



# Summary

April 2023  
Bank of Japan

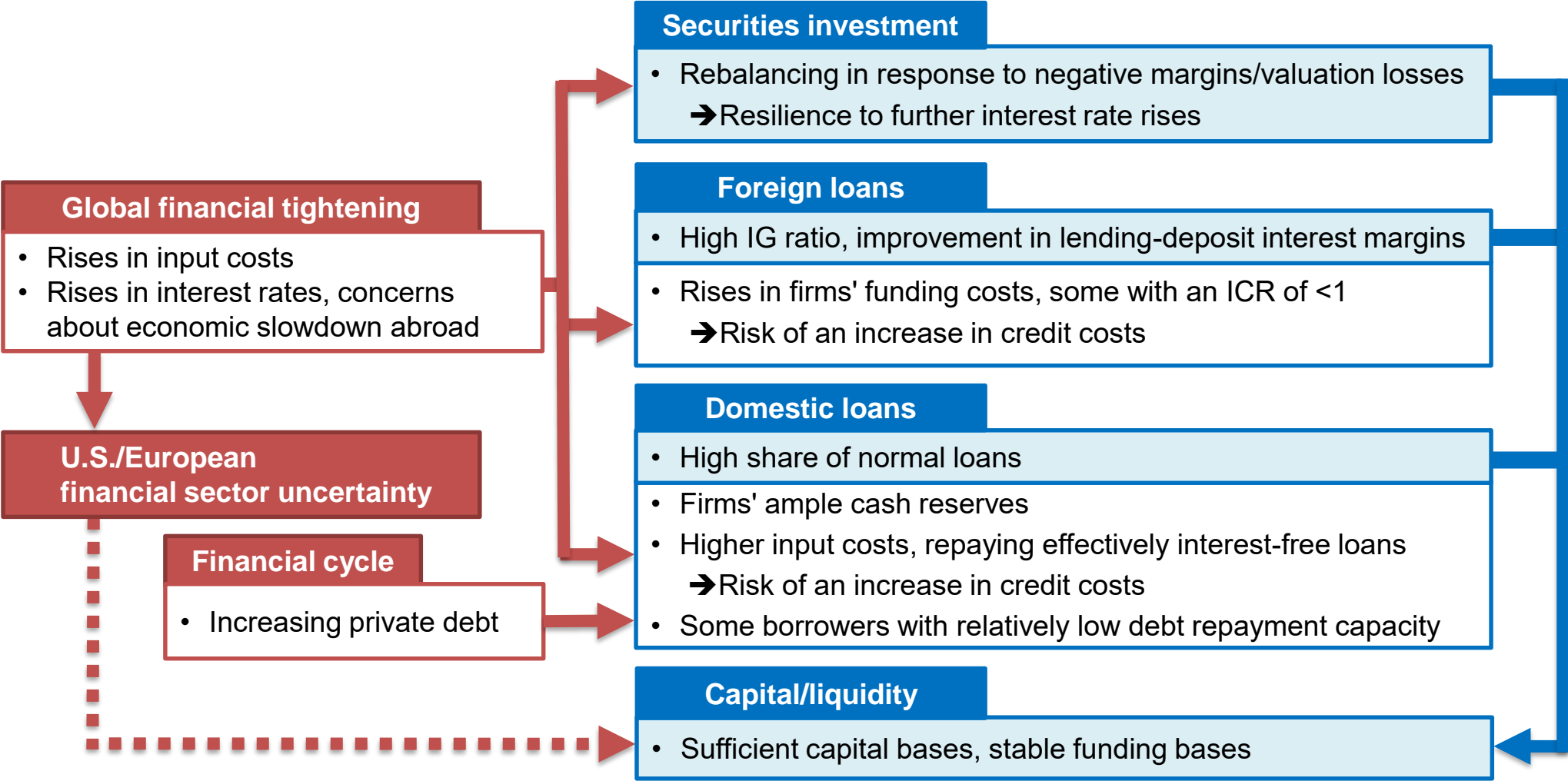


Note: This document presents a summary of the April 2023 issue of the *Financial System Report*. See the *Report* for more details on the analyses as well as notes and sources of the charts.

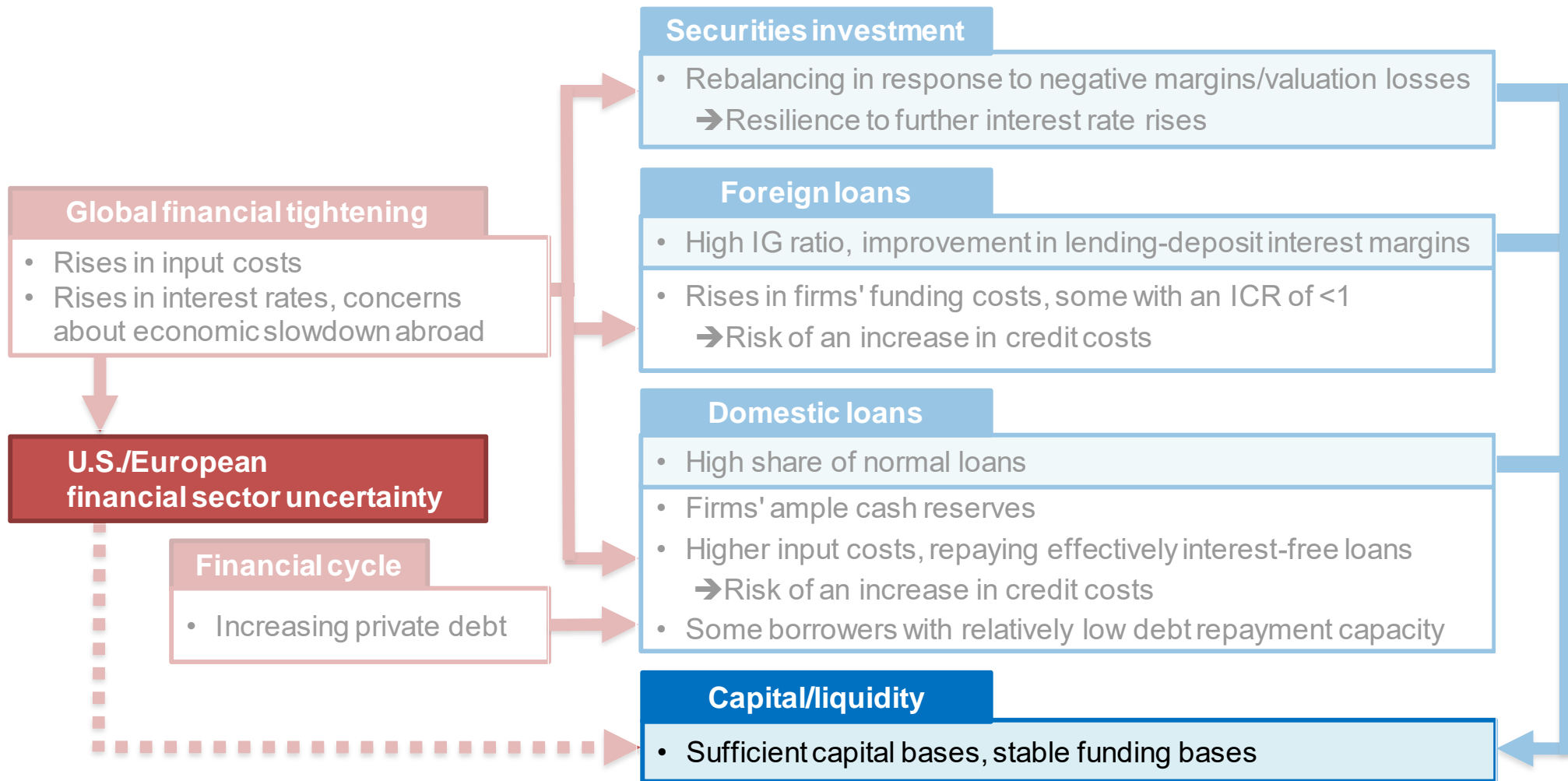
# Stability assessment of Japan's financial system

- Japan's financial system has been maintaining stability on the whole.
  - Japanese banks have sufficient capital bases to perform financial intermediation activities appropriately even amid the global tightening of financial conditions and the resultant various types of stress. They also have stable funding bases, especially small, sticky retail deposits.
  - Despite heightened uncertainty about the financial sector in the United States and Europe, triggered by the U.S. bank failures in March, Japan's financial system has been sound and resilient.
  
- However, vigilance against tail risks continues to be warranted.
  - Future developments remain highly uncertain as financial and capital markets have been nervous. Although the quality of banks' domestic and foreign loan portfolios has remained high on the whole, some loans entail high credit risk.
  - To ensure the stability of Japan's financial system, it is necessary to examine the risks of contraction and overheating in the financial system and address potential vulnerabilities appropriately.

# Motivations behind the April 2023 issue



1. Impact of the U.S. bank failures
2. Increase in private debt in the financial cycle
3. Domestic firms' default and cash reserves
4. Changes in the risk profiles of foreign loans
5. Banks' resilience to foreign interest rate rises



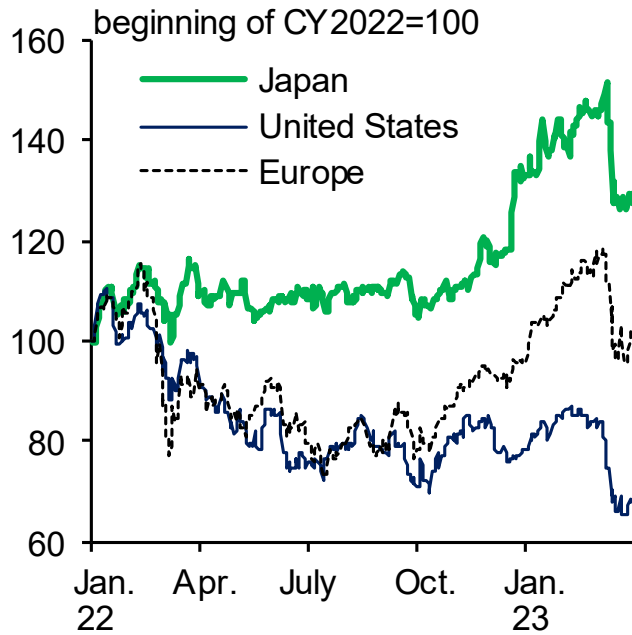
## 1. Impact of the U.S. bank failures

- Whether banks have sufficient loss-absorbing capacity relative to various types of stress.
- Whether banks' funding bases are stable.

# Contagion in financial markets

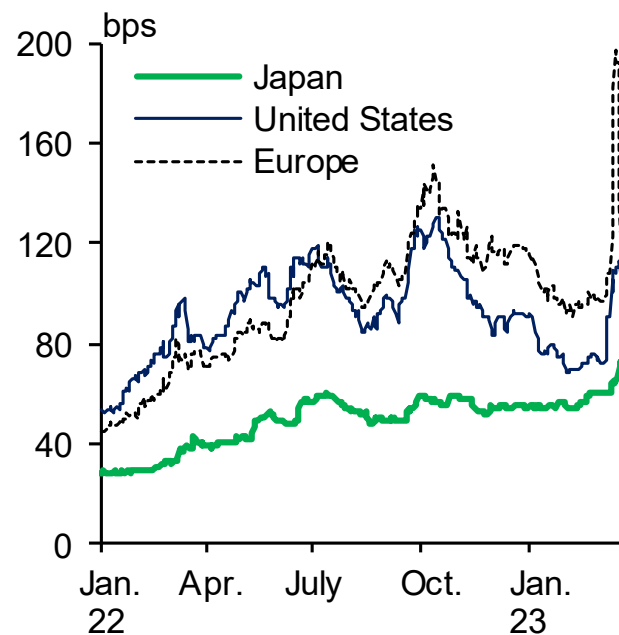
- The impact of increased uncertainty about the U.S. and European financial sector on Japan's financial system is limited.
  - In Japan, prices of bank stocks fell; however, credit assessment for banks, including that of AT1 bonds, has been stable compared to the U.S. and Europe; the rise in U.S. dollar funding premiums have remained modest relative to that observed beyond the year-end.

### Bank stock prices



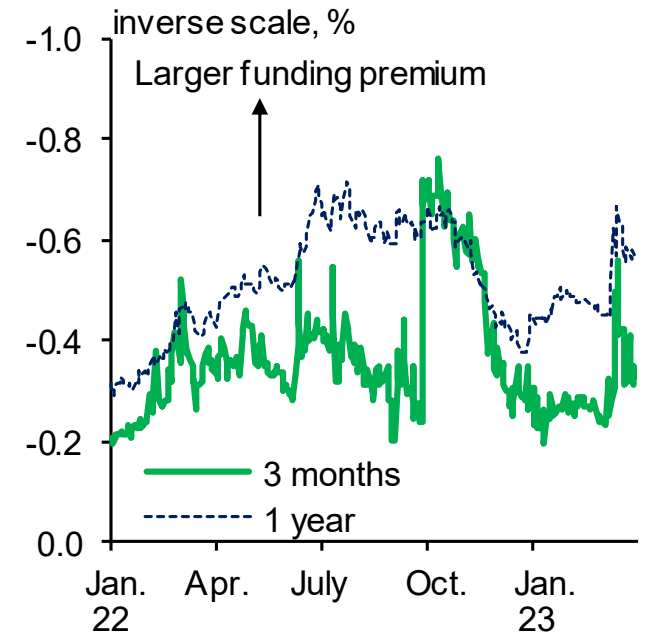
Note: The data for Japan, United States, and Europe indicate bank prices indices of the TOPIX, the S&P 500, and the EURO STOXX, respectively. See Chart B1-1.

### CDS spreads of banks



Note: Figures are averages for G-SIBs for which data are available. See Chart B1-2.

### U.S. dollar funding premiums

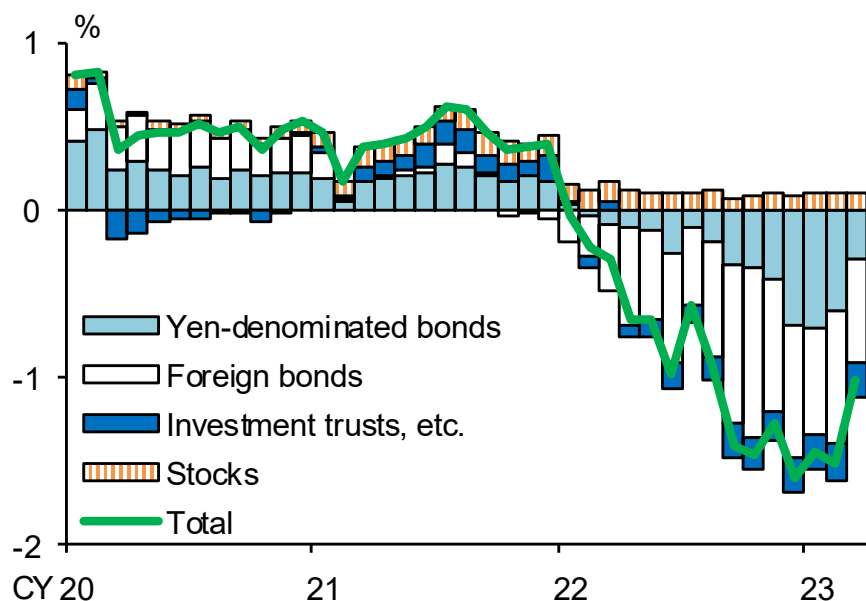


Note: "3 months" refers to premiums on FX swaps (inverse scale). "1 year" refers to alpha of basis swaps. See Chart B1-3.

# Sufficiency of loss-absorbing capacity

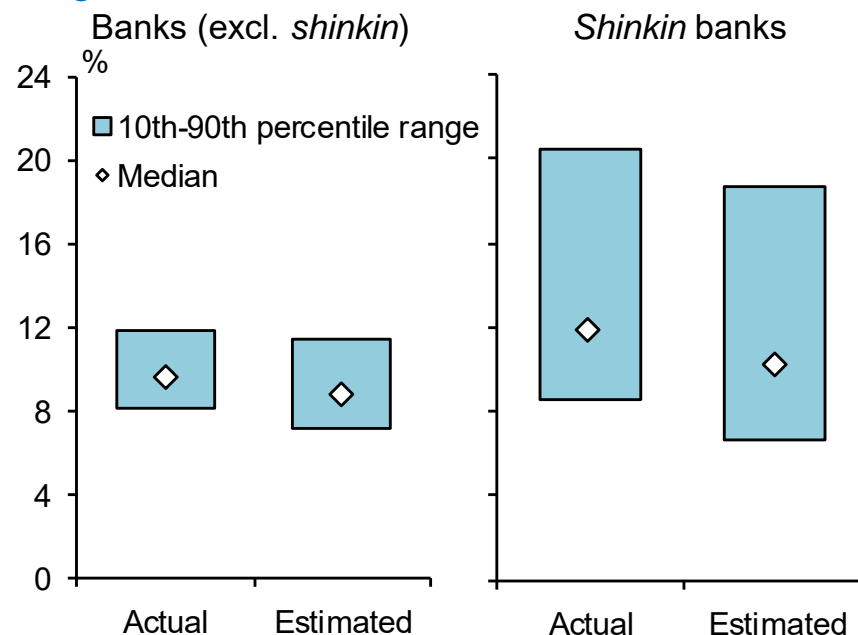
- Japanese banks would have capital bases to withstand losses, even if they realized all valuation losses, which many banks have suffered.
  - Banks with a large amount of valuation losses are those that have high capital adequacy ratios.
  - The ratios remain above regulatory requirements even after including valuation gains/losses on securities (including held-to-maturity securities and excluding strategic stockholdings) in the capital for domestic banks (see page 42).

## Valuation gains/losses for Japanese banks



- Note: 1. The chart shows the ratio of valuation gains/losses on securities (including held-to-maturity securities and excluding strategic stockholdings) to risk-weighted assets.  
 2. Covers major, regional, and *shinkin* banks.  
 3. See Chart B1-4.

## Capital adequacy ratios including valuation gains/losses

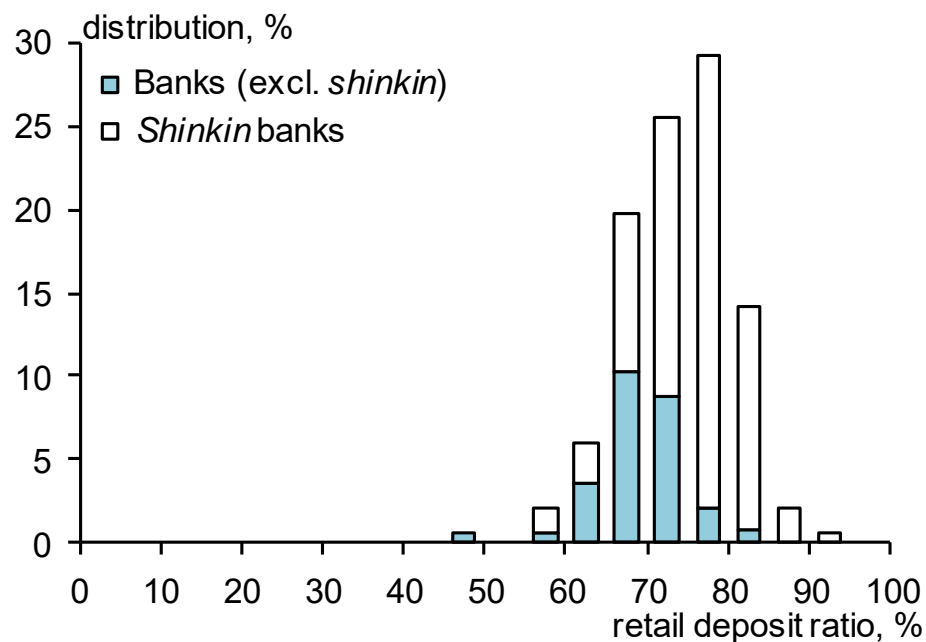


- Note: 1. "Actual" indicates ratios as of end-March 2022. "Estimated" indicates ratios estimated based on the valuation gains/losses on securities as of end-March 2023. Core capital basis.  
 2. Covers domestic banks among major, regional, and *shinkin* banks.  
 3. See Chart B1-5.

# Stability of funding bases

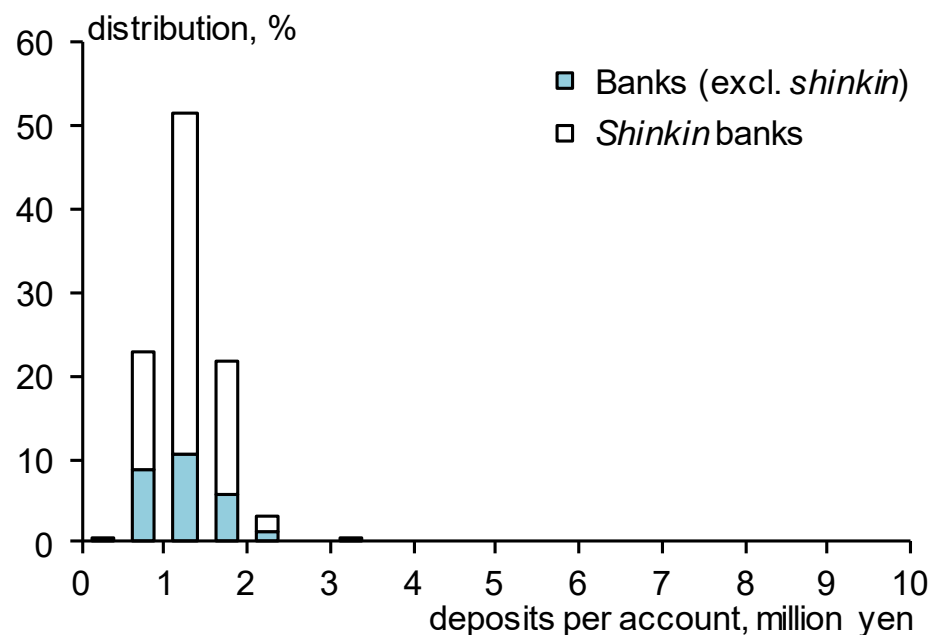
- Japanese banks have stable funding bases.
  - Their yen funding bases consist mainly of small, sticky retail deposits (see page 29).
  - Banks that mainly focus on corporate business have a relatively high share of corporate deposits, but these do not consist primarily of deposits from specific industries.
  - There are no Japanese banks with a unique feature of liabilities similar to that of the failed U.S. bank.

