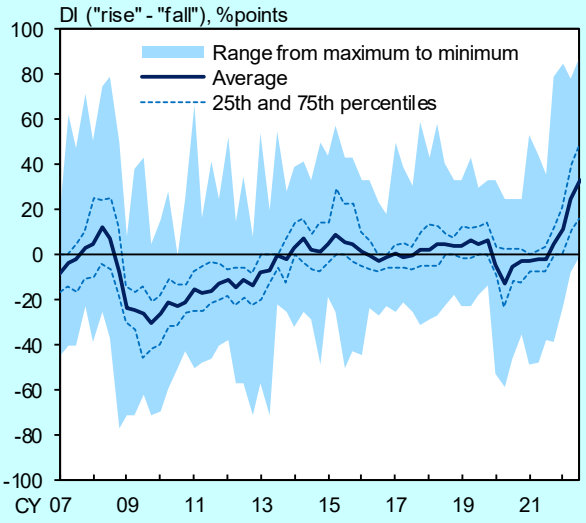
In the *Tankan*, results for three consumption-related industries — "retailing," "accommodations, eating & drinking services," and "services for individuals" — are aggregated and released by firm size. In this paper, the output prices DIs for consumption-related industries are classified into 26 business types and then reaggregated using the microdata in order to grasp firms' behavior in more detail. The 11 business types which have a sufficient number of samples are divided into large firms and small and medium-sized firms, resulting in an overall classification of the consumption-related industries into 37 categories (hereafter referred to as detailed aggregation). Specifically, retailing is classified into "department stores" and "supermarkets," etc., accommodations, eating & drinking services into "pubs & izakaya (Japanese-style bars)" and "hotels," etc., and services for individuals into "recreation" and "sports," etc.[5] Examining the detailed aggregation makes it possible to, for example, determine the business types in which output prices have been raised when the output prices DI for "retailing" has risen.

Looking at the results of the aforementioned detailed aggregation shows that the reaggregated output prices DIs have risen significantly for a wide range of business types recently, with the DIs for the September 2022 survey being at or above 0 percentage point for all categories (Chart 3). This suggests that an increasing number of firms, regardless of business type, have raised prices in the current phase, even more so than during the 2007-2008 period, when the rate of increase in the CPI exceeded 2 percent mainly due to a surge in international commodity prices and when the DIs registered a net "fall" for quite a few business types.

Detailed developments in retailing indicate that, while price rises mainly for food products have led supermarkets to raise their output prices as in the past, a significant feature of the current phase is that such moves have even spread to other business types — such as electronics stores and pharmacies — for which the reaggregated DIs had remained at low levels amid continued intense price competition (Chart 4).

Such widespread moves to raise selling prices among firms that were cautious about changing prices can be confirmed from another angle. Firms are divided into two groups using microdata from the *Tankan* surveys: "firms cautious about changing output prices" and "other firms." Firms in the former group, which consist of 20 percent of all firms, replied that their output prices were "unchanged" for most of the period from 1991 to 2019 before the outbreak of COVID-19.[6] Looking at developments in the reaggregated output prices DIs for the two groups shows that the DI for "other firms" saw cyclical developments due to, for example, rises in raw material costs in the past. On the other hand, the DI for "firms cautious about changing

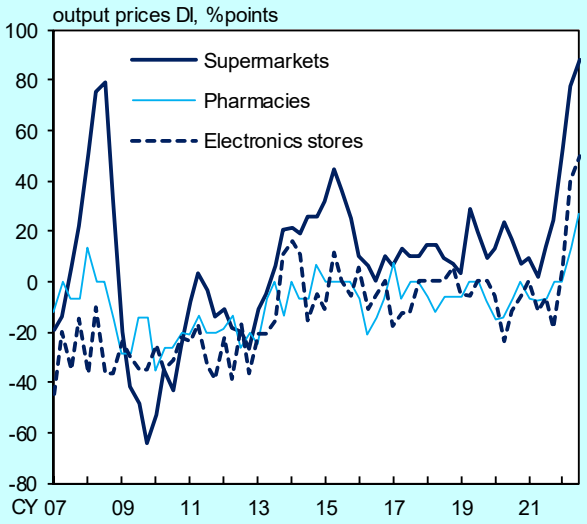
[Chart 3] Output Prices in Consumption-Related Sectors



Source: Bank of Japan.

