

# FSA Analytical Notes

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January 2025 vol.2



# Analysis of Borrower Classifications Assigned to Shared Borrowers

## (Summary)

This paper analyzes the borrower classifications (internal ratings) of shared borrowers, to which two or more banks extend loans, using granular loan-by-loan level data collected by the Common Data Platform. The results of the analysis suggest that loans extended to the shared borrowers outside the home region of banks (prefecture-wise cross-border loans) and loans which include major bank(s) in their creditors, are more likely to be rated as "normal" even after controlling the effects of the financial conditions of the borrowers. The FSA will continue to deepen its understanding of banks' credit risk management by analyzing the data from various perspectives.

## I. Introduction

This paper focuses on the borrower classifications (internal ratings) of corporate borrowers<sup>1</sup> to which two or more banks extend loans (hereinafter defined as "shared borrowers") to better understand the credit risk management practices of banks. In general, borrower classification is determined based on a comprehensive assessment of a wide range of information, including both quantitative and qualitative information such as the borrower's financial condition, business continuity and profitability prospects, and the support provided by financial institutions. Thus, it is not uncommon for shared borrowers to be given different borrower classifications by different banks. Understanding the situation where such differences may likely to be seen would be useful to promote dialogues with financial institutions about the credit risk management practices.

In the following sections, the loan-by-loan level data collected through the Common Data Platform are used to examine the borrower classifications applied to shared borrowers. Specifically, whether a loan is a cross-border one (i.e., loans extended outside the home region/prefecture of banks) and whether major bank(s) is/are included in the creditors affect borrower classifications are examined.<sup>2</sup>

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<sup>1</sup> Local governments are excluded.

<sup>2</sup> "Major banks" in this report refers to Mizuho Bank (the data of Mizuho Trust & Banking are included), MUFG Bank, SMBC, Sumitomo Mitsui Trust Bank, Resona Bank, Aozora Bank, and SBI Shinsei Bank. "Regional banks I" refers to Saitama Resona Bank and members of the Association of Regional Banks. "Regional banks II" refers to members of the Second Association of Regional Banks. "Regional banks" refers to both Regional banks I and Regional Banks II.

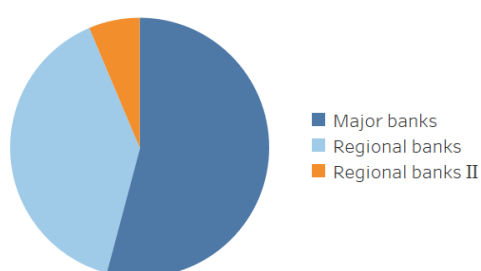
## II. Profile of Shared Borrowers

Among the corporate borrowers other than local governments that can be identified through the Common Data Platform, shared borrowers take up approximately 50% in terms of the number of borrowers and 80% in terms of outstanding loan amount. These indicate that a considerable number of corporate borrowers have multiple banking relationships. This section examines the data on shared borrowers to ascertain under which circumstances their borrower classification varies.

### I. Profile and Trend Score Calculation

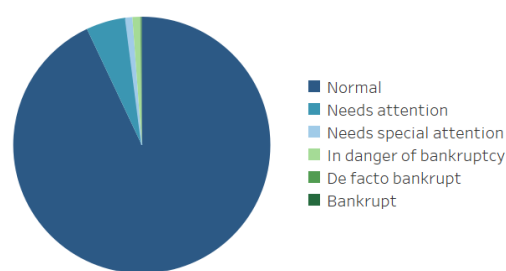
Figures 1 and 2 show that more than 50% of loans to shared borrowers are extended by major banks, and more than 90% of the outstanding loans are rated "normal"<sup>3</sup>.

Figure 1: Proportion by bank type  
(Outstanding amount basis)



| bank type         | n       | Loan (1 T yen) | Rate  |
|-------------------|---------|----------------|-------|
| Major banks       | 89,194  | 169.3          | 54.2% |
| Regional banks    | 346,255 | 123.4          | 39.5% |
| Regional banks II | 111,729 | 19.8           | 6.4%  |

Figure 2: Proportion by borrower classification  
(Outstanding amount basis)



| borrower classification | n       | Loan (1 T yen) | Rate  |
|-------------------------|---------|----------------|-------|
| Normal                  | 408,778 | 290.7          | 93.0% |
| Needs attention         | 102,039 | 15.6           | 5.0%  |
| Needs special attention | 7,755   | 2.7            | 0.9%  |
| In danger of bankruptcy | 24,057  | 3.1            | 1.0%  |
| De facto bankrupt       | 3,087   | 0.4            | 0.1%  |
| Bankrupt                | 1,462   | 0.2            | 0.1%  |

Figures 3 and 4 show whether there are variations in borrower classifications assigned to shared borrowers. "Same across banks" indicates that all creditor banks assign the same borrower classification, while "Different across banks" indicates that at least one creditor bank assigns different borrower classification compared to the other creditors. Figure 3 indicates that 15.2% (on an outstanding amount basis) of shared borrowers have "same across banks" borrower classifications. Major banks have the largest proportion of "same across banks" classifications, probably because major banks are more likely to extend loans to large, creditworthy corporate borrowers whose

<sup>3</sup> The classification categories are "Normal", "Need attention", "Special attention", "In danger of default", "Substantial default", and "Default".

borrower classifications are less subject to judgment. Figure 4 shows the proportion by industry, from which it is observed that the proportion of “same across banks” is slightly higher in the construction, retail, and service industries.

Figure 3: Classification variation by bank type

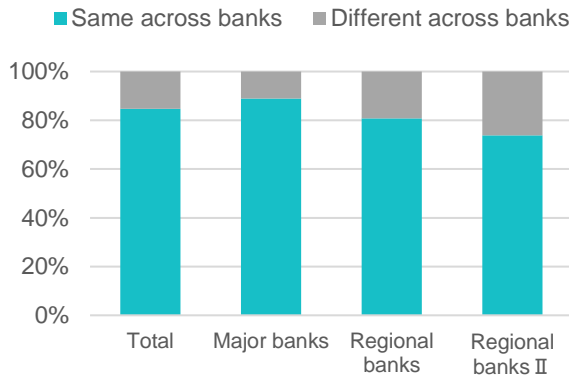
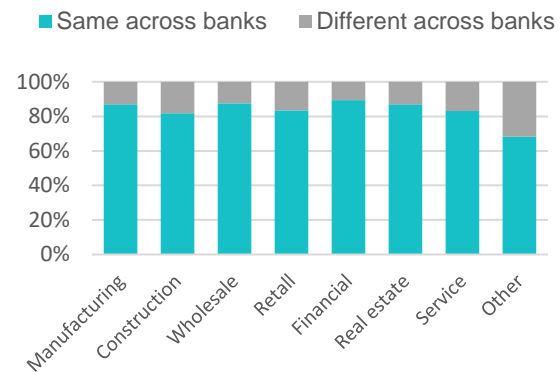


Figure 4: Classification variation by industry



To grasp whether there are differences in the assignment of borrower classification among banks, this paper attempted a scoring for each bank (the calculation methods are shown in Figure 5). First, the following points/rankings are assigned to each borrower classification: "Normal" = 1, "Need attention" = 2, "Special attention" = 3, "In danger of default" = 4, "Substantial default" = 5, and "Default" = 6. Then, the following two borrower classification trend scores are calculated for each bank:

- (i) “Mean  $\Delta$ Borrower Classification Score” which yields weighted average of difference/distance from the average (mean)<sup>4</sup> of borrower classifications assigned to multiple loan borrowers; and
- (ii) “Top  $\Delta$ Borrower Classification Score” which yields weighted average of difference/distance from the borrower classification assigned by a bank having the largest loan amount.

For both type of scores, a larger (smaller) number indicates a tendency to assign a relatively lower (higher) borrower classification among peers, taking into account their loan amount as a calculation weight. In the case of Figure 5, Bank B has the highest figure for both type of scores, indicating that Bank B assigns relatively lower borrower classification compared to the other peers. Bank C and Bank D assign the same borrower classification, however, their scores are not the same reflecting the difference between their loan amounts to Company E.

<sup>4</sup> Similar scoring using median value instead of mean value was also tested. It was confirmed that the result was similar to the one shown in this report.

Figure 5: Calculation method and example for Borrower Classification Trend Score

|        | total loan | Company E |                          | rate of total loan |
|--------|------------|-----------|--------------------------|--------------------|
|        |            | loan      | borrower classification  |                    |
| bank A | 1T yen     | 50B yen   | Needs attention          | 5% (50B/1T)        |
| bank B | 0.5T yen   | 15B yen   | Needs aspecial attention | 3% (15B/0.5T)      |
| bank C | 0.5T yen   | 15B yen   | Normal                   | 3% (15B/0.5T)      |
| bank D | 0.5T yen   | 5B yen    | Normal                   | 1% (5B/0.5T)       |