## Distribution of retail deposit ratio

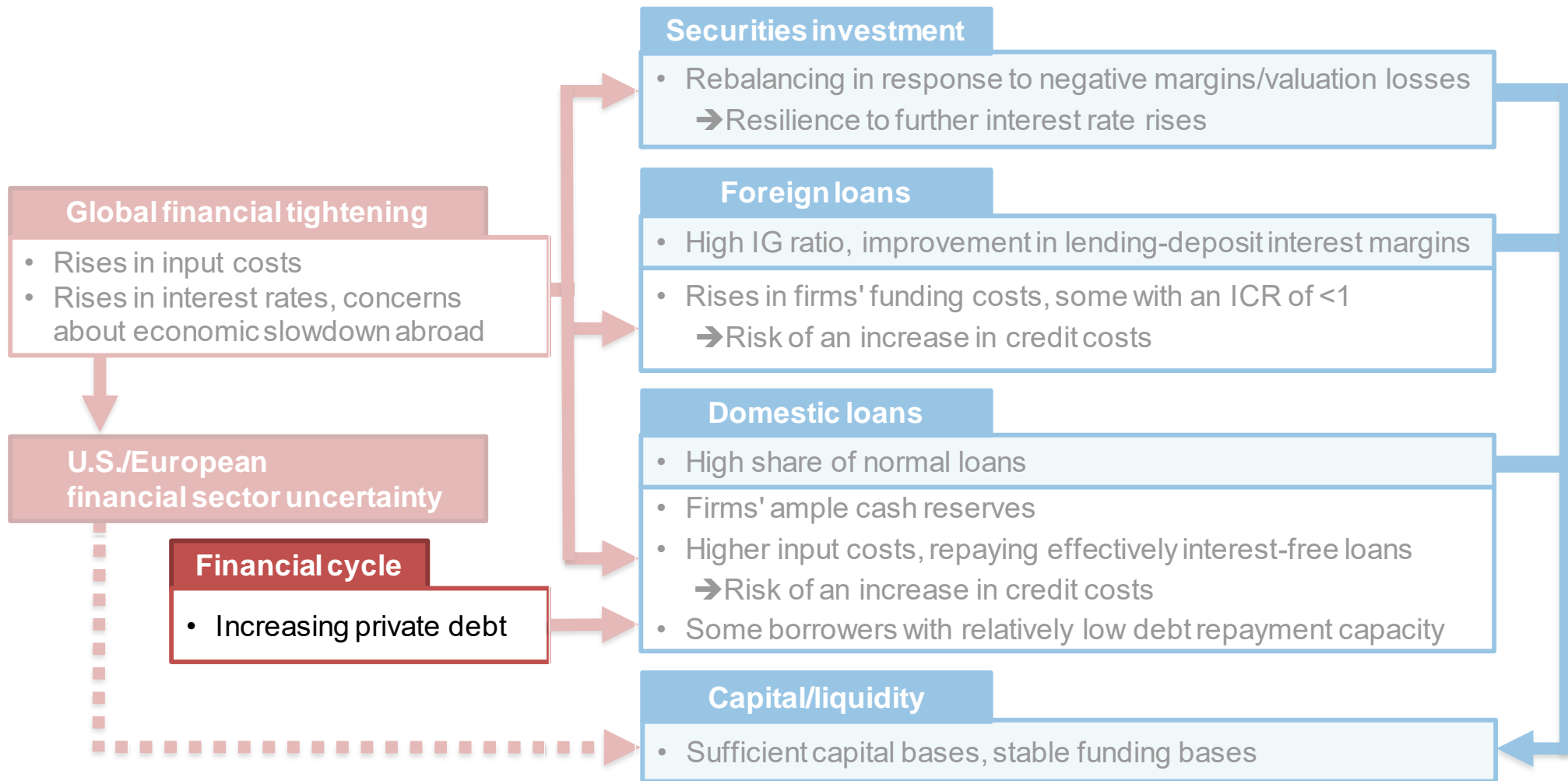


Note: The chart shows the ratios to overall banks including major, regional, and *shinkin* banks on a bank group basis. Covers the accounts held by domestic branches. Financial institutions' deposits are excluded. Data as of end-September 2022. See Chart B1-6.

## Distribution of deposits per account



Note: The chart shows the ratios to overall banks including major, regional, and *shinkin* banks on a bank group basis. Covers the accounts held by domestic branches. Financial institutions' deposits are excluded. Data as of end-September 2022. See Chart B1-7.



## 2. Increase in private debt in the financial cycle

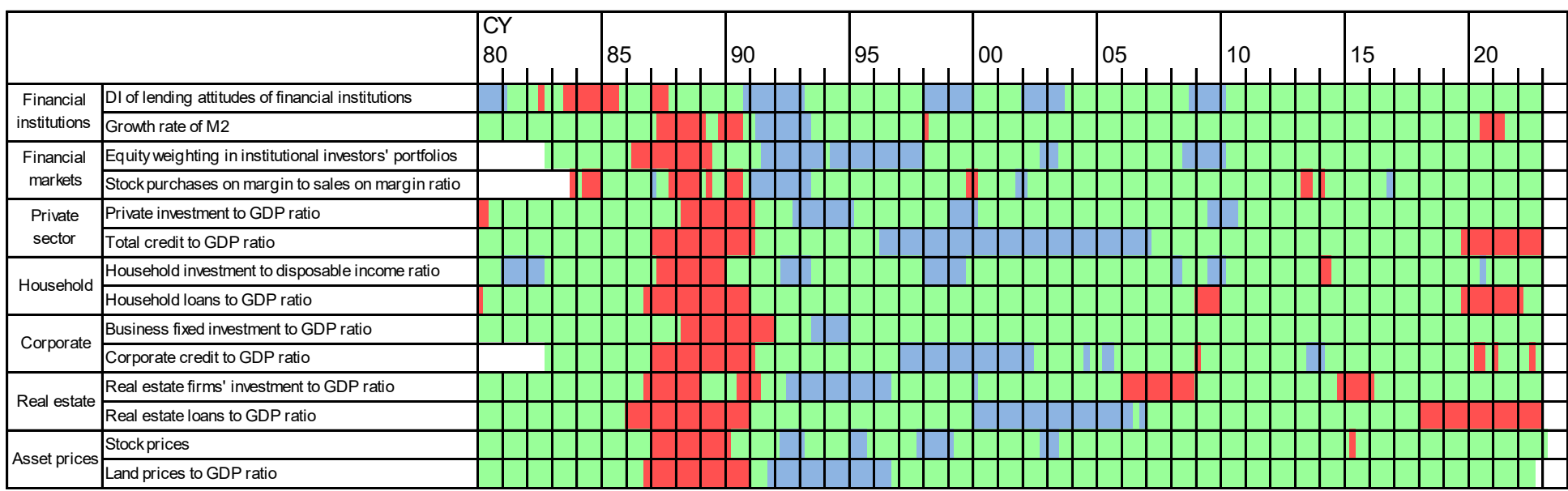
- Whether smooth functioning of financial intermediation and the resultant increase in private debt have led to a buildup of financial imbalances.
- Whether the increase in private debt reflects borrowers with relatively low debt repayment capacity.



# Heat map (1)

- The heat map depicts whether various Financial Activity Indexes (FAIXs) point to an overheating or contraction of activity, using three different colors.
- 2 out of the 14 FAIXs are "red," which signals an overheating.
  - Compared with the previous issue of the *Report*, the *corporate credit to GDP ratio* has turned from "red" to "green."

Heat map

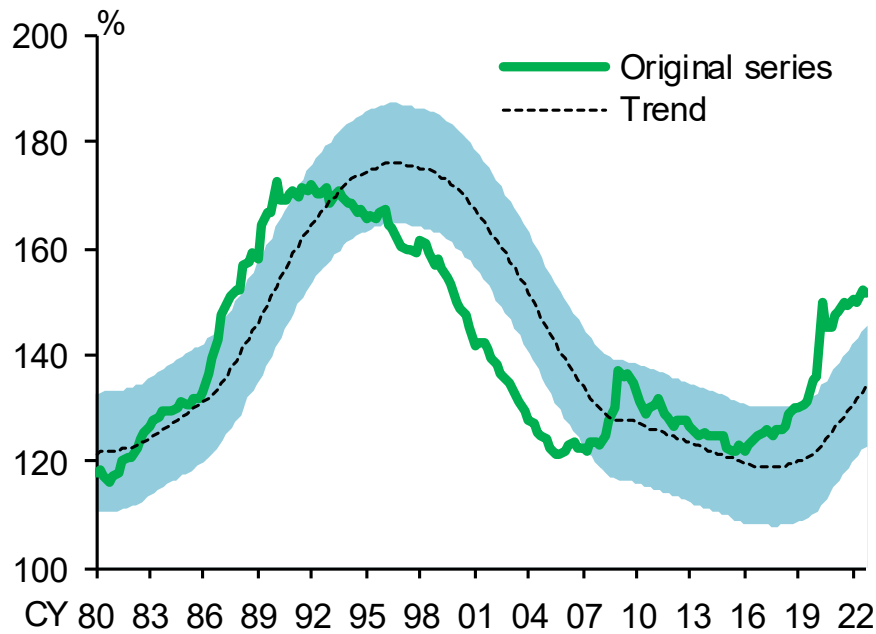


Note: See Chart III-3-1.

# Heat map (2) Corporate credit

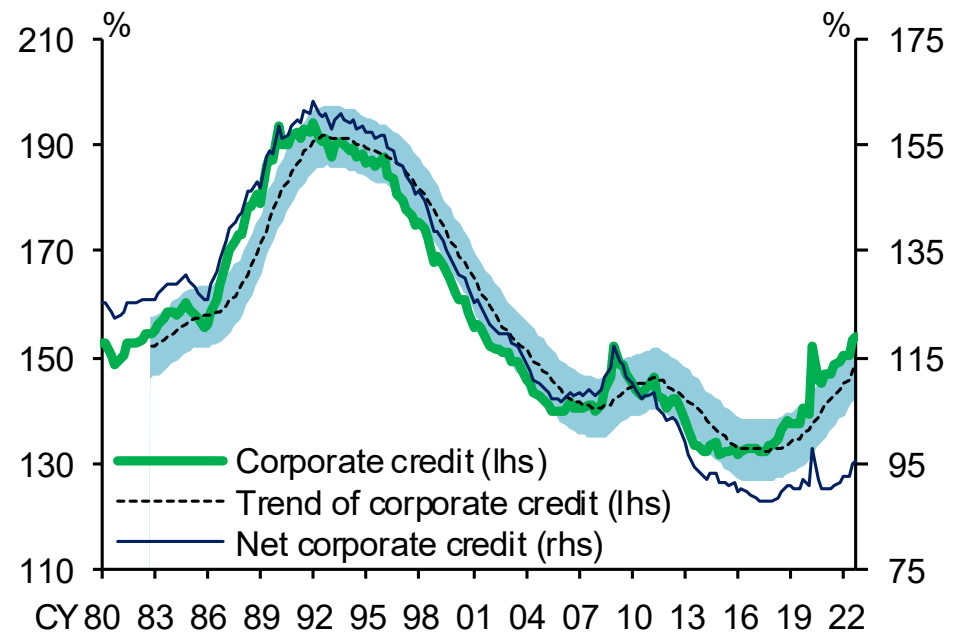
- The *total credit to GDP ratio* and the *corporate credit to GDP ratio* have remained at high levels, due partly to firms' cash management aimed at securing ample cash reserves.
  - Working capital demand due to the rise in input costs has also contributed to the two FAIXs remaining at high levels.
  - Net corporate credit (gross corporate credit minus firms' cash and deposits) has hardly expanded despite the increase in gross corporate credit.
- There is no overheating of current financial activities.

### 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.

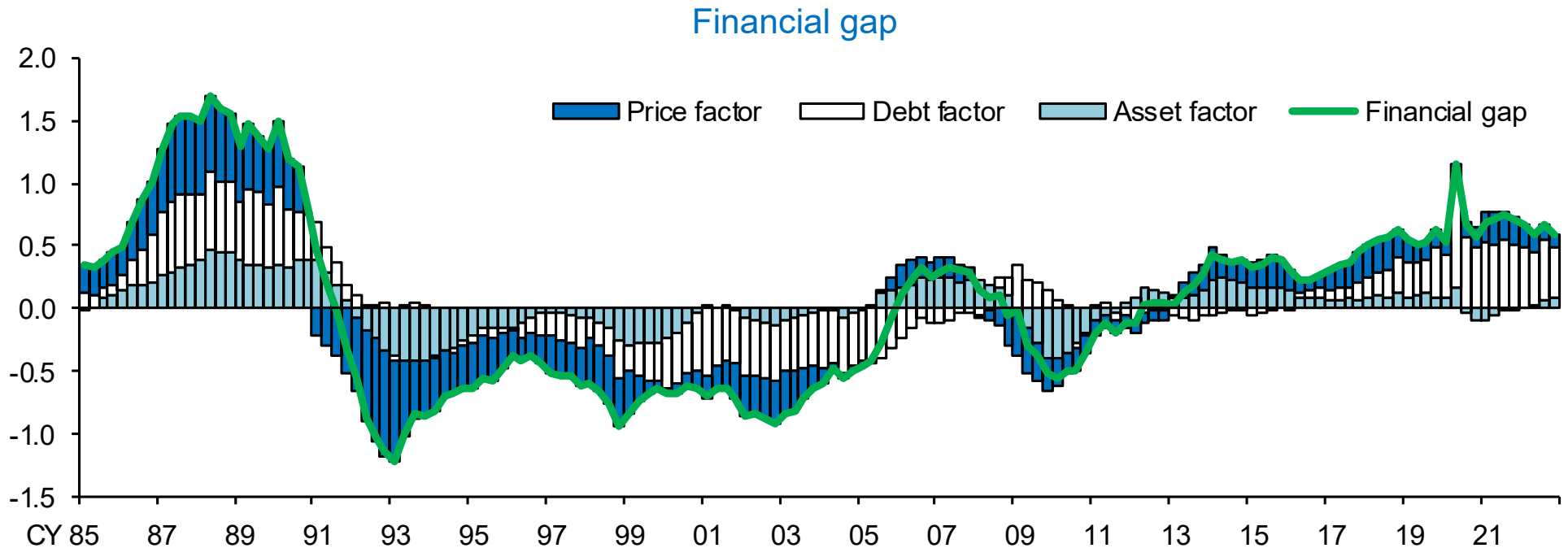
### Corporate credit to GDP ratio



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.
- No major financial imbalances can be observed in current financial activities, although the current expansionary phase of the financial cycle has been prolonged, due mainly to the increase in private debt.
  - Attention should be given to whether the increase in private debt (housing loans and real estate loans) reflects borrowers with relatively low debt repayment capacity.

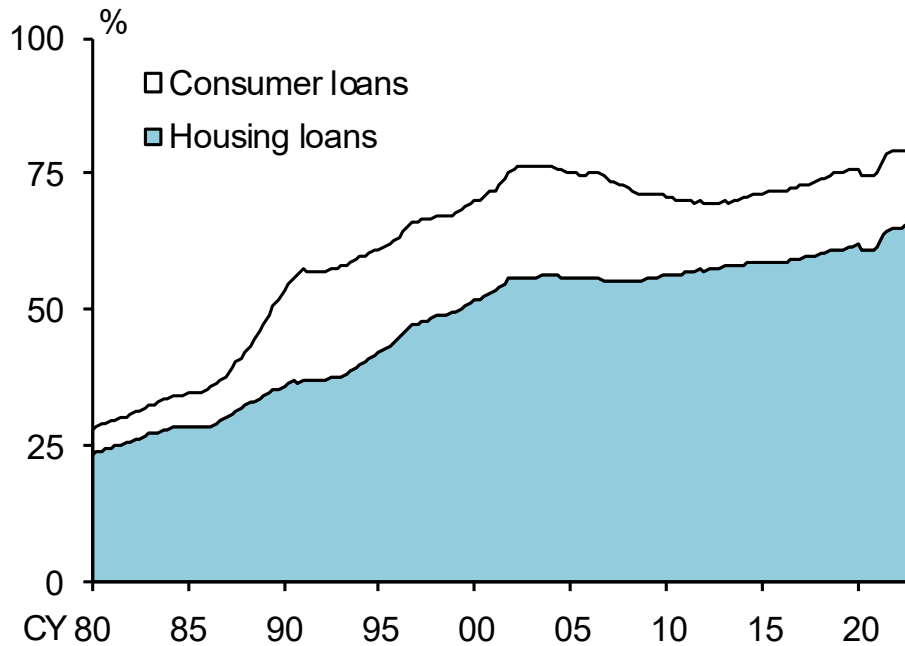


Note: "Asset factor" consists of indexes of fixed investment by the private sector, households, firms, and real estate businesses.  
"Debt factor" consists of indexes of their debt financing. "Price factor" consists of the remaining indexes. See Chart III-3-4.

# Housing loans (1) Loan developments

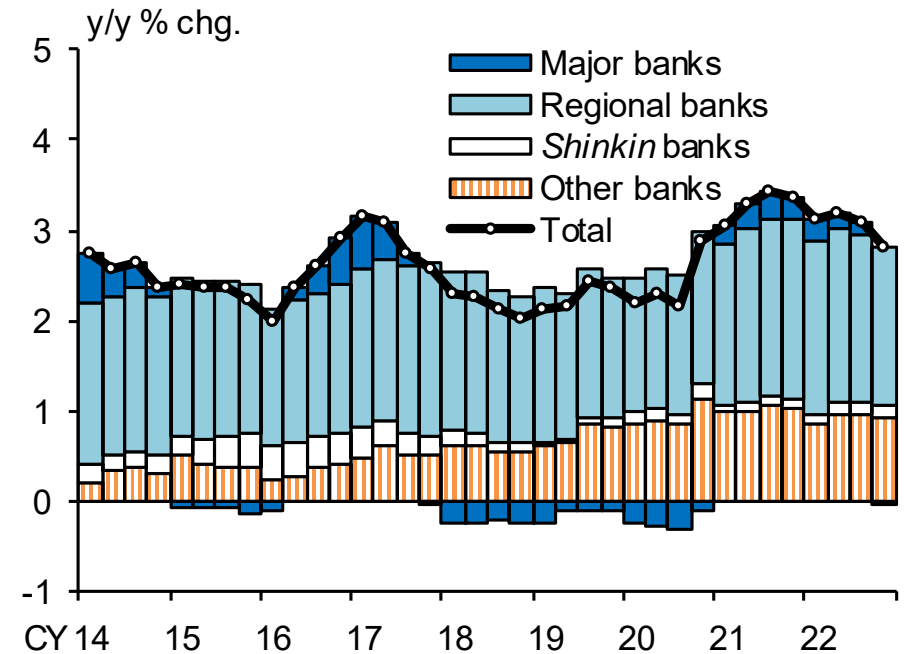
- The *household debt to disposable income ratio*, which is equivalent to the LTI ratio on a macro basis, has reached an all-time peak.
- Housing loans, which account for the largest part of household debt, have continued to grow.

## Household debt to disposable income ratio



Note: 4-quarter backward moving averages. See Chart III-3-7.

## Banks' housing loans outstanding

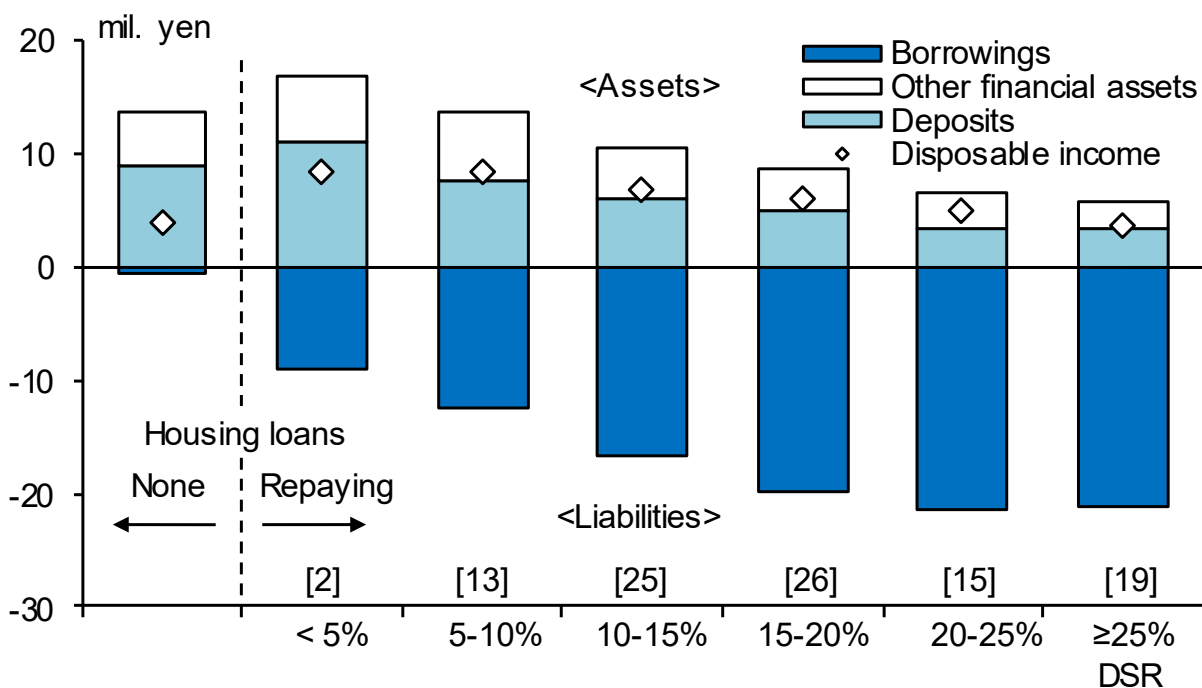


Note: "Other banks" covers domestically licensed banks but excludes major banks and regional banks. See Chart III-1-10.

