



Summary

October 2021
Bank of Japan



Motivations of the October 2021 issue

- **Domestic credit risk**: this *Report* presents a simulation of the impact of the pandemic on SMEs' probability of default (PD) through a change in liquidity and solvency, in consideration of **heterogeneity among individual firms' profits**. This *Report* also analyses the funding behavior and the medium-term developments in the PD of **firms with vulnerable financial bases before the pandemic**.
- **Securities investment risk**: this *Report* **measures the degree of portfolio overlap at the level of individual financial institutions (FIs) in Japan and investment funds** by investment product and region, and examines the impact of this overlap on the transmission of market shocks.
- **Foreign currency funding risk**: this *Report* examines the impact of adjustment in global financial markets on Japanese FIs' foreign currency funding instruments and funding rates, based on the event study including of the global financial crisis (GFC) and the market turmoil in March 2020. In the analysis, **the nature of changes in global market conditions and the difference of the characteristics of foreign currency funding profiles for individual FIs** are taken into account.
- **Macro stress testing**: the resilience of Japan's FIs and financial system is examined under three downside scenarios.

Executive summary

Current assessment of the stability of Japan's financial system

- 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 at home and abroad.
- The Japanese government and the Bank of Japan, in close cooperation with overseas authorities, swiftly implemented large-scale fiscal and monetary policy measures and took flexible regulatory and supervisory actions to support economic activity and maintain the functioning of financial markets. Firms that are significantly affected by the pandemic experience funding difficulties. However, underpinned by the financial soundness of FIs on the whole, the policy responses have been effective and the financial intermediation function is being fulfilled smoothly. In financial markets, with risk sentiment remaining favorable on the whole, there have been continuing inflows of funds to the stock market and emerging market economies.

Future risks and caveats

- Japan's financial system is likely to remain highly robust even in the case of future resurgence of COVID-19 or 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 FIs' 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. In this regard, the following three risks warrant particular attention: (1) an increase in credit costs due to a delay in economic recovery at home and abroad; (2) a deterioration in gains/losses on securities investment due to substantial adjustments in financial markets; and (3) a destabilization of foreign currency funding due to the tightening of foreign currency funding markets.
- Even after the pandemic subsides, it is likely that the low interest rate environment and structural factors will continue to exert downward pressure on FIs' profits. Against this backdrop, attention should be paid to the risk of a gradual pullback in financial intermediation, or on the contrary, to the possibility that the vulnerability of the financial system increases, mainly as a result of FIs' search for yield behavior.

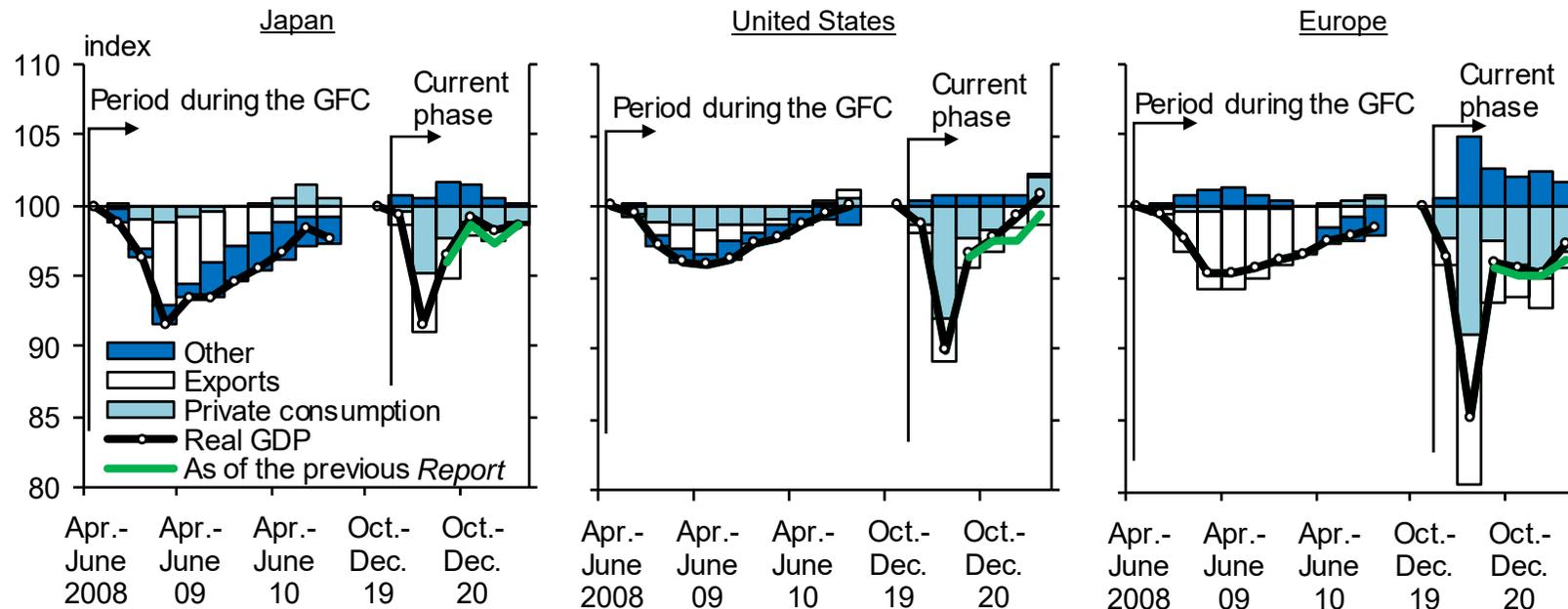
Contents

- 1 . Introduction
- 2 . Domestic credit
- 3 . Overseas credit
- 4 . Securities investment
- 5 . Foreign currency funding
- 6 . Macro stress testing

Developments in GDP in Japan, the U.S., and Europe

- Due to the spread of COVID-19, domestic and overseas economies experienced a significant downturn in the first half of 2020.
- Thereafter, the Japanese and European economies have generally recovered in line with the average forecasts by research institutions and markets at the time of the previous *Report* and the pace of recovery in the U.S. economy has been faster than forecasted.

Chart IV-1-1: GDP levels in current phase and during GFC



Note: Indexation with the real GDP in the April-June quarter of 2008 is set at 100 for the period during the GFC and that in the October-December quarter of 2019 is set at 100 for the current phase. "As of the previous *Report*" indicates the average forecasts of professionals and markets in March 2021.
 Source: BEA; Cabinet Office; Eurostat; IMF; Japan Center for Economic Research, "ESP forecast."

Firms' sales forecasts and financial positions

- The sales of large firms for fiscal 2021 are expected to recover to a level comparable to that in fiscal 2019. SMEs' pace of recovery is expected to be moderate.
- The pace of recovery in the transportation and postal services as well as face-to-face services industries is expected to be sluggish. Heterogeneity across firms within the face-to-face services industry will remain high.
- The DI of financial positions generally has improved slightly, but many firms in the face-to-face services industry continue to regard their financial positions as "tight."

Chart IV-1-5: Sales changes by industry (from fiscal 2019)

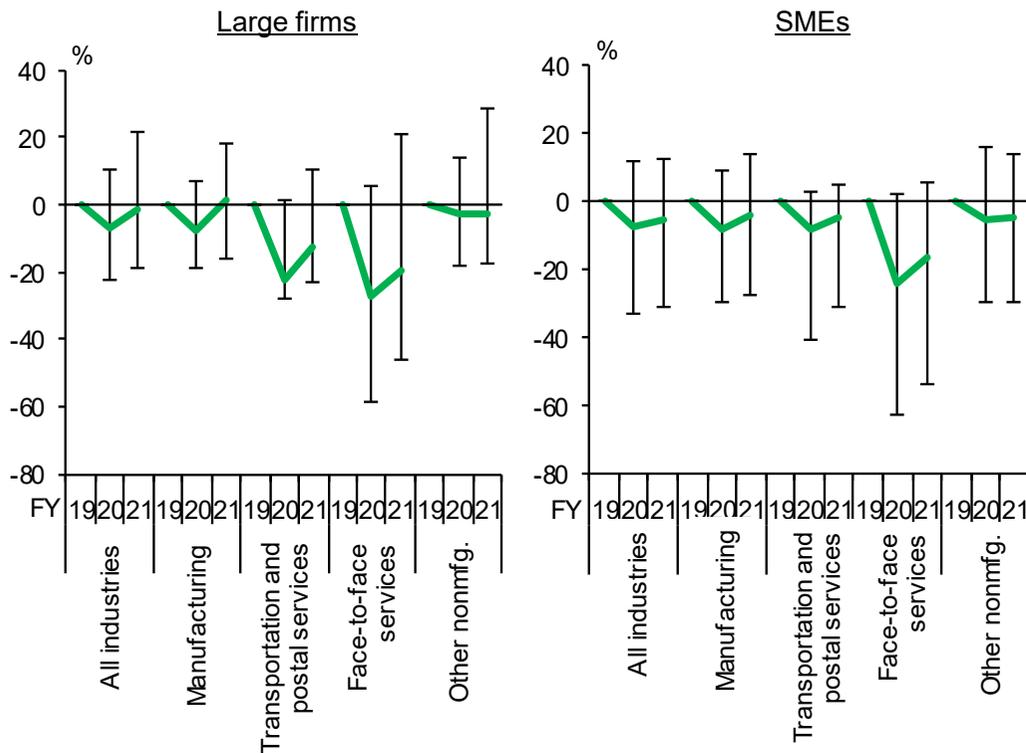
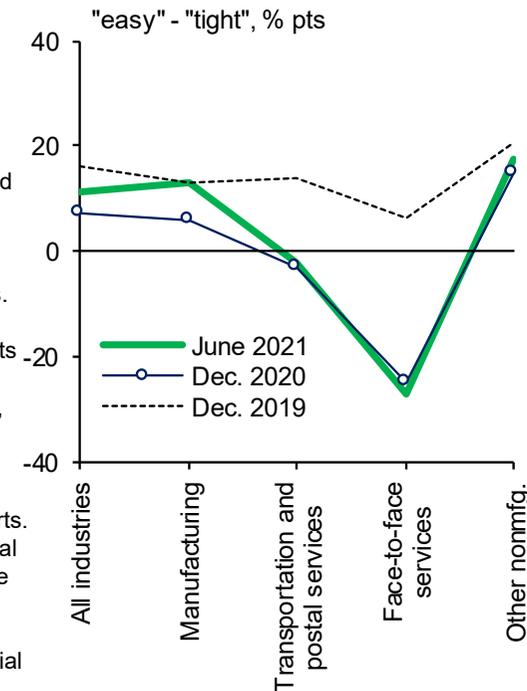


Chart IV-1-4: DI of financial positions (all firm sizes and by industry)



Note: 1. The solid lines indicate weighted averages. The bands indicate 10th-90th percentile points.
 2. "Face-to-face services" consists of food, accommodation, and consumer services. The same applies to subsequent charts.
 3. The data for fiscal 2021 indicate the forecasts.

Source: Nikkei Inc., "NEEDS-Financial QUEST"; BOJ, "Tankan."

Note: The figures for "Face-to-face services" and "Other nonmfg." are weighted averages by the number of firms that responded to the question in each industry.
 Source: BOJ, "Tankan."

Funding conditions of firms

- SMEs that experienced a larger decline in operating cash flow tend to increase their funding to a greater degree. This pattern is more pronounced during the current crisis, thanks to proactive measures to support corporate financing.
- During the current crisis, cash reserves have increased even among firms with negative operating cash flows. This may suggest that they are borrowing precautionary loans on the back of significant uncertainty.

Chart B1-2: Operating cash flow and amount of funding (all industries)

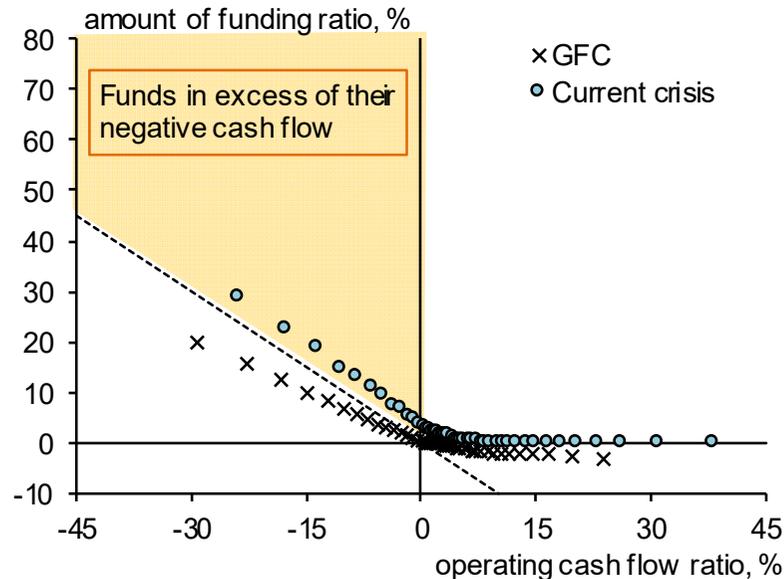
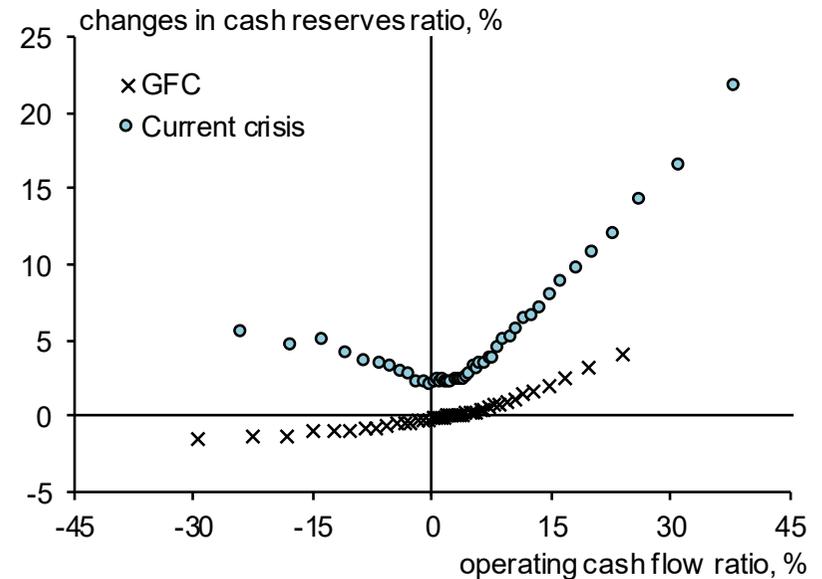


Chart B1-4: Operating cash flow and changes in cash reserves (all industries)



Note: 1. Left panel: Amount of funding ratio = (loans at the end of the fiscal year - loans at the beginning of the fiscal year) / total assets at the beginning of the fiscal year (the same applies to the left chart on page 11).

