



# Summary

October 2022  
Bank of Japan

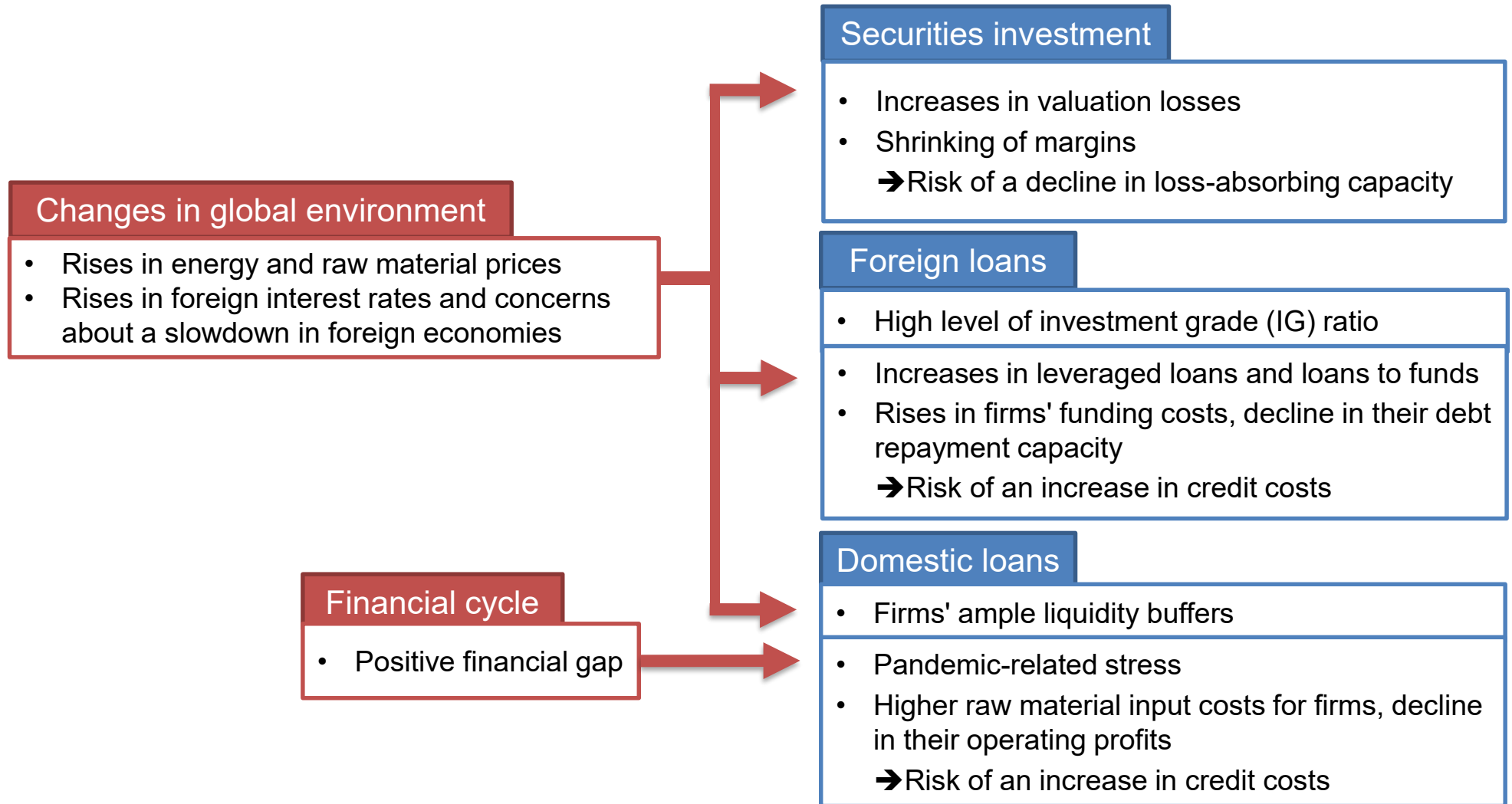


Note: This document presents a summary of the October 2022 issue of the *Financial System Report*.  
See the *Report* for more details on the analyses as well as notes and sources of the charts.

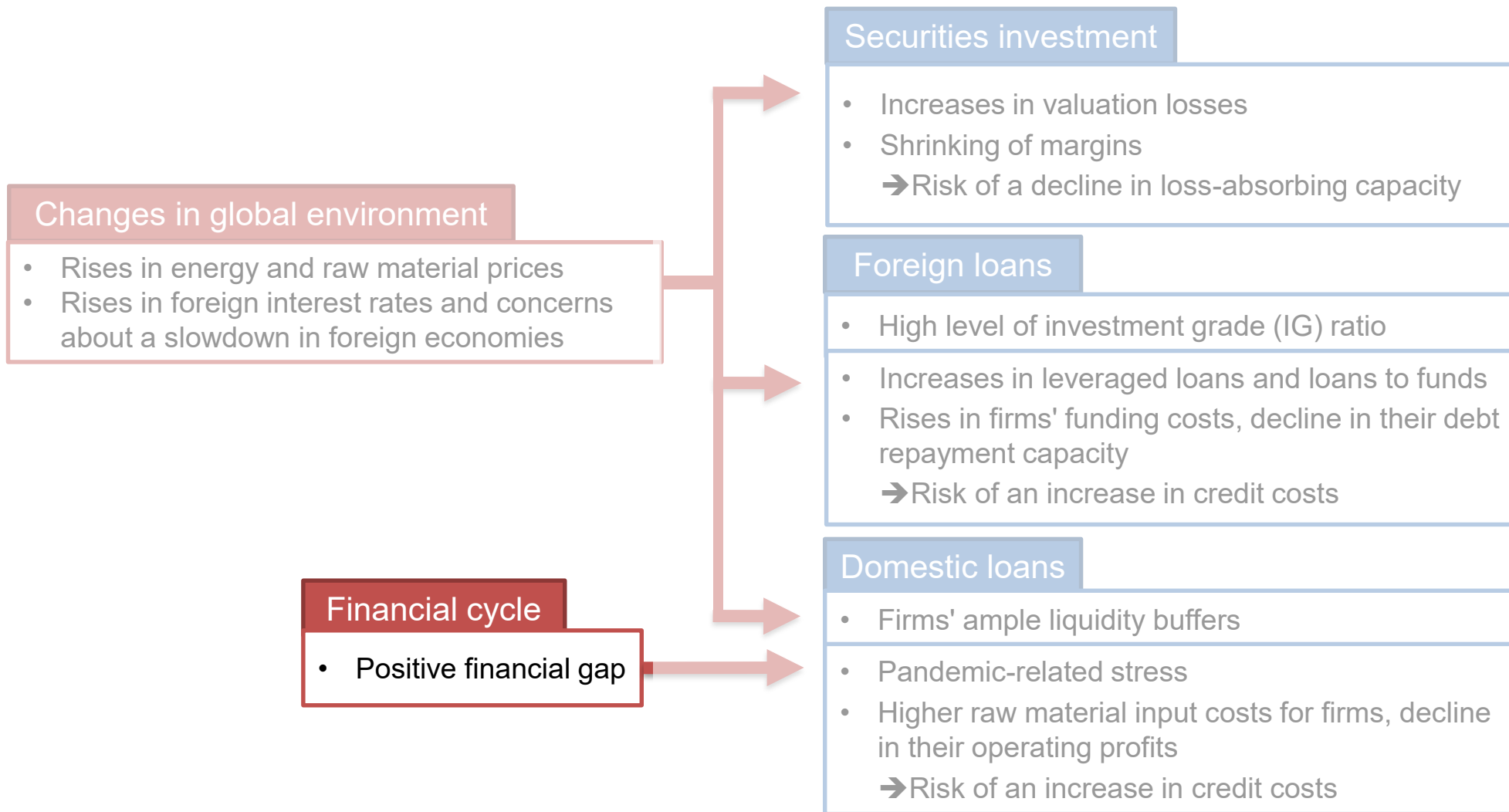
# Stability assessment of Japan's financial system

- Japan's financial system has been maintaining stability on the whole.
- Japanese financial institutions (FIs) have kept sufficient capital and liquidity even under various types of stress since the outbreak of COVID-19, including supply constraints and rises in energy and raw material prices under the normalization of economic activity and the materialization of geopolitical risks.
  - However, the period of stress may be prolonged further as policy rate hikes by central banks are continued and concerns about a slowdown in foreign economies are spreading. Financial and capital markets have continued to be nervous.
- From a long-term perspective, if FIs' core profitability were to stagnate, financial intermediation could be impaired due to a decline in loss-absorbing capacity, or vulnerabilities in the financial system could increase through excessive risk-taking.
- To ensure the stability of Japan's financial system, it is necessary to examine these contraction and overheating risks in the financial system and address potential vulnerabilities appropriately.

# Motivations behind the October 2022 issue



1. The current phase of the financial cycle
2. Domestic firms' financial condition under prolonged stress
3. Interest rate sensitivity of foreign loans
4. Financial institutions' resilience to foreign interest rate rises



## 1. The current phase of the financial cycle

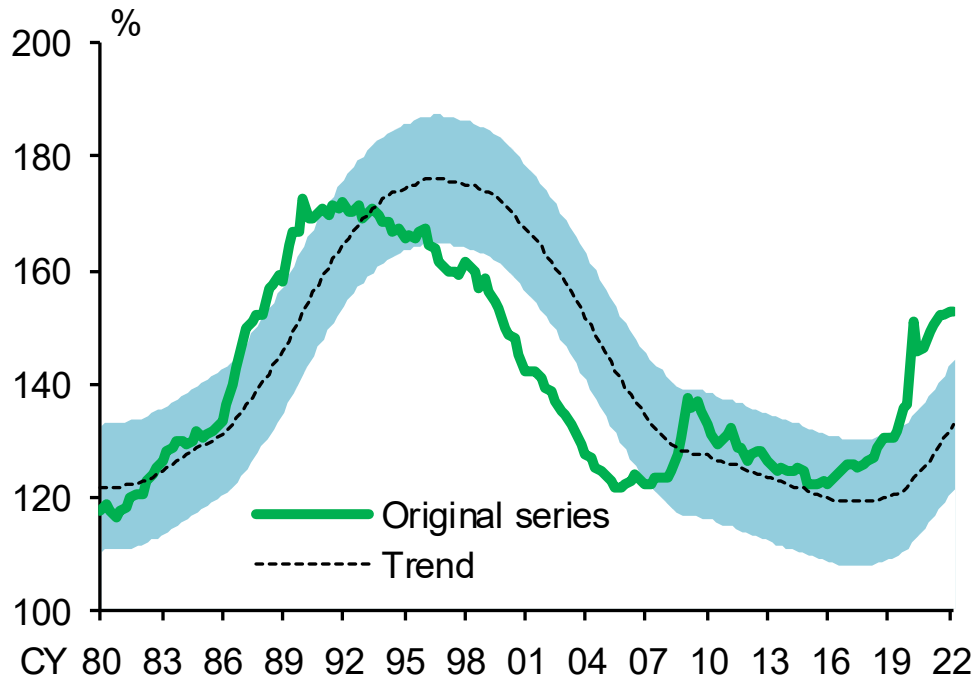
Whether smooth functioning of financial intermediation and the resultant increase in private debt have led to a buildup of financial imbalances that could cause a significant downturn in future economic activity.



# Heat map (2) Corporate credit

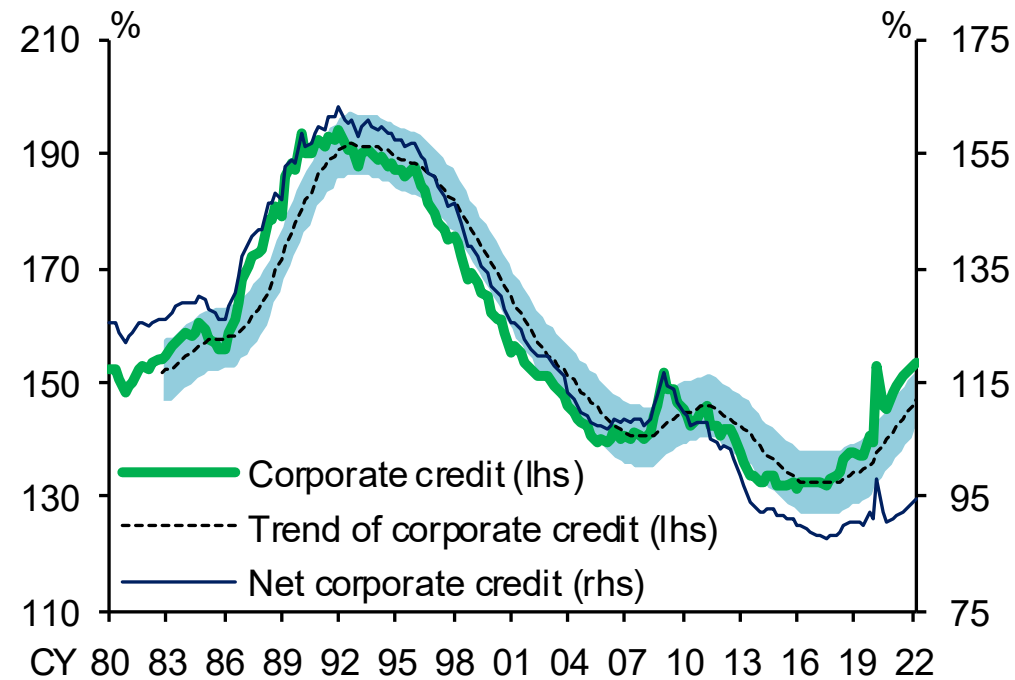
- The three "red" FAIXs are the result of the decrease in economic activity and active measures to support corporate financing since the pandemic. They do not reflect overheating of financial activities.
- Firms' cautious financing stance has also contributed to the "red" FAIXs.
  - Net corporate credit (gross corporate credit minus firms' cash and deposits) has hardly expanded despite the increase in gross corporate credit since the pandemic.

### Total credit to GDP ratio



Note: 1. "Trend" is calculated using the one-sided HP filter. The shaded area indicates the root mean square of the deviation from the trend.  
 2. See Chart III-3-2.

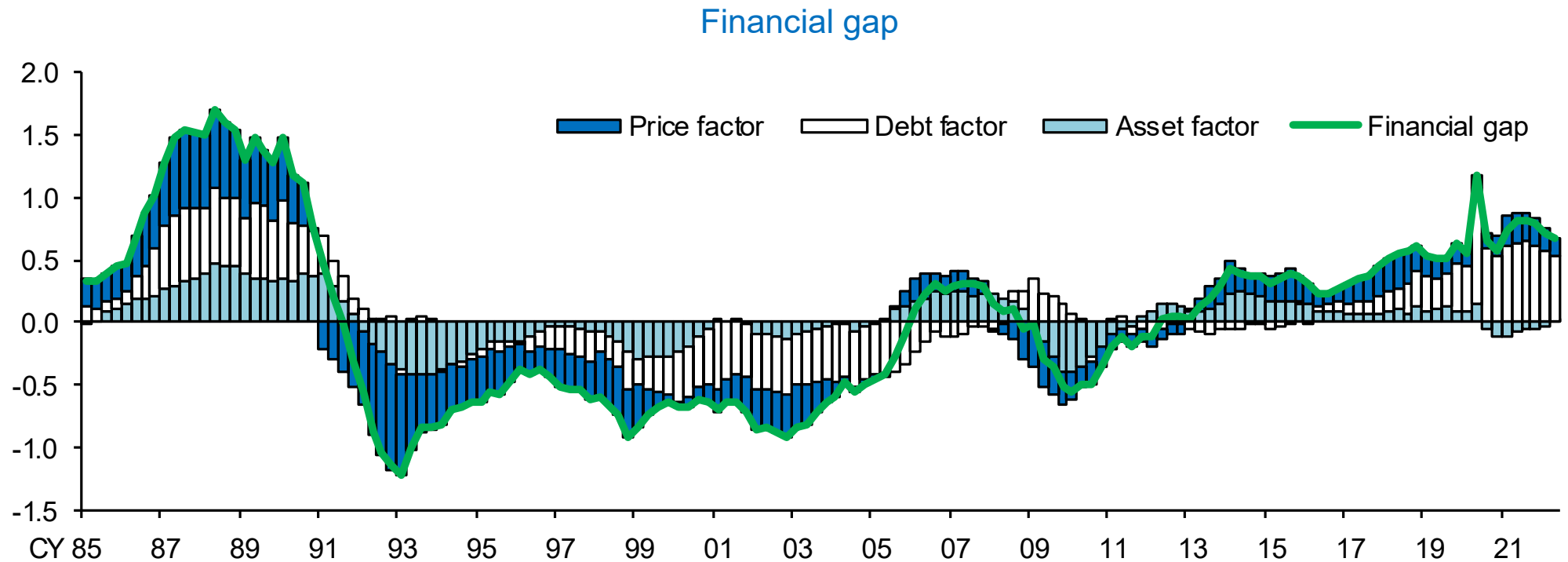
### Corporate credit to GDP ratio



Note: 1. "Trend of corporate credit" is calculated using 3-year backward moving averages. The shaded area indicates the root mean square of the deviation from the trend.  
 2. "Net corporate credit" is the ratio to GDP of gross corporate credit excluding firms' cash and deposits.  
 3. See Chart III-3-3.

# Heat map (3) Financial gap

- The financial gap is a summary measure of the 14 FAIXs in the heat map.
- In the current expansionary phase, the contribution of an increase in active investment (Asset factor) and a rise in asset prices (Price factor) has been limited, while an increase in private debt (Debt factor) has contributed to the widening of the financial gap.
  - No major financial imbalances -- such as that feature an increase in leverage together with an increase in asset prices -- can be observed.

