

January 23, 2013

Bank of Japan

**Background Note regarding the Bank's Thinking on Price Stability\***

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\* This note provides the background explanation of the Bank's thinking on "price stability" associated with "The 'Price Stability Target' under the Framework for the Conduct of Monetary Policy," decided at the Monetary Policy Meeting on January 21 and 22, 2013.

1. What is "price stability"?

"Price stability" forms the foundation for the nation's economy and the general public's living. The Bank of Japan conducts monetary policy, based on the principle that monetary policy shall be aimed at "achieving price stability, thereby contributing to the sound development of the national economy," as stipulated in the Bank of Japan Act. In light of this principle, "price stability" is defined conceptually as "a state where various economic agents including households and firms may make decisions regarding such economic activities as consumption and investments without being concerned about the fluctuations in the price levels of goods and services in general." "Price stability" that enables economic decision-making smoothly and is consistent with sustainable economic growth is not to realize a particular rate of inflation in the short run or temporarily. Rather it must be the one on a sustainable basis from somewhat a long-term perspective.

According to the *Opinion Survey on the General Public's Views and Behavior* that the Bank conducts quarterly, approximately 80 percent of the respondents -- irrespective of their sex, age, and occupation -- view the price rise as "rather unfavorable" consistently, implying that they are not looking for a situation where prices simply rise (Chart 1). The results of the survey suggest that "price stability" the general public is looking for corresponds with an environment where the economy improves in a balanced and sustainable manner, accompanied by increases in employment, wages, and corporate profits, consequently leading to moderate inflation.

2. Numerical definition of "price stability"

The basic indicator for the evaluation of price developments is a price index that comprehensively covers goods and services consumed by households and that the general public at large is accustomed to. To this end, the consumer price index (all items) continues to be important in light of its favorable attributes including timeliness.

When assessing the consumer price developments and extracting the underlying fluctuations, a variety of price indexes has to be monitored comprehensively. In the

long run, price indexes will show the same movements as the overall index; at each time point, however, they could move differently due to temporary factors.

In order to capture underlying changes in prices by eliminating temporary fluctuations, the consumer price index excluding fresh food and 10-percent trimmed mean show somewhat better performances than other indicators in terms of tracking the underlying trend of headline inflation and forecasting the future direction of headline inflation, and this conclusion remains intact with the data up to date (Chart 2).<sup>1,2</sup> Nonetheless, it is not sufficient to monitor only those indexes, but it is necessary to recognize the temporary and idiosyncratic factors and accurately identify the underlying trend of inflation.

As such, the consumer price index excluding fresh food or 10-percent trimmed mean is effective in terms of capturing the underlying trend of inflation in Japan. It should be noted that the effects of idiosyncratic disturbances on prices can be different among countries, depending on economic conditions and the method of composing price index statistics. In the United States, energy-related prices tend to show more fluctuations than those in Japan, and therefore it has been standard to use the index excluding not only food but also energy (i.e., "core CPI") as an indicator for capturing the underlying inflation.

In expressing "price stability" in a numerical value of an actual price index, the review was conducted, based on three perspectives, as was in the past: (1) the measurement bias in the price index; (2) the safety margin that acts as a buffer against the risk of a vicious cycle of declining prices and deteriorating economic activity; and (3) the general public's perception of price developments under which households and firms perceive price stability.

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<sup>1</sup> The 10-percent trimmed mean is obtained by systematically discarding a 10 percentage of the highest and lowest marks of the price fluctuation distribution by items and taking the weighted averages of those items.

<sup>2</sup> See "Core Indicators of Japan's Consumer Price Index," Bank of Japan Review Series 2006-E-7, November 2006. Updating the empirical analysis in this *Review*, based on the recent data, the main conclusion did not change materially; the CPI excluding fresh food and the 10-percent trimmed mean show better performance than other indicators in terms of tracking the underlying trend of inflation and forecasting the future direction of headline inflation.