Right panel: Changes in cash reserves ratio = (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 same applies to the middle chart on page 11).

Operating cash flow ratio = operating cash flow / total assets at the beginning of the fiscal year.

2. Firms are grouped into 2-percentile bins based on their operating cash flow ratios. The dots represent the median values for each group.

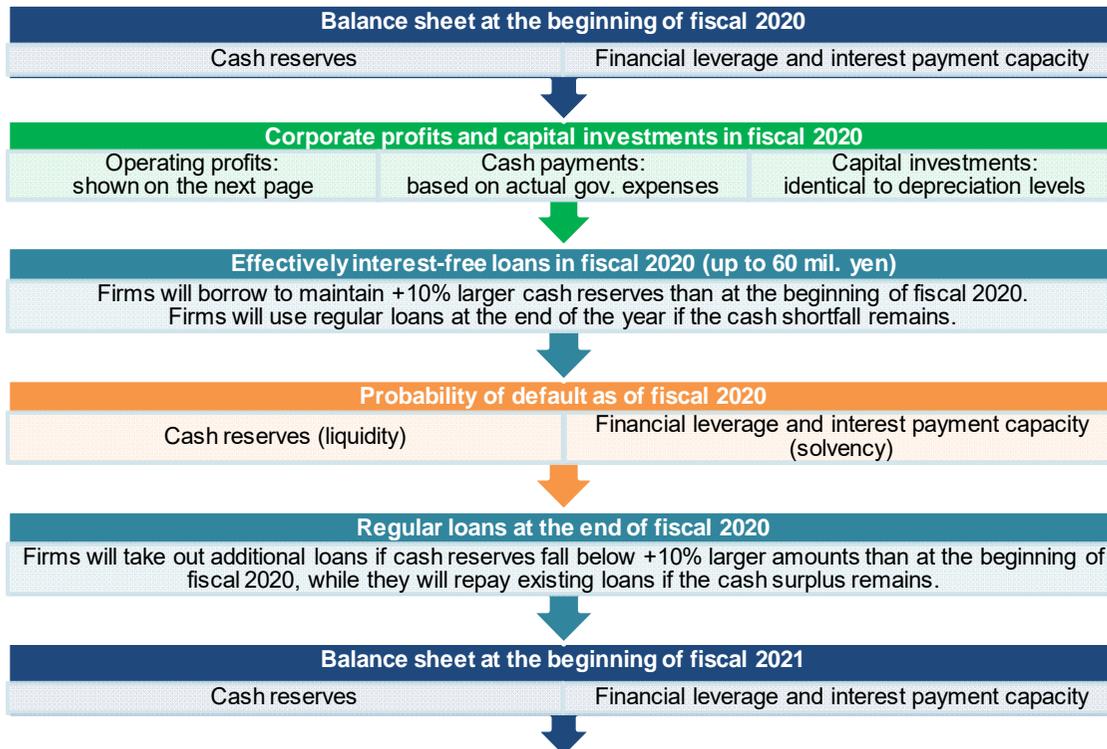
3. The data for the "Current crisis" cover the currently available financial results for fiscal 2020 and those for the "GFC" cover the financial results for the one-year period from October 2008 to September 2009.

Source: CRD Association.

Medium-term simulation on financial soundness and the PD of SMEs

- To examine the impact of changes in cash reserves (liquidity) as well as in debt repayment capacity (solvency) on the PD of SMEs, this *Report* conducts a medium-term simulation of the developments in about 880 thousand SMEs' profits and balance sheets through fiscal 2023.

Steps and assumptions for medium-term simulation



Repeat the steps above up to fiscal 2023
 (As the impact of COVID-19 wanes, the precautionary level of cash reserves is assumed to decline to +5% at the end of fiscal 2021 and 0% at the end of fiscal 2022 and 2023)

Trade-off between liquidity and solvency

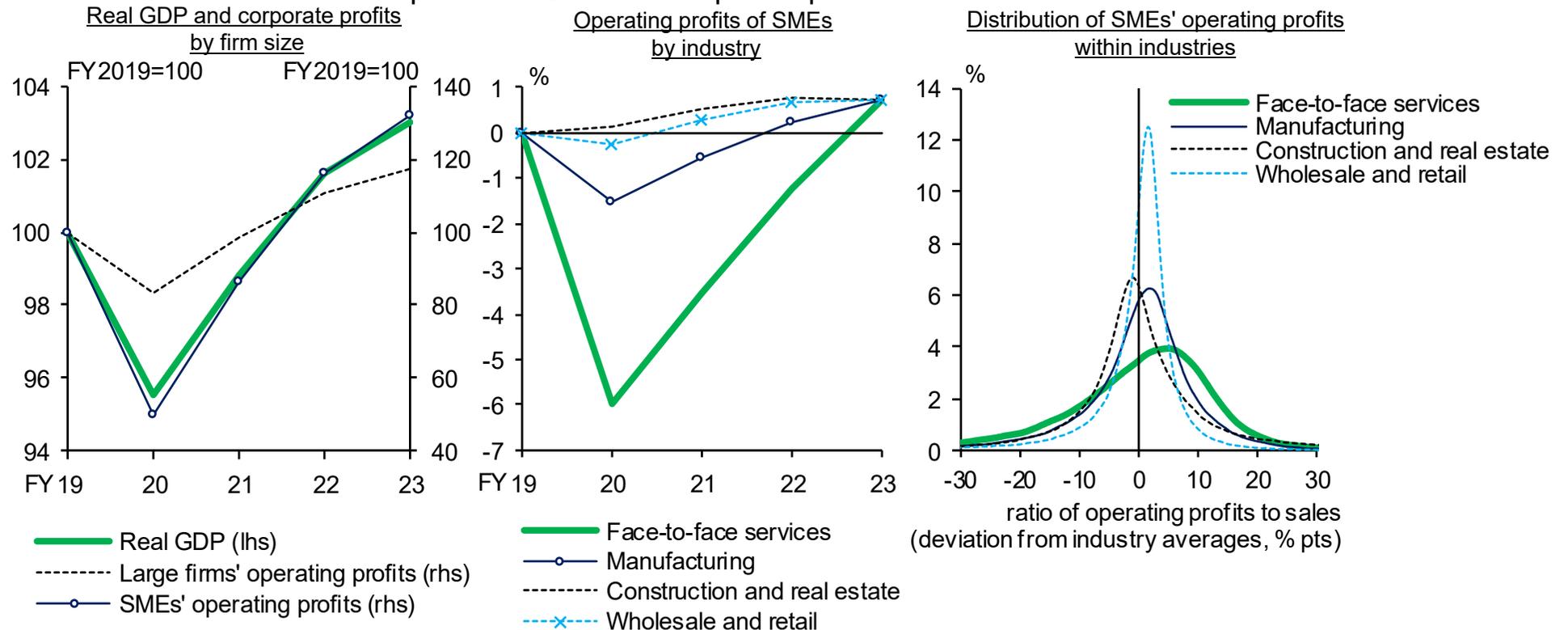
	Regular loans	Effectively interest-free loans	Cash payments
Cash reserves	↑	↑	↑
Debt repayment capacity	↓	Short term ↘	↑
		Medium term ↓	
Trade-off between liquidity and solvency			
	Yes	Short term Slightly Medium term Yes	No

↑: improve ↓: worsen ↘: somewhat worsen

Assumptions on corporate profits

- Individual firms' profits are estimated taking into account differences in firm sizes and industries, as well as heterogeneity among SMEs within the same industry.
- The estimates of aggregate corporate profits based on the future path of GDP and profits by firm size and industry are calculated using financial data of fiscal 2020.

Chart IV-1-7: Assumptions on GDP and corporate profits for medium-term simulation



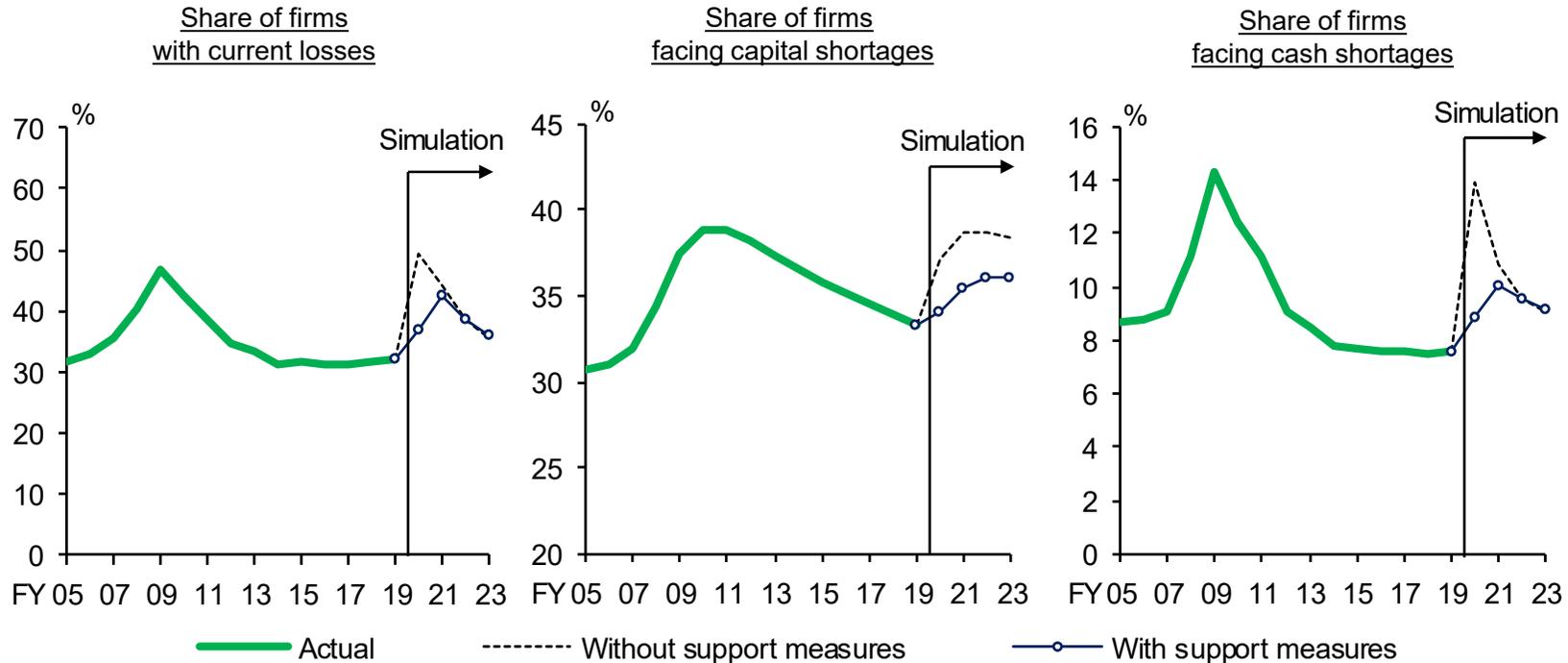
Note: The figures in the middle chart indicate changes in operating profits from fiscal 2019 as a percentage of sales in fiscal 2019. In the right chart, the horizontal axis indicates operating profits divided by sales in fiscal 2021.

Source: Japan Center for Economic Research, "ESP forecast"; Ministry of Finance, "Financial statements statistics of corporations by industry."

Simulation results: SMEs' financial conditions

- Without the support measures, the share of SMEs making losses would increase. With the support measures, the increase is contained significantly.
- Reflecting the outlook that the cash payments from the government decrease compared to fiscal 2020, and that profits recover only moderately, the share of SMEs making losses increases in fiscal 2021, even when the support measures are taken into account. The share of SMEs with capital or cash shortage remains high.

