

Highlights of the April 2022 *Financial System Report*

Japan's financial system has been maintaining stability on the whole, while COVID-19 continues to affect economic and financial activity at home and abroad. Profits of firms that have been significantly affected by the pandemic are weak. However, underpinned by the financial soundness of financial institutions on the whole, policy responses have been effective and the financial intermediation function is being fulfilled smoothly. Financial markets have been nervous, reflecting concerns about a reduction in the degree of monetary easing in the United States and Europe as well as the situation in Ukraine.

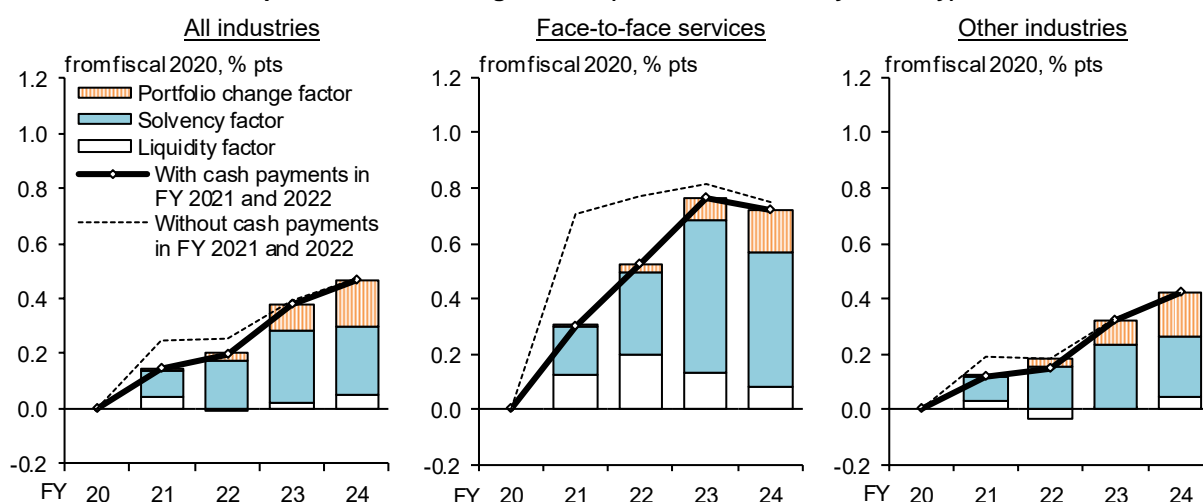
Against this background, with a view to ensuring the stability of Japan's financial system, the following three risks warrant attention: (1) credit risk of domestic loans due to the pandemic; (2) the risk of transmission of global economic and financial shocks, such as an adjustment in global financial markets; and (3) risks resulting from vulnerabilities that have been present since before the pandemic.

A. Credit risk of domestic loans due to the pandemic

The *Report* simulates the impact of COVID-19 on the probability of default (PD) of small and medium-sized enterprises (SMEs) and financial institutions' credit cost ratio through fiscal 2024 using firm-level data of about 750 thousand SMEs this time. The simulation assumes that the economy recovers in line with the average expectations of market participants and incorporates recent economic developments and heterogeneity in business performance across industries and firms. The results of the analysis are as follows.

- The overall PD of SMEs increases slightly in fiscal 2021 and beyond from the low, restrained level in fiscal 2020 (left panel of Chart 1). This reflects the considerations that the heterogeneity in profits across industries and firms remains and interest payments on effectively interest-free loans increase from fiscal 2023, while firms have ample cash reserves. In the face-to-face services industry, assuming that the pace of recovery overall is moderate, both liquidity and solvency factors push up the PD to a greater degree than in other industries, since firms take out more loans to offset the decline in cash reserves (middle panel of Chart 1).

