

Highlights of the October 2021 *Financial System Report*

Japan's financial system has been maintaining stability on the whole, while COVID-19 continues to have a significant impact on economic and financial activity around the globe. In global financial markets, risk sentiment has remained favorable on the whole, and there have been continuing inflows of funds to the stock market and emerging market economies.

However, how much the pandemic will dampen the real economy at home and abroad and affect corporate financing and firms' debt repayment capacity remains uncertain. In addition, there is potential for an adjustment in global financial markets, depending on, for example, developments in U.S. long-term interest rates and the pandemic.

Based on the above observations, with a view to ensuring the stability of Japan's financial system, the following three risks warrant particular attention going forward: (1) an increase in credit costs; (2) a deterioration in gains/losses on securities investment; and (3) a destabilization of foreign currency funding due to the tightening of foreign currency funding markets, mainly for the U.S. dollar.

A. Risk of an increase in credit costs

As in the previous *Report*, this *Report* simulates financial conditions of small and medium-sized enterprises (SMEs) through fiscal 2023 using firm-level data (880 thousand SMEs are covered this time), focusing on the impact of COVID-19 on their probability of default (PD). The simulation assumes that the economy will recover in line with the average forecasts by market participants and incorporates economic developments after the release of the previous *Report* and heterogeneity in business performance across industries and firms. The results of the analysis are mostly unchanged from the previous *Report* as follows.

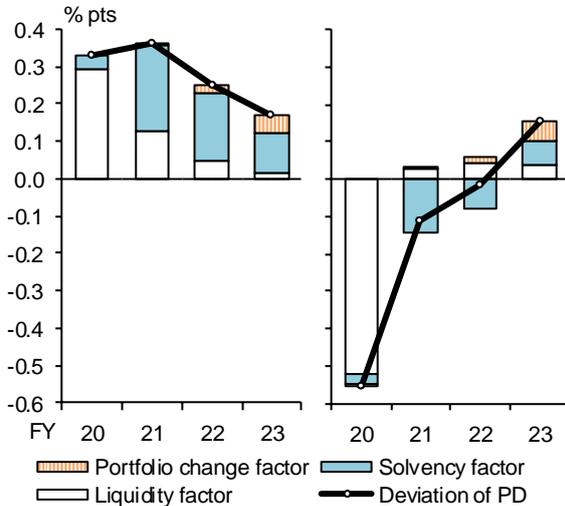
- The PD falls in fiscal 2020 because the shortage of firms' cash reserves ("liquidity factor" in Chart 1) is eased significantly by support measures such as cash payments and effectively interest-free loans.¹ A rise in the PD is more than offset in fiscal 2021 and 2022 as repayment of principal and interest payments for effectively interest-free loans are not required in these years ("solvency factor" in Chart 1). However, the PD rises modestly with the start of the interest payments of effectively interest-free loans in fiscal 2023 (Chart 1). By contrast, in the face-to-face services industry, the PD rises considerably from fiscal 2021, as profits are set to remain in severe condition at some firms (left panel of Chart 2).
- The simulation also suggests that firms with more vulnerable financial bases before the pandemic tend to see larger declines in their PD in fiscal 2020 (Chart 3). In the current crisis, on the back of large-scale support measures, firms, including those with such vulnerability, have been borrowing funds more proactively than during the global financial crisis (GFC) and have held what they borrowed in the form of cash reserves (Chart 4), reducing the PD in fiscal 2020. In fiscal 2023, however, as the recovery pace of firms is set to be moderate, the PD tends to be slightly higher for firms with more vulnerable financial bases before the pandemic (Chart 3).

These results suggest that, depending on the pace of economic recovery going forward, there will be an adverse impact on the quality of loans extended to firms that have been severely affected by the pandemic or those that had vulnerable financial bases before the pandemic.

¹ Based on announcements by the government until end-August 2021 (see Chart IV-1-8 in the main text for details).

