BOJ Reports & Research Papers

August 2022

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Abstract

On May 30, 2022, the second workshop on "Issues Surrounding Price Developments during the COVID-19 Pandemic," entitled "The Phillips Curve and Cost Pass-Through in Japan," was held at the Bank of Japan's Head Office. The workshop featured lively discussions involving experts and scholars in economics and empirical analysis on the impact on prices of the recent increase in cost-push pressures triggered by high raw material costs and the weak yen, on the various factors affecting price formation from a somewhat longer-term perspective, and on what to make of these developments in light of changes in economic structure as a result of the pandemic.

Session 1 focused on the characteristics of the recent pass-through of cost-push pressures to consumer prices, comparing current developments in Japan with those abroad and in the past. The session featured an analysis showing that in Japan, too, where the pass-through until recently was limited, the pass-through rate may be increasing, especially at the intermediate demand stage, and, based on this analysis, discussion of the recent price-setting behavior of firms, etc. Session 2 started with the presentation of an analysis of the impact of various factors, such as cost-push pressures and inflation expectations, on inflation based on the Phillips curve framework. The presentation further focused on the mechanism of inflation expectations formation, wage developments, and other issues, which are thought to have a significant impact on price formation in the long run, and featured discussion on the implications of the findings presented.

* The views expressed at the workshop and summarized in this paper are those of the individual speakers and do not necessarily represent the views of the Bank of Japan or the Research and Statistics Department.

Session 3 consisted of a panel discussion on what to expect with regard to future inflation developments taking structural changes due to the pandemic into account. First, it was pointed out that while the recent increase in cost-push pressures was expected to push up prices in the immediate future, from a somewhat longer-run perspective it was necessary to keep an eye on the downward pressure on the economy and prices from the downward push on real incomes. In this context, it was suggested that recent price hikes, especially for daily necessities, would have a greater impact on lower-income households. Second, in terms of whether the current cost-push inflation would help to achieve future price stability, the view was that the key issues were (1) whether firms' price-setting stance was gradually changing and this stance was becoming ingrained in society, and (2) whether, for this to happen, wages were going to rise firmly and household incomes were maintained.

1. Introduction

This paper is a summary of the second workshop on "Issues Surrounding Price Developments during the COVID-19 Pandemic," entitled "The Phillips Curve and Cost Pass-Through in Japan," held on May 30, 2022, at the Bank of Japan's Head Office.[1] The workshop began with opening remarks by Bank of Japan Executive Director Masaaki Kaizuka. In Sessions 1 and 2, staff members of the Bank of Japan's Research and Statistics Department gave presentations, followed by discussions by discussants and floor participants. Session 3 consisted of a panel discussion on "Behavioral Changes of Economic Entities and Inflation," followed by closing remarks by Kazuo Ueda, Professor at Kyoritsu Women's University and Professor Emeritus at the University of Tokyo (see Appendix 1 for the program).

The following is a summary of the opening remarks, the two presentation sessions, the panel discussion, and the closing remarks. The affiliation of each speaker below was current at the time of the workshop, and honorific titles are omitted in the text (see Appendix 2 for a list of participants and their affiliations). Teppei Nagano served as the moderator for the entire workshop.

2. Opening Remarks

Bank of Japan Executive Director Kaizuka reviewed the first workshop held in March, noting that the workshop examined reasons for the differences in price developments in Japan, the United States, and Europe during the pandemic, and presented analyses of the relationship between wages and prices. He noted that in the discussions it was argued that although cost-push pressures stemming from soaring commodity prices were increasing, chronic low inflationary factors that existed prior to the pandemic were continuing to hold sway.

In addition, he pointed out that given that the year-on-year rate of increase in the CPI (excluding fresh food) rose to 2.1 percent in April, mainly due to price hikes in energy and food, it was even more important to discuss (1) the channels through which and to what extent the recent increase in cost-push pressures fed through to consumer prices and (2) whether price stability would be achieved in the future through cost-push inflation. In this connection, he highlighted that the presentation in Session 1 of the workshop provided an analysis using the Final Demand-Intermediate Demand Price Indexes (FD-ID Price Indexes) newly established in conjunction with the base year revision of the Corporate Goods Price Index in June. He also observed that in order to deepen our understanding of these issues, it might be necessary to consider how structural changes in the economy and society brought about by the pandemic

[1] For a summary of the first workshop on "Issues Surrounding Price Developments during the COVID-19 Pandemic," entitled "Characteristics of Price Developments in Japan," held on March 29, 2022, see: https://www.boj.or.jp/en/research/brp/ron_2022/ron220523a.htm/.

potentially affect the behavior of economic entities and inflation dynamics in the future.

He concluded his opening remarks by noting that uncertainty surrounding prices continued to be high worldwide, and then expressed his hope that the discussions in the first workshop would be further advanced in the current workshop and lead to a deeper understanding of price developments in Japan.