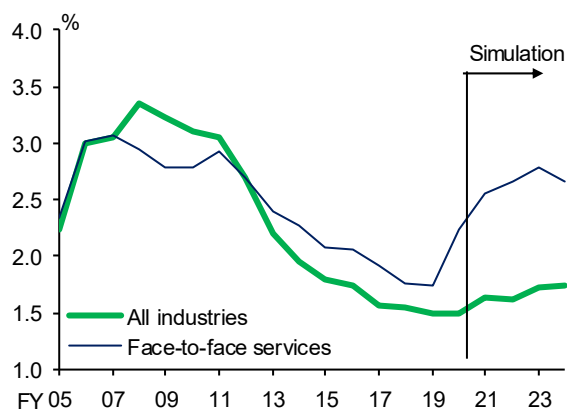
Chart 1: Decomposition of the changes in PD (all industries and by industry) <Chart IV-1-15>¹



¹ The chart number in the angular brackets indicates that in the main text. The same applies to the subsequent charts.

- Although the share of defaulting firms for all industries increases gradually going forward, the increase is limited and the share remains at a low level in fiscal 2024. However, in the face-to-face services industry, the share increases further through fiscal 2023 from the current level (Chart 2).
- The credit cost ratio for the SME loan portfolios increases gradually through fiscal 2024, but the increase is contained, partly due to the relatively small share of loans to the face-to-face services industry in financial institutions' loan portfolios overall (Chart 3).

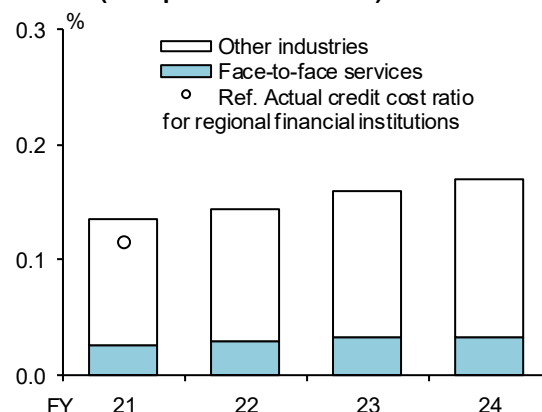
Chart 2: Developments in the share of firms in default <Chart IV-1-16>



Note: The share of firms in default is calculated as the number of firms in default during the fiscal year divided by the number of existing firms at the beginning of the fiscal year.

Source: CRD Association.

Chart 3: Financial institutions' credit cost ratios (loan portfolios to SMEs) <Chart IV-1-18>



Note: 1. The marker indicates the average of actual credit cost ratios over the last three years for regional financial institutions (the latest data for regional banks are annualized values for the first half of fiscal 2021).

2. The loan coverage ratio is calculated as the latest value of regional financial institutions (about 60 percent). The recovery rate for uncovered loans is assumed to be 60 percent.

Source: BOJ.

While the quantitative results of the analysis should be treated with some caution, the analysis indicates that, depending on factors including developments in corporate profits at the macro-level and the degree of heterogeneity in the pace of recovery in corporate profits across industries and firms, firms' PD and financial institutions' credit cost ratio may rise in the medium term.

B. Risk of transmission of global economic and financial shocks

The *Report* analyzes the impact of global economic and financial shocks on Japanese financial institutions' overseas lending and foreign currency funding.