# Housing loans (2) Balance sheet in the household sector

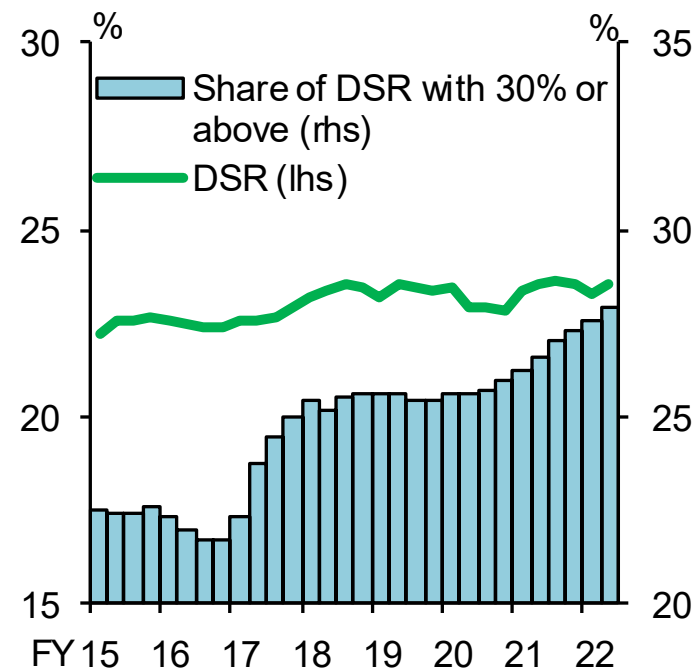
- Households with a DSR of 25% or above account for almost 20% of all households in the housing loan market.
  - Among households with a high DSR, asset portfolios are heavily skewed toward real assets and the share of financial assets is low.
  - Among banks, the share of housing loans with a high DSR has been increasing.

### Financial assets and liabilities of households



Note: The data for financial assets, liabilities, and disposable income are averages per household. Figures in brackets indicate the share of each DSR in total households repaying housing loans. Based on the 2019 survey. See Chart III-3-8.

### DSR for housing loans

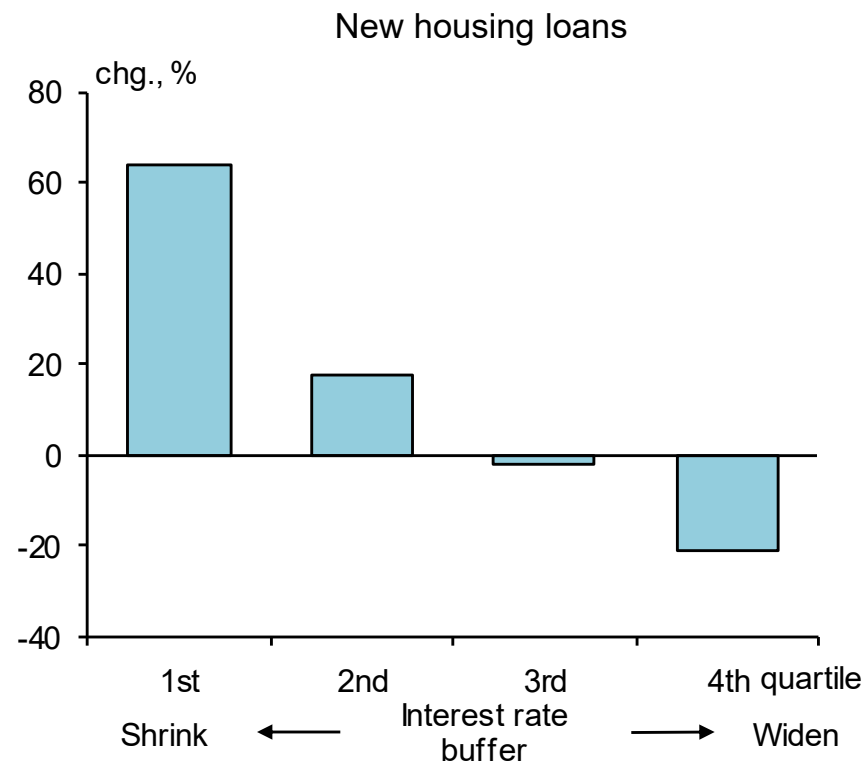
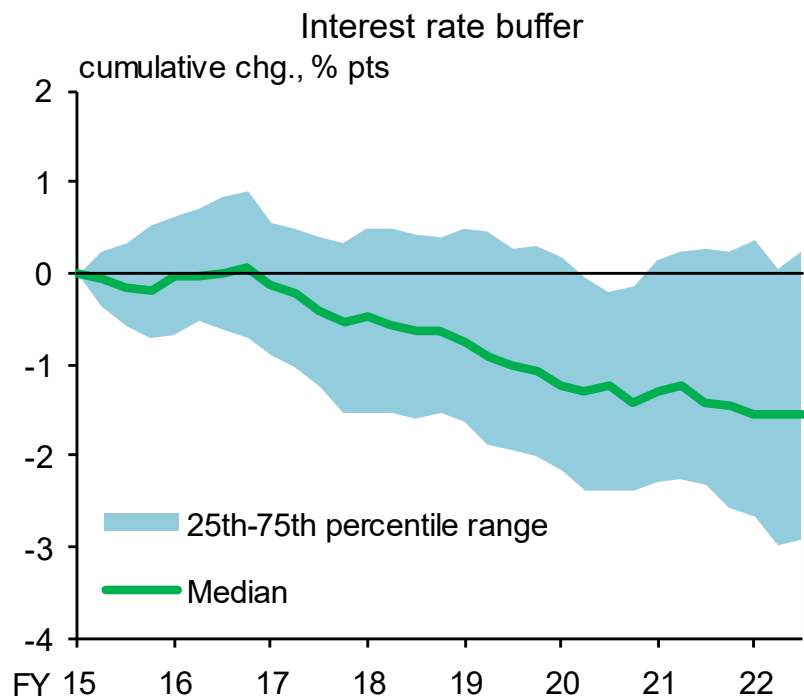


Note: Covers major, regional, and *shinkin* banks. 4-quarter backward moving averages. See Chart III-3-10.

# Housing loans (3) Stress interest rate and interest rate buffer

- Estimating an *interest rate buffer* that is necessary to keep each bank's average DSR no greater than 30% shows that it has generally been shrinking due to a decline in the stress interest rate.
  - Banks prevent the deterioration in the quality of housing loans by securing a sufficient interest rate buffer or a gap between the stress interest rate and the actual loan interest rate.
- The larger the decline in banks' interest rate buffer, the larger the increase in their housing loans.
  - Suggests an increasing number of households with relatively low resilience to income declines or interest rate rises.

## Housing loans and interest rate buffer



Note: 1. Covers regional and *shinkin* banks.

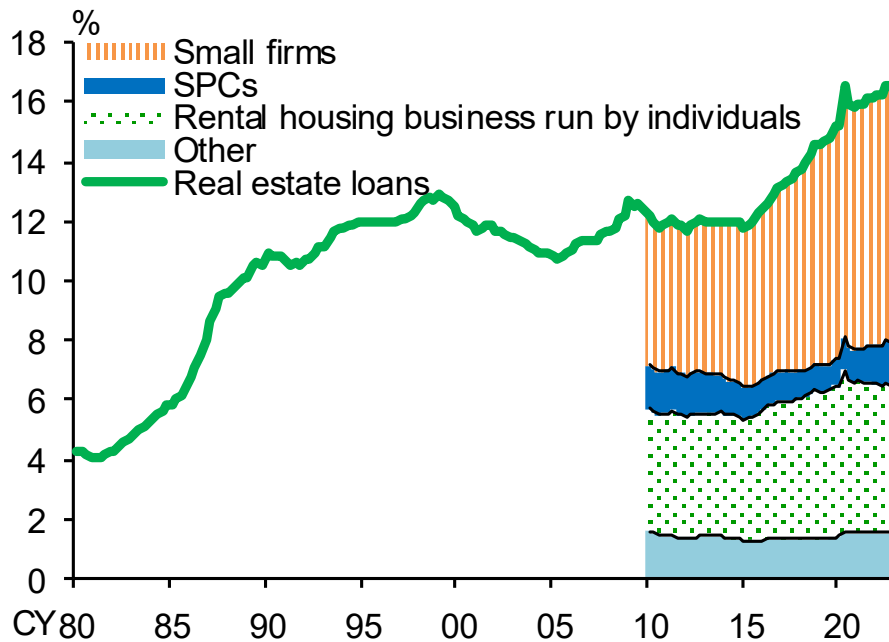
2. The left-hand chart shows cumulative changes from the April-June quarter of 2015 to the October-December quarter of 2022. 4-quarter backward moving averages. The right chart shows the changes in new housing loans (from fiscal 2015 to April-December of fiscal 2022), for each quartile of cumulative changes in the interest rate buffer.

3. See Chart III-3-9.

# Real estate loans (1)

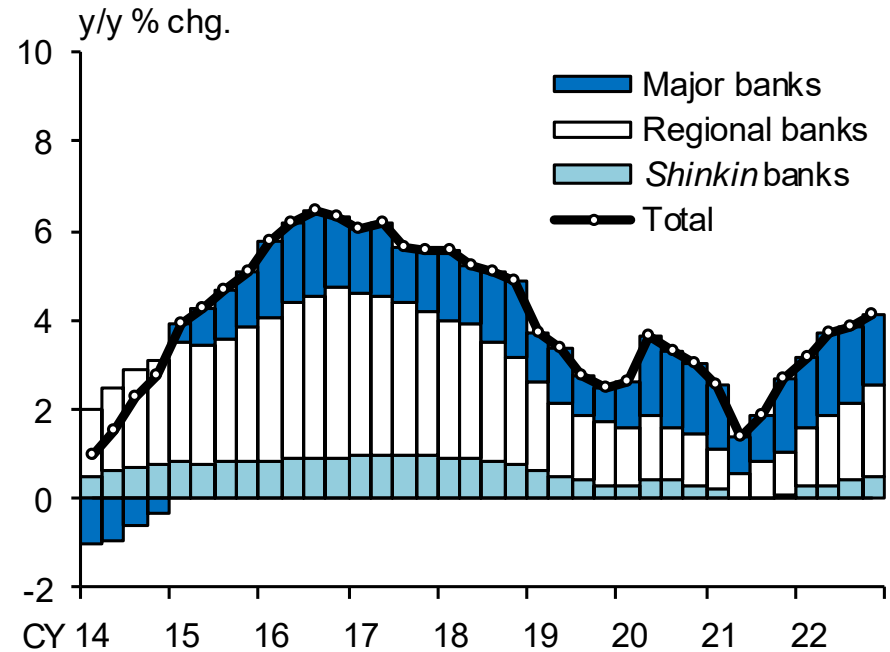
- Real estate loans, which account for almost 30% of corporate loans, have been on a long-term uptrend.
  - At major banks, loans to real estate business have increased, driven by non-recourse loans to real estate investment funds ("SPCs" in the left chart) along with loans to REITs.
  - At regional banks, loans to real estate leasing businesses ("small firms" in the left chart) have continued to increase.

## Real estate loans to GDP ratio



Note: 1. 4-quarter backward moving averages.  
 2. "Small firms" includes J-REITs.  
 3. See Chart III-3-14.

## Banks' real estate loans outstanding

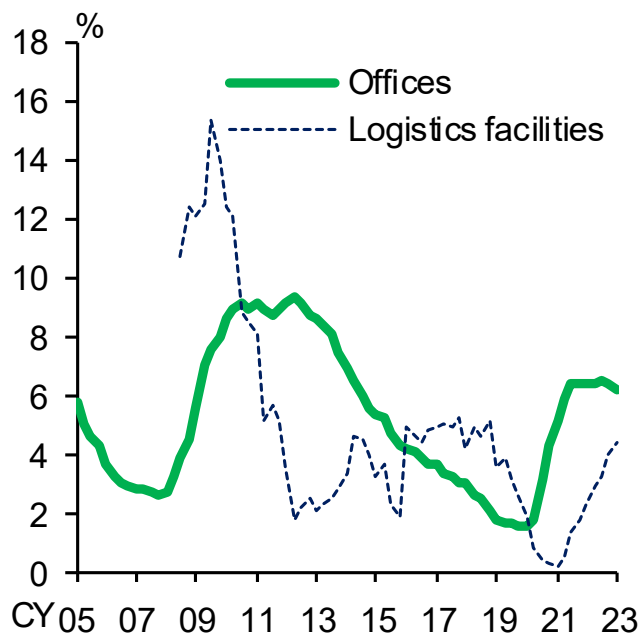


Note: See Chart III-1-9.

# Real estate loans (2) Real estate transaction market

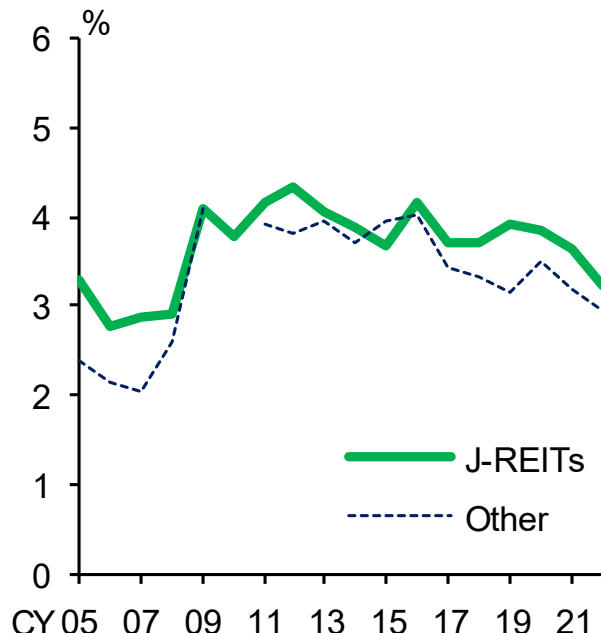
- With vacancy rates for office buildings and logistics facilities rising, J-REITs have become more cautious in their investment stance. However, foreign investors have continued to engage in trades.
  - There are some investment properties with low yield spreads that are below the target of J-REITs.
  - Although some foreign investment funds and individual investors have been holding off on investing, foreign institutional investors have been active in investment on the whole.

## Vacancy rates in Tokyo



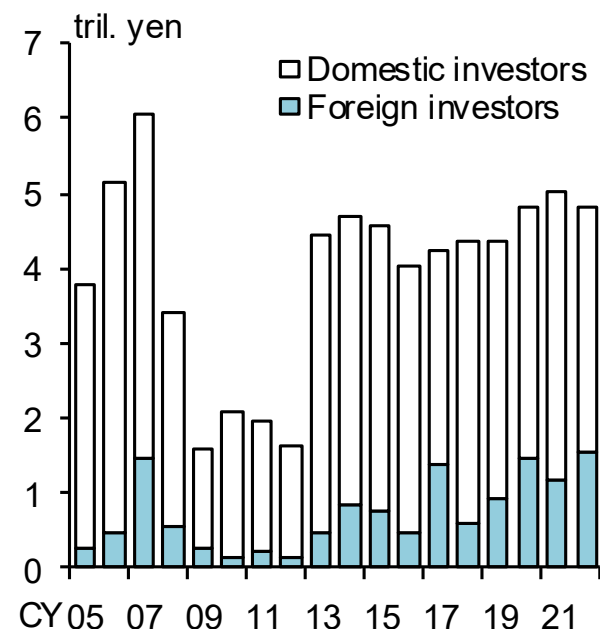
Note: See Chart III-3-15.

## Yield spreads on individual properties traded by type of buyer



Note: Calculated based on "Nikkei Real Estate Market Report DEAL SEARCH." The differences in the characteristics of individual properties (type of use, location, age, total floor area, number of aboveground and basement floors) are controlled in the estimation. See Chart III-3-16.

## Real estate property acquisitions



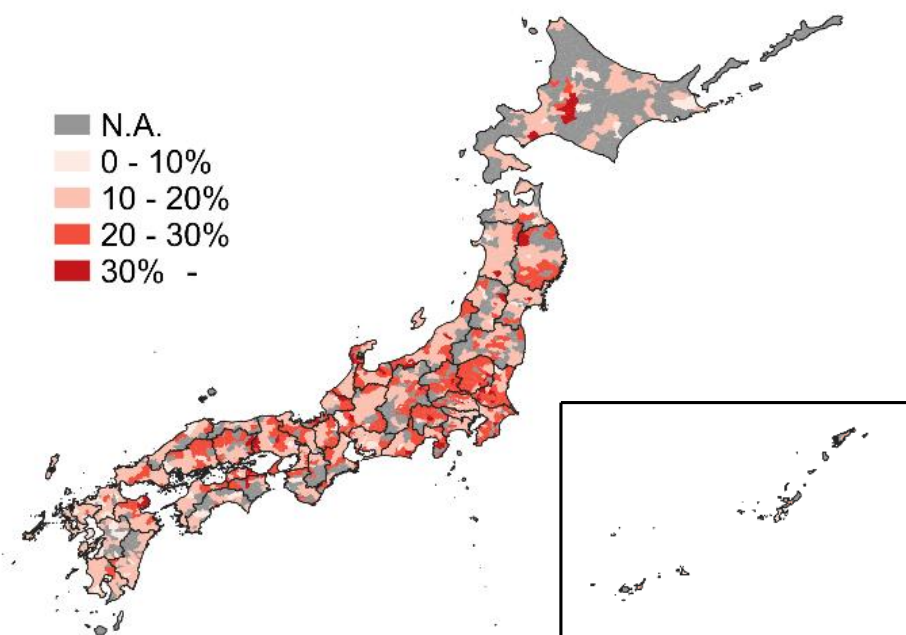
Note: See Chart III-3-18.



# Real estate loans (3) Real estate leasing market

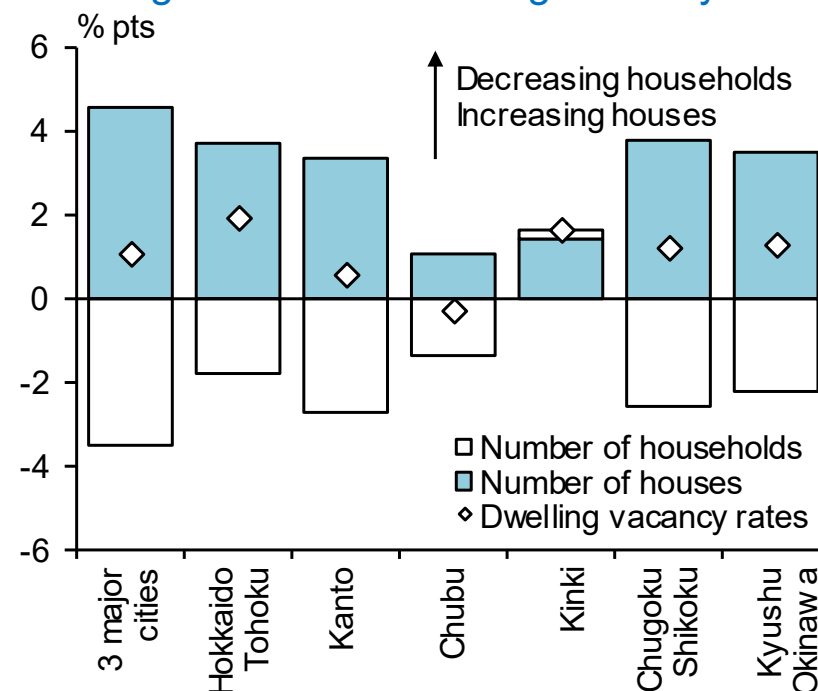
- The rental income declines and vacant house increases have become more pronounced across Japan.
  - Dwelling vacancy rates have risen because the supply of rental houses has continued to exceed the projected increase in the number of renter households.
- Banks' active lending to real estate businesses has also contributed to the increase in rental housing.
  - There are some cases where banks have set loan durations in excess of the useful life of properties.