3. Session 1: "Pass-Through of Cost-Push Pressures to Consumer Prices"

(1) Presentation

In the presentation, Tomoyuki Yagi provided his calculation of the cost-push pressures resulting from the recent increase in raw material costs and depreciation of the yen and then presented the results of measuring the pass-through rate of such cost pressures on consumer prices. He then outlined the characteristics of the recent pass-through and provided an overview of issues for the post-COVID era.

Specifically, based on an analysis using input-output tables, he started by highlighting that (1) although the recent cost-push pressures in Japan were considerably larger than in the past, (2) they were smaller than those in the United States since the increase in the input costs of services in Japan had been limited due to sluggish wage growth and other factors. In addition, regarding the pass-through rates to consumer prices, he pointed out that (1) the pass-through rate of exchange rate changes had been rising in recent years, especially for durable consumer goods, as the import penetration ratio had been increasing, and (2) the pass-through rate of changes in raw material costs had not changed substantially in recent years and was low compared to the United States. However, he said that a closer look revealed that there were currently signs of a change in the pass-through rate of changes in raw material costs and presented the following analyses.

First, presenting a time-series analysis using the Final Demand-Intermediate Demand Price Indexes (FD-ID Price Indexes)[2] newly established in conjunction with the rebasing of the Corporate Goods Price Index, he showed that whereas there was no significant change in the degree to which cost increases were passed on to selling prices in the final demand stage, at the intermediate demand stage, i.e., from the upstream to midstream stage, firms' price-setting behavior might be changing and the pass-through rate might be increasing. Second, measuring the pass-through rate for each of the items that make up the Consumer Price Index, he found that for some items, such as food products, the pass-through rate might be increasing even in

[2] In conjunction with the 2020 rebasing of the Corporate Goods Price Index, the Bank established new satellite indexes, the Final Demand-Intermediate Demand Price Indexes (FD-ID Price Indexes), which are new demand stage-based indexes integrating goods and services prices.

the final demand stage. As a reason for these changes, he noted that, due to changes in the global demand structure and stronger supply constraints in the wake of the pandemic, supply and demand conditions in some industries and for some commodities had become tighter than macroeconomic supply and demand balance indicators suggested.

Finally, based on these analyses, he presented some issues he thought were important when considering the future pass-through of cost-push pressures. First, he pointed out that the pass-through rate might increase in a phase of rapidly increasing cost-push pressures. He argued that developments in pass-through rates in the past had shown such nonlinearity, and the retail price statistics by region and product also showed a tendency for selling price hikes to become widespread when cost-push pressures increased sharply. Second, he highlighted that estimates showed that pass-through tended to increase during economic expansions, and that whether firms would reflect cost increases in selling prices in the future largely depended on whether the economic recovery continued under rising prices. In this connection, he noted that it was also important how the easing of the impact of the pandemic, through improvements in consumer confidence and wage expectations, affected households' views and behavior toward prices.

(2) Comments from the discussants

Discussant Tsutomu Watanabe, referring to his own analysis of recent developments in corporate price increases and developments in the Consumer Price Index by item, noted that the findings of the presentation were consistent with his own analysis. He then suggested that, in order to capture firms' price-setting behavior, it would be useful to examine not only the pass-through at the industry or sector level, but also to delve into developments in the pass-through at a more detailed item- and firm-specific level.

Moreover, he argued that new discoveries might be made by examining more closely firm-level differences in price-setting behavior, such as differences between firms that are and that are not able to pass on price increases to consumers. Further, he presented the results of a survey of consumers he conducted regarding households' perceptions of price increases, and observed that in Japan, when asked "Suppose that the price of a product that you always buy in your supermarket goes up by 10%. What would you do?," an increasing number of respondents answered: "Nothing would change. I would continue to buy the same amount of the same product and brand at the same supermarket as before." In addition, he noted that households' inflation expectations had also been rising recently. On the other hand, the survey did not show any improvement in the outlook for wages, and he argued that in order to determine households' stance toward price hikes in the future it was important whether wage expectations improved.

Discussant Ryo Jinnai praised the presentation for its substantial analysis and interesting summary of the issues. In particular, he pointed out that it empirically clearly showed that the two important factors underlying the difference in inflation rates between Japan and the United States, which had experienced the same shock in terms of rising commodity prices, were differences in wage developments and differences in pass-through rates.

He then noted that in order to understand the reasons for the low pass-through rate of raw material costs in Japan, it would be useful to examine in more detail -- both theoretically and empirically -- the market structure faced by firms. Specifically, he pointed out that while the analysis using the FD-ID Price Indexes suggested that firms at the final demand stage did not find it easy to pass on cost-push pressures to selling prices, it was not easy to tell the reason for this. In this regard, he mentioned that while the monopolistic competition model often assumed in standard macroeconomics, which was based on the assumption of monopolistic sellers and many buyers, a better understanding of who had price bargaining power at the intermediate and final demand stages, and what motivated the setting of sales prices, might become important for understanding price developments in practice.