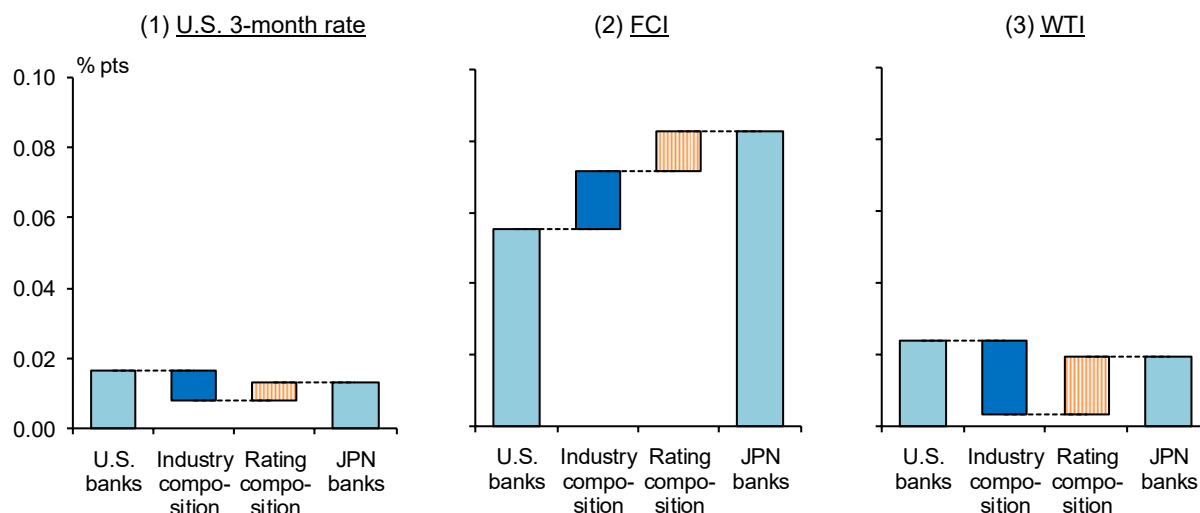
As for credit risk of overseas loans, the sensitivity of loan portfolio PDs with respect to a rise in (1) the three-month U.S. interest rate, (2) FCI,² and (3) crude oil prices is estimated using credit rating data for overseas firms.

- In response to the three global risk factors, the PD of non-investment grade (non-IG) firms increases larger than that of investment grade (IG) firms, and there is also heterogeneity across industries regarding the impact of these risk factors.
- The share of non-IG loans is higher in the overseas loan portfolios of Japanese banks than of major U.S. commercial banks, possibly making Japanese banks more susceptible to the three shocks than these U.S. banks. Japanese banks may become even more susceptible to these

² The financial conditions index (FCI) captures the impact of a widespread deterioration in financial conditions. The analysis uses the FCI (Chicago Fed National Financial Conditions Index) released by the Federal Reserve Bank of Chicago, which is constructed from variables such as the volatility index (VIX) and credit spreads on corporate bonds.

shocks if they increase lending to lower-rated borrowers. One other notable characteristic of Japanese banks' overseas loan portfolios is that the share of the electricity and gas industry and that of the energy industry are large. The analysis suggests that, with regard to the impact of a rise in the three-month U.S. interest rate and crude oil prices, this industry composition works to mitigate the deterioration in PDs relative to major U.S. commercial banks so that the degree of deterioration in the PDs may become about the same as that for the U.S. banks (Chart 4).

Chart 4: Sensitivity of Japanese and U.S. banks' loan portfolio PDs with respect to global risk factors <Chart IV-2-11>



Note: The chart shows the percentage point increase in the PDs in loan portfolios in response to one standard deviation increase in each risk factor calculated based on historical data. Increases in the PD in banks' portfolios are calculated as the weighted averages of PD increases by industry and investment grade, using the composition of U.S. and Japanese banks' loan portfolios as weights. Source: Moody's; Published accounts of each financial institution; BOJ.

With regard to foreign currency funding risk, the analysis focuses on developments in deposits during the global financial crisis (GFC) and at the time of the market turmoil in March 2020. The main results are as follows.

- At Foreign Banking Offices (FBOs) in the United States, when financial conditions deteriorate, lending in foreign currency increases due to, for example, the drawdown of committed lines while the growth in foreign currency deposits is either limited or negative. Thus, they tend to see difficulties in foreign currency funding (Chart 5). A liquidity risk indicator taking into account the possibility of a drawdown of unused committed lines suggests that the liquidity risk for Japanese banks is higher than that for European banks in the United States (Chart 6).

