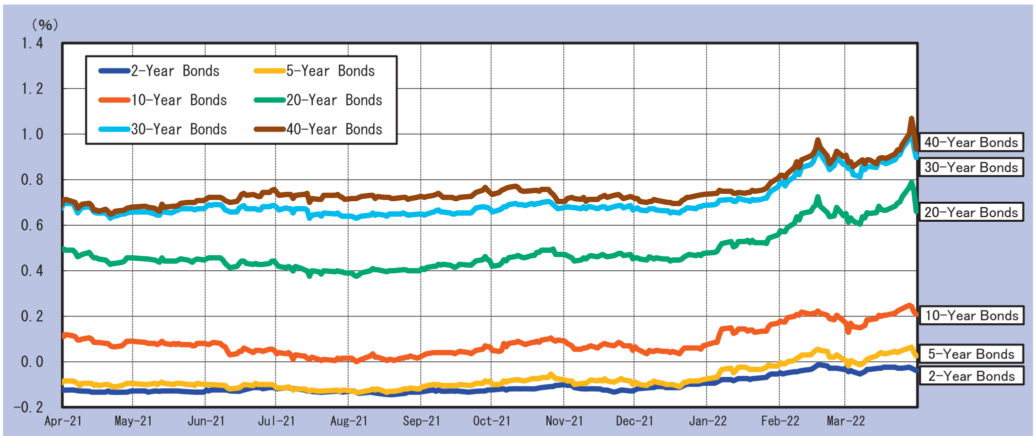
1 Trends of JGB Market in FY2021

(1) Review

The JGB market entered FY2021 as market fluctuations calmed down in the wake of the BOJ's monetary policy review in March 2021. From April to July, the 10-Year JGB yield fell gradually, with volatility declining. In September, the 10-Year JGB yield rose slightly due to an increase in overseas long-term interest rates. As overseas interest rates accelerated their hikes in early 2022, JGB yields posted relatively larger increases. Although JGB yields fell temporarily in response to Russia's invasion into Ukraine, the 10-Year JGB yield rose close to the upper limit of the BOJ's target range, at 0.25%, from February to March, prompting the central bank to implement the fixed-price, unlimited-amount purchase operation to suppress JGB yield hikes. With rising yields, the JGB market grew volatile. Volatility measures of the JGB market reached record high levels at the end of March.

Fig. 1-1 JGB Yield Trends by Maturity



(Source) Nikkei QUICK

Trading volume of coupon-bearing JGBs (☞) in FY2021 increased from 80.6 trillion yen per month in FY2020 to 88.7 trillion yen, topping 86.7 trillion yen in FY2019. Daytime and nighttime 10-Year JGB futures trading volume averaged 33,320 contracts per day, up from 29,090 contracts in FY2020 but down from 39,640 contracts in FY2019.

☞Outright transactions in "Trading Volume of Over-the-Counter Bonds" by the Japan Securities Dealers Association. Computed by subtracting half of bond dealers' trading volume from the total trading volume.

On the yen interest rate derivatives market, a transition from LIBOR-based transactions to overnight call rate-based transactions started in July 2021 before the London interbank offered rate ceased to be published at the end of 2021. Yen interest-rate swap transactions in January-March 2022 after the transition increased from the transition period due to the abovementioned increase in interest rate volatility.

In March 2021, the BOJ reviewed its monetary policy and specified the target range for the 10-Year JGB yield as between plus and minus 0.25%. While reaffirming its policy of stabilizing the overall yield curve at low levels, the central bank indicated a view that interest rate fluctuations, if within a certain range, can work to the advantage of market functions without affecting the effects of monetary easing. As a result, the 10-Year JGB yield on April 1 at the start of FY2021 came to 0.107%.

As U.S. long-term interest rates gradually trended down later, JGB yields declined slowly through early August. On August 4, the 10-Year JGB yield fell to 0%. Volatility also declined from May to June. The implied volatility computed from 10-Year JGB futures options and swaptions sank to the lowest level since 2018.

U.S. and European inflation rates rose from spring 2021 and accelerated their hikes in summer. The Bank of England in September and the U.S. Federal Reserve Board in October indicated that they would begin to raise interest rates earlier than expected in the market to cope with the rising inflation rates. In response to the indication, European and U.S. long-term interest rates turned up. JGB yields followed suit. As interest rate hikes were expected increasingly in Europe and the U.S., short- and medium-term interest rates rose faster than long- and super long-term rates on yield curves. In contrast, Japan's consumer price index hikes posted no remarkable acceleration, leading the BOJ's monetary policy to be expected to remain unchanged. Long- and super long-term JGB yields rose faster than short- and medium-term JGB yields, prompting the yield curve to steepen. On October 25, the 10-Year JGB yield came to 0.101%. As European and U.S. interest rates turned down later, JGB yields fell through December.