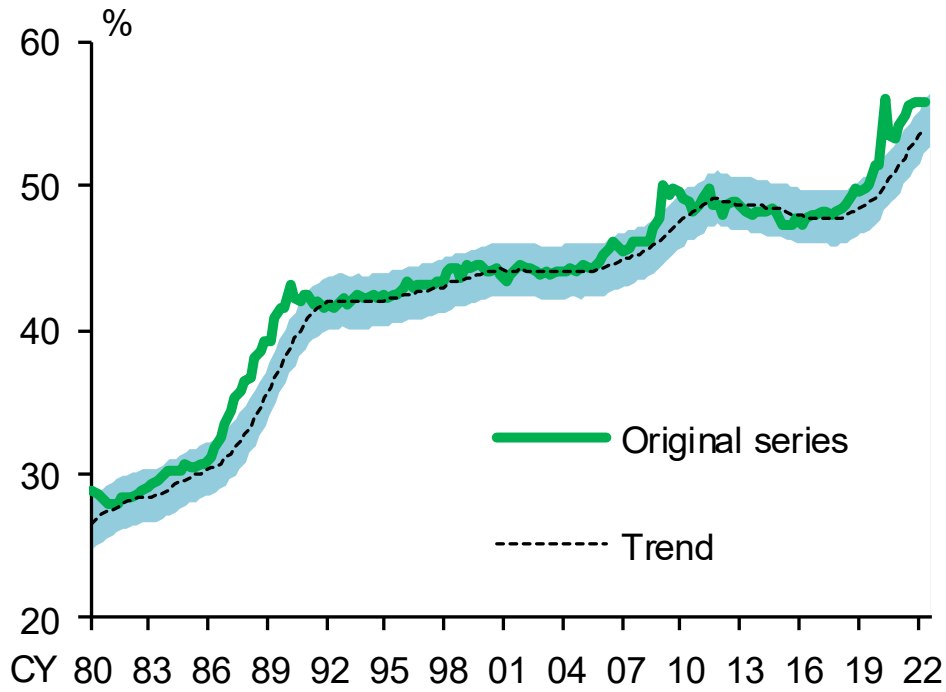


Note: "Asset factor" consists of indexes of fixed investment by the private sector, households, firms, and real estate businesses. "Debt factor" consists of indexes of their debt financing. "Price factor" consists of the remaining indexes. See Chart III-3-4.

# Housing loans (1)

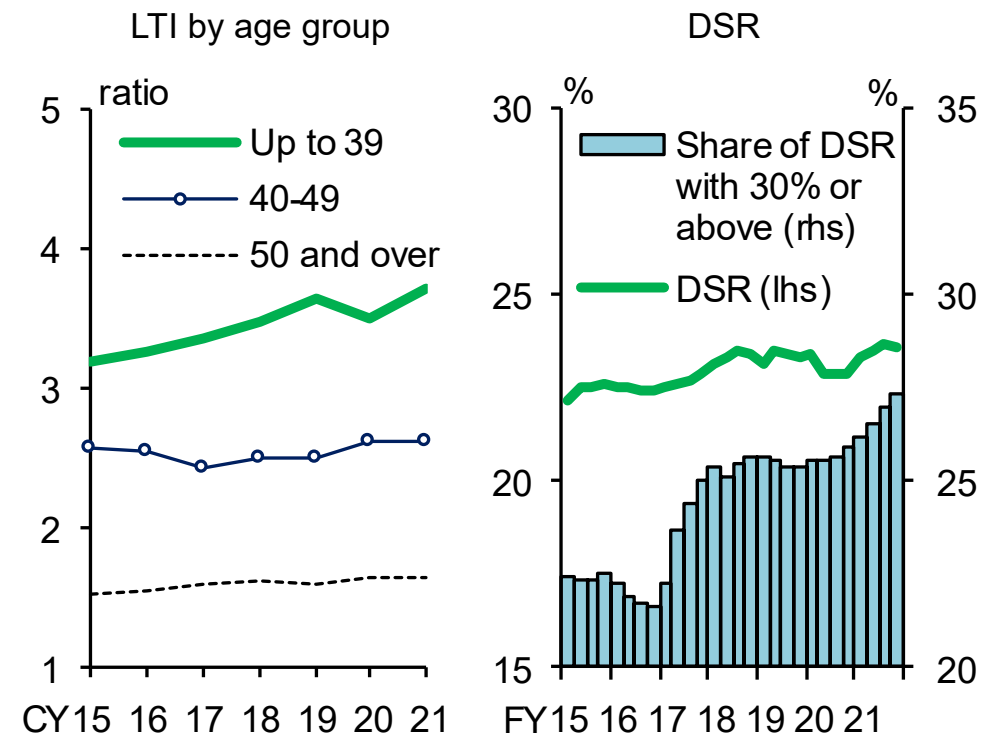
- The recent rise in total credit is partly attributable to increases in household loans and real estate loans.
- *Household loans to GDP ratio* has continued to be above the trend.
- The tendency for younger households to take out loans has led to the rises in the LTI and the share of housing loans with a DSR of 30 percent or more.

## Household loans to GDP ratio



Note: 1. "Trend" is calculated using 3-year backward moving averages. The shaded area indicates the root mean square of the deviation from the trend multiplied by 1.25.  
 2. See Chart III-3-6.

## Characteristics of housing loans



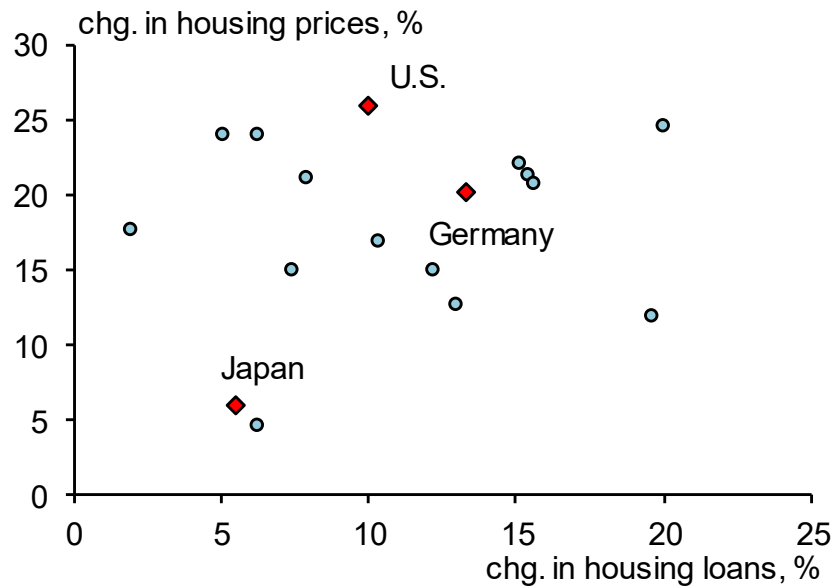
Note: 1. "LTI by age group" covers two-or-more-person households with liabilities.  
 2. "DSR" covers major banks, regional banks, and *shinkin* banks. 4-quarter backward moving averages.  
 3. See Chart III-3-9.



# Housing loans (2) International comparison

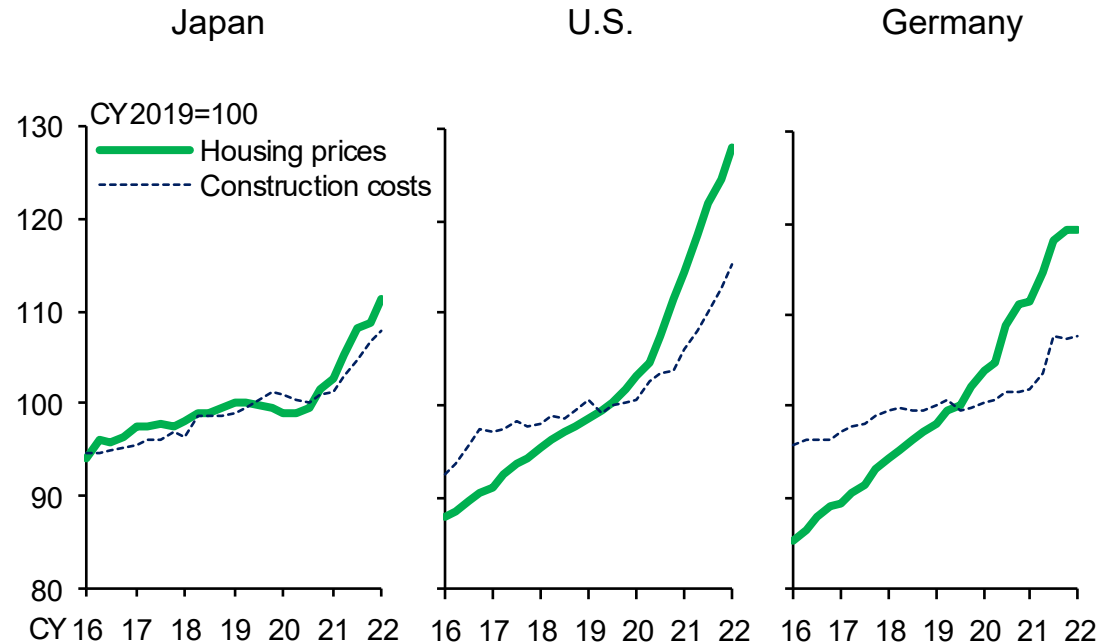
- In Japan, the pace of increase in housing loans has been more modest than the other countries and a stretched valuation of housing prices as seen in foreign countries has not been observed.
  - The rise in housing prices in the United States and Germany may be the result not only of supply-side factors but also of demand-side factors.

## Housing loans and housing prices



Note: The vertical and horizontal axis show changes from 2019 to 2021.  
See Chart B1-1.

## Housing prices and construction costs

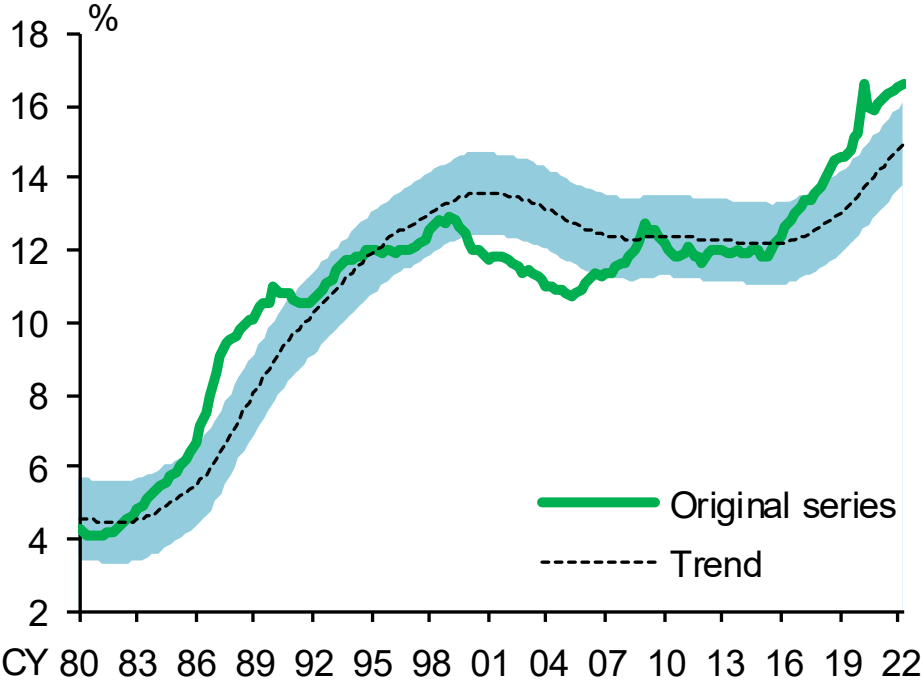


Note: Housing prices and construction costs are deflated by the consumer price index in each country.  
See Chart B1-7.

# Real estate loans (1)

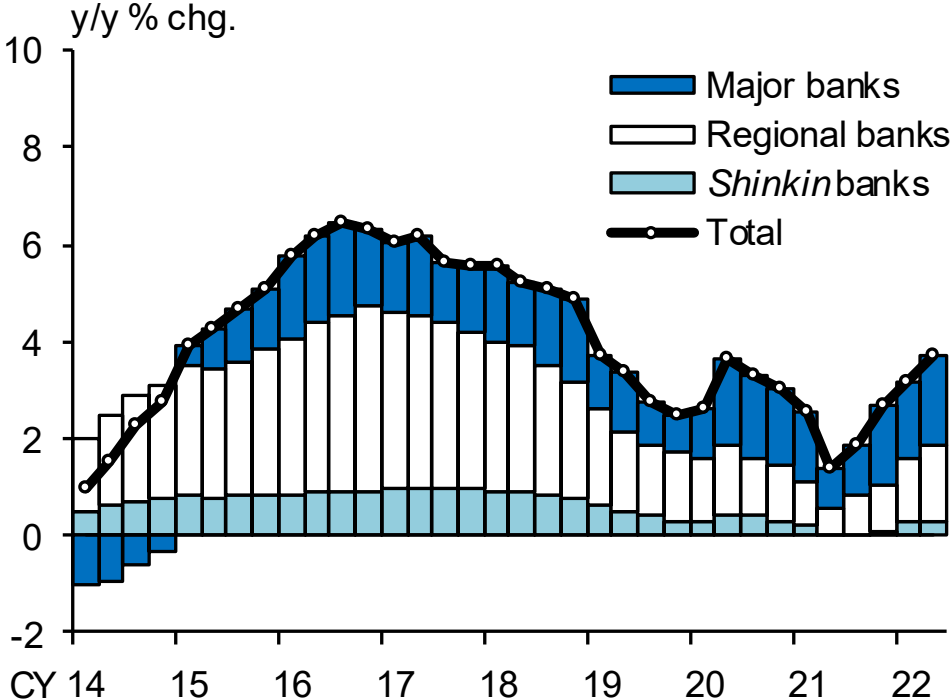
- Real estate loans have also led to the recent rise in total credit.
- Real estate loans have continued to increase, driven by major banks' lending to real estate funds and by regional FIs' lending to small and medium-sized real estate leasing businesses.

Real estate loans to GDP ratio



Note: "Trend" is calculated using the one-sided HP filter. The shaded area indicates the root mean square of the deviation from the trend. See Chart III-3-7.

Real estate loans among financial institutions

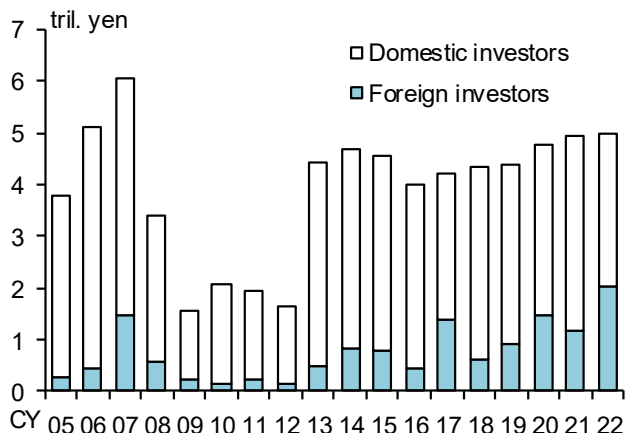


Note: See Chart III-1-10.

# Real estate loans (2) Loans to real estate funds

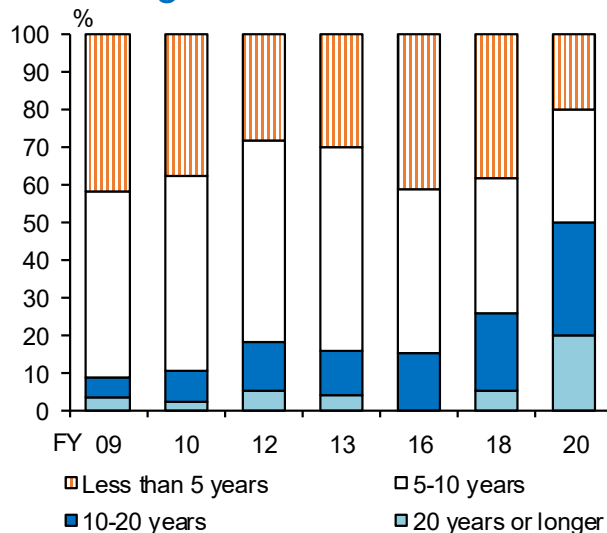
- Loans to real estate funds have increased as foreign investors have engaged in trades at high prices.
  - The pace of property acquisitions by foreign investors in the first half of 2022 exceeded that in 2007.
  - As a result of the increased presence of institutional investors, an assumed holding period has become longer.
  - Profitability in Japan's real estate market has remained relatively stable.

## Real estate property acquisitions by domestic and foreign investors



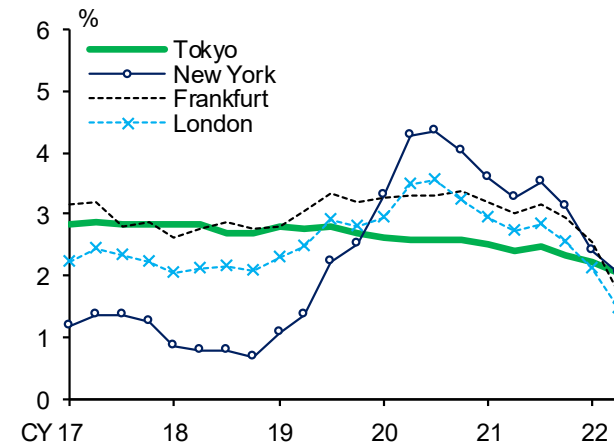
Note: The latest data are annualized values for the first half of 2022. See Chart III-3-12.