Chart 5: Role of liquid assets and transaction accounts in stress periods

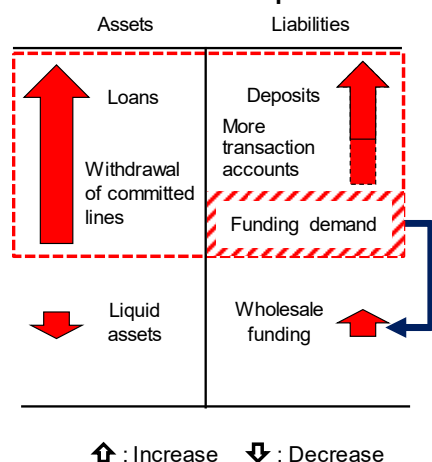
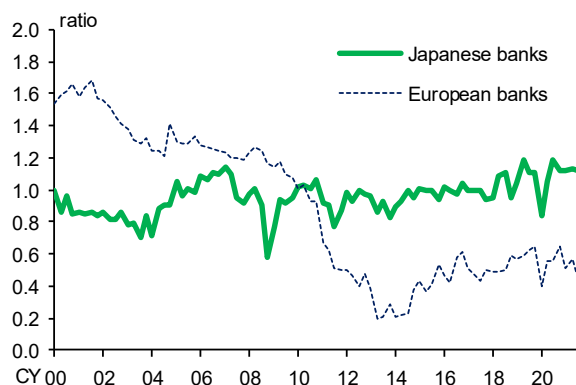


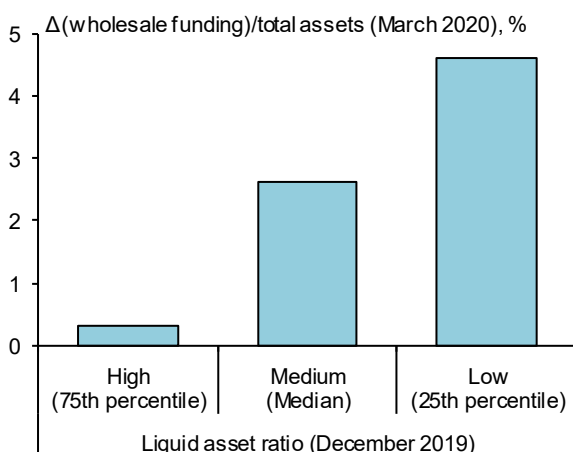
Chart 6: Liquidity risk indicator <Chart B4-3>



Note: 1. Liquidity risk indicator = (Committed lines + Wholesale funding – Liquid assets) / Total assets (Acharya et al. 2021).
 2. The liquidity risk indicator is calculated for FBOs in the U.S. Wholesale funding consists of large time deposits, repos, and other borrowings of the U.S. branches. Liquid assets consist of cash and deposits, U.S. government securities, and reverse repos of the U.S. branches.
 3. The latest data are as of the end of December 2021.
 Source: Federal Reserve Bank of Chicago; FFIEC.

- The analysis using data for FBOs in the United States around the time of the market turmoil in March 2020 suggests that foreign banks in the United States that hold a larger amount of liquid assets or have a higher transaction account deposits ratio before a crisis may face less stress in terms of funding during the crisis (Charts 7 and 8). Japanese banks have worked on securing liquid assets and increasing their transaction account deposits as they expand foreign currency balance sheets, and such efforts may improve the stability of foreign currency funding at times of crises.