Chart IV-1-10: Simulation results



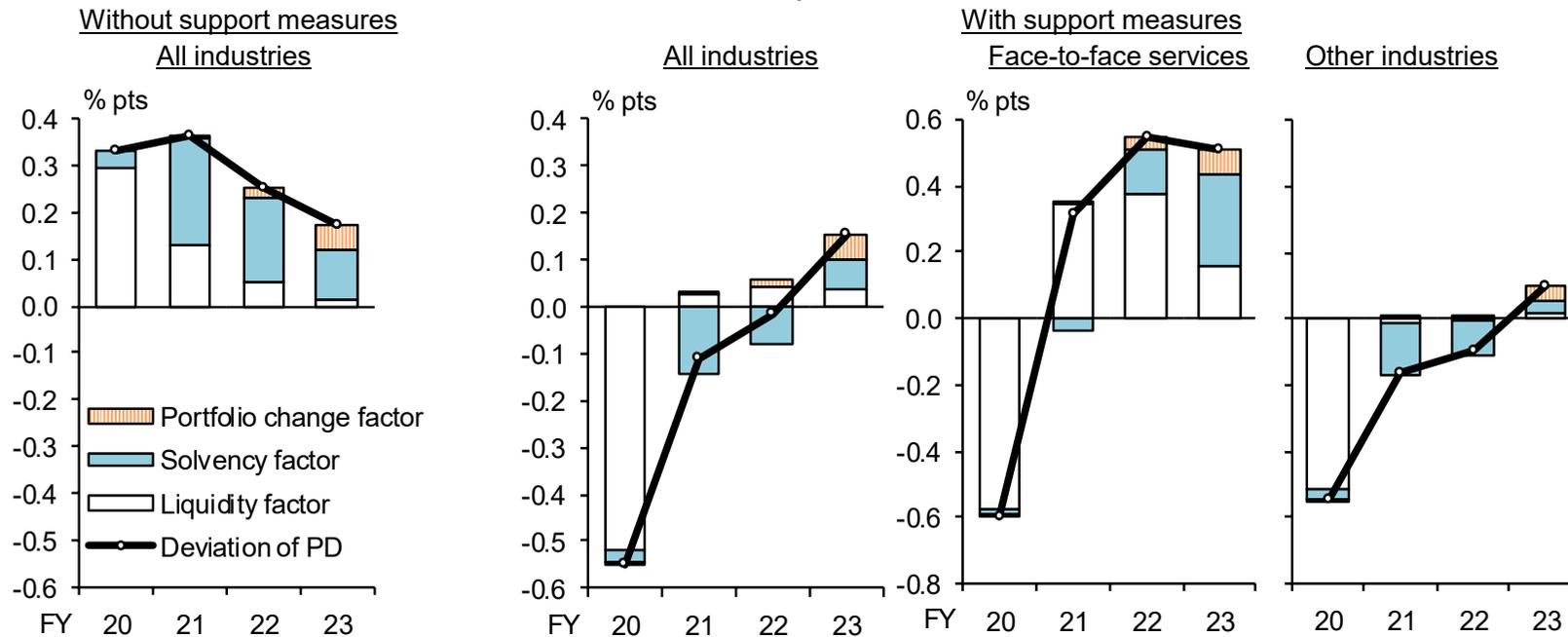
Note: Firms facing capital shortages are defined as firms whose (net assets at the beginning of the fiscal year) + (current profit) * (1 - the effective tax rate) is negative.
 Firms facing cash shortages are defined as firms whose net operating cash outflow during the year exceeds their cash reserves at the beginning of the fiscal year.
 Source: CRD Association.

Simulation results: SMEs' PD

- Without the support measures, the PD would increase substantially in fiscal 2020. Such an increase in the PD gradually becomes smaller thereafter, reflecting the recovery of corporate profits, but the deterioration in creditworthiness, led by the increase in borrowing, continues to push up the PD.
- With the support measures, the PD falls substantially in fiscal 2020 due to the increase in cash reserves. In fiscal 2023, when interest subsidies for effectively interest-free loans end, the PD slightly exceeds the simulated level without the outbreak of COVID-19 through an increase in interest payments.

The PD of the face-to-face services industry is pushed up considerably from fiscal 2021 under the assumption of the slow recovery in demand and the large heterogeneity across firms.

Charts IV-1-12,13: Decomposition of the deviation of PD

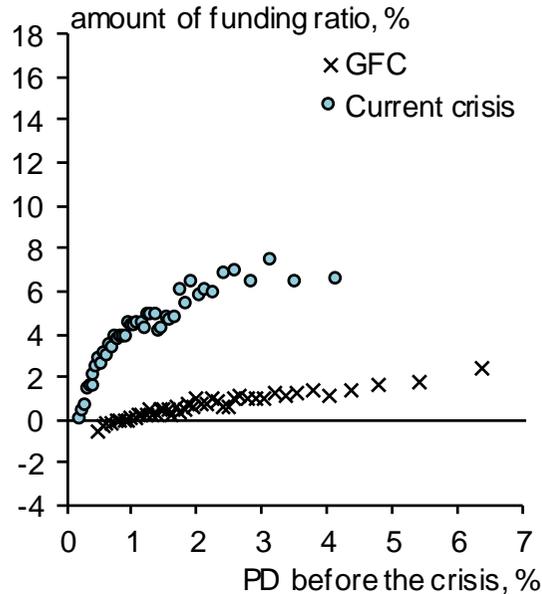


Note: The charts indicate the deviation of PD from the simulation without the COVID-19 outbreak (firms' profits are unchanged and precautionary loans are not obtained, etc.).

Funding behavior of firms with vulnerable financial bases before pandemic

- Firms with a higher PD before the outbreak of COVID-19 tend to obtain more funding after the outbreak. This leads to an increase in cash reserves.
- The PD for fiscal 2020 is contained to a larger degree for firms with a higher PD before the pandemic, thanks to the increase in cash reserves. However, the PD for these firms is estimated to become higher in fiscal 2023 due to the assumption about the moderate recovery in corporate profits.

Chart B1-3: Amount of funding by PD before the crisis



Note: 1. Based on all industries.

2. Firms are grouped into 2-percentile bins based on their PD before the crisis. The dots represent the median values for each group. 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."

Source: CRD Association.

Chart B1-5: Changes in cash reserves by PD before the crisis

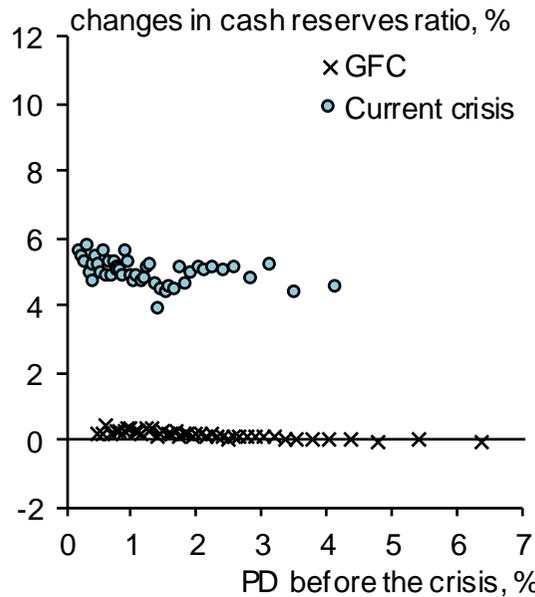
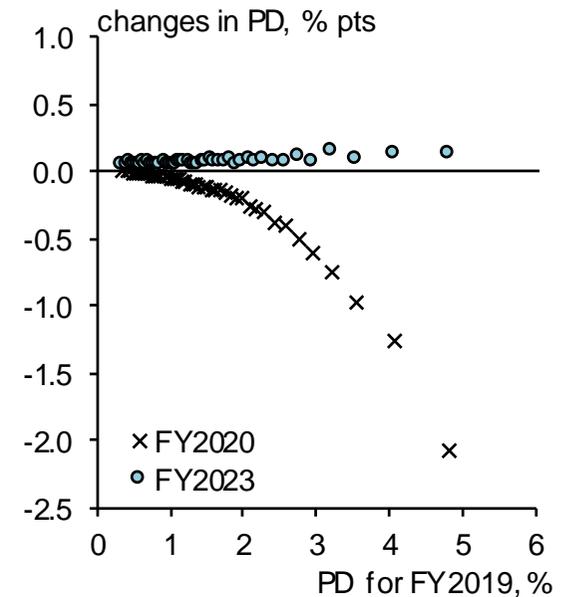


Chart IV-1-14: Changes in PD by the PD for fiscal 2019



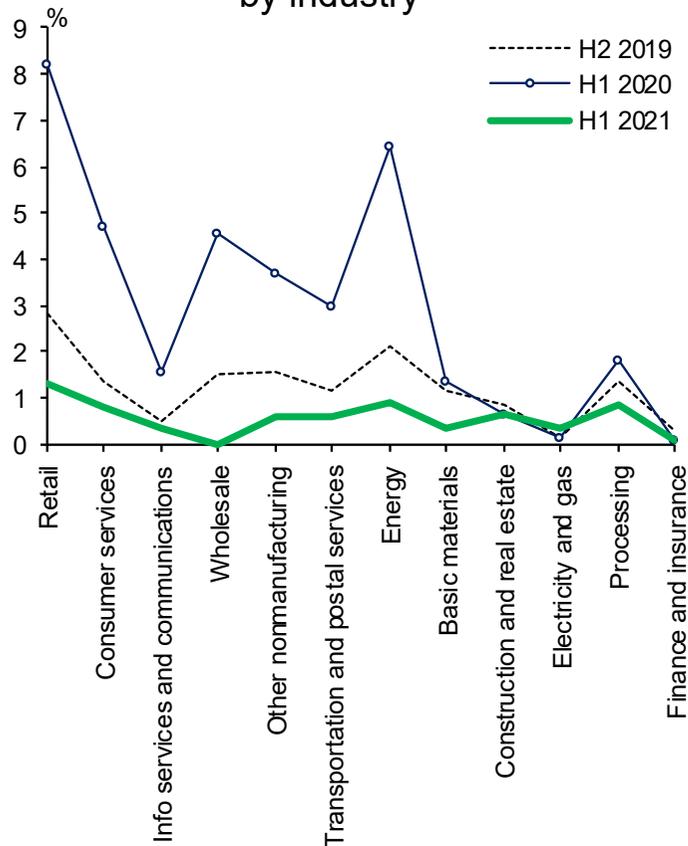
Note: 1. Based on all industries. With support measures.

2. Firms are grouped into 2-percentile bins based on their PD, which is estimated by the BOJ. The horizontal axes show the median values for each group and the vertical axes show the averages for each group.

Default rates of corporate bonds in overseas markets

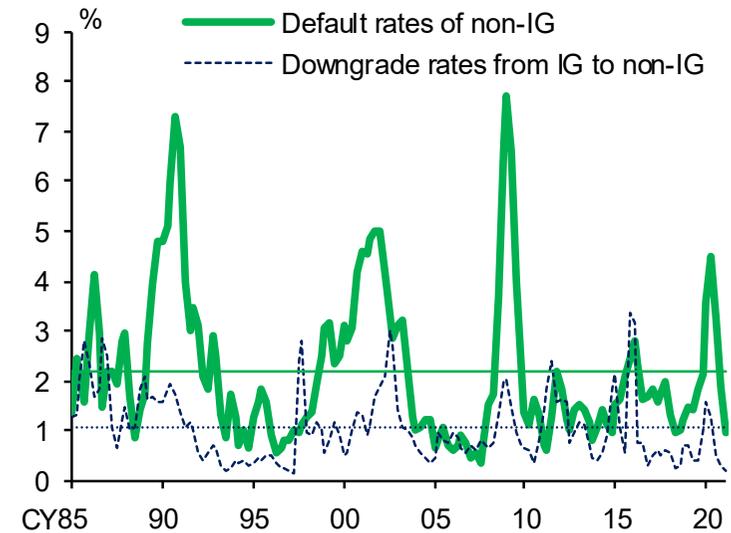
- Although the corporate bond default rates in overseas markets rose following the outbreak of COVID-19, especially in the retail and energy industries, they have declined to below pre-pandemic levels on the whole in the first half of 2021.
- The downgrade rate from investment grade (IG) to non-investment grade (non-IG) and the default rate of non-IG corporate bonds are now clearly below historical average levels.

Chart IV-2-1: Default rates of corporate bonds by industry



Note: 1. Default rates are on the issuer basis, including bond and loan issuers.
 2. Energy covers oil and natural gas development.
 Source: Moody's.

