Developments in the Natural Rate of Interest and the Assessment of the Degree of Monetary Accommodation

Monetary Affairs Department

March 2026

The natural rate of interest is defined as the level of the real interest rate that is neutral to economic activity and prices, and it is an important concept in the conduct of monetary policy. Following the recent revision of the GDP benchmark, the Bank of Japan has re-estimated the natural rate of interest using the latest data. As before, the estimates display considerable dispersion. Given such uncertainty in the estimation, when assessing the degree of monetary accommodation, the Bank -- similarly to the approach taken by central banks in the United States and Europe -- needs to make a comprehensive judgment. This involves not only looking at the relationship between the real interest rate and the natural rate of interest but also carefully examining economic activity, prices, and financial developments. In doing so, it is critical to examine a wide range of indicators related to financial conditions, which can be considered to serve as a transmission channel of monetary policy to the real economy. These include funding costs, the availability of funds, asset prices, and funding volumes.

Introduction

The natural rate of interest is defined as the level of the real interest rate that is neutral to economic activity and prices in the sense that it is neither accommodative nor restrictive, and it is an important concept in the conduct of monetary policy. In standard macroeconomic theory, it is also referred to as the equilibrium real interest rate, and is defined as the level of the real interest rate that balances saving and investment under full employment and stabilizes the inflation rate. Central banks influence real interest rates by controlling nominal interest rates. When assessing the stance of monetary policy, therefore, examining the relationship between the real interest rate and the natural rate of interest is regarded as providing a basis for determining whether financial conditions are accommodative or restrictive (Chart 1).[1]

However, since developments in the natural rate of interest cannot be observed directly, the rate needs to be estimated using certain methodologies. As central banks in the United States and Europe have also noted, estimating the natural rate involves substantial uncertainty, making it difficult to pin down the rate's level in advance. Estimates thus need to be viewed with considerable latitude.

Given these considerations, when the Bank of Japan assesses the degree of monetary accommodation, it faces the need to make a comprehensive judgment.

[Chart 1] Overview of the Relationship between the Real Interest Rate and the Natural Rate of Interest
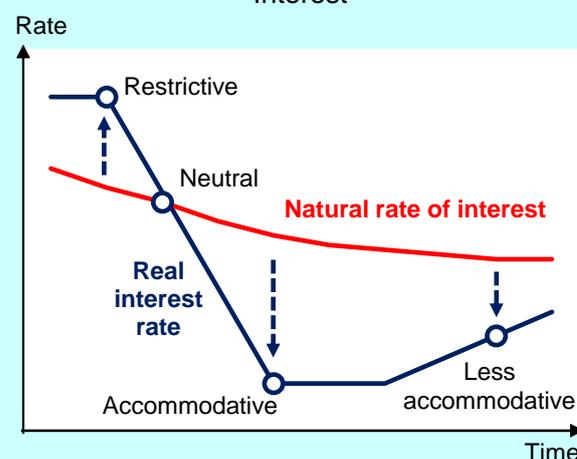
Source: Bank of Japan.

This involves not only looking at the relationship between the real interest rate and the natural rate but also carefully examining economic activity, prices, and financial developments.
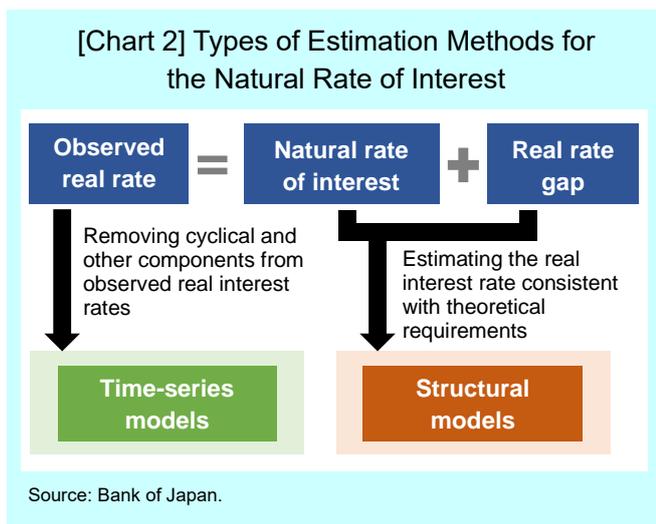
Against this backdrop, this paper first provides updated estimates of Japan's natural rate of interest using the latest data, while reiterating that these estimates are subject to considerable uncertainty. It then reviews how the natural rate is incorporated into the conduct of monetary policy in the United States and Europe and outlines the frameworks central banks in

these economies use to evaluate the stance of monetary policy. Finally, the paper summarizes the metrics the Bank uses to assess financial conditions as it gradually adjusts the degree of monetary accommodation.