## Dwelling vacancy rates by municipality

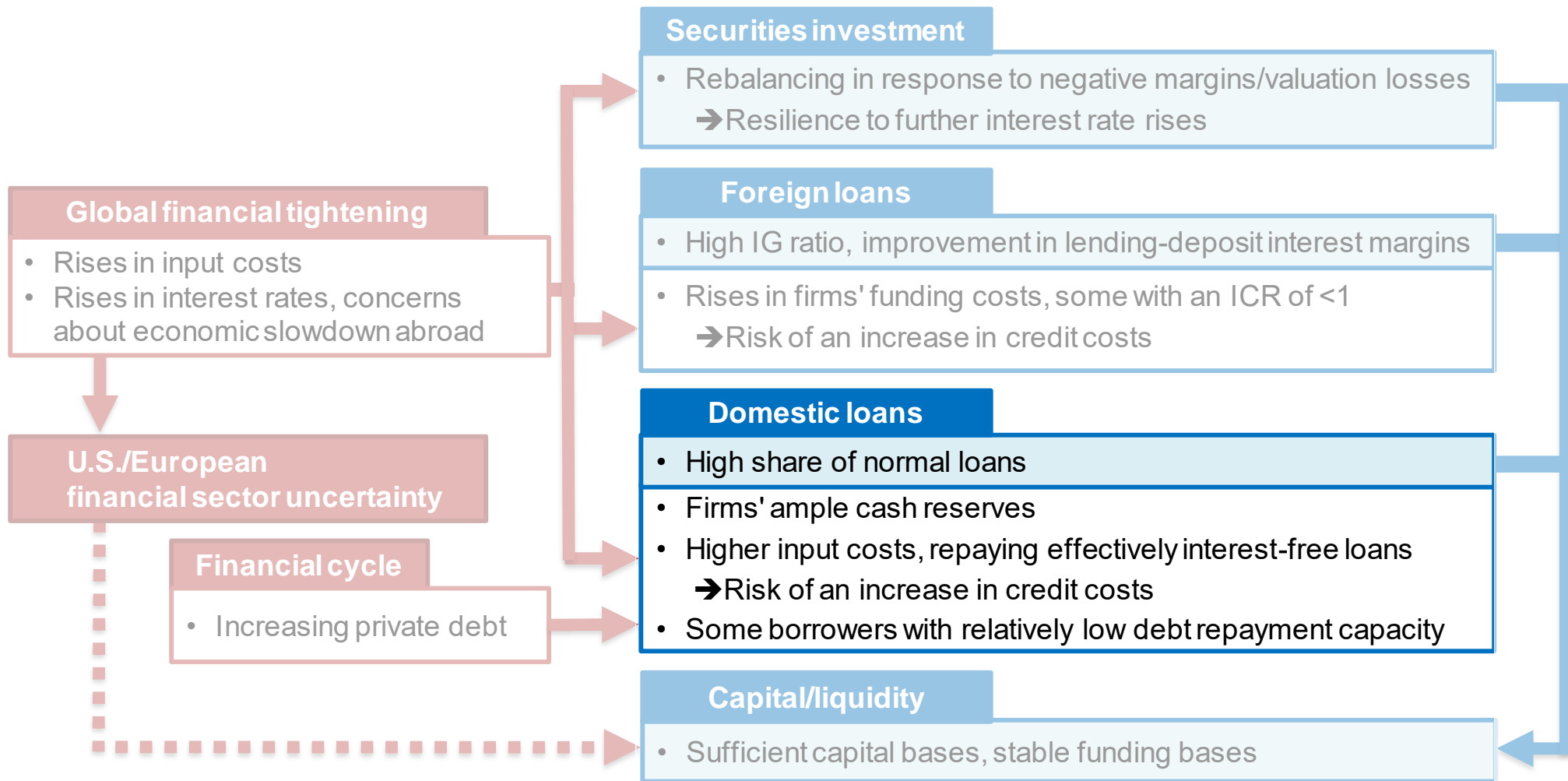


Note: Based on Ministry of Land, Infrastructure, Transport and Tourism, "National Land Numerical Information (administrative district data)" and Ministry of Internal Affairs and Communications, "2018 Housing and Land Survey." See Chart III-3-21.

## Change factors of dwelling vacancy rates



Note: 1. The chart shows the decomposition of the changes in dwelling vacancy rates from 2013 to 2018 into the number of renter households and the number of houses for rent, respectively.  
 2. "3 major cities" includes Tokyo, Osaka, and Fukuoka. "Kanto," "Kinki," and "Kyushu" exclude 3 major cities.  
 3. See Chart III-3-22.



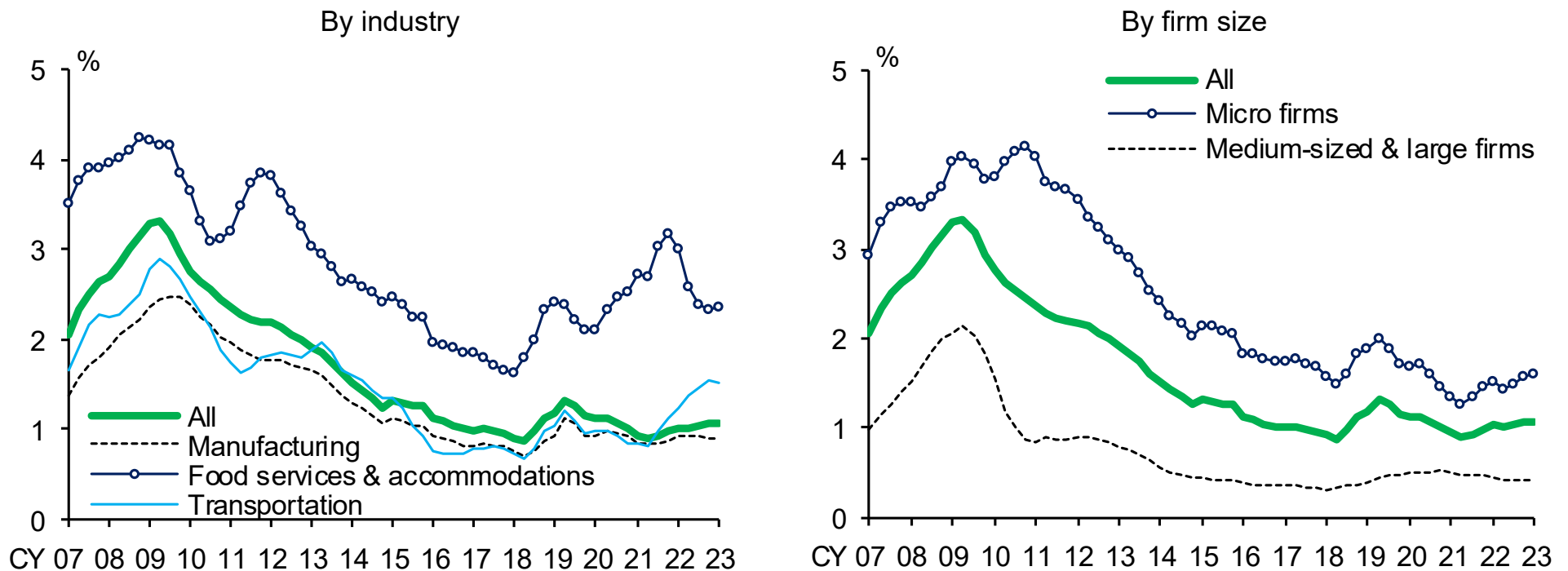
### 3. Domestic firms' default and cash reserves

- How the repayment on effectively interest-free loans will affect firms' financial conditions.
- Whether there are potential credit risks that are not necessarily captured by borrower classification.

# Firms' financial conditions

- So far, firms' defaults have remained at a low level.
  - By industry, the default rate has peaked in food services and accommodations, largely impacted by the pandemic. However, the rate has been on the rise in the transportation, where it is difficult to pass on input cost increases.
  - By firm size, while default rates among relatively large firms are at historically low levels, those among smaller firms are beginning to rise gradually.

## Firms' default rates



Note: 1. Default rates indicate the share of borrowers that meet the following conditions for the first time: becoming delinquent for 3 months or longer, or being downgraded to "in danger of bankruptcy" and below.

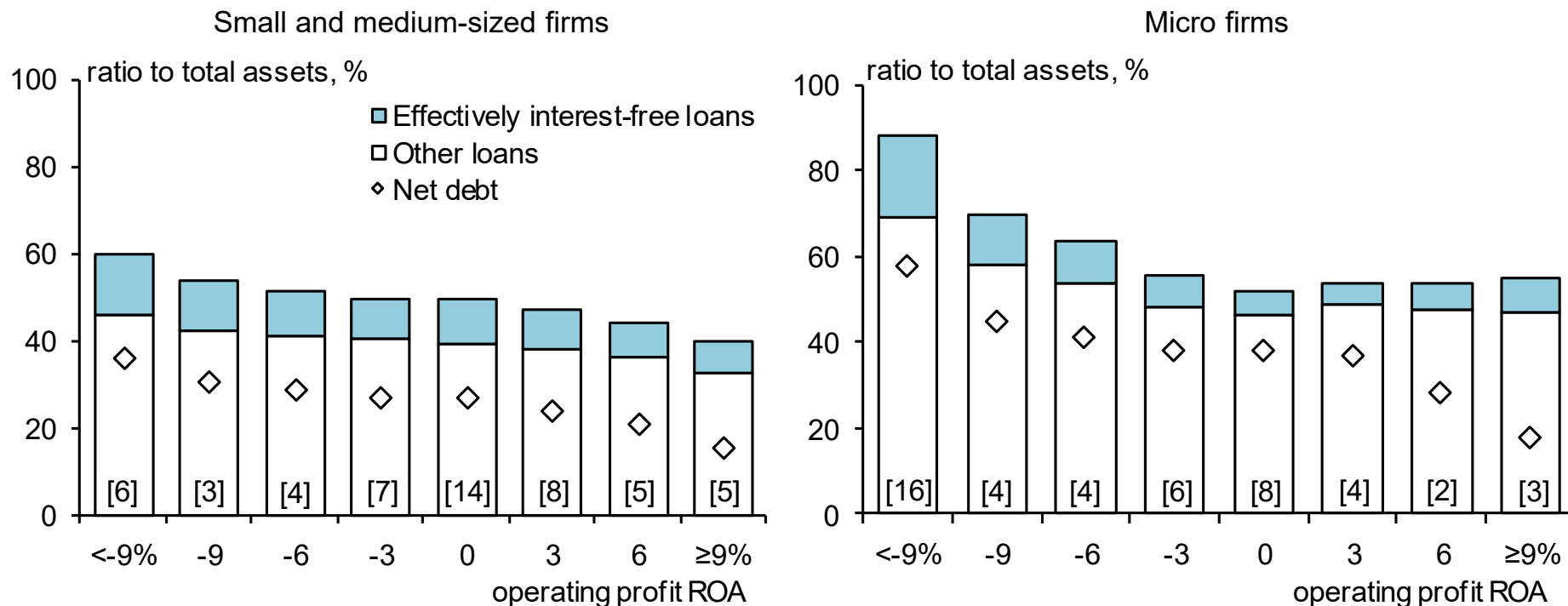
2. In the right-hand chart, "Micro firms" covers firms with sales of less than 100 million yen. "Medium-sized & large firms" covers firms with sales of 1 billion yen or more.

3. See Chart IV-1-7.

# Firms' balance sheets

- Regarding firms' balance sheets, firms with lower profit margins have larger debt relative to total assets. These firms have relatively little cash reserves and larger net debt (loans minus cash and deposits).
- Micro firms in particular have higher financial leverage (loans/total assets) in both gross and net terms, making them more financially vulnerable than other firms.

## Firms' financial liabilities

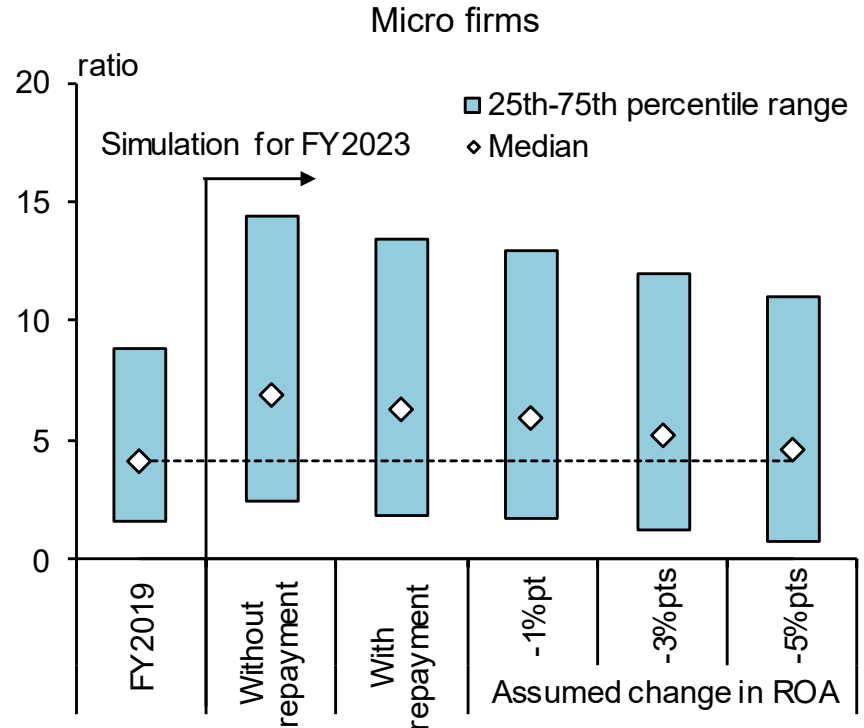
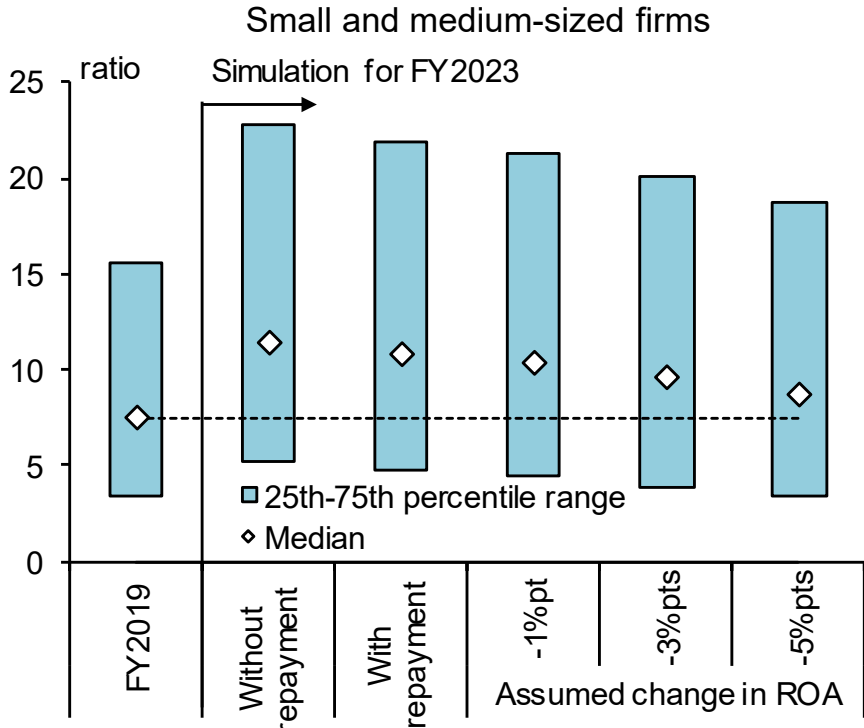


Note: The charts show the ratios of financial liabilities and net debt (calculated as borrowings minus cash reserves) to total assets. The figures in brackets indicate the shares of small and medium-sized firms or micro firms in all SMEs. Data as of fiscal 2021. See Chart IV-1-8.

# Financial risks ahead

- The impact on SMEs' liquidity buffer (cash reserves/administrative expenses) of repayments on effectively interest-free loans and of difficulties in passing on input cost increases is estimated.
  - In the case where repayments on such loans are made ("with repayment" in the chart), more than half of the firms have liquidity buffers equal to or greater than before the pandemic in fiscal 2019.
  - Even in an extreme situation in which firms experience a uniform decline in ROA, the cash reserves secured during the pandemic remain as a buffer.

## Distribution of liquidity buffer

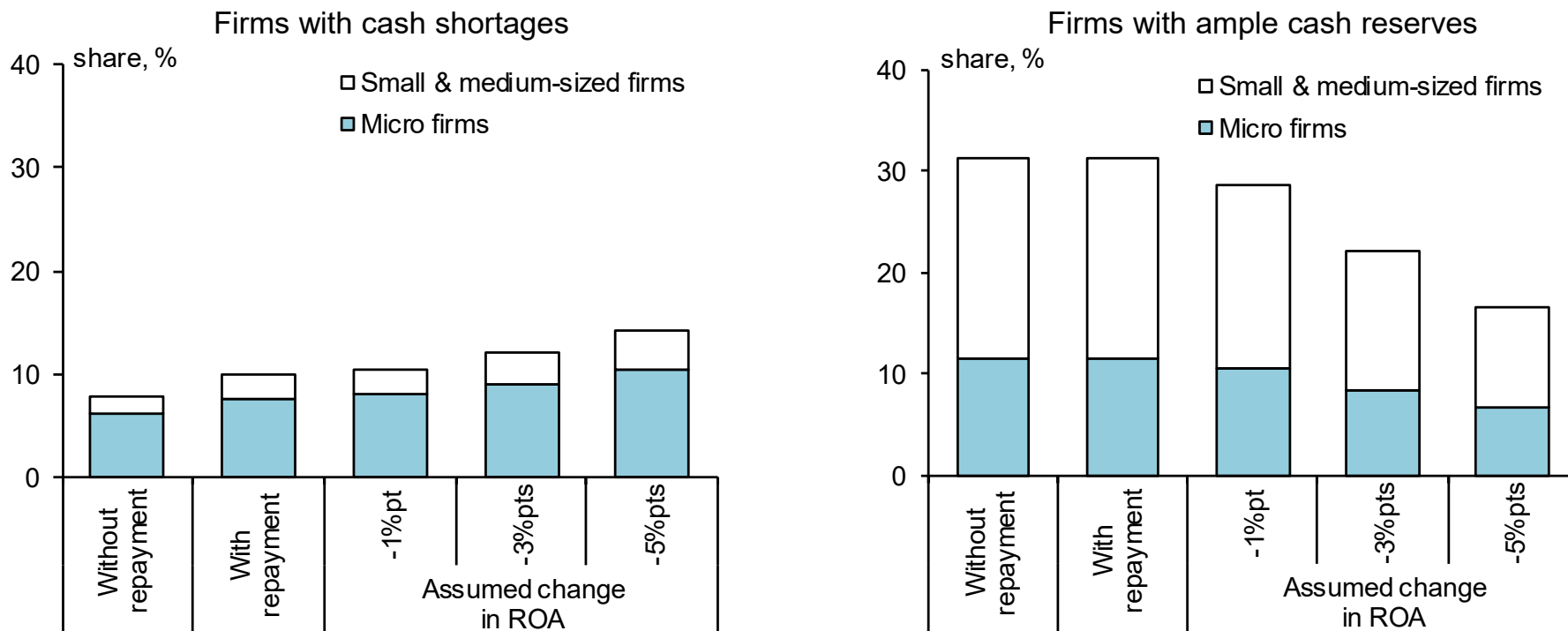


Note: Liquidity buffer is calculated as the ratios of cash reserves to monthly average administrative expenses. The dotted lines indicate median values of the actual level of fiscal 2019. See Chart IV-1-11.

# Tail risk with regard to firms' financial conditions

- While firms as a whole are quite resilient to stress, their financial conditions are largely heterogeneous.
- In the "with repayment" case, the number of firms with cash shortages is several percentage points higher than in the "without repayment" case.
  - Banks' credit cost ratios could potentially be pushed up by around 0.1% pts. Note that the recent level of the credit cost ratio has been around 0.1%, which would not necessarily be large from a macro perspective.
- There are also firms with ample cash reserves that would be able to maintain a high liquidity buffer even after full repayment of their effectively interest-free loans.

## Tails of distribution of firms' cash reserves

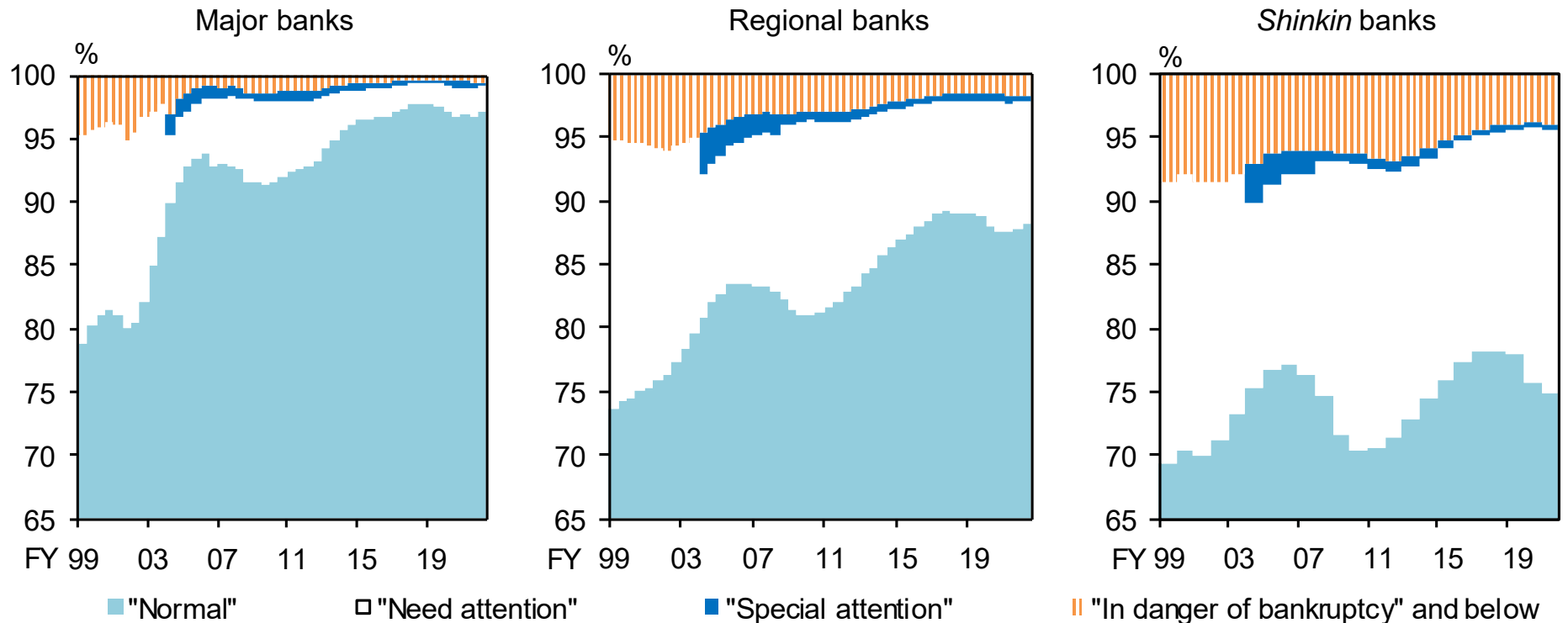


Note: The left-hand chart indicates the share of firms whose operating cash outflow during the fiscal 2023 exceeds their cash reserves at the beginning of that year. The right-hand chart indicates the share of firms with operating profits that are positive and for which the liquidity buffer after repayment of all the effectively interest-free loans is 10 times or more. See Chart IV-1-12.

# Potential credit risk (1)

- Looking at banks' loan portfolios, the shares of normal loans have stayed high. The share of loans to borrowers "in danger of bankruptcy" has been on a downward trend for a long time.
- Among borrowers categorized as "need attention" or "special attention" who have not been downgraded to "in danger of bankruptcy," however, there are not a few whose business conditions have been unfavorable since before the pandemic.
  - A turnaround at these firms is important to maintain the quality of their loan portfolios into the future.