Note: In compiling these figures, consumption-related firms (firms in "retailing," "accommodations, eating & drinking services," and "services for individuals") were classified into 37 categories based on their detailed industry classification and size, and the output prices DIs for these 37 categories were then reaggregated.

[Chart 4] Output Prices by Business Types

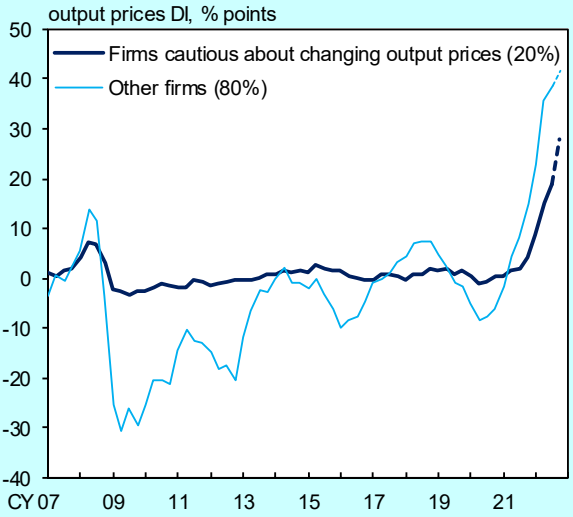


Source: Bank of Japan.

Note: Figures for supermarkets and electronics stores are for small and medium-sized enterprises, while those for pharmacies are for all enterprises.

output prices" was almost unchanged even when raw material costs rose in the past, but has risen remarkably in the current phase (Chart 5). Many of these firms have raised their selling prices for the first time in at least 30 years, since the early 1990s (Chart 6).

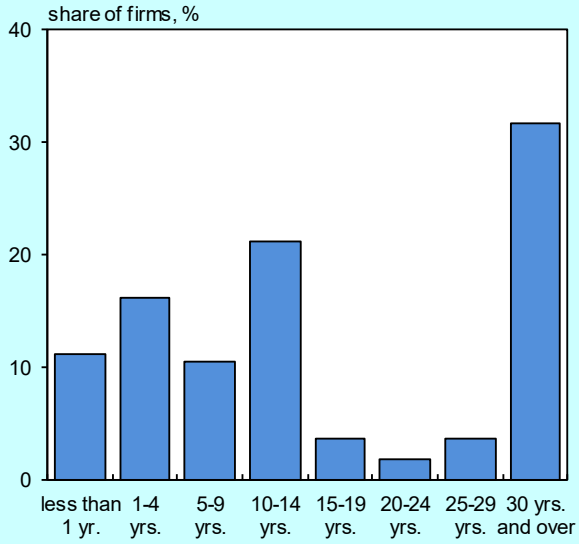
[Chart 5] Change in Firms' Price-Setting Stance



Source: Bank of Japan.

Note: The figures are for all industries and enterprises. Figures for "firms cautious about changing output prices" are for firms that for at least about 95 percent of the period from 1991 to 2019 replied that their output prices were "unchanged." The dots at the end of the lines are forecasts from the September 2022 survey.

[Chart 6] Years since the Previous Price Rise

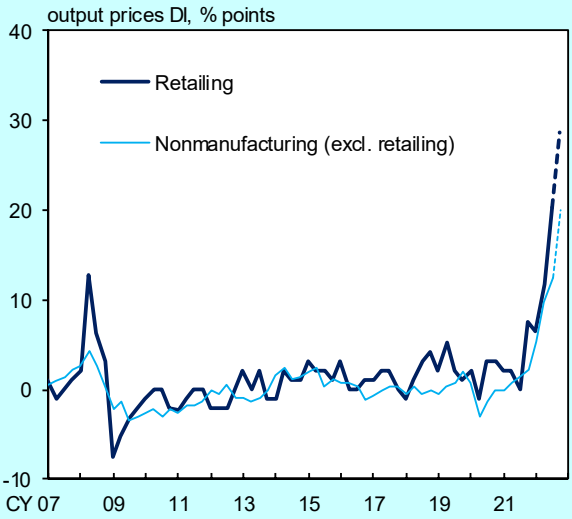


Source: Bank of Japan.