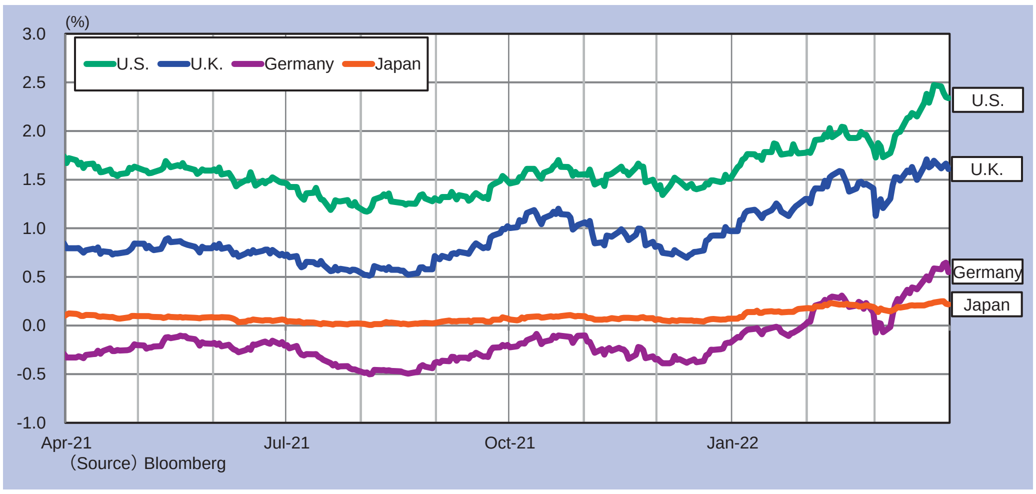
As European and U.S. long-term interest rates soared fast in early 2022, the rise in the 10-Year JGB yield accelerated. While long positions on 10-Year JGB futures were unwound in early January, yields rose sharply, mainly in the 7-Year zone linked to futures. As European and U.S. interest rate hikes were increasingly expected to accelerate in February, short- and medium-term JGB yields soared on the yield curve. Reflecting a market view that the BOJ could raise interest rates in response to foreign central banks' growing readiness to increase rates, the 5-Year JGB yield left the negative zone on February 4 for the first time since January 2016.

On February 10 when the 10-Year JGB yield rose to 0.228%, close to the upper limit of the BOJ's target range of 0.25%, the central bank announced that it would conduct a unlimited- ammount of purchase operation of 10-Year JGBs at the yield of 0.25% on the next business day. While the 10-Year JGB yield ceased to rise in response to the announcement, other JGB yields continued to increase. On February 17, the 5-Year JGB yield increased to 0.055%, the 20-Year JGB yield to 0.739%, and the 30-Year JGB yield to 0.987%.

The 10-Year JGB yield peaked as other JGB yields rose to the highest levels in several years. From mid-February, concern about Russia's invasion of Ukraine grew gradually. After Russia launched the invasion on February 24, the world's long-term interest rates, including the 10-Year JGB yield, generally declined amid wild fluctuations in response to flight-to-quality purchases of government bonds and a market view that central banks would delay interest rate hikes.

As inflationary pressure increased further due to crude oil and other commodity price hikes on Russia's invasion of Ukraine, however, the U.S. Federal Reserve Board and the European Central Bank reaffirmed plans to put an end to monetary easing. From early March, foreign long-term interest rates accelerated their increases again, leading JGB

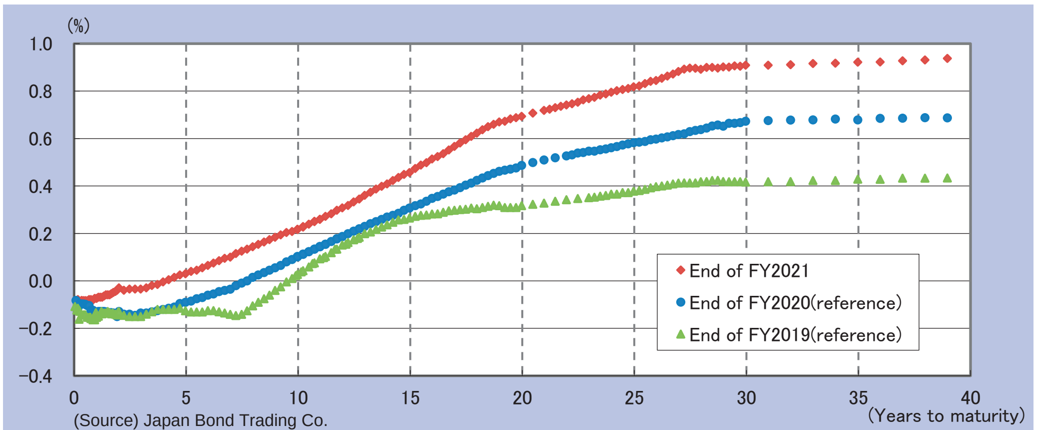
Fig. 1-2 10-Year Government Bond Yields (U.S., U.K., Germany, Japan)