Developments in the Natural Rate of Interest

Estimation methodologies: categorization and characteristics

As noted, because developments in the natural rate of interest cannot be observed directly, it needs to be estimated on the basis of certain assumptions. Following the existing literature, estimation methods for the natural rate of interest can be broadly grouped into two categories: time-series models and structural models. [2] The following briefly outlines the characteristics of each estimation method, as summarized in Chart 2.

[Chart 2] Types of Estimation Methods for the Natural Rate of Interest

Observed real rate = Natural rate of interest + Real rate gap

Removing cyclical and other components from observed real interest rates → Time-series models

Estimating the real interest rate consistent with theoretical requirements → Structural models

Source: Bank of Japan.

Time-series models extract the trend component from time-series data on observed real interest rate and treat this as the natural rate. This approach is based on the assumption that real interest rates fluctuate around the natural rate over the medium to long term, as financial conditions alternate between accommodation and tightening. The advantage of this approach is that it maximizes the use of real interest rate data and avoids issues related to model specification -- discussed later -- since it does not rely on strong assumptions regarding economic structure. On the other hand, the approach entails several disadvantages: (1) the results are highly sensitive to the specific filtering techniques used to extract the trend component, (2) they are heavily influenced by actual movements in real interest rates, and (3) they lack a robust grounding in economic theory.

Structural models estimate the natural rate of interest as the real interest rate that is consistent with theoretical requirements regarding the relationships between economic variables. The method employed can be categorized into two estimation approaches, depending on the extent to which the economic structure is explicitly modeled theoretically. The first approach uses typical macroeconomic relationships like the IS curve and the Phillips curve as analytical premises, and then estimates the natural rate as the interest rate that would bring the output gap to zero. This approach has the advantage of enabling fluctuations in the natural rate to be more readily interpreted in relation to developments in the real economy, such as in the output gap. On the other hand, since the estimates depend heavily on how the model is specified, accurate estimation becomes difficult when (1) the assumed model does not adequately capture the determinants of movements in the natural rate, or (2) relationships among economic variables change over time. The second approach explicitly models the optimizing behavior of households and firms among other factors that underlie typical macroeconomic relationships, like the IS curve and the Phillips curve. This approach then regards the natural rate of interest as the rate that exists in a flexible price equilibrium.[3] This approach has the advantage of enabling an analysis of the impact of structural shocks on the natural rate of interest, such as technological advances or demographic trends. On the other hand, it is important to note that estimates can vary substantially depending on how the model is specified and how the parameters are calibrated.
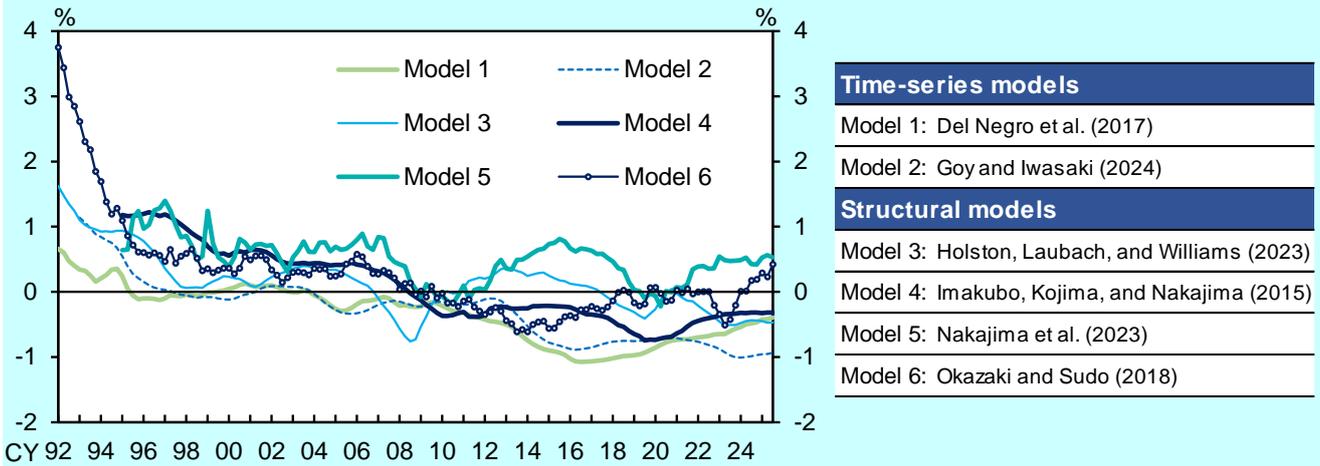
The various methods for estimating the natural rate of interest thus differ in terms of their assumptions and the data they draw on, and each offers advantages and disadvantages. When examining developments in the natural rate, therefore, it is important not to rely on a single approach but rather to make a comprehensive assessment using multiple estimation methods while grasping the characteristics of each approach.