Chart IV-2-2: Default rates of corporate bonds

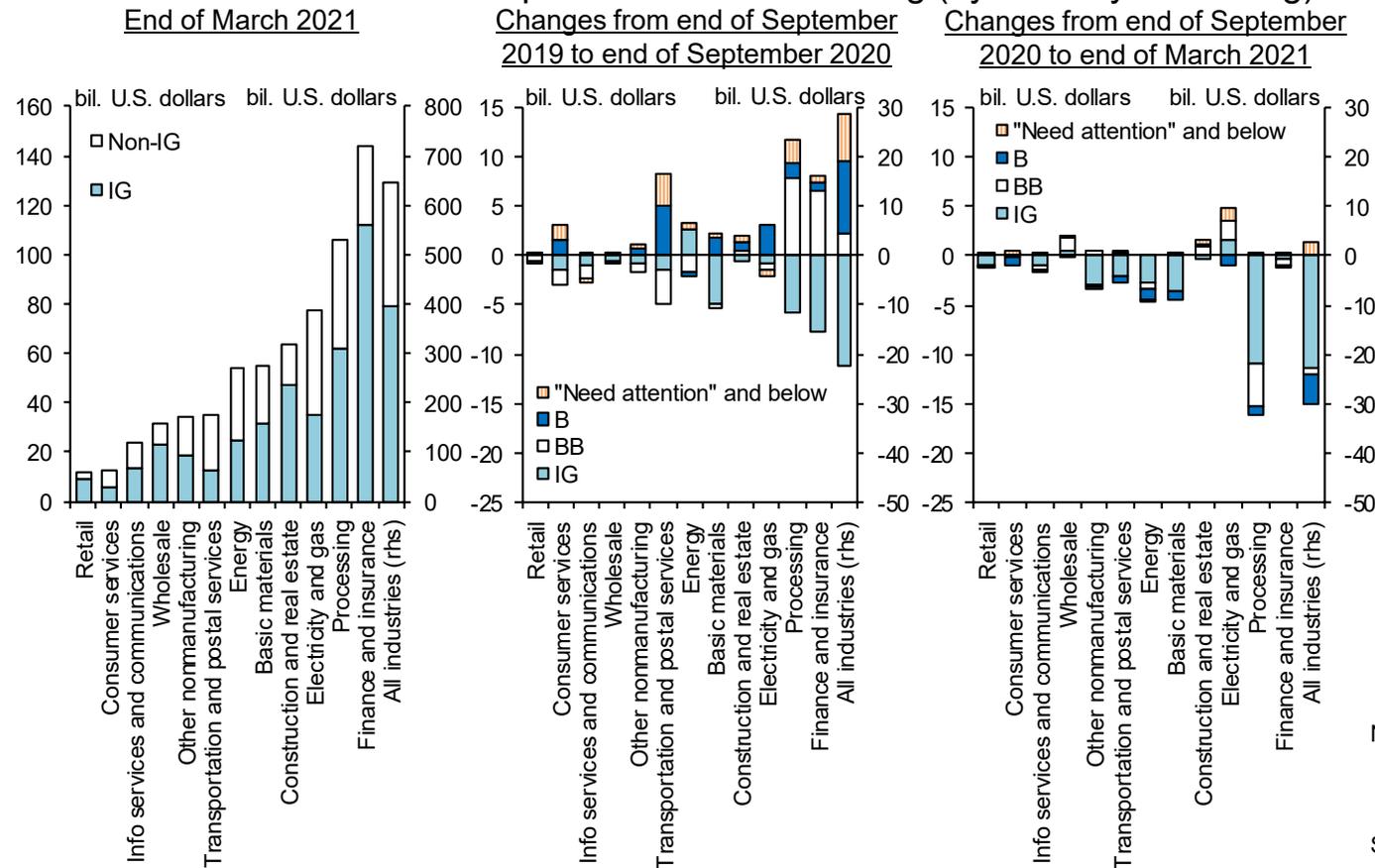


Note: 1. Default rates and downgrade rates are calculated quarterly for each 2-quarter long window on the issuer basis, including bond and loan issuers. Latest data as at January-June of 2021.
 2. The thin solid line and the thin dotted line indicate the historical averages of default rates and downgrade rates, respectively.
 Source: Moody's.

Overseas corporate loans outstanding

- The quality of Japanese banks' overseas corporate loan portfolios has remained high.
- Compared with before the pandemic, it has deteriorated for some industries, including the transportation and postal services as well as processing industries. There has not been any significant increase in non-IG loans outstanding recently.

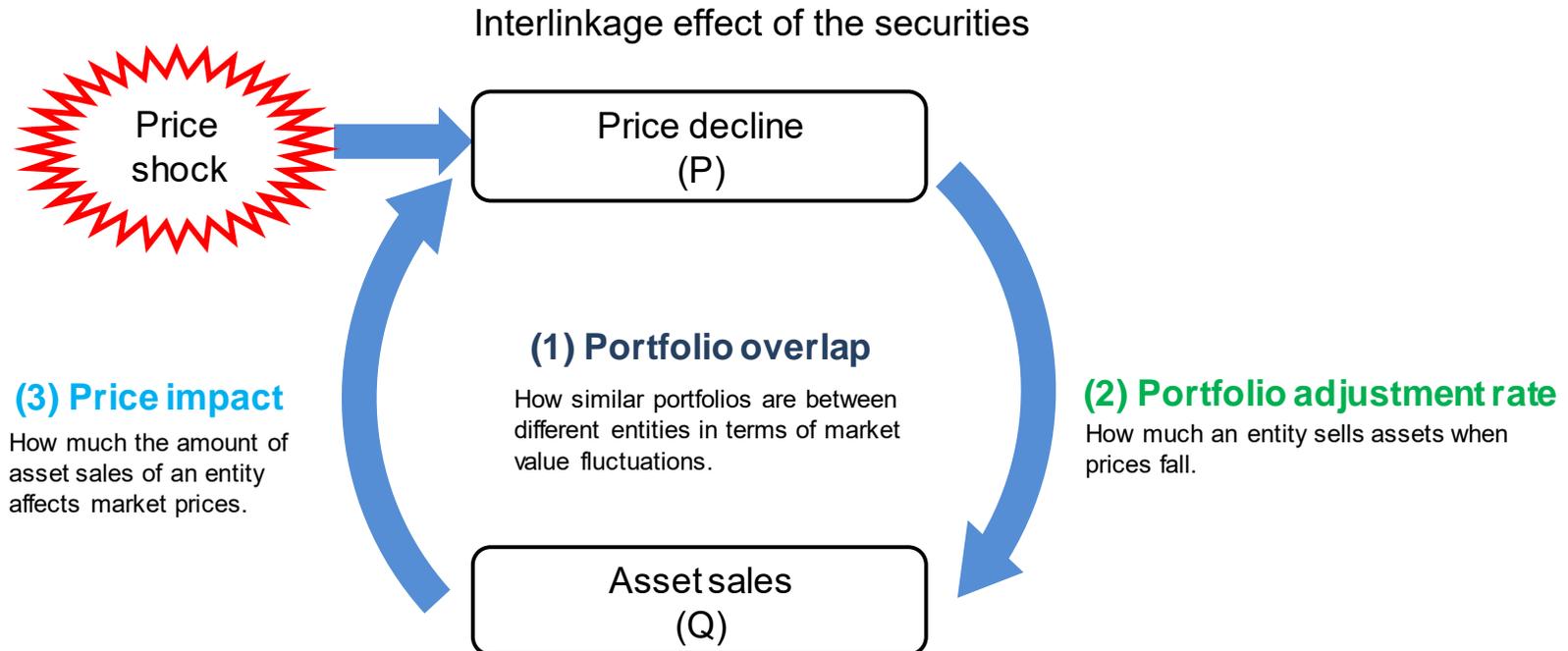
Chart IV-2-3: Overseas corporate loans outstanding (by industry and rating)



Note: 1. Covers the three major banks' lending.
 2. Energy covers oil and natural gas development.
 3. Based on internal rating of each banks.
 Source: BOJ.

Interlinkage effect of securities

- The "interlinkage effect" refers to the effect of an external shock to asset prices amplified and transmitted through transactions among each entity in the financial network. The degree of interlinkage effect depends mainly on (1) the degree of portfolio overlap, (2) the portfolio adjustment rate, and (3) the degree of price impact.
- The analysis in this *Report* (a) measures the degree of portfolio overlap between individual FIs in Japan and investment funds, (b) breaks the level of investment funds down by investment product and region, and (c) examines to what extent the degree of portfolio overlap amplifies the transmission of market shocks.



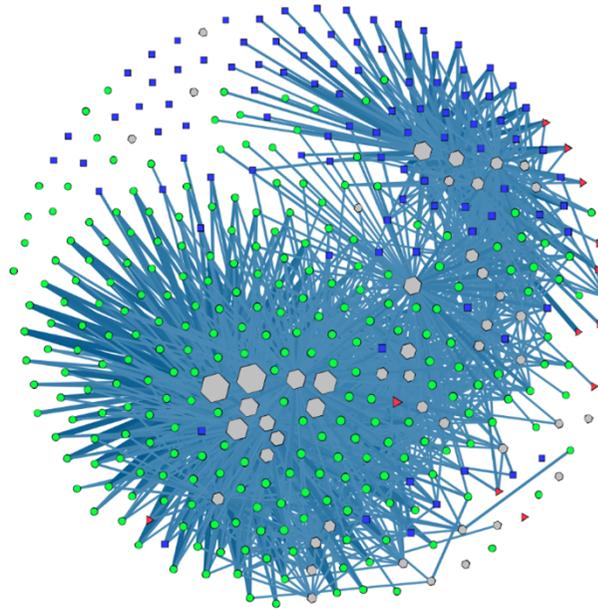
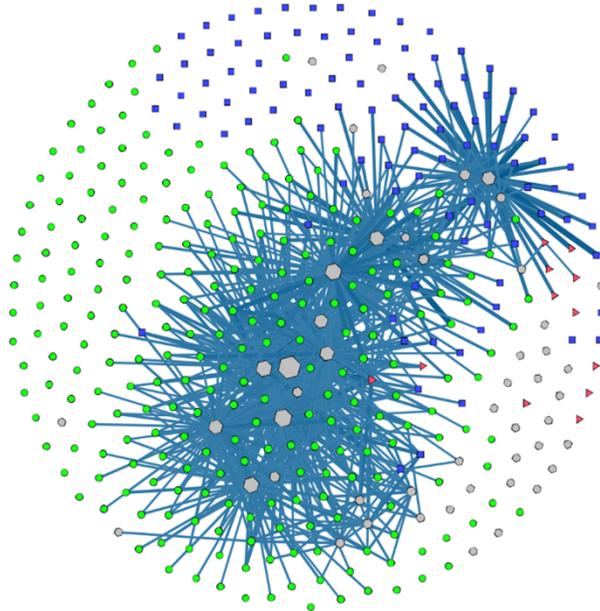
Secular changes in portfolio overlap

- The degree of portfolio overlap between individual FIs in Japan and investment funds by investment product and region is estimated in terms of the correlation of market values of the portfolios. The degree of portfolio overlap between the two just before the market turmoil in March 2020 was higher than before the GFC.

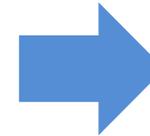
Charts IV-3-6,7: Portfolio overlap between Japanese financial institutions and investment funds

1: Before the GFC
(January 2005 – January 2007)

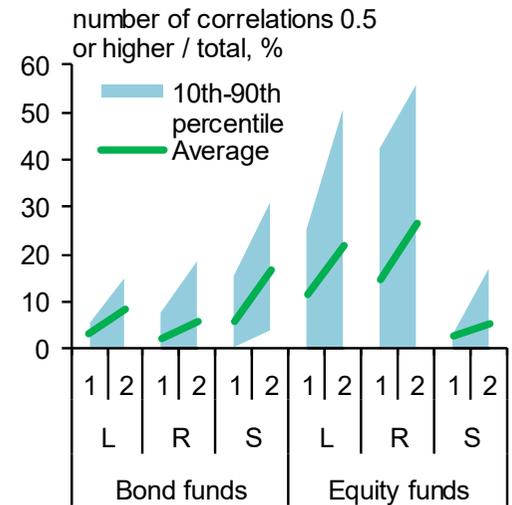
2: Before the market turmoil in March 2020
(January 2018 – January 2020)



Summary by types of FIs and funds



Overlap by types of financial institutions and funds



1: Before the GFC
2: Before the market turmoil in March 2020
L: Large financial institutions
R: Regional banks
S: Shinkin banks

Red▲: Large financial institutions, Blue■: Regional banks, Green●: Shinkin banks, Gray hexagon: Investment funds

Note: Gray hexagons indicate approximately 50 types of investment funds by investment region and product. 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.

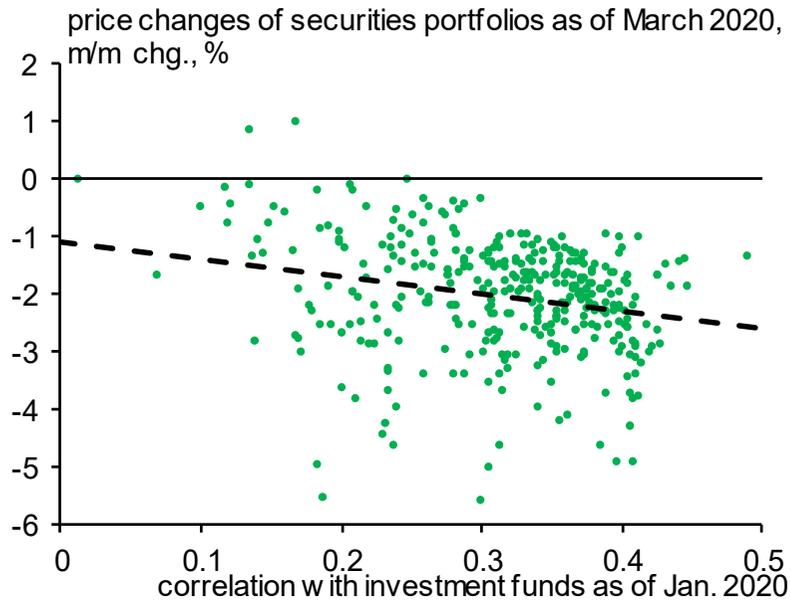
Note: "Before the GFC" and "Before the market turmoil in March 2020" periods are the same as in the left chart.

Source: EPFR Global; Haver Analytics; BOJ.

Portfolio overlap and transmission of market shocks

- In the March 2020 market turmoil, the higher an FI's overlap just before the turmoil, the larger the decline in the market value of the FI's securities portfolio tended to be.
- A deterioration in the market values of securities portfolios is significantly larger for FIs with a higher degree of overlap with investment funds for all factors causing market shocks.