Note: This chart shows the number of years from the previous price rise to the first price rise since the September 2021 survey. The figures are for firms within those "cautious about changing output prices" selected based on the data from 1991 onward in Chart 5, and for those since the September 2021 survey replied that they had raised their output prices.

Such price rises have been evident for goods, which have seen a significant increase in raw material costs, as observed in the DI for "firms cautious about changing output prices" in retailing rising relatively considerably (Chart 7).

[Chart 7] Firms' Price-Setting Stance (Nonmanufacturing)



Source: Bank of Japan.

Note: The figures are for all enterprises and cover nonmanufacturing firms included in "firms cautious about changing output prices." The dots at the end of the lines are forecasts from the September 2022 survey.

Competitors' Behavior and Firms' Price-Setting Stance

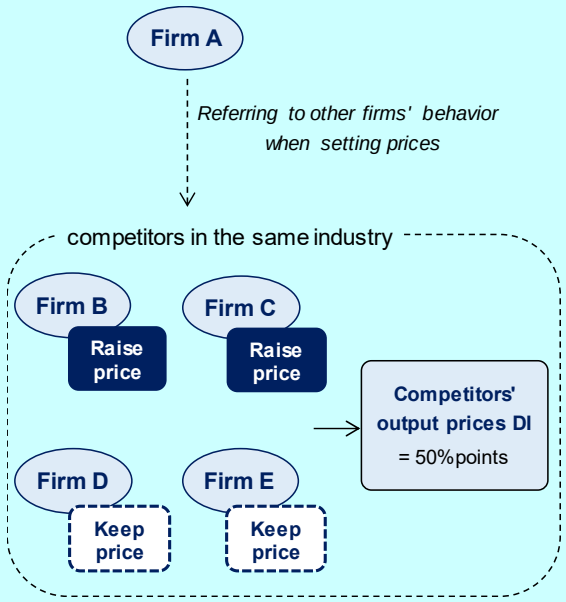
The biggest reason for more firms increasingly passing on cost increases seems to be the recent higher rise in costs compared to the past. Previous studies indicate that slight cost increases tend to be absorbed by firms due to the existence of menu costs — costs for changing menus and price tags — and are less likely to be passed on to the CPI, whereas firms are inclined to change their price-setting behavior when cost increases are significant.[7]

In addition, it seems that individual firms have taken into account their competitors' behavior when changing their price-setting stance. For instance, previous studies point out that, with consumers having a strong tendency to change their spending in accordance with selling prices, firms are likely to become hesitant to pass on cost increases. This is because they project that customers will switch to rival firms if they raise prices, leading to a greater decline in their sales —in other words, they will face a so-called kinked demand curve. Under such circumstances, it will also become rational for competitors to do the same; therefore, at the equilibrium, it will more likely be the optimal strategy for all firms to leave prices unchanged.[8] On the other hand, under circumstances in which many firms raise their selling prices, it may become a rational option for firms to raise prices as well, since they expect that raising prices will not shift their customers to rival firms. When each economic

entity's optimal behavior depends on their related economic entities' behavior and it becomes the best choice for all firms to act in the same way, it is called a "strategic complementarity."[9]

The aforementioned microdata from the *Tankan* surveys indicate that there has been a "strategic complementarity" in price setting of firms in retailing in Japan. In this regard, firms' behavior regarding the pass-through of cost increases given their competitors' price setting in the previous quarter is examined (Chart 8).[10]