As for the first perspective (i.e., the measurement bias), the consumer price index in Japan has been compiled, based on the fixed-weighted Laspeyres formula, which implicitly assumes that a consumption basket of goods and services in the base year is fixed for 5 years. It has been pointed out that the rate of inflation measured by the CPI has an upward bias, because (1) it does not reflect the tendency to increase the weight of cheaper goods and services in the whole consumption basket on a real-time basis (the weight effect) and (2) with regard to durable goods whose prices usually tend to decline substantially, their negative contribution to the year-on-year rate of change in the total CPI is likely underestimated as the absolute level of index for those goods shrinks distant from the base year (the reset effect).<sup>3</sup> On this point, the chain-weighted index, released separately as reference, is regarded as being away from such an upward bias. By subtracting the year-on-year rate of change of the chain-weighted index from that of the fixed-weighted index and looking at the movements in the bias, it tends to expand as time passes from the base year; on average, however, one can be assured that there is no significant bias quantitatively (Chart 3). Moreover, in addition to the upward bias, it has been pointed out that there is also a possibility of a downward bias in recent years, due to the fact that survey respondents are mainly large-scale stores and quality adjustment is not done in housing rents.<sup>4</sup> On the whole, the extent to which the measurement bias inherent in price index has to be taken into consideration in the numerical expression of price stability appears to be small.

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<sup>3</sup> This is called the "reset effect," because the bias is corrected by "resetting" the index of individual items equal to 100 in the new base year.

<sup>4</sup> The following three factors, for example, have been pointed out that would generate the downward bias in the CPI. First, the respondents are selected according to the criteria of their sales volumes or numbers of employees. It has recently been said that the price competition has been severe in the large-scale stores and the sales in such stores have been somewhat weak. Thus, when compiling statistics, price index is possibly somewhat weaker. Second, quality adjustment in terms of aging deterioration has not been incorporated in housing rents, which generates the downward bias. The weight of housing rents in the CPI (all items excluding fresh food) is small (i.e., 2.8 percent), but this applies to imputed rents as well, whose weight is 16.2 percent. On the whole, this effect is regarded as non-negligible. Third, with respect to the hedonic regression method -- an econometric method that captures quality improvement as price declines by estimating regression analysis of the relationship between price and quality -- applied to some durable consumption goods, in a situation where the quality improvement in, for example, personal computers cannot be fully appreciated by all the users, quality adjustment may be excessive, possibly generating the downward bias in the index.

As for the second perspective (i.e., the safety margin), given the zero lower bound on the nominal interest rate, accommodating slight inflation and maintaining somewhat higher nominal interest rate accordingly may be appropriate in order to ensure room for monetary policy to respond to negative economic shocks. On this point, it should be noted that real GDP growth rate per capita in Japan has been falling much faster than major overseas economies due to the effect of rapid aging. In other words, the fact that real GDP growth rate per capita is declining for a structural reason implies the real interest rate in the medium to long term -- the natural rate of interest -- is on a decline as well. Therefore, in order to ensure somewhat higher nominal interest rate, by allowing the safety margin, it is deemed appropriate to accommodate somewhat a positive inflation rate on a sustainable basis and a positive expected inflation rate, as well as to make the natural rate of interest higher by strengthening growth potential.

As for the third perspective (i.e., the general public's perception of price developments), even during those years before 1998 when consumer prices started to decline moderately, the inflation rate in Japan has been lower than those in major economies overseas. Comparing the year-on-year increases in the CPI with the United States and European economies, that of Japan has been consistently lower than those of other economies where the CPI inflation rate has been around 2-3 percent (Chart 4). As such, the inflation rate at which households and firms perceive price stability is regarded to be lower than those in major economies overseas, and it is highly likely that the decision-making for investment and consumption has inherently been done, based on such low inflation rates that have lasted for a number of years.

The result of the review based on the above-mentioned three perspectives has not changed materially from those in the past. Replacing the "price stability goal in the medium to long term" with the "price stability target," and setting that target at 2 percent in terms of the year-on-year rate of change in the CPI are based on the following recognition.

