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May 27, 2024  
Bank of Japan

## **Price Dynamics in Japan over the Past 25 Years**

*Keynote Speech at the 2024 BOJ-IMES Conference  
Hosted by the Institute for Monetary and Economic  
Studies, Bank of Japan*

**UCHIDA Shinichi**

*Deputy Governor of the Bank of Japan*

## **Introduction**

It is my great pleasure to welcome all of you to this conference. As Governor Ueda mentioned in his opening remarks, the Bank of Japan is conducting the “Broad Perspective Review” of our monetary policy over the past 25 years. In short, it has been a battle against persistent deflation and a battle with the zero lower bound.

Let me start by giving an overview of the inflation picture during this period. Please look at Chart 1. Japan’s deflation started in the late 1990s and continued for 15 years. The average inflation rate was just minus 0.3%. It was a mild but persistent deflation.

To tackle this situation, the Bank introduced the 2% price stability target and Quantitative and Qualitative Monetary Easing, or QQE, in 2013, and a negative interest rate policy and Yield Curve Control, or YCC, in 2016. As a result, we succeeded in achieving a situation without deflation, but the average inflation rate was 0.5%, which fell short of our 2% goal. Recently, inflation rate has risen to around 3%, following the global inflation.

The big question is whether the current change in inflation picture means an irreversible, structural change from deflation, or just a temporary phenomenon led by global inflation. In this speech, I will try to give an answer to this important question, which has implications for the future course of our monetary policy as well as Japan’s economy.

## **I. The Causes of Japan’s Deflation**

### ***The Bursting of the Asset Bubble and Chronic Shortages of Demand***

For this, we need to go back to the 1990s and explore the causes of Japan’s deflation. As background to this deflation, from a real economy perspective, Japan’s economy experienced two things: a decline in the growth trend and chronic shortages of demand. You can see these in Chart 2.

The causes of these developments are compound. The most important factor appears to be the bursting of the asset bubble in the early 1990s. This was followed by financial system turmoil and painful balance sheet adjustments in the corporate sector. Companies had to address excess capacity, excess labor, and debt-overhang. Against this backdrop, they

became more and more reluctant to take risks and were slow to adjust their operations to the globalization trend brought about by the rises of the emerging economies. As shown in the left-hand panel of Chart 3, the corporate sector turned to a net saving position. Companies invested their limited resources mostly abroad, as shown in the center panel of Chart 3. This lowered the accumulation of capital stock and the growth rate of labor productivity and hence, the potential growth rate, as shown in the right-hand panel of Chart 3.

In this environment, the natural rate of interest,  $r^*$ , declined earlier and to a greater extent than in other countries. It is always difficult to estimate  $r^*$ , and various models give us different figures ranging from minus 1% to plus 0.5%, as you can see in Chart 4. But it is safe to say that our  $r^*$  is low and has been declining over time. Otherwise, we cannot explain what has happened over these decades.

#### ***Declining and Aging Population and Decline in the Natural Rate of Interest***

In addition to the bursting of the bubble, the declining and aging population might have affected  $r^*$ . The impact of demography on  $r^*$  is not straightforward, even theoretically.  $r^*$  is often related to the per-capita growth rate of GDP. So, a declining population itself would not necessarily lower  $r^*$  if the size of the economy went hand-in-hand with labor input. But still, a higher dependency ratio should lower per-capita growth, as you can see in Chart 5.

To address the problem of dependency, the answer is clear: continue working. The good thing is that senior people are much healthier than before. But the move toward continued employment did not happen until the 2010s. The labor force participation rate of seniors started to rise from 2012, as you can see in Chart 6. Japan then experienced a labor-shortage situation for the first time since the bursting of the bubble, with the aggressive stimulus to the economy by QQE and other policies. Before then, companies did not necessarily have to rely on senior workers.

As you know, Japan is a frontrunner among countries with aging populations. In 2019, when Japan hosted the G20 meetings, “aging” was one of the priority topics. Participants discussed various issues on this topic and reached the natural conclusion: the impact of aging

is complicated. When senior citizens reduce savings in their life cycle,  $r^*$  rises. But, if people have strong concerns over the risks associated with increased longevity, younger generations save more and seniors slow the pace at which they use their savings. I am not saying that a declining and aging population is a problem by itself. I would rather stress that society appears to have failed or been slow to address this issue properly.

We tend to have a negative attitude when we discuss demographic issues. Companies tended to focus on the demand side and worry about shrinking domestic markets. Of course, a declining population also means a decline in the labor force. However, the supply-side implications were ignored or marginalized during the course of deflation, for good reason, I would say. As you can see in Chart 7, during that period, colored in blue, companies felt that they had more than enough employees. I will return to this issue later. Here, I just want to stress that the labor market is the key.

### ***Decline in Actual and Expected Inflation***

Let's move onto inflation. Actual and expected inflation declined in the 1990s, stayed low in the 2000s, and then rose somewhat after 2013 (Chart 8).

There are two distinctive features in our inflation expectations. First, inflation expectations in Japan have a high positive correlation with growth trends or growth expectations, as you can see in Chart 9. Secondly, the formation of medium- to long-term inflation expectations is adaptive rather than forward-looking, as shown in Chart 10. Of course, these observations are far from ideal. No central banker would welcome them. It means that inflation expectations are not anchored and fluctuate, reflecting real variables and actual inflation rates.

Basically, what happened is as follows (Chart 11). In the 1990s and 2000s, the inflation rate declined due to chronic demand shortages. The growth trend and  $r^*$  declined, and the Bank of Japan's monetary policy, which was mostly conventional at that time and faced with the zero lower bound constraint, could not sufficiently stimulate demand. Prolonged weak demand prevented the inflation rate from rising. It is natural that people lack faith in the central bank's ability to raise the inflation rate and, so, inflation expectations remained low. All in all, our monetary policy did not have enough power to lift up the actual and expected

inflation under the zero lower bound constraint, while it would be fair to mention that the policy measures then contributed to protect the financial system by providing ample liquidity.

Since 2013, we have overcome the zero lower bound to some extent through the introduction of QQE and YCC. As you can see in Chart 12, real interest rates were in negative territory, and monetary policy has been very accommodative, even while  $r^*$  has been low. But ten more years are needed to give enough stimulus to change the whole picture of the economy.

## **II. Deflationary Norm**

### ***Formation of Deflationary Norm***

So far, I have explained the mechanism by which Japan's economy dropped into deflation and failed to exit from it, from the perspective of a central banker. This is the main component of our story, though I am afraid it may not be particularly interesting from an academic point of view. In the end, it was just a typical story of the zero lower bound.

To paint a complete picture, however, we need to add another set of stories. There is one phenomenon which only Japan has experienced. The mild but persistent deflation created a social norm based on the belief that "today's prices and wages will be the same tomorrow." I use the word "social." It is not just an economic phenomenon.

Chart 13 shows the distribution of the inflation rate for all goods and services in the CPI. You can see that most items have concentrated around zero % in Japan. In the US, the peak was around 2%, and the distribution is much wider compared with Japan. Of course, these figures are before the pandemic and the recent global inflation. In Japan, the price-setting behavior based on the belief that there would be no change in prices and wages spread widely among companies and became a kind of norm. They all kept their prices unchanged for fear of losing customers.

How does this come to be the norm? Again, the initial trigger was chronic demand shortages. A typical textbook way of handling demand shortages would be to reduce prices, downsize production, and reduce the number of employees, in the hope of a later recovery. But that was not the case in Japan. There was a strong consensus in society that employment should

be maintained as long as possible. Companies continued to hold on to their labor force, and the government helped them by providing various subsidies, furlough programs, and public financing. As you can see in Chart 14, the unemployment rate was not very high, even at its peak, and we had limited cases of bankruptcy.

On the price front, companies continued to face harsh competition, as their rivals were still there. As for wages, employees started to accept reduced wages in exchange for job security (Chart 15). Companies also tried to replace retiring employees with part-time workers. As in Chart 16, price markups declined significantly, while wage markdowns increased.

In our large-scale survey of the corporate sector, companies responded that, in the face of harsh competition, they refrained from passing on costs to their customers, as you can see in the left-hand panel of Chart 17. Instead, they tried to cut costs by reducing wages and by asking their suppliers to reduce prices, or they just accepted smaller profit margins as shown in the right-hand panel of Chart 17.

They also argued that, under this deflationary norm, it was difficult to move in the direction of making better products and raising prices. As the left-hand panel of Chart 18 shows, more than 70 % of the respondents favor a future landscape with mild, positive price and wage inflation to that with zero inflation. They believe such an environment will make their businesses easier, as they can pass on costs to their customers. They also said that if such a situation is realized, they would invest more and raise wages, instead of just cutting costs, as shown in the right-hand panel of Chart 18.

Those results correspond with some stylized facts. For the past 25 years, Japanese companies have implemented process innovations that cut costs, rather than product innovations that develop new products. This explains and is explained by the decline in markups. Companies did not invest enough in R&D and failed to differentiate their products sufficiently from their competitors.

It is often argued that deflation or the deflationary mindset in Japan is the fundamental cause of the slow economic development during that period. Here, you may argue, causes and

consequences are being confused. You may also argue that relative prices and overall inflation are being mixed up. In theory, of course, changes in the relative prices between individual products can happen even when the overall inflation rate is zero. Companies can raise their relative prices regardless of the overall inflation rate. Basically, I agree. It is difficult to tell whether and through what channels this norm has adversely affected the economy.

### ***Menu Costs***

There are several possible candidates for theoretical explanations of the norm, such as the nominal rigidity of wages and menu costs. Here I would like to focus on menu costs, as I believe this illustrates some important aspects of what happened during this period.