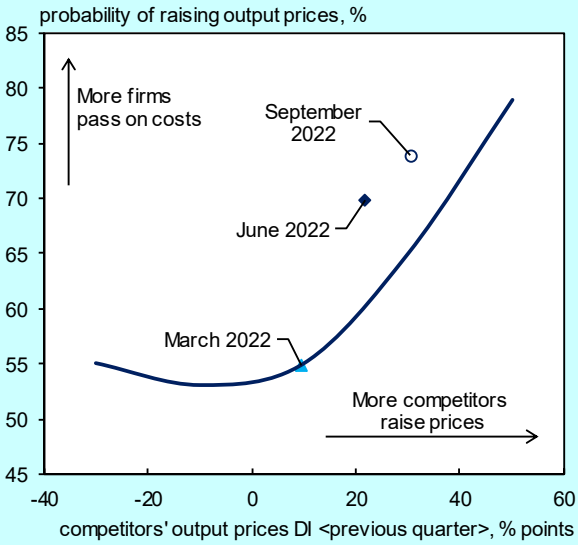
[Chart 8] Referring to Competitors' Behavior (A Concept)



First, competitors' price setting in the previous quarter is calculated as "competitors' output prices DI," which is represented by the horizontal axis of Chart 9. Specifically, as for each firm that belongs to the 10 business types in retailing (on a detailed aggregation basis), other firms of the same business type are defined as its competitors, and the DIs for the competitors are aggregated. Next, each firm is grouped into 20-percentile bins based on the levels of its competitors' output prices DI. Then, the percentage of firms that raised their selling prices when their input prices had risen (probability of raising output prices) is quantified as "the share of firms that raised their output prices among those that saw an increase in their input prices," which is represented by the vertical axis of Chart 9. This process is repeated for each of the *Tankan* survey from 1991 to 2022. Their standard relationship is denoted by the solid line in Chart 9.

Chart 9 shows that, in a situation where many competitors do not raise their output prices — in other words, the output prices DI is below 20 percentage points — firms would be hesitant to raise their selling prices even if their input prices have increased. On the other hand, there seems to be a relationship in which the number of firms passing on cost increases to selling prices goes up in a nonlinear fashion as more competitors raise prices. Such a relationship has also been observed recently, indicating that many firms have decided to raise their selling prices through "strategic complementarity" while many firms have been facing a situation in which they are forced to consider passing on cost increases and a wide range of stakeholders are aware of this situation. It has been pointed out in various sources such as anecdotal information from firms that, after firms with a large market share in the industry had announced to raise prices, other firms have followed suit and changed their selling prices. As mentioned earlier, such firms' moves have been associated with a rise in input costs. Thus, it is suggested that firms hardly raise their selling prices when their input costs have not increased, regardless of price increases by competitors (Chart 10).

[Chart 9] Output Prices of Firms and Their Competitors (When Input Prices Rise)



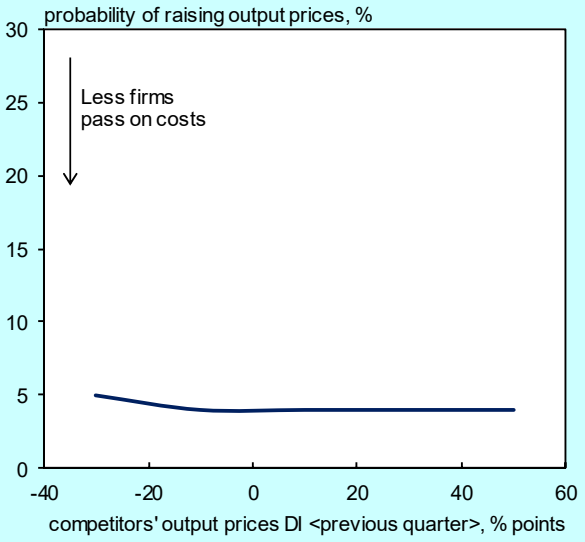
Source: Bank of Japan.

Notes: 1. Figures are for 10 business types in "retailing" from 1991 to 2022.