The Bank recognizes that the inflation rate consistent with price stability on a sustainable basis will rise as efforts by a wide range of entities toward strengthening competitiveness and growth potential of Japan's economy make progress. In this regard, the Government has shown its intention to promote measures such as carrying

out bold regulatory and institutional reforms strongly for strengthening competitiveness and growth potential of Japan's economy. Today's expected rate of inflation has been shaped over the years. As the strengthening of growth potential makes progress going forward, the actual rate of inflation would gradually rise and accordingly the expected inflation rate of households and firms is likely to rise as well. Going forward, as prices are expected to rise moderately, it is judged appropriate to clearly indicate the target of 2 percent in order to avoid excessive rise and fall of expected rate of inflation (the anchoring effect), thereby anchoring the sustainable rate of inflation.

Switching from a "goal" to a "target" reflects an increasing awareness regarding the importance of flexibility in the conduct of monetary policy in Japan. The effects of monetary policy permeating economic activity and thereafter prices require a considerable and variable time lag. The conduct of monetary policy has to be flexible by examining various risk factors, including those related to financial imbalances, in addition to the assessment of current developments and outlook for economic activity and prices, from the perspective of achieving sustainable growth with price stability. In other words, it is not appropriate to run monetary policy mechanically aiming to achieve a certain inflation rate within a certain period of time in order to achieve sustainable growth with price stability. For example, if monetary policy attempts to address, in the short run, the supply shock stemming from fluctuations in oil prices, economic activity may largely be curtailed and it will become more difficult to achieve price stability from a long-term perspective. Moreover, reflecting the recent experiences at home and abroad, many credit bubbles emerged under the recognition that prices were stable on a real-time basis, but they created large fluctuations in economic activity and prices after the bursting of the bubbles.

Understanding the importance of flexibility in the conduct of monetary policy has been widely shared around the globe; particularly, in the aftermath of the global financial crisis, major economies of the world have come to emphasize flexibility in the conduct of monetary policy -- by, for example, publicly articulating the importance of paying due attention to financial system stability (Chart 5). Over the last year, there has been an increasing awareness of such understanding in Japan as well. In these circumstances, it is judged transparent and appropriate to use the expression, "target,"

in order to explain the Bank's thinking on price stability.

### 3. The micro features behind the fluctuations in consumer prices in Japan

This section discusses the micro features behind the fluctuations in consumer prices in Japan after the previous section examined the numerical definition of price stability mainly from the macro viewpoint.

Looking at the distribution of changes in the CPI by item, the first is that the mode is slightly positive, but significant declines in durable goods prices push down the average of overall consumer prices (Chart 6). Such tendency can also be seen in overseas including the United States, but the decline in durable goods' prices -- specifically for such items as digital home appliances including television and personal computers -- is particularly pronounced in Japan. Taking into account that about the same products are sold in Japan and the United States for these durable items, the difference in the declining pace of durable goods between the two countries is likely due to different statistical compilation methods (i.e., sampling method of survey items and quality adjustment method) and the difference in the competitive environment in the retail sectors.

Second, the difference in the rate of increase in the CPI between Japan and the United States since mid-1990s is 2.6 percent on average. Among all, housing rents and services (excluding housing rents) contribute to 0.8 percentage point and 0.9 percentage point respectively for the difference, and the service sector as a whole contributes to 1.7 percentage point (about 65 percent in terms of contribution rate). Behind the gap in the rates of increase in services prices between Japan and the United States, Japanese firms, as discussed later, tend to adjust wages rather than lay off employees when faced with the decline in demand and as a result of this, prices in the labor-intensive service sector in Japan are likely to decline than in the United States (Chart 7).

Durable goods prices are expected to decline due to technological innovation going forward and for the purpose of composing price index, improvement in their functioning and qualities will be treated as declining prices. Owing to such

development, prices of durable goods are expected to continue declining at a corresponding pace even as strengthening growth potential of Japan's economy makes progress. Thus, in an environment where the year-on-year rate of change in the CPI reaches 2 percent, it is highly likely that prices of non-durable goods and services -- including public utilities such as medical care and education, and housing rents -- are likely to rise at a pace above 2 percent.

4. The mechanism behind rising inflation rate under the zero lower bound on nominal interest rates

The inflation rate is basically determined by the following three factors.