In Chart 19, we can see that the frequency of price changes in Japan declined in the 1990s, especially in the service sector. The frequency of price increases, that is, the share of prices that saw an upward change, as shown by the blue line, declined along with trend inflation. In this context, the decline in frequency itself is quite natural, but the extent of the decline is large. Meanwhile, the frequency of price decreases, that is, the share of prices that saw a downward change, the green line, rose only slightly, even though trend inflation declined. A salient decline in the former and a modest rise in the latter both suggest that companies have become more reluctant to change their prices. These observations suggest that there have been an increase in menu costs. Please look at Chart 17 again. Based on the survey mentioned above, companies responded that they refrained from passing on costs to their prices because, among other things, they were afraid of losing reputation. That is why I used the word “social” norm to describe this “economic” phenomenon.

Higher menu costs, together with mild inflation, have slowed the pace of price adjustment. And for us, the central bank, this requires more effort to get out of this situation. The “no change in prices and wages” norm worked as if inflation expectations are anchored at zero %. And the gravity towards zero % is stronger than a 2% anchor; as you can see, the 0% peak of the distribution in Japan’s CPI is much higher than 2% peak seen in that of the US.

### **III. Escaping from the Deflationary Situation**

Two things are required to escape this situation. First, we need to resolve the original causes of deflation, that is, demand shortages and consequent excess labor supply. Secondly, we need to overcome the threshold of menu costs, or more fundamentally, the deflationary norm.

As to the first, QQE and other accommodative monetary policy tools provided powerful stimulus to the economy and, together with government measures, created more than 5 million jobs, mainly for women and seniors (Chart 20). It was basically a high-pressure economic strategy.

Chart 21 shows what happened in the labor markets during the period under QQE. In this period, the year-on-year rate of change in employee income was stable at around 2-3 percent. Prior to the pandemic, the increase was driven by a rise in the number of employees, the blue bars. But since the pandemic, the increase has been led by a rise in wages, the white bars, given the limited room for additional labor supply of women and seniors. The labor market structure appears to have changed after the pandemic, and wages are likely to continue increasing.

In other words, when we started QQE in 2013, there was considerable slack in the economy. We did not expect this scale of additional labor coming from women and seniors. Of course, this should be taken as a favorable development in addressing our demographic challenges. In addition, there was another type of slack, a kind of hidden slack, in which companies continued to provide too many services to their customers for free, which is possible only with an abundant labor force. The Bank of Japan has spent ten years providing high pressure, aiming to remove all of these slacks in the economy.

Another issue we need to address is to overcome the threshold of menu costs, or the deflationary norm. As an initial response, menu costs appear to have been normalized after the global inflation. Please see Chart 19 again. The frequency of price changes has returned to the levels of the early 1990s. And in Chart 22, the shape of the distribution of the CPI has changed significantly. Now the distribution is wider and the peak is lower, which is not surprising in the current situation. The question is whether this is a temporary



development due to the recent global inflation or an irreversible, structural change. I will discuss this issue again shortly, focusing more on the fundamental issue of the deflationary norm.

### **Conclusions and Future Prospects**

Before I conclude, let me summarize today's explanation in Chart 23. The bursting of the asset bubble in the 1990s was followed by financial system turmoil and painful balance sheet adjustments in the corporate sector. Companies and society as a whole were slow to address trends in globalization and, more importantly, the declining and aging population.

The trend growth rate declined, coupled with chronic demand shortages, particularly in the labor market.  $r^*$  also declined. On price front, actual and expected inflation declined, and the Bank of Japan's monetary policy did not have enough power to lift them up under the zero lower bound constraint.

Faced with this difficult situation, the consensus in society was that employment should be maintained. Labor hoarding by companies, supported by the government, contributed to maintaining economic and social stability in exchange for leaving the excess labor and excess numbers of companies. Price markups declined significantly, along with an increase in wage markdowns. "No change in prices and wages" became the norm. Companies proceeded with process innovations rather than product innovations, which affected and was affected by markups.

From 2013, the Bank of Japan started to provide high pressure to the economy under QQE and YCC, which, together with government measures, created millions of jobs, mainly for women and seniors, and gradually changed labor market conditions, resulting in labor shortages. And the recent global inflation has put final pressure on the deflationary norm. These are the summary of today's explanation.

Now it is time to answer the question I posed at the beginning of this speech. Are these trends irreversible? As I mentioned, two things are needed to change the current situation: resolving the original causes of deflation and overcoming the deflationary norm.

As to the first issue, resolving the original causes of deflation, I can confidently answer “yes.” Labor market conditions have changed structurally and irreversibly. We cannot expect much more labor participation to come from women and seniors. The job participation rate for women in Japan is now higher than that in the US. To be precise, there is still some more room for supply. Women may work longer hours as fulltime workers. Companies are extending the retirement age to keep their labor force. These efforts are reasonable and necessary, but they are not enough to change the overall picture.

As to the second issue, overcoming the deflationary norm, the answer is not so clear. Will companies continue the current price-setting behavior even after the cost-push pressure from global inflation wanes? The key once again is the labor market. If the structural changes in the labor market continue, companies will have to build business models that generate enough profits and wages to keep and attract employees. As to price-setting strategy, companies need to rewrite their prices in their menus promptly, reflecting their labor costs while paying due attention to the possible impact on demand for their products.

In the end, the “social norm” is set to be dissolved. The main driving force for these developments and long-awaited structural changes is labor shortages. Labor shortages drive individual companies’ transformations and the dynamics of the whole economy, while this process entails relatively low transition costs, as it is less likely to give rise to unemployment.

After ten years of experience under QQE, YCC, and the negative interest rate policy, the Bank of Japan declared in this March that these unconventional policy tools had fulfilled their roles. We returned to a conventional monetary policy framework, aiming at a 2% price stability target through adjustments of the short-term policy rate, which means we have overcome the zero lower bound. While we still have a big challenge to anchor the inflation expectations to 2%, the end of our battle is in sight.

So, I would like to conclude my speech with this phrase: “This time is different.”

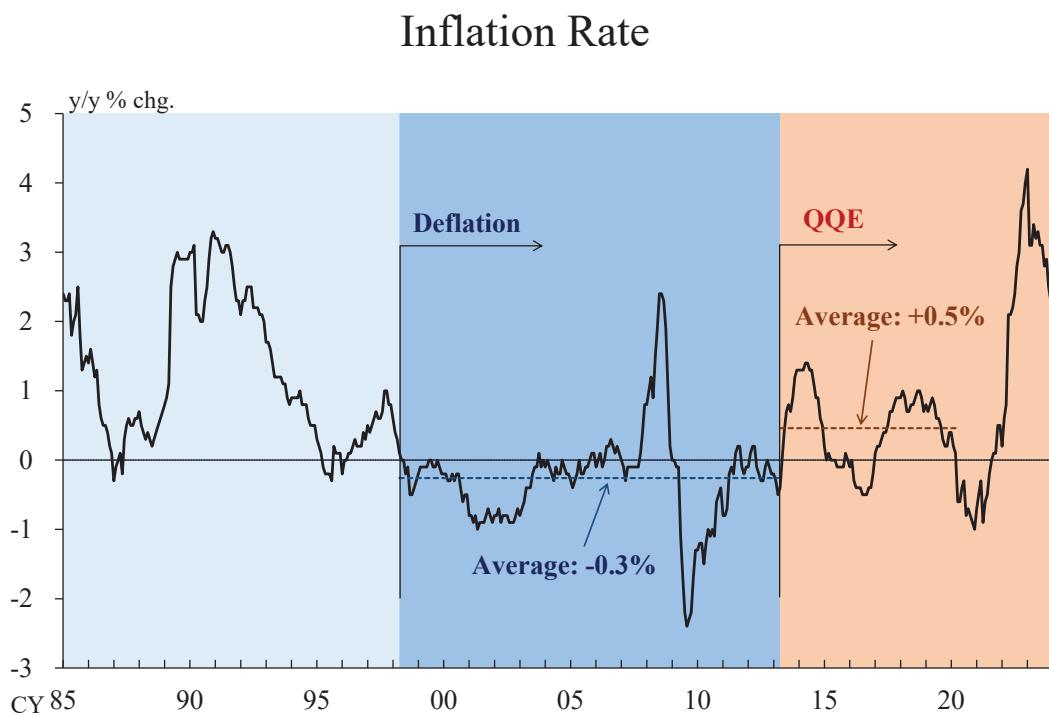
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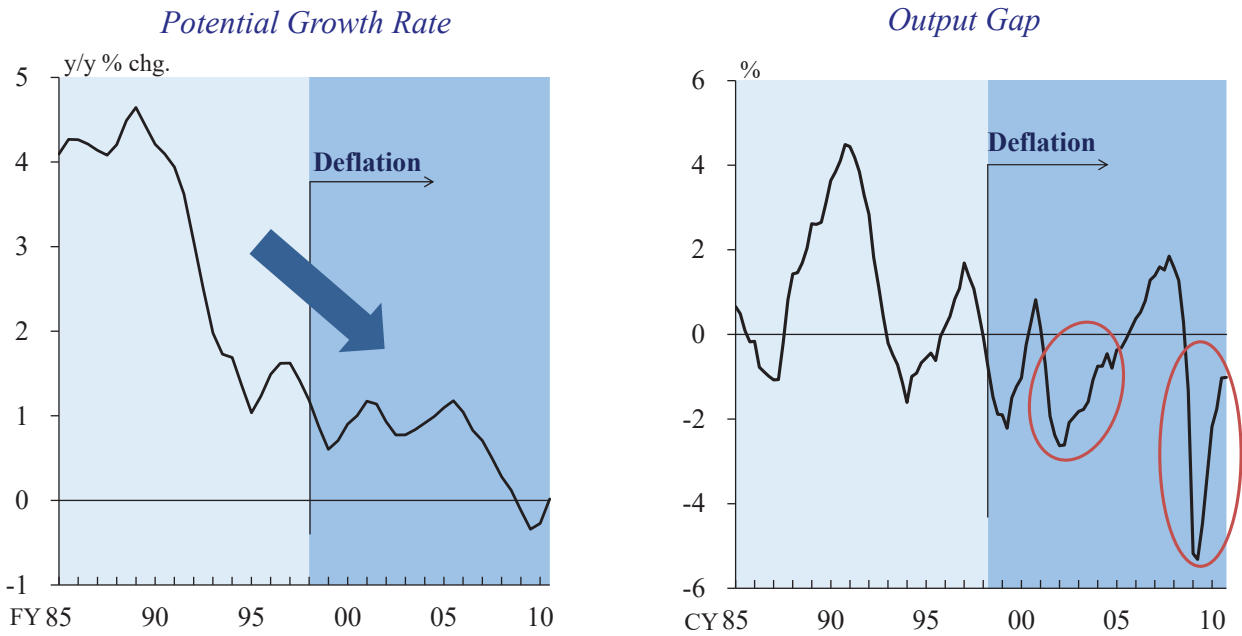
Chart 1