Latest estimates of the natural rate of interest

Based on these considerations, the Bank estimates the natural rate of interest using six models and, in its "Review of Monetary Policy from a Broad Perspective" released in December 2024, showed that the estimates based on these methods (as of 2023/Q1) ranged from around -1.0 percent to +0.5 percent.[4]

Following the GDP benchmark revision conducted in December 2025 (moving from 2015 as the base year to 2020), the Bank has updated its estimates of Japan's potential growth rate and the output gap,[5] and, using

[Chart 3] Estimates of the Natural Rate of Interest

Time-series models		
Model 1: Del Negro et al. (2017)		
Model 2: Goy and Iwasaki (2024)		
Structural models		
Model 3: Holston, Laubach, and Williams (2023)		
Model 4: Imakubo, Kojima, and Nakajima (2015)		
Model 5: Nakajima et al. (2023)		
Model 6: Okazaki and Sudo (2018)		

Note: 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; Ministry of Internal Affairs and Communications; Cabinet Office; Bloomberg; Consensus Economics Inc., "Consensus Forecasts."

these new estimates and other latest data, has re-estimated the natural rate of interest. The results show that, as of 2025/Q3, the estimates of the natural rate of interest across the six models were in the range of around -0.9 percent to +0.5 percent (Chart 3).

Compared with previous estimates, although the range itself has not changed significantly, a closer look reveals that many of the estimates have recently been moderately on the rise. These movements likely reflect two factors: (1) Japan's potential growth rate, which fell sharply during the COVID-19 pandemic, has since been rising, albeit moderately (Chart 4), and (2) as an environment in which wages and prices are both rising moderately becomes entrenched, market participants have become more willing to take risks, and demand for safe assets has declined somewhat. In this context, the potential growth rate is a key determinant of the level of the natural rate in structural models (Models 3

to 6 in Chart 3), while in time-series models (Models 1 and 2), developments in safe asset demand likely affect the natural rate through changes in government bond yields.
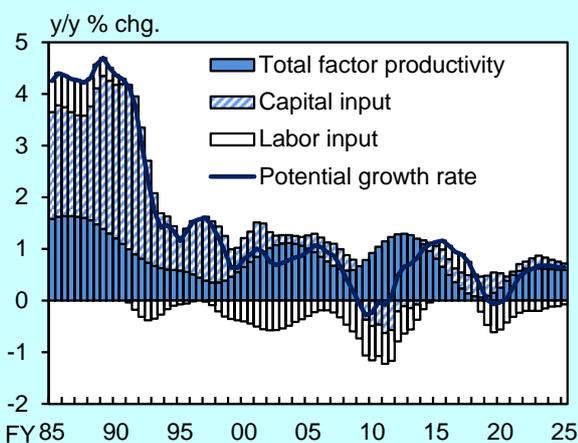
Uncertainty in estimates of the natural rate of interest

Although the natural rate of interest is an important concept in the conduct of monetary policy, there are many caveats when it comes to its use in actual policy conduct. The following highlights three aspects of the uncertainty surrounding estimates of the natural rate of interest.

First, the estimates themselves exhibit considerable dispersion and error. That is, estimates of the natural rate of interest vary substantially depending on the modeling framework and parameter settings employed. In fact, as shown in Chart 3, the latest updated estimates of the natural rate of interest also exhibit considerable dispersion across estimation methods. Moreover, in addition to the estimation errors present in individual estimates themselves (left panel of Chart 5), there is the so-called real-time problem, in which estimates for each point in time are subject to significant ex-post revisions as new data are added (right panel of Chart 5). Further, it is important to note that the data used for the estimations themselves, such as the potential growth rate and the output gap, are subject to uncertainties.