(3) General discussion

In response to discussant Watanabe, Presenter Yagi mentioned that he would like to deepen the analysis by conducting item- and firm-level analyses, although there were some difficulties such as the issue of data availability and the need to take into account certain business characteristics (e.g., item-level aspects such profit margins and the degree of market oligopoly for each item). He also noted that the consumer survey provided interesting data for understanding households' views. Regarding the importance of wages highlighted by discussant Jinnai, he said that he was closely watching wage developments from the perspective that a fall in real incomes due to cost-push inflation would have a negative impact on the economy. In response to the comments on market structure and firms' price-setting stance, he stated that he had not found any theory or model that could successfully explain the reality, and that it was a task for the future to think about these issues carefully while making use of the expertise of the academic community.

From the floor, Kosuke Aoki noted that the FD-ID Price Indexes were very useful and suggested that building a model that takes the strategic complementarity of firms and their access to financial markets by demand stage into account would help to further deepen our understanding of firms' price-setting behavior. Etsuro Shioji also praised the development of the FD-ID Price Indexes by the Bank of Japan and expressed the hope that the Bank would conduct more analyses using the indexes in the future. Shin-ichi Fukuda noted that analyses using the indexes were extremely interesting and that, given the expansion of global value chains, it would be useful to expand the analysis to take the impact of increased imports at the intermediate stage into account. Presenter Yagi responded that he would like to continue to deepen the analysis using the FD-ID Price Indexes, taking aspects such as strategic complementarity into account. In response to Fukuda's point, co-presenter Yoshiyuki Kurachi replied that since Japan's FD-ID Price Indexes incorporate import price fluctuations, he would like to consider whether further analyses were possible by more precisely modeling this part.

Shioji asked whether cost-push inflation could spread to wages and lead to further inflation. In response to this question, Kazuo Ueda argued that, assuming a multiple equilibria model consisting of a state in which the inflation rate remained stuck at 0 percent and a state in which the inflation rate was 2 percent, although cost-push price inflation might temporarily have an adverse effect on the economy, this could subsequently become an opportunity to transition from the 0 percent equilibrium to an equilibrium in which a stable rate of inflation of 2 percent was achieved. Presenter Yagi pointed out that while cost-push inflation could trigger a change in the social "norm" overall, such as in the price-setting behavior of firms, which so far had not changed much, at the same time it was important to note that such inflation could also exert downward pressure on the economy and prices.

Masayuki Morikawa stated that it would also be useful to examine whether there were differences in pass-through when upstream costs rise or fall. Presenter Yagi responded that the pass-through rate appeared to tend to increase when costs rise, and that this was an issue he would like to examine in more detail in the future. Citing fuel surcharges for flights as well as electricity prices as examples of items for which selling prices are determined mechanically in response to changes in costs, Takashi Unayama asked whether analyses could be conducted based on the existence of such price-setting mechanisms for some items. Presenter Yagi replied that, as an issue for the future, he would like to consider analyses taking industry and firm characteristic into account. Fukuda noted that the recent increase in cost-push pressures was partly due to supply shocks caused by supply constraints, as seen in semiconductors and other products, and that it was necessary to keep a close eye on these developments. Co-presenter Kurachi noted that the balance of supply and demand was actually quite tight for some goods and that it was necessary to carefully monitor whether this was leading to an increase in the pass-through rate.

4. Session 2: "Inflation in Japan: Changes during the Pandemic and Issues for the Future"

(1) Presentation

In his presentation, Haruhiko Inatsugu started by providing an overview of inflation developments in Japan before the COVID-19 pandemic using the Phillips curve framework and then suggested issues to consider with regard to price trends in the post-pandemic era, taking also the discussion in the first session into account.

He began by providing an overview of the characteristics of consumer price inflation in Japan from a somewhat longer-term perspective based on the Phillips curve framework. Specifically, he highlighted that (1) the Phillips curve in Japan flattened from the 1990s to the early 2000s and had remained flat since then, and that (2) in the service sector in particular, a substantial decline in price sensitivity to the macroeconomic output gap could be observed, even when looking at prefecture-level and other data. Further, he pointed out that while goods prices had fluctuated to some degree since the 2000s as a result of changes in prices overseas, service price inflation had remained unaffected, moving in a narrow range around zero percent since the 2000s. One reason for this, he argued, might be that while goods prices tended to be linked to those in overseas economies through trade, service prices were largely determined by domestic costs such as wages.

Next, based on the above economic and price structure, he presented two analyses of the possible impact of the recent cost-push price hikes discussed in Session 1 on future prices. First, he constructed a time-series model incorporating cost-push pressures into the usual Phillips curve and highlighted that the impact of raw material cost hikes and yen depreciation on prices would be short-lived compared to the impact of an improvement in the output gap. Second, he presented an analysis using item-specific data to estimate the impact of cost-push pressures (import prices), improvements in the output gap, and increases in inflation expectations on future prices. The analysis showed that (1) prices of only some goods would rise in response to a cost-push shock, (2) an improvement in the output gap would push up prices of a relatively large number of goods and some services, and (3) an increase in inflation expectations would push up the prices of many items, including services.