Note: Figures are the CPI for all items less fresh food, excluding the effects of the consumption tax hikes, etc.

Source: Ministry of Internal Affairs and Communications.

### Potential Growth Rate and Output Gap until 2010

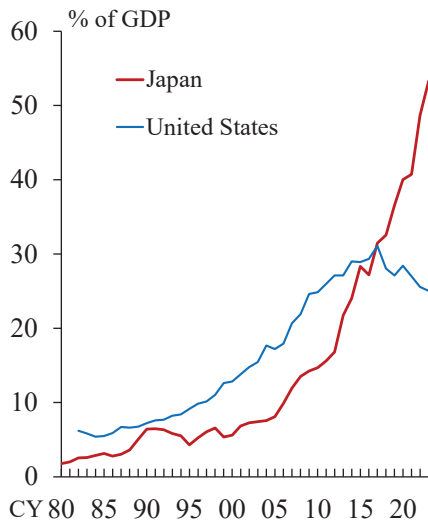
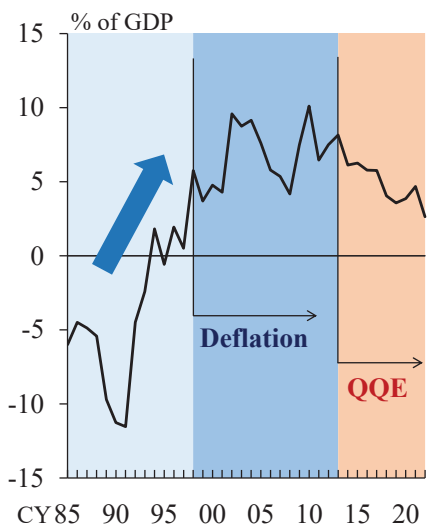


Note: Figures are staff estimates.  
Source: Bank of Japan.

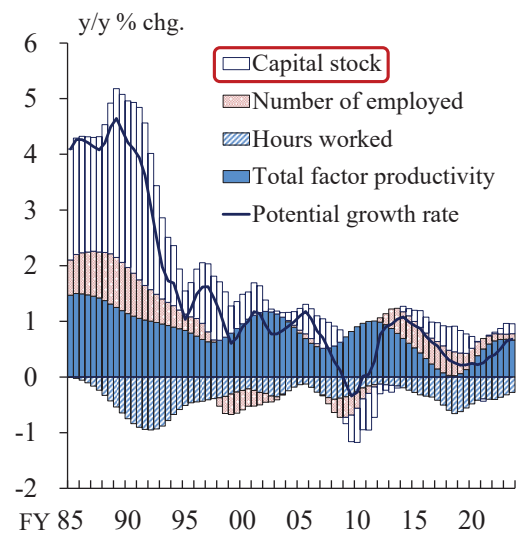
### Corporate Investment

#### Foreign Direct Investment (FDI) Stock

#### Saving-Investment Balance of Corporate Sector



#### Potential Growth Rate

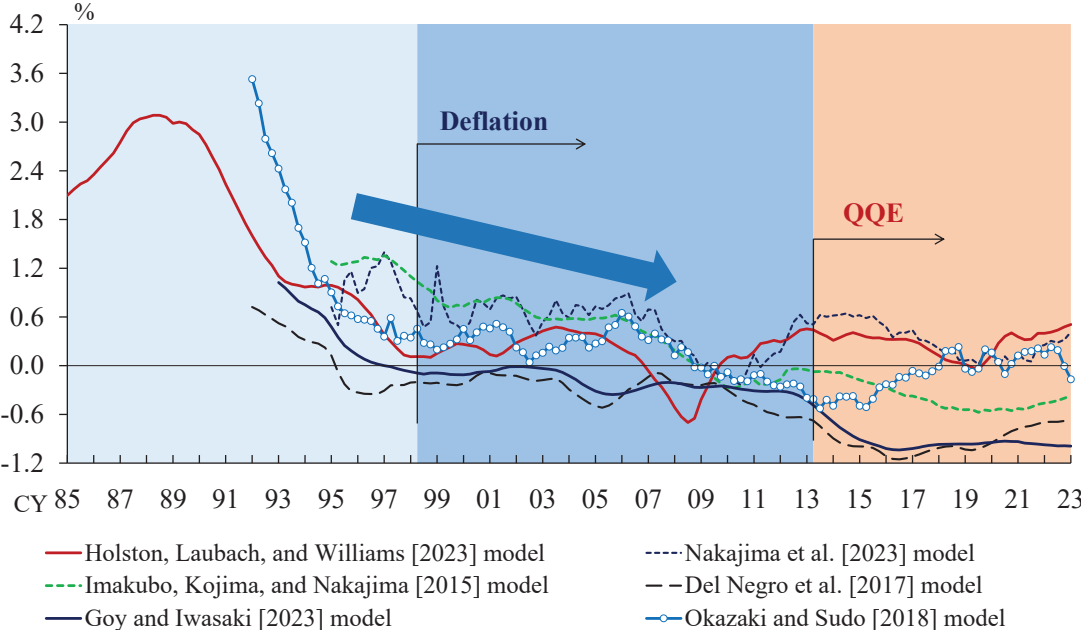


Note: Figures before 1994 are based on the 1993SNA.

Note: Figures are staff estimates.

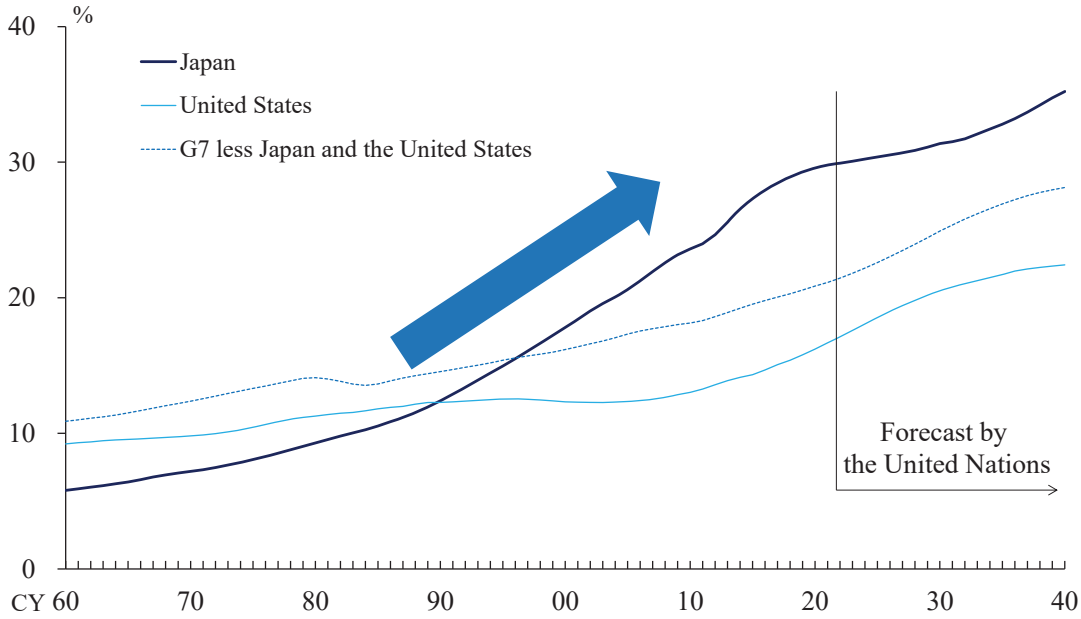
Sources: Cabinet Office; Bureau of Economic Analysis; International Monetary Fund; United Nations Conference on Trade and Development; Bank of Japan.