## Assumed holding period of foreign investors



Note: "Assumed holding period" is based on the survey of top foreign investors in Japan in terms of transaction value. See Chart III-3-13.

## Yield spreads of commercial properties

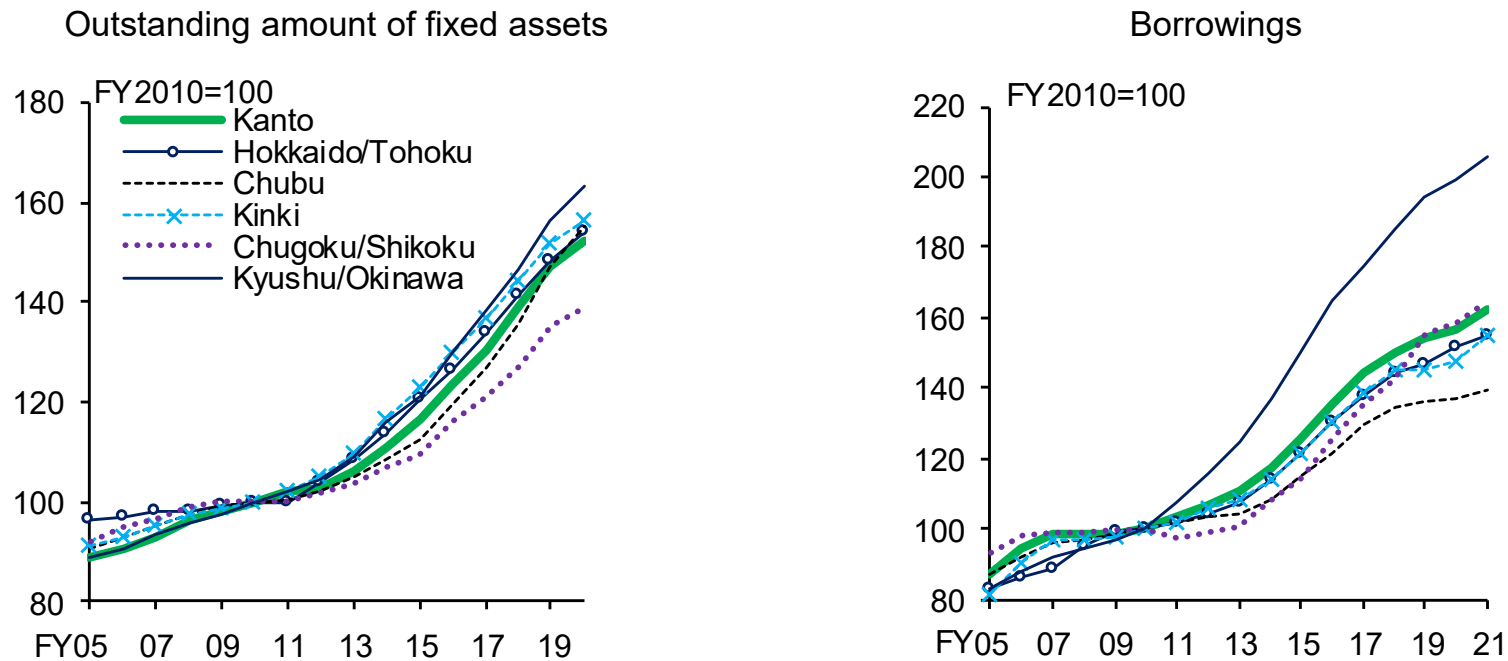


Note: Yield spreads = grade-A office yields - 10-year government bond yields. See Chart III-3-14.

# Real estate loans (3) Loans to real estate leasing businesses

- Real estate loans by regional FIs have continued to increase in parallel with investment in fixed assets by real estate leasing businesses.
  - Nationwide, the pace of investment has been accelerated for nearly a decade. This active investment in fixed assets partly reflects the fall in the burden of interest payments on loans.

## Outstanding amount of fixed assets and borrowings for real estate leasing businesses

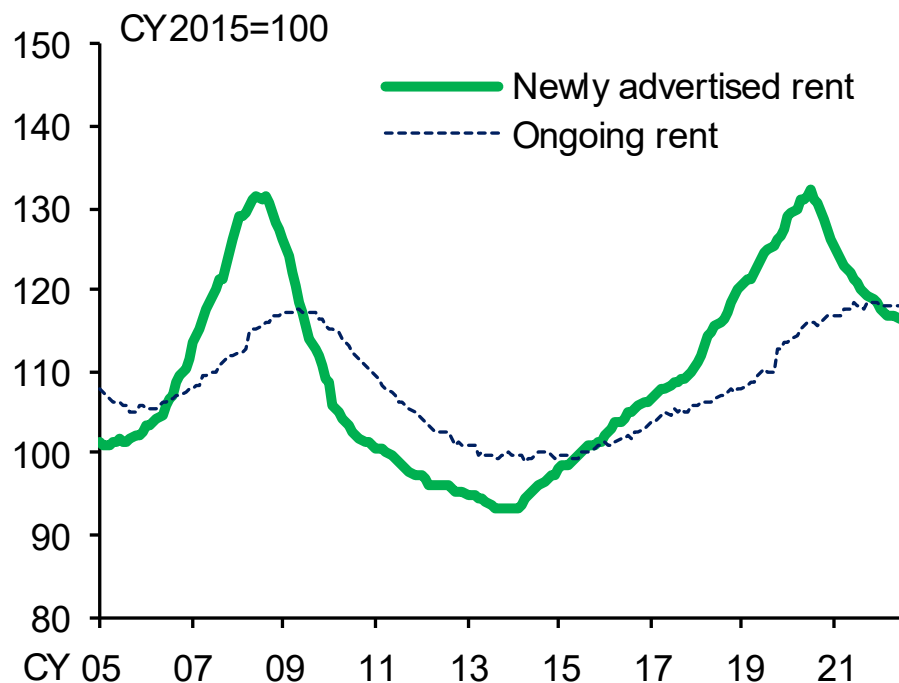


Note: In the left-hand chart, the data are aggregated based on the location of head offices of small and medium-sized real estate leasing businesses with capital of less than 100 million yen, while, in the right-hand chart, they are aggregated based on the location of head offices of regional banks and *shinkin* banks. See Chart III-3-18.

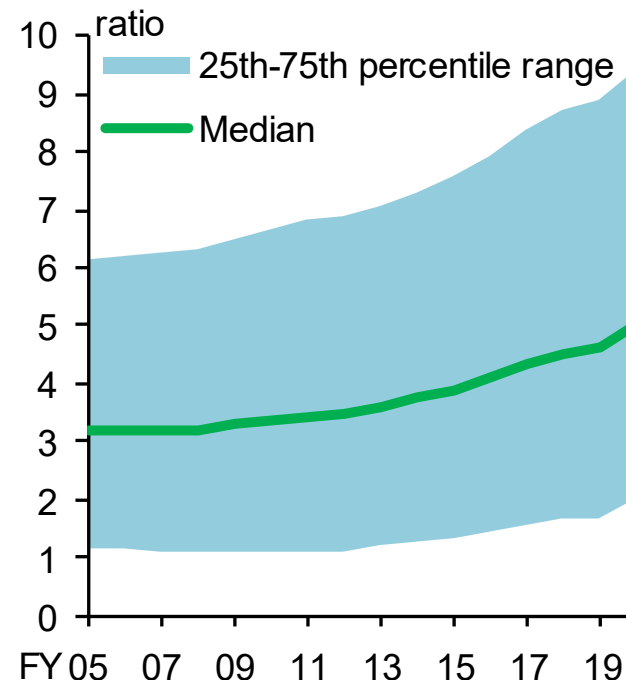
# Real estate loans (4) Changes in the real estate market

- Office rent has started to decline. Financial leverage of real estate leasing businesses is increasing.
  - Newly advertised rents for office space have declined ahead of ongoing rents.
  - The LTI ratio for real estate leasing businesses has been on an increasing trend.

### Office rents

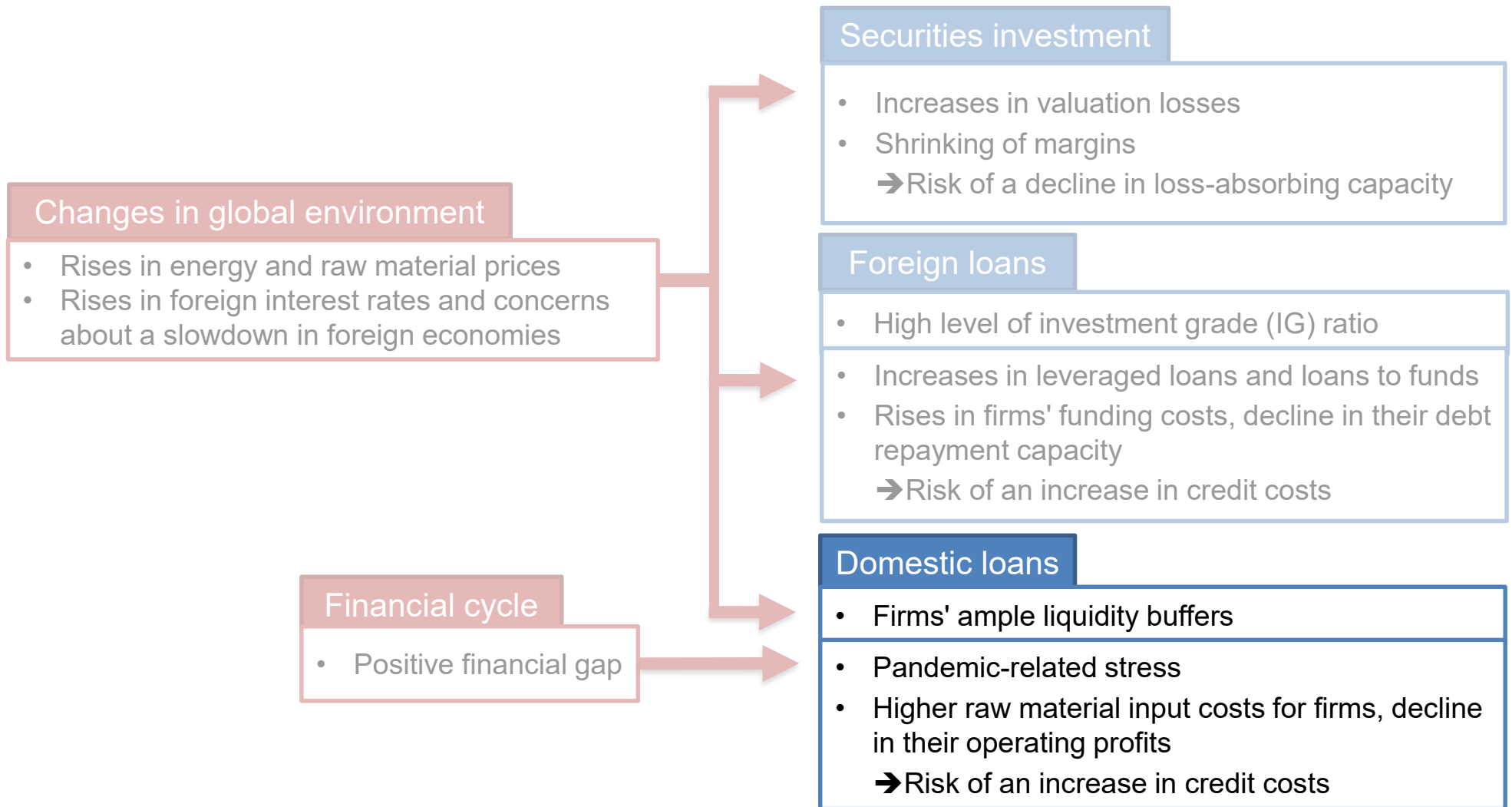


### LTI of real estate leasing businesses



Note: 1. "Newly advertised rent" indicates the average office rent offered in the Tokyo business area.  
2. "Ongoing rent" indicates the office space rental price in the Tokyo area within the Services Producer Price Index (excluding the effects of the consumption tax hike).  
3. See Chart III-3-16.

Note: The chart shows the distribution of small and medium-sized leasing businesses. See Chart III-3-20.



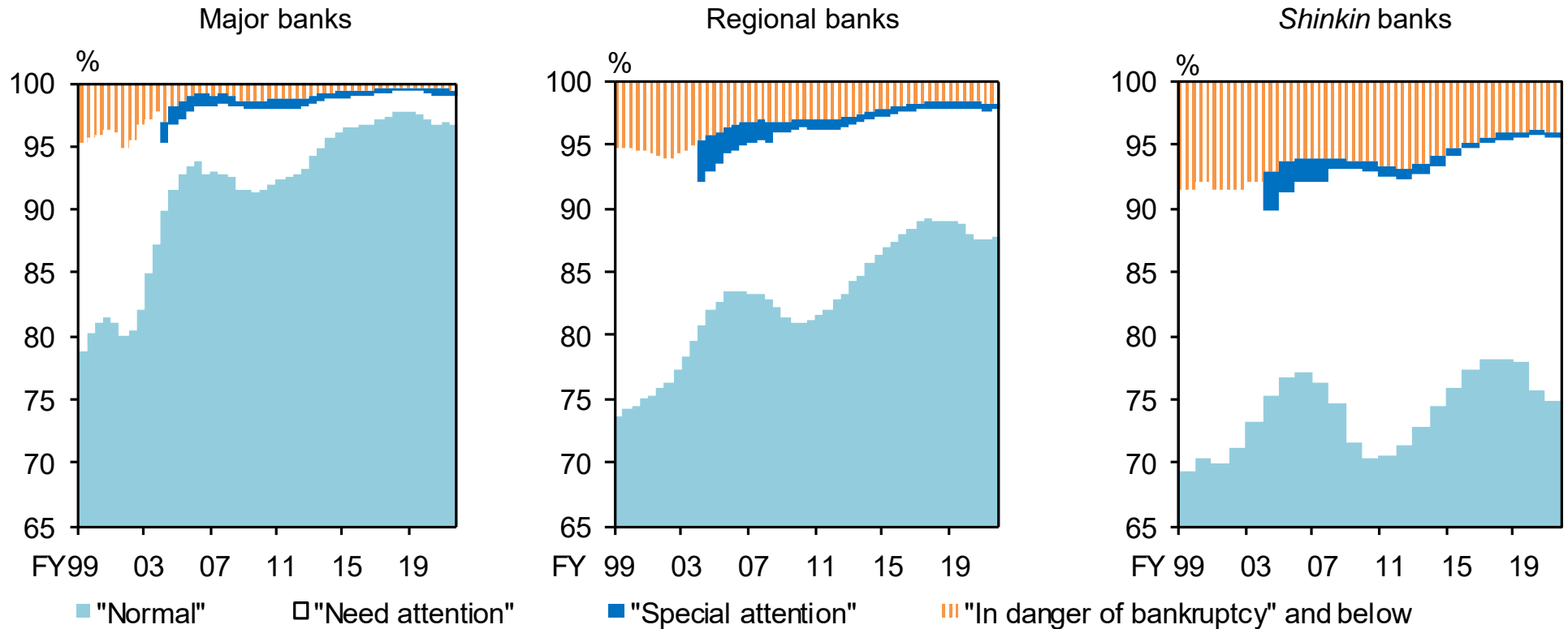
## 2. Domestic firms' financial condition under prolonged stress

The recent rise in energy and raw material prices could put additional stress on borrower firms.

# Domestic credit risk

- The credit risk posed to FIs has remained low.
  - In their loan portfolios, the shares of normal loans have remained high.

## Breakdown of loans by borrower classification

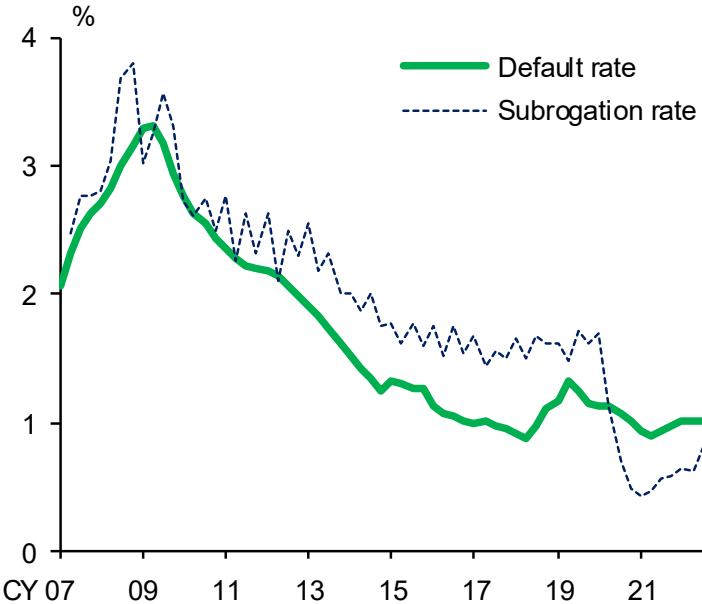


Note: "Need attention" indicates "Need attention excluding special attention" from fiscal 2004. See Chart IV-1-1.