Chart 1: Decomposition of the deviation of PD (all industries) <Chart IV-1-12>²

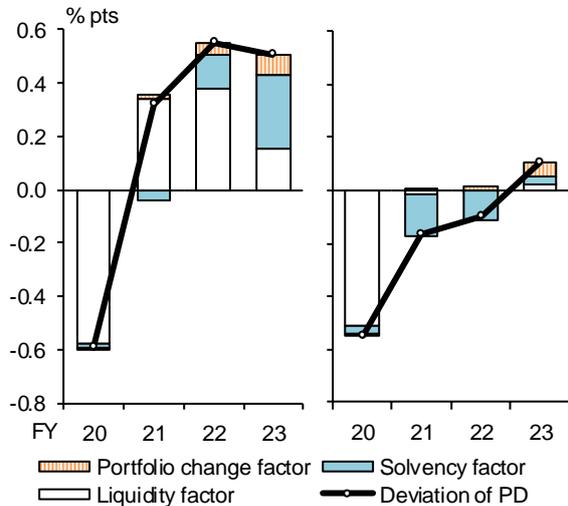
Without support measures With support measures



Note: The charts indicate the deviation of PD from the simulation without the COVID-19 outbreak (firms' profits are unchanged and precautionary loans are not obtained, etc.). The same applies to Charts 2 and 3.

Chart 2: Decomposition of the deviation of PD (by industry) <Chart IV-1-13>

Face-to-face services Other industries



Note: The charts show the simulation with the measures to support corporate financing.

Chart 3: Change in PD by the PD for fiscal 2019 <Chart IV-1-14>

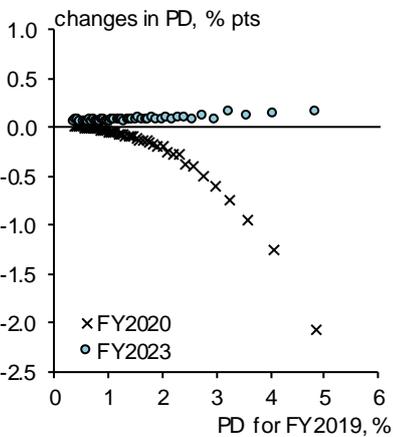
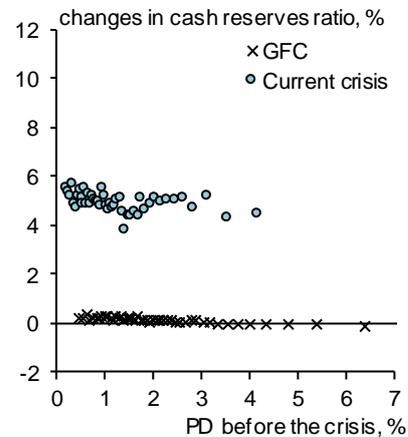


Chart 4: Change in cash reserves by PD before the crisis <Chart B1-5>



Note: Based on SMEs and all industries. With support measures. Changes in cash reserves ratio (right-hand chart) = (cash reserves at the end of the fiscal year - cash reserves at the beginning of the fiscal year) / total assets at the beginning of the fiscal year. The PD before the crisis indicates the estimated PD based on the financial results for fiscal 2019 for the "Current crisis" and for the one-year period from October 2007 to September 2008 for the "GFC." Firms are grouped into 2-percentile bins based on their PD. Source: CRD Association.

² The chart number in the angular brackets indicates that in the main text. The same applies to the subsequent charts.