### Natural Rate of Interest



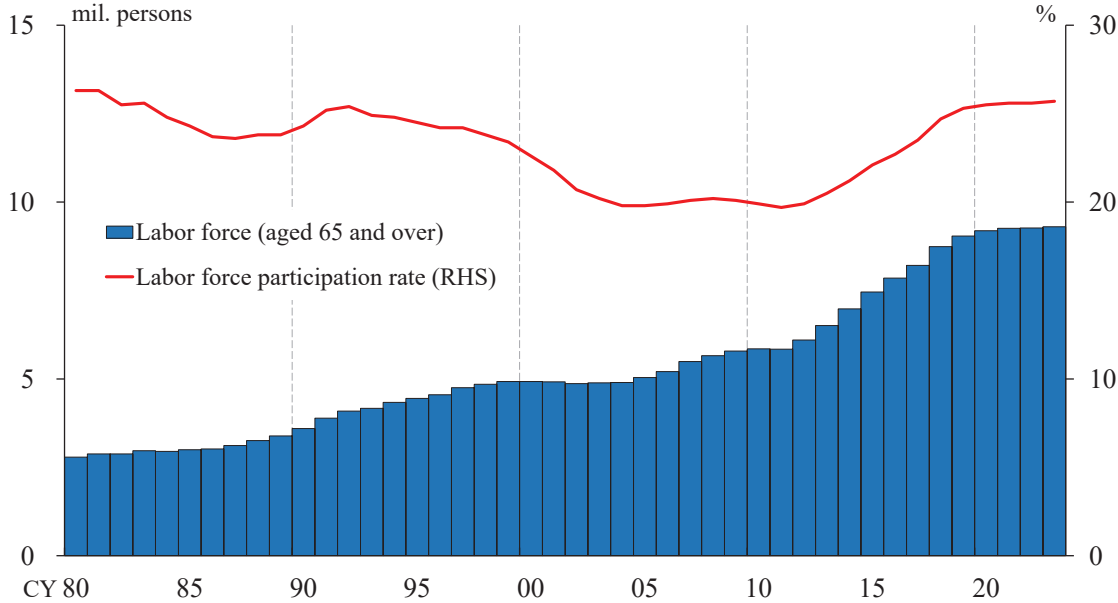
Note: The estimates are based on staff calculations using the models proposed in the different papers.  
Sources: Bank of Japan; Ministry of Finance; Ministry of Health, Labour and Welfare; Cabinet Office; Ministry of Internal Affairs and Communications; Bloomberg; Consensus Economics Inc., "Consensus Forecasts."

### Dependency Ratio



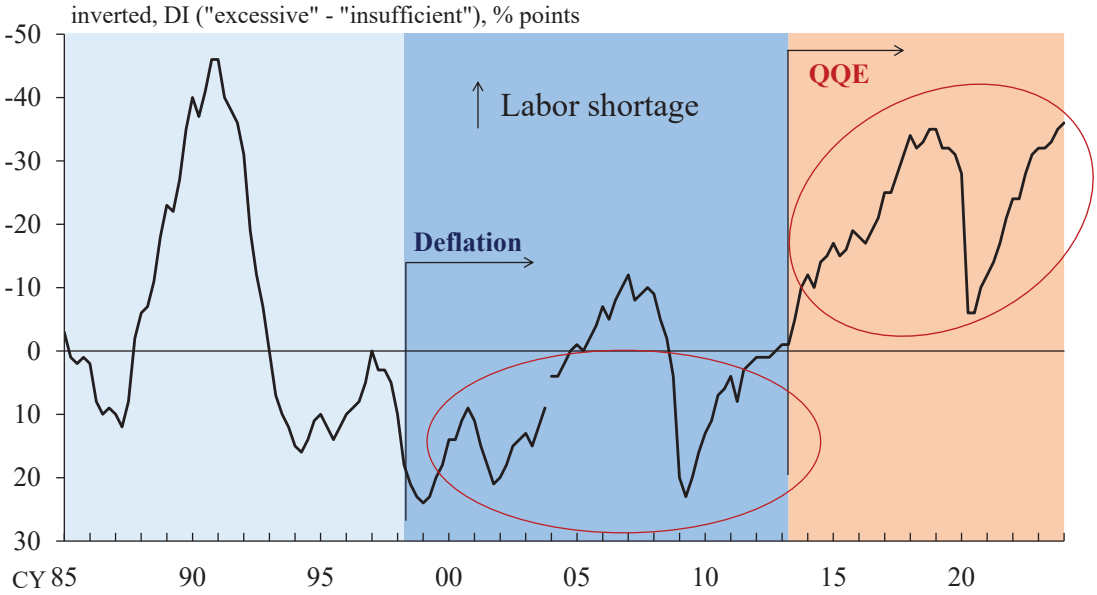
Note: Dependency ratio is the ratio of the population aged 65 and over to the total population. Figures from 2022 onward are estimates by the United Nations.  
Source: United Nations.

### Labor Force Participation of Seniors



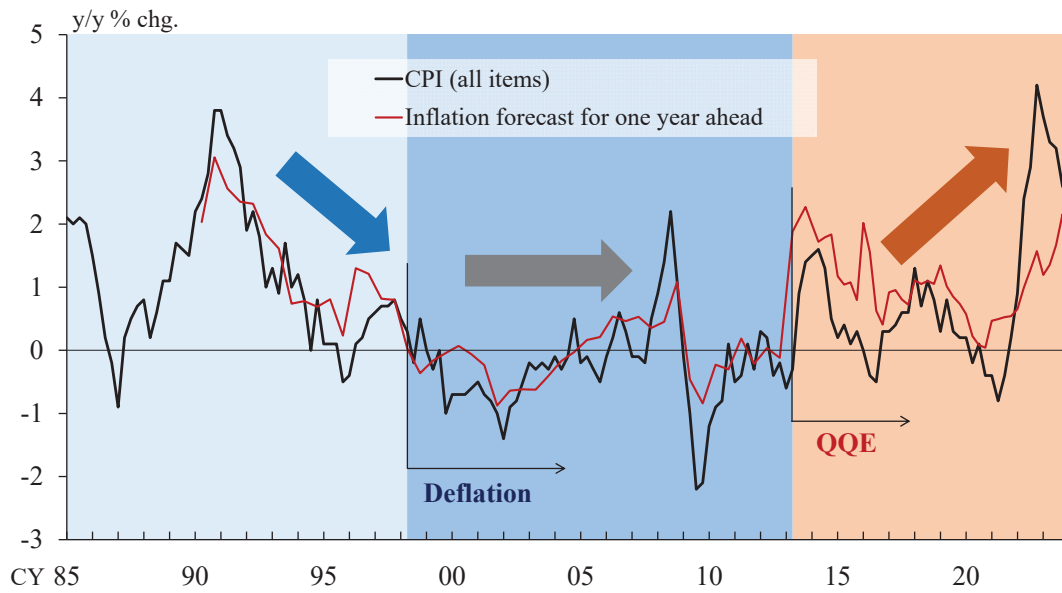
Source: Ministry of Internal Affairs and Communications.

### Employment Conditions felt by Companies



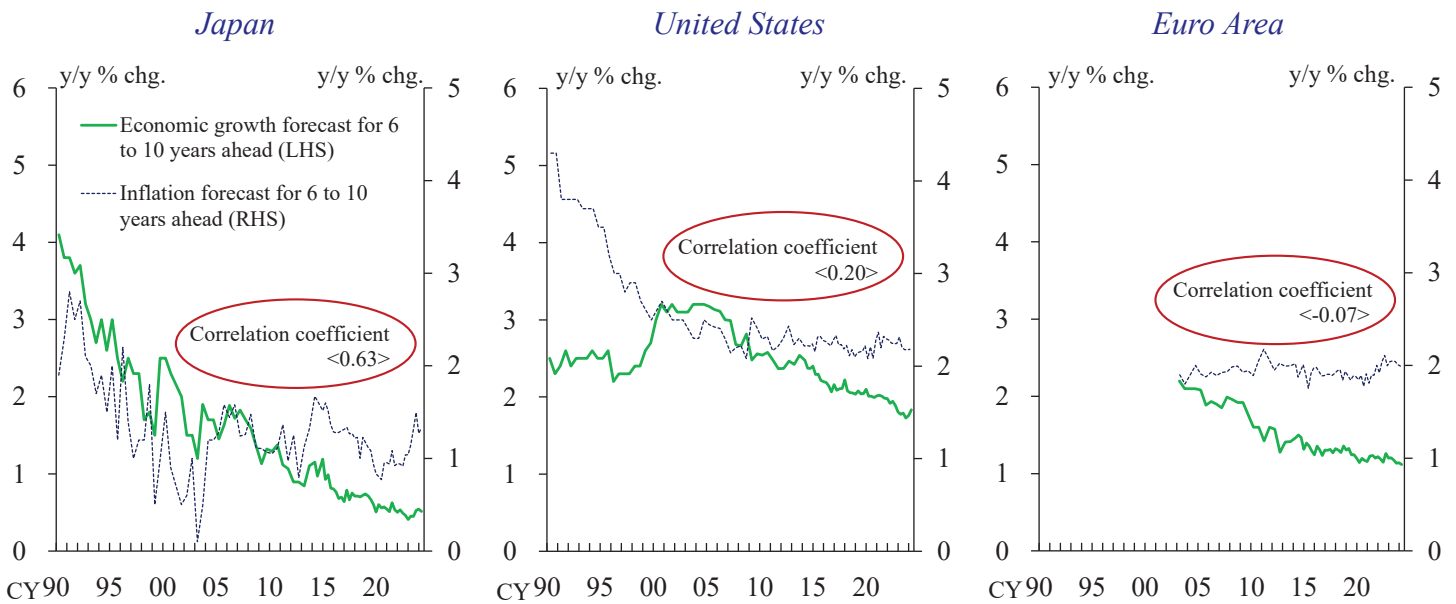
Note: Based on the Tankan. All enterprises and industries. There is a discontinuity in the data for December 2003 due to a change in the survey framework.  
Source: Bank of Japan.