(※)T : Trillion, B : Billion

**(i) Mean ΔBorrower classification Score**

Company E's mean borrower classification points

$$\Rightarrow (2+3+1+1)/4=1.75$$

Bank A's Mean ΔBorrower Classification Score

$$(2-1.75) \times 0.05 = 0.0125$$

Bank B's Mean ΔBorrower Classification Score

$$(3-1.75) \times 0.03 = 0.0375$$

Bank C's Mean ΔBorrower Classification Score

$$(1-1.75) \times 0.03 = -0.0225$$

Bank D's Mean ΔBorrower Classification Score

$$(1-1.75) \times 0.01 = -0.0075$$

**(ii) Top ΔBorrower classification Score**

Company E's Top borrower classification points

$$\Rightarrow \text{Bank A's "Needs attention"} = 2$$

Bank A's Top ΔBorrower Classification Score

$$(2-2) \times 0.05 = 0$$

Bank B's Top ΔBorrower Classification Score

$$(3-2) \times 0.03 = 0.03$$

Bank C's Top ΔBorrower Classification Score

$$(1-2) \times 0.03 = -0.03$$

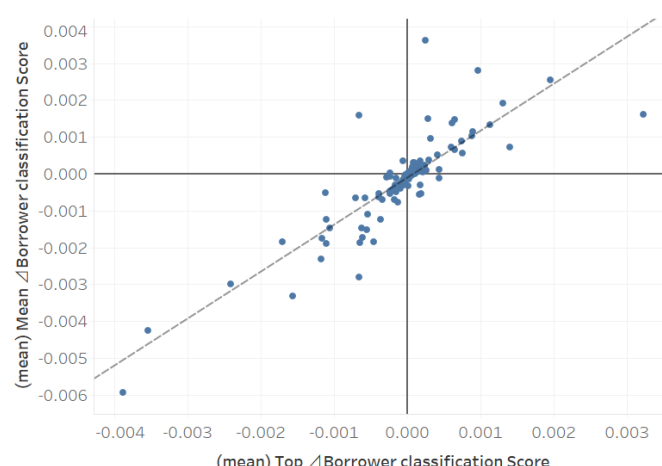
Bank D's Top ΔBorrower Classification Score

$$(1-2) \times 0.01 = -0.01$$

Figure 6 plots the two types of scores of each bank, which have been calculated by averaging the score obtained from each shared borrower. The figure suggests that there is a certain variation among banks, i.e., there exist some banks that assign lower/higher borrower classifications among peers.

Although this figure shows the tendency to assign higher/lower borrower classifications, other relevant factors and detailed information need to be closely examined to evaluation risks of each bank. For example, although the difference between "Normal" and "Need attention", and that of "Special attention" and "In danger of bankruptcy" are both calculated to be 1 (as numerical values ranging from 1 to 6 are assigned to each borrower classification), the gap of "riskiness" would be higher in the latter case. In addition, not only the average score but also the variance of scores among the relevant shared borrowers for each bank should also be evaluated to capture the trends in more detail. Furthermore, the weight, i.e., the loan amount for each borrower within the bank's portfolio, also influences the final average score.

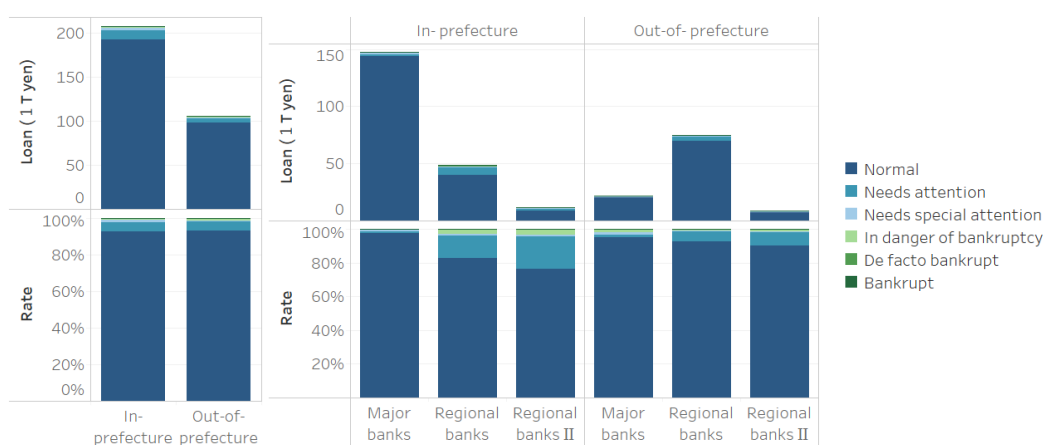
Figure 6: Borrower Classification Trend Score for each bank



## II. Borrower Classification of Prefecture-wise Cross-border Loans

Figure 7 shows the borrower classification of shared borrowers by whether they are cross-border borrowers or not. Hereinafter, a loan is defined as a “cross-border” loan if a borrower and its creditor bank locate in different prefectures (the location of a bank is determined on a branch location basis for major banks that operate across Japan and on a head office basis for regional banks that operate mainly in each prefecture). Otherwise, a loan is classified as “within-the-home” loans. The proportion of shared borrowers rated normal is higher in cross-border loans than otherwise (i.e., in within-the-home loans) in the case of regional banks.

Figure 7: Distribution of borrower classification of cross-border loans



The characteristics of cross-border loans should differ depending on the distance between borrowers and creditors. To examine this point, cross-border borrowers are classified into Tokyo, local city (or major regional block city), neighboring prefecture and others as indicated in Figure 8. Figures 9 and 10 show the outstanding loan amount and borrower classifications, respectively, for each cross-border category, suggesting that most of the regional banks' cross-border loans are extended to Tokyo located borrowers, whose borrower classifications are rated “normal” with a high probability.

Figure 8: Cross-border classification<sup>5</sup>

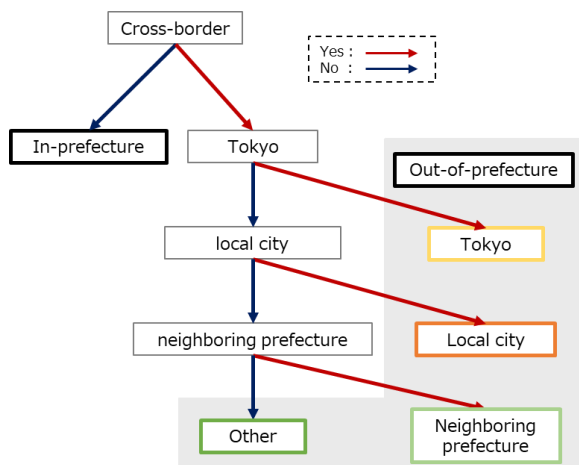
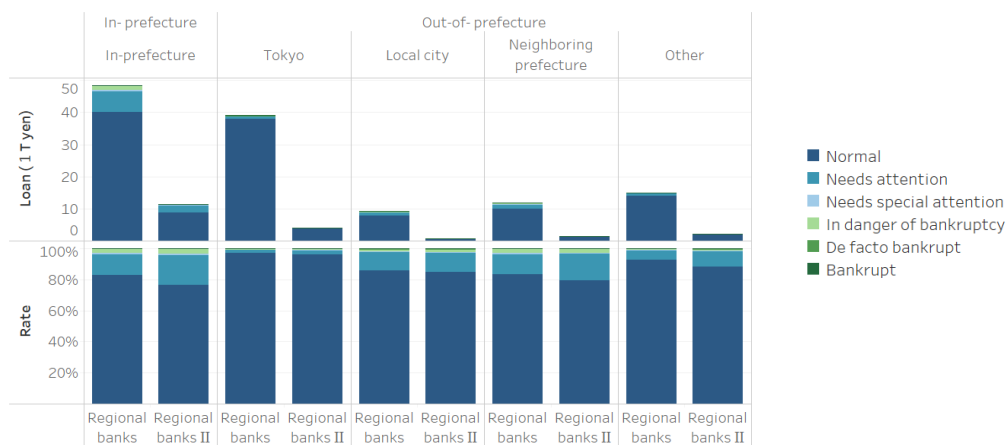


Figure 9: Outstanding loan amount for each cross-border classification



Figure 10: Distribution of borrower classification for each cross-border classification



<sup>5</sup> "Local city" indicates a prefecture where a major city of the banks' home region exists, i.e., Miyagi Prefecture for Tohoku region, Ishikawa Prefecture for Hokuriku region, Aichi Prefecture for Tokai region, Osaka Prefecture for Kinki region, Hiroshima Prefecture for Chugoku region, Kagawa Prefecture for Shikoku region, Fukuoka Prefecture for Kyushu region. "Neighboring prefecture" refers to adjoining prefectures, including those with bridges and tunnels.

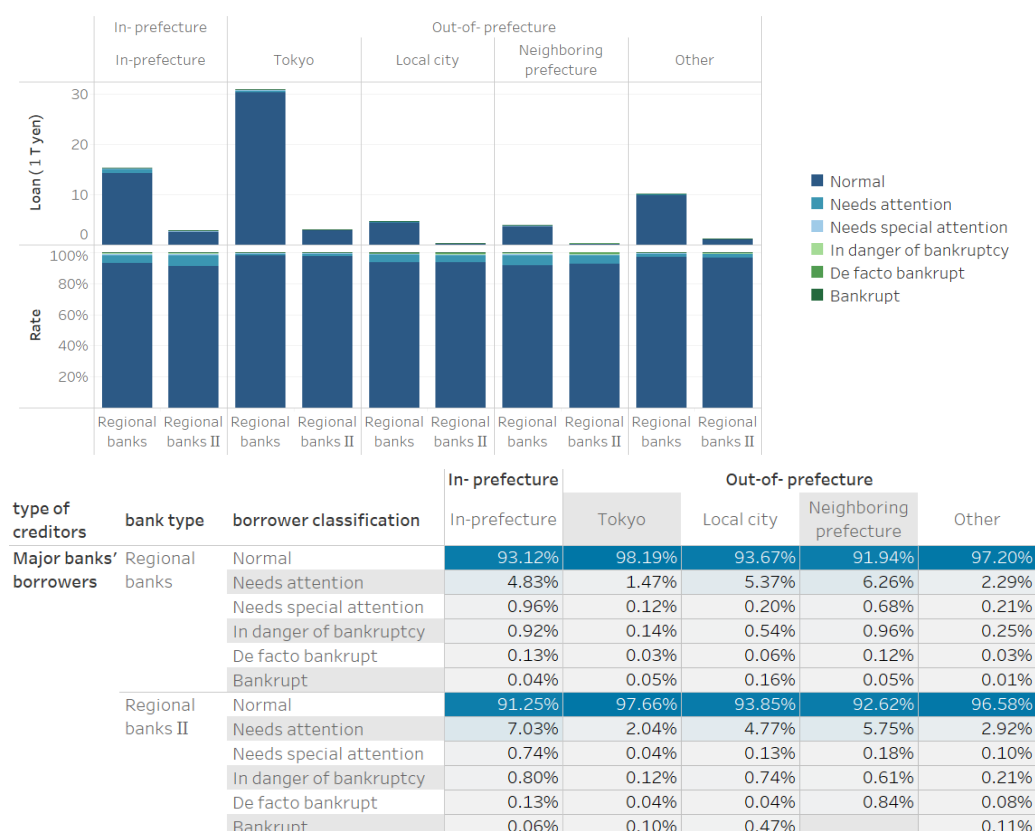


### III. Breakdown by Type of Creditors

Shared borrowers of the regional banks are categorized into two types: (i) “major banks’ borrowers”, whose creditors include major bank(s) and (ii) “regional banks dominant borrowers”, whose creditors consist of regional banks only.