Second, current estimation models do not necessarily fully account for the impact of overseas economic and financial developments on Japan's natural rate of interest.[6] In economies with free and active capital mobility, the equilibrium level of domestic interest rates is strongly influenced not only by the domestic saving-investment balance but also by
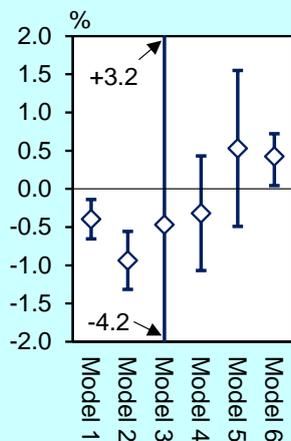
[Chart 4] Potential Growth Rate
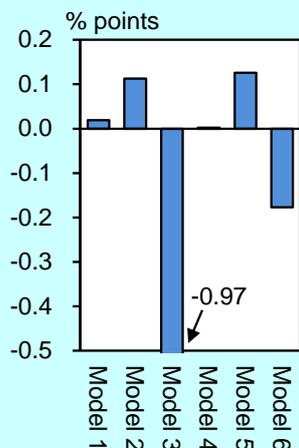
Note: Figures are staff estimates.
Source: Bank of Japan.

interest may deviate from the actual equilibrium level. Time-series models (Models 1 and 2 in Chart 3) in particular assume that the actual real interest rate fluctuates around the natural rate over the medium to long term, as mentioned, but this assumption is not necessarily fully justified in Japan, and there is a strong possibility that the estimated natural rate is subject to downward bias.

Given these various sources of uncertainty surrounding estimates of the natural rate of interest, it is difficult to pin down the level of the rate in advance, implying that estimates still have to be viewed with considerable latitude.

Role of the Natural Rate, Assessment of Policy Stances among Central Banks in the United States and Europe

Communication by central banks in the United States and Europe emphasizes that monetary policy should not be conducted by relying on any particular estimate of the natural rate of interest, but rather by carefully examining a wide range of data on economic activity, prices, and financial developments. This tendency is especially pronounced when the policy rate has approached or reached the neutral range.

For example, at a speech in 2023, Federal Reserve Chair Powell described using the natural rate as akin to "navigating by the stars under cloudy skies," noting that the level of the rate cannot be measured precisely and that the assessment of monetary policy stance is always accompanied by uncertainty. [8,9] Additionally, the Federal Reserve, in its Federal Open Market Committee (FOMC) statements, specifies that in conducting monetary policy it examines a wide range of information, including labor market conditions, inflation pressures and inflation expectations, and financial and international developments. Moreover, in its semiannual *Monetary Policy Report* to Congress, the Federal Reserve reviews developments across a wide variety of indicators to assess financial conditions, such as long-term interest rates, lending to firms and households, the availability of financing as perceived by firms and households, equity prices, and corporate bond spreads.[10]

The European Central Bank (ECB), in its staff reports explaining economic and financial developments (the *Economic Bulletin*), presents estimates of the natural rate of interest derived from multiple models and notes that "while estimates of [the natural rate of interest] provide complementary information for monetary policy decisions[…], these

the global saving-investment balance and developments in overseas growth rates. This means the natural rate of interest is shaped not only by domestic factors but also to a great extent by structural changes in overseas economies and developments in international financial and capital markets.[7] However, many models for estimating the natural rate of interest are based primarily on domestic factors to avoid excessive complexity, which may limit their ability to sufficiently explain movements in the natural rate. In a country like Japan, which has strong links with overseas economies and free capital mobility, the natural rate is likely to be susceptible to overseas economic and financial developments, especially those occurring in the United States.

Third, caution is called for regarding the characteristics of the historical data used in estimations. In an economy like Japan's, which experienced prolonged deflation, and where the policy interest rate was constrained by the zero lower bound for an extended period and monetary accommodation was maintained for many years, it is highly likely that financial cycles, from tightening to easing and back again, did not fully materialize. Moreover, given that low interest rate policies were in place for such a long time, estimations may not properly capture the response of the real economy to policy rate hikes. As a result, there is a risk that estimates of the natural rate of

cannot be seen as a mechanical gauge of appropriate monetary policy at any point in time."[11],[12] Further, in Governing Council statements, the ECB has specified that policy rate decisions are based on its assessment of (1) the inflation outlook and risks in light of incoming economic and financial data, (2) the dynamics of underlying inflation, and (3) the strength of monetary policy transmission. In examining the strength of this transmission, the ECB assesses financial conditions using a broad range of indicators, including market interest rates, funding costs, the volume of financing via bank lending and corporate bond issuance, banks' lending attitudes, and the money stock, and provides public explanations of this during the President's press conferences following Governing Council meetings and in subsequent issues of the *Economic Bulletin*.