### Actual and Expected Inflation Rates



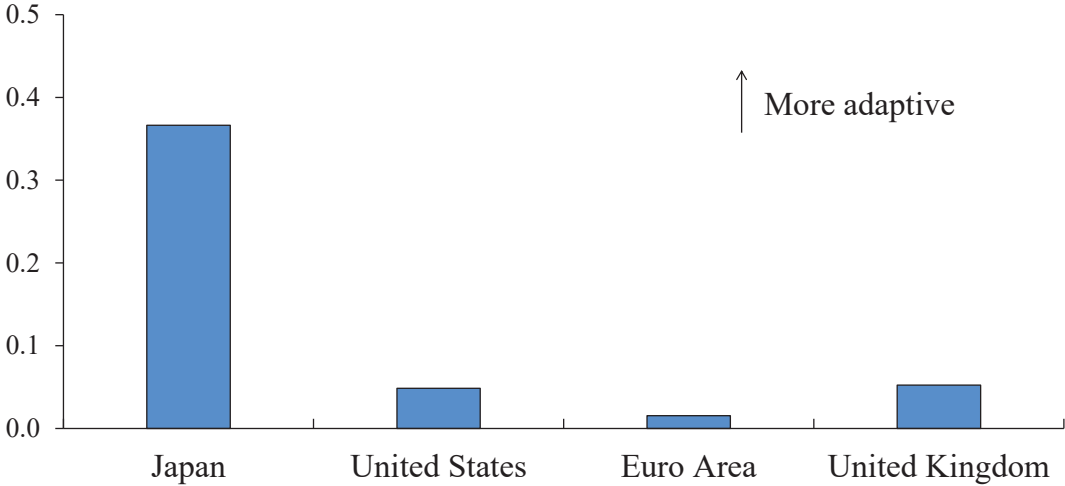
Note: "Consensus Forecasts" was conducted twice a year until 2013, three times a year in 2014, and four times a year from 2015 onward. The CPI figures are staff estimates and exclude the effects of the consumption tax hikes, policies concerning the provision of free education, and travel subsidy programs.  
 Sources: Ministry of Internal Affairs and Communications; Consensus Economics Inc., "Consensus Forecasts."

### Medium- to Long-Term Expected Growth Rates and Expected Inflation Rates



Note: "Consensus Forecasts" was conducted twice a year until 2013, three times a year in 2014, and four times a year from 2015 onward. Correlation coefficients are calculated using data for CY 1990-2024 for Japan and the United States and CY 2003-2024 for the euro area.  
 Source: Consensus Economics Inc., "Consensus Forecasts."

### Degree of Adaptiveness in Inflation Expectations

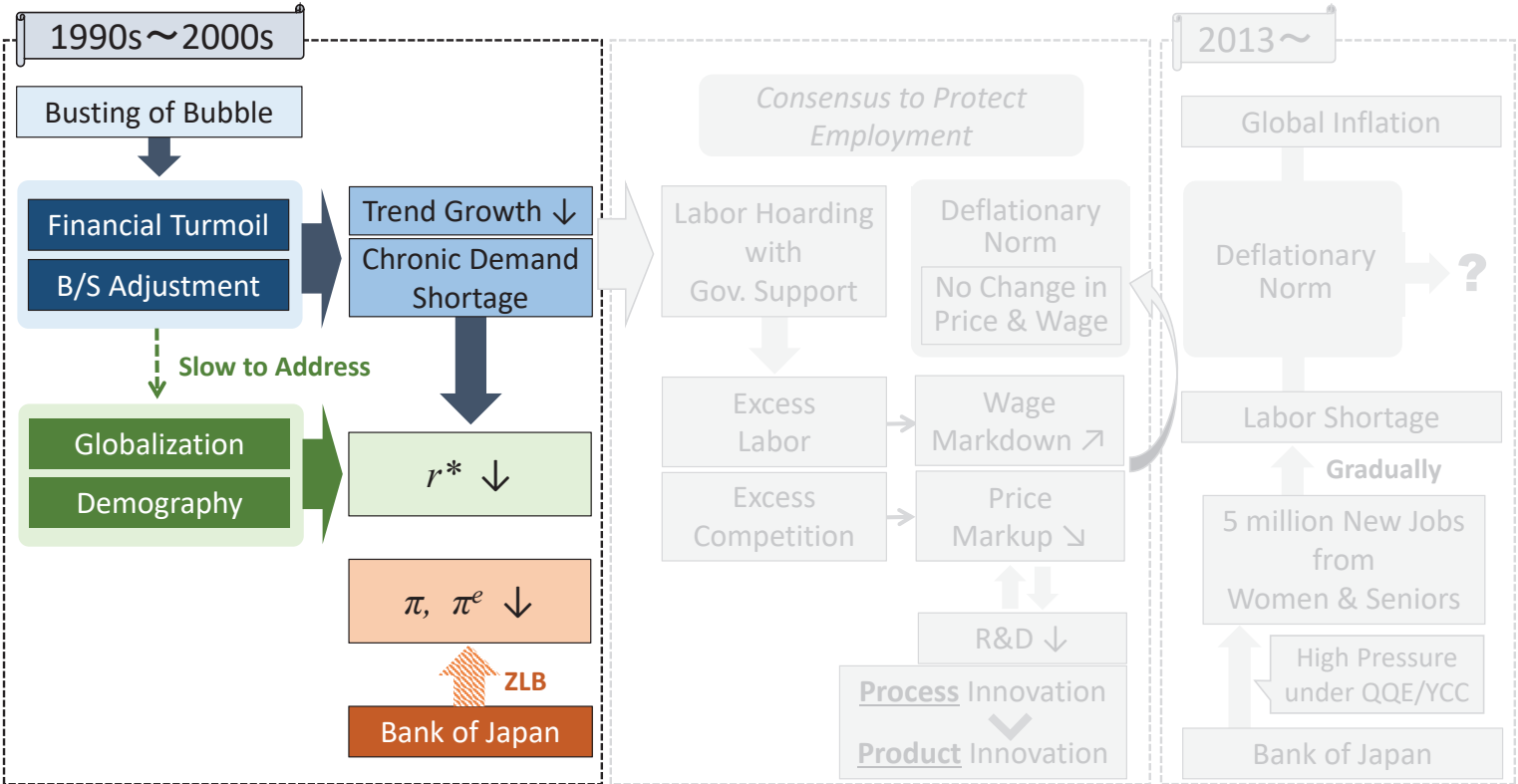


Notes: 1. This figures show the contribution of observed inflation to inflation expectations 6-10 years ahead using the following equation:  

$$\text{Inflation expectations 6-10 years ahead (\%)} = \theta \times \text{Observed headline inflation rate (lagged 1 quarter, \%)} + (1 - \theta) \times \text{Central bank price stability target (2\%)}$$
  
 2. The estimation periods are as follows: 2000/Q1-2024/Q1 for Japan and the United States; 2003/Q2-2024/Q1 for the euro area; and 2005/Q1-2024/Q1 for the United Kingdom.  
 Sources: Consensus Economics Inc., "Consensus Forecasts"; Ministry of Internal Affairs and Communications; Bureau of Labor Statistics; Eurostat; Office for National Statistics.