Figure 11 shows the borrower classifications of major banks' borrowers, while Figure 12 shows those of regional banks dominant borrowers. Overall, borrower classifications of regional banks dominant borrowers, including those of Tokyo located borrowers, tend to be lower than those of major banks' borrowers. Financial indicators of shared borrowers presented in Figure 13 indicate that major banks' borrowers exhibit higher profitability (high ROA) and more stable debt conditions (low interest rate expense and low debt ratio). However, no characteristics are observed which suggest that the financial indicators for Tokyo located borrowers are particularly favorable.<sup>6</sup>

Figure 11: Borrower classifications of major banks' borrowers



<sup>6</sup> Financial indicators are as of September 2023. In this paper, financial information reported by Regional Banks I and Teikoku Data Bank., Ltd. are used, while assuming that all creditor banks have the access to the same financial information for a shared borrower.

Figure 12: Borrower classifications of regional banks dominant borrowers

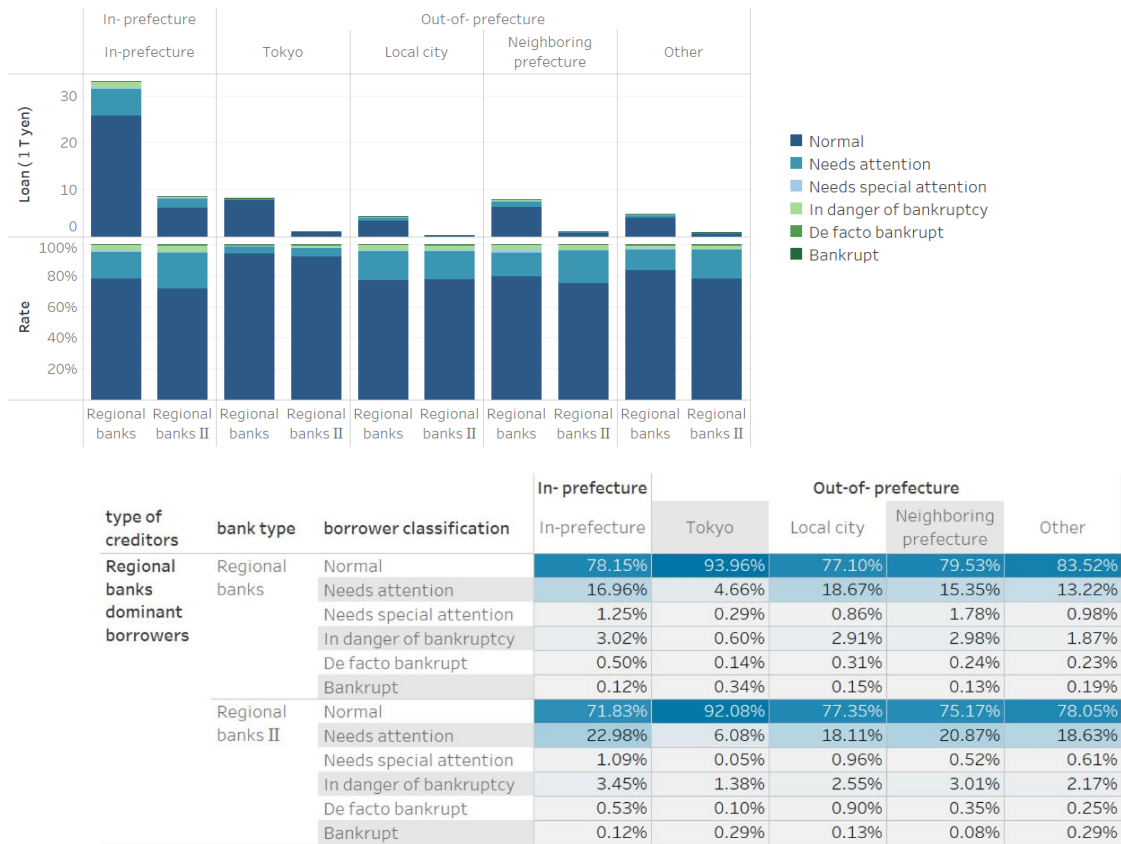
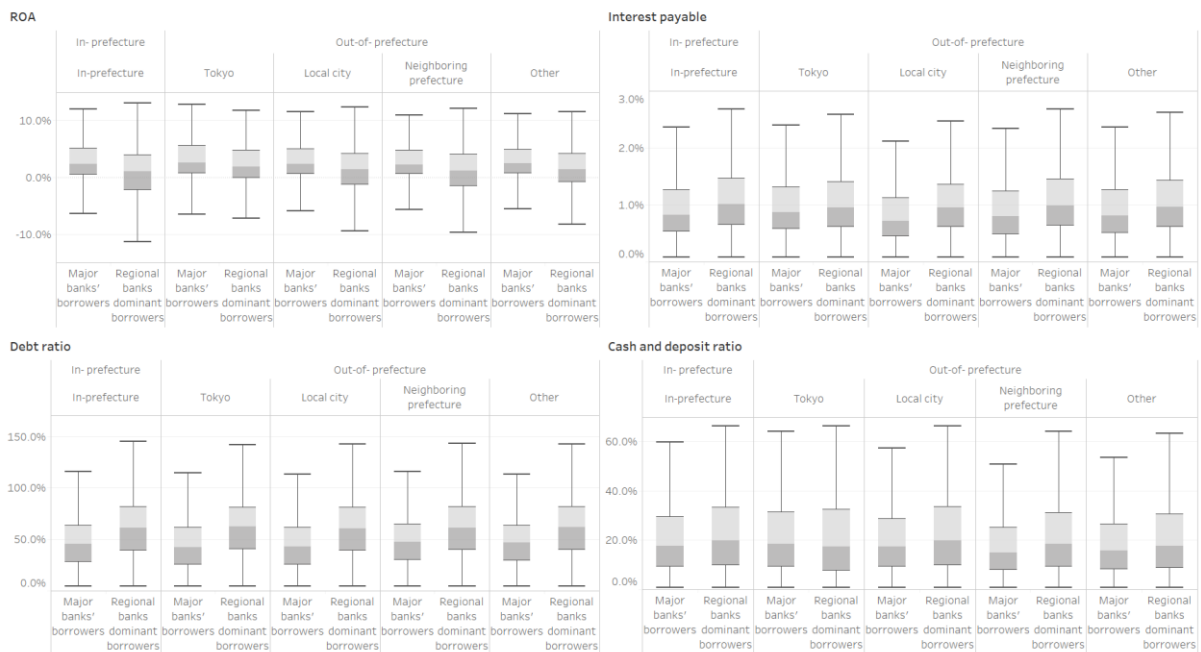


Figure 13: Financial Indicators of shared borrowers



### III. Verification by Logistic Regressions

From the figures in the previous section, the following three points are observed: (i) cross-border loans are more likely to be rated “normal” compared to within-the-home loans; (ii) major banks’ borrowers are more likely to be rated “normal” than regional banks dominant borrowers; and (iii) the financial indicators of major banks’ borrowers are better than those of regional banks dominant borrowers. On the other hand, it is difficult to discern whether phenomenon (i) and (ii) resulted from the high creditworthiness of borrowers (as is shown in (iii)) or other factors.

In this section, therefore, a statistical examination is conducted to confirm whether the probability of shared borrowers to be rated “normal” in the case of cross-border loans or major banks’ borrowers becomes higher or not, while controlling the factors that may affect borrower classification, such as borrowers’ financial information.<sup>7</sup>

First, the probability of a shared borrower, excluding a borrower who only take loans from banks located in the same prefecture, to be rated “normal” is estimated by using the following regression equation. The variables and estimation results are shown in Tables 1 and 2, respectively. In addition to the borrowers’ financial information, a financial institution dummy and an industry dummy are also included as control variables to eliminate differences in the decision-making policy for borrower classification among financial institutions and different characteristics of different industries.

$$\log \frac{p_i}{1 - p_i} = \beta_0 + \beta_1 \text{With major Dummy}_i + \beta_2 \text{Cross border Dummy}_i + \beta_3 \text{With major Dummy}_i \\ * \text{Cross border Dummy}_i + \text{Control}_i + \varepsilon_i, \quad \varepsilon_i \sim N(0, \sigma^2)$$

Table 1: List of variables

| Object variable      | $\log \frac{p_i}{1 - p_i}$            | Normal destination probability                                            |
|----------------------|---------------------------------------|---------------------------------------------------------------------------|
| Explanatory variable | 1.With major Dummy                    | "1" : major banks' borrower, "0" : otherwise                              |
|                      | 2.Cross border Dummy                  | "1" : cross-border borrower, "0" : otherwise                              |
|                      | 3.With major Dummy*Cross border Dummy | interaction term of 1 and 2                                               |
| Control              | ROA                                   | operating income/total assets                                             |
|                      | Interest payable                      | interest expense/(short-term debt + long-term debt)                       |
|                      | Debt ratio                            | (short-term debt + long-term debt)/total assets                           |
|                      | Cash and deposit ratio                | cash deposits/total assets                                                |
|                      | Size                                  | company size (ordinary logarithm of capital)                              |
|                      | Industry Dummy                        | manufacturing,construction,wholesale,retail,financial,real estate,service |
|                      | Bank Dummy                            | regional banks dummy                                                      |

<sup>7</sup> The correlation coefficient between cross-border loans and major banks borrowers is 0.13.