Finally, based on the above analyses, he discussed the outlook for inflation expectations, which are seen as an important factor for stable price increases in a wide range of items. He started by pointing out that while there were various hypotheses regarding the mechanism of inflation expectations formation, such as the rational inattention and sticky information hypotheses, at present there was not sufficient research on the validity of these hypotheses. He then presented the results of one simulation attempt in which several small-scale models were constructed by incorporating these mechanisms into a basic model in which inflation expectations change depending on people's degree of confidence in the central bank's price stability target, price trends, and other factors. The analysis suggested that inflation expectations vary considerably depending on the assumptions of the models, especially when oil prices etc. fluctuate substantially, leading Inatsugu to argue that uncertainty surrounding future inflation expectations was high. Moreover, in relation to inflation expectations, he also presented discussion points in considering future wage trends. He pointed out that the distribution of wage adjustments in Japan showed a large peak at zero percent in the 2000s, and that wages were rigid both upward and downward, but that this tendency had been weakening in recent years.

He also noted that, in light of expected demographic changes, the labor market was likely to tighten in the future, and that he was keeping a close eye on whether rising prices and inflation expectations would have an impact on wage setting in the future.

(2) Comments from the discussants

Discussant Aoki praised the presentation for a careful analysis of price developments in Japan based on the Phillips curve framework. He started by observing that it was interesting to note the large difference in the influence of global factors on goods and services prices and then highlighted that it would be useful to deepen the analysis by focusing on differences in the characteristics of tradable and nontradable goods and differences in the share of wages in value added.

Moreover, regarding the finding that improvements in the output gap and rising inflation expectations were more important than rising cost-push pressures in the price-setting for individual items -- a result that is not self-evident given the standard view that the prices of individual items are determined by each firm's marginal costs --, he commented that he would like the presenters to consider the reasons. Furthermore, in relation to the inflation expectations formation mechanism, he pointed out that while New Keynesian models often assumed that inflation expectations converge to the central bank's inflation target, it was necessary to verify whether this assumption was empirically correct. He then noted that there was still much that was not known about the interdependence between prices and wages, and suggested that the analysis be deepened by treating both in a unified framework.

Discussant Takayuki Tsuruga commended the approach of examining the inflation rates of goods and services separately as valuable and well organized overall. He then made several comments on the simulation of item-level inflation rates. He started by asking how statistically significant the changes in the item-level price distribution in response to a shock were and what the economic implications were. Next, he suggested that the item-level speed of price adjustment in response to a shock could be examined through devising a specification of the lag term in the estimation. He also pointed out that while the finding that the price distribution shifts in the direction of price increases when inflation expectations increase was interesting, this finding might be strongly influenced by a single phase in the 1990s when inflation expectations and service prices moved substantially at the same time. He then observed that it would be desirable to conduct robustness checks to see if the same analytical results would be obtained with a limited observation period.

He further discussed potential improvements of the model for the simulation of the inflation expectations formation mechanism. In particular, he noted that the assumption of the model that the speed of convergence of inflation expectations accelerates as they approach the inflation target needed to be examined in detail. Moreover, he pointed out that changes in the behavior of economic entities and inflation expectations could be discontinuous when shocks are large and suggested that it might be useful to incorporate the concept of regime switching into the model.

(3) General discussion

In response to discussant Aoki's comment that the analysis of the reasons for the low responsiveness of service prices to global factors should be deepened, presenter Inatsugu replied that he would like to extend his analysis, including comparisons with other countries. Moreover, in response to Aoki's comment on the convergence of inflation expectations, he answered that he would like to explore the possibility of, for example, analyses using firm-level microdata. Regarding the interdependence between prices and wages, given the link between inflation expectations and wage developments, he noted that the analysis in the presentation captured to some extent the interdependence, although the relationship was not explicitly modeled and, going forward, he would think about a model that takes this relationship into account.

In response to discussant Tsuruga's comment regarding the simulation of item-level inflation rates, presenter Inatsugu responded that the changes in the price distribution were statistically significant and noted that he would like to conduct additional analyses including the lag structure and other factors pointed out by the discussant. Regarding the observation period for the analysis, he replied that the results would not be significant if the period of the 1990s when prices and inflation expectations changed significantly was excluded and cited the limited fluctuations in prices and inflation expectations from the 2000s onwards as the reason for this. Further, he noted that while he first tried a simple model for the simulation of the inflation expectations formation mechanism, he would like to consider an extended model in the future.

From the floor, Naohito Abe pointed out that the flattening of the Phillips curve might be partly due to issues in the measurement of prices during the pandemic. He also noted that adjusting services prices for quality was difficult and that this might have affected the estimation results. In response, co-presenter Kenichi Sakura noted that in addition to the points mentioned by Abe, there were many other measurement issues brought about by the pandemic. For example, (1) measures such as ensuring sufficient space between seats in restaurants might have put downward pressure on the real supply capacity of the economy, and (2) with the structure of supply and demand in the markets for goods and services having changed substantially, it might be difficult to capture the supply and demand for individual items. He then added that it was necessary to assess price developments keeping these points in mind.