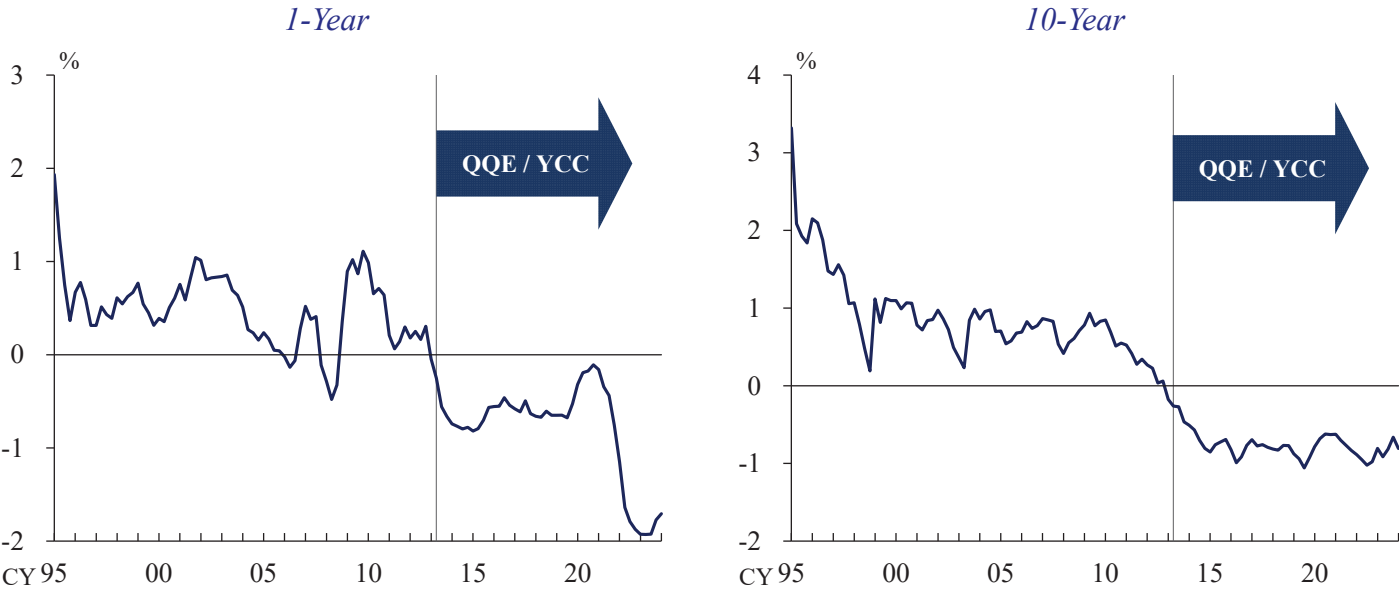
### Summary of This Story

Chart 11



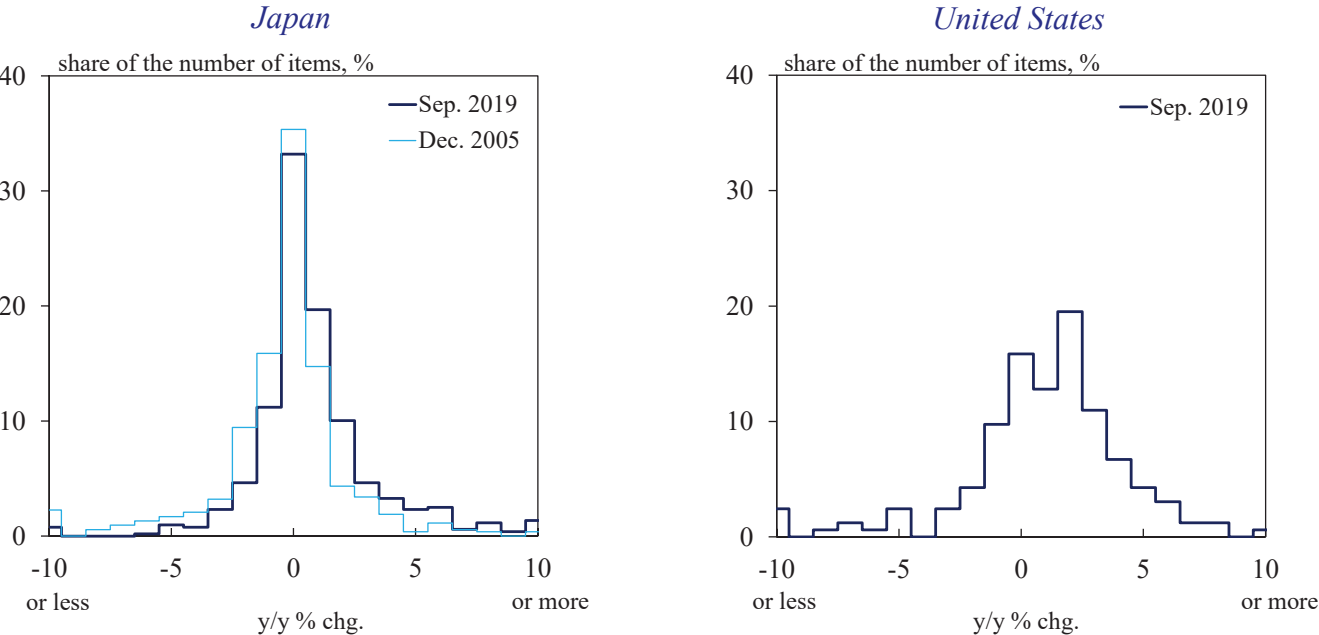


### Real Interest Rates



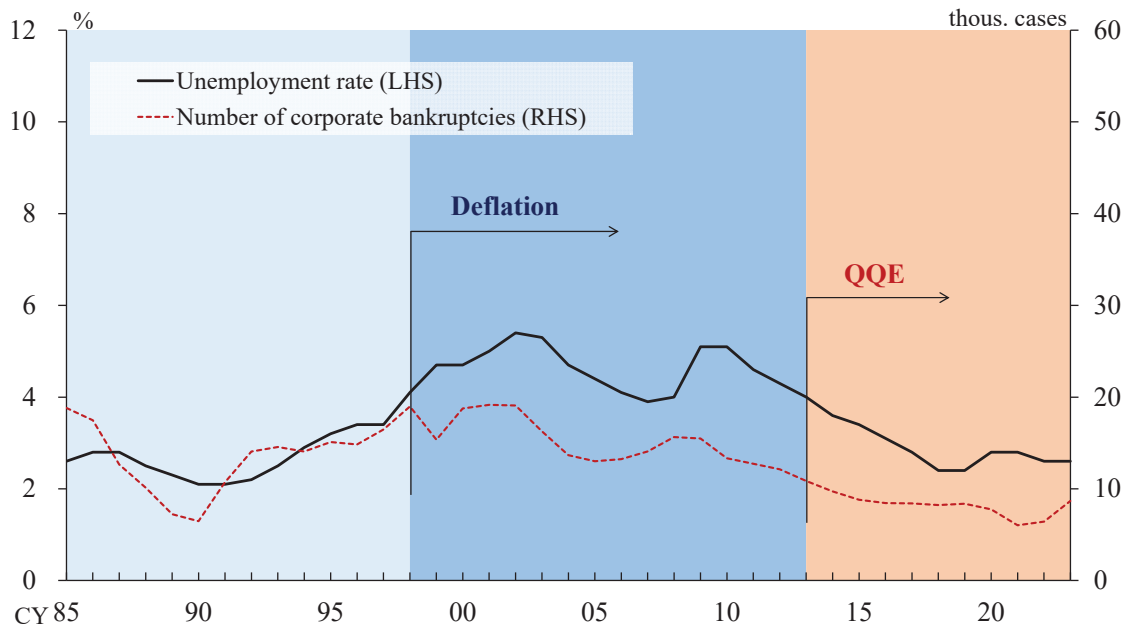
Note: Figures for real interest rates for each maturity are calculated as government bond yields minus the composite index of inflation expectations (staff estimates) for the corresponding maturity.  
Sources: Bank of Japan; QUICK, "QUICK Monthly Market Survey <Bonds>"; Consensus Economics Inc., "Consensus Forecasts"; Bloomberg.

### Price Change Distribution (CPI)



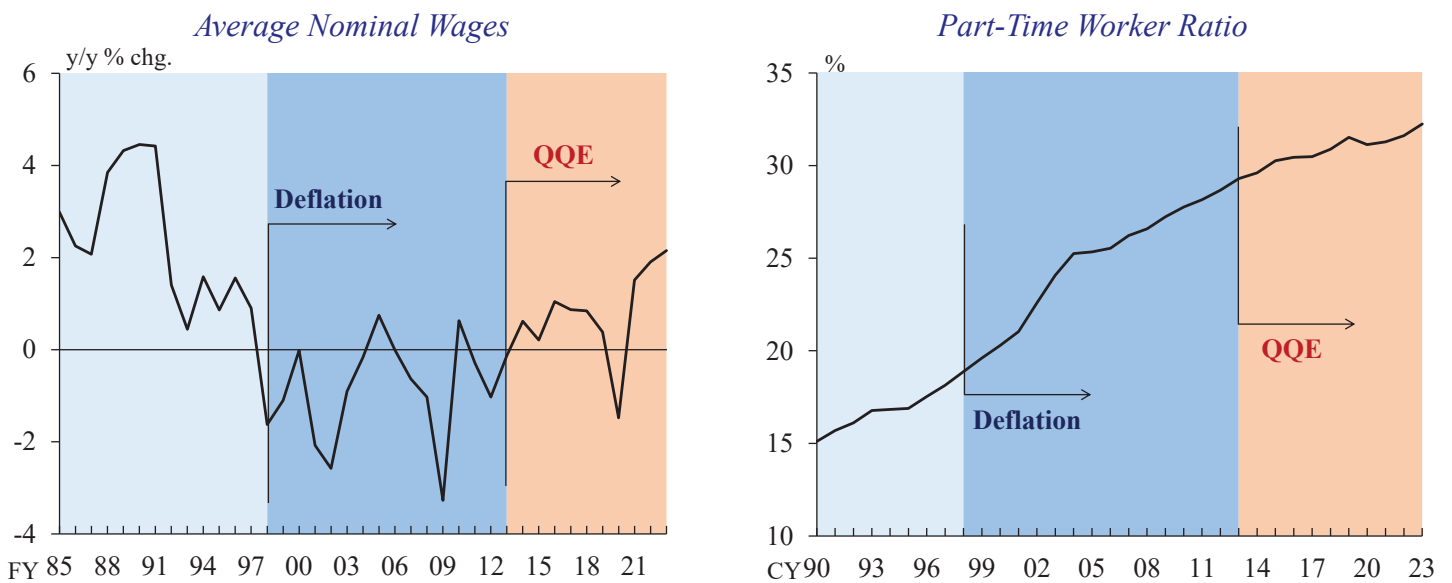
Note: Figures for Japan are for the CPI (less fresh food and energy). Those for the United States are for the CPI (less energy).  
Sources: Ministry of Internal Affairs and Communications; Bureau of Labor Statistics.

### Unemployment and Bankruptcy



Sources: Ministry of Internal Affairs and Communications; Tokyo Shoko Research, Ltd.