Table 2: Estimation Results

|                                                     | Coefficient | Std.Error |     |
|-----------------------------------------------------|-------------|-----------|-----|
| <i>With major Dummy</i>                             | 0.4054      | 0.033     | *** |
| <i>Cross border Dummy</i>                           | 0.1186      | 0.014     | *** |
| <i>With major Dummy</i> * <i>Cross border Dummy</i> | -0.0426     | 0.039     |     |
| n                                                   |             | 237,793   |     |
| pseudo-R <sup>2</sup>                               |             | 0.2937    |     |

\*\*\*, \*\* and \* indicate significance at the 0.1%,1%,5% levels

As shown in Table 2, after controlling aforementioned factors, there was a positive correlation between the probability of rated “normal” and both *With major Dummy<sub>i</sub>* and *Cross border Dummy<sub>i</sub>*. On the other hand, there was no statistically significant relationship between the probability of “normal” and the cross-term *With major Dummy<sub>i</sub> \* Cross border Dummy<sub>i</sub>*, suggesting that no additional effects are observed even if a loan is applicable to both cross-border loan and major banks’ borrower.

Next, cross-border loans are subdivided as has described in Figure 8, and then the following regression formula are applied to examine the results. The variable and the estimation results are shown in Tables 3 and 4, respectively.

$$\begin{aligned}
\log \frac{p_i}{1-p_i} = & \beta_0 + \beta_1 \text{With major Dummy}_i + \beta_2 \text{Tokyo Dummy}_i + \beta_3 \text{Local city Dummy}_i \\
& + \beta_4 \text{Neighbor Dummy}_i + \beta_5 \text{Other Dummy}_i + \sum_{k=6}^{10} \beta_k \text{Cross}_i + \text{Control}_i \\
& + \varepsilon_i, \quad \varepsilon_i \sim N(0, \sigma^2)
\end{aligned}$$

Table 3: List of variables

| Object variable      | $\log \frac{p_i}{1-p_i}$ | Normal destination probability                                                  |
|----------------------|--------------------------|---------------------------------------------------------------------------------|
| Explanatory variable | 1.With major Dummy       | "1" : major banks' borrower, "0" : otherwise                                    |
|                      | 2.Tokyo Dummy            | "1" : borrower in Tokyo, "0" : otherwise                                        |
|                      | 3.Local city Dummy       | "1" : borrower in local city, "0" : otherwise                                   |
|                      | 4.Neighbor Dummy         | "1" : borrower in neighboring prefecture, "0" : otherwise                       |
|                      | 5.Other Dummy            | "1" : borrower in others, "0" : otherwise                                       |
|                      | 6~9.Cross                | interaction term of 1 and 2, 1 and 3, 1 and 4, 1 and 5                          |
| Control              | ROA                      | operating income/total assets                                                   |
|                      | Interest payable         | interest expense/(short-term debt + long-term debt)                             |
|                      | Debt ratio               | (short-term debt + long-term debt)/total assets                                 |
|                      | Cash and deposit ratio   | cash deposits/total assets                                                      |
|                      | Size                     | company size (ordinary logarithm of capital)                                    |
|                      | Industry Dummy           | manufacturing, construction, wholesale, retail, financial, real estate, service |
|                      | Bank Dummy               | regional banks dummy                                                            |

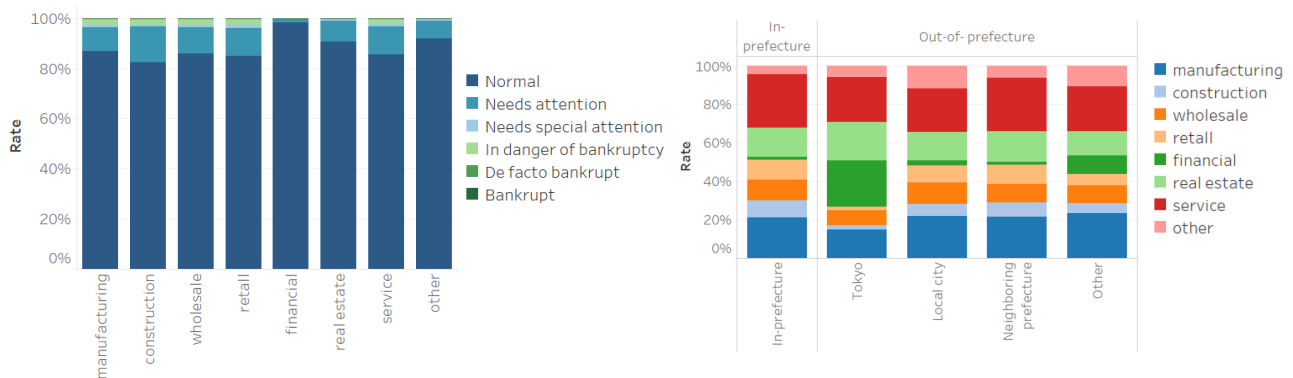
Table 4: Estimation results

|                                          | Coefficient | Std.Error |     |
|------------------------------------------|-------------|-----------|-----|
| <i>With major Dummy</i>                  | 0.4014      | 0.033     | *** |
| <i>Tokyo Dummy</i>                       | -0.0362     | 0.031     |     |
| <i>Local city Dummy</i>                  | 0.0876      | 0.025     | *** |
| <i>Neighbor Dummy</i>                    | 0.1223      | 0.017     | *** |
| <i>Other Dummy</i>                       | 0.2174      | 0.023     | *** |
| <i>With major Dummy*Tokyo Dummy</i>      | 0.0894      | 0.054     |     |
| <i>With major Dummy*Local city Dummy</i> | -0.1721     | 0.059     | **  |
| <i>With major Dummy*Neighbor Dummy</i>   | -0.2206     | 0.057     | *** |
| <i>With major Dummy*Other Dummy</i>      | 0.1224      | 0.053     | *   |
| n                                        | 237,793     |           |     |
| pseudo-R <sup>2</sup>                    | 0.2942      |           |     |

\*\*\*, \*\* and \* indicate significance at the 0.1%, 1%, 5% levels

As shown in Table 4, a positive correlation with the probability of being “normal” was confirmed for every (non-cross-term) category other than *Tokyo Dummy<sub>i</sub>*. In general, banks have access to rich information in case of borrowers within the home region, i.e., creditworthiness can be assessed based on various information in addition to basic financial information, which may be one reason of lower possibility of rated “normal” for non-cross-border loans. The reason for *Tokyo Dummy<sub>i</sub>* showing no statistic significance may be that loans to Tokyo located borrowers are mostly finance and real estate industries (Figure 14), thus predominately explained by industry dummy variables.<sup>8</sup>

Figure 14: Distribution of regional banks' borrower classifications by industry (left panel) and industry distribution by location of borrowers (right panel)



<sup>8</sup> When no controls for industry types are made, a positive correlation between loans to Tokyo and the probability of “normal” are observed.

On the other hand, among the cross-terms, *With major Dummy<sub>i</sub> \* Local city Dummy<sub>i</sub>* and *With major Dummy<sub>i</sub> \* Neighbor Dummy<sub>i</sub>* have shown negative significance. The reason for this could be that this paper defines a cross-border loan on a prefecture basis, while some regional banks have their business base beyond the prefecture where their head offices are located.

For *With major Dummy<sub>i</sub> \* Other Dummy<sub>i</sub>* term, positive correlation is observed. It suggests that in the case of loans to borrowers who locate far away from the home prefecture of banks, the access to the information on borrowers could be limited to some extent and thus the fact that major bank(s) is/are also the creditor(s) may have become a key element when judging their borrower classifications.

In interpreting the estimation formula in this section, various caveats should be taken into consideration. First, the estimation formula developed in this paper does not consider qualitative information such as the prospects for business continuity and profitability based on the type of industry, as well as the status of support from financial institutions. Second, each bank has its own business base in a different area which cannot be easily classified by prefecture basis.

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## V. Conclusion

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This paper analyzes the borrower classifications (internal ratings) of shared borrowers using loan-by-loan level data collected by the Common Data Platform. The results of the analysis suggest that prefecture-wise cross-border loans and loans to major banks' borrowers are more likely to be rated as "normal" even if the effects of the financial conditions of the borrowers are excluded.