The Bank of England (BOE) likewise notes in speeches by Monetary Policy Committee members that, while the natural rate of interest is a useful concept, it is not used as a "direct guide" to monetary policy because of the high degree of uncertainty surrounding its estimation.[13] In its *Monetary Policy Report*, which brings together staff analyses for the Monetary Policy Committee, alongside sections on "Inflation" and "Activity," the BOE devotes a separate section to "Global and financial conditions" as part of its assessment of current economic activity, prices, and financial developments. In this section, the BOE monitors a wide range of indicators related to financial conditions, including market data such as long-term interest rates, equity prices, and exchange rates; funding costs for firms and households; banks' loan volumes; and measures of the availability of credit.[14]
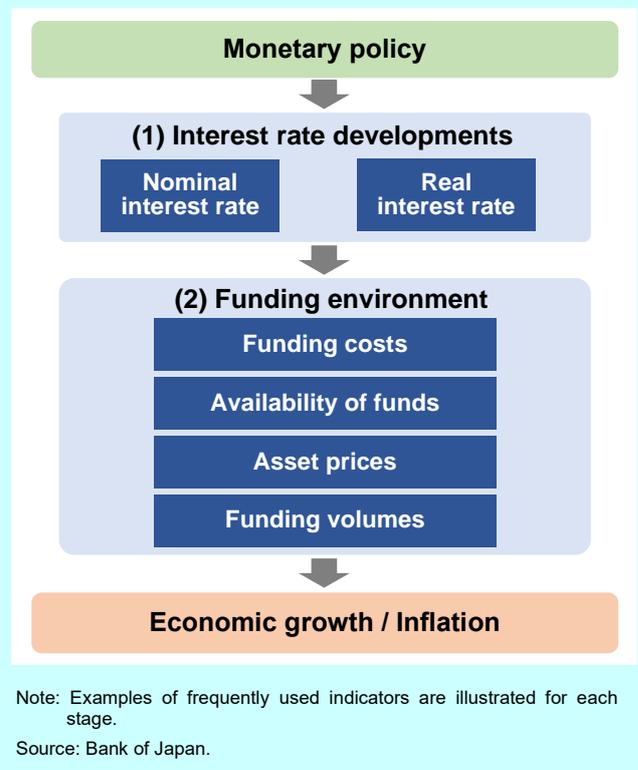
Assessment of Financial Conditions in Japan

Framework for assessing financial conditions

The Bank of Japan is presently adjusting the degree of monetary accommodation toward the sustainable and stable achievement of the price stability target of 2 percent. Given the uncertainty surrounding estimates of the natural rate of interest, it is necessary to assess the degree of monetary accommodation in a comprehensive manner, carefully examining economic activity, prices, and financial developments. However, it takes a considerable amount of time for the effects of monetary policy to permeate the real economy, and the specific relationships between the two are complex. For this reason, as mentioned above, when assessing the degree of monetary accommodation or tightening, many central banks meticulously evaluate financial

conditions, which can be seen to serve as a transmission channel from monetary policy to the real economy, and the Bank adopts a similar approach. The following is a brief outline of its evaluation framework in two stages (Chart 6).

[Chart 6] Framework for Assessing Financial Conditions

Monetary policy

(1) Interest rate developments
Nominal interest rate | Real interest rate

(2) Funding environment
Funding costs
Availability of funds
Asset prices
Funding volumes

Economic growth / Inflation

Note: Examples of frequently used indicators are illustrated for each stage.
Source: Bank of Japan.

The first stage involves developments in interest rates. Here, short-term policy rates and yields on safe assets, such as the yield curve of government bonds, influence a variety of lending rates and asset prices. Moreover, it is necessary to look at real interest rates -- that is, nominal interest rates minus the expected inflation rate -- given that real interest rates exert a greater influence on the consumption and investment decisions of economic agents. Furthermore, in assessing the impact on the real economy more closely, it is also important to examine developments in real interest rates across different maturities.

Turning to the second stage, the funding environment, it is important to monitor not only funding costs -- such as lending rates and issuance rates for CP and corporate bonds, which consist of yields on safe assets plus various spreads -- but also the availability of financing as perceived by firms and households. This necessitates assessing indicators that are useful in evaluating the availability of funds, including financial institutions' lending attitudes and firms' financial positions. In addition, asset prices such as stock prices and exchange rates significantly

influence the decision-making of firms and households through their effects on balance sheets and expected returns, making it necessary to monitor these developments as well. Further, developments in the volume of funding are also crucial. For example, if funding demand by firms and households remains strong even after a policy rate hike, the change in the degree of monetary accommodation may not be significant. On the other hand, if there is a clear shift in the volume of funding, this may indicate that the change in the degree of monetary accommodation is having an effect. From this perspective, it is important to monitor developments in lending to firms and households as well as in the issuance of CP and corporate bonds by firms.