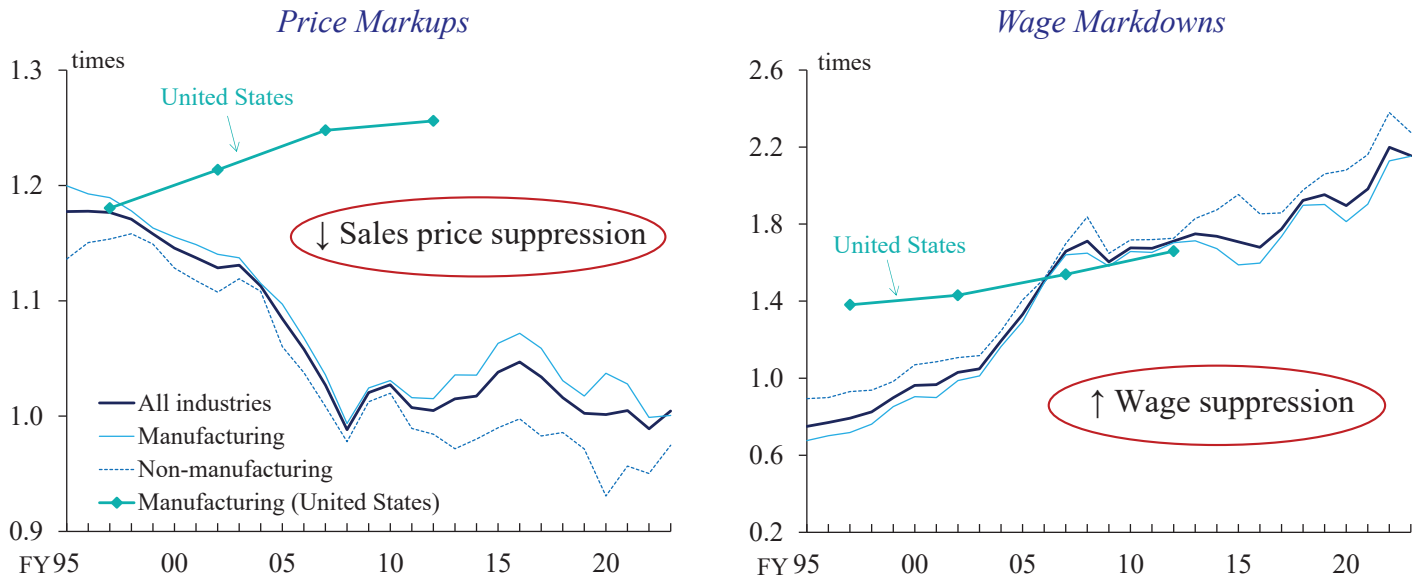
### Average Nominal Wages and Part-Time Worker Ratio



Note: In the left-hand chart, figures indicate total cash earnings (Monthly Labour Survey) for establishments with 30 or more employees until FY 1990 and those with 5 or more employees from FY 1991 onward. Those from FY 2016 onward are based on continuing observations following the sample revisions of the Monthly Labour Survey and the figure for FY 2023 is that from April 2023 to February 2024.

Source: Ministry of Health, Labour and Welfare.

## Price Markups and Wage Markdowns

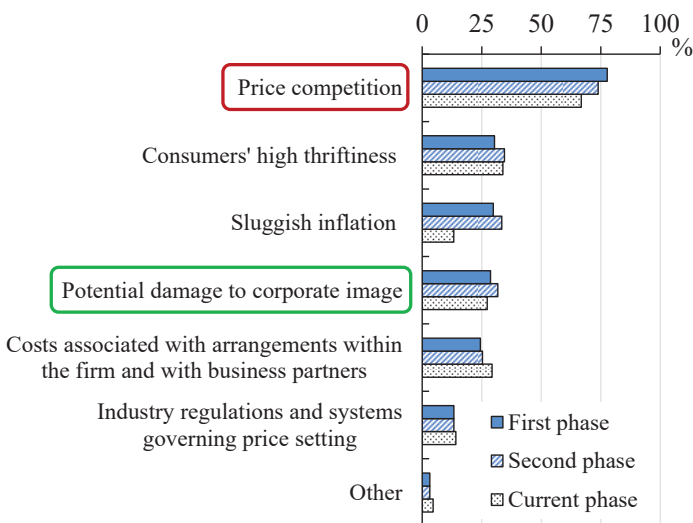


Note: Price markups and wage markdowns are estimated based on the method of Aoki, Hogen, and Takatomi [2023] using individual firm data from the Development Bank of Japan's "Corporate Financial Databank." Calculations for the U.S. manufacturing sector are based on the results of Yeh et al. [2022]. Figures for FY 2023 are from April to December 2023.

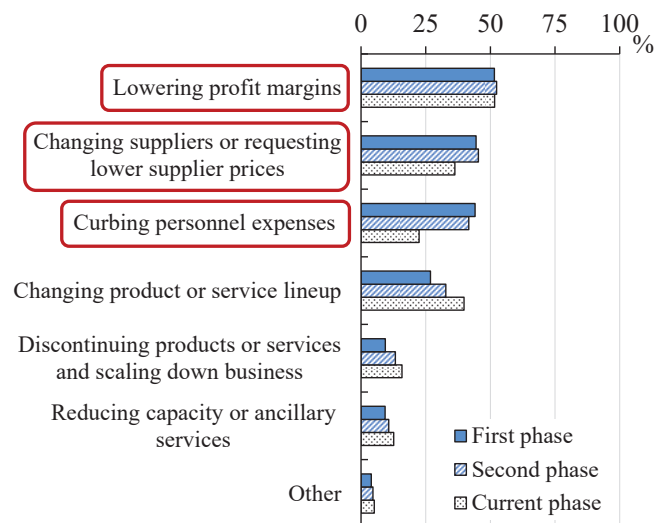
Sources: Cabinet Office; Development Bank of Japan; Ministry of Finance; Research Institute of Economy, Trade and Industry (RIETI); Yeh et al. [2022].

## Large-Scale Survey on the Corporate Sector (1)

### Reasons why raising prices was difficult



### Addressing cost increases



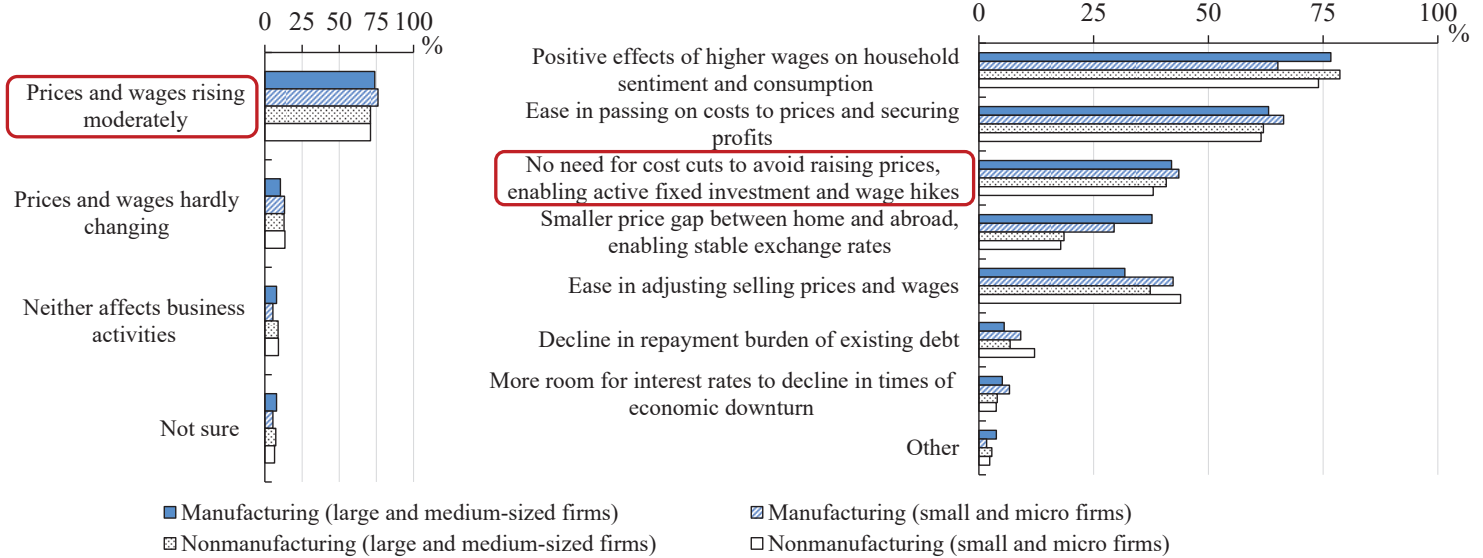
Note: Firms were asked to respond to the questions by dividing the past 25 years since the mid-1990s into three phases, which comprise (1) the "first" phase, defined as the period from the mid-1990s to the 2000s, (2) the "second" phase, defined as the 2010s, and (3) the "current" phase, defined as the period over the past one year.

Source: Bank of Japan.

## Large-Scale Survey on the Corporate Sector (2)

Preferable state of prices and wages for business activities

Reasons for preferring a moderate rise in prices and wages

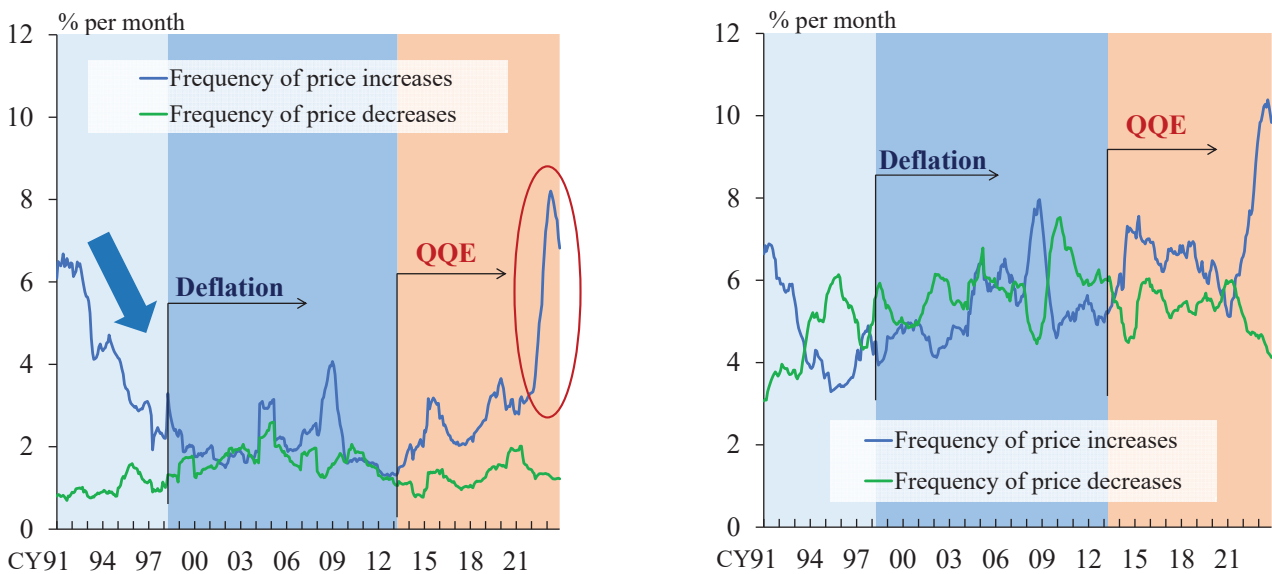


Note: In the right-hand chart, figures are the ratios among firms which responded "prices and wages rising moderately" as a preferable state in the left-hand chart.  
Source: Bank of Japan.