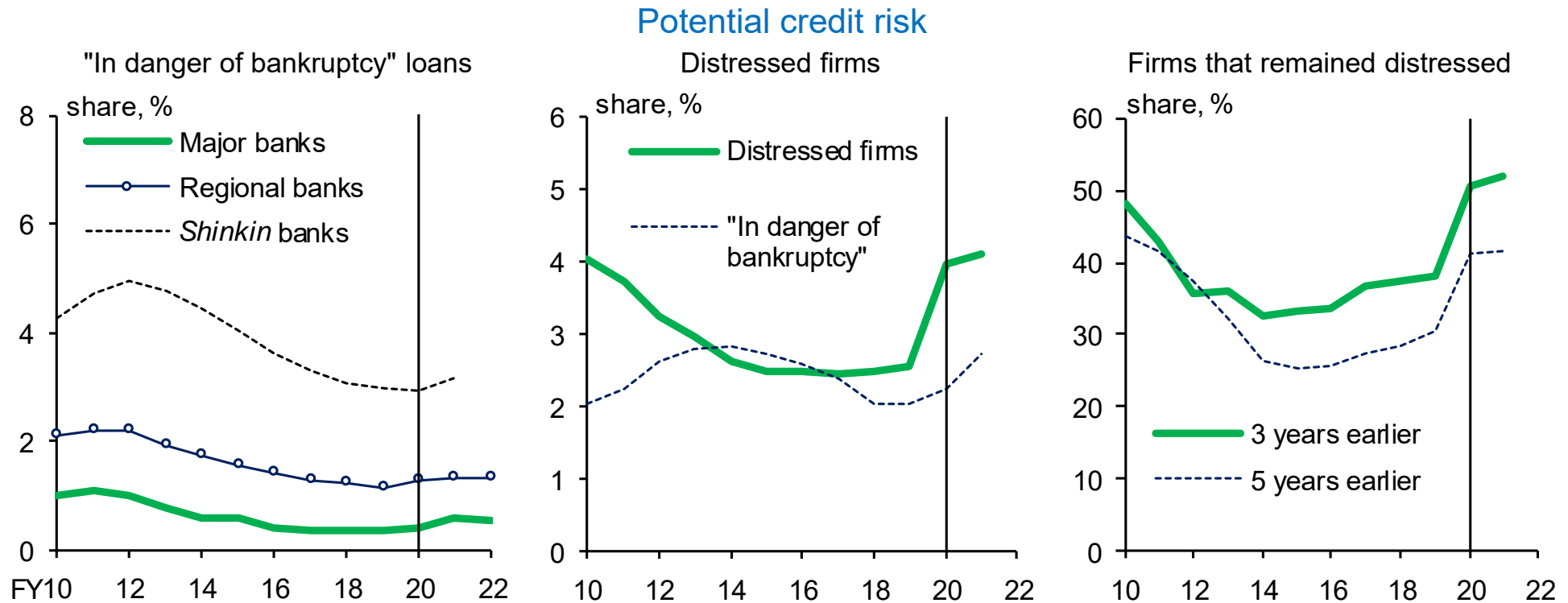
## Breakdown of loans by borrower classification



Note: "Need attention" excludes "Special attention" from fiscal 2004. See Chart IV-1-1.

# Potential credit risk (2)

- The share of distressed firms did not decline when the economy was improving prior to the pandemic, but instead was unchanged.
  - Firms that are both insolvent and are making operating losses are referred to as "distressed" firms.
- Rather, the share of firms that continued to be distressed was on a gradual upward trend before the start of the pandemic.



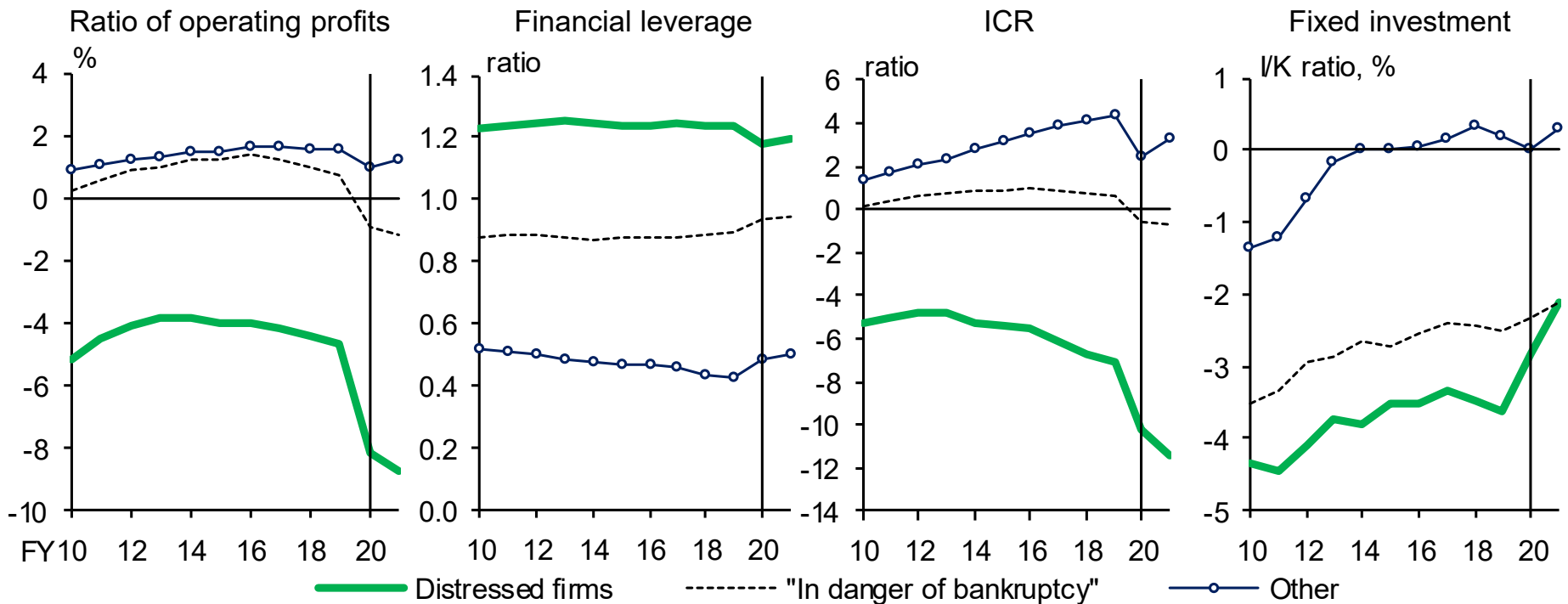
Note: 1. The right-hand chart shows the share of firms classified as distressed at each point in time when they were classified in the same category three or five years earlier.  
 2. The vertical lines indicate the beginning of the pandemic.  
 3. See Chart IV-1-13.



# Potential credit risk (3)

- The financial conditions of firms that have been financially distressed for a prolonged period of time are prone to a vicious cycle.
  - The unstable operating cash flow tends to make firms more dependent on additional financing. As a result, their financial leverage remains high, and their ICR is on a downtrend. Since the firms place the priority on securing working capital and put off making proactive investments, they struggle to improve the core profitability.
  - Even compared to firms classified as "in danger of bankruptcy," distressed firms have a high leverage and low ICR.

Financial indicators among distressed firms

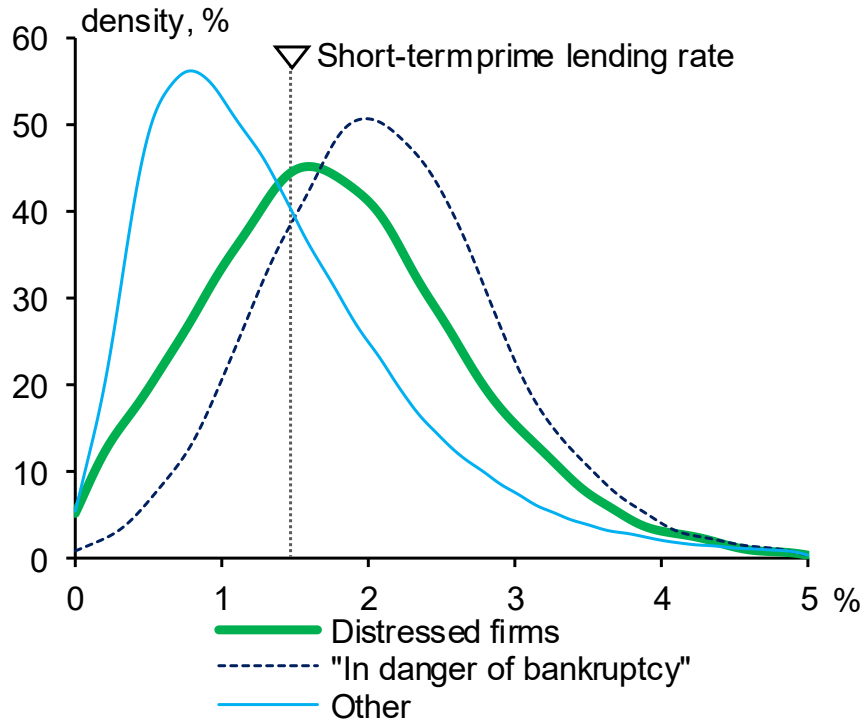


Note: Financial leverage is the ratio of borrowings to total assets. ICR = (operating profits + interest and dividends received) / interest payments. Investment (I) is calculated as the change ( $\Delta K$ ) in fixed assets (K) from the previous year. The charts show the median values. The vertical lines indicate the beginning of the pandemic. See Chart IV-1-14.

# Potential credit risk (4)

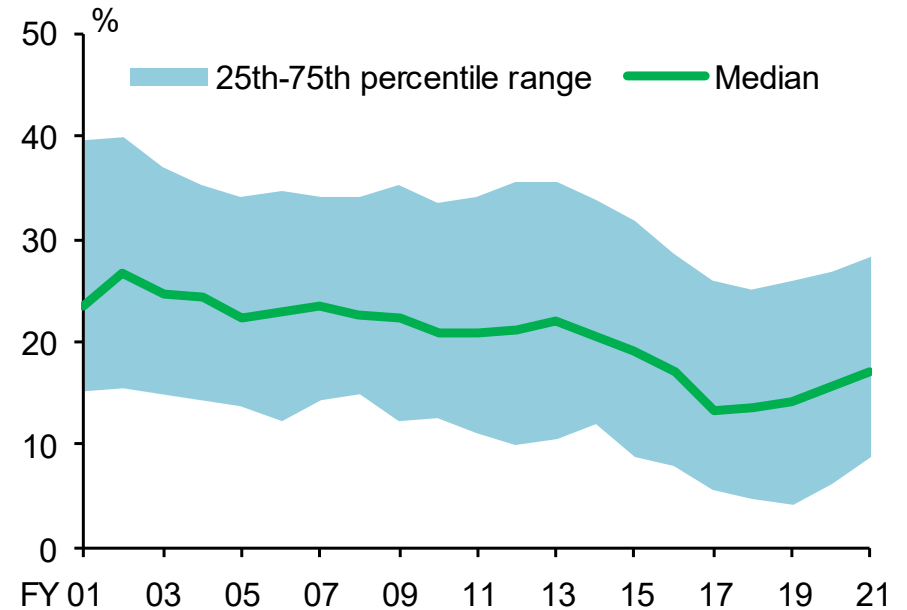
- Some distressed firms find it difficult to pay interest rates commensurate with their credit risk.
  - Nearly half of distressed firms pay interest rates below the prime lending rate. Among distressed firms with higher financial leverage and lower ICRs than firms "in danger of bankruptcy," there are quite a few who pay interest rates as low as those of firms "in danger of bankruptcy."
- Some banks have significantly lowered their loan-loss provision ratios for firms categorized as "special attention," reflecting the low number of distressed firms that have been downgraded.

## Distribution of loan interest rates

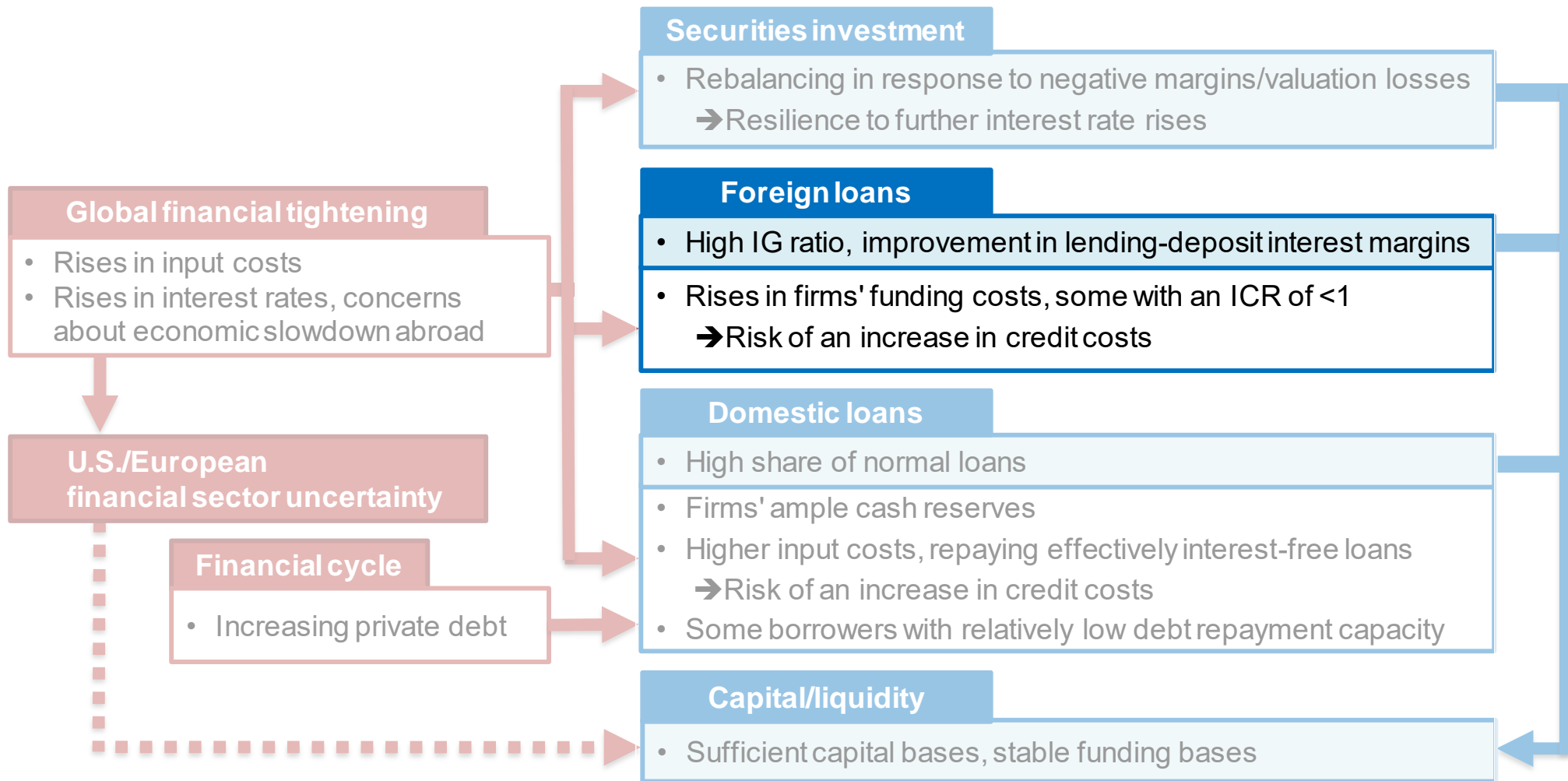


Note: See Chart IV-1-15.

## Distribution of loan-loss provision ratios for "special attention" loans



Note: The ratios of loan-loss provisions to unsecured "special attention" loans. Covers regional and *shinkin* banks. See Chart IV-1-16.



## 4. Changes in the risk profiles of foreign loans

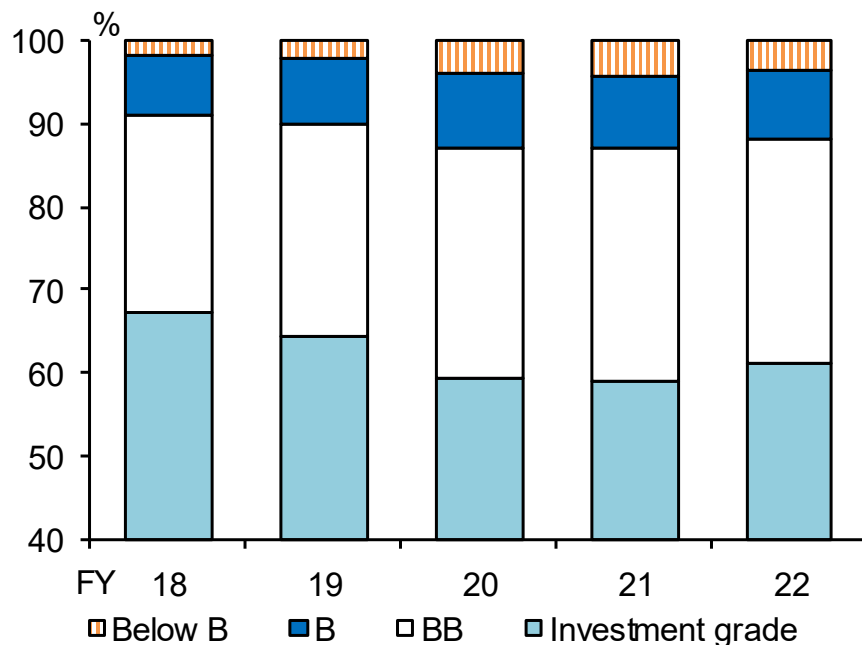
- How the risk profiles of foreign loans have changed.
- Whether the resilience of banks' foreign loans has improved.

# Changes in profiles (1) Loan composition

➤ Banks have changed the composition of loans to reduce risks.

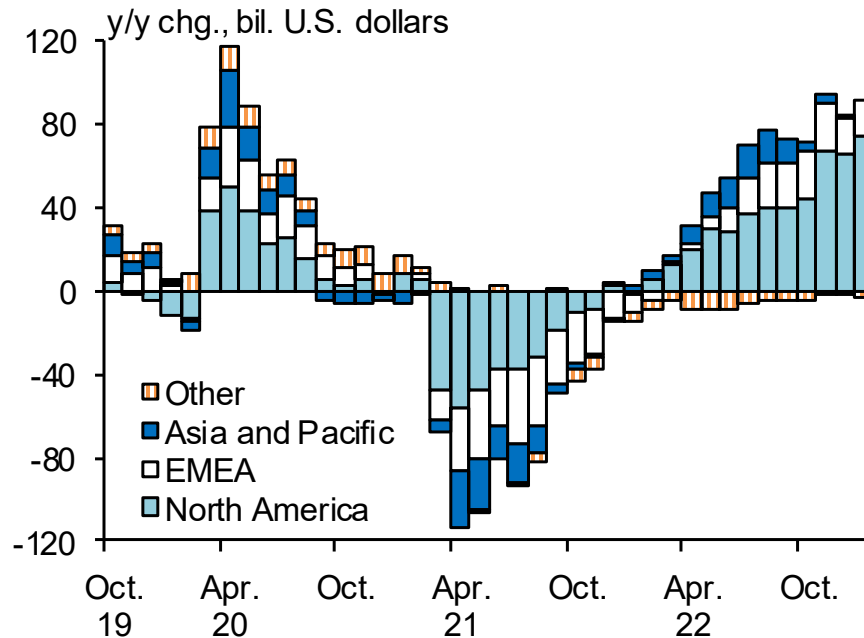
- The moderate downtrend in the share of IG loans has come to a halt. The increase in foreign loans over the past few years was mainly driven by relatively low-rated leveraged loans. In contrast, the driving force behind recent increases in foreign loans has been loans for working capital to IG firms in the U.S. and Europe.
- While major banks have been active in meeting demand, particularly from the U.S. and Europe, they have been reluctant to extend loans to the Asia-Pacific region because of concerns over the Chinese real estate market.

## Rating composition of foreign loans



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

## Foreign loans outstanding of the three major banks by region

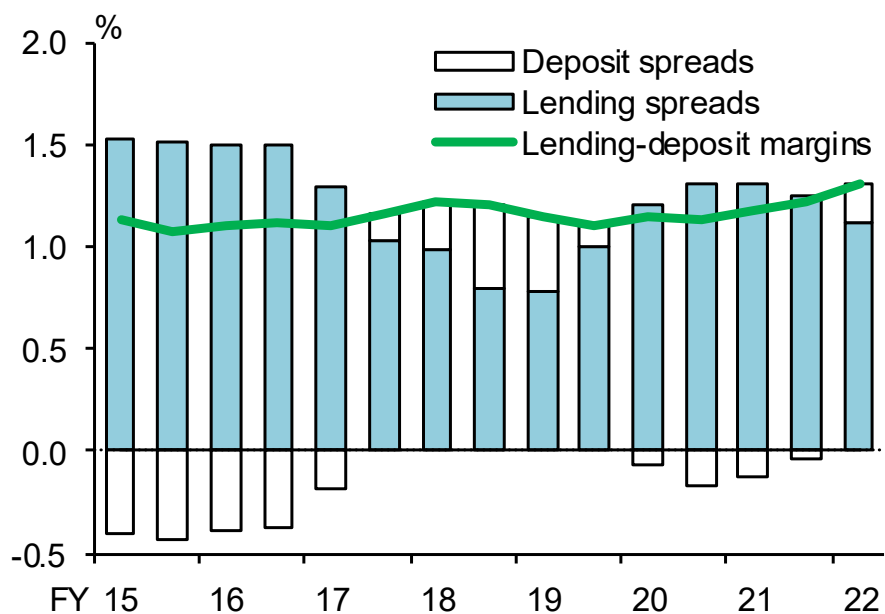


Note: "EMEA" includes Europe, the Middle East, and Africa. See Chart III-1-14.