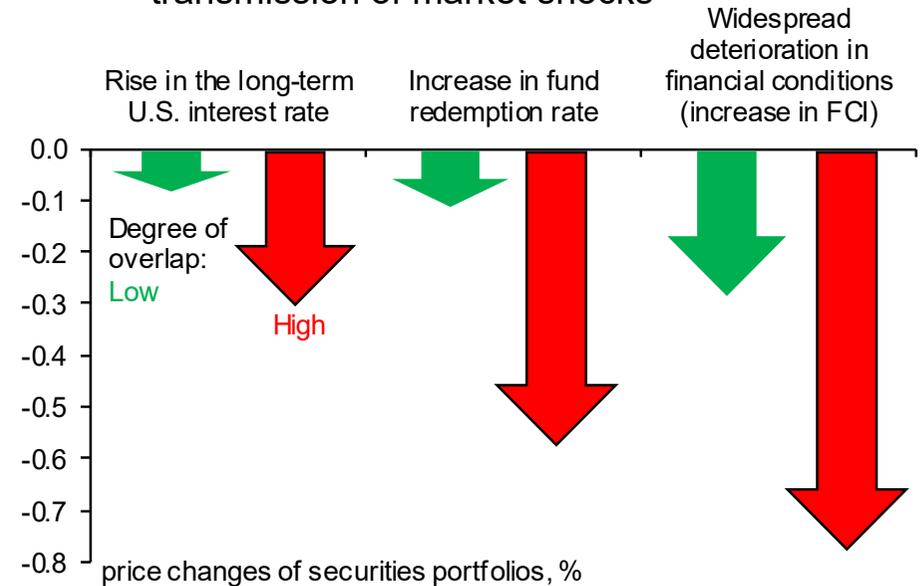
Chart IV-3-8: Portfolio overlap with investment funds and securities portfolio price changes in the March 2020 market turmoil



Note: Correlation with investment funds is calculated as the average across all bilateral correlations. The intercept and slope of the regression line are both statistically significant at the 1% level.

Source: EPFR Global; Haver Analytics; BOJ.

Portfolio overlap with investment funds and transmission of market shocks



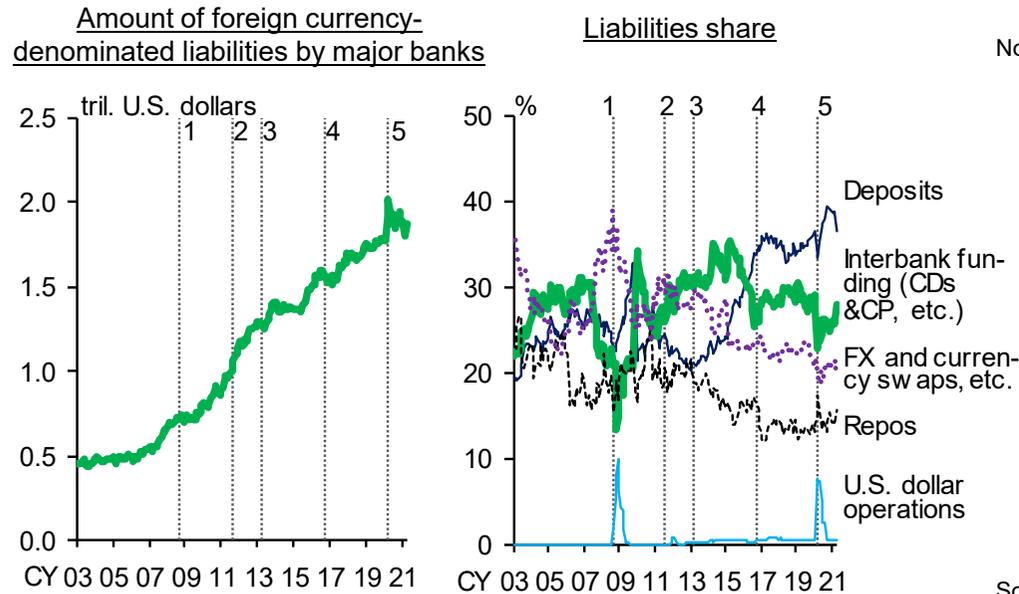
- Note: 1. This figure summarizes the estimation results of mainly Chart IV-3-9 in the main text.
 2. The length of arrows shows the impact of market shocks (rise in the U.S. interest rate: +0.6% pts <equivalent to the Taper Tantrum>; increase in fund redemption rate: +6% pts <the market turmoil in March 2020>; widespread deterioration in financial conditions: +1% pts <the GFC>), on price changes of securities portfolios. FCI represents the Financial Conditions Index.
 3. The high (low) degree of overlap with investment funds represents financial institutions with a correlation that is at least one standard deviation higher (lower) than the full-sample average.

Source: Bloomberg; EPFR Global; Federal Reserve Bank of Chicago; Haver Analytics; ICI; BOJ. 17

Event study of foreign currency-denominated balance sheets of major banks (1)

- Japanese major banks have been increasing foreign currency-denominated assets. Looking at the composition of their foreign currency funding, the share of deposits has been increasing over the medium to long term, indicating progress in building a stable funding basis.
- However, there were periods of stress in which large fluctuations in the composition were observed, such as the market turmoil in March 2020 and the GFC.
- The following analyses examine the impact of changes in global market conditions on major banks' funding conditions and assess their strategies for building a stable funding basis by using big data.

Chart B3-1: Event study of foreign currency-denominated balance sheets of major banks



Note: Covers internationally active banks among major banks (based on all currencies). The event lines represent 1: the GFC (September 2008), 2: the European debt crisis (August 2011), 3: the Taper Tantrum (April 2013), 4: the MMF reform (October 2016), and 5: the market turmoil in March 2020. "FX and currency swaps, etc." in the liabilities share includes corporate bonds. "U.S. dollar operations" represents mainly U.S. Dollar Funds-Supplying Operations. The same applies to subsequent charts. There are some discontinuities in the data around December 2009. Latest data as at April 2021.

Source: BOJ.

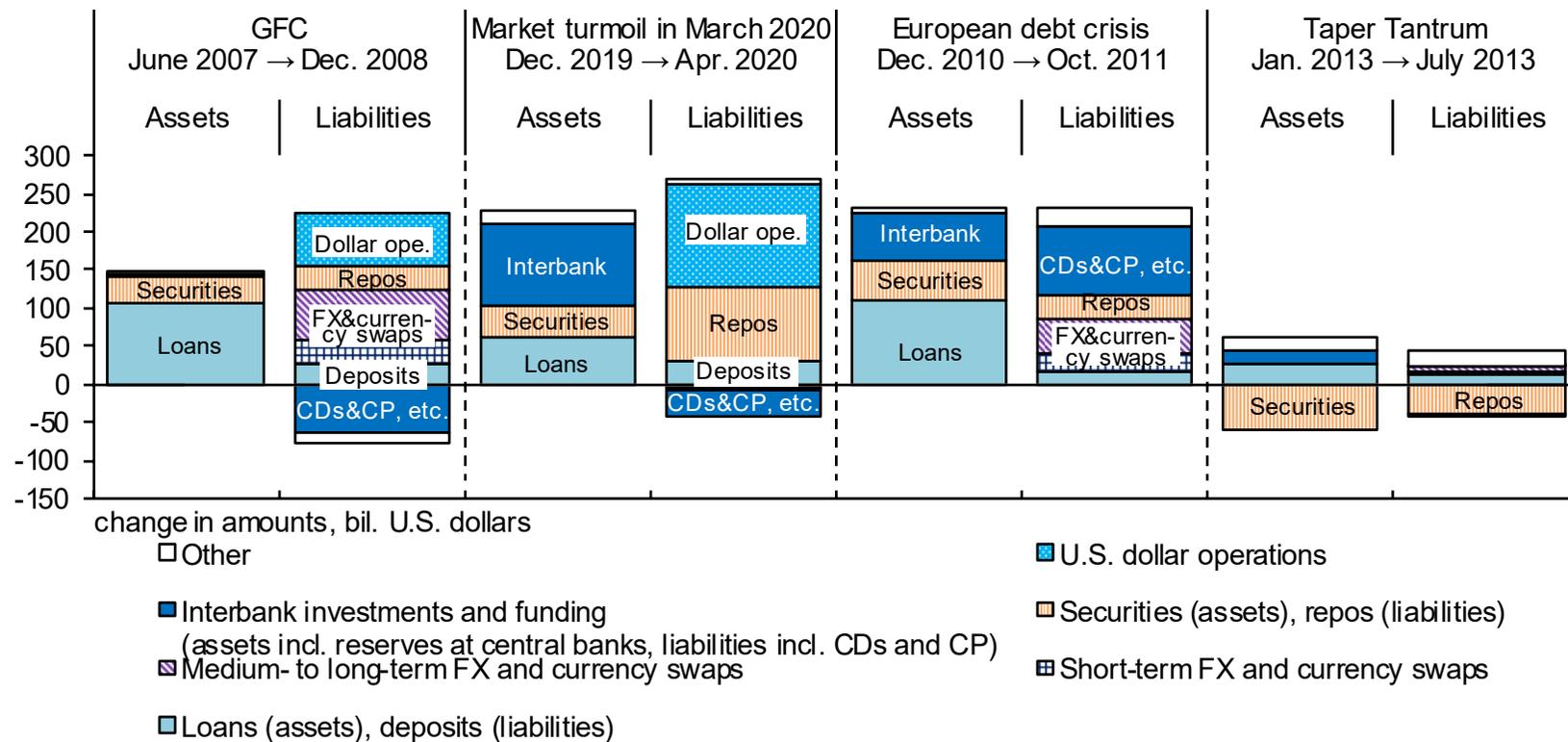
Data used in the analyses

Funding instruments (Sources)		Description
Foreign currency-denominated BS of major banks (BOJ)		• Long-term time-series data from 2003
Big data	CDs and CP Repos (Crane Data)	• Level and volatility of funding rates, and the characteristics of each transaction (volume, CDS, etc.)
	Cross-currency basis swaps (OTC Derivative Transaction Data)	• Transaction data • Number of observations: about 200 thousand (CDs&CP, and repos) about 10 thousand (cross-currency basis swaps)
	Deposits (FDIC, FED)	• Deposits by types in U.S. branches • Number of observations: about 900 thousand

Event study of foreign currency-denominated balance sheets of major banks (2)

- The GFC and the market turmoil in March 2020 are characterized by (1) an increase in market funding as a result of an increase in lending that was not met by a corresponding increase in deposit funding, and (2) a large shift in market funding from CDs and CP to other market funding instruments such as repos and FX and currency swaps.
- (1) was observed also in the European sovereign debt crisis. In the Taper Tantrum, neither (1) nor (2) prevailed.

Chart B3-1: Event study of foreign currency-denominated balance sheets of major banks



Source: BOJ.

Impact of changes in global market conditions on foreign currency funding instruments

- Three variables representing changes in global market conditions (the FCI, fund redemption rate, and U.S. interest rates) have a large explanatory power on changes in the shares of funding instruments of major banks.
- (1) A deterioration in the FCI will widen the gap between loans and deposits through an increase in the loans by, for example, drawing a commitment line, and will push up the share of FX and currency swaps. (2) A rise in the fund redemption rate reduces the share of funding through CDs and CP, etc., and especially increases the share of repo and short-term FX and currency swap funding. (3) A rise in U.S. interest rates reduces the share of deposits.

Explanatory power of changes in global market conditions on changes in shares of foreign currency funding instruments

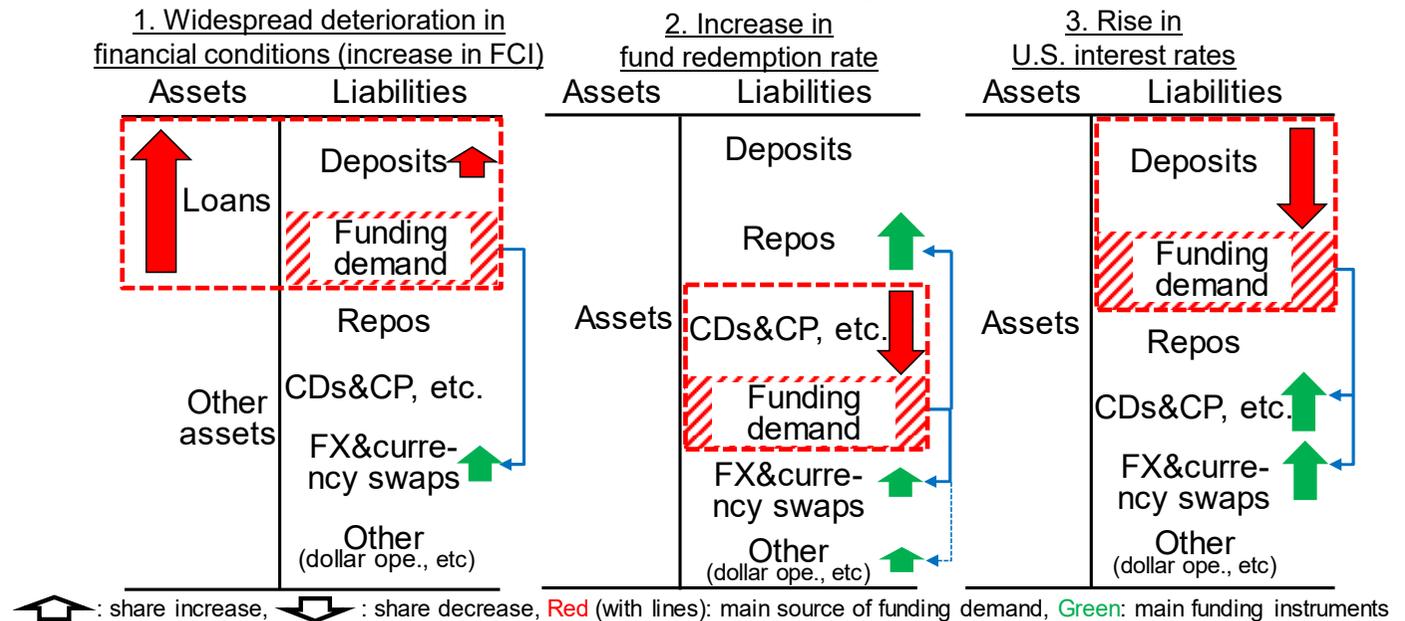
Funding instruments	Adjusted R ²
Deposits	0.83
Repos	0.62
Interbank funding (CDs and CP, etc.)	0.71
Medium- to long-term FX and currency swaps	0.46
Short-term FX and currency swaps	0.81
Other (U.S. dollar funds-supplying operations, etc.)	0.29

Note: 1. This figure summarizes the estimation results of Chart B3-2 in the main text.