In relation to the mechanism of inflation expectations formation, Mototsugu Shintani noted that while macroeconomic data for both Japan and the United States showed that inflation expectations were consistent with standard theoretical models suggesting that inflation expectations are gradually revised to reflect the actual rate of inflation, recent empirical research using firm-level microdata for the United States had shown that inflation expectations tended to overreact to news about inflation. He then raised the question whether inflation expectations in Japan would also change rapidly as a result of rising inflation. In response to Aoki's comments on where inflation expectations might converge, Taisuke Nakata observed that in the United States there was much discussion in the 2010s about the possibility that inflation expectations might converge to a level below the inflation target. He then argued that possible theoretical candidates to explain why this might happen were multiple equilibria models and models that take into account the possibility of an endogenous decline in inflation expectations under the zero lower bound on nominal interest rates. In response, co-presenter Sakura pointed out that a related important issue was that the level of and developments in inflation expectations differed from one economic entity to another. Presenter Inatsugu noted that in Japan, too, it was necessary to further the analysis of inflation expectations taking heterogeneity across economic entities or in firm-level microdata into account.

Keiichiro Kobayashi asked whether the impact on social welfare would differ depending on the reasons for price increases. Co-presenter Sakura responded that since Japan was a resource-importing country, cost-push inflation worsened social welfare through a deterioration in the terms of trade, inflation with improvements in the output gap most likely would be associated with an increase in social welfare.

Tsutomu Watanabe, with regard to the simulation of item-level inflation, suggested observing changes in the shape of the tail of the distribution using quantile regression in order to capture the interaction of prices across items. He also wondered about the robustness of the analysis of the sensitivity of service prices to the output gap using prefecture-level data, pointing out that when he conducted his own research around 2000, he did not find any stable significant differences in service prices across prefectures. In his response, presenter Inatsugu agreed with Watanabe's suggestion regarding the simulation of item-level inflation rates and responded that he would like to try the proposed analysis. Moreover, he noted that the analysis using prefecture-level data was robust -- such as to changes in explanatory variables -- and observed that the accumulation of data since 2000 might be responsible for the different results.

In addition, Tsutomu Watanabe, with regard to the discussion on labor supply and demand, pointed out that in other countries, especially the United States, seniors and women had temporarily left the labor market during the pandemic and had been slow to return. He then raised the question whether it might be possible for the labor market participation of seniors and women in Japan to stagnate as well when economic activity resumed. In this context, he added that during the period of economic expansion prior to the pandemic Japan had met labor demand through the increased labor market participation of seniors and women, and that if these groups became more cautious about participating in the labor market, labor supply and demand could become significantly tighter. In response, co-presenter Sakura pointed out that the situation differed from that in the United States in that the labor market participation rate in Japan had declined only to a limited extent. He then noted that it was possible that the pandemic might have affected the labor market participation stance of seniors and others, so that attention needed to be paid to developments in labor market participation.

5. Panel Discussion: Behavioral Changes of Economic Entities and Inflation

Moderator: Etsuro Shioji (Hitotsubashi University)
Panelists: Shin-ichi Fukuda (University of Tokyo)
Naohito Abe (Hitotsubashi University)
Akira Otani (Bank of Japan)

5.1 Panel presentations

Moderator Shioji presented the following issues that he asked the panelists to address: (1) what should we make of recent price developments in Japan in light of structural changes such as shifts in demand among goods and services caused by the pandemic? And (2) what was the outlook for prices based on the recent situation? Each panelist gave a presentation on these issues.

(1) Naohito Abe (Hitotsubashi University)

Panelist Abe argued that, with regard to the first issue, it was debatable whether the Laspeyres consumer price indexes used in Japan and other countries (where consumption expenditure weights are fixed at the base period) were appropriate targets for monetary policy in a situation where households' behavior and the structure of consumption were undergoing substantial changes. He pointed out that while in this regard it was not clear which index would be ideal, (1) Paasche price indexes, which take changes in consumption weights into account, were still at a lower level than before the pandemic, although they had been rising recently, and (2) Edgeworth indexes, which attempt to capture common macroeconomic determinants of inflation excluding shocks specific to individual items, showed almost no change in trend since the start of the pandemic, thus displaying very different developments from Laspeyeres indexes.

With regard to the second issue, he presented the results of an analysis using point of sale (POS) and other data to estimate, among other things, the penetration rate of new products. The results indicated that whereas during the period of high resource prices in 2008, many high-priced new products were introduced and saw their sales increase, during the current period, sales of new products were not growing, suggesting that consumers were increasingly preferring inexpensive existing products. He then noted that if the reason for such household behavior was growing concerns about a stagnation of incomes, pensions, and permanent income due to the pandemic, there was a strong possibility that these factors would exert downward pressure on prices, and that the recent rise in inflation would remain transitory.

(2) Shin-ichi Fukuda (University of Tokyo)

With regard to the first issue, panelist Fukuda noted that (1) Japan's structural problems and the resulting decline in the potential growth rate and sluggish growth expectations were at the root of the low inflation environment in Japan, and that (2) when examining the impact of the pandemic on prices, we should also focus on the effects via these structural problems. He then pointed out that Japan's various problems, such as the widening budget deficit, declining birth and marriage rates, and the growing excess savings of households and firms, had recently become even worse. In addition, he argued that the policy responses to the pandemic had led to new problems, such as stagnation in the turnover of enterprises (i.e., the entry and exit of firms, etc.), and that compared to other countries, future-oriented reforms, such as the use of information technology and green investment, had been slow. Based on these considerations, he argued that the worsening of structural problems during the pandemic was the reason for Japan's slow economic recovery and low rate of inflation compared to the United States and Europe.