B. Risk of a deterioration in gains/losses on securities investment

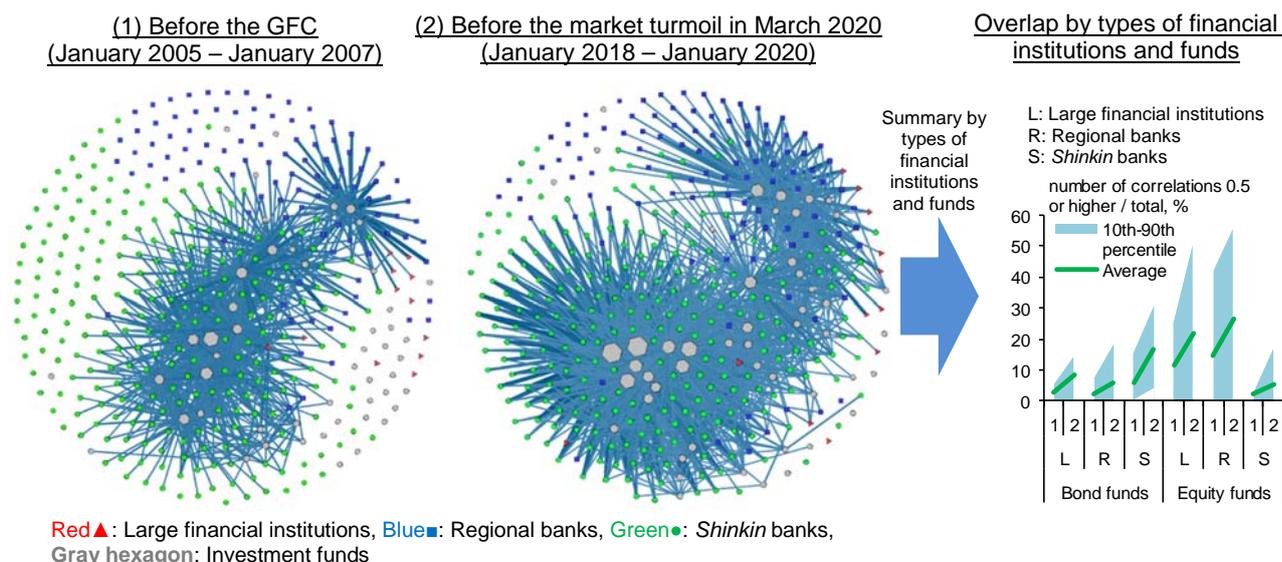
Japanese financial institutions have been actively investing in domestic and overseas credit products and investment trusts. Meanwhile, the role of foreign investment funds has become increasingly important in financial intermediation activities in the global financial system. Against the background of these changes, the previous *Report* pointed out the possibility that the interlinkage effects -- amplifications of changes in market values of securities portfolios held by Japanese financial institutions, triggered by foreign investment funds' transactions -- might be growing in recent years.

This *Report* analyzes the interlinkage effects, this time focusing on the degree of overlap between Japanese financial institutions' and investment funds' securities portfolios at the level of about 360 financial institutions, as well as about 50 types of investment funds that are aggregated by investment region and product. The degree of overlap is computed as the correlation of market values of securities portfolios between each financial institution and investment fund and represents the similarity of their securities portfolios, constituting the key component of the interlinkage effects. The main results are as follows.

- The overlap between Japanese financial institutions and investment funds generally increased from the period before the GFC to the period before the market turmoil in March 2020 (left and middle panels of Chart 5). The increase in the degree of overlap with bond funds is pronounced at *shinkin* banks and that with equity funds is pronounced at large financial institutions and regional banks (right panel of Chart 5).
- During the March 2020 market turmoil, financial institutions that saw a larger decline in market values of the securities portfolios were those that exhibited a higher degree of overlap with investment funds before the turmoil. Financial institutions with a higher degree of overlap with investment funds generally see a larger change in the market value of their securities portfolios in response to changes in key drivers of global market conditions, such as in the U.S. long-term interest rate and fund redemption rate.

The results suggest that the impact of market shocks in global financial markets on Japanese financial institutions' securities portfolios may be amplified by the actions of investment funds, etc., and that the impact may extend over a wide range of financial institutions simultaneously.

Chart 5: Portfolio overlap between Japanese financial institutions and investment funds
 <Charts IV-3-6, IV-3-7>



Note: A line is drawn when the overlap between a financial institution's securities portfolio and AUM (assets under management) of an investment fund is high (i.e. correlation of price changes is 0.5 or higher). Shapes are larger the more they are connected.

Source: EPFR Global; Haver Analytics; BOJ.