## Frequency of Price Changes

Services

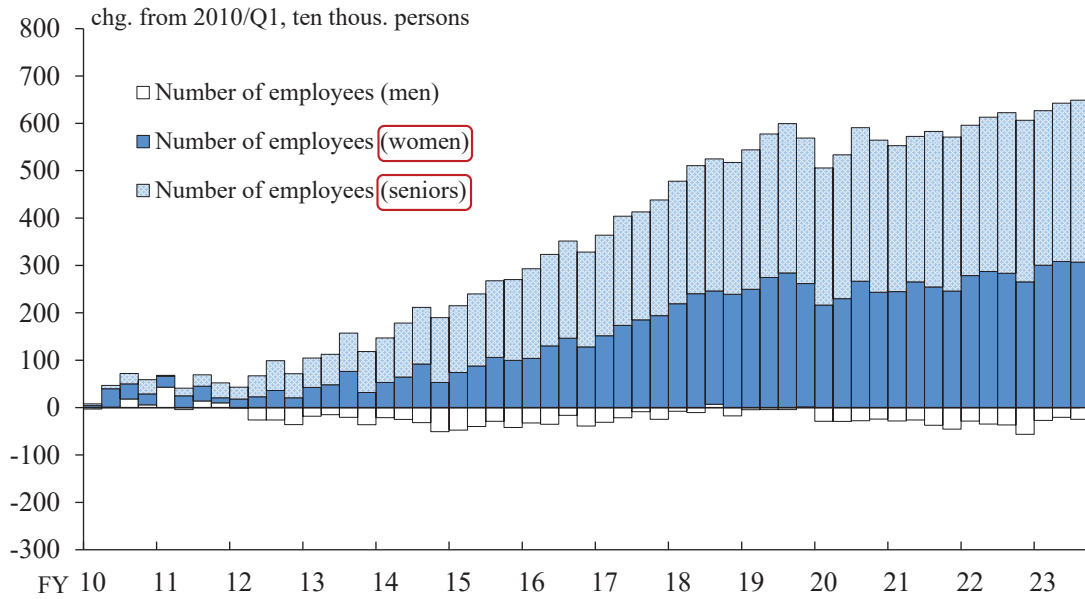
Goods



Note: Figures are the share of prices (based on the average for each item and city) that changed from the previous month (12-month backward moving average).  
Data excludes fresh food, electricity, manufactured and piped gas, water charges, housing rent, periods of consumption tax hikes, and temporary price changes mainly due to special sales.

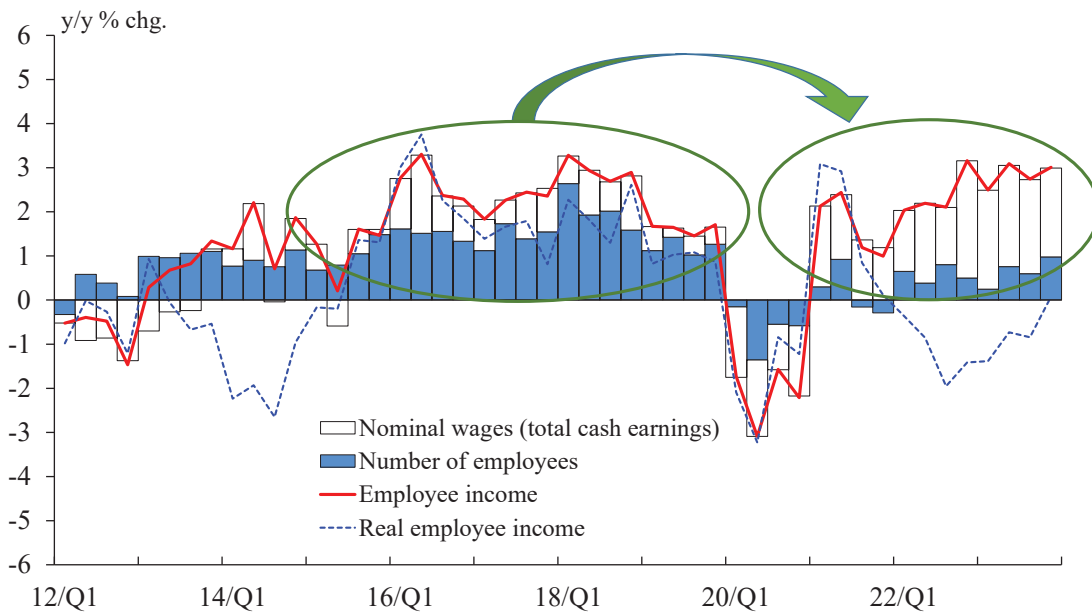
Source: Ministry of Internal Affairs and Communications.

### Labor Market since the Start of QQE (1)



Note: Figures for women and men are for employees aged between 15 and 64, while those for seniors are for employees aged 65 and over.  
 Source: Ministry of Internal Affairs and Communications.

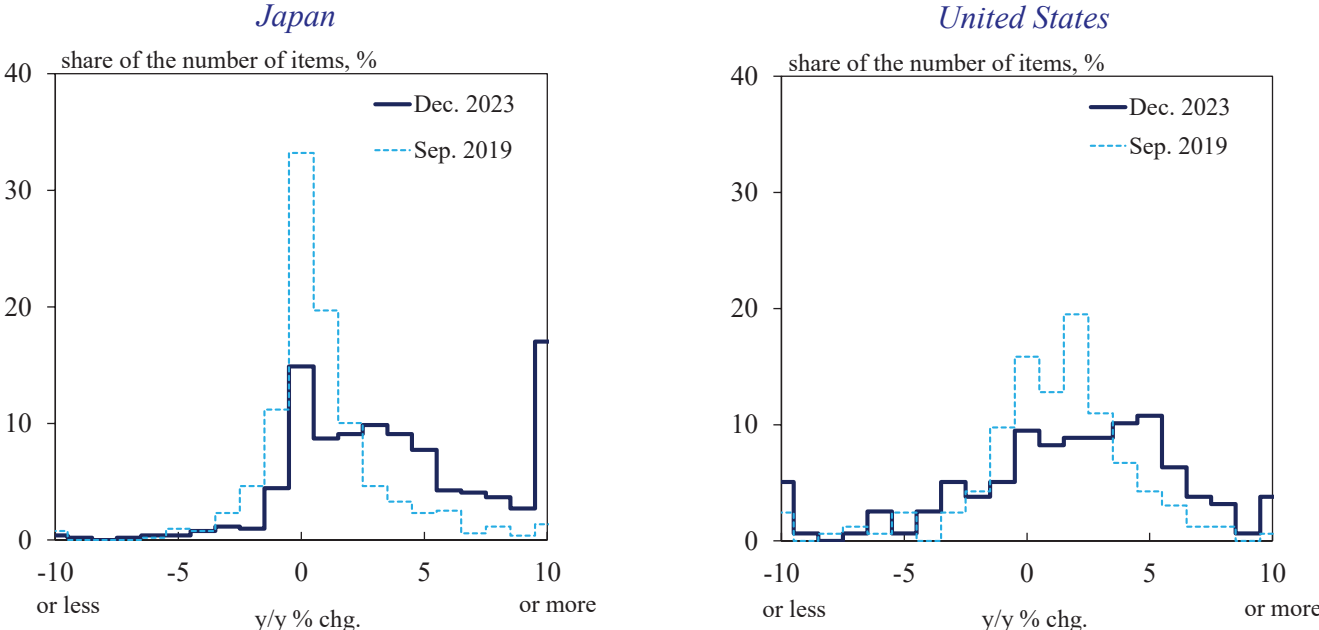
### Labor Market since the Start of QQE (2)



Note: In the chart, Q1 = March-May, Q2 = June-August, Q3 = September-November, Q4 = December-February. Employee income = Nominal wages (Monthly Labour Survey) × Number of employees (Labour Force Survey). Figures from 2016/Q1 onward are based on continuing observations following the sample revisions of the Monthly Labour Survey. Those for real employee income are based on staff calculations using the CPI (less imputed rent).

Sources: Ministry of Health, Labour and Welfare; Ministry of Internal Affairs and Communications.

Price Change Distribution (CPI)



Note: Figures for Japan are for the CPI (less fresh food and energy). Those for the United States are for the CPI (less energy).  
 Sources: Ministry of Internal Affairs and Communications; Bureau of Labor Statistics.

Summary of This Story: Overall View