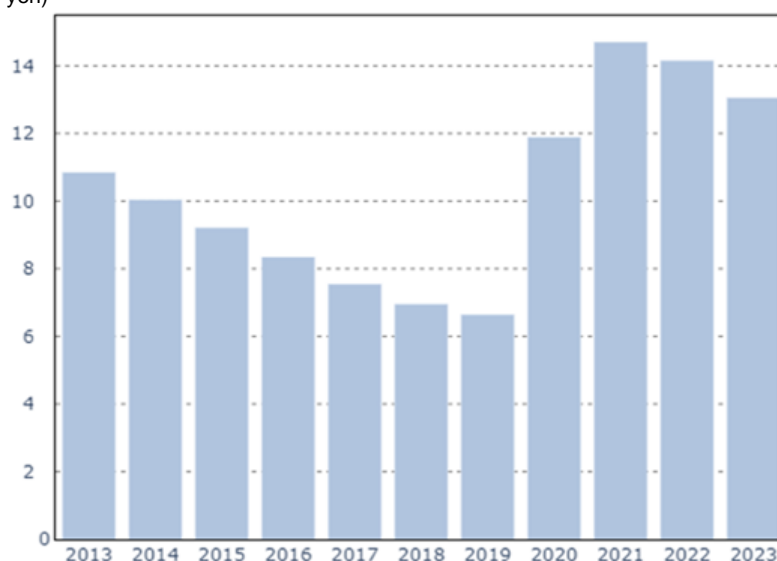
Although the results of this analysis contribute to a deeper understanding of the credit risk management practices of banking industry as a whole, it is also necessary to take various factors into account in understanding the lending discipline of each bank. For example, the use of Credit Guarantee System, which has not been covered in this analysis due to data limitation, could be considered for shared borrowers and also all other borrowers to have a comprehensive picture of lending practices (see the BOX below). The FSA will continue to deepen its understanding of the credit risk management practice by further enhancing its data analysis capabilities.

## BOX: Utilization of Credit Guarantee System

The Credit Guarantee System, where Credit Guarantee Corporations provide guarantees to small and medium-sized enterprises (SMEs) when they take out loans from financial institutions, is one of key elements that influence the riskiness of loans and the credit decision of financial institutions. Since the Common Data Platform is at the gradual operation phase, detailed analysis around the status of guarantees is limited at present, however, it is desirable to take this factor into account in the future. In this box, basic profiles of credit guaranteed loans are presented.<sup>910</sup>

Figure 15 shows the historical trend in guaranteed loans of regional banks. The ratio of guaranteed loans rose sharply during the COVID-19 crisis but declined gradually in other periods.<sup>11</sup>

Figure 15: Trend in outstanding guaranteed loans of regional banks over time  
(trillion yen)



Guaranteed ratio varies from around 0% to 40% depending on industry. "Food and Beverage" and "Construction" industries, which consist of small companies in general, have relatively high guaranteed ratios, while "Real Estate," "Finance," "Electricity & Gas," and "Goods & Leasing"

<sup>9</sup> In the verification using logistic regression in this paper, control variables for whether a loan is guaranteed is not introduced due to data limitations. However, as shown in this box, the status of guarantees differs depending on the industry and region, so it is likely that the status of guarantees is controlled to a certain extent by the industry dummies and financial institution dummies.

<sup>10</sup> Figures 16-19 uses the granular loan data from the Common Data Platform but limited to Regional Bank I due to data limitation.

<sup>11</sup> Quoted from SME Agency, "Guarantees by financial institutions" (<https://www.chusho.meti.go.jp/kinyu/shikinguri/hosho/jisseki.html>) From the data definition, it should be noted that the data before fiscal 2019 is the balance as of the end of March, while the data after fiscal 2020 is the average of the balance at the end of each month.

have low guaranteed ratios (Figure 16)<sup>12</sup>.

Enterprises with smaller sales make greater use of guaranteed loans (Figure 17), which is consistent with the purpose of the Credit Guarantee System to facilitate financing for SMEs, and that the guaranteed ratio has been on a declining trend from September 2023 to December 2024 (Figure 17).

The guaranteed ratio by bank size shows that the ratio is lower at regional banks with large total loans outstanding, which may reflect that fact that the proportion of large borrowers increases as bank size increases (Figure 18).

The guaranteed ratio by region of borrower location indicates that the guaranteed ratio declines for cross-border loans compared to within-the-home loans in all regions, but the extent of the decline varies by region (Figure 19).

As described above, the use of credit guarantee varies depending on the attributes of creditors and borrowers. Further analysis around credit guaranteed loans while improving the accuracy of loan data would enrich the analysis presented in this paper.

Figure 16: Guaranteed ratio by type of industry

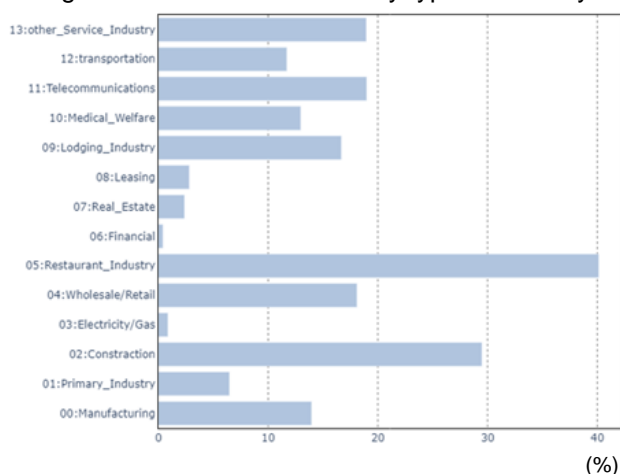
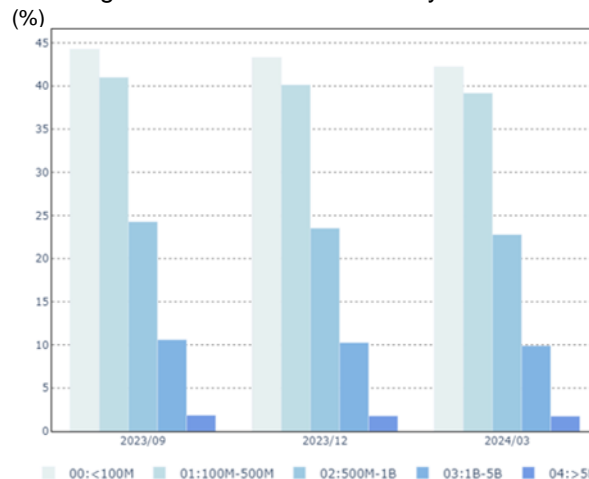


Figure 17: Guaranteed ratio by firm size



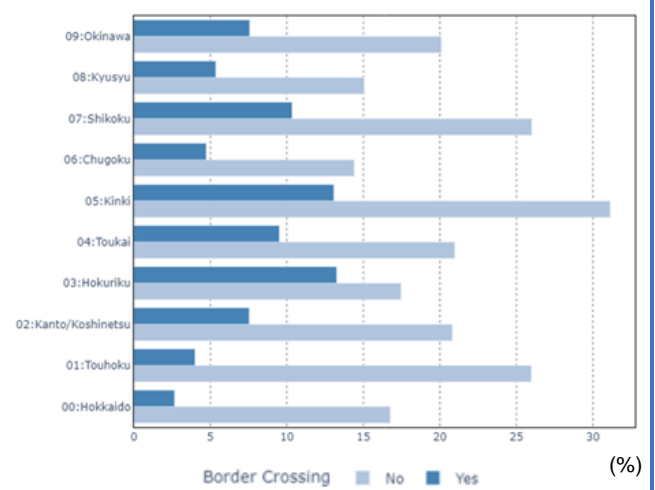
<sup>12</sup> It should be noted that "Agriculture & Forest business (excluding raw material production and raw material production services)," "Fishery business," and "Finance & Insurance business (excluding some finance & insurance businesses)" are excluded from the scope of the Credit Guarantee Program. In Figures 17-19, only industries subject to the credit guarantee program (manufacturing / construction / wholesale & retail / food & beverage / accommodation / medical & welfare / information & communications / transportation / other services) are included in the aggregation.



(%) Figure 18: Guaranteed ratio by bank size



Figure 19: Guaranteed ratio by borrower location



# Attributes of Housing Loans by Regional Banks

## (Summary)

This paper compiles a detail picture of the housing loans extended by regional banks, using granular loan data collected by the Common Data Platform. It is confirmed that there are regional differences in interest rate types and levels. In addition, it is observed that transaction volumes and lending periods per loan are growing, which may lead to higher risks. The FSA will continue to enhance its capability to utilize granular data to better understand the actual pictures of housing loans and their trends.

## I. Introduction

The environment surrounding Japanese housing loan market has been changing recently. The prolonged low-interest rate environment has shifted more borrowers to prefer floating interest rates, drawing more attention to the impact of recent interest rate hike. It is important to get update of the actual pictures of housing loan attributes in a more detailed manner.

Figure 1: Outstanding domestic housing loans

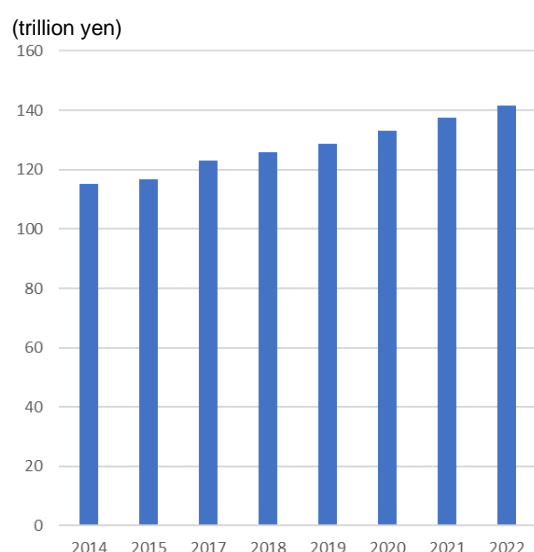
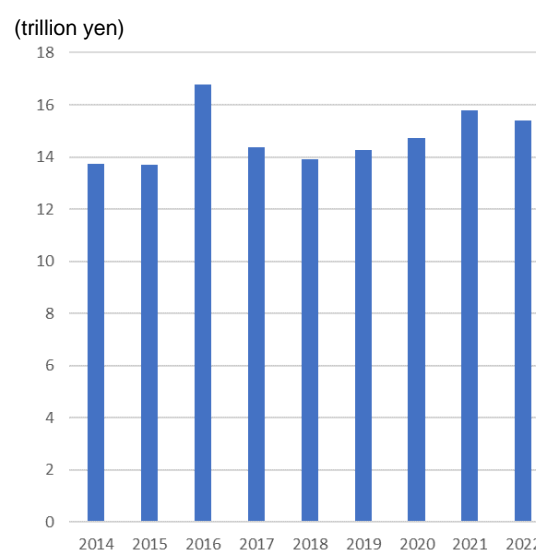