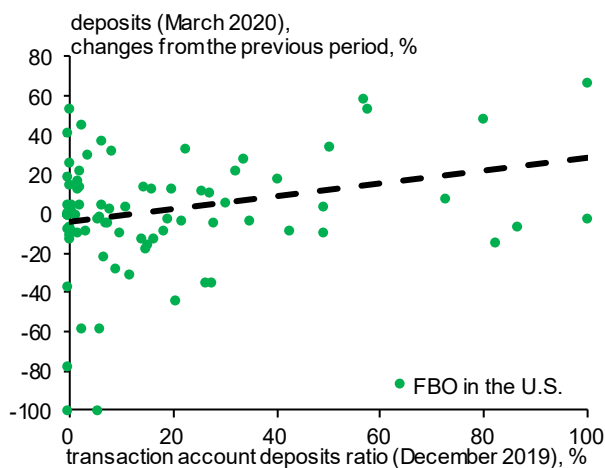
Chart 7: Liquid assets and wholesale funding
<Chart B4-4>



Note: Figures are calculated using the parameter estimates obtained by regressing changes in FBOs' wholesale funding on the liquid asset ratio and the committed line ratio. Estimated as of end-March 2020.

Source: Federal Reserve Bank of Chicago.

Chart 8: Transaction account deposits and changes in deposits <Chart B4-5>



Note: The figures for "FBO in the U.S." represent the total for branches of each financial institution. Deposits exclude large time deposits. The slope of the regression line is statistically significant at the 5% level.

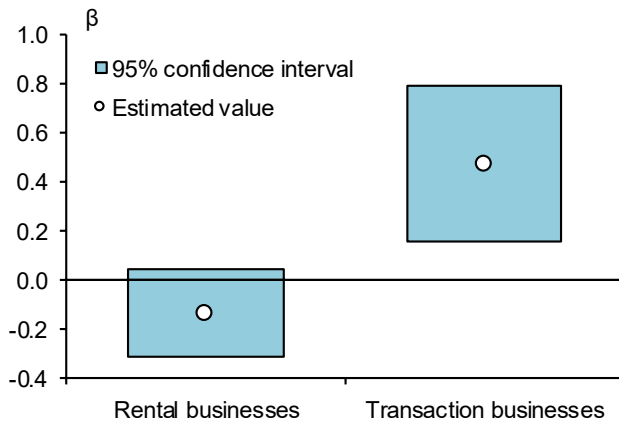
Source: Federal Reserve Bank of Chicago.

C. Risks resulting from vulnerabilities that have been present since before the pandemic

Japanese financial institutions have been facing downward pressure on profitability, mainly against the background of the fall in the potential growth rate. Regional financial institutions in particular have been active in lending to middle-risk firms and the real estate industry. The *Report* outlines the risk characteristics of rental real estate businesses, which have been the driving force of the increase in lending to the real estate industry in recent years, and examines the impact of possible changes in the structure of the profitability of land use and global factors since the outbreak of the pandemic on Japan's real estate market.

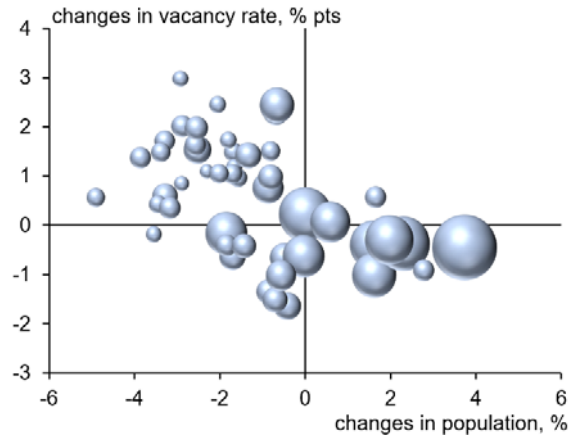
- Rental real estate businesses are less affected by the business cycles and their ROA is less volatile than that of real estate transaction businesses, for which default rates rose during the GFC (Chart 9). However, with the population declining in Japan on the whole, prefecture-level data suggest that a decline in the population may lead to a rise in vacancy rates (Chart 10).
- If the structure of the profitability of land use changes due to the pandemic -- for example, due to the decline in inbound tourism demand -- this could have an impact on land values. Comparing land values before and after the outbreak of the pandemic, the closer sites are to tourism resources, the more their land values have tended to fall (Chart 11). The estimation using the "Land Market Value Publication" and municipality-level data on income shows that a permanent decline in revenue may lead to a subsequent persistent decline in land values (Chart 12).