# Firms' financial condition

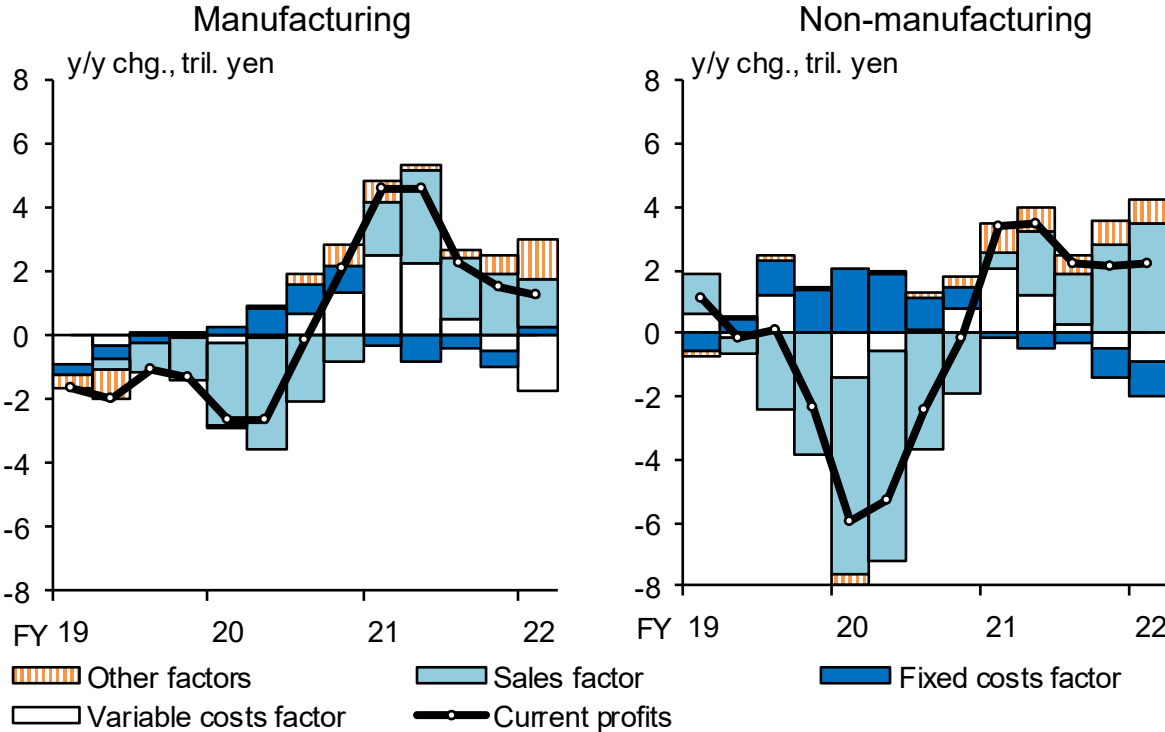
- Many firms have secured ample on-hand liquidity. However, the increase in variable costs associated with the rise in input costs has been an additional factor that negatively affects firms' financial condition.
  - Firms' ample liquidity buffers have been one factor in keeping defaults at historically low levels.
  - The pandemic can be regarded as an industry-specific shock; the rise in input costs has been a macroeconomic shock that affects a wide range of industries.

Firms' default



Note: 1. "Default rate" indicates the ratio of borrowers that meet the conditions for the first time, such as becoming delinquent for 3 months or longer, or being downgraded to the borrower classification of "in danger of bankruptcy" and below.  
 2. "Subrogation rate" is the ratio of borrowers subrogated by credit guarantee corporations.  
 3. See Chart IV-1-4.

Firms' current profits



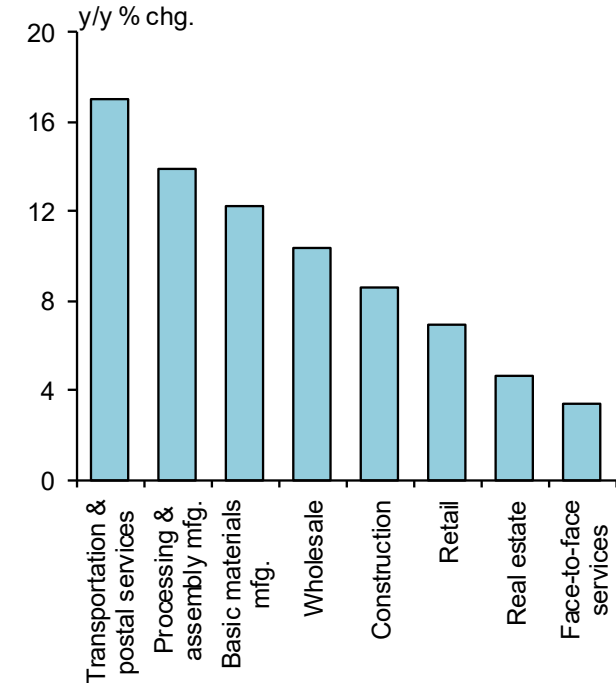
Note: 2-quarter backward moving averages. See Chart IV-1-6.



# Price pass-through and firms' probability of default

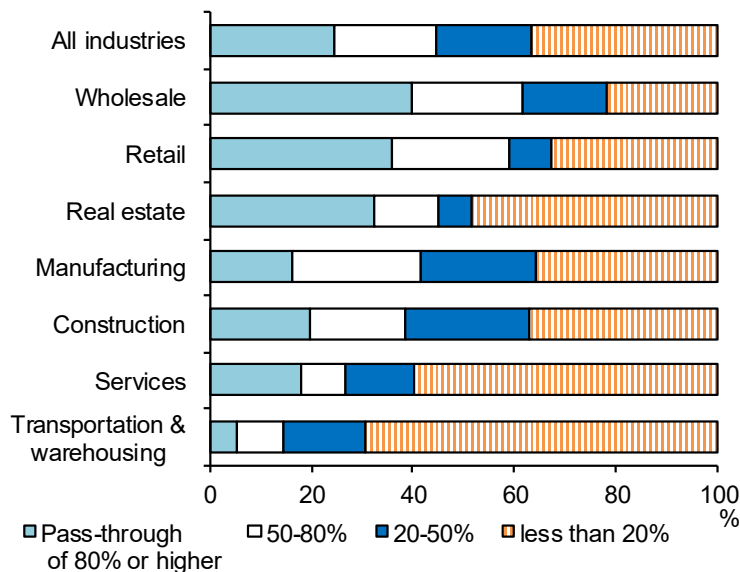
- Firms' variable costs are estimated to have increased substantially, especially in industries that are highly energy-dependent. Some firms find it difficult to pass on this increase in variable costs to sales prices.
- The simulation results show that the lower the firms' price pass-through rate, the higher is their PD.
  - The PD is likely to increase for (1) firms for which variable costs are sensitive to import prices, (2) firms with limited bargaining power in price negotiations, and (3) firms with low liquidity buffers.

### Variable costs by industry



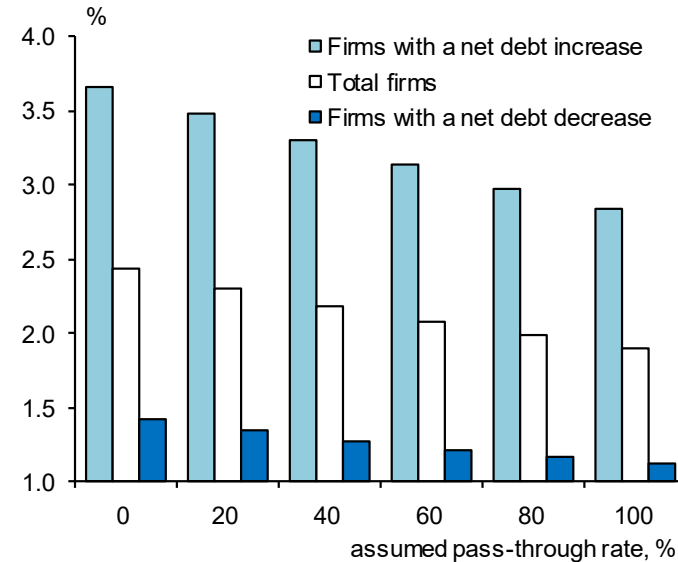
Note: The year-on-year rates of change in variable costs estimated in response to the increase in the import prices in fiscal 2022. See Chart IV-1-8.

### Price pass-through rate



Note: The ratios of the responses to each pass-through rate. The survey was conducted in June 2022. See Chart IV-1-9.

### Default curves

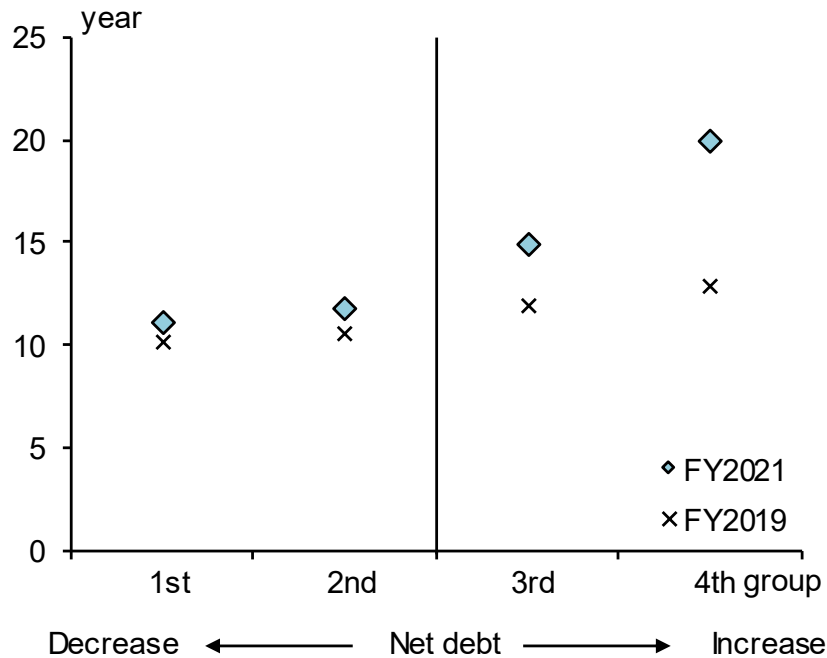


Note: The estimated PD based on assumed pass-through rate. "Firms with a net debt increase" indicates firms for which net debt (borrowings minus cash and deposits) has increased since the start of the pandemic. "Firms with a net debt decrease" indicates firms for which net debt has decreased. See Chart IV-1-11.

# Characteristics of SMEs in debt (1)

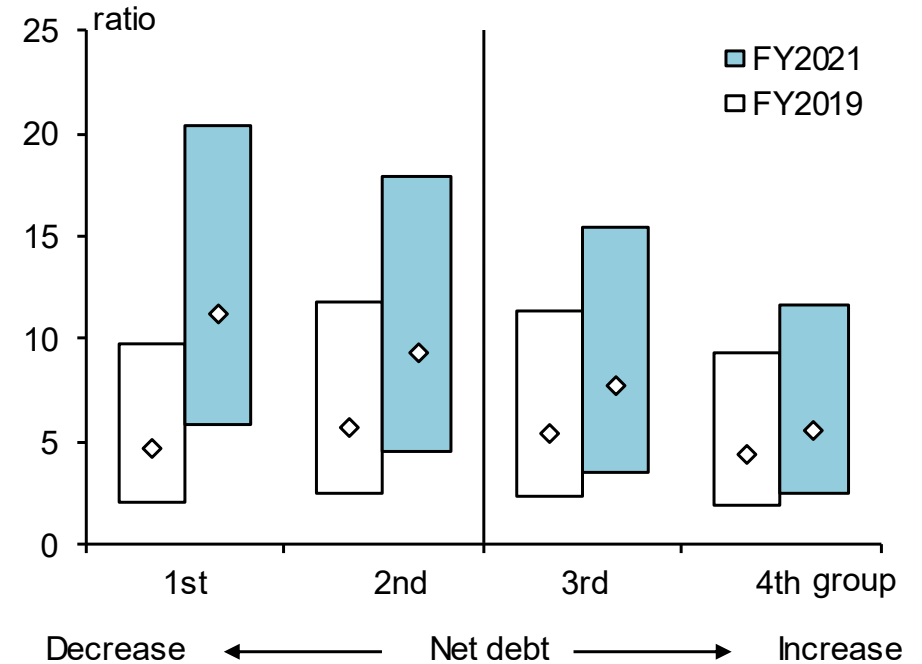
- In supporting borrower firms, it is worth examining their risk characteristics.
- SMEs for which net debt has increased since the pandemic tend to have loans with longer durations. They also tend to hold a lower liquidity buffer and are less resilient to additional stress.
  - In the charts below, SMEs are divided into four groups based on changes in their net debt (borrowings minus cash and deposits) since the pandemic, and financial indicators are shown for each group.

## Distribution of years of debt redemption



Note: The median values of years of debt redemption in each group, calculated as loan amounts in each year divided by operating cash flow in fiscal 2019. See Chart IV-1-16.

## Distribution of liquidity buffer

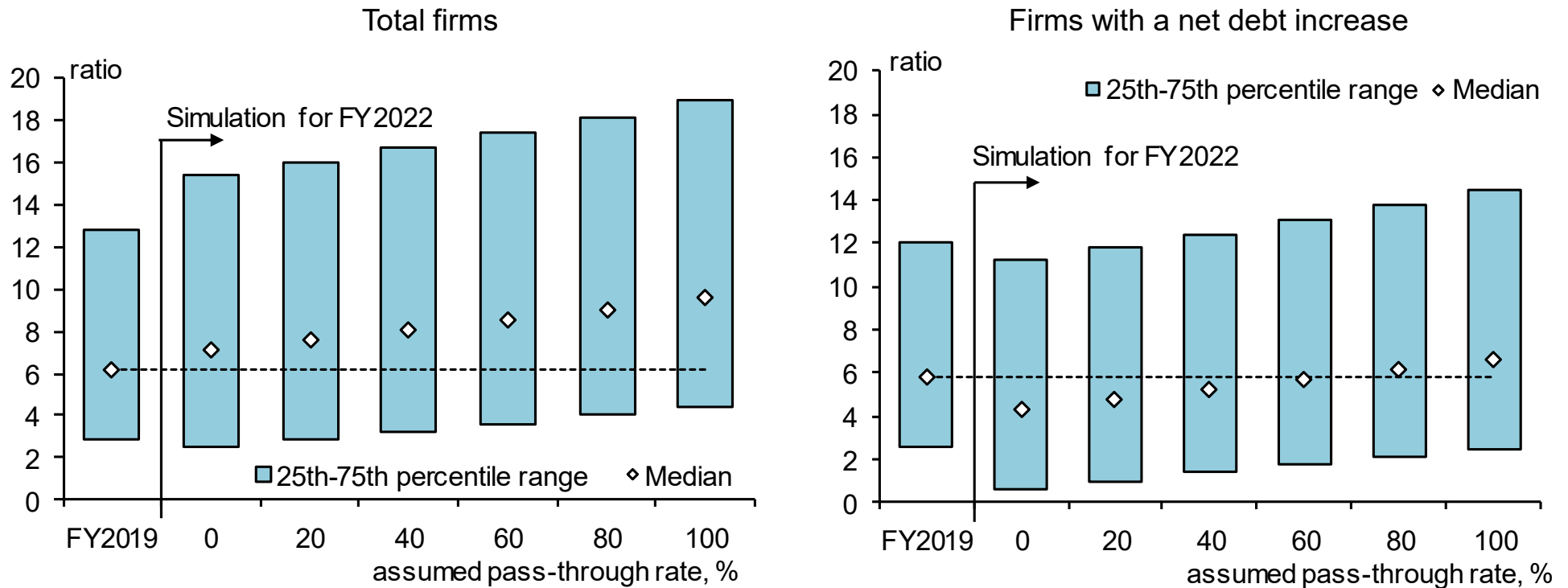


Note: The markers and bands indicate the median values and 25th-75th percentile of the ratios of cash reserves to monthly average administrative expenses in each group, respectively. See Chart IV-1-19.

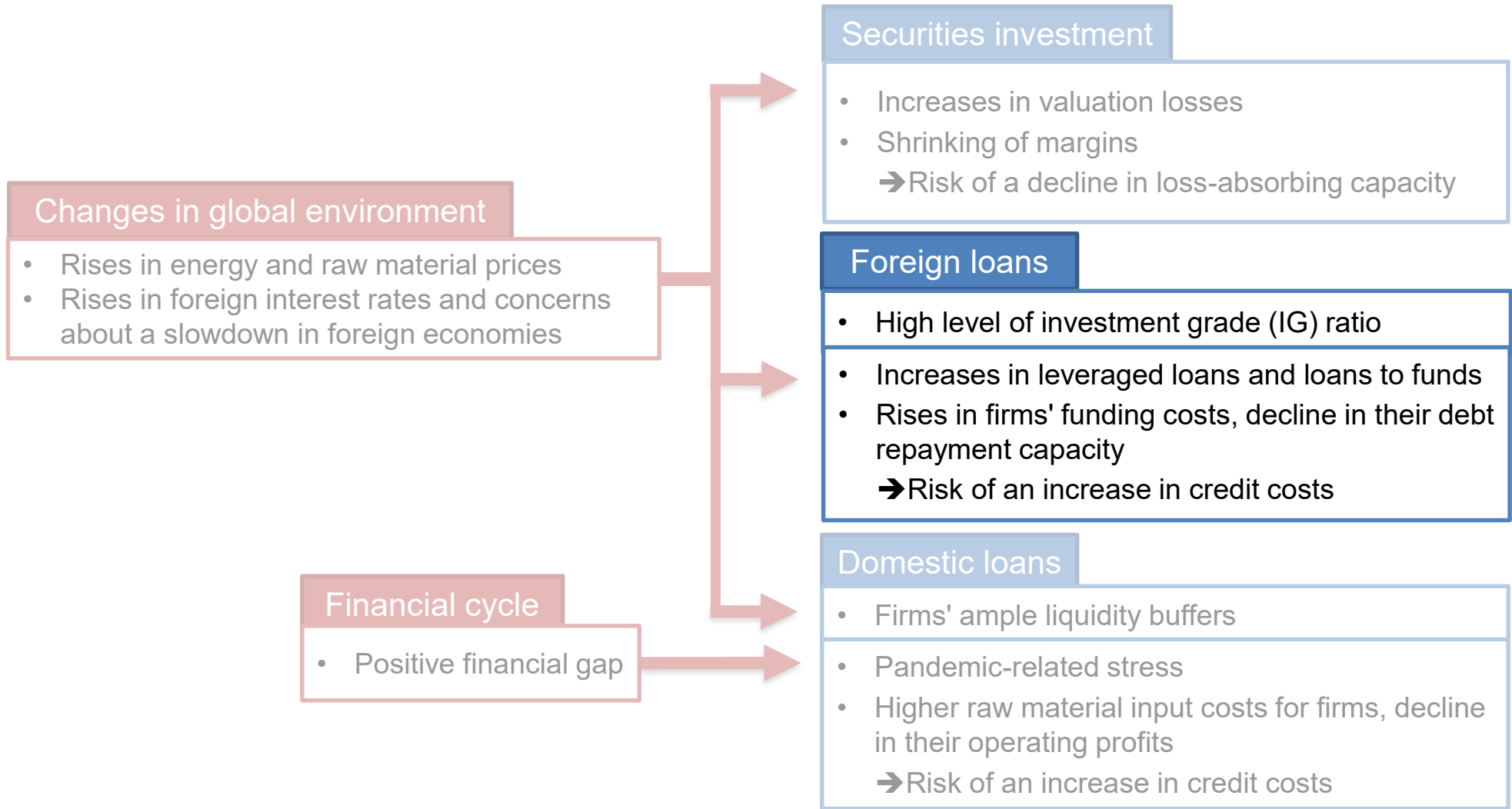
# Characteristics of SMEs in debt (2)

- Firms' PD depends on the size of their liquidity buffer in addition to their price-setting behavior.
- According to the simulation results, more than half of firms would have a liquidity buffer equal to or greater than the level just before the pandemic, regardless of their price pass-through rate.
  - The liquidity buffers of some firms with a net debt increase since the pandemic would fall below the level just before the pandemic if their pass-through rate falls below 40 percent.