2. Adjusted R-squared is obtained by regressing shares of each funding instruments on the FCI, fund redemption rate, U.S. interest rates, etc. between January 2003 and April 2021.

Source: Bloomberg; Federal Reserve Bank of Chicago; Haver Analytics; ICI; BOJ.

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

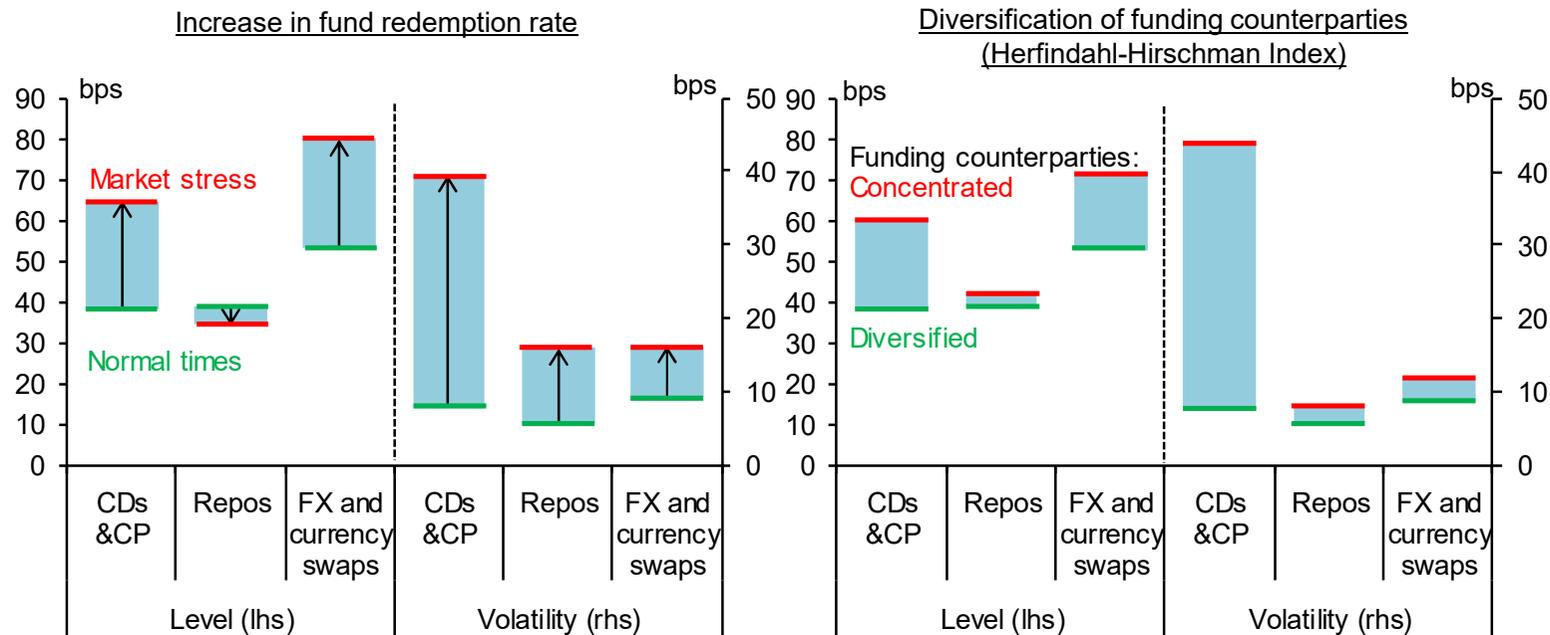


Note: This figure summarizes the estimation results of Chart B3-2 in the main text. The up (down) arrows represent share increases (decreases) and the length of the arrows represents the degree of impact.

Impact of an increase in redemption rate and diversification of funding counterparties

- The rise in the fund redemption rate pushes up the level of funding rates of CDs and CP as well as FX and currency swaps. The volatility of funding rates of all the instruments is increased.
- FIs with a larger number of funding counterparties tend to face a lower funding rate level and volatility, suggesting that a diversification of funding counterparties leads to more stable funding.

Impact of an increase in fund redemption rate and 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.

2. The left chart shows the impact of an increase in the fund redemption rate, corresponding to the market turmoil in March 2020 (+6% pts), on funding rates. Normal times represent full-sample averages.

3. The right chart shows the impact of HHI, which ranges from zero (i.e. the number of funding counterparties is infinity) to one (i.e. the number of funding counterparties is one) on funding rates.

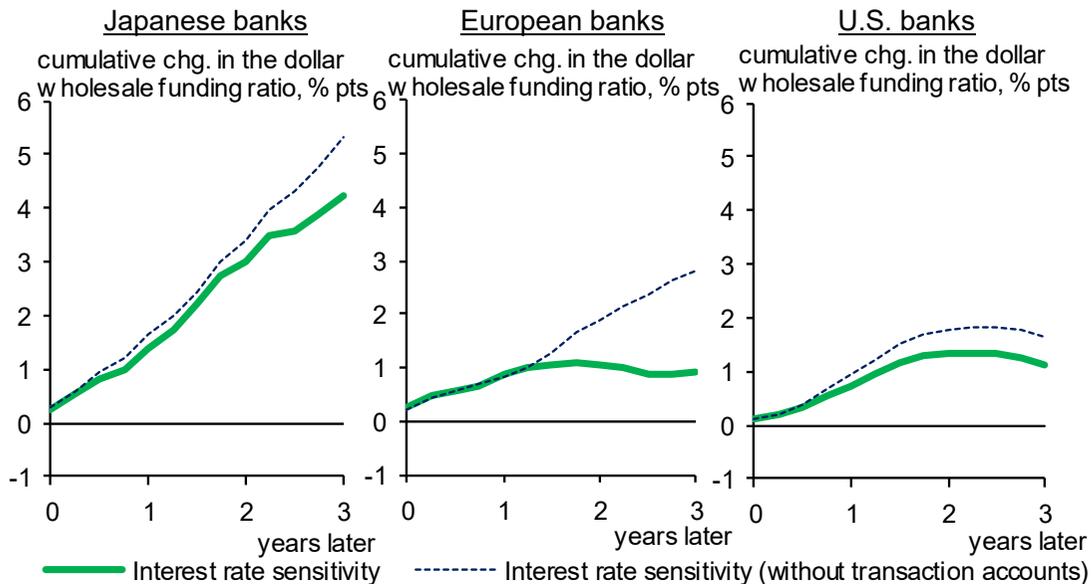
4. Signs of U.S. dollar funding premiums in cross-currency basis swaps are reversed.

Source: Bloomberg; Crane Data; FRB; FSA, "OTC Derivative Transaction Data"; Haver Analytics; ICI.

Interest rate sensitivity of dollar wholesale funding

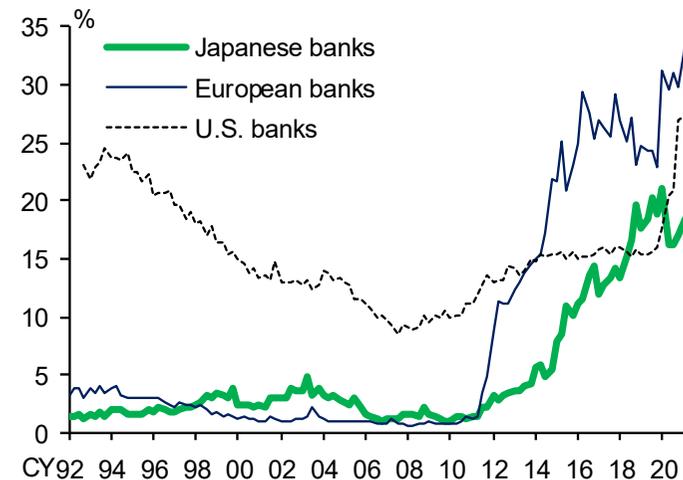
- The dollar wholesale funding ratio has a positive relationship with a rise in the U.S. interest rate, as existing studies have pointed out that a rise in interest rates leads to a rebalancing of assets by depositors to MMFs and other assets.
- Japanese banks have a higher interest rate sensitivity of the dollar wholesale funding than European and U.S. banks, but it is also the case that the existence of transaction account deposits restricts the shift to market funding to a certain extent. These findings support Japanese banks' strategies of an increase in the share of transaction account deposits.

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



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. 3-month interest rate. "Japanese banks" and "European banks" represent branches in the U.S. (the same applies to the right chart).
 2. Dollar wholesale funding ratio = (large deposits <mainly CDs> + repos + other borrowings) / (other deposits + dollar wholesale funding <numerator> + borrowings from group companies, etc.).
 Source: Bloomberg; FDIC; Federal Reserve Bank of Chicago.

Chart B3-8: Transaction account ratio



Note: 1. Latest data as at the January-March quarter of 2021.
 2. The transaction account ratio is the ratio of transaction account deposits to total deposits (the same applies to the left chart).
 Source: FDIC; Federal Reserve Bank of Chicago.

Scenarios for macro stress testing

- Macro stress testing examines the resilience of Japan's financial system under three downside scenarios.

Chart V-2-1: Scenarios for simulation

		Real economy	Financial variables
Baseline scenario		Moderate recovery in line with average forecasts of professionals and markets	Unchanged from the level at end-August 2021
Downside scenarios	Diverging business conditions scenario	 Downturn of domestic and overseas economies with diverging firms' business conditions across and within industries	Historical average reaction to shocks on the real economy 
	Emerging markets stress scenario	Significantly slower recovery in emerging economies	Financial shocks due to a rise in the U.S. long-term interest rate (+100bps) 
	Financial stress scenario	Severe downturn of domestic and overseas economies due to financial shocks	Substantial and rapid financial shocks comparable to the GFC 

Diagram annotations: Blue arrows labeled 'Propagation' point from the 'Diverging business conditions scenario' to the 'Financial stress scenario', and from the 'Emerging markets stress scenario' to the 'Financial stress scenario'.

Note: Long- and short-term interest rates evolve in line with the forward rates under the baseline scenario while they fall to the lowest level observed until August 2021 under the diverging business conditions scenario and the financial stress scenario. Under the emerging markets stress scenario, they are subject to the shocks due to a rise in the U.S. long-term interest rate (+100bps).

Economic scenarios

Chart V-2-2: Economic scenarios for simulation (Japan)

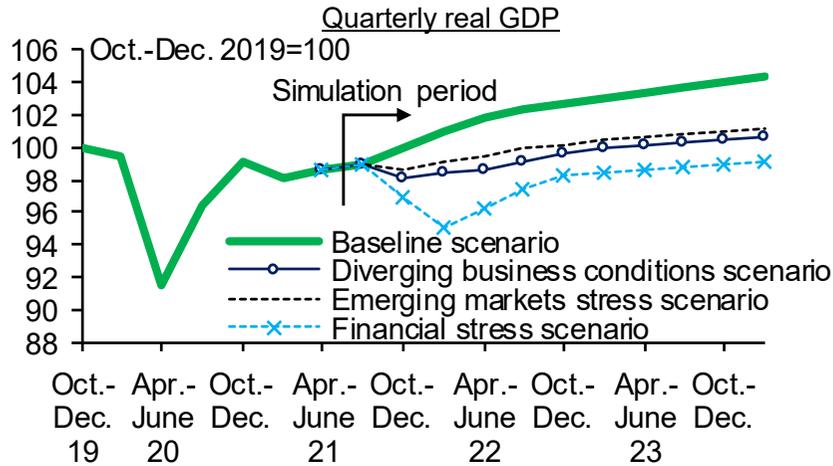


Chart V-2-3: Economic scenarios for simulation (overseas)