yields to turn up again. As the 10-Year JGB yield rose close to 0.25% again, the BOJ conducted a fixed-price purchase operation from March 28 through 31 to suppress JGB yield hikes. On March 29, the 10-Year JGB yield rose to 0.248%, the 5-Year JGB Yield to 0.056%, the 20-Year JGB yield to 0.816% and the 30-Year JGB yield to 1.078%. These JGB yield levels were the highest since 2015.

Due to central banks' decisions or expected plans to raise interest rates, as well as Russia's invasion into Ukraine, volatility increased remarkably on bond markets around the world from February. In Japan, implied volatility for super long-term swaptions reached the highest level since March 2020.

Fig. 1-3 Yield Curve Trends



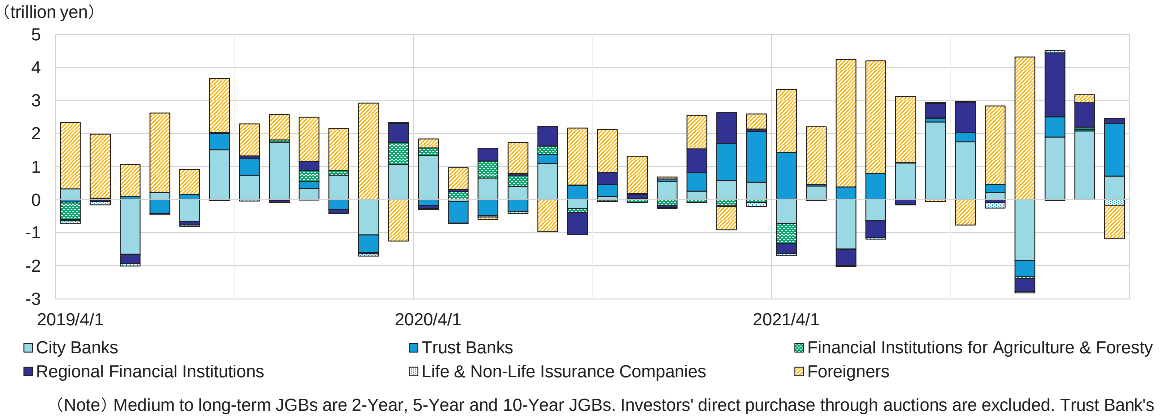
(Source) Japan Bond Trading Co.

(2) Investor Trends

Firstly, FY2021 JGB investment trends by investor category indicated that foreign investors posted remarkably large net buying of medium to long-term JGBs maturing in 2, 5 and 10 years. In the April-August and November-December periods, when long-term interest rates were globally stable, foreign investors' monthly net buying of medium to long-term JGBs ranged from 1.7 trillion yen to 4.3 trillion yen. Although their net buying decreased in the September-October and January-March periods, when interest rates rose globally, their net buying in the whole of FY2021 totaled as much as 17.9 trillion yen. An apparent factor behind foreign investors' massive net buying of medium to long-term JGBs may be that they were allowed to invest in JGBs at lower yields than Japanese investors as U.S. dollar payers were positioned to get premiums on cross-currency basis swap markets.

Among investors other than foreigners, city banks posted 5.8 trillion yen in their net buying of medium to long-term JGBs in FY2021, roughly the same ammount from the previous year. Pension funds substantially increased their net buying of such JGBs in FY2021, from 2.7 trillion yen in the previous year to 5.1 trillion yen.