## Distribution of liquidity buffer



Note: "Liquidity buffer" is calculated as the ratios of cash reserves to monthly average administrative expenses. The dotted lines indicate median values of the actual level of fiscal 2019. See Chart IV-1-12.



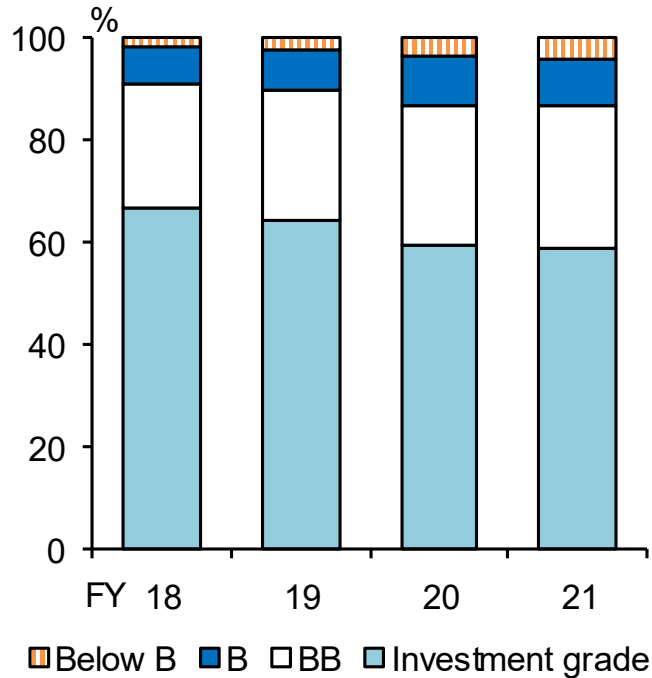
### 3. Interest rate sensitivity of foreign loans

The rise in foreign interest rates could put additional stress on borrower firms.

# Foreign credit risk

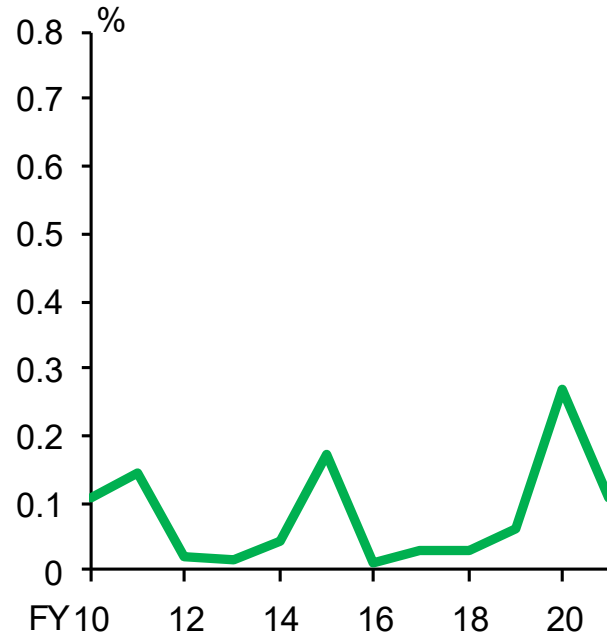
- The credit risk on foreign loans has remained low to date.
  - The share of non-IG loans has remained at around 40 percent.
  - Credit cost ratios and NPL ratios have remained at relatively low levels.

Rating composition of foreign loans



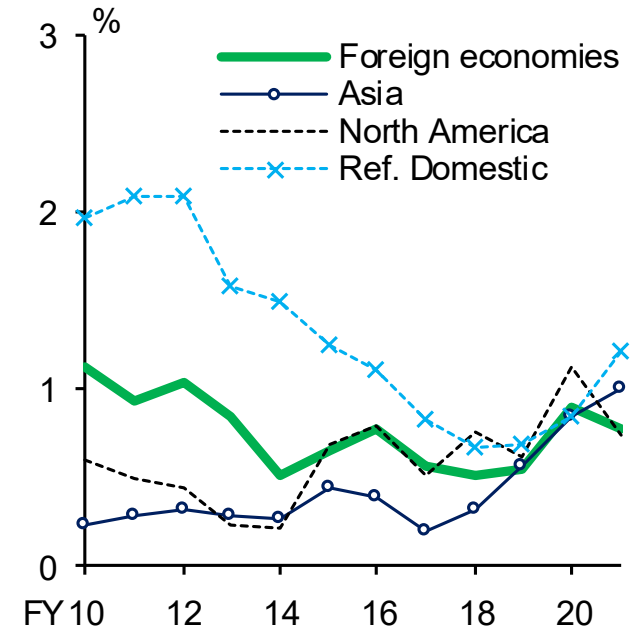
Note: Covers the three major banks' lending (based on the internal rating of each bank). See Chart IV-2-1.

Credit cost ratios of foreign loans



Note: Covers the international business of the three major banks (on a non-consolidated basis). See Chart IV-2-2.

NPL ratios by region

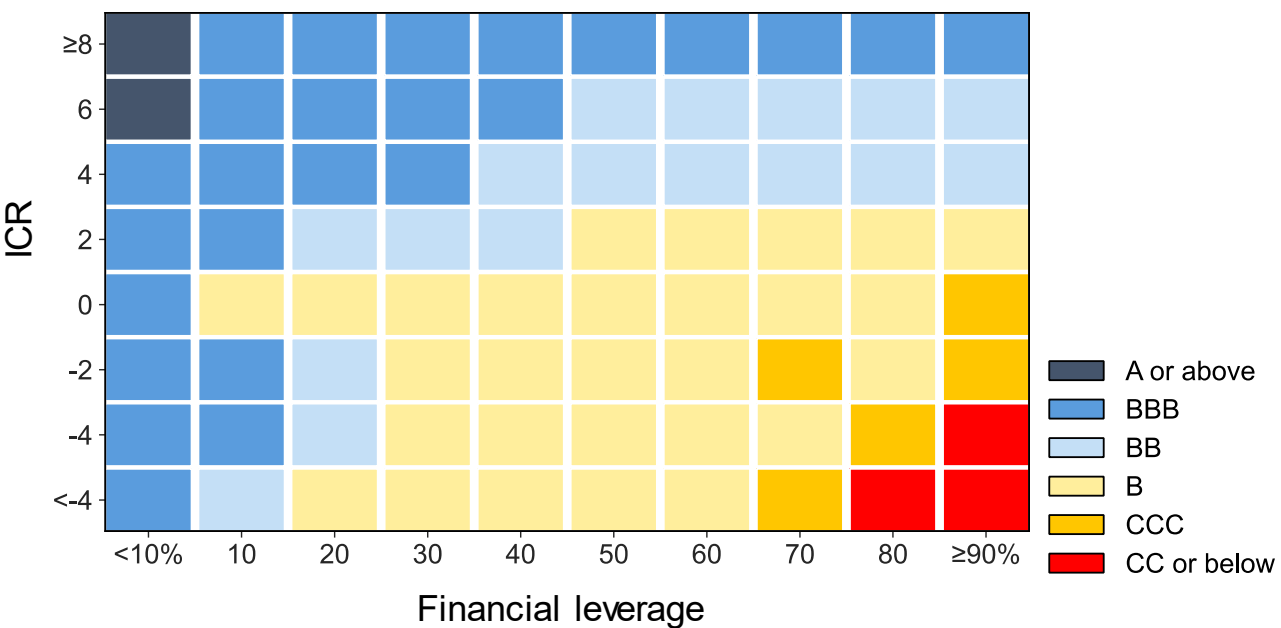


Note: Covers the three major banks (on a non-consolidated basis). See Chart IV-2-3.

# Corporate indicators and credit rating

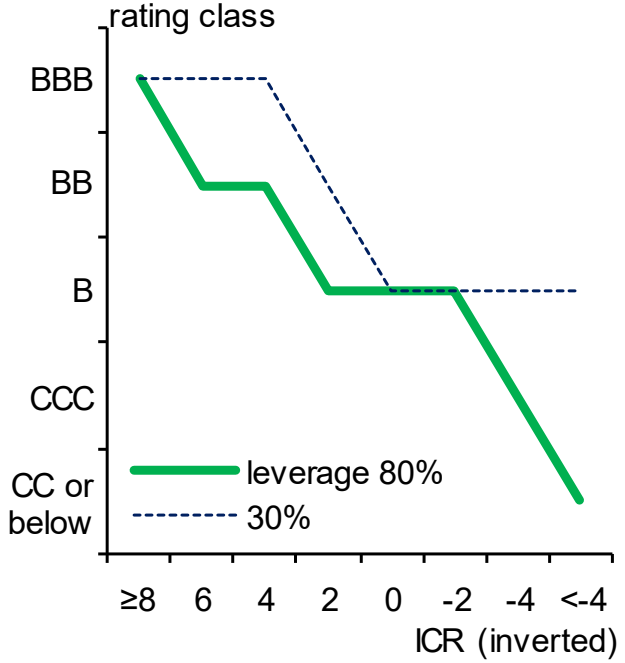
- With foreign interest rates rising quickly, the creditworthiness of highly leveraged firms could deteriorate.
  - Even with the same initial rating, the higher the firms' financial leverage, the lower their ratings tend to be when their ICR worsens.

Firms' financial condition and credit rating



Note: 1. Shows the most frequent rating class for each combination of financial leverage (interest-bearing debt / total assets) and ICR (EBITDA / interest expenses) levels.  
 2. Covers a total of approximately 110,000 firms for which rating and financial data are available from 2000.  
 3. See Chart IV-2-5.

ICR and rating class

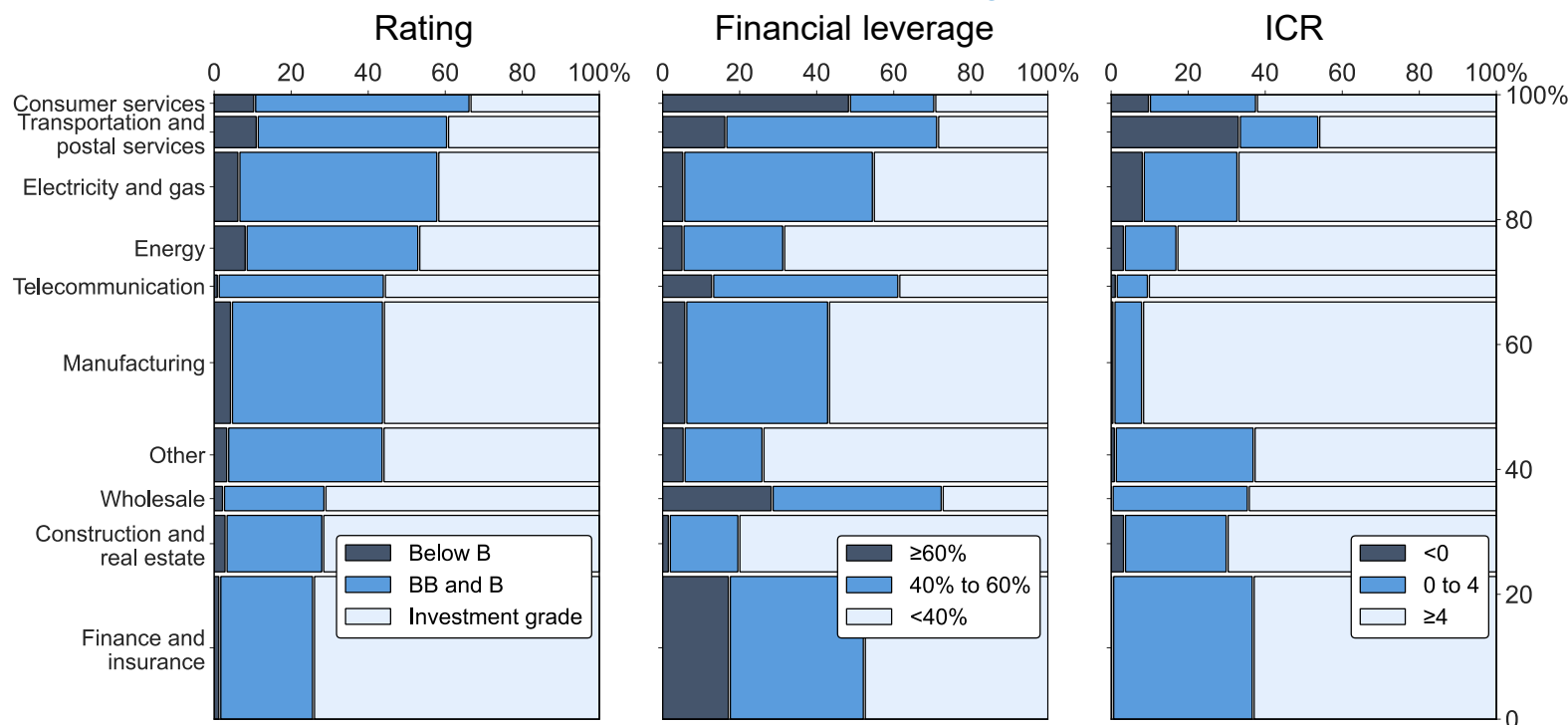


Note: Changes in rating class when only ICR worsens, keeping financial leverage at 80% and 30% respectively.

# Foreign loans (1) Risk map

- A risk map visualizes relationships between the loans outstanding by industry and the financial indicators.
  1. Industries that have been negatively affected by the pandemic (consumer services as well as transportation and postal services) have high shares of non-IG firms, highly leveraged firms, and low-ICR firms.
  2. Even industries with a high share of IG firms (finance and insurance as well as wholesale) have quite a few firms with high leverage and a low ICR. → page 23
  3. The growth in leveraged loans has pushed up the shares of non-IG firms and highly leveraged firms. → page 24

## Risk maps of foreign loans

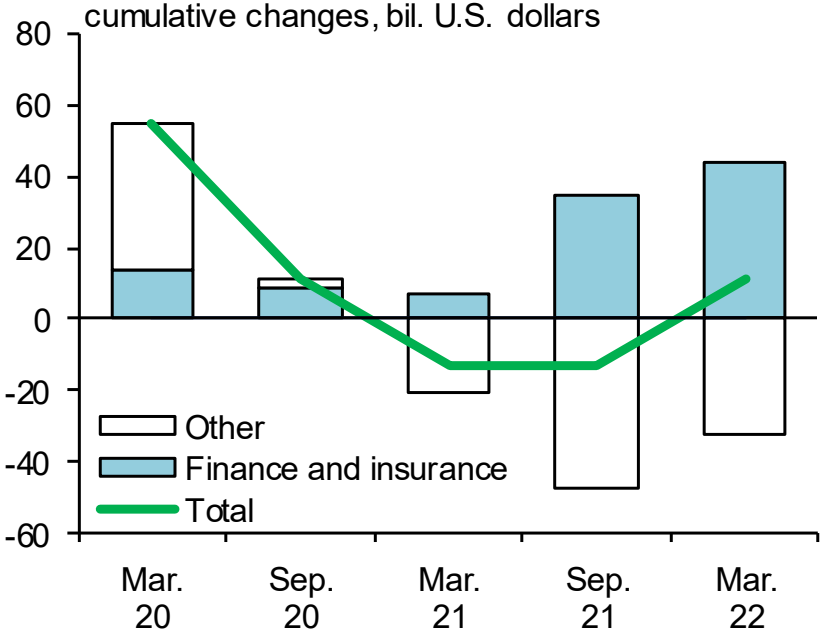


Note: The vertical axis in each chart represents the share of the three major banks' foreign loans outstanding by industry. The horizontal axes represent, from left to right, the percentage shares of firms by rating, financial leverage (interest-bearing debt / total assets), and ICR (EBITDA / interest expenses), respectively. Data as at end-March 2022. See Chart IV-2-6.