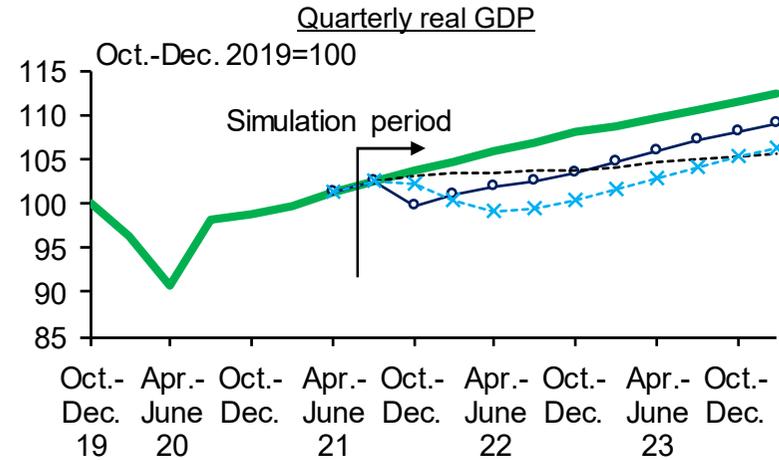
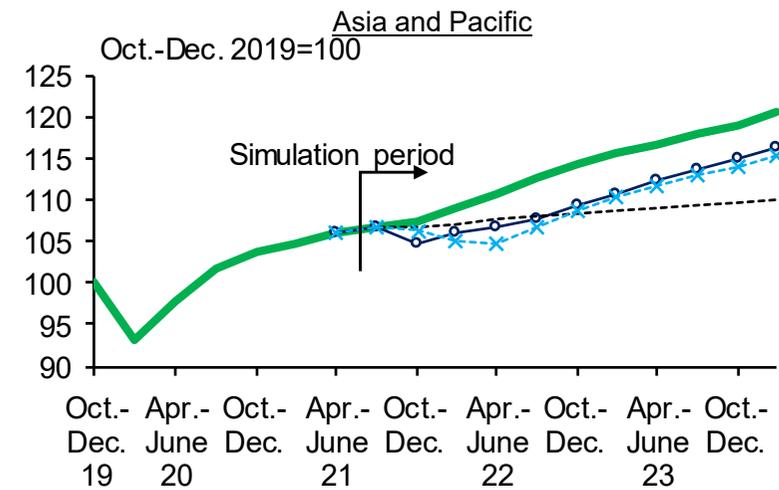
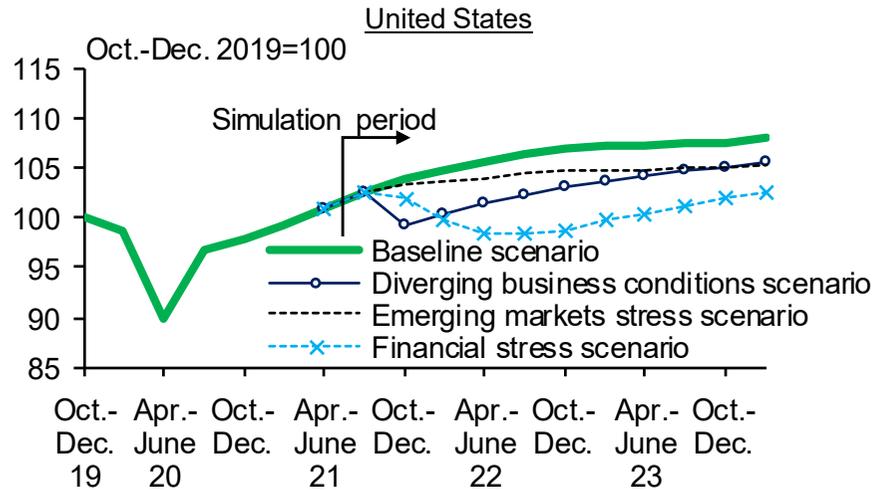


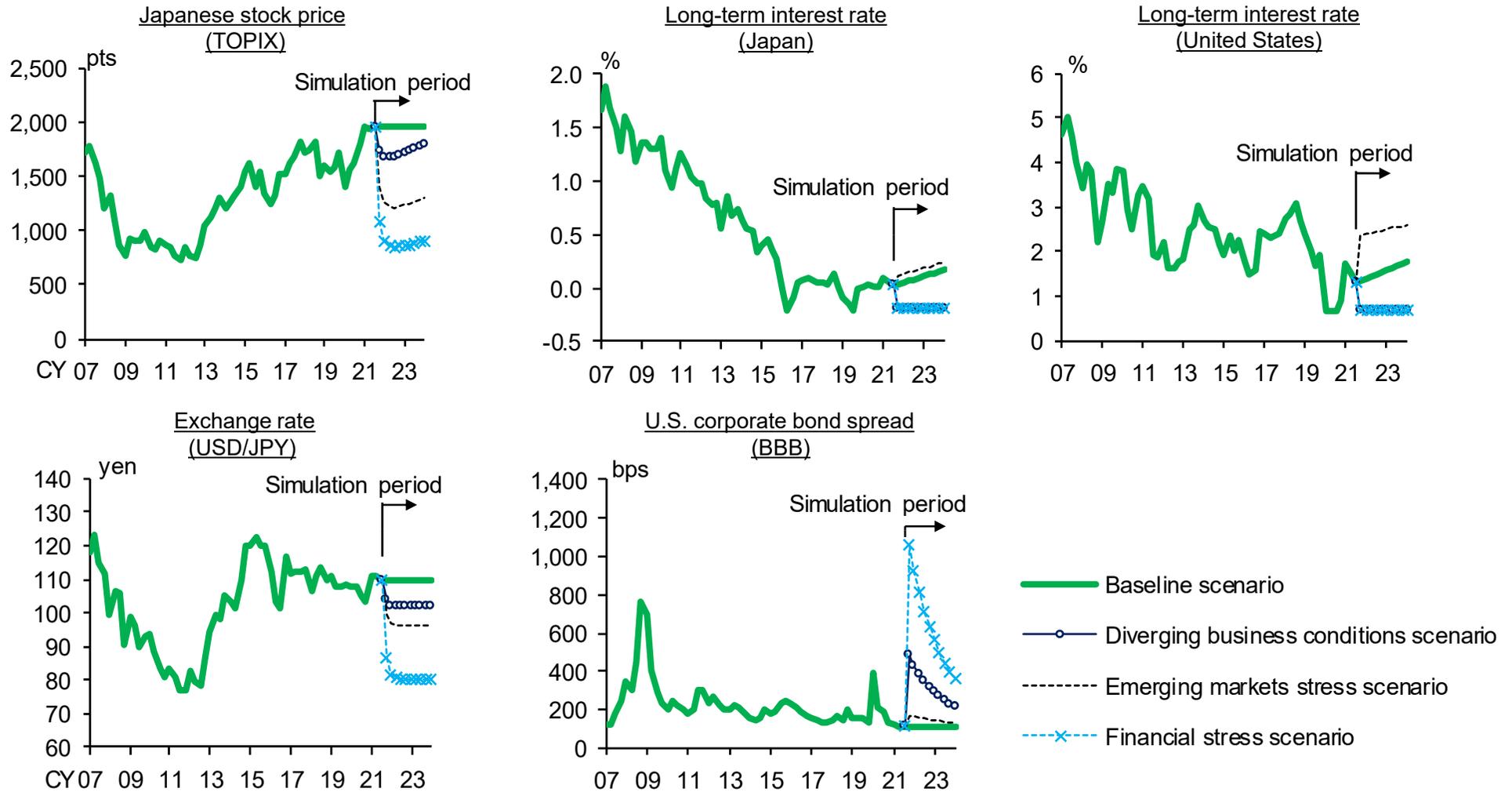
Chart V-2-3: Economic scenarios for simulation (overseas)



Source: BEA; Cabinet Office; Eurostat; Haver Analytics; IMF; Japan Center for Economic Research, "ESP forecast."

Financial market scenarios

Chart V-2-4: Financial market scenarios for simulation

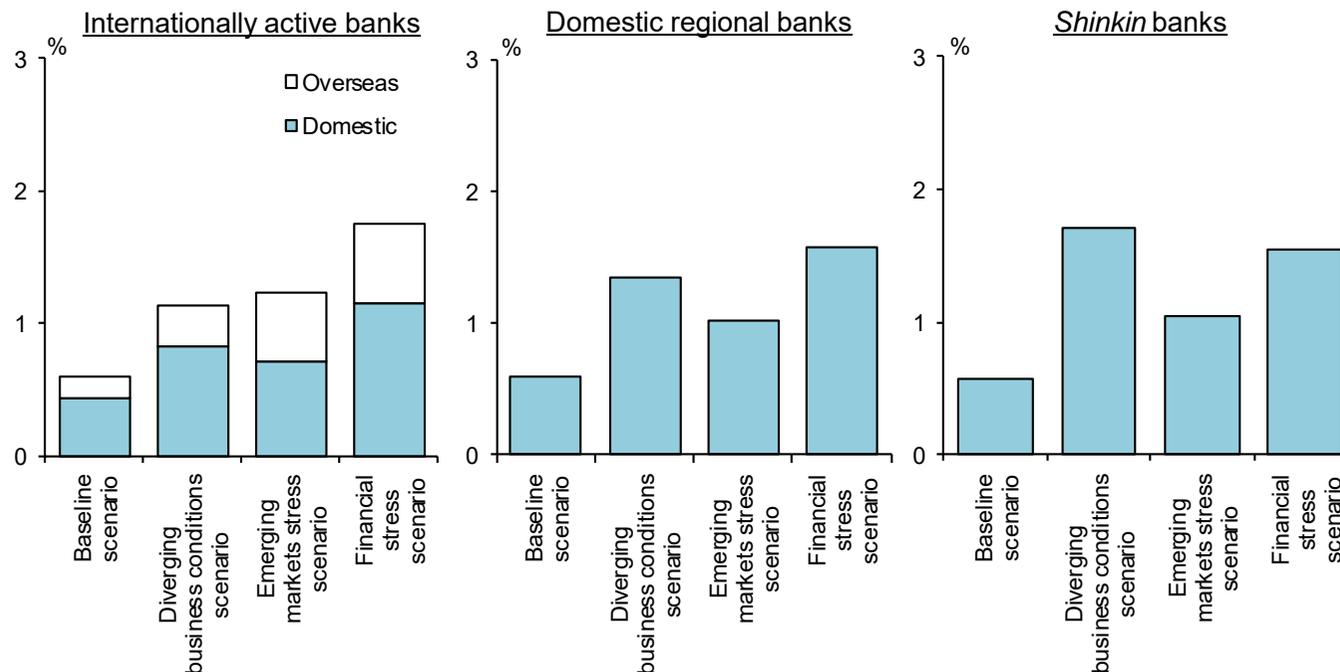


Note: Long-term interest rate indicates 10-year government bond yield.
 Source: Bloomberg; FRB; Ministry of Finance, "Interest rate."

Stress testing results: credit cost ratios

- In the baseline scenario, the average credit cost ratios for fiscal 2021-2023 (annualized) remain at about 0.2 percent for all types of banks. In all three downside scenarios, they increase more than in the baseline scenario.
- For internationally active banks, the credit cost ratios reach similar levels in the "diverging business conditions" and "emerging markets stress" scenarios, and increase further in the "financial stress scenario." For domestic regional banks and *shinkin* banks, they are relatively low in the "emerging markets stress scenario."
- This difference between the types of banks stems from the divergence in the shares of overseas loans and loans to the face-to-face services industry.

Chart V-2-6: Credit cost ratios (3-year cumulative totals)

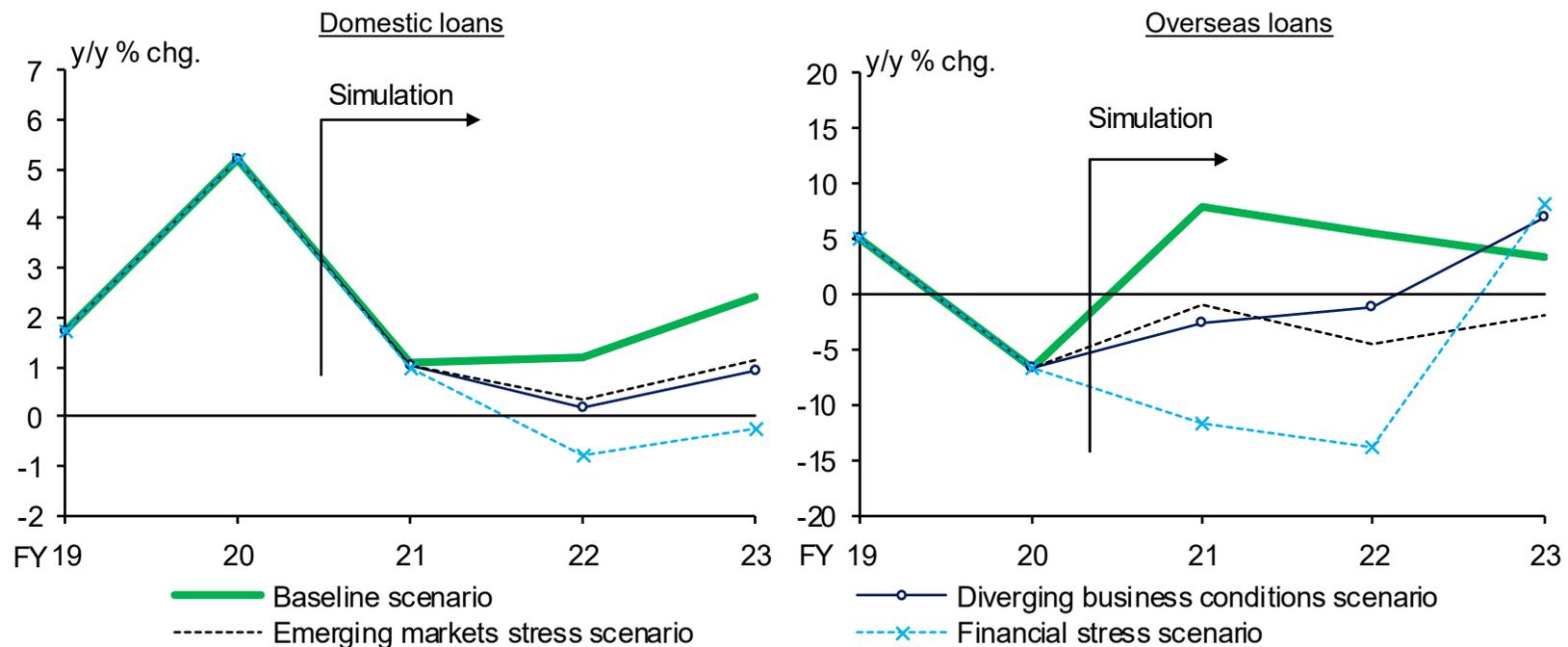


Note: Credit cost ratios are cumulative totals of fiscal 2021 to 2023.

