

## 5. Banking sector performance

Despite the visible economic recovery in the first half of 2021, retail banks registered thinner profits amid the low interest rate environment. Nonetheless, the Hong Kong banking sector remained resilient, underpinned by robust capital and liquidity positions. Asset quality remained stable and sound by historical and international standards. Bank credit also resumed growth during the review period, thereby providing support for the economy to recover. Looking ahead, the pace and strength of economic recovery could be clouded by the ongoing pandemic developments. This, together with uncertainties over the future pace and direction of monetary policy in major economies, the lingering China-US geopolitical tensions and their ensuing impacts on business activities, will pose challenges to the Hong Kong banking sector. In view of rising indebtedness in the household and corporate sectors, banks should remain vigilant and carefully assess the potential effects of these risk factors on the asset quality of their loan portfolios.

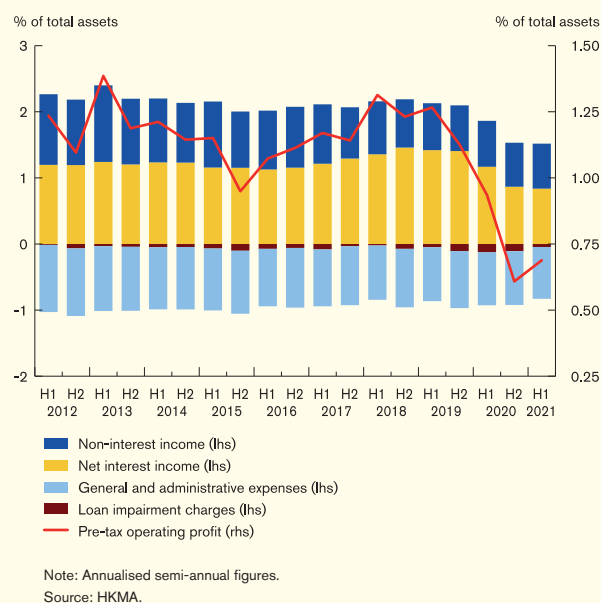
### 5.1 Profitability and capitalisation

#### Profitability

The aggregate pre-tax operating profit of retail banks<sup>49</sup> declined by 19.8% in the first half of 2021, compared with the same period in 2020. As a result, the return on assets also fell to 0.69% in the first half of 2021, compared with 0.94% in the same period in 2020 (Chart 5.1).

The fall in profit was mainly attributed to a reduction in net interest income, as the net interest margin (NIM) of retail banks narrowed to 0.98% in the first half of 2021 (Chart 5.2), compared with 1.37% in the same period last year. The decrease in net interest income more than offset an increase in non-interest income and a notable reduction in loan impairment charges during the same period.

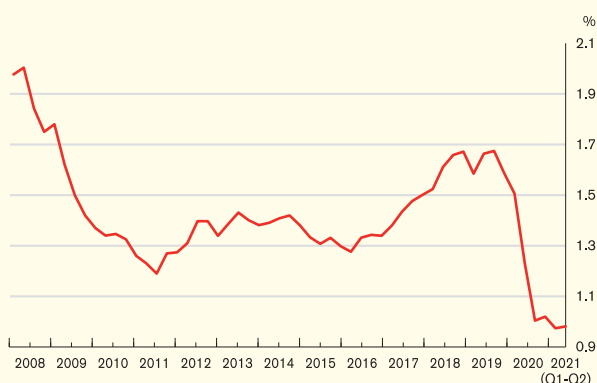
**Chart 5.1**  
Profitability of retail banks



<sup>49</sup> Throughout this chapter, figures for the banking sector relate to Hong Kong offices only, unless otherwise stated.

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**Chart 5.2**  
**NIM of retail banks**

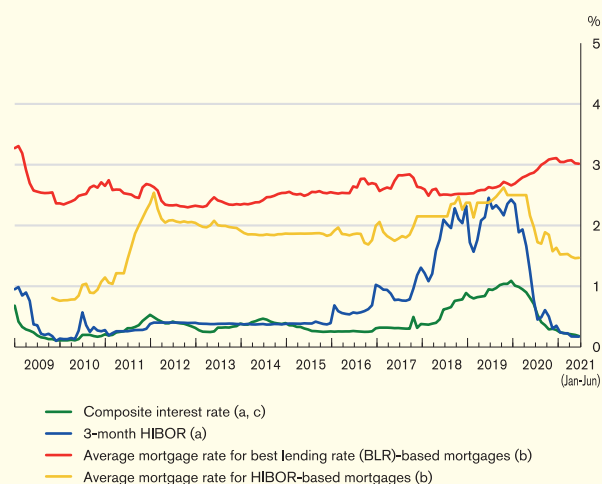


Note: Annualised quarterly figures.  
Source: HKMA.

Underpinned by ample Hong Kong dollar liquidity, Hong Kong interbank interest rates softened further in the first half of 2021. Specifically, the three-month Hong Kong Interbank Offered Rate (HIBOR) saw a mild reduction of 18 basis points during the first half to 0.17% at the end of June 2021 (blue line in Chart 5.3).

Hong Kong dollar retail deposit rates also decreased in the review period, as some major retail banks<sup>50</sup> lowered their Hong Kong time-deposit rates. Reflecting both lower interbank funding costs and retail funding costs, the average Hong Kong dollar funding costs for retail banks, as measured by the composite interest rate, decreased further to 0.18% at the end of June 2021 from 0.28% six months ago.