# Foreign loans (2) Loans to the finance and insurance industry

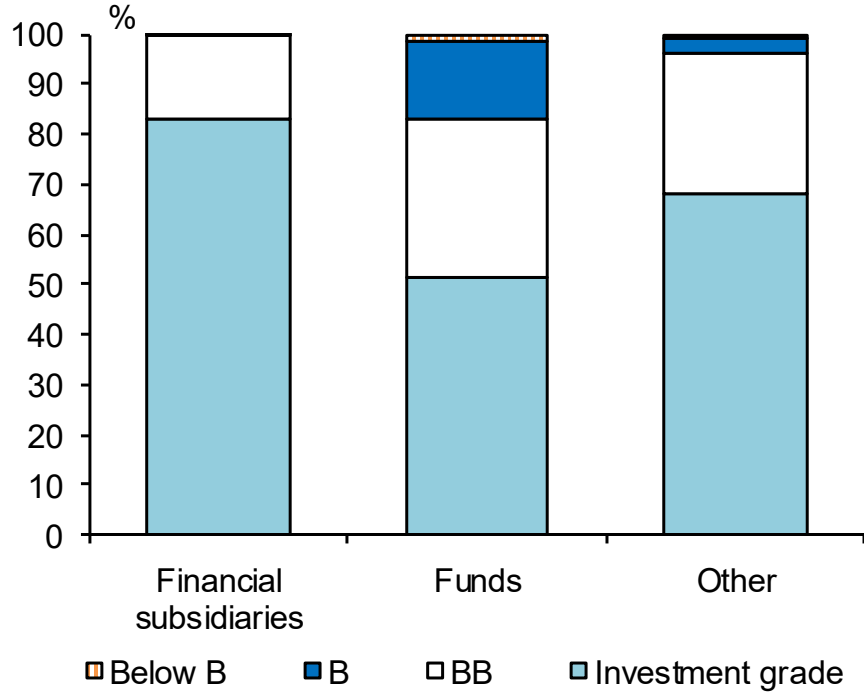
- Loans to the finance and insurance industry have increased, driven mainly by loans to investment funds.
  - Major banks have been providing subscription finance and making bridge loans.
  - Loans outstanding to large funds account for only 20 percent of overall loans to large borrowers in the finance and insurance industry; the share of non-IG loans is close to 50 percent.

Changes in foreign loans by industry



Note: Shows cumulative changes in foreign loans from end-September 2019. Covers the three major banks' lending. See Chart IV-2-7.

Rating composition of loans to finance and insurance



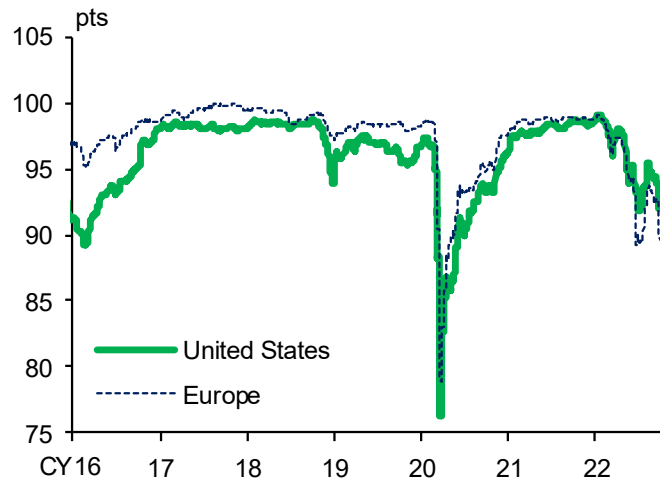
Note: Covers the three major banks' large borrowers (based on the internal rating of each bank). Data as at end-March 2022. See Chart IV-2-8.



# Foreign loans (3) Leveraged loans

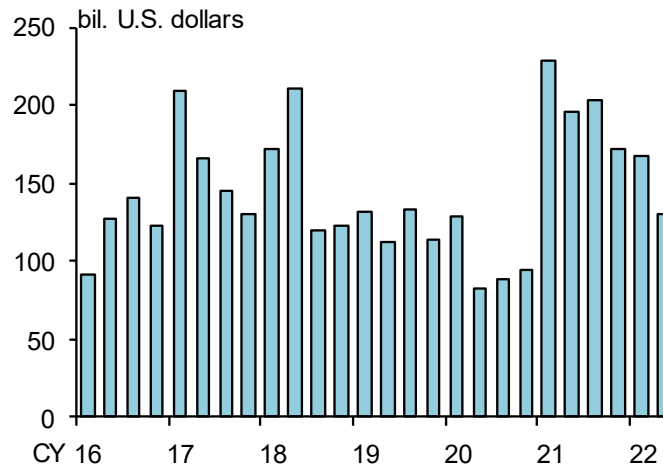
- Major banks have actively worked on extending leveraged loans.
  - In response to the recent fall in prices of leveraged loans, major banks have taken a more cautious stance with regard to new loans.
  - Leveraged loans account for about 10 percent of major banks' foreign loans. The share of those with leverage of more than 6 times has been on the rise.

### Leveraged loan prices



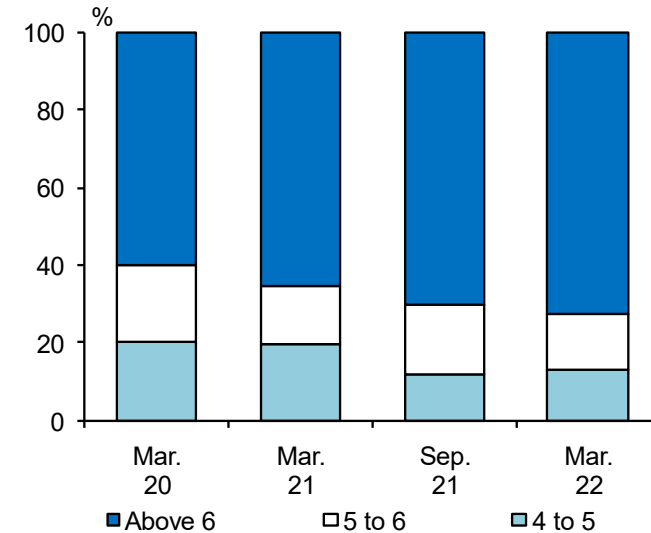
Note: The figures indicate the index of leveraged loan prices in the secondary markets. See Chart II-1-9.

### Amount of leveraged loans originated



Note: The amount of leveraged loans originated in the United States. See Chart IV-2-9.

### Composition of leveraged loans by leverage ratio

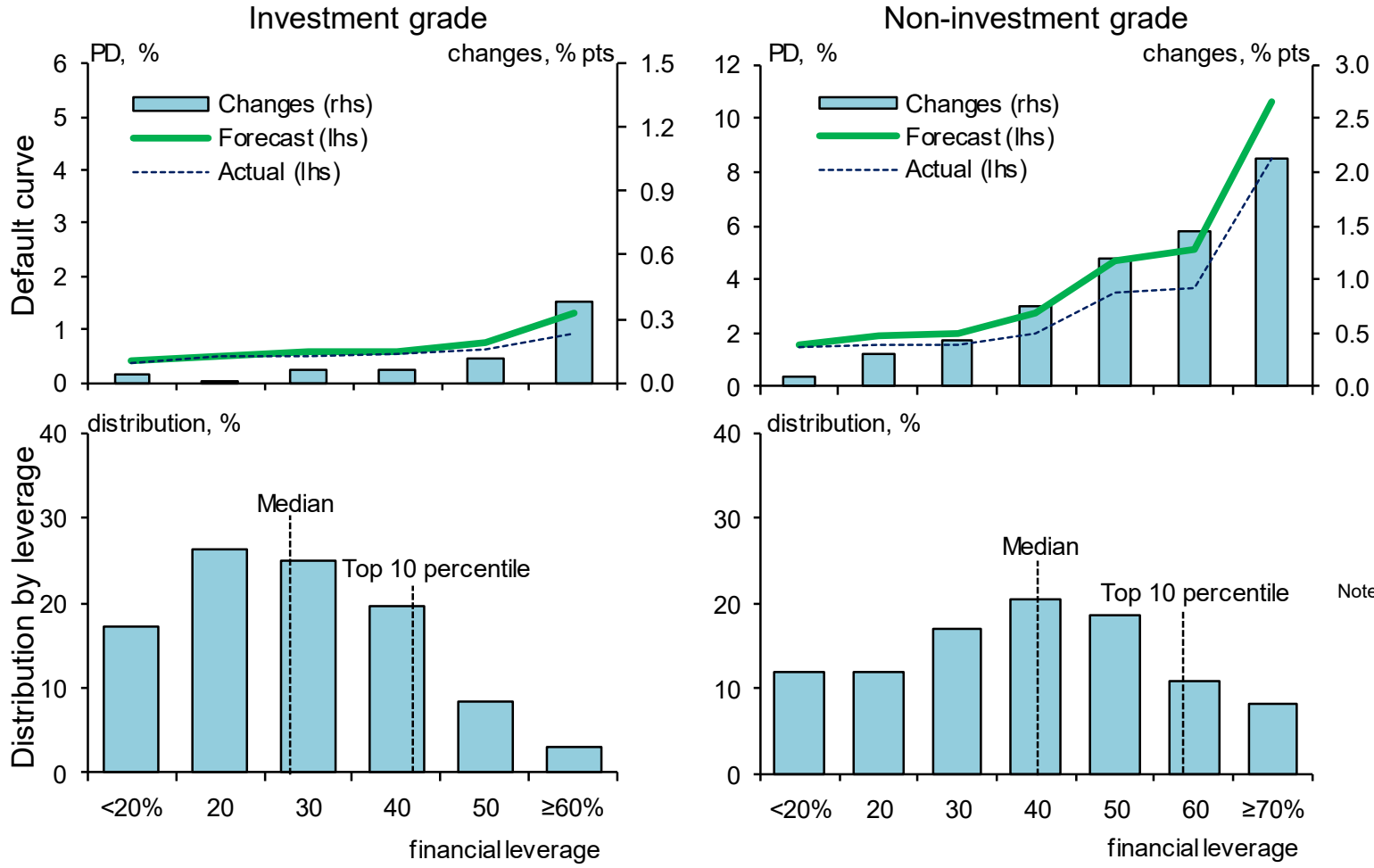


Note: The leverage ratio is measured as interest-bearing debt / EBITDA. Covers the three major banks. See Chart IV-2-10.

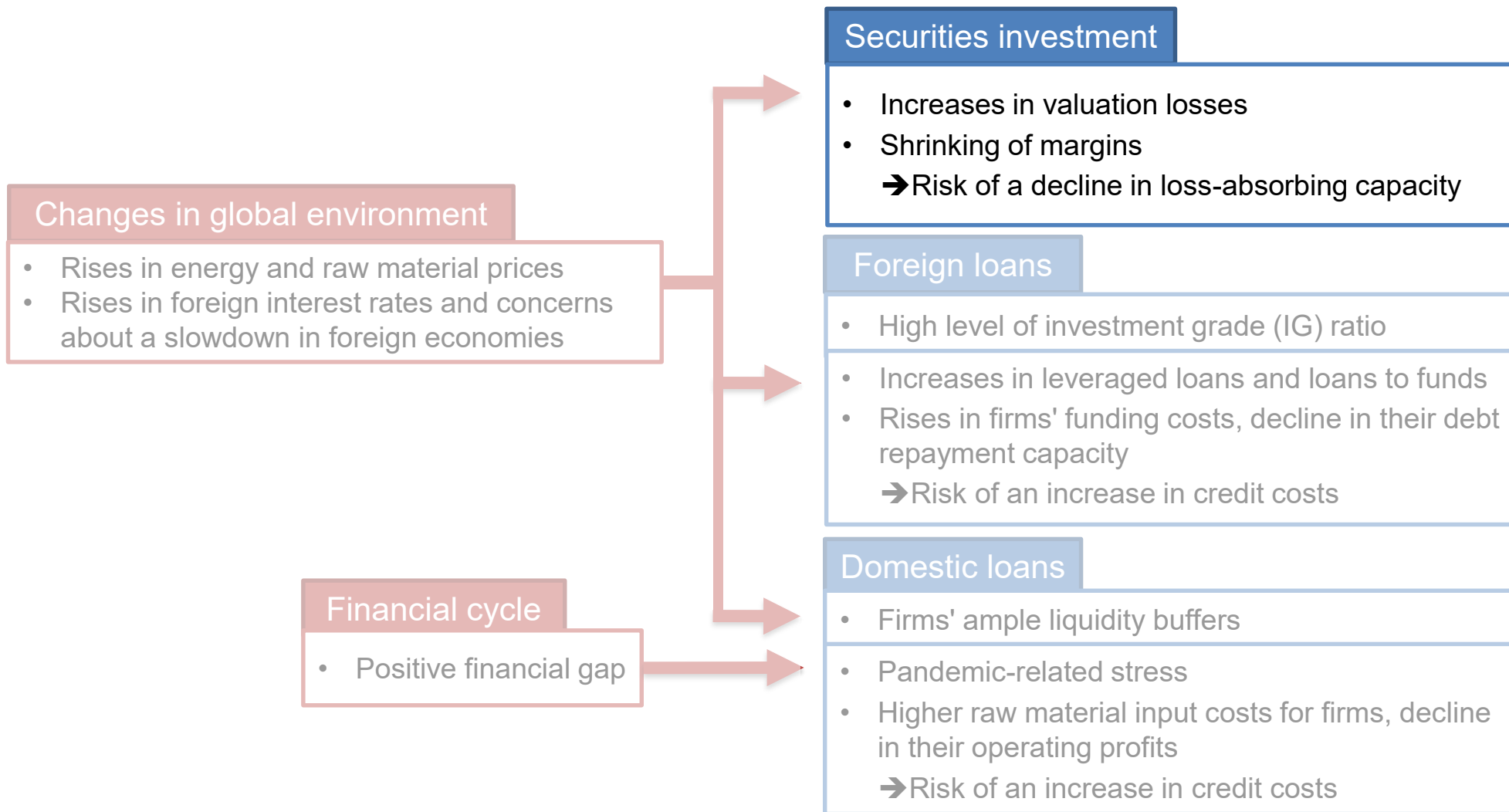
# Rising interest rates and firms' probability of default

- As shown in the risk map, foreign loans are likely to be sensitive to interest rate rises.
  - The estimate shows that the response of the PD tends to be more amplified, the higher firms' financial leverage.
  - The forecasted default curve shifts upward and its slope becomes steeper.

## Firms' default curves and distribution by financial leverage



Note: 1. "Forecast" in the upper charts shows the estimated PD assuming a rise in funding costs. "Actual" is the PD as at June 2022. "Changes" represents the increase in the PD from "Actual" to "Forecast."  
 2. The lower charts show the distribution by financial leverage of the three major banks' large borrowers (as at end-March 2022).  
 3. See Chart IV-2-12.

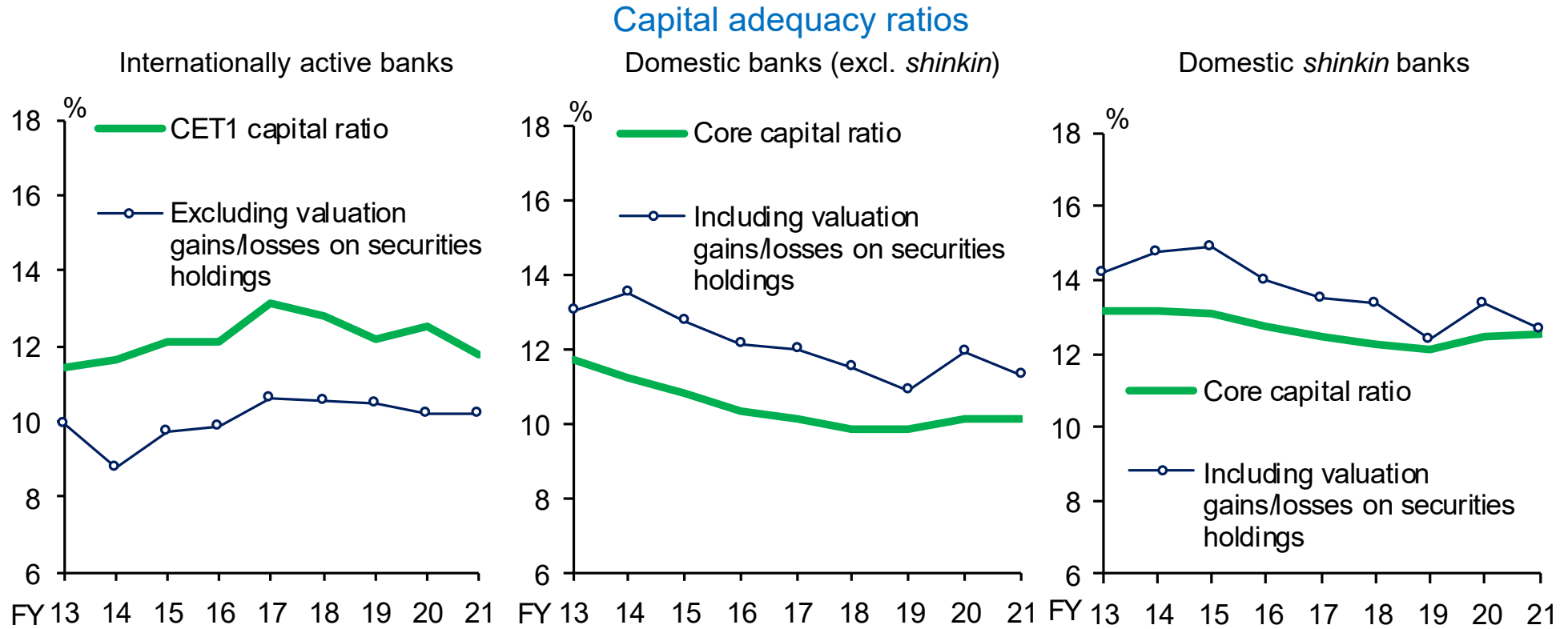


## 4. Financial institutions' resilience to foreign interest rate rises

The decline in interest and dividends on securities and the decrease in room for realizing gains could reduce FIs' loss-absorbing capacity.