With regard to the second issue, he noted that (1) while so far, compared to the Second Oil Shock, the increases in corporate goods prices and consumer prices had been limited in comparison with the sharp rise in resource prices, (2) it was possible that firms were approaching the limit of their ability to absorb cost increases, and the Tankan survey and other data showed signs of changes in the pricing-setting behavior of firms, so that (3) firms might increasingly pass on higher costs to selling prices. However, in his view, taking the deterioration of the structural problems during the pandemic into account, it was difficult at present to envision a channel through which price hikes driven by stronger cost-push pressures would lead to sustained demand-driven price increases as a result of changes in people's mindsets.

(3) Akira Otani (Bank of Japan)

Regarding the first issue, panelist Otani stated that whether the upward trend in prices continued in the future would depend on whether the changes in corporate pricing behavior became more widespread and such behavior took hold in society. In this connection, he pointed out that in the past, the frequency of price changes, etc., had changed in a nonlinear manner, and although the mechanism that generates such changes had not been clarified, the framework of evolutionary game theory might provide a hint: for example, if a certain percentage of companies adopt a strategy of raising prices, that strategy will establish itself as the optimal response for society as a whole. He then noted that, in light of today's session presentations, increases in inflation expectations and wages might be necessary to create an environment in which firms were more likely to choose a strategy of raising prices, and that this might also require raising growth expectations.

Regarding the second issue, he highlighted that changes in real wages were likely to be negative for the time being as prices rise, and stated that in order to realize stable price increases, it was important for wages to rise firmly and real incomes to be secured. In this regard, he noted that labor-management wage negotiations in Japan had focused on "maintaining employment," and that even if real wages fell, this was unlikely to lead to wage increases, but that, looking ahead, one key point was whether -- due to tightening labor market conditions partly as a result of demographic changes -- the focus of wage negotiations might gradually shift to "wages." Moreover, he noted that while cost-push price increases would reduce social welfare in the short term, if this were to trigger a shift to an equilibrium in which wage increases and price increases are achieved, this could have a positive impact on the economy in the medium to long term.

5.2 Discussion

The presentations by the panelists were followed by discussions including floor participants.

(On structural changes and price developments during the pandemic)

In response to Fukuda's comments, Otani pointed out that inflation had also risen in Europe, which -- like Japan -- had been slow to address structural problems, and asked whether it might be necessary to consider channels through which structural problems could impede the smooth reallocation of resources across sectors and the expansion of supply capacity in areas of strong demand and thereby push up prices. Fukuda replied that in Japan, due to the pessimism about the future caused by the structural problems and other issues, any increase in corporate and household incomes would not result in an increase in spending, and downward pressure on prices would prevail. He further responded that corporate markups in Japan had not increased relative to those in the United States and Europe, and that the lack of growth of firms and industries capable of supplying competitive products had also contributed to low inflation.

Related to Fukuda's presentation, Aoki highlighted that if delays in structural reforms depressed the natural rate of interest via a lower potential rate of growth, then, under the lower bound on nominal interest rates, this could create a deflationary bias and lead to lower trend inflation. Fukuda agreed with this point and observed that the decline in marginal productivity due to the shrinking population and a lack of investment and consumption in the corporate and household sectors might be putting downward pressure on the natural rate of interest.

Tsutomu Watanabe pointed out that it was important to understand whether the recent global increase in prices was a sustained increase in inflation or a one-time adjustment in the price level. He then argued that if the current increase in prices was a one-time relative adjustment of prices due to structural changes in the consumption structure or labor supply stance brought by a change in economic entities' preferences in response to the pandemic, it was unlikely to lead to sustained price rises. However, he noted that in this case, there was insufficient understanding of what relative price changes were required for this adjustment -- for example, whether the disutility of labor had increased and real wages needed to rise -- and how long the adjustment would take. Fukuda agreed with the view that the preferences of economic entities had changed substantially in the wake of the pandemic and suggested that, given the generous policy support provided to a wide range of industries and sectors in Japan since the outbreak of the pandemic, the necessary adjustment of relative prices might take a considerable amount of time.

(On firms' price-setting behavior and thresholds in inflation dynamics)

With respect to Otani's discussion on whether firms' price-setting behavior could change in a nonlinear manner, Abe outlined that, from a theoretical perspective, the idea assumed menu costs and strategic complementarity; however, POS data showed that the retail prices of individual products changed frequently, raising doubts whether these hypotheses were valid. Regarding the debate on thresholds in inflation dynamics, Aoki pointed out that one of the differences between periods with some inflation and the current period was the existence of a mechanism through which prices were automatically adjusted in response to the rate of inflation (indexation), and argued that one key issue was how far inflation would have to rise for indexation to be revived. Otani pointed out that although the actual price-setting behavior of firms differed depending on the characteristics of the product involved and the degree of market oligopoly, firms would often be conscious of some threshold, such as what percentage of rivals had changed their prices, when deciding whether to make a major price change or not. He then noted that this threshold was not fixed in advance at a specific level but could change depending on the social situation at the time and how households perceived price changes. He added that, in this sense, the discussion on thresholds was inextricably linked to the debate on price norms and that it was necessary to accumulate further research on the subject.