Recent financial conditions

With these multiple axes of assessment in mind, the following examines recent financial conditions in Japan.

Looking first at interest rate developments, yields on Japanese government bonds (JGBs) have been on the rise across maturities since fall 2025, reflecting market views on future economic and price developments as well as monetary and fiscal policy. In this context, examining real interest rates -- calculated by subtracting expected inflation rates from nominal interest rates -- for various maturities shows that, while long-term real interest rates have recently been hovering near zero percent, short- and medium-term real interest rates -- which have a relatively greater impact on economic activity -- remain clearly in negative territory (Chart 7).

[Chart 7] Real Interest Rates by Maturity

Note: Figures are calculated as government bond yields minus the composite index of inflation expectations (staff estimates). Figures for 2026/Q1 are January-February averages.

Sources: Bank of Japan; QUICK, "QUICK Monthly Market Survey <Bonds>"; Consensus Economics Inc., "Consensus Forecasts"; Bloomberg.

Next, looking at the funding environment, lending rates linked to market interest rates and issuance rates for CP and corporate bonds have been rising in line with the recent increase in market rates. Even so, financial institutions' lending attitudes remain accommodative, and firms' financial positions also continue to be favorable (Chart 8).[15] Many firms also report that issuance conditions for CP and corporate bonds are still favorable, with issuance spreads generally remaining low. In addition, stock prices in Japan have been at elevated levels, underpinned by expectations regarding improvement in corporate profits and government economic policies, among other factors. Meanwhile, looking at developments in funding volume, buoyed by extremely low real interest rates and a favorable funding environment, the outstanding amounts of bank lending, CP, and corporate bonds have been growing at a relatively solid pace (Chart 9). Although funding costs are on the rise following changes in the policy interest rate, overall funding demand remains firm, reflecting factors such as the recovery in economic activity and an increase in large-scale corporate acquisitions.

[Chart 8] Indicators Related to the Availability of Funds for Firms
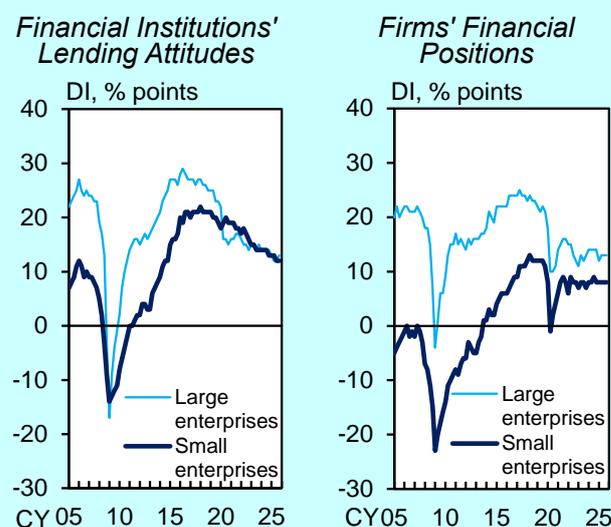
Notes: 1. In the left-hand chart, figures represent the diffusion index (DI, "accommodative" - "severe") for all industries in the *Tankan* (Short-Term Economic Survey of Enterprises in Japan).

2. In the right-hand chart, figures represent the DI ("easy" - "tight") for all industries in the *Tankan*.

Source: Bank of Japan.

In light of these developments, it can be considered that Japan's financial conditions have remained accommodative even after the policy interest rate hike in December 2025.

It should be noted, however, that a policy rate increase exerts differing effects depending on the attributes of firms and households. For instance, small and medium-sized firms and industries with high levels

[Chart 9] Amounts Outstanding of Bank Lending, CP, and Corporate Bonds
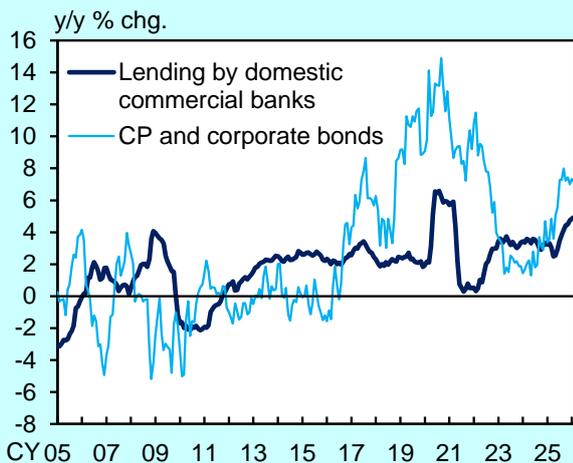
Note: Figures for lending by domestic commercial banks are monthly averages. Figures for CP and corporate bonds are those at the end of the period.