2. The competitors' output prices DI denotes the output prices DI for firms' competitors defined as other firms of the same business type.

3. The probability of raising output prices denotes the share of firms that raised their output prices in a certain quarter among those that saw an increase in their input prices in the same period. The probability will rise, as more firms raise prices in response to higher input prices. The curved line in the chart approximately represents the median of the probability for each level of the competitors' output prices DI.

[Chart 10] Output Prices of Firms and Their Competitors (When Input Prices Are Unchanged or Decline)



Source: Bank of Japan.

Notes: 1. Figures are for 10 business types in "retailing" from 1991 to 2022.

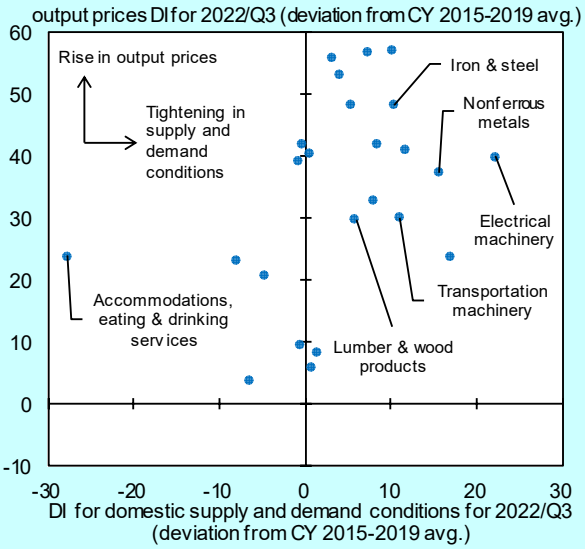
2. The probability of raising output prices denotes the share of firms that raised their output prices in a certain quarter among those whose input prices were unchanged or decreased in the same period. The curved line in the chart approximately represents the median of the probability for each level of the competitors' output prices DI.

Concluding Remarks

This paper examines firms' recent price-setting stance using microdata from the *Tankan* surveys. It has been confirmed that moves to raise prices have been spreading among business types and firms that were cautious about changing their selling prices.

As pointed out in the *Outlook for Economic Activity and Prices* (Outlook Report) and other papers, there seem to be three basic reasons behind firms' moves to increasingly pass on the rise in costs to selling prices: (1) the recent increase in costs has been greater than in the past; (2) Japan's economy is currently on its way to recovery from a significant downturn caused by COVID-19; and (3) supply and demand conditions for some individual goods have been tight, partly due to a surge in global demand and the impact of supply-chain disruptions (Chart 11).[11] As pointed out in this paper, the fact that many competitors have begun to raise prices also seems to have driven firms to lean more toward passing on cost increases through "strategic complementarity." It is necessary to continue monitoring carefully developments in the aforementioned basic factors, such as upward pressure of costs, and firms' price-setting stance.

[Chart 11] Domestic Supply and Demand Conditions and Output Prices



Source: Bank of Japan.

Note: Figures are for all enterprises.

* Currently at the Personnel and Corporate Affairs Department.

[1] For the characteristics of the recent price developments in Japan, including since the outbreak of COVID-19, see the following paper:
Ikeda, Shuichiro, Haruhiko Inatsugu, Yui Kishaba, Takuji Kondo, Kenichi Sakura, Kosuke Takatomi, Takashi Nakazawa, and Kotone Yamada (2022), "Inflation in Japan: Changes during the Pandemic and Issues for the Future," Bank of Japan Working Paper Series, No. 22-E-18.

For the impact of an increase in cost-push pressure on consumer prices — namely, prices at the final demand stage — see the following paper:
Yagi, Tomoyuki, Yoshiyuki Kurachi, Masato Takahashi, Kotone Yamada, and Hiroshi Kawata (2022), "Pass-Through of Cost-Push Pressures to Consumer Prices," Bank of Japan Working Paper Series, No. 22-E-17.