- (1) Aggregate demand and supply balance: From a somewhat long-term perspective, there is a mild positive correlation between the rates of increase in the CPI and the aggregate demand and supply balance (Chart 8). If the aggregate demand of the economy as a whole increases relative to its production capacity and, therefore, the balance between aggregate demand and supply improves, the rate of increase in the CPI will rise with a time lag of several quarters. For that purpose, in order to raise inflation rates, it is necessary to improve the economy ahead. When import prices rise, inflation rates could go up ahead. Such inflation is not accompanied by economic improvement because the terms of trade will deteriorate and real income of households and firms will fall.
- (2) Inflation expectations: Inflation expectations will influence the actual inflation rates through wage and price-setting behavior. Firms and households are likely to take account of future price fluctuations and determine their output prices and wages accordingly. Economic decision making of firms and households will largely be based on medium- to long-term inflation expectations rather than short-term expectations.
- (3) Import prices: Rise and fall in import prices will affect consumer prices directly and fluctuations in materials goods prices -- such as the oil shock -- will ultimately influence consumer goods prices through changes in costs.



There are both cyclical and structural factors behind moderate declining prices in Japan's economy (Chart 8). As for the cyclical factor, deterioration in economic activity in the aftermath of the Lehman shock was significantly large, and it will still take some time before the aggregate demand and supply balance is restored. The aggregate demand and supply balance, which reached nearly -8 percent after the Lehman shock, has narrowed to about -2 to -3 percent recently; however, the momentum to raise prices has not been strong enough.

In addition to such cyclical factor behind moderate price declines in Japan's economy, there is a structural factor -- namely chronic shortage of demand. Since mid-1990s, Japan's economy has faced the underlying shortage of aggregate demand and the CPI (all items less fresh food) has been on a moderate declining trend since the latter half of 1990s, with the exception of 2007 and 2008. Meanwhile, the aggregate demand and supply balance in the United States before the financial crisis registered around 0 percent on average, while showing cyclical fluctuations, as the economy grew consistently at the pace of 3 percent (Chart 9). There lie structural factors (i.e., a decline in trend growth) behind the failure of Japan's economy getting out of the underlying shortage of aggregate demand, notwithstanding a number of aggressive fiscal and monetary policy measures. To be specific, after the bursting of the bubbles in early-1990s, the balance-sheet adjustment took time to overcome. In addition, the environment surrounding Japan's economy changed dramatically, such as the rapid progress of aging and globalization; nevertheless, the reallocation of labor and capital between industries and enterprises did not proceed smoothly and the response to such changes in its economic structure was delayed. Consequently, the economic growth rate declined as a trend and firms' and households' growth expectations in the medium to long term showed a trend decline as well (Chart 10).

The decline in growth expectations has fostered a situation where firms make efforts to survive by cutting costs and lowering prices, coupled with the economic structure where new projects and firms are unlikely to replace unprofitable economic activity. Under such circumstances, Japanese firms have given priority to maintaining employment as much as possible and made efforts to cut costs mainly by reducing wages. As a result, while the rise in unemployment rate in Japan has been subdued,

compared with the United States, wages, whose downward rigidity appeared prevalent in the past, have faced chronic downward pressure since end-1990s. This has become a factor behind a moderate decline in prices, particularly in the labor-intensive service sector (Chart 11). Moreover, the pricing power of Japanese firms has declined since mid-1990s and firms have started to face severe price competition, as exemplified in the gap between output price DI and input price DI of the *Tankan* survey (Chart 12).<sup>5</sup>

Since the 1990s, a substantial decline in potential growth per capita against the background of declining number of working-age population in the aging society has exerted downward pressure on the medium- to long-term expected inflation rates, through the weakening of the general public's growth expectation. In major economies overseas, there is no correlation between the potential growth rate per capita and the medium- to long-term inflation expectations (Chart 13). This suggests that the aging population is not a direct cause of moderate price declines in Japan; rather, delay in the transformation of economic structure in response to the population aging and firms' behavioral tendency to reduce wages and engage in price competition in response to the decline in economic growth have been likely to cause moderate price declines.