Stress testing results: domestic and overseas loans outstanding

- In the baseline scenario, domestic and overseas loans outstanding continue to show positive growth throughout the simulation period as economic activity recovers at home and abroad.
- The growth in domestic loans outstanding in the downside scenarios falls below the baseline scenario. In the "financial stress scenario" in particular, the annual rate of change turns negative in fiscal 2022.

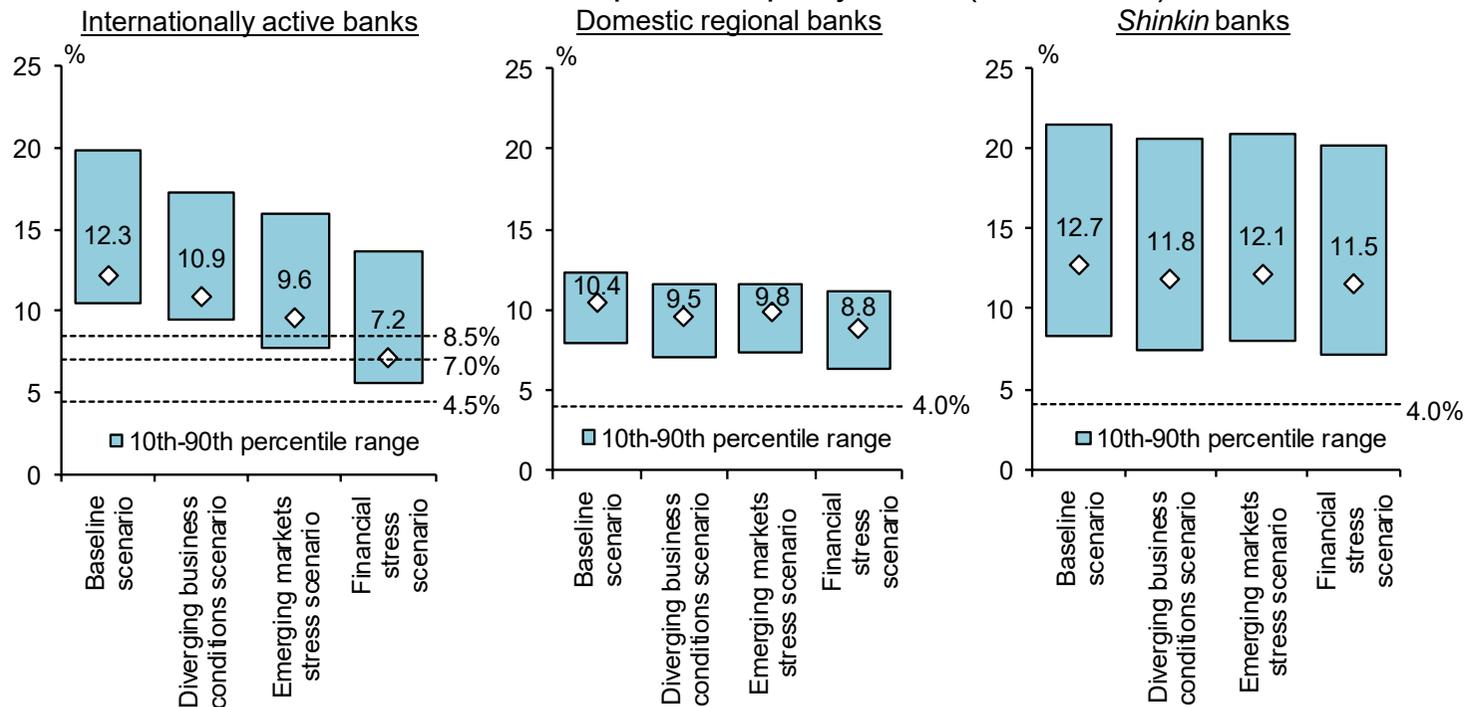
Chart V-2-7: Loans outstanding (total of financial institutions)



Stress testing results: capital adequacy ratios and summary of stress testing

- Japan's financial system is likely to remain highly robust even in the case of future resurgence of COVID-19 or 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 FIs' 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.

Chart V-2-11: Capital adequacy ratios (fiscal 2023)



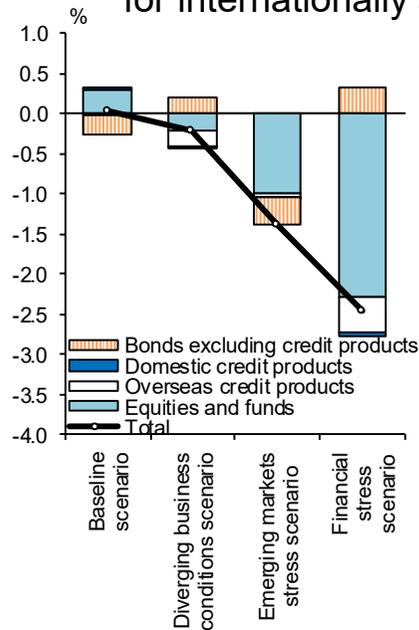
Note: 1. The left chart shows the CET1 capital ratios of internationally active banks. The middle and right charts show the core capital ratios of domestic regional banks and *shinkin* banks. The transitional arrangements for domestic regional banks and *shinkin* banks are taken into consideration.
2.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

Appendixes

Stress testing results: total gains/losses on securities holdings and lending margin

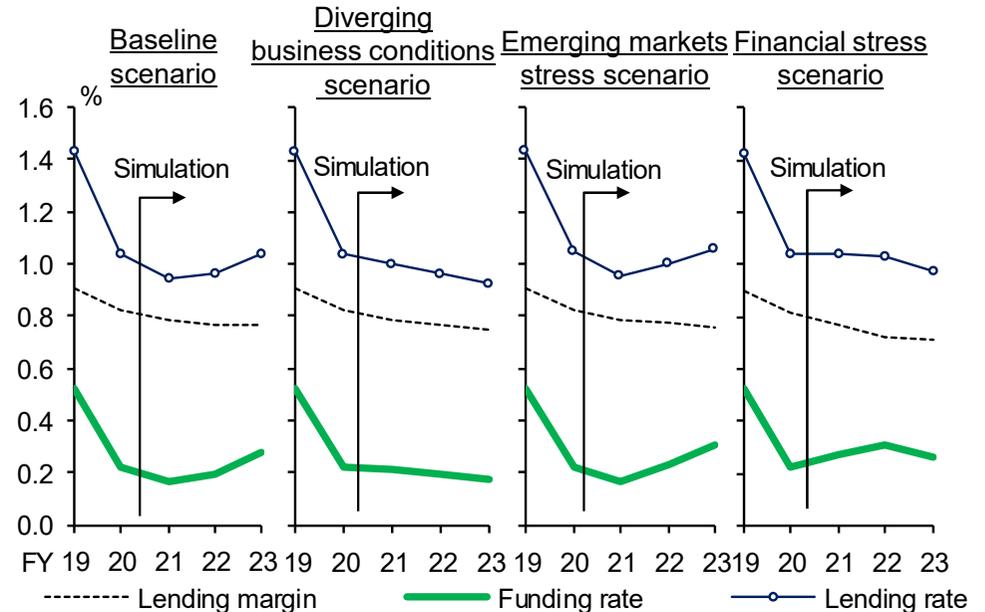
- In the "diverging business conditions" and "financial stress" scenarios, the total gains/losses on securities holdings for internationally active banks are pushed down by equities and funds as well as overseas credit products, while bonds underpin them due to a decline in interest rates. In the "emerging markets stress scenario," bonds inflict a loss due to a rise in long-term interest rates.
- In the "diverging business conditions" and "emerging markets stress" scenarios, the lending margins for internationally active banks remain at the same level as in the baseline scenario because the increase in domestic lending margins is offset by the contraction in overseas lending margins. In the "financial stress scenario," the further contraction in overseas lending margins due to higher foreign currency funding costs leads to a decline in overall lending margins.

Total gains/losses on securities holdings for internationally active banks



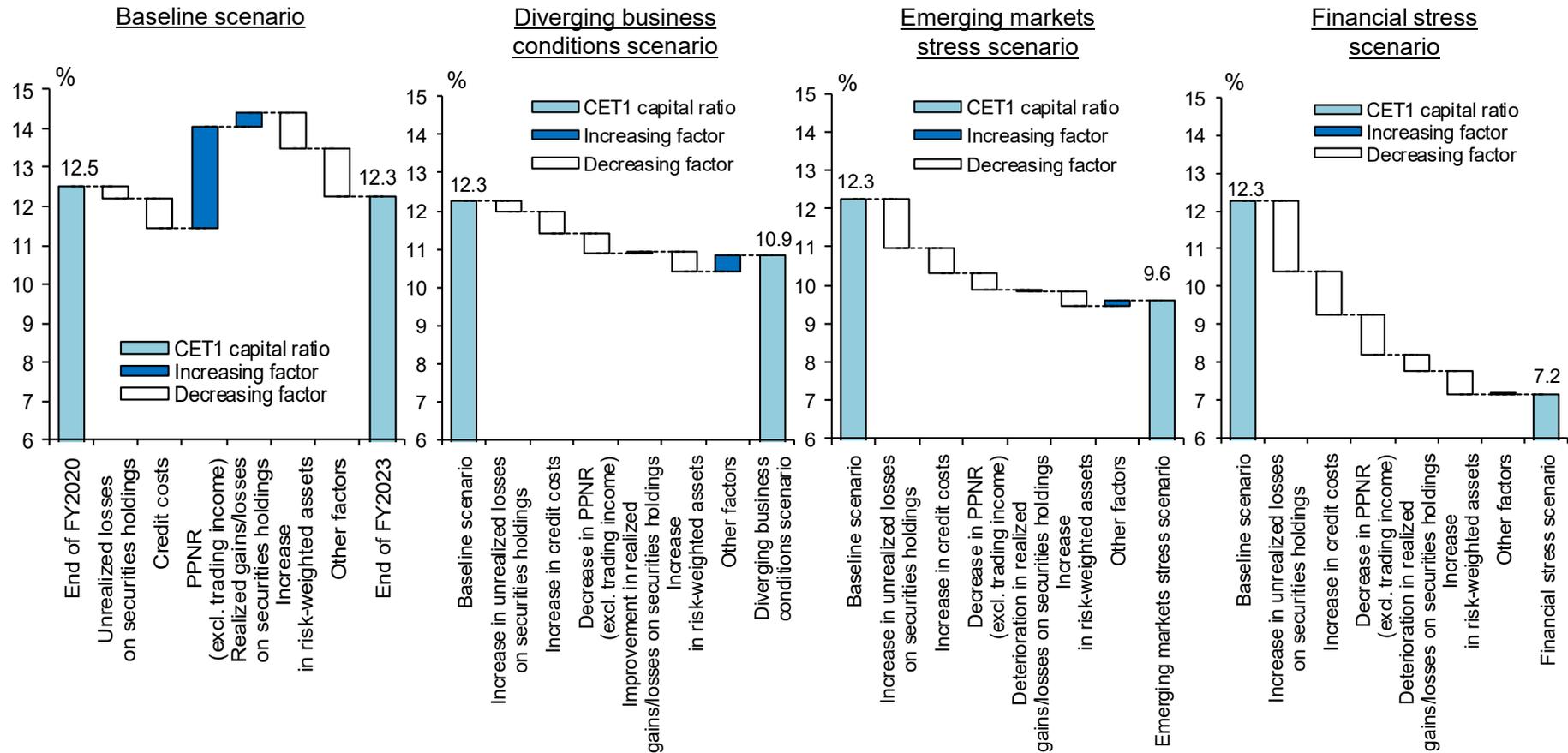
Note: 1. Relative to risk-weighted assets at the end of fiscal 2020.
 2. "Total gains/losses on securities holdings" is the sum of cumulative totals of realized gains/losses on securities holdings from fiscal 2021 to 2023 and changes in unrealized gains/losses on securities holdings from the end of fiscal 2020 to fiscal 2023. Unrealized gains/losses on securities holdings take tax effects into account.

Funding rate, lending rate, and lending margin for internationally active banks



Stress testing results: decomposition of CET1 capital ratio

Charts V-2-12, 13: Decomposition of CET1 capital ratio (internationally active banks)



- Note: 1. The left chart indicates the contribution of each factor to the difference between the capital adequacy ratios at end-March 2021 and the end of the simulation period (as at end-March 2024) under the baseline scenario. The other charts indicate the contribution of each factor to the difference between the capital adequacy ratios at the end of the simulation period (as at end-March 2024) under the baseline and downside scenarios.
2. "Unrealized losses on securities holdings" takes tax effects into account.
3. "Other factors" includes taxes, dividends, and CET1 regulatory adjustments.