# Loss-absorbing capacity (1) Capital adequacy

- The capital adequacy ratios of FIs have been sufficiently above the regulatory requirements for all types of banks.
  - FIs have sufficient capital bases, which will enable them to continue risk-taking.

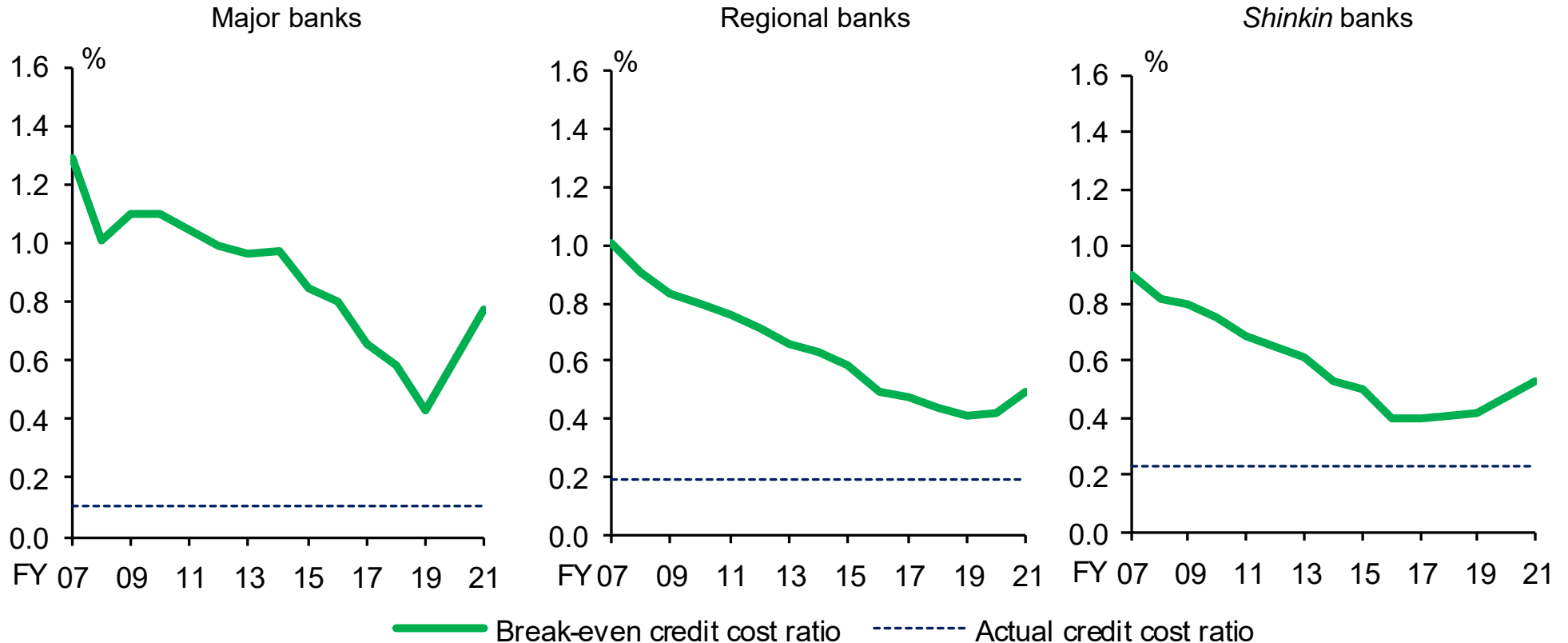


Note: The charts are calculated on a consolidated basis. The transitional arrangements are taken into consideration. See Chart V-1-1.

# Loss-absorbing capacity (2) Profit buffers

- As a result of the improvement in OHRs, break-even credit cost ratios have been improving.
  - The break-even ratio represents credit costs that can be absorbed by core profits relative to loans outstanding.
  - Regional FIs have accelerated efforts to strengthen their business base under the Bank's Special Deposit Facility, improving their OHRs.

## Break-even credit cost ratios

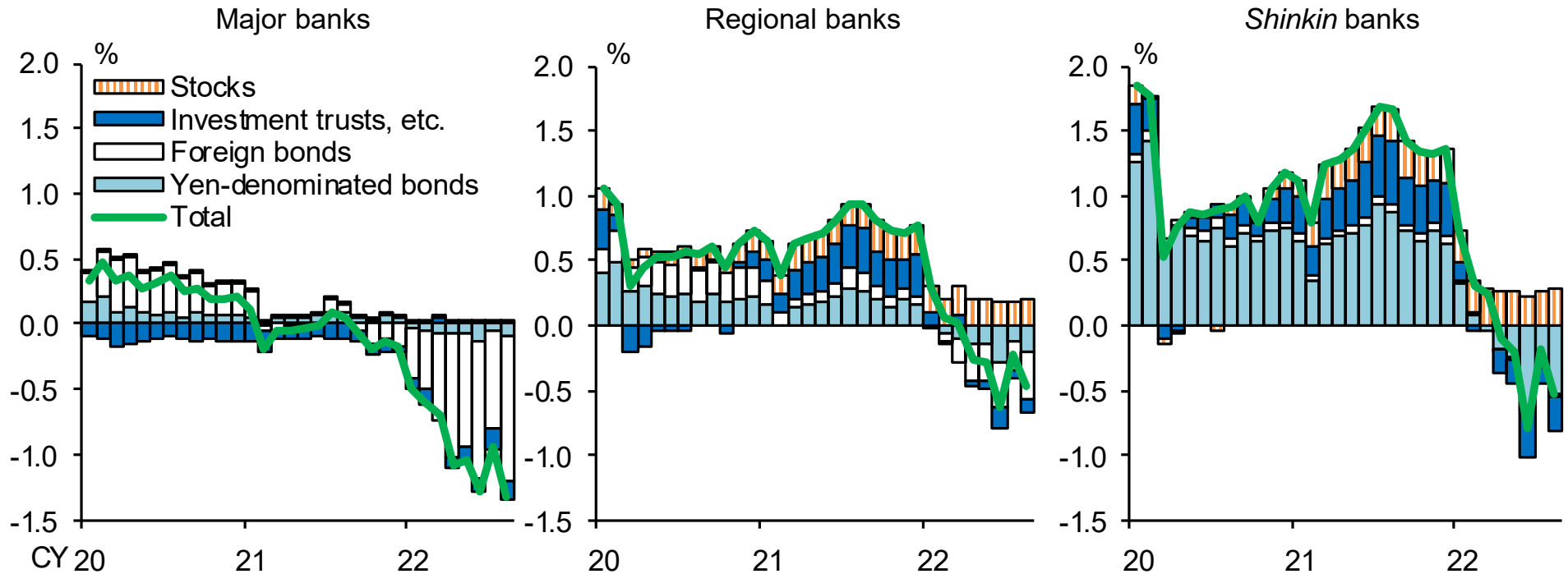


Note: "Break-even credit cost ratio" is the ratio at which credit costs equal PPNR (excluding trading income). PPNR from fiscal 2012 onward excludes profits and losses from investment trusts due to cancellations. "Actual credit cost ratio" is the average from fiscal 2005 to the latest year. See Chart V-1-3.

# Loss-absorbing capacity (3) Room for realizing gains

- Valuation losses on securities have increased for all types of banks.
  - Room for realizing gains on securities holdings, which can be used to offset losses in a relatively flexible manner, has been declining on the whole.
  - Depending on future interest rate developments, valuation losses could increase further. The rising cost of foreign currency funding could result in a negative spread between investment yields and funding rates of foreign currency.

## Valuation gains/losses on securities holdings

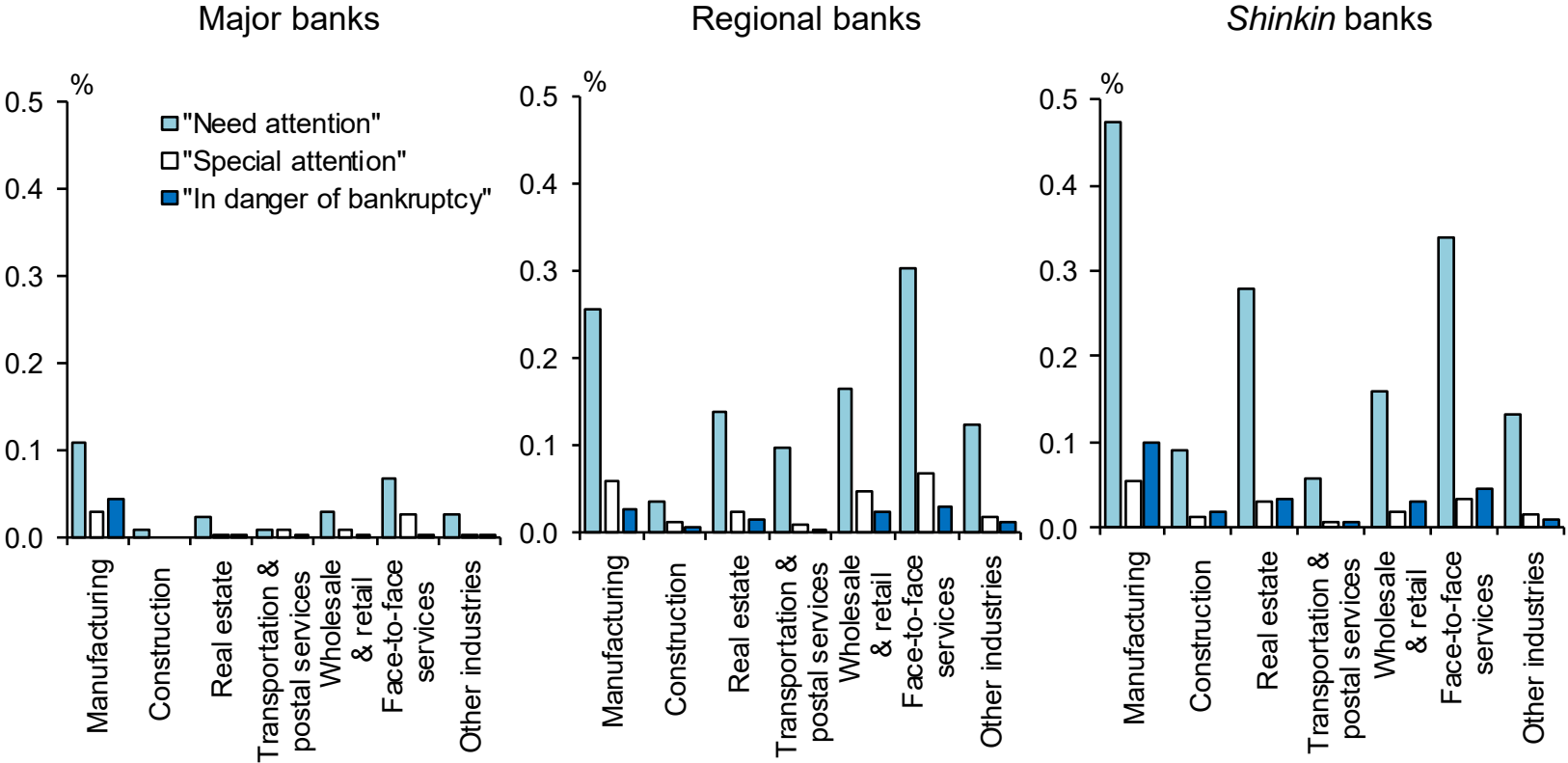


Note: The ratio of valuation gains/losses on securities (excluding strategic stockholdings) to risk-weighted assets. See Chart IV-3-1.

# Loss-absorbing capacity (4) Loan-loss provisions

- The shares of unsecured and unprovisioned loans to large borrowers have been low on the whole.
  - The shares have been low, partly because FIs have enhanced their precautionary loan-loss provisioning.
  - The shares stand at slightly less than 2 percent in total at regional and *shinkin* banks.

## Unsecured and unprovisioned ratios of large-scale loans

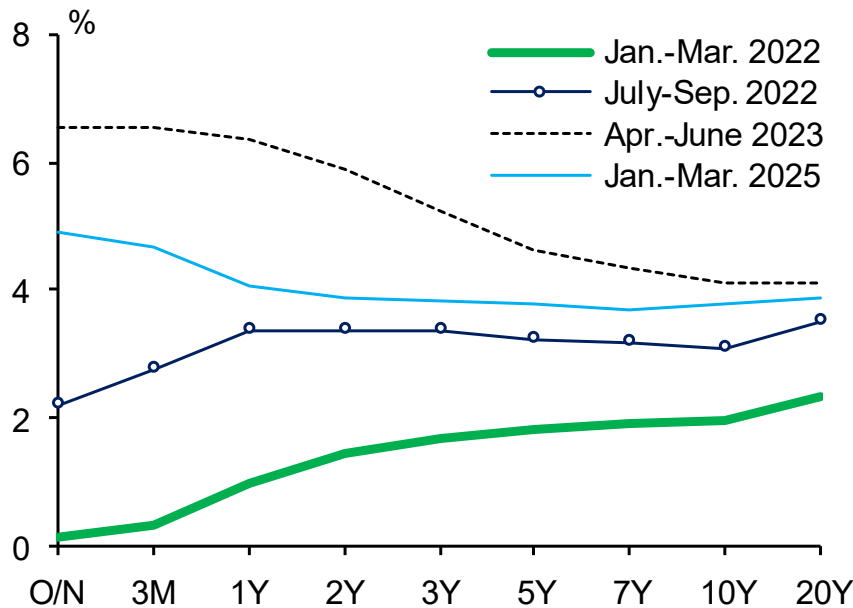


Note: 1. The figures indicate the ratios of unsecured and unprovisioned loans to overall loans. Data as at end-March 2022.  
 2. For major banks, the large-scale loans consist of the top 100 borrowers classified as "need attention" and below. For regional banks and *shinkin* banks, the large-scale loans consist of the top 50 borrowers in each borrower classification.  
 3. See Chart IV-1-3.

# Stress testing (1) Inverted yield curve scenario

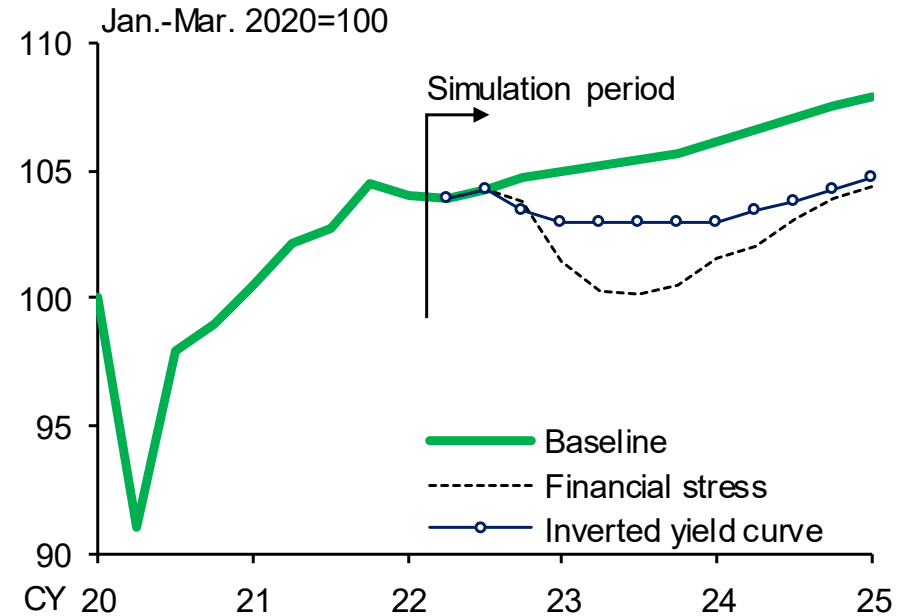
- The scenario assumes that interest rates in the United States and Europe become substantially inverted.
  - The scenario assumes that the U.S. federal funds rate rises in line with the upper end of the confidence interval in the FOMC projections, and then remains high for a while. The growth rate of the U.S. economy is assumed to turn slightly negative within fiscal 2022 in line with the lower end of the confidence interval in the FOMC projections.
  - The financial stress scenario is assumed as another downside scenario.

## U.S. yield curves



Note: See Chart V-2-3.