Chart 9: Linkage between the ROA of each business and of all industries



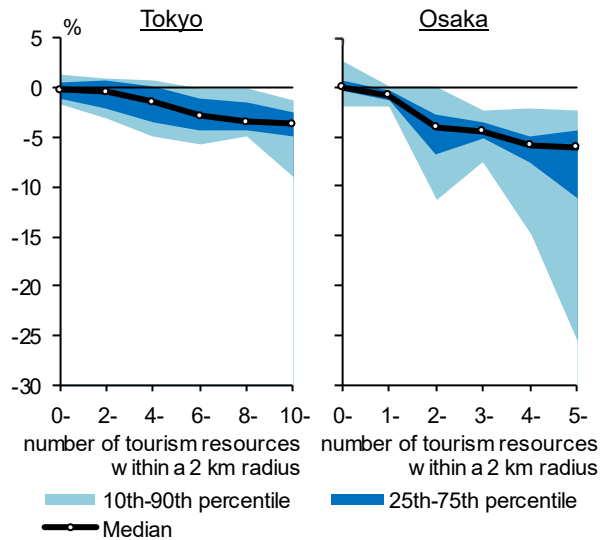
Note: "Rental businesses" consists of office lessors, land lessors, and house lessors. "Transaction businesses" consists of sales agents of buildings and houses as well as land subdividers and developers.
Source: Teikoku Databank.

Chart 10: Relationship between changes in population and vacancy rates <Chart IV-5-11>



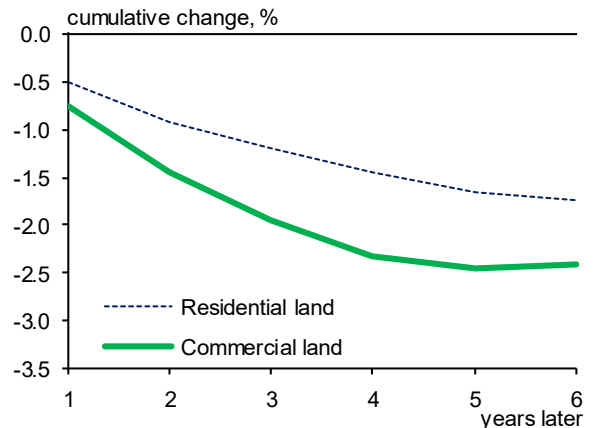
Note: 1. Each prefecture is represented by a bubble, whose size indicates the size of population.
2. The chart shows average changes for every five years between 1998 and 2018.
3. Vacancy rate = (number of vacant rooms in flats) / (total number of rooms in flats).
Source: Ministry of Internal Affairs and Communications, "Housing and land survey," "Population estimates."

Chart 11: Changes in land values around tourism resources <Chart B1-2>



Note: Changes in land values are based on the location of commercial land aggregated in terms of the number of tourism resources within a 2 km radius. The charts indicate changes from 2020 to 2022.
Source: Ministry of Land, Infrastructure, Transport and Tourism, "Land Market Value Publication," "Tourism Resource Data."

Chart 12: Effects of a 1 percentage point decline in the changes in income on land values <Chart B1-3>

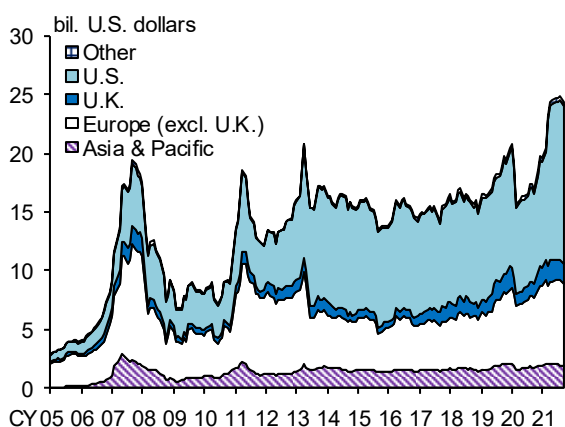


Note: The estimation period is from 2001 to 2021. The chart shows the response of land values to a 1 percentage point decline in the growth in taxable income per capita.
Source: Ministry of Internal Affairs and Communications; Ministry of Land, Infrastructure, Transport and Tourism.