# Changes in profiles (2) Lending-deposit interest margins

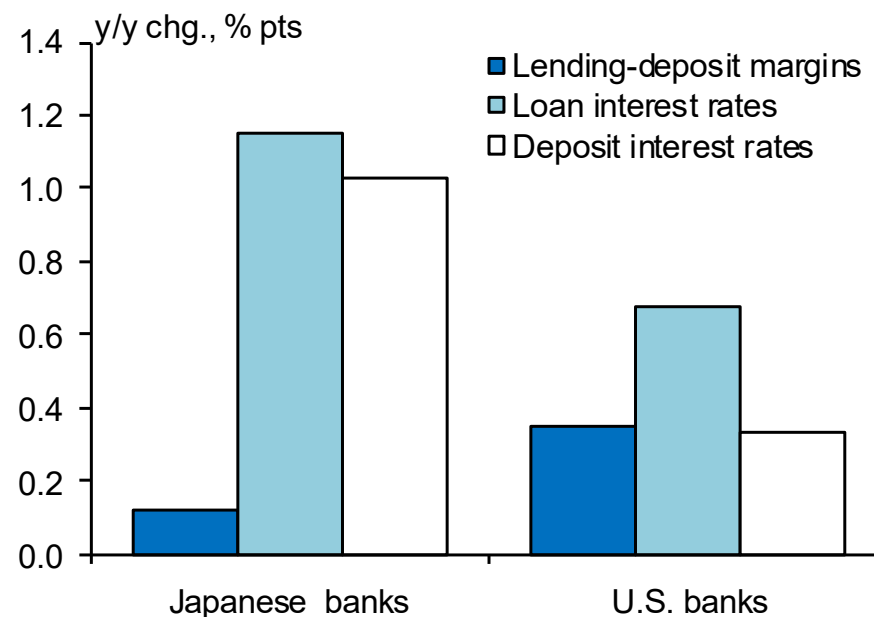
- Lending-deposit interest margins have improved somewhat, improving banks' loss-absorbing capacity.
- However, the improvement in lending-deposit margins differs between Japanese banks and U.S. banks.
  - The rise in loan rates of Japanese banks has been larger, partly because they have reviewed loans to low-return borrowers. The rise in their deposit rates is also larger (see next page).
  - As a result, the positive impact of the improvement in lending-deposit margins on net interest income has been larger for U.S. banks.

## Foreign lending-deposit interest margins



- Note: 1. Deposit/lending spreads respectively are the differences between deposit/lending rates and base rates (the U.S. 3-month rate).  
 2. Covers the international business of the three major banks (on a non-consolidated basis).  
 3. See Chart IV-2-3.

## Comparison of lending-deposit interest rates

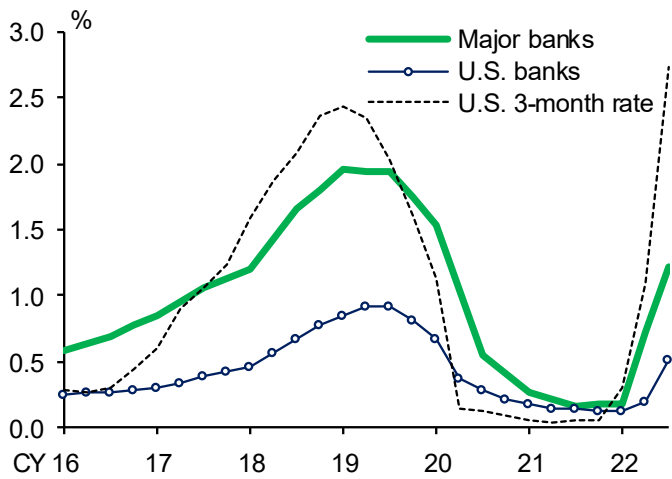


- Note: "Japanese banks" refers to the three major banks, while "U.S. banks" consists of Bank of America, Citigroup, and J.P. Morgan Chase. The chart shows the year-on-year changes from April-September 2021 to April-September 2022. See Chart IV-2-4.

# Dollar deposit market

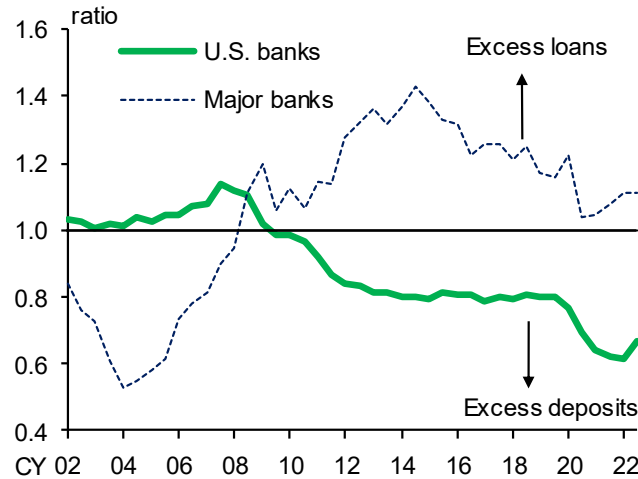
- The increase in major banks' deposit funding rates has been limited relative to market interest rates.
  - A reason is that, in the dollar deposit market, U.S. banks have held deposits significantly in excess of loans.
  - However, transaction account deposits of firms are more sensitive to interest rates than those of individuals. Major banks, therefore, have raised deposit rates more than their U.S. counterparts and made use of long-term market funding. Thanks to such stable funding, there were no particular disruptions despite the rise in dollar funding premiums triggered by the U.S. bank failures.

## Dollar deposit interest rates



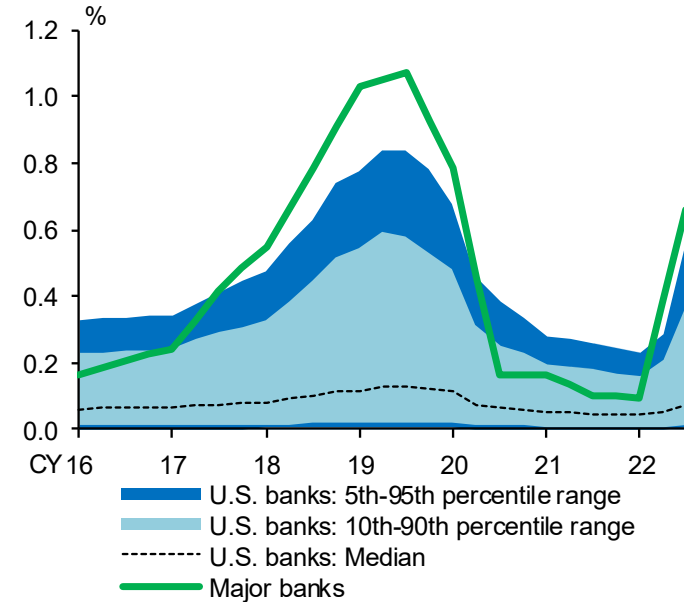
Note: Deposit interest rates include CDs. "Major banks" indicates deposit interest rates in the international business. See Chart IV-4-5.

## Loan-deposit balance in U.S. banks



Note: "Major banks" indicates the loan-deposit balance in the international business. See Chart IV-4-6.

## Distribution of dollar deposit rates on transaction accounts

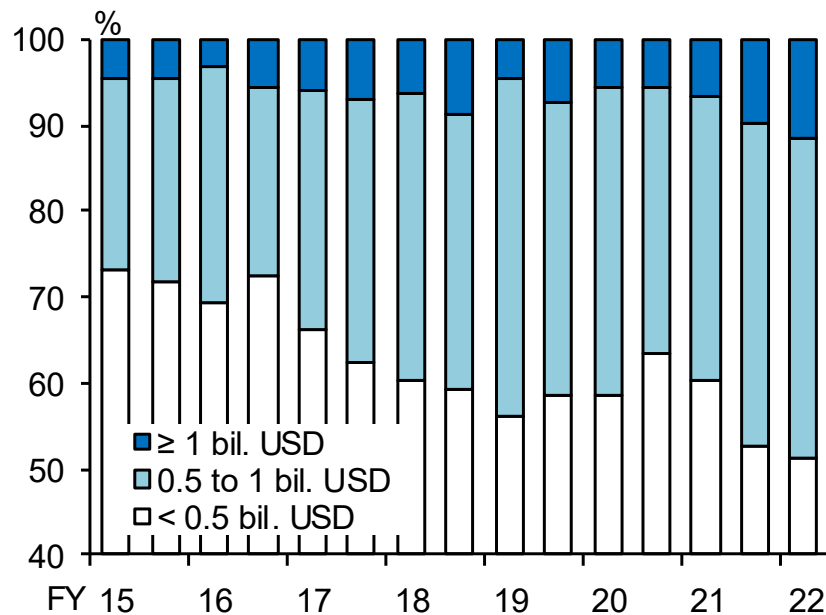


Note: "Major banks" indicates deposit interest rates in the international business. See Chart IV-4-8.

# Changes in profiles (3) Trend to larger loans and loan concentration

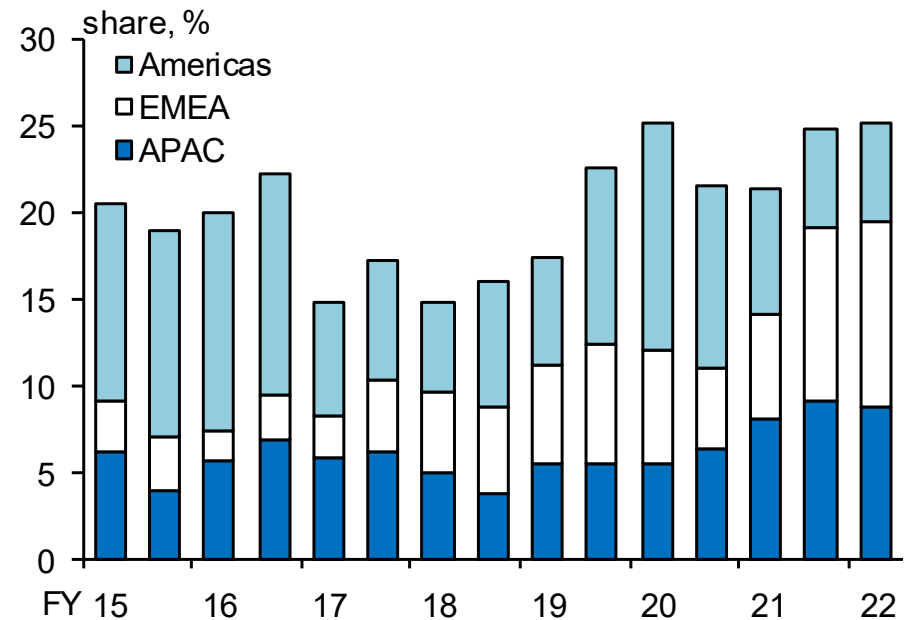
- Looking at the loan amount per large borrower, the share of relatively large borrowers has increased.
  - This is because major banks have been actively responding to the loan demand of their borrowers. Additional borrowing reflecting borrowers' growing demand for working capital has also contributed to the trend to larger loans.
- There has been an increase in the number of borrowers overlapping among major banks.
  - While the increase in common exposures in loans to the Americas is limited, it is pronounced in loans to the EMEA and APAC regions.

### Composition of large borrowers



Note: Covers the three major banks' large borrowers (non-Japanese firms). See Chart IV-2-5.

### Shares of overlapping large borrowers



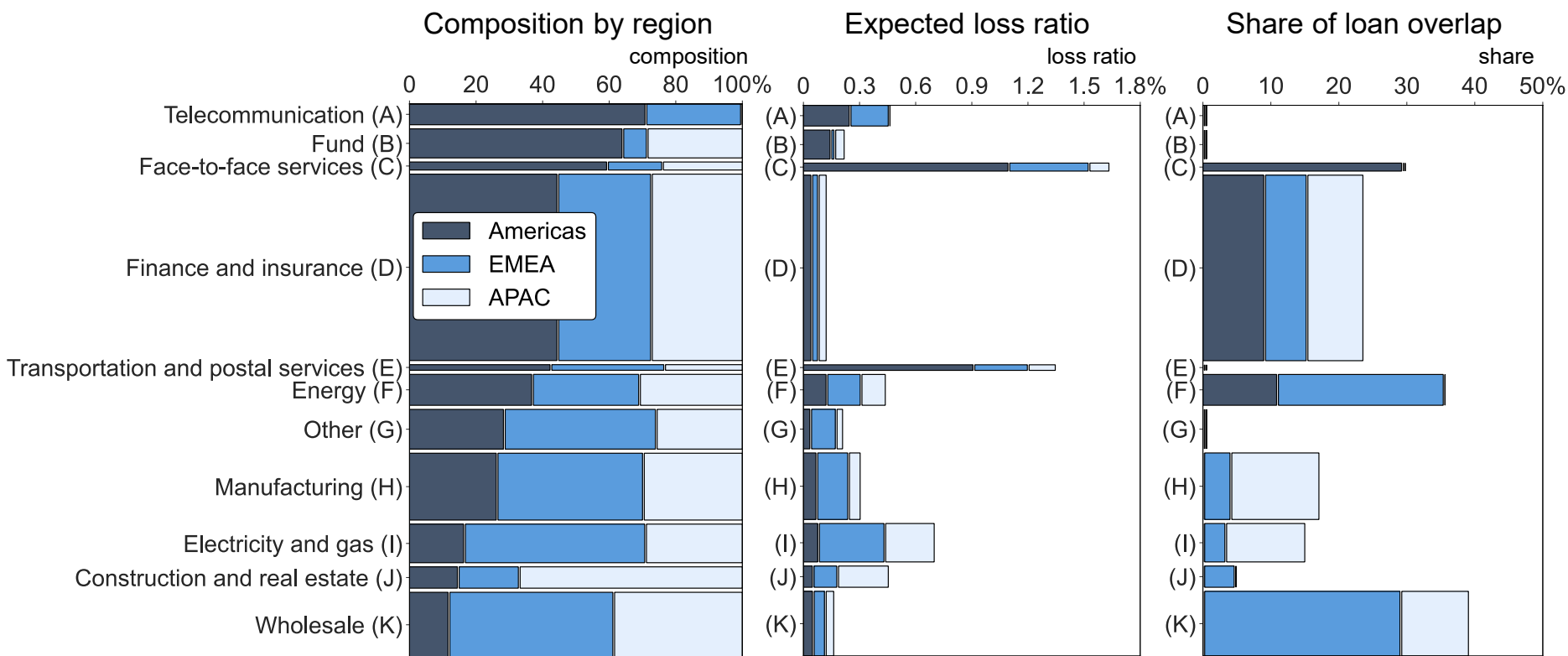
Note: The chart shows the shares of outstanding loans to large borrowers that overlap for all three major banks. Covers the three major banks' large borrowers. See Chart IV-2-6.

# Risks associated with large loans (1)

## ➤ Concentration of large borrowers varies by region.

- The expected loss ratio for loans to borrowers in the face-to-face services in the Americas is considerably higher, and the rate of loan overlap among major banks is high. 70% of this lending is provided through leveraged loans.
- In the EMEA, there is a pronounced concentration in large loans to commodity traders ("wholesale" in the chart).
- 70% of large loans to the construction and real estate industry go to the APAC, and the expected loss ratio is relatively high.

## Risk maps of large loans



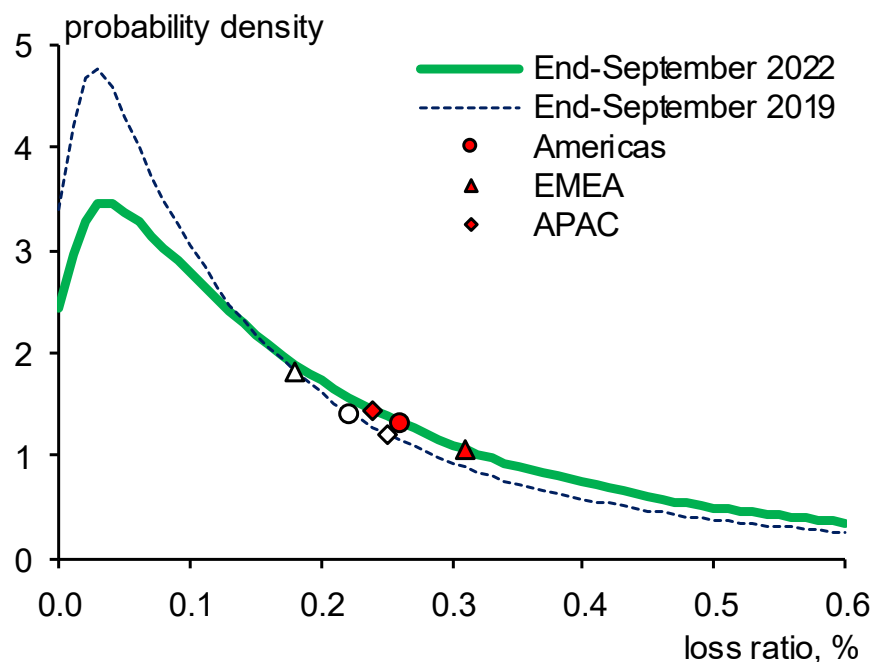
Note: The vertical axis in each chart shows the industry composition of the three major banks' outstanding loans to large borrowers. "Finance and insurance" excludes banks and investment funds. See Chart IV-2-7.



# Risks associated with large loans (2)

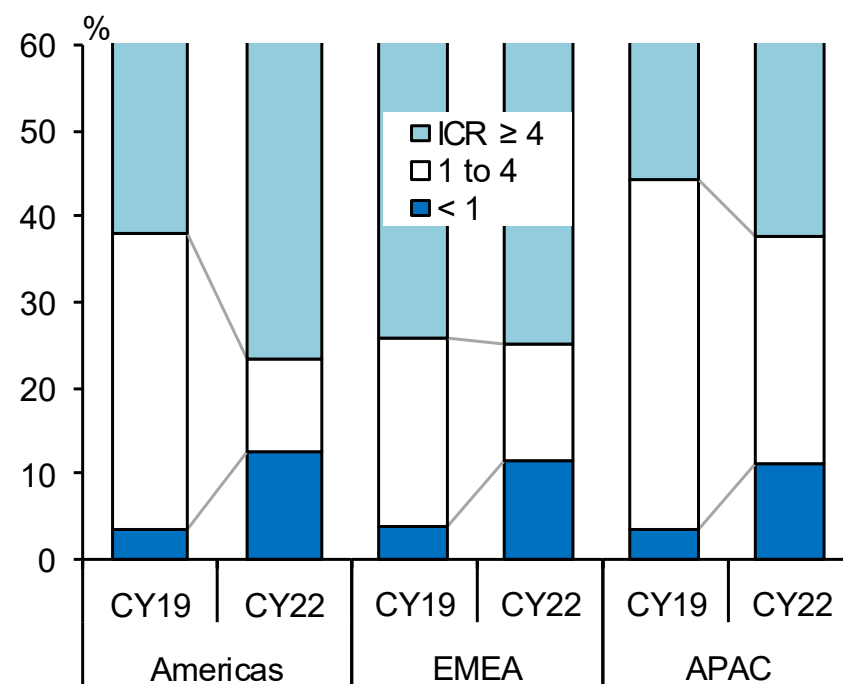
- The credit risk associated with large foreign loans has increased somewhat.
  - Expected loss ratios have risen, especially in the EMEA region.
  - Looking at borrowers overall, strong sales of firms have prevented a deterioration in their ICRs even as funding costs have risen. However, the percentage of firms with an ICR of <1 -- i.e., firms that cannot cover their interest payments with their profits from core business alone -- has been rising.
  - The PD would be likely to rise since large borrowers of major banks tend to have relatively high financial leverage.

## Expected losses of large loans

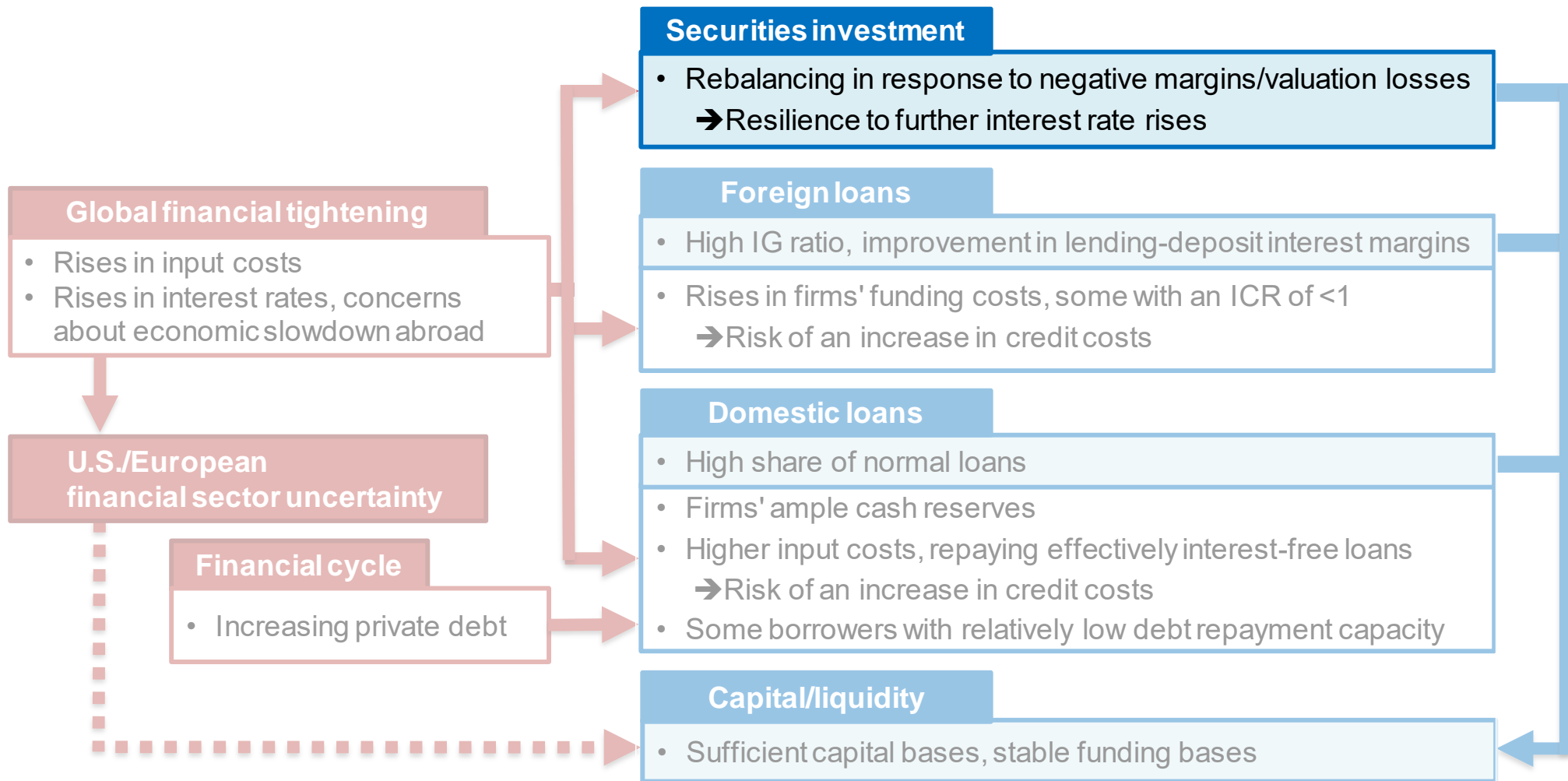


Note: Shows the distribution of loss ratios (losses/loans outstanding) of the three major banks' large loans. The markers indicate the expected loss ratios for each region. See Chart IV-2-11.