## U.S. GDP



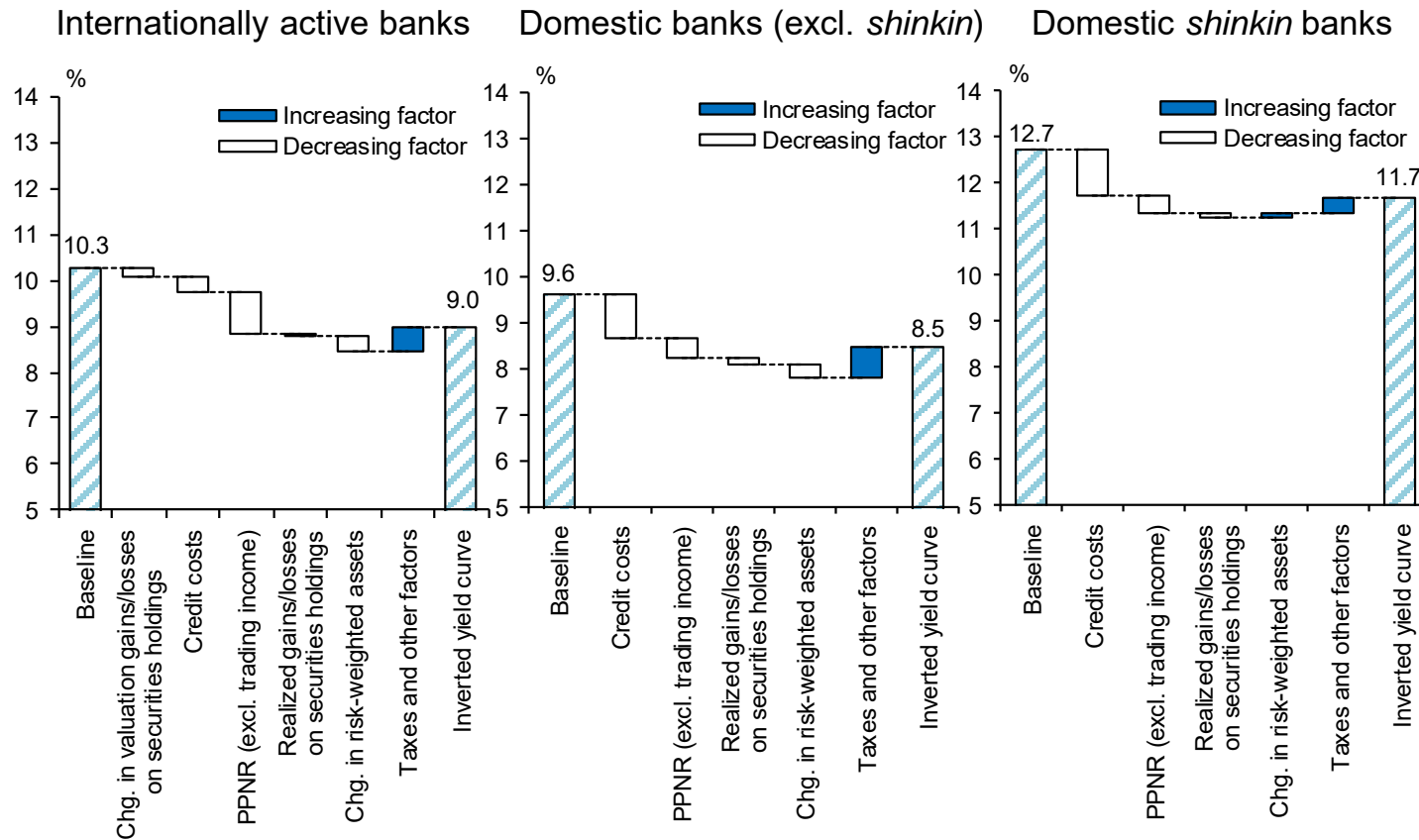
Note: See Chart V-2-4.



# Stress testing (2) Impact on capital adequacy

- FIs on the whole are resilient to stress events such as a substantially inverted yield curve in foreign markets.
  - The capital adequacy ratios are lower than in the baseline scenario for all types of banks; the decrease is modest.

## Decomposition of capital adequacy ratio: Inverted yield curve

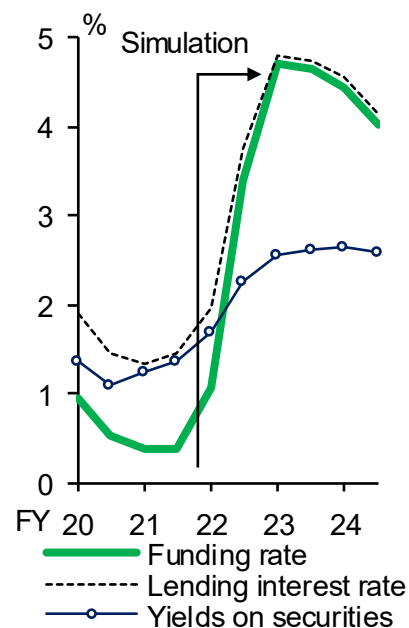


Note: The charts indicate the contribution of each factor to the difference between the capital adequacy ratios at the end of the simulation period (as at end-March 2025) under the baseline scenario and the inverted yield curve scenario. See Chart V-2-5.

# Stress testing (3) Direct impact of an inverted yield curve

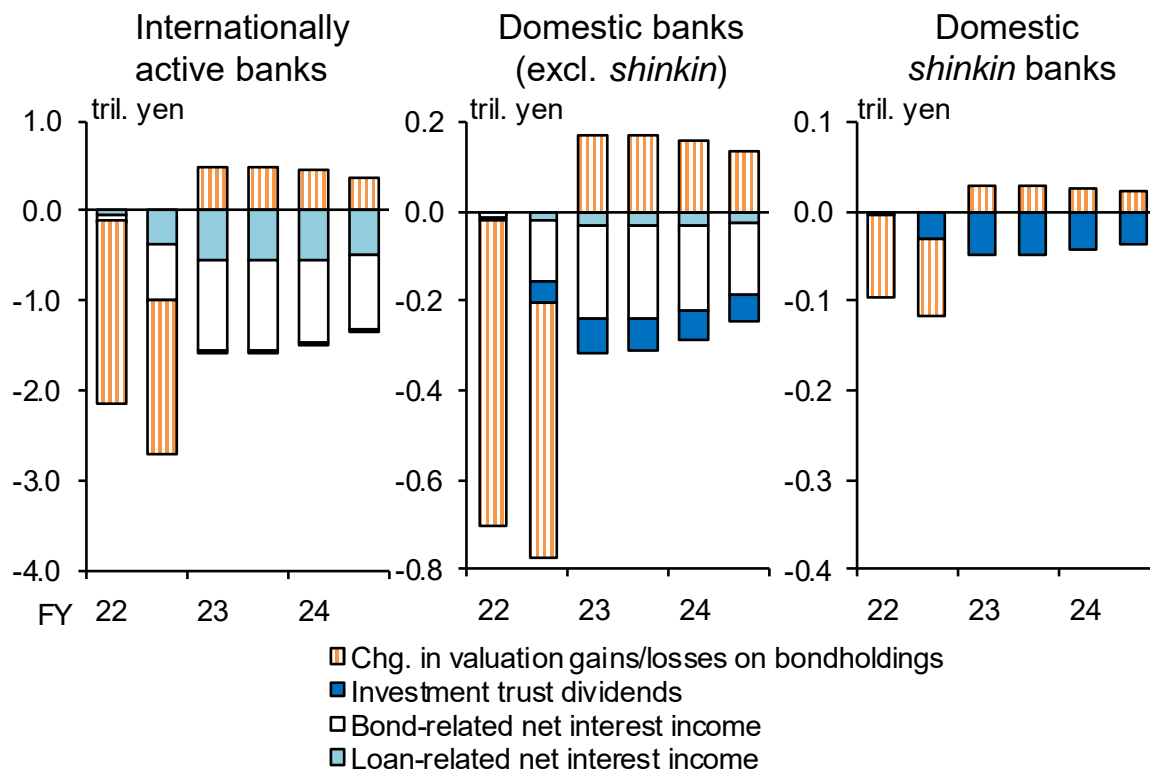
- Although capital adequacy ratios remain above a certain level, there is considerable downward pressure on FIs' PPNR excluding trading income and valuation gains/losses on securities holdings.
  - Lending margins are squeezed substantially, and margins on securities investment turn negative. Changes in both loan-related and securities-related net interest income contribute to the decline in foreign net interest income.
  - In the initial phase of simulation, valuation gains/losses on bondholdings deteriorate substantially for all types of banks.

## Foreign currency investment yield and funding rate



Note: Covers internationally active banks and domestic banks (excl. *shinkin*). See Chart V-2-7.

## Impact of foreign interest rate rises

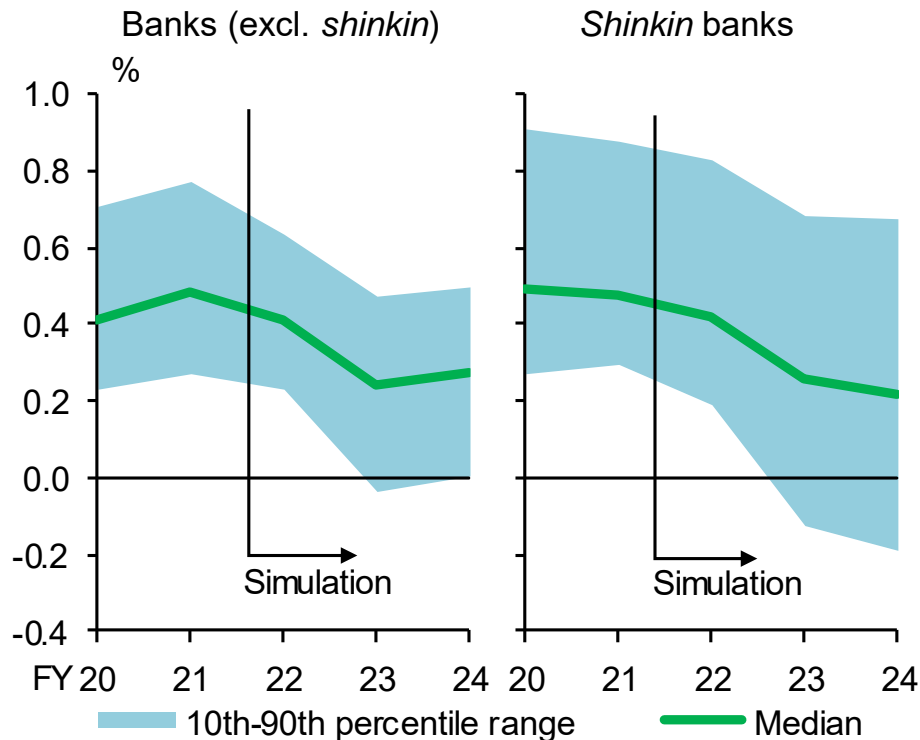


Note: The chart shows the direct impact of changes in yield curves from Jan.-Mar. 2022. See Chart V-2-8.

# Stress testing (4) Impact on loss-absorbing capacity

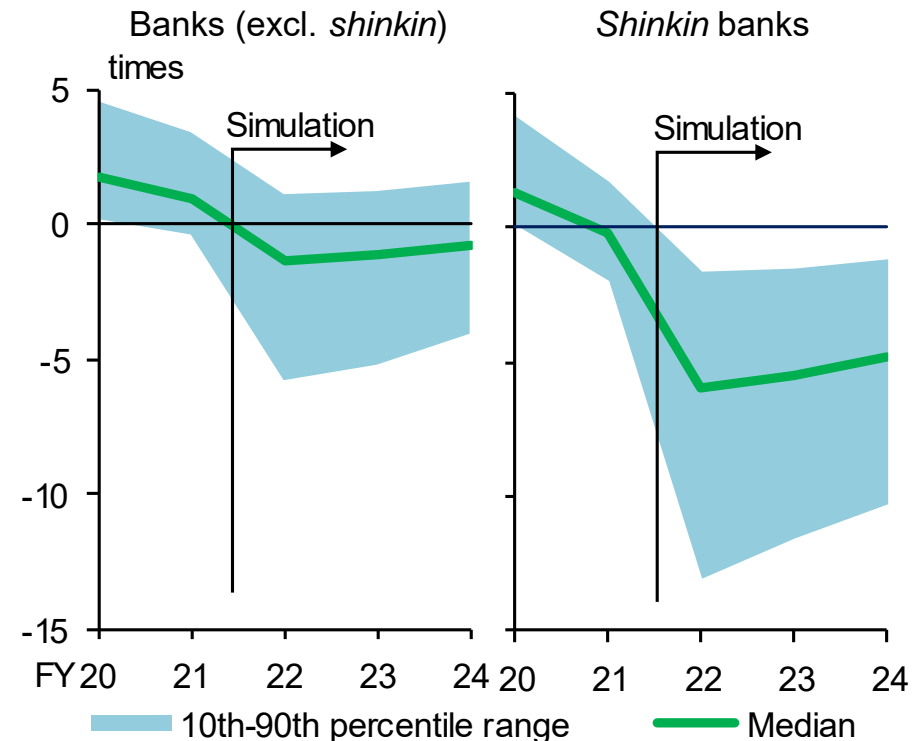
- The decline in foreign net interest income and the deterioration in valuation gains/losses on securities holdings lead to a deterioration in FIs' profit buffers and room for realizing gains.
  - The distribution of the break-even credit cost ratios, which represent profit buffers, shows a decline overall.
  - The room for realizing gains turns negative for many FIs. Note that securities portfolios are assumed to be constant and no flexible replacement of products is assumed.

## Distribution of break-even credit cost ratios



Note: The break-even credit cost ratios are the ratios at which credit costs equal PPNR (excluding trading income). See Chart V-2-9.

## Distribution of room for realizing gains

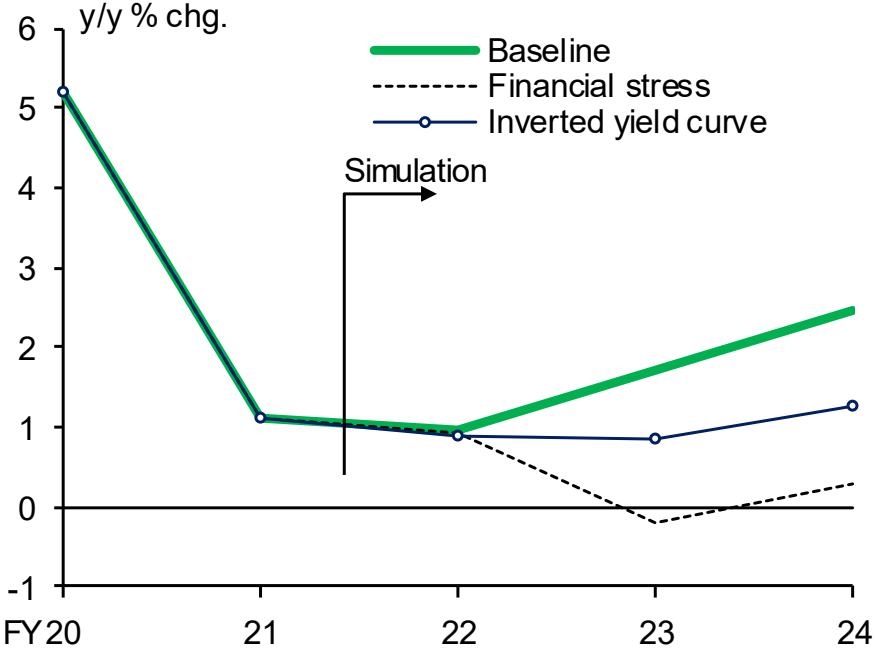


Note: "Room for realizing gains" = valuation gains or losses on securities holdings / previous 3-year average of PPNR (excluding trading income). See Chart V-2-10.

# Stress testing (5) Impact on financial intermediation

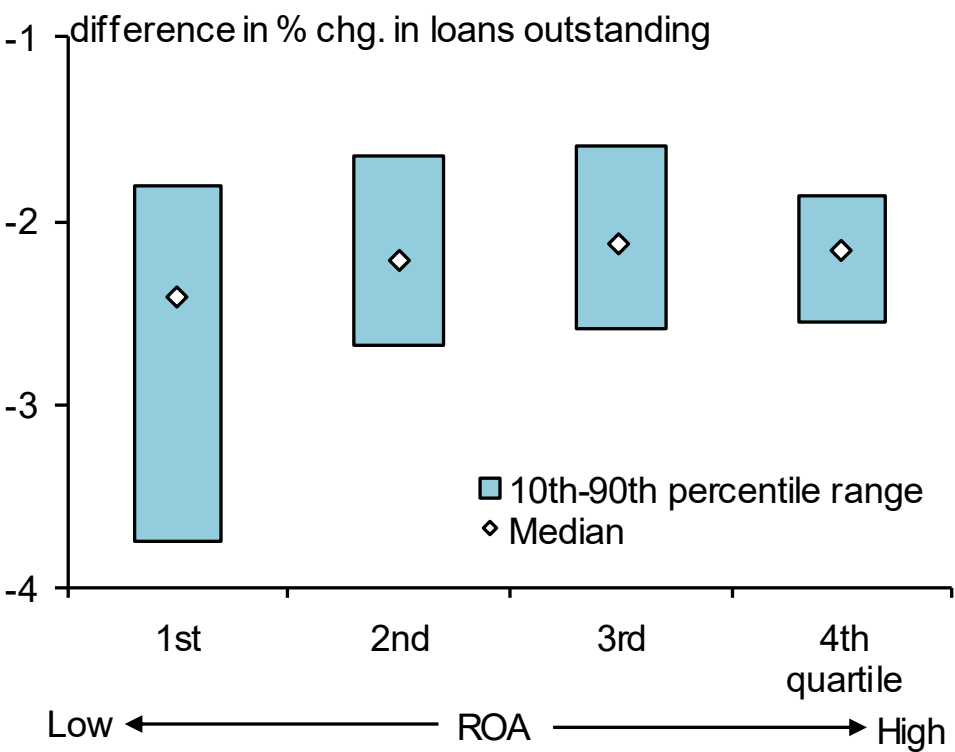
- The deterioration in capital adequacy ratios and profits makes FIs more cautious in their lending.
  - FIs for which room for realizing gains has fallen would have difficulty in engaging in additional risk-taking, and their profitability would become more likely to decline.
  - The functioning of financial intermediation could be impaired for some FIs.

Domestic loans outstanding



Note: See Chart V-2-13.

Loans outstanding and ROA



Note: The markers and bands in each quartile of net income ROA (the averages of fiscal 2021-2023) indicate the medians and the 10th-90th percentile ranges of differences in changes in loans outstanding from 2021 to 2024 relative to the baseline scenario, respectively. See Chart V-2-14.