Based on the above recognition, in order to overcome deflation in Japan under the constraints of the zero lower-bound on nominal policy interest rates, it is vital to improve the aggregate demand and supply balance by strengthening growth potential, along with the support from the financial side. In terms of providing the support from the financial side, the Bank has increased substantially the total size of the Asset Purchase Program -- far larger than what was envisaged at the time of the introduction, and under this program, it has been purchasing a variety of financial assets steadily. At the Monetary Policy Meeting held in January 2013, the Bank decided to introduce a method of purchasing a certain amount of financial assets every month without setting

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<sup>5</sup> Output price DI and input price DI are calculated by subtracting the percentage share of enterprises responding "Fall" from the percentage share of enterprises responding "Rise." The fact that output price DI has consistently been lower than input price DI suggests that it has been the case where firms have not been able to pass the rise in input prices on output prices -- or alternatively firms are forced to reduce output prices more than the decline in input prices -- due to declining pricing power of firms. Such a decline in firms' pricing power since mid-1990s is also supported by a number of empirical analyses.

any termination date after completing the current purchasing method.

The transmission mechanism of such accommodative monetary policy can be divided into two stages: the first stage is to create the accommodative financial environment where firms and households can raise sufficient funds at low costs as a result of monetary easing; and the second stage is to allow firms and households to take advantage of the accommodative financial conditions and increase their investment and spending, leading to the improvement of the aggregate demand and supply balance and prices. As for the first stage, the effect of aggressive monetary easing has thoroughly permeated the financial environment, and extremely accommodative financial conditions have been achieved both in terms of interest rates and the availability of funds (Charts 14 and 15). Comparing the amount of funds provided by the Bank of Japan with other economies from the perspective of quantities, Japan is largest in terms of the monetary base (i.e., the sum of banknotes in circulation and current account balances at the Bank) relative to nominal GDP and the broadly-defined money stock relative to nominal GDP (Chart 16). As for the second stage, if the accommodative financial conditions are made active use of, the effect of monetary easing will surely be seen in economic activity and prices. It is for this reason that the key to the overcoming of deflation is that the efforts by a wide range of entities to strengthen growth potential make progress and accommodative financial conditions will be made fully use of. From this perspective, the Bank has been making its utmost support by expanding the Growth-Supporting Funding Facility and introducing the Stimulating Bank Lending Facility, in December 2012, which provides unlimited funds to financial institutions at their request with a view to promoting their aggressive action and helping increase proactive credit demand of firms and households.

## 5. Importance of strengthening growth potential

It is hardly possible to change the demographic changes (i.e., the aging population) in the short term. Thus in order to strengthen growth potential, the first important thing is to foster an environment where the labor participation by the elderly and women can be increased. The second thing is to build an economic system where innovation in a broad sense -- including the development of new business models -- can be realized

more easily in order to raise the value added per worker. By accelerating efforts on these fronts, if firms' core business strategy can be changed from the price competition to the competition generating new goods and services, accompanied by increases in the number of labor-force and household income, the medium- to long-term growth expectation of firms and households will rise in the midst of rigorous economic activity, eventually leading to the wider use of accommodative financial conditions.

On this point, the role of the Government is crucial in terms of strengthening competitiveness and growth potential. To be specific, the strengthening of competitiveness and growth potential will be made possible by the accumulating efforts on the part of firms and financial institutions to create and expand new businesses. To this end, the Government plays a pivotal role to foster an environment where the private sector is encouraged to take on the challenges by carrying out regulatory and institutional reforms.

At the same time, it is important for the Government to ensure the confidence of financial markets toward fiscal consolidation in the medium to long term. In Japan, the government debt-to-GDP ratio is the highest among leading economies and the pressure to increase fiscal expenditure -- particularly that related to social security-related spending -- is expected to mount against the background of rapid progress in aging (Chart 17). Under such circumstances, if the market confidence toward fiscal management were eroded, long-term yields would likely rise, giving substantially negative effects on the funding cost of firms and the management of financial institutions with a large amount of JGB holdings. In this case, the effect of monetary easing will be largely curtailed (Chart 18). Moreover, if the expected rate of inflation by market participants rises without improvement in economic activity, long-term yields alone will go up before the actual prices and wages start to rise, possibly having negative impact on fiscal balances through an increase in interest payment. Close attention should be paid to such developments (Chart 19). In addition, strengthening the general public's confidence on the sustainability of fiscal management including the future prospects of social security system will underpin private demand through alleviating the general public's concern about the future.