Sources: Bank of Japan; Japan Securities Depository Center; Japan Securities Dealers Association; I-N Information Systems.

of interest-bearing debt are likely to feel the impact of a rate hike sooner and more significantly. On the other hand, debt-free firms and highly profitable firms are expected to experience relatively smaller direct impacts from interest rate increases. As for the impact of rate hikes on households, it is necessary to evaluate the situation from the perspective of both savings and borrowing while also considering trends in wages and other factors.

Conclusion

As highlighted in this paper, although the natural rate of interest is an important concept for the conduct of monetary policy, it is difficult to pin down the level of this rate in advance, and estimates of the rate therefore need to be viewed with considerable latitude.

Based on this premise, the Bank considers it appropriate to continue to adjust the degree of monetary accommodation while examining how economic activity and prices respond to changes in short-term interest rates. In particular, as the policy interest rate gradually approaches the neutral range, to smoothly achieve the 2 percent price stability target, it will become more important than ever to correctly gauge how the degree of monetary accommodation is changing. Ultimately, the Bank will make a comprehensive judgment on developments in economic activity, prices, and financial conditions. In doing so, in addition to the various indicators introduced in this paper, the Bank will carefully examine a wide range of information on spending behavior by firms and households, as well as the financial conditions influencing such behavior, utilizing, among other sources, anecdotal information gathered through the Bank's Head Office and branches.

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[1] Another concept used in assessing the stance of monetary policy apart from the natural rate of interest is the neutral rate of interest. The neutral interest rate, literally, refers to the interest rate level that is neutral to economic activity and prices; in practice, it is often discussed on a nominal basis, calculated as the sum of the natural rate of interest in real terms and expected inflation or the inflation target. In this case, examining the relationship between the policy rate and the neutral interest rate provides a basis for evaluating the degree of monetary accommodation or tightening.

[2] Okazaki and Sudo (2018) point out that estimation methodologies for the natural rate of interest can broadly be classified into two approaches: one approach that estimates the rate by using time-series methodologies with the observed data, and another that derives estimations grounded in economic theory. In addition, an approach referred to as a term-structure model -- which is similar to time-series models in that it estimates the natural rate of interest using observed data and does not rely on strong assumptions regarding economic structure -- has found increasing application in recent years. This approach estimates the expected component of the real short-term interest rate based on interest rates of various maturities in the market, and regards the value in equilibrium as the natural rate of interest. For a more detailed overview of estimation methodologies for the natural rate of interest, see Nakano et al. (2024).

Okazaki, Y. and Sudo, N. (2018), "Natural Rate of Interest in Japan: Measuring Its Size and Identifying Drivers Based on a DSGE Model," Bank of Japan Working Paper Series, No. 18-E-6.

Nakano, S., Sugioka, Y., and Yamamoto, H. (2024), "Recent Developments in Measuring the Natural Rate of Interest," Bank of Japan Working Paper Series, No. 24-E-12.

[3] In the New Keynesian model that takes the optimizing behavior of households and firms into consideration, the natural rate of interest is determined to be the equilibrium point at which saving and investment, based on economic agents' expectations about the future, are balanced. Structural factors such as total factor productivity (TFP) growth and demographic trends affect this equilibrium point through their impact on firms' investment appetite and households' saving behavior, while factors such as increased demand for safe assets also play a key role in causing fluctuations in the level of the equilibrium interest rate.

[4] For details on the six approaches, see Okazaki and Sudo (2018) and the following references.

Del Negro, M., Giannone, D., Giannoni, M. P., and Tambalotti, A. (2017), "Safety, Liquidity, and the Natural Rate of Interest," *Brookings Papers on Economic Activity*, Spring 2017, pp.235-316.

Goy, G. and Iwasaki, Y. (2024), "From the Natural Rate towards a Natural Curve: A First Step to Benchmarking the Term Structure," mimeo.

Holston, K., Laubach, T., and Williams, J. C. (2023), "Measuring the Natural Rate of Interest after COVID-19," Federal Reserve Bank of New York Staff Report, No. 1063.

Imakubo, K., Kojima, H., and Nakajima, J. (2015), "The Natural Yield Curve: Its Concept and Measurement," Bank of Japan Working Paper Series, No. 15-E-5.

Nakajima, J., Sudo, N., Hogen, Y., and Takizuka, Y. (2023), "On the Estimation of the Natural Yield Curve," Discussion Paper Series A, No. 753, Institute of Economic Research, Hitotsubashi

University.