Figure 2: Transaction volume of new housing loans



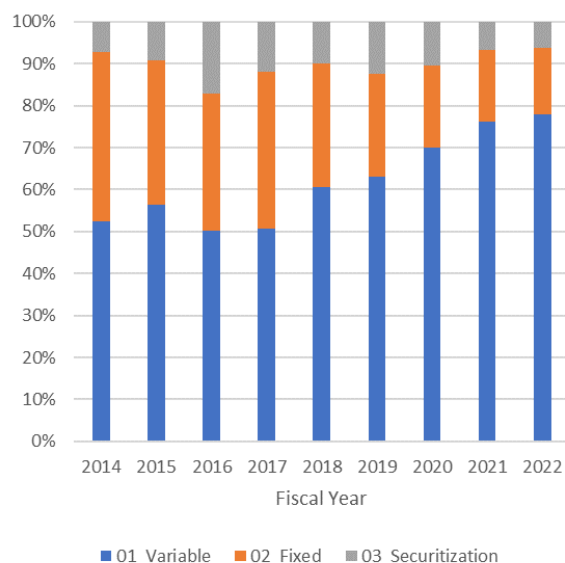
Source: Bank of Japan

Figure 3: Market interest rates



Source: Bank of Japan, Ministry of Finance

Figure 4: Distribution of interest rate type<sup>1</sup> (newly originated housing loans)



Source: MLIT

This paper uses the data on regional banks' housing loans obtained from the Common Data Platform<sup>2</sup>, a novel data collection and management framework jointly operated by the FSA and the Bank of Japan. Housing loans, which account for the largest proportion of retail loans, are aggregated by, for example, region, interest rate types and levels, and usage of guarantees. By focusing on the time when loans are originated, a time-series picture of transaction volume and lending period per each loan are also examined.

<sup>1</sup> Interest rate type which contains fixed rate for certain period during the contract is treated as fixed interest rate.

<sup>2</sup> The data used in this analysis is the outstanding loan data as of September 2023 submitted by a total of 99 banks, consisting of 62 member banks of the Regional Banks Association of Japan and 37 member banks of the Second Association of Regional Banks. In addition to loans that are explicitly defined as housing loans in the dataset, loans that can be presumed to be housing loans based on their conditions such as transaction volume, interest rate level, and lending period are estimated as housing loans. These estimates were confirmed to be within a range of the existing dataset. Although a few banks are excluded due to their data accuracy for some data items, their impact on the overall trends of the regional banks is expected to be limited.

## II. Housing loan characteristics as of September 2023

This section focuses on the housing loan characteristics by region<sup>3</sup> as of September 2023.

Figures 5 and 6 show the outstanding transaction volume and number of regional banks' housing loans, respectively. The total transaction volume for all regions was 76.3 trillion yen<sup>4</sup>, while the number of housing loans was 4.36 million. Both the transaction volume and the number of housing loans show similar regional trends, with the Kanto region having the highest proportion of approximately 25%, followed by the Kinki and Chubu regions with approximately 15% each.

Figure 5: Total housing loan volume by region

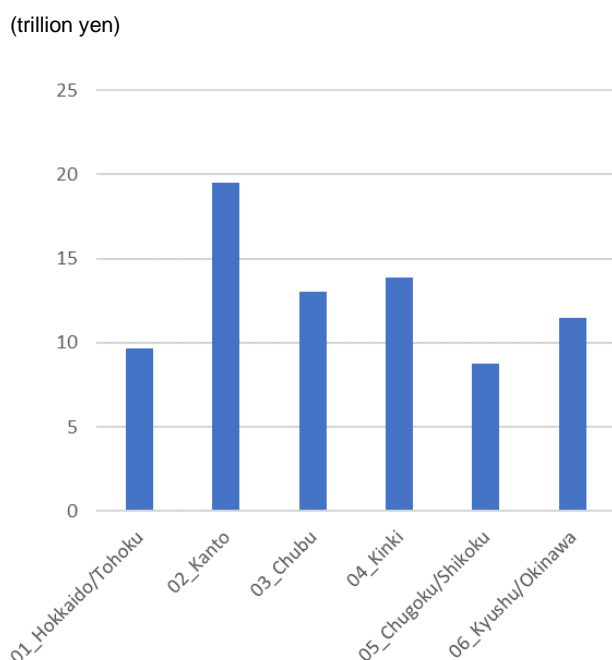


Figure 6: Total number of housing loans by region

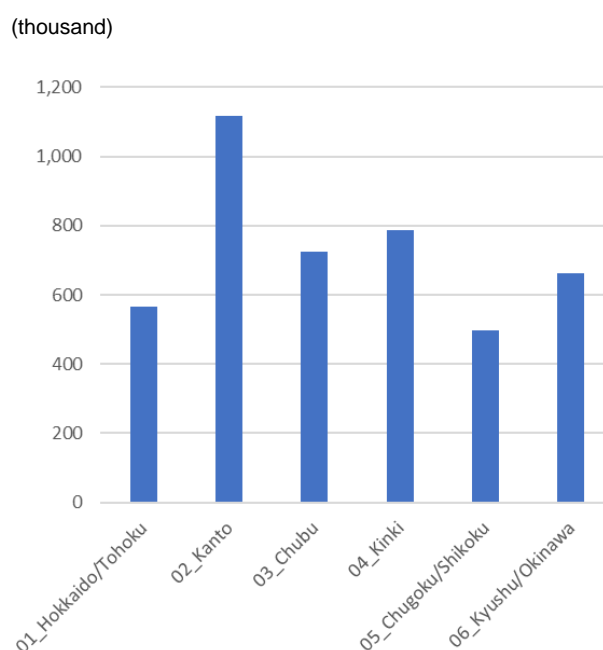


Figure 7 shows the regional distribution by interest type, i.e., fixed rate or variable rate. The regions with relatively high ratios of fixed interest rates are Hokkaido/Tohoku and Chugoku/Shikoku, while the regions with relatively high ratios of variable rates are Kinki and Kyushu/Okinawa. It should be noted

<sup>3</sup> The geographic segments are as follows:

Hokkaido/Tohoku: Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima

Kanto: Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa

Chubu: Niigata, Yamanashi, Toyama, Ishikawa, Fukui, Nagano, Gifu, Shizuoka, Aichi

Kinki: Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama

Chugoku/Shikoku: Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Kochi

Kyushu/Okinawa: Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima, Okinawa

<sup>4</sup> The outstanding amount of housing loans extended by all domestic banks is about 144 trillion yen, meaning that the amount of housing loans extended by regional banks accounts for about 53% of the domestic total.

that some regions have a certain proportion of “missing (lack of data)” due to the data limitation<sup>5</sup> as of September 2023. Continuous improvement in data collection is required.

Figure 8 shows the regional distribution of interest rate levels. Overall, sizable proportion of housing loans have the interest rates between 0.5% and 1.0%. Hokkaido/Tohoku and Chugoku/Shikoku regions have relatively large percentage of high interest rates (1.0% and above), similar to the trend observed in Figure 7. In particular, the proportion of interest rates between 1.0% and 1.5% is highest in Hokkaido/Tohoku, while the proportion of low interest rates (below 0.5%) is highest in Chubu and Kinki regions.