Fig. 1-4 Net buying/selling of medium to long-term JGBs by investor category

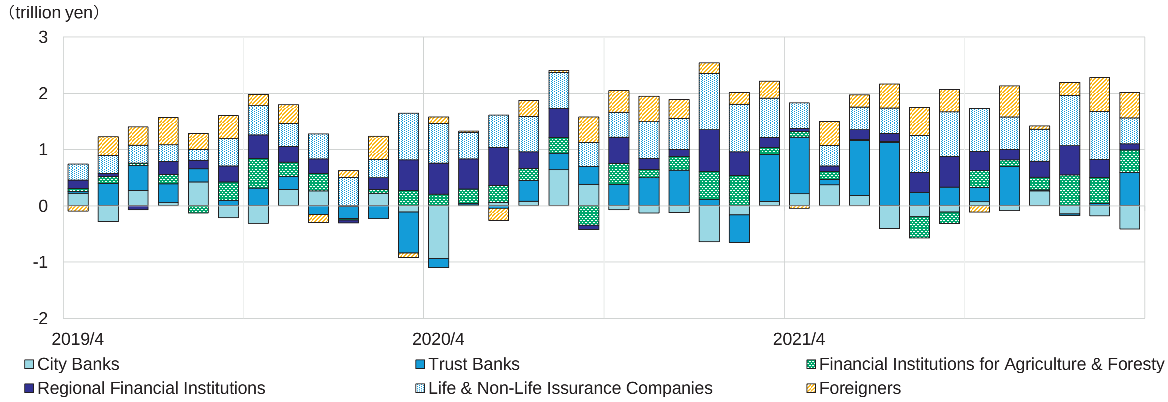


(Note) Medium to long-term JGBs are 2-Year, 5-Year and 10-Year JGBs. Investors' direct purchase through auctions are excluded. Trust Bank's trading covers their proprietary trading as well as transactions on behalf of pension funds, etc.
(Source) Japan Securities Dealers Association

Secondly, life insurance companies and pension funds posted their large net buying of super long-term JGBs maturing in 20, 30 and 40 years. Life insurance companies reduced their net buying of super long-term JGBs between April and July year on year but remarkably expanded such net buying in the second half of FY2021 when JGB yields rose. Their net buying in the whole of FY2021 totaled as much as 7.3 trillion yen, though slightly less than 7.6 trillion yen in the previous year. A factor behind their proactive investment in super long-term JGBs may be that they are required to respond to new international capital adequacy regulations.

Pension funds' net buying of super long-term JGBs in FY2021 came to 5.3 trillion yen. Particularly between April and July, they posted as much as 3.2 trillion yen in such net buying. In the period, pension funds' net buying of medium to long-term JGBs reached 2.6 trillion yen.

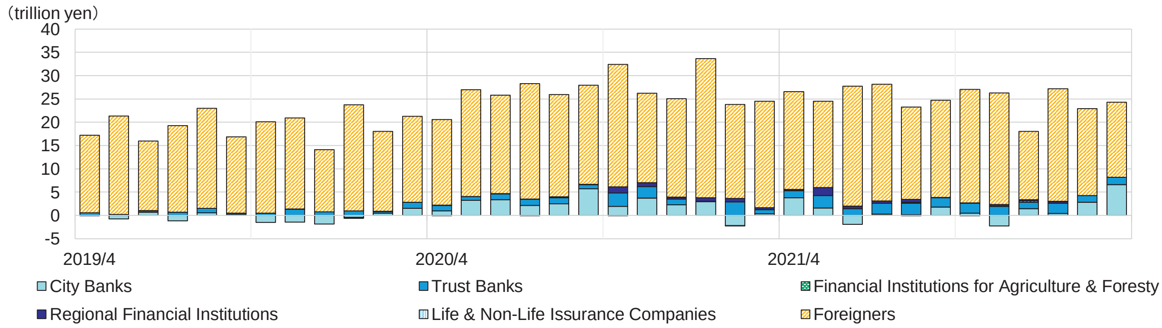
Fig. 1-5 Net buying/selling of super long-term JGBs by investor category



(Note) Super long-term JGBs are 20-Year, 30-Year and 40-Year JGBs. Investors' direct purchase through auctions are excluded. Trust Bank's trading covers their proprietary trading as well as transactions on behalf of pension funds, etc.

Finally, in short-term JGB (T-Bills) trading, foreign investors remained the largest net buyer among investor categories as usual. A major reason for foreign investors' massive investment in short-term JGBs might have been that U.S. dollar payers were positioned to get premiums on cross-currency basis swap markets. Among investor categories other than foreigners, pension funds were a relatively large net buyer. City banks posted 15.2 trillion yen in their net buying of short-term JGBs in FY2021 after their massive net buying of 27 trillion yen in the previous year. This might have been because their demand for short-term JGBs as collateral for BOJ operations declined as their new use of BOJ operations decreased.

Fig. 1-6 Net buying/selling of short-term JGBs by investor category



(Note) Short term JGBs are T-Bills. Investors' direct purchase through auctions are excluded. Trust Bank's trading covers their proprietary trading as well as transactions on behalf of pension funds, etc.
(Source) Japan Securities Dealers Association