(On the impact of cost-push price increases on the income distribution)

Junko Koeda presented the argument that price increases due to rising cost-push pressures had the aspect of increasing households' perceived inflation and that this might put downward pressure on consumption. In this connection, Fukuda noted that it was an important point that the current inflation, which disproportionately affected daily necessities, was likely to be more costly in terms of the income distribution than inflation in which the prices of all items rose to the same extent. With regard to the impact of the recent inflation affecting daily necessities in particular, Otani observed that whereas high-income households tended to have a financial buffer such as cash reserves built up during the pandemic, low-income households, for which daily necessities accounted for a large share of spending, would be strongly affected, partly because their decline in real incomes was large, and from a somewhat longer-term perspective this could exert downward pressure on the economy and prices. Moderator Shioji concluded that the distributional impact of price increases was very important and should be discussed further in the future.

(On inflation expectations and wage developments)

Fukuda pointed out to Otani that when assessing inflation expectations, it was also important to consider which items people expected to see price increases in, adding that while the outlook for increases in prices such as those of energy recently appeared to be strengthening, he was wondering whether the prospect of price increases in other items were also increasing. Otani pointed out that the recent rise in inflation expectations in part factored in price increases in items affected by higher energy prices and the weakening yen, and noted that if economic activity continued to improve, expectations of gradual price increases for a range of items would likely increase.

Masazumi Wakatabe asked for opinions about which indicators of inflation expectations the emphasis in Japan should be on, given that that there were different indicators -- short-, medium-, and long-term indicators -- for the inflation expectations of different economic entities (households, firms, and experts). In response, Abe pointed out that there were many issues related to the measurement of inflation expectations, and that it was difficult to identify a superior indicator at this point. Referring to the results of studies for other countries, he observed that it might be important to focus not only on the value of inflation expectations but also on their distribution and other factors. Fukuda expressed the view that it would be desirable to include various heterogeneities in the evaluation, such as differences by entity including households, firms, and market participants, as well as differences by income group among households.

Regarding wage developments, Abe asked Fukuda about the impact of the pandemic on productivity and wages. Fukuda pointed out that while the number of unemployed did not increase much during the pandemic, the number of employed persons not at work rose substantially, partly due to strong government support. He also argued that in order to increase productivity and wages it would be desirable for employed persons not at work to acquire new skills and move to other sectors, adding that the fact that no such movement was observed was problematic.

Jinnai noted that the differences in wage dynamics were a particularly important reason why inflation dynamics in Japan differed from those in the United States and Europe. He argued that while the two workshops discussed the rigidity of wages in Japan, another way to look at this was that the difference in wage dynamics between Japan and other countries might be due to Japan's labor market being segmented from labor markets overseas. Fukuda highlighted that while there was global competition not only for highly skilled personnel in the IT industry, etc., but also for personnel engaged in relatively simple tasks, Japan was lagging behind in securing human resources due to the segmentation between the domestic and overseas labor markets. He also argued that this was impeding economic growth and might be responsible for the difference in wage developments between Japan and other countries.

(On behavioral changes and the measurement of inflation)

Otani remarked to Abe that it was interesting that in the United States and Europe, the published Laspeyres price indexes might underestimate price increases because the demand for some products and their prices rose sharply during the pandemic; on the other hand, developments in Japanese indexes had been moving in the opposite direction. Abe noted that while a rigorous comparison was difficult, since neither the United States nor any of the European countries calculated Paasche price indexes, it seemed that the reason for the lower level of inflation based on Paasche price indexes in Japan might be a strong preference by consumers for cheap goods.

Fukuda asked Abe about the appropriateness of using the averages of the consumption expenditure weights in 2019 and 2020 as the basis for the 2020 base year CPI, given that the structure of demand changed substantially during the pandemic. Abe replied that there were many theoretical issues, and that in the end the averages of the weights for the two years might have been used to take a conservative approach, given that these are official statistics. In this connection, Chihiro Shimizu added that the dominant view among price index experts was that price indexes should move smoothly and that measurement based on past expenditure weights was therefore preferable.

6. Closing Remarks

In closing, Ueda reviewed the workshop and summarized the very fruitful discussions on the characteristics of price developments in Japan before and after the outbreak of the pandemic. He highlighted the nonlinearities in pass-through rates, the relationship between service price rigidity and inflation expectations, and changes in the distribution of wage inflation etc. as interesting points raised in the presentations in Sessions 1 and 2. Then, in relation to the debate on the outlook for prices in the panel discussion, he presented several additional points to think about when considering the reasons for Japan's more than two decades of low inflation and the outlook for prices.