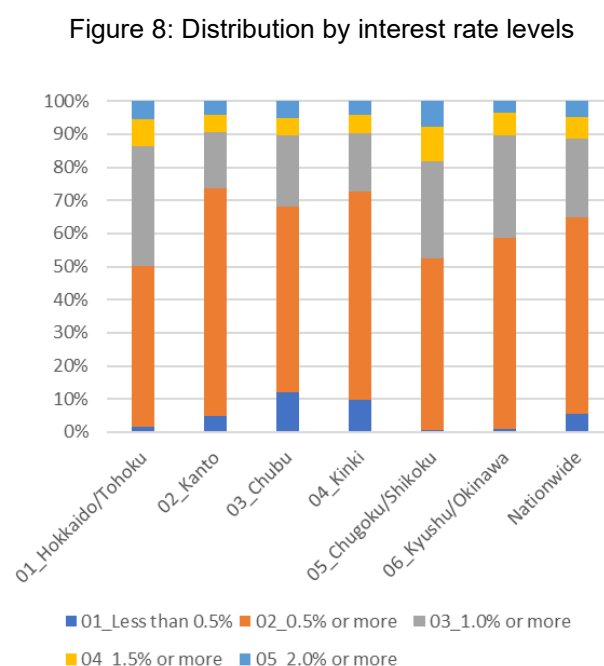
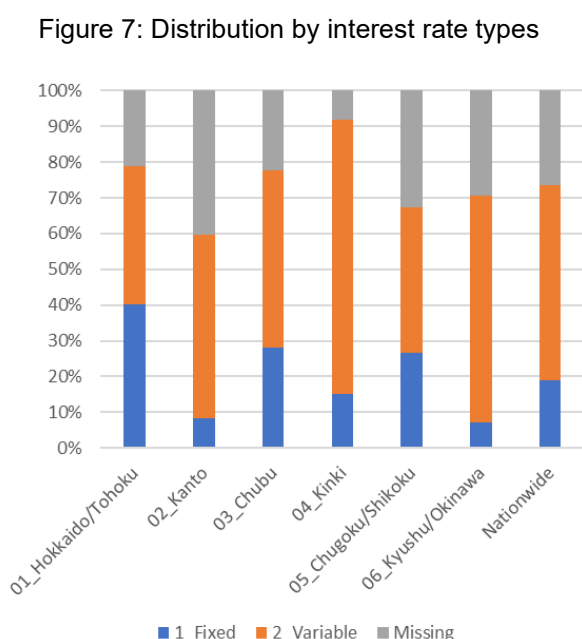
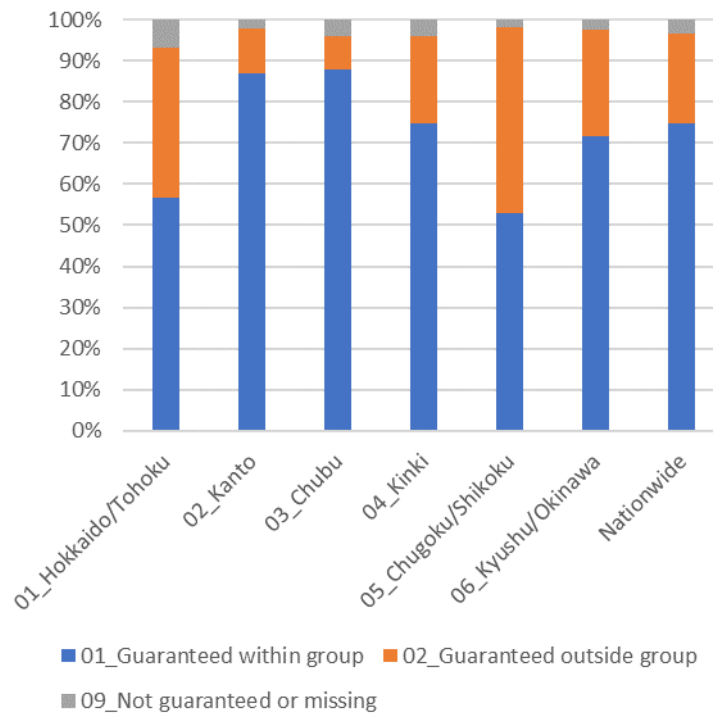


Figure 9 shows the distribution sorted by guarantee-types. As a whole, most of the loans are guaranteed, and the ratio of loans with no guarantee is around 5%. Guarantee companies are broadly classified into companies within the banking group or outside, i.e., independent companies. On the transaction volume basis, approximately 70% of loans are guaranteed within the group and approximately 20% are guaranteed by independent companies, while regional differences are observed.

<sup>5</sup> The Common Data Platform is scheduled to commence its full operation from March 2025, and it is in the stage of gradually expanding data, with some items being optional at present. The lack of data is confirmed for some items in this analysis, but this seems to have limited impact on the overall picture of housing loans at regional banks.

Figure 9: Distribution by guarantee-types (transaction volume basis)

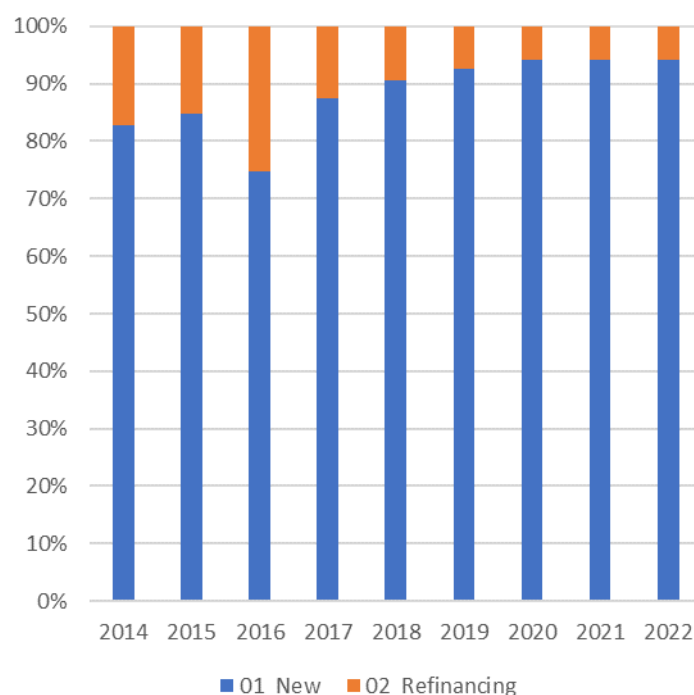


### III. Trend of New Origination

In this section, newly originated housing loans (hereinafter “new loans”) are examined by year of origination and region. It should be noted that the data available from the Common Data Platform is only the list of existing loans as of September 2023 or later, thus the claims which have been fully repaid or substituted by another payment before September 2023 have disappeared from the available dataset<sup>6</sup>. However, since housing loans in general have long lending periods and refinancing has been low in recent years (Figure 10), it is expected that a general trend of new origination can be grasped even from the aggregation of claims remaining in the dataset as of September 2023.

<sup>6</sup> For example, a housing loan which was originated in April 2016 but fully repaid in January 2023 does not appear in the dataset.

Figure 10: Proportion of loans executed for refinancing purpose



Source: MLIT

Figure 11 shows the distribution of new loans in terms of the transaction volume per case. While the proportion of new loans ranging from 10 million to less than 30 million yen decreased, that ranging from 40 million to less than 100 million yen increased. The ratio of new loans of 100 million yen and more also increased, albeit still at a low level, suggesting that changes in the macro environment, such as sharp rises in real estate prices, labor costs, and material costs, may have had an impact on such volume increase.

Figure 12 shows the trend of the average transaction volume per case of new loans by region. It indicates that the average volume has been increasing in all regions, particularly in Chubu and Chugoku/Shikoku regions. This is partly due to some financial institutions' increasing "cross-border (in terms of prefectures)"<sup>7</sup> loans to urban areas where real estate prices are relatively high.

<sup>7</sup> Cross-border loans are defined as loans extended to outside the prefecture where the head office of the financial institution is located.

Figure 11: Volume distribution of new loans

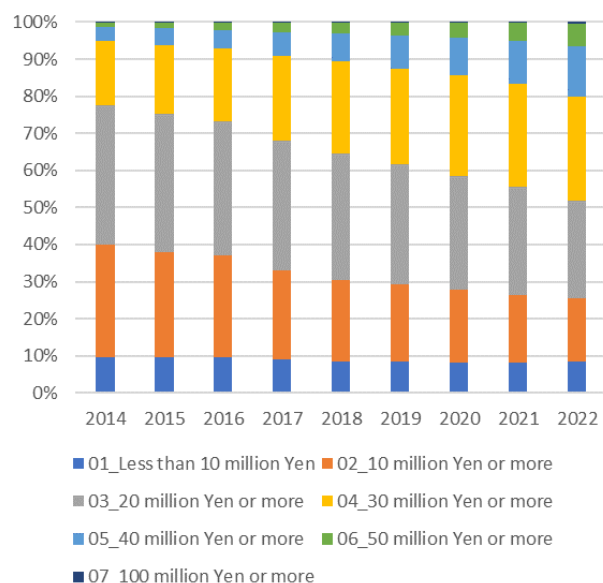


Figure 12<sup>8</sup>: Average volume trend by region

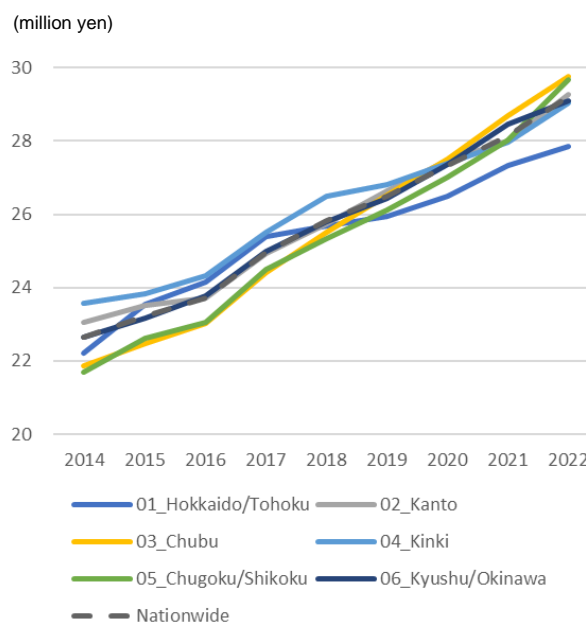


Figure 13 shows the distribution of lending period for new loans in each year. The ratio for loans with a lending period of 30 years or less is decreasing, while that of more than 30 years is increasing, particularly that of more than 35 years but less than 40 years is remarkable. The proportion of new loans with a lending period of more than 40 years is also increasing, albeit still at a low level.

Figure 14 shows the trend of the average lending period for new loans by region, which shows that the average lending period has become longer in all regions, especially in Kyushu/Okinawa.