[2] Figures in Chart 1 are the contribution to changes in the CPI (less fresh food and energy). The figures are staff estimates and exclude mobile phone charges and the effects of the consumption tax hike, policies concerning the provision of free education, and travel subsidy programs.

[3] The *Tankan* asks about 10,000 firms if the output prices of their main products and services (the input prices of main raw materials and merchandise) have risen, been unchanged, or fallen, compared to three months earlier on a yen basis.

[4] Figures in Chart 2 are staff estimates and exclude the effects of the consumption tax hikes, policies concerning the provision of free education, and travel subsidy programs.

[5] Looking at this in more detail, the three consumption-related industries are classified as the following based on the information regarding "main business products and services" each firm provides on the survey form. "Retailing" is categorized into (a) department stores, (b) supermarkets, (c) grocery stores, (d) apparel, (e) electronics stores, (f) car dealers, (g) convenience stores, (h) pharmacies, (i) furniture stores, (j) fuel stores (gas stations), and (k) other retailing. "Accommodations, eating & drinking services" is classified into (l) pubs and izakaya (Japanese-style bars), (m) other restaurants, (n) hotels, and (o) ryokans (Japanese-style inns), etc. "Services for individuals" comprises (p) recreation, (q) sports, (r) laundry, (s) tourism, (t)

ceremonial occasions, (u) nursing care, (v) education, (w) hairdressing, (x) cleaning, (y) automobile maintenance, and (z) other services for individuals.

[6] Specifically, based on changes in the output prices for each firm, firms that for at least about 95 percent of the period from 1991 to 2019 replied that their output prices were "unchanged" are categorized as "firms cautious about changing output prices" due to the relatively low frequency of price changes.

[7] See, for example, the following paper:
Colavecchio, Roberta, and Ieva Rubene (2020), "Non-linear Exchange Rate Pass-Through to Euro Area Inflation: A Local Projection Approach," ECB Working Paper Series, No. 2362.

[8] It has been pointed out that, with the low inflation environment remaining, Japan's economy has fallen into an equilibrium where it was an optimal choice for firms to leave prices unchanged. For details, see the followings:
Watanabe, Tsutomu (2022), *Bukka to wa nani ka* [What Are Prices?], Tokyo: Kodansha (available in Japanese only),
Aoki, Kosuke, Hibiki Ichiue, and Tatsushi Okuda (2019), "Consumers' Price Beliefs, Central Bank Communication, and Inflation Dynamics," Bank of Japan Working Paper Series, No. 19-E-14.

[9] The following paper indicates that there is a "strategic complementarity" in firms' price-setting behavior, and that each firm takes other firms' behavior into consideration when setting prices, by using microdata from the *Tankan* surveys as this paper does:
Koga, Maiko, Koichi Yoshino, and Tomoya Sakata (2019), "Strategic Complementarity and Asymmetric Price Setting among Firms," Bank of Japan Working Paper Series, No. 19-E-5.

[10] The analysis covers the period from 1991 to 2022. It focuses on 10 business types in "retailing" (see footnote 5), excluding "fuel stores (gas stations)." This is because "fuel stores (gas stations)" has been affected by the government's gasoline subsidies and the fuel cost adjustment system. For details on such measures by the government, see Box 2 in the Bank of Japan's April 2022 *Outlook for Economic Activity and Prices* (Outlook Report).

[11] For background to changes in firms' price-setting stance, see Box 3 in the July 2022 Outlook Report and Box 3 in the October 2022 Outlook Report. For the impact of upward pressure of costs and the business cycle on the pass-through of cost increases, see, for example, Colavecchio and Rubene (2020) and the following paper:
Ben Cheikh, Nidhaleddine, Younes Ben Zaied, Houssam Bouzgarrou, and Pascal Nguyen (2018), "Nonlinear Exchange Rate Pass-Through: Does Business Cycle Matter?" *Journal of Economic Integration*, Vol. 33(2), pp. 1234-1261.
In addition, Yagi *et al.* (2022) conducted an empirical analysis regarding these points using Japan's data.

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