First, he pointed out the impact on the economy and prices of the depreciation of the yen (in terms of the real exchange rate) and deterioration in the terms of trade over the past two decades. Specifically, he highlighted the following issues: (1) In theory, a depreciation of the yen could lead to an increase in exports, which in turn should lead to higher prices and wages in Japan. Why did this not happen? (2) What to make of the impact of the capital gains on Japanese firms' overseas assets as a result of yen depreciation and the impact of the increase in investment of overseas firms due to yen depreciation on asset prices in Japan? (3) What should be made of the impact of the loss of real income due to the deterioration in the terms of trade on domestic prices, especially services?

Second, he pointed to the question of how inflation expectations and wage growth rates were determined. He observed that (1) while, when they moved, they could move rapidly, as they did in the late 1990s, when they fell sharply, (2) they had remained stagnant since the 2000s, making it difficult to understand the mechanism determining them. He then pointed out that further research was needed to determine whether the recent changes in wage developments etc. shown in the staff presentation etc. indicated that the adjustment over a period of more than two decades was coming to an end.

Third, he raised the question of whether the prolonged period of low inflation and low interest rates itself had had a negative impact on the Japanese economy. He observed that it was possible that slow adjustments of relative prices under low inflation, the persistence of so-called "zombie firms," the impact on the allocation of resources, and other issues had a negative impact on the economy, and this point also needed to be discussed further.

He concluded by pointing out that just like hardly anyone had foreseen the recent surge in prices in the United States triggered by supply constraints, there was substantial uncertainty surrounding future price developments in Japan as well. He noted that Japan's long-term low inflation environment may have been the result of various positive and negative factors, including those discussed so far, balancing each other out, and that one could not rule out the possibility that this balance might break down and inflation rise sharply due to the strengthening of unexpected factors in the future.

(Appendix 1)

The Phillips Curve and Cost Pass-Through in Japan

The Second Workshop on "Issues Surrounding Price Developments during the COVID-19 Pandemic"

Conference Date: Monday, May 30, 2022

Venue: Conference Room A, Bank of Japan

Program			
13:00-13:05	Opening Remarks	Masaaki Kaizuka	Bank of Japan
Session 1 Pass-Through of Cost Push Pressure to Consumer Prices			
13:05-14:20	Presenters	Tomoyuki Yagi	Bank of Japan
		Yoshiyuki Kurachi	Bank of Japan
	Discussants	Tsutomu Watanabe	University of Tokyo
		Ryo Jinnai	Hitotsubashi University
14:20-14:35	Coffee Break		
Session 2 Inflation in Japan: Changes during the Pandemic and Issues for the Future			
14:35-15:50	Presenters	Kenichi Sakura	Bank of Japan
		Haruhiko Inatsugu	Bank of Japan
	Discussants	Kosuke Aoki	University of Tokyo
		Takayuki Tsuruga	Osaka University
15:50-16:05	Coffee Break		
Session 3 Panel Discussion: Behavioral Changes of Economic Entities and Inflation			
16:05-17:35	Moderator	Etsuro Shioji	Hitotsubashi University
	Panelists	Shin-ichi Fukuda	University of Tokyo
		Naohito Abe	Hitotsubashi University
		Akira Otani	Bank of Japan
17:35-17:50	Closing Remarks	Kazuo Ueda	Kyoritsu Women's University and University of Tokyo
	Overall Moderator	Teppei Nagano	Bank of Japan

* Sessions 1 and 2 consist of 30 minutes of presentation, 10 minutes of comment by each discussant, and 25 minutes of floor discussion (including responses from presenters).

List of External Participants and Speakers from the Bank of Japan, etc
(in alphabetical order, titles omitted, affiliations current at the time of the workshop)

Name	Affiliation
Naohito Abe	Hitotsubashi University
Masayoshi Amamiya	Bank of Japan
Kosuke Aoki	University of Tokyo
Shin-ichi Fukuda	University of Tokyo
Haruhiko Inatsugu	Bank of Japan
Ryo Jinnai	Hitotsubashi University
Masaaki Kaizuka	Bank of Japan
Keiichiro Kobayashi	Keio University
Junko Koeda	Waseda University
Yoshiyuki Kurachi	Bank of Japan
Haruhiko Kuroda	Bank of Japan
Masayuki Morikawa	Hitotsubashi University and RIETI
Teppei Nagano	Bank of Japan
Taisuke Nakata	University of Tokyo
Akira Otani	Bank of Japan
Kenichi Sakura	Bank of Japan
Chihiro Shimizu	Hitotsubashi University
Mototsugu Shintani	University of Tokyo
Etsuro Shioji	Hitotsubashi University
Takayuki Tsuruga	Osaka University
Shinichi Uchida	Bank of Japan
Kazuo Ueda	Kyoritsu Women's University and University of Tokyo
Takashi Unayama	Kyoto University
Masazumi Wakatabe	Bank of Japan
Tsutomu Watanabe	University of Tokyo
Yasutora Watanabe	University of Tokyo
Tomoyuki Yagi	Bank of Japan