- Domestic real estate funds such as J-REITs have seen inflows of funds from foreign investment funds since before the pandemic (Chart 13). Such flows of funds are sensitive to changes in global financial and economic conditions, and investment flows fall and prices of real estate funds decline in response to, for example, a rise in the U.S. interest rate (Chart 14).

The increase in lending to the real estate industry in recent years differs from that during the GFC in that it is led by the increase in lending to rental real estate businesses, which are considered to be relatively stable and robust. However, attention should be paid to the impact of medium- and long-term structural changes such as demographic changes on the profitability of rental real estate businesses and the impact on the real estate market of possible changes in the structure of land use profitability and global factors since the pandemic.

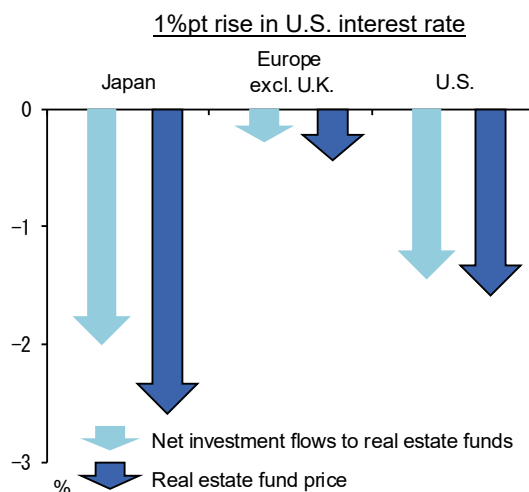
Chart 13: Japanese real estate fund holdings of foreign investment funds <Chart B2-2>



Note: Figures are calculated using the regional share of AUM (assets under management) for investment funds that mainly invest in real estate funds. "Asia & Pacific" excludes Japan. The number of investment funds is about 12 thousand. Latest data as at September 2021.

Source: Refinitiv Lipper.

Chart 14: Sensitivity of investment flows to real estate funds and their prices to global shocks



Note: Arrows represent estimated sensitivities. Real estate fund prices are calculated from the relationship between AUM and net investment flows. The U.S. interest rate is the 10-year U.S. Treasury yield. The estimation period is from the January-March quarter of 2003 through the January-March quarter of 2021.