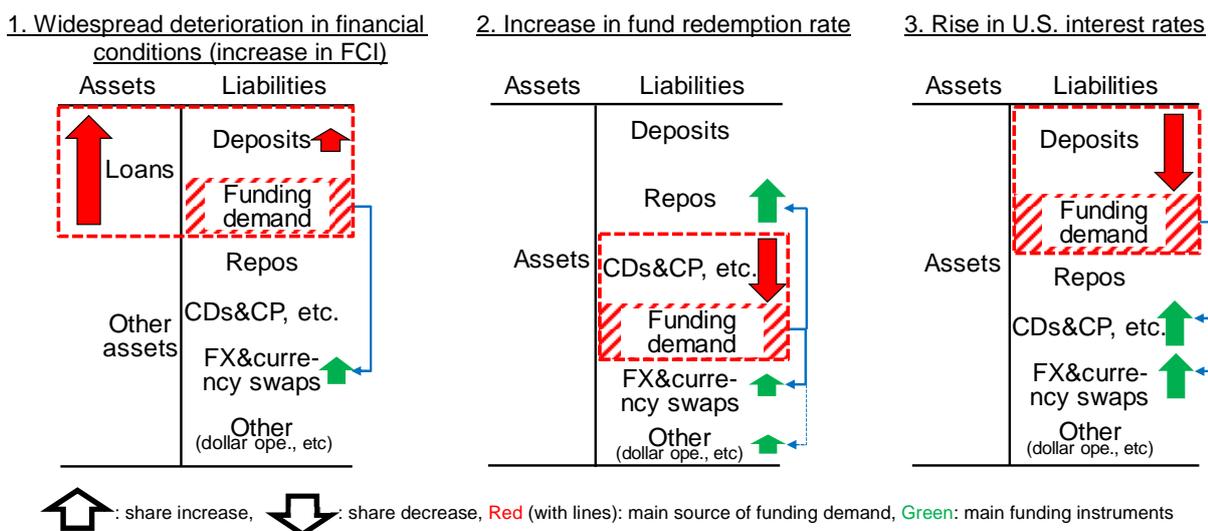
C. Risk of a destabilization of foreign currency funding

During the GFC and at the time of the market turmoil in March 2020, Japanese financial institutions saw difficulties in foreign currency funding. The two crises are characterized by (1) an increase in reliance on market funding as a result of an increase in lending in foreign currency that was not fully met by a corresponding increase in deposit funding in foreign currency, and (2) a decrease in reliance on CDs and CP and a shift to other market funding instruments.

This *Report* estimates how changes in global financial markets are translated into changes in the composition of foreign currency funding instruments and the funding rates of Japanese financial institutions using long-term time-series data on Japanese banks' foreign currency funding and granular transaction-level data on U.S. dollar funding. The main results are as follows.

- Three key drivers of global financial markets -- FCI,³ fund redemption rate, and the U.S. interest rate -- in total account for an important portion of variations in the share of foreign currency funding instruments, explaining, for example, about 70 to 80 percent of the variations in the share of deposits or interbank funding of major banks. The transmissions of these drivers differ. First, in the case of a worsening of FCI, increases in deposits cannot fully cover increases in lending, resulting in a larger share of FX and currency swap funding. Second, a rise in the fund redemption rate leads to a shift from CDs, CP, and similar instruments to repo and short-term FX and currency swap funding. Third, a rise in U.S. interest rates leads to a shift from deposits to market funding instruments (Chart 6).

Chart 6: Impact of changes in global market conditions on foreign currency funding instruments
<Chart IV-4-4>



Note: This figure summarizes the estimation results of Chart B3-2 in the main text. The up (down) arrows represent share increases (decreases) and the length of the arrows represents the degree of impact.

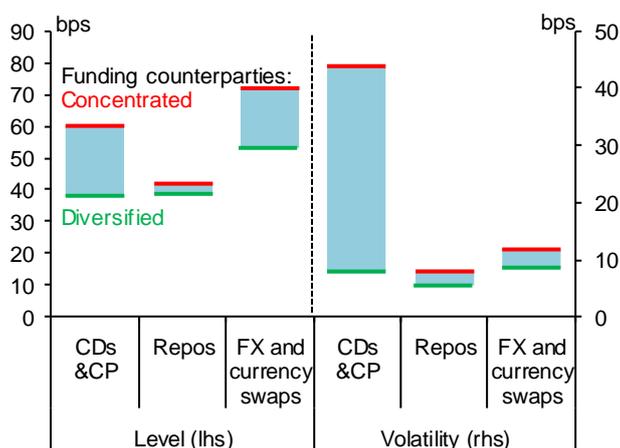
- A rise in the fund redemption rate pushes up the level of the funding rates of CDs and CP, as well as FX and currency swaps, and increases the volatility of the funding rates of CDs and CP, repos, as well as FX and currency swaps.