## ICR composition of large borrowers



Note: "CY19" and "CY22" indicate December 2019 and September 2022, respectively. Covers the three major banks' large borrowers (non-Japanese firms). See Chart IV-2-12.



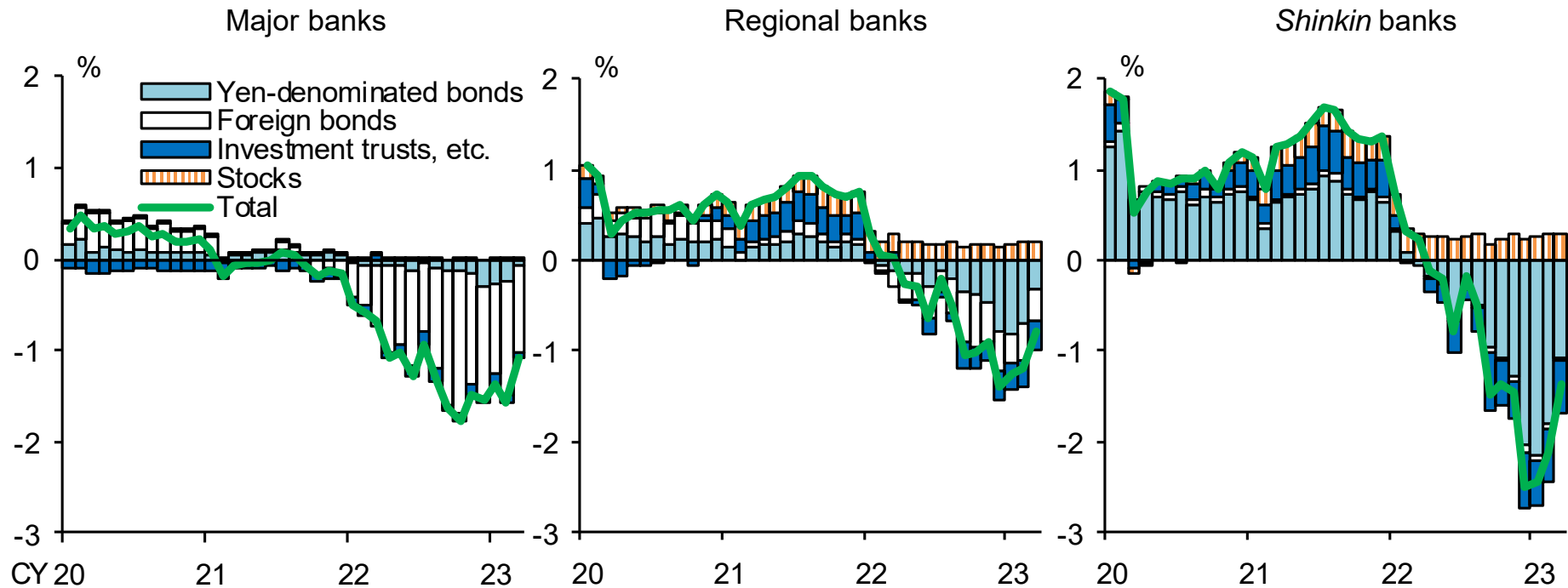
## 5. Banks' resilience to foreign interest rate rises

- How the risk profiles of securities portfolios have changed.
- Whether banks' resilience to foreign interest rate rises has improved.

# Securities portfolios (1) Valuation gains/losses

- Valuation losses on securities have increased for all types of banks.
  - Valuation losses on securities include those on held-to-maturity securities and exclude strategic stockholdings.
  - Since this March, valuation losses have decreased due to a decline in domestic interest rates.

## Valuation gains/losses on securities holdings

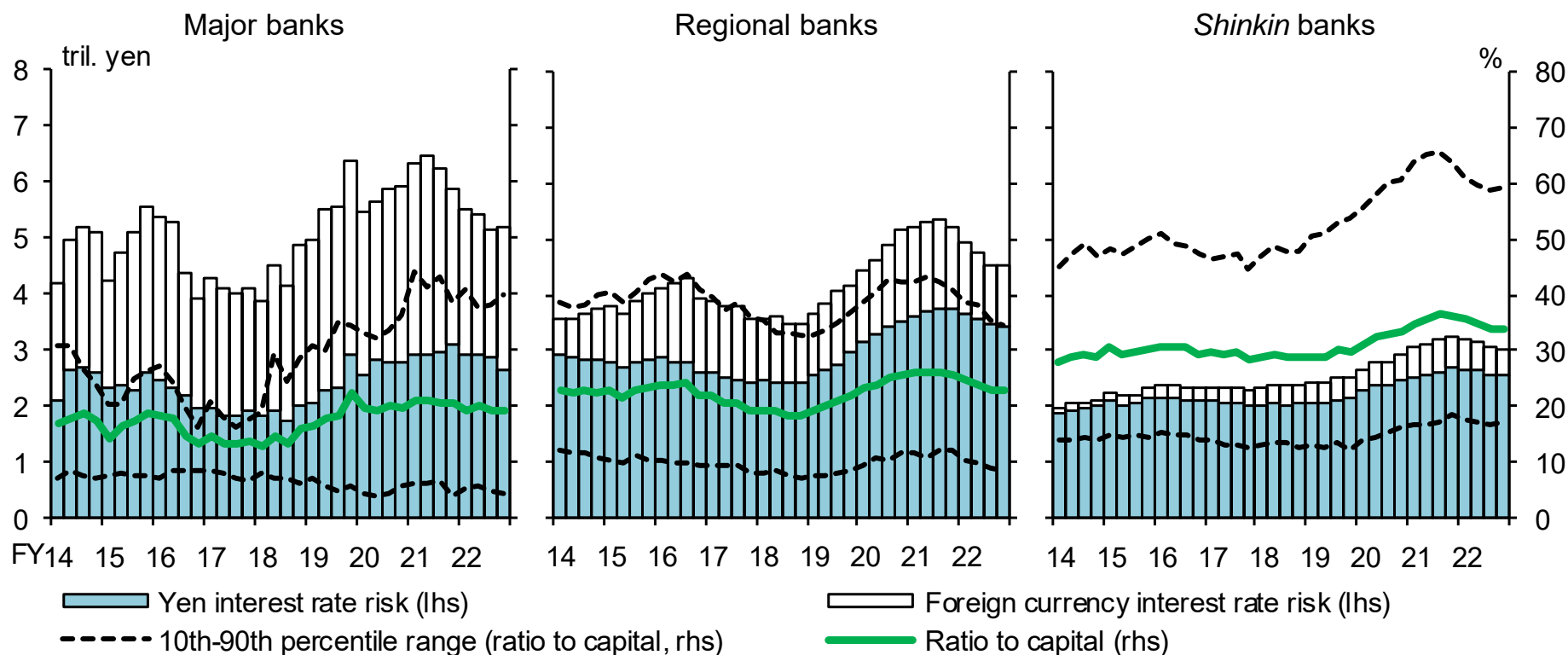


Note: The ratio of valuation gains/losses on securities (including held-to-maturity securities and excluding strategic stockholdings) to risk-weighted assets. Latest data are estimated based on interest rates as of end-March 2023. Latest data for "Stocks" and "Investment trusts, etc." are imputed by the values as of February 2023. See Chart IV-3-1.

# Securities portfolios (2) Interest rate risk

- Yen and foreign currency interest rate risk has been reduced along with banks' rebalancing.
  - Foreign currency interest rate risk (200 BPV) has been on a clear declining trend.
  - Yen interest rate risk (100 BPV), which had been on an uptrend, has also started to decline.
  - Banks' resilience to the risk of higher interest rates has been improving on the whole.

## Interest rate risk of securities holdings

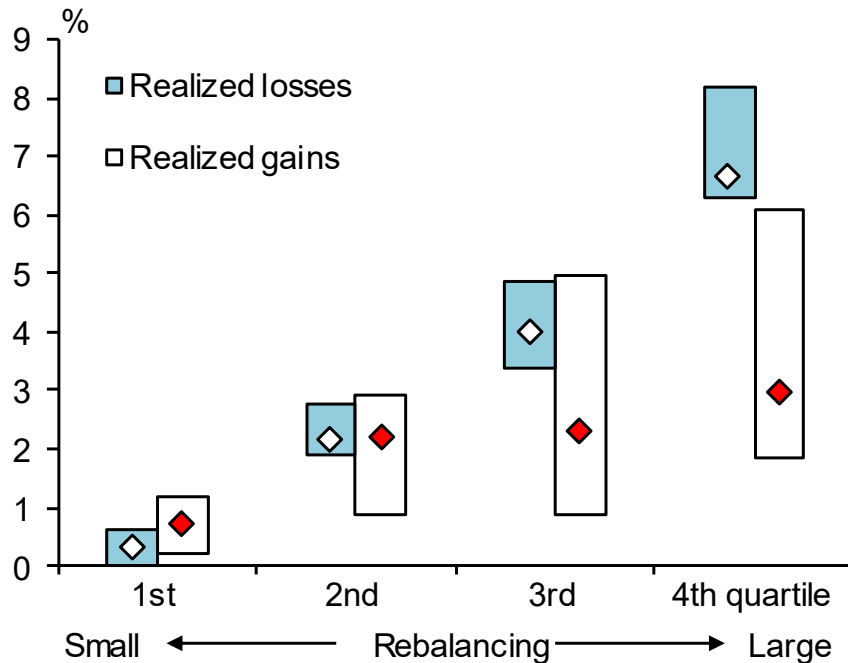


Note: 1. "Yen interest rate risk" is a 100 BPV. "Foreign currency interest rate risk" is a 200 BPV. Off-balance-sheet transactions are included for foreign currency interest rate risk.  
 2. "Ratio to capital" is calculated using CET1 capital for internationally active banks and core capital for domestic banks (excluding the transitional arrangements).  
 3. See Chart IV-3-2.

# Securities portfolios (3) Heterogeneity in the rebalancing behavior

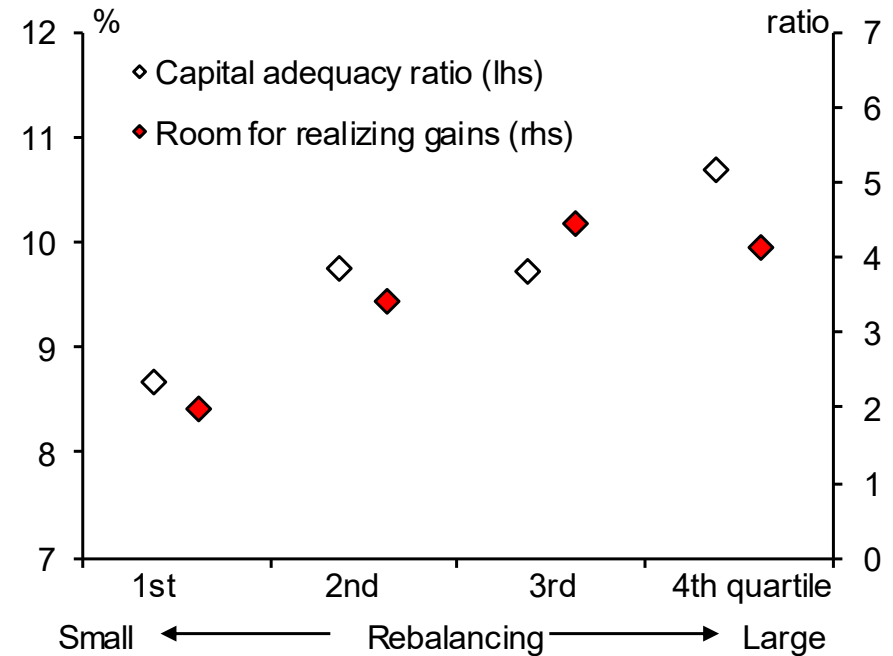
- Heterogeneity is large in terms of the interest rate risk and the underlying rebalancing behavior of banks.
  - Regional banks are grouped into quartiles based on their degree of rebalancing (losses on sales during 2022).
  - Banks that rebalanced significantly (those in the third and fourth quartiles) were those that had high capital adequacy ratios and ample valuation gains (room for realizing gains) to start with.

### Distribution of realized gains/losses



- Note: 1. The chart shows the medians (markers) and 25th-75th percentile ranges (bands) of realized gains/losses in 2022 as ratios to capital for each quartile of the degree of rebalancing.
2. Ratios to capital are calculated using Tier 1 capital for internationally active banks and core capital for domestic banks.
3. See Chart IV-3-3.

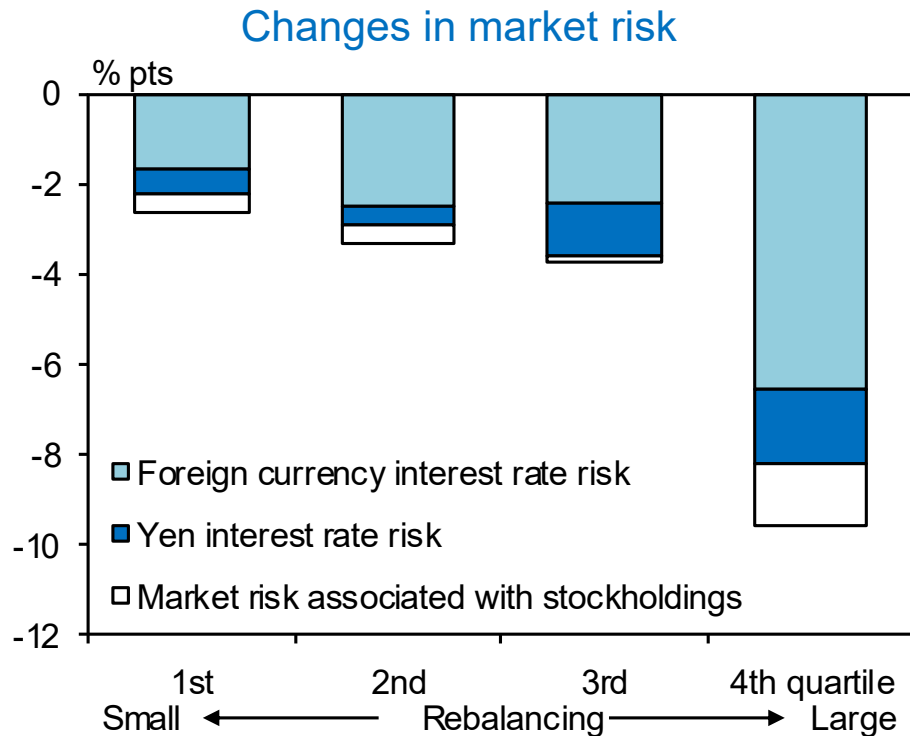
### Distribution of loss-absorbing capacity



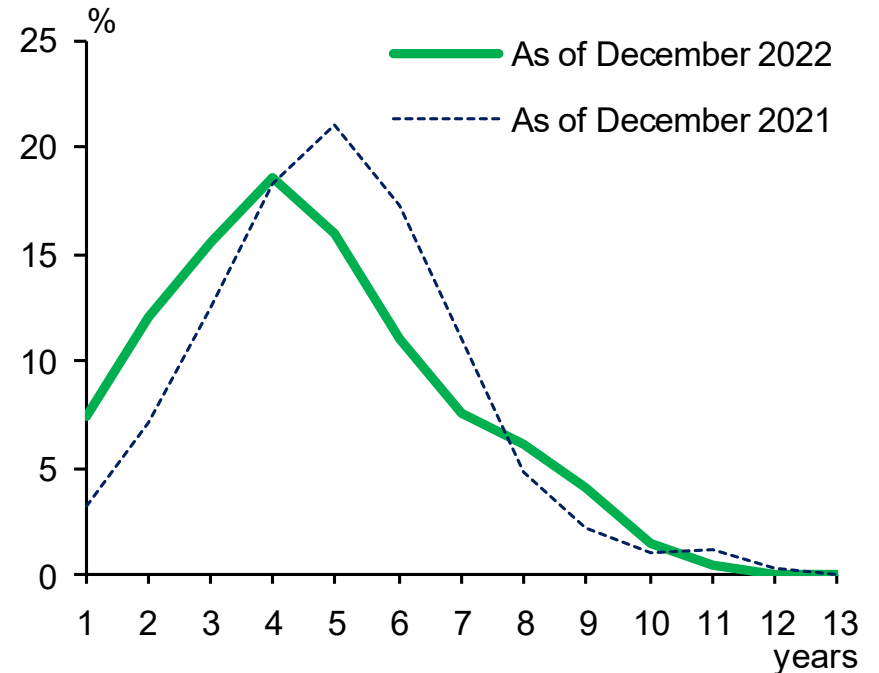
- Note: 1. The chart shows the medians of capital adequacy ratios (as of end-September 2021) and room for realizing gains (as of end-December 2021) for each quartile of the degree of rebalancing.
2. "Capital adequacy ratio" refers to the Tier 1 capital ratio for internationally active banks and the core capital ratio for domestic banks. "Room for realizing gains" = valuation gains or losses on securities holdings / PPNR excluding trading income (average over the last three years).
3. See Chart IV-3-4.

# Changes in profiles (1)

- The risk profiles of banks' securities portfolios have changed as a result of their rebalancing.
  - Looking at the market risk, there has been an overall reduction, especially in foreign currency interest rate risk.
  - The average duration of foreign bondholdings has been shortened by nearly one year.



### Distribution of duration of foreign bondholdings



Note: 1. The chart shows the medians of changes in market risk in 2022 as ratios to capital for each quartile of the degree of rebalancing.

2. "Yen interest rate risk" refers to a 100 BPV; "Foreign currency interest rate risk" refers to a 200 BPV; "Market risk associated with stockholdings" refers to valuation changes in response to a 10% decline in the stock price index. Ratios to capital are calculated using Tier 1 capital for internationally active banks and core capital for domestic banks.

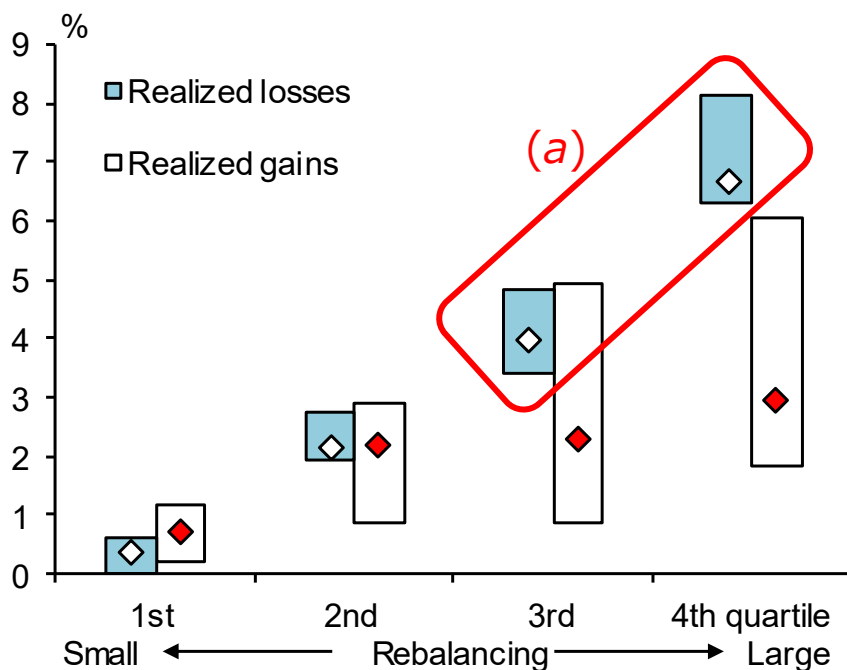
3. See Chart IV-3-5.

Note: Covers regional banks. See Chart IV-3-6.