5 Regarding the revision of the estimation methods for the potential growth rate and output gap in light of the GDP benchmark revision and recent structural changes in Japan's economy, see Bank of Japan Research and Statistics Department (2026), "Updates on the Output Gap and Potential Growth Rate, and Monitoring Labor Market Indicators," Bank of Japan Research Paper, forthcoming.

6 In a speech, Deputy Governor Seim of the Sveriges Riksbank noted that, for Sweden as a small open economy, movements in the natural rate of interest over the long run are largely determined by global factors, while referring to existing literature which argues that much of the variation in the natural rate of interest can be accounted for by spillovers from structural changes in overseas economies, particularly the United States. It is worth noting that Hatayama et al. (2024) examine the effect of globalization on the natural rates of interest in developed economies, including Japan.

Seim, A. (2024), "Neutral Interest Rate: Meaning, Limitations and Assessment," speech at a breakfast seminar at the Sveriges Riksbank, November 26.

Hatayama, Y., Iwasaki, Y., Nakagami, K., and Okimoto, T. (2024), "Globalization and Its Growing Impact on the Natural Rates of Interest in Developed Economies," Bank of Japan Working Paper Series, No. 24-E-13.

7 For example, see the following speech by Bank of England Monetary Policy Committee member Mann.

Mann, C. L. (2025), "The Neutral Rate of Interest -- and Its Relevance for Monetary Policy," speech at the Bank of England Watchers' Conference, May 12.

8 Powell, J. H. (2023), "Inflation: Progress and the Path Ahead," speech at the Jackson Hole Economic Policy Symposium hosted by the Federal Reserve Bank of Kansas City, August 25.

9 Governor Waller likewise remarked in a speech that the natural rate of interest is a theoretical concept and that policymakers should avoid referring with too much confidence to any specific numerical estimates when conducting policy.

Waller, C. J. (2024), "Some Thoughts on r*: Why Did It Fall and Will It Rise?" speech at the Reykjavik Economic Conference, May 24.

Regarding estimates of the U.S. natural rate, President Williams of the Federal Reserve Bank of New York (FRBNY) has presented recent estimates from multiple models on the FRBNY blog, and some Federal Reserve Banks regularly update several such estimates.

Cho, S. and Williams, J. C. (2025), "Are Financial Markets Good Predictors of R-Star?" Federal Reserve Bank of New York Liberty Street Economics, August 25.

10 In addition, financial conditions indexes (FCIs) are used as indicators to comprehensively assess financial conditions. The FCIs combine various indicators, including interest rates, corporate bond spreads, loan survey results, equity prices, and exchange rates, to indicate how accommodative or restrictive financial conditions are. Publicly available past FOMC materials (Tealbooks) refer to indexes such as the Chicago FCI published by the Federal Reserve Bank of Chicago.

11 Brand, C., Lisack, N., and Mazelis, F. (2025), "Natural Rate Estimates for the Euro Area: Insights, Uncertainties and Shortcomings," ECB Economic Bulletin, Issue 1/2025.

12 Similar arguments have also been made in speeches by ECB officials. For instance, see Schnabel, I. (2024), "Navigating towards Neutral," keynote speech at the CEPR Paris Symposium 2024 hosted by the Banque de France, December 16, and Lane, P. R. (2025), "A Middle Path for ECB Monetary Policy," speech at the Peterson Institute for International Economics (PIIE), February 5.

13 In a speech, Governor Bailey, noting that any estimation methodology for the natural rate of interest is subject to substantial uncertainty, pointed out that "the equilibrium real interest rate is typically used to look back on past policy and its stance, or to provide an indication of the general outlook for interest rates over the coming years, rather than as a direct guide to policy."

Bailey, A. (2022), "The Economic Landscape: Structural Change, Global R* and the Missing-Investment Puzzle," speech at the Official Monetary and Financial Institutions Forum, July 12.

14 Similarly, the Bank for International Settlements (BIS) has also highlighted both the substantial uncertainty surrounding estimates of the natural rate of interest and the need for caution in using it in the conduct of monetary policy. See, for example, Borio, C. (2021), "Navigating by r*: Safe or Hazardous?" BIS Working Papers, No. 982.

15 While the figures for financial institutions' lending attitudes and firms' financial positions in the *Tankan* (Short-Term Economic Survey of Enterprises in Japan) shown in Chart 8 are only available up to December 2025, various private-sector surveys released since January this year (the Japan Finance Corporation's "Monthly Survey on SME Trends" and the Japan Chamber of Commerce and Industry's "LOBO survey") likewise show no significant changes in financial institutions' lending attitudes as perceived by small and medium-sized firms or in their assessments of financial positions.