³ The FCI (financial conditions index) captures the impact of a widespread deterioration in financial conditions. The analysis uses the FCI (Chicago Fed National Financial Conditions Risk Subindex) 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.

- Financial institutions with a larger number of funding counterparties -- those that supply U.S. dollars to them -- tend to face funding rates with lower levels and lower volatility (Chart 7). Financial institutions with more transaction accounts tend to see a more gradual shift from deposits to market funding when the U.S. interest rate rises (Chart 8).

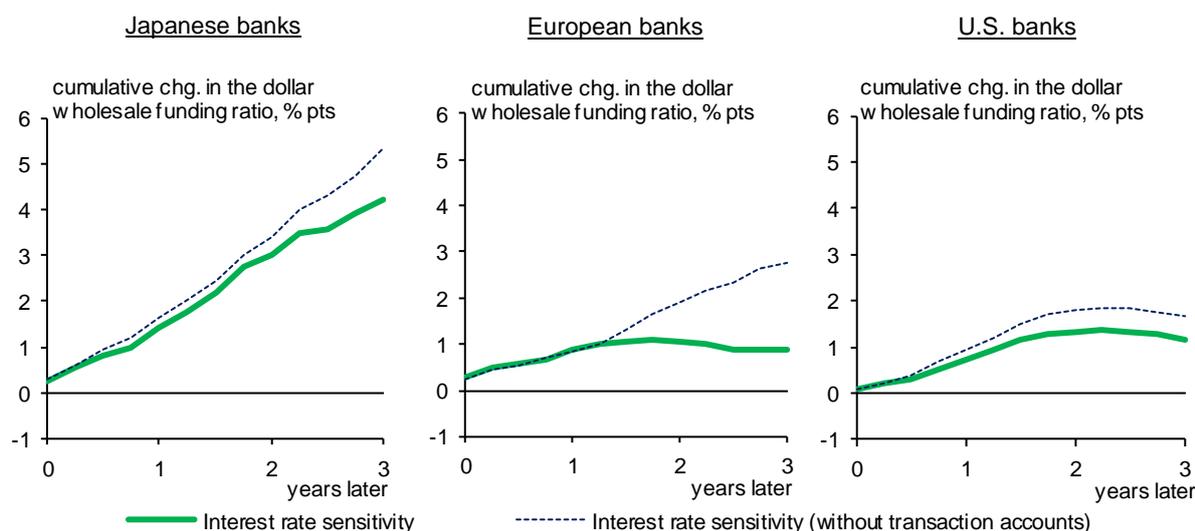
In addition to improvements in the liquidity risk management, Japanese banks have been pushing forward with acquiring transaction accounts and diversifying counterparties of market funding. The results above underscore the importance of continuing with such efforts.

Chart 7: Impact of diversification of funding counterparties on funding rates



Note: 1. This figure summarizes the estimation results of Charts B3-5 and B3-6 in the main text. The impact on CDs, CP and repos is estimated by using roughly 200 thousand individual transaction samples, while about 10 thousand samples are used for FX and currency swaps.
 2. "Diversified" shows that the number of funding counterparties is infinity, and "Concentrated" shows that the number of counterparties is one.
 3. Signs of U.S. dollar funding premiums in cross-currency basis swaps are reversed.
 Source: Bloomberg; Crane Data; FRB; FSA, "OTC Derivative Transaction Data"; Haver Analytics; ICI.