# Changes in profiles (2)

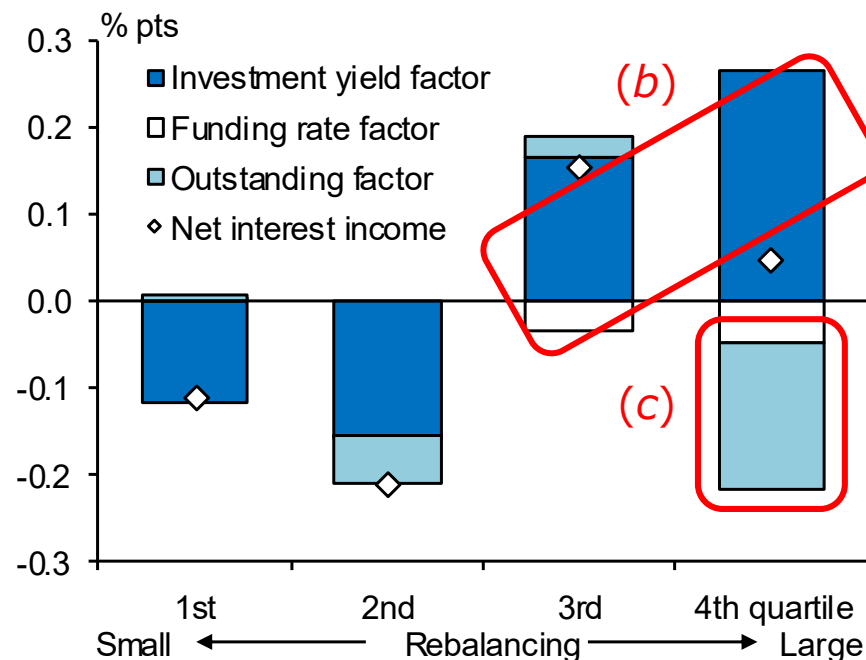
- Banks that rebalanced significantly have improved their yields (b) and contained the risk of negative interest margins. This is due to the realization of losses on some of their interest rate risk (a).
  - Some banks that also realized gains saw a reduction in their remaining valuation gains, while others that did not restore reduced positions have lost profit opportunities (c); however, both groups of banks have lowered the risk of valuation losses.

## Distribution of realized gains/losses



- Note: 1. The chart shows the medians (markers) and 25th-75th percentile ranges (bands) of realized gains/losses in 2022 as ratios to capital for each quartile of the degree of rebalancing.  
 2. Ratios to capital are calculated using Tier 1 capital for internationally active banks and core capital for domestic banks.  
 3. See Chart IV-3-3.

## Changes in net interest income related to securities portfolios

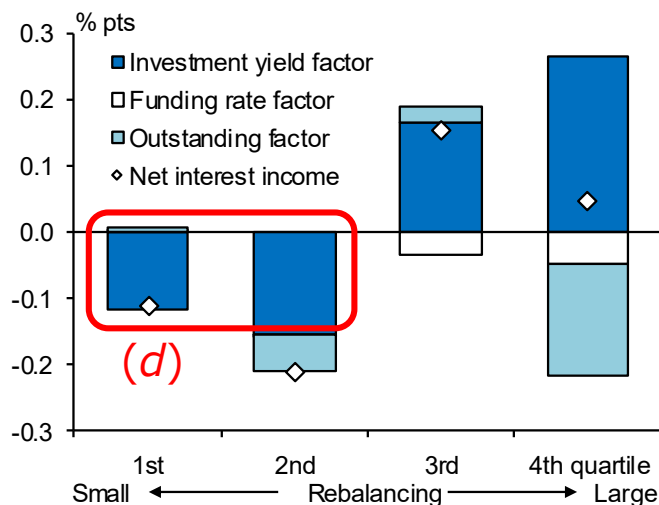


- Note: 1. The chart shows, for each quartile of the degree of rebalancing, the medians of changes in net interest income (including foreign currency-denominated foreign bonds and investment trusts) in 2022 as ratios to capital, and their decomposed factors.  
 2. Ratios to capital are calculated using Tier 1 capital for internationally active banks and core capital for domestic banks.  
 3. See Chart IV-3-7.

# Changes in profiles (3)

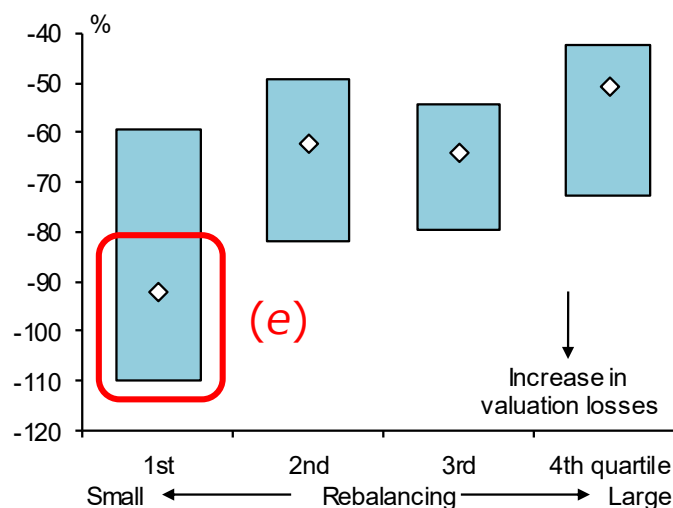
- For banks that maintained their positions, the risk associated with rising interest rates has materialized:
  - The yields on securities have been one reason for the decline in net interest income (*d*).
  - Some banks, especially those that maintained their positions, posted valuation losses that were of a similar size as the expected losses from the recent rise in foreign interest rates (*e*).
  - If the ratio of allocated capital utilization to market divisions increases due to the increase in valuation losses (*f*), it will become more difficult for them to adjust positions in a flexible manner.

## Changes in net interest income related to securities portfolios



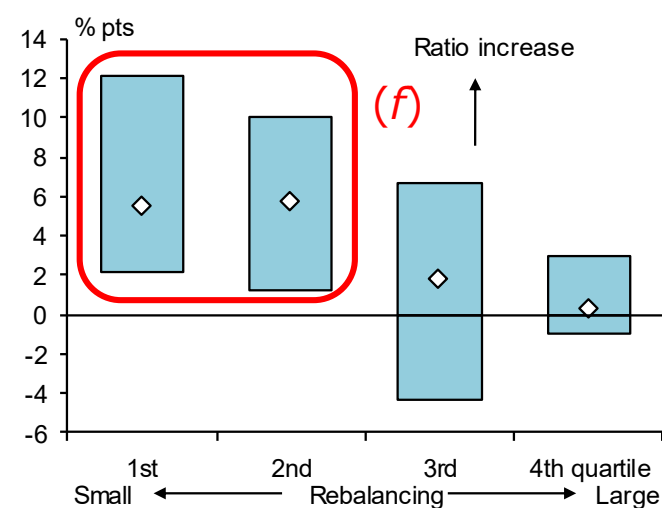
Note: 1. The chart shows, for each quartile of the degree of rebalancing, the medians of changes in net interest income (including foreign currency-denominated foreign bonds and investment trusts) in 2022 as ratios to capital, and their decomposed factors.  
 2. Ratios to capital are calculated using Tier 1 capital for internationally active banks and core capital for domestic banks.  
 3. See Chart IV-3-7.

## Distribution of valuation losses



Note: 1. The chart shows the medians (markers) and 25th-75th percentile ranges (bands) of changes in valuation losses (relative to expected losses) in 2022 for each quartile of the degree of rebalancing.  
 2. Valuation losses cover foreign bonds and investment trusts. Expected losses refer to a 400 BPV of foreign currency interest rate risk as of end-December 2021.  
 3. See Chart IV-3-8.

## Distribution of the ratio of capital utilization



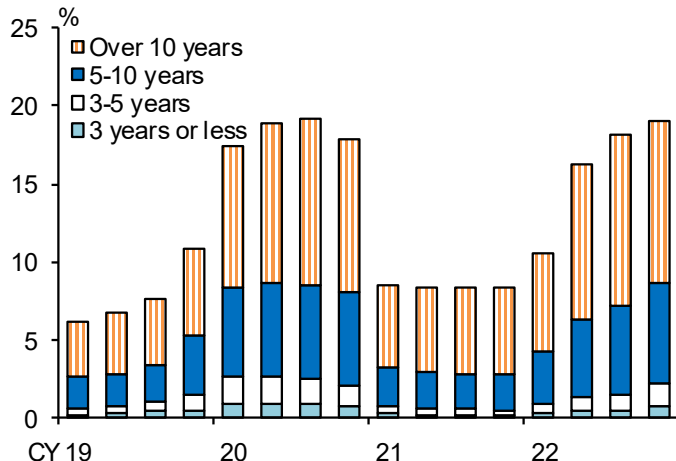
Note: The chart shows the medians (markers) and 25th-75th percentile ranges (bands) of changes in the ratio of capital utilization allocated to market divisions in the first half of fiscal 2022 for each quartile of the degree of rebalancing. See Chart IV-3-9.



# Changes in profiles (4)

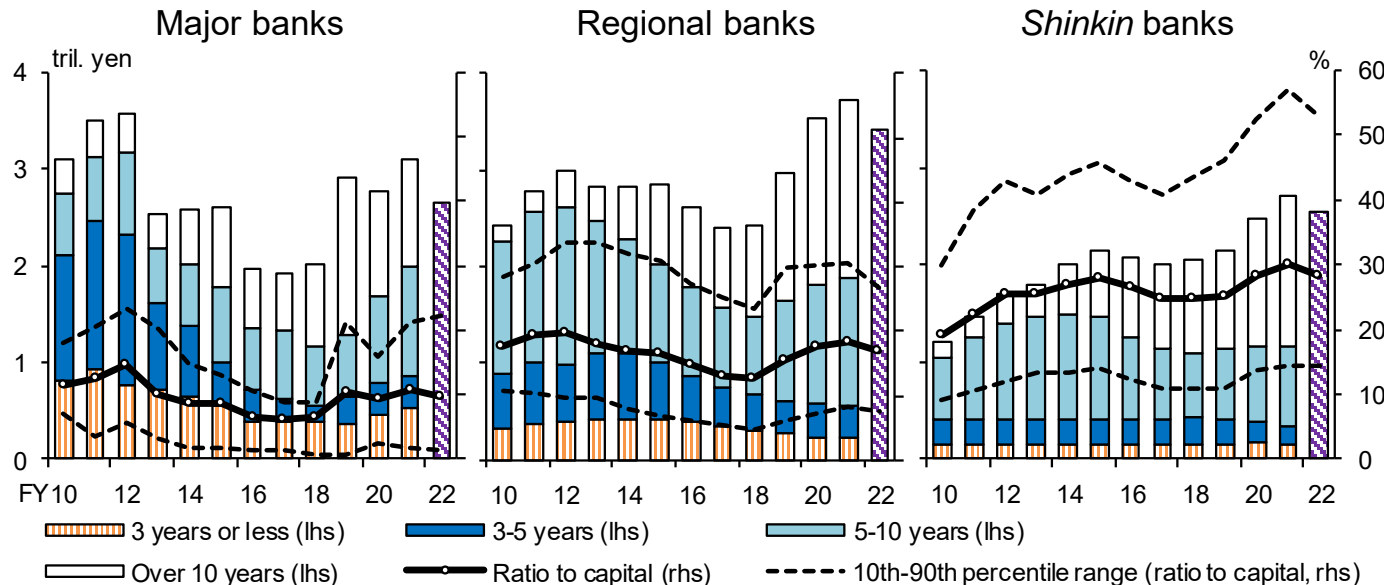
- The risk profiles for investments in yen-denominated bonds have also changed.
  - Despite the reduction in the outstanding amount of bondholdings, the interest rate risk in terms of VaR is increasing due to the rising volatility of domestic interest rates.
  - The interest rate risk in terms of the 100 BPV remains near its historical peak, particularly for regional and *shinkin* banks, although it has started to decline.

## VaR associated with yen-denominated bondholdings



Note: The chart shows the ratio of VaR (with a 99 percent confidence level and a 1-year holding period) to capital. Covers regional and *shinkin* banks. See Chart IV-3-12.

## 100 BPV associated with yen-denominated bondholdings

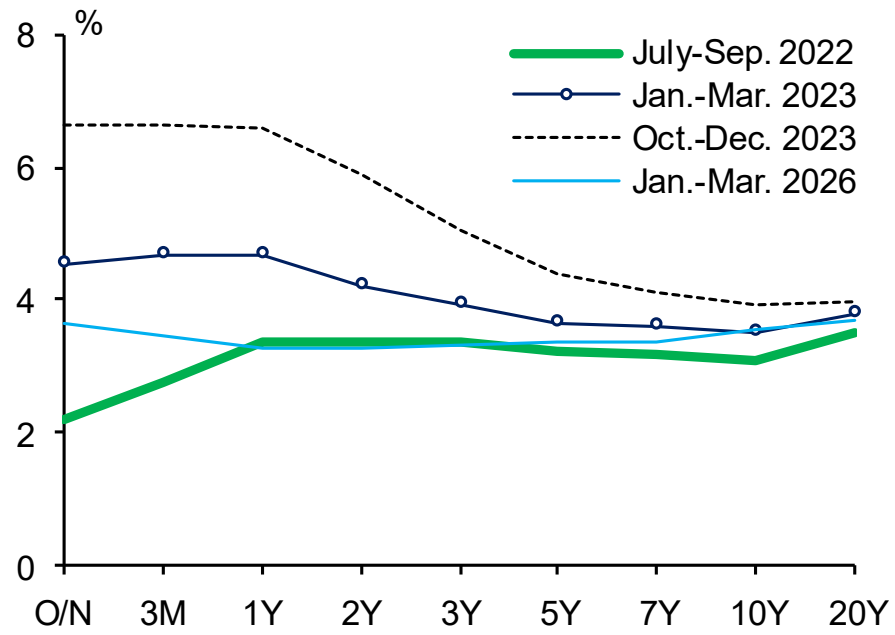


Note: 1. Interest rate risk is a 100 BPV in the banking book. Convexity and higher order terms are taken into account. The data for fiscal 2022 are estimated as of end-February 2023.  
 2. "Ratio to capital" is calculated using common equity Tier 1 (CET1) capital for internationally active banks from fiscal 2012 onward, core capital for domestic banks from fiscal 2013 onward, and Tier 1 capital for all others (excluding the transitional arrangements).  
 3. See Chart IV-3-13.

# Macro stress testing (1) Inverted yield curve scenario

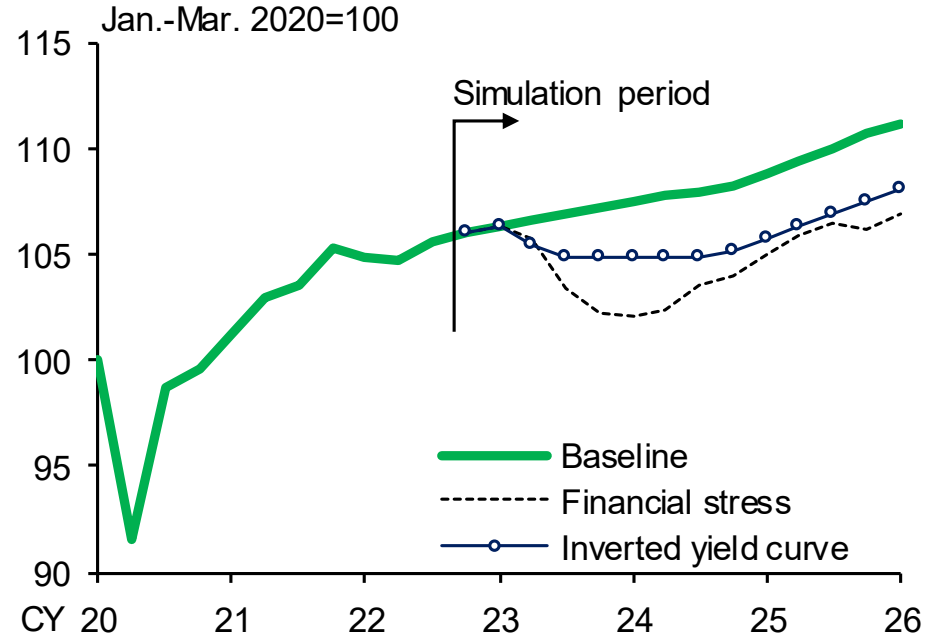
- Assume that interest rates in the U.S. and Europe remain substantially inverted to examine the effects of changes in banks' balance sheets.
  - The inverted yield curve scenario assumes that the FF rate rises to a range of 6-7% (upper end of the confidence interval in the FOMC projections), and then remains high for one year. The growth rate of the U.S. economy is assumed to turn slightly negative within fiscal 2023 (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

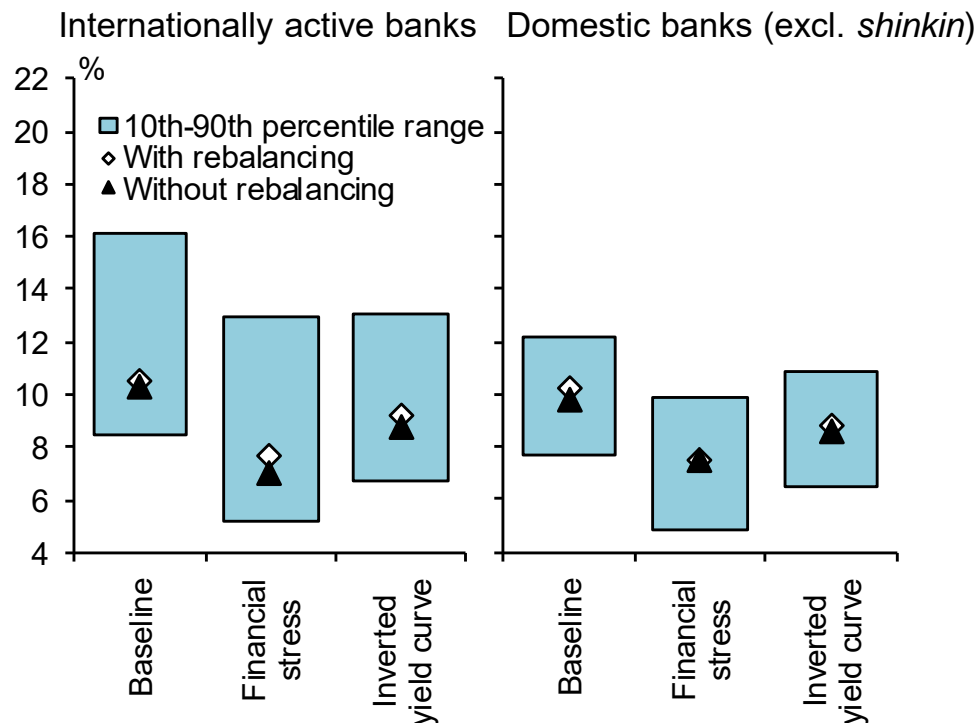


Note: See Chart V-2-4.

# Macro stress testing (2) Effects of changes in banks' balance sheets

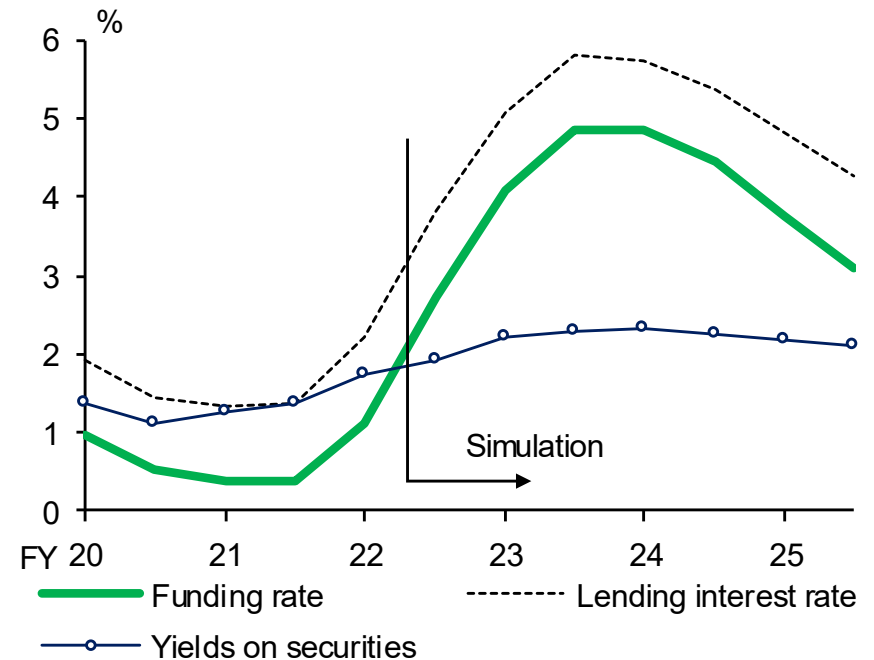
- Changes in banks' balance sheets have contributed to improvements in their resilience against rising foreign interest rates.
  - Banks' capital adequacy ratios are about 0.5% pts higher with rebalancing. The ratios are pushed up by improvements in foreign lending-deposit margins as well as interest margins and valuation gains/losses on securities.
- However, interest margins on securities are significantly negative throughout the simulation period.
  - The decline in securities-related net interest income exerts downward pressure on their loss-absorbing capacity.

## Capital adequacy ratios



Note: The white markers and bands indicate the averages and the 10th-90th percentile ranges of capital adequacy ratios as of end-fiscal 2025, respectively, based on the portfolio with rebalancing. The black markers indicate the averages of capital adequacy ratios based on the portfolio without rebalancing. See Chart V-2-7.

## Foreign currency yield and rate



Note: Covers internationally active banks and domestic banks (excl. *shinkin*). See Chart V-2-8.

# Stability assessment and caveats

- Japan's financial system has been maintaining stability on the whole.
  - Banks have sufficient capital bases and stable funding bases. Despite heightened uncertainty about the financial sector in the U.S. and Europe, Japan's financial system has been sound and resilient.

## Financial cycle

- No major financial imbalances can be observed in current financial activities.
- However, the increase in private debt partly reflects borrowers with relatively low debt repayment capacity.

## Securities investment

- The interest rate risk has been reduced along with banks' rebalancing.
- However, heterogeneity is large in terms of the interest rate risk and the underlying rebalancing behavior of banks.

## Domestic loans

- The default risk of firms with cash shortages, albeit not large on a macro basis, tends to be concentrated in banks that deal with micro firms.
- Without a turnaround at distressed firms, it will be difficult for banks to maintain the quality of loan portfolios into the future.

## Foreign loans

- Foreign credit risk has remained low even amid the global financial tightening.
- However, large borrowers of major banks tend to have high financial leverage. In particular, financial conditions of borrower firms in the APAC are relatively vulnerable.

## Capital/liquidity

- Banks are resilient to stress on the back of ample capital and liquidity.
- However, their valuation gains on securities, which can be used to offset losses in a relatively flexible manner, has declined.