Figure 13: Lending period distribution of new loans

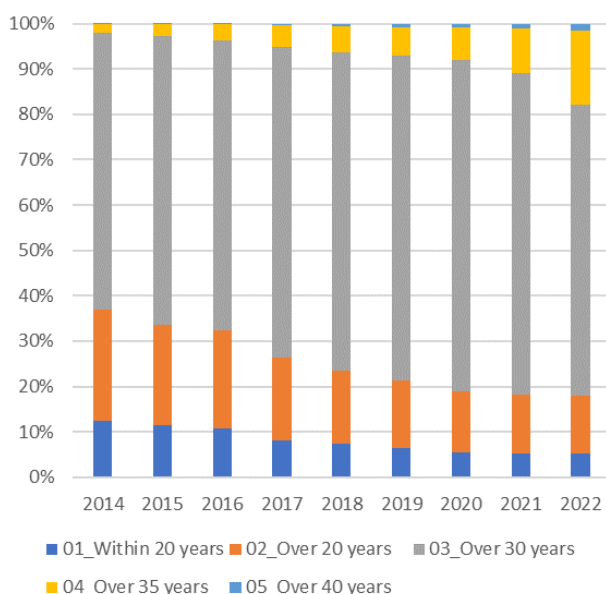
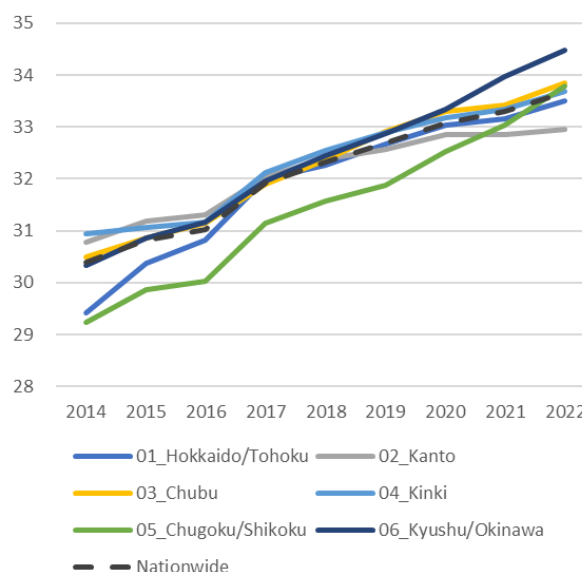


Figure 14: Average lending period trend by region



<sup>8</sup> Due to data limitation at present, the data of the member of the Second Association of Regional Banks is excluded.



Figures 15 and 16 show the transaction volume per case and lending period, respectively, for new loans extended between April and September 2023. The regional distribution of transaction volume shows a similar trend nationwide, with the highest ratio being in the range of 20-30 million yen, followed by 10-20 million and 30-40 million.

Looking at the distribution of lending period by region shown in Figure 16, the proportion of loans with a lending period of more than 30 years but within 35 years is high in Kanto and Kinki. On the other hand, in Hokkaido/Tohoku, Chugoku/Shikoku, and Kyushu/Okinawa, the proportion of loans with a lending period of more than 35 years is high, particularly that of more than 40 years is approaching 10% in Chugoku/Shikoku, and Kyushu/Okinawa.

Figure 15<sup>9</sup>: Distribution of new loans' transaction

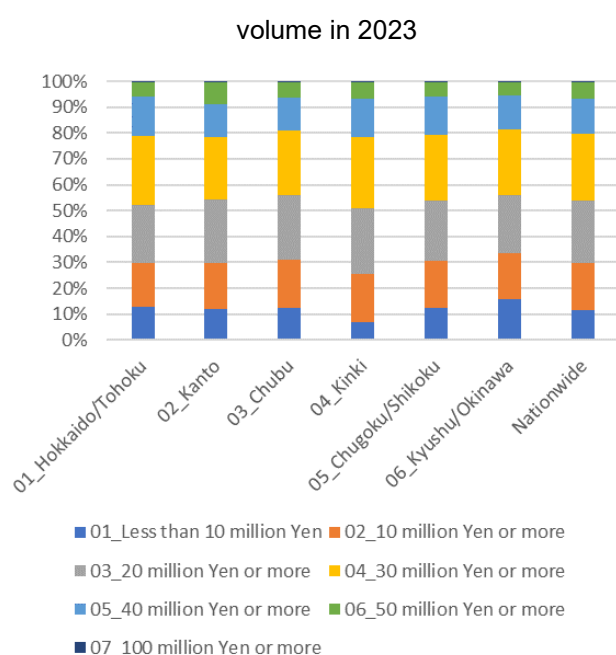
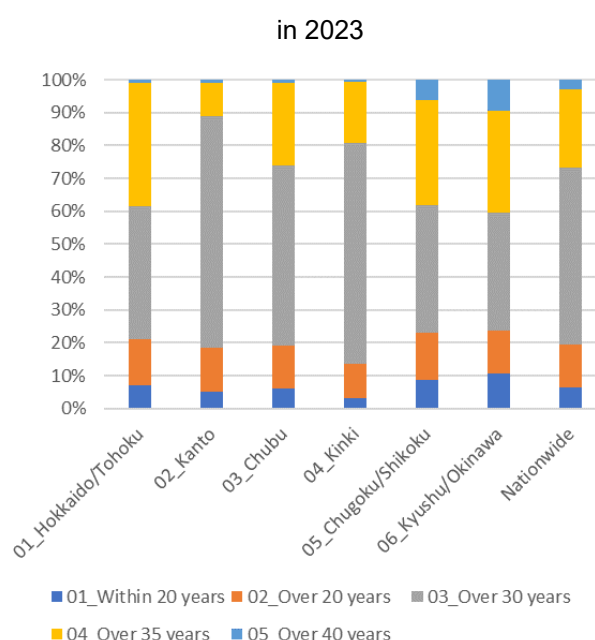


Figure 16: Distribution of new loans' lending period

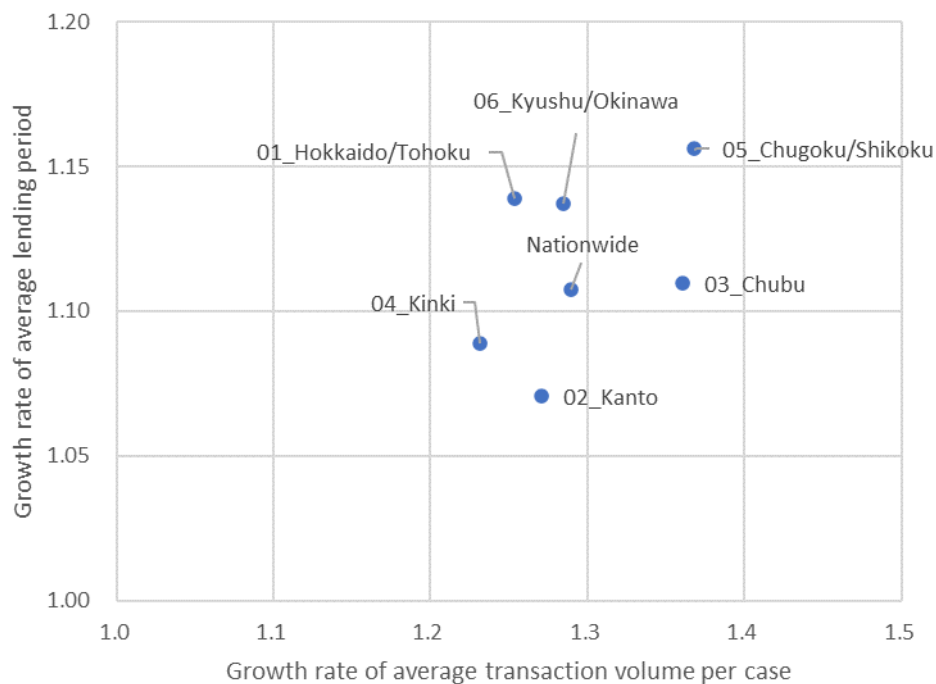


In general, the larger transaction volume and the longer lending period contribute to an increase in housing loan risk, although the borrowers' creditworthiness may vary depending on other factors such as annual income of borrowers. Figure 17 shows plots of the growth rate of the average transaction volume and that of the average lending period in 2022 against 2014 for each region. In contrast to the relatively low transaction volume growth in Hokkaido/Tohoku and Kyushu/Okinawa, the lending period has shown relatively high growth, which may be attributed to the appeal of housing loans to younger generation. In Chugoku/Shikoku, both the transaction volume and the lending period increased

<sup>9</sup> Due to data limitation at present, the data of the member of the Second Association of Regional Banks is excluded.

significantly, and in Chubu, the growth rate of the transaction volume was relatively high. While Kanto and Kinki show the relatively low transaction volume and the lending period growth, the overall trend of housing loans in these regions are expected to be different as the number of borrowers who borrow from major banks and online based banks is expected to be relatively large in these regions.

Figure 17: Transaction volume growth and lending period growth



## IV. Conclusion

In this analysis, housing loans were analyzed with the use of the granular data from the Common Data Platform.

The interest rate level was mostly in the range of 0.5% to 1.0% in all regions. However, regional differences were observed, for example, relatively large proportion of fixed-rate loans were seen in some regions. As for new loans, both the transaction volume and the lending period per case were on the rise, suggesting that risks may be expanding. Continuous monitoring on these trends is necessary.

It should be noted that this analysis is subject to data limitations, such as deficiencies in some data items because the Common Data Platform is still at the gradual operation phase. In addition, it is

difficult to accurately classify whether loans recorded in the dataset are new loans or loans refinanced by other banks. In recent years, refinancing activity has been weak due to the moderate interest rate fluctuations. However, depending on the future interest rate trends, refinancing may increase as seen at the time of the introduction of negative interest rates in 2016. In these times, there may be a gap between the aggregate figures and the actual trend of new loans.

Loan to value (LTV) ratio and debt to income (DTI) ratio are usually used as indicators of housing loan exposure, however, it is currently difficult to directly calculate these indicators from the dataset from the Common Data Platform. One of the potential future issues to be addressed may be combining the data with macro-economic data such as land prices to obtain useful indications around risks of loan exposures.

In addition, it should be recalled that this analysis covers only regional banks due to data limitations, thus the figures in this paper may not fully capture the overall domestic housing loan trends. In Japan, many other financial institutions, such as major banks and online based banks, are also active in the housing loan market.

The FSA will continue to improve the data accuracy of the Common Data Platform and deepen its understanding of housing loan trends and risks to enhance its monitoring capabilities.