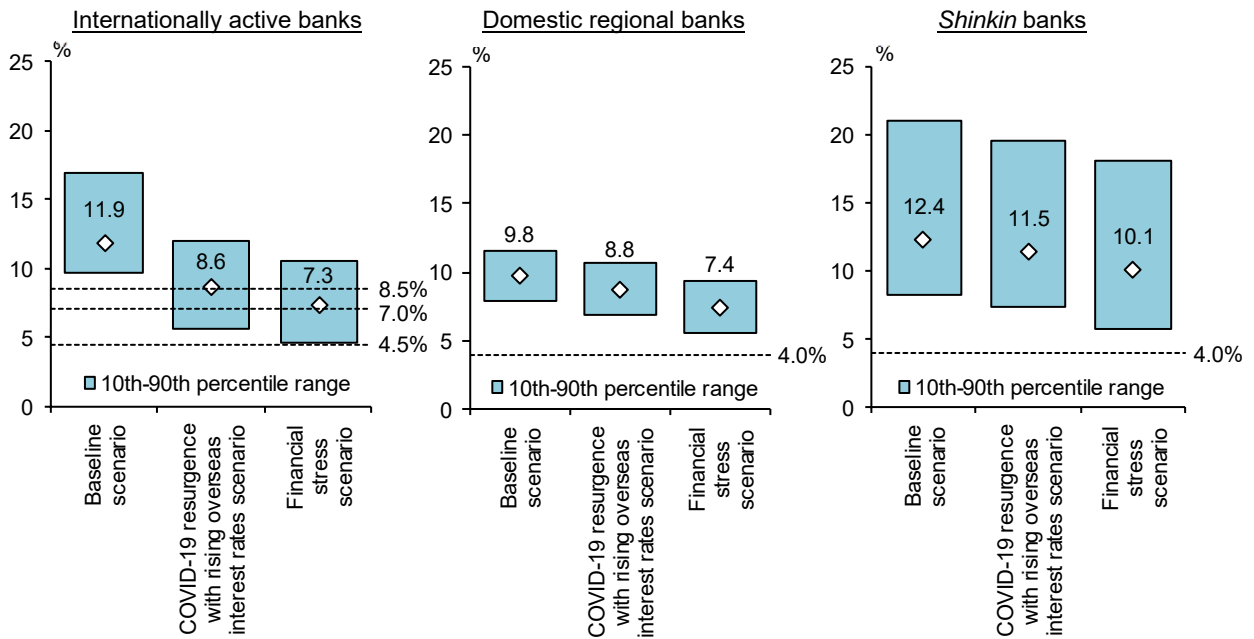
Source: Federal Reserve Bank of Chicago; OECD; Refinitiv Lipper.

Macro stress testing

Based on the risk recognition outlined above, this *Report* conducts macro stress testing using two downside scenarios. Assumed scenarios and the results of the analysis are as follows (Chart 15).

- "COVID-19 resurgence with rising overseas interest rates scenario": The scenario assumes that the domestic and overseas economies are hit by an adverse shock caused mainly by a resurgence in the pandemic and the resultant supply constraints. It also assumes that a simultaneous rise in U.S. long-term interest rates pushes down the real economy further, particularly in emerging economies, which have been susceptible to pressure for capital outflows, and leads to an adjustment in global financial markets. Capital adequacy ratios on average remain above regulatory levels for all types of banks, although the increase in credit costs and the decline in pre-provision net revenue (PPNR) excluding trading income, as well as realized losses on securities holdings due to the decline in stock and bond prices, contribute to pushing down the ratios.
- "Financial stress scenario": The scenario assumes a situation in which global financial markets experience a substantial and rapid adjustment comparable to that during the GFC, which has a negative impact on financial intermediation activities, putting further downward pressure on the domestic and overseas economies. This scenario is the most severe of the scenarios in this *Report*. Capital adequacy ratios are lower than in the "COVID-19 resurgence with rising overseas interest rates scenario" for all types of banks due to the increase in credit costs and the larger decline in PPNR excluding trading income as well as the increase in realized losses on securities holdings. The CET1 ratio of a fair number of internationally active banks declines to a level that breaches the capital buffer ratios, which are set in the range of 7.0 to 8.5 percent for individual financial institutions.

Chart 15: Capital adequacy ratios (fiscal 2024) <Chart V-2-12>



Note: 1. The left-hand chart shows the CET1 capital ratios of internationally active banks. The middle and right-hand charts show the core capital ratios of domestic regional banks and *shinkin* banks. The transitional arrangements for domestic regional banks and *shinkin* banks are taken into consideration.
 2. Markers in the charts indicate the total of financial institutions for each type of bank.

Based on these results, the Bank assesses that Japan's financial system is likely to remain highly robust even in the case of a resurgence of COVID-19 and a simultaneous rise in U.S. long-term interest rates leading to an adjustment in the real economy and global financial markets. However, in the event of a substantial and rapid adjustment in global financial markets, a deterioration in financial institutions' financial soundness and the resultant impairment of the smooth functioning of financial intermediation could pose a risk of further downward pressure on the real economy.