Chart 8: Effects of transaction accounts on interest rate sensitivity of dollar wholesale funding
 <Chart B3-7>



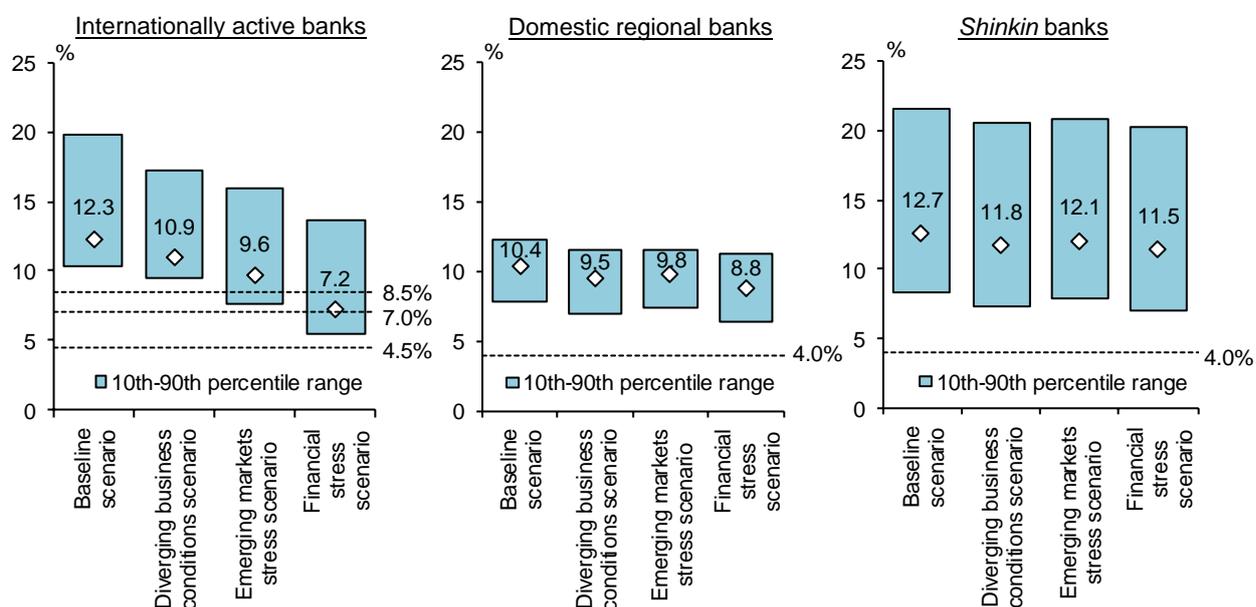
Note: 1. Each figure represents the cumulative change in the dollar wholesale funding ratio in response to a 1 percentage point rise in the U.S. interest rate. The U.S. interest rate is 3-month, the estimation period is from the January-March quarter of 1992 to the January-March quarter of 2021, and the sample size is about 930 thousand. "Japanese banks" and "European banks" represent branches in the U.S.
 2. The transaction account ratio is the ratio of transaction account deposits to total deposits.
 3. The wholesale funding ratio is the ratio of dollar funding through CDs and CP as well as repos to total dollar funding.
 Source: Bloomberg; FDIC; Federal Reserve Bank of Chicago.

Macro stress testing

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

- **Diverging business conditions scenario:** It is assumed that there is a resurgence of COVID-19, putting downward pressure on the real economy with diverging business conditions across and within industries. Capital adequacy ratios on average remain above regulatory levels for all types of banks, although the increase in credit costs contributes largely to pushing down the ratios for domestic regional banks and *shinkin* banks, which extend a large amount of loans to industries that are susceptible to the pandemic.
- **Emerging markets stress scenario:** It is assumed that there is an adjustment in global financial markets and that growth in the real economy decelerates at home and abroad, particularly in emerging economies, both triggered by a rise in the U.S. long-term interest rate. Capital adequacy ratios on average remain above regulatory levels for all types of banks, although the negative contributions of credit costs and of unrealized gains/losses on securities holdings are sizable for internationally active banks.
- **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. Capital adequacy ratios are lower than in the other downside scenarios for all types of banks due to further increases in credit costs and 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 9: Capital adequacy ratios (fiscal 2023) <Chart V-2-11>



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 event of, for example, a resurgence of COVID-19 or an adjustment in global financial markets and emerging economies due to a rise in U.S. long-term interest rates. 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.