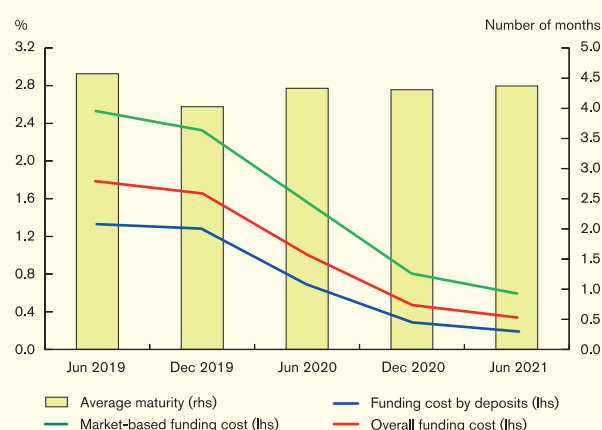
**Chart 5.3**  
**Interest rates**



Notes:  
(a) End-of-period figures.  
(b) Period-average figures for newly approved loans.  
(c) Since June 2019, the composite interest rate has been calculated based on the new local "interest rate risk in the banking book" (IRRBB) framework. As such, figures from June 2019 onwards are not strictly comparable with those of previous months.  
Sources: HKMA and staff estimates.

More broadly, the overall Hong Kong dollar and US dollar funding costs for licensed banks in Hong Kong also declined slightly by 14 basis points during the first half of 2021 (red line in Chart 5.4).

**Chart 5.4**  
**Hong Kong dollar and US dollar funding costs and maturity of licensed banks**



Note: Since June 2019, licensed banks not exempted from the new local IRRBB framework report under the new framework, while exempted licensed banks continue to report under the existing interest rate risk exposure framework. The overall funding cost and the maturity have been calculated as the weighted averages of the respective figures for these two groups of licensed banks. As such, figures from June 2019 onwards are not directly comparable with those of previous periods.

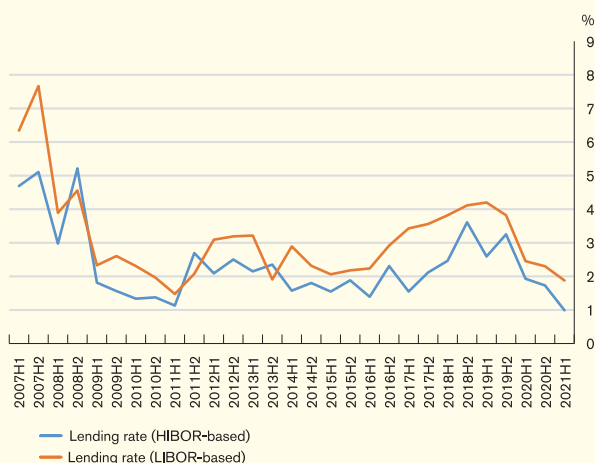
Source: HKMA.

<sup>50</sup> Although several virtual banks began operations in 2020 and offered competitive deposit rates to customers, their business scale remained small in the first half of 2021.

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The more significant drop in banks' NIMs compared with funding costs during the review period suggests that the unprecedented loosening of monetary policy by major central banks in response to the COVID-19 pandemic has suppressed the yields of banks' earning assets significantly. Consistent with the above, the average lending rates of corporate loans have declined noticeably since the beginning of 2020, as seen in the syndicated loan market in Hong Kong (Chart 5.5).

**Chart 5.5**  
Average lending rates of syndicated loans



Note: The average lending rate of syndicated loans is weighted by the loan amounts and the lending rate of loans refers to sum of spread and the corresponding reference rate.

Source: HKMA staff estimates based on data from LoanConnector.

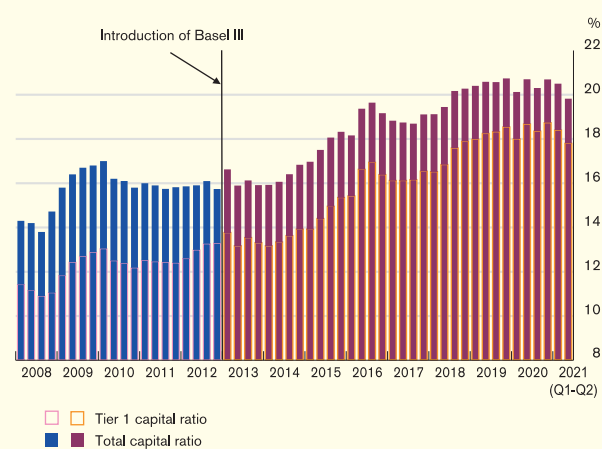
The near-term outlook for banks' profitability may remain challenging in part because the global low interest rate environment may continue to suppress their NIMs. In addition, uncertainties surrounding the global pandemic and the lingering China-US geopolitical tensions could dampen business confidence and threaten the current pace of global economic recovery. These risk factors, if intensified, could affect banks' asset quality adversely, weighing on their profitability.

### Capitalisation

Capitalisation of the Hong Kong banking sector continued to be strong and well above minimum international standards. The consolidated total capital ratio of locally incorporated authorized

institutions (AIs) stood at a high level of 19.8% at the end of June 2021 (Chart 5.6), well above the international minimum requirement of 8%. The Tier 1 capital ratio was 17.8% in the same period, with 15.9% being contributed by Common Equity Tier 1 (CET1) capital. In addition, the non-risk-based Leverage Ratio<sup>51</sup> (LR) of locally incorporated AIs stood at a healthy level of 7.9% at the end of June 2021, exceeding the statutory minimum of 3%.

**Chart 5.6**  
Capitalisation of locally incorporated AIs



Notes:

1. Consolidated basis.
2. With effect from 1 January 2013, a revised capital adequacy framework under Basel III was introduced for locally incorporated AIs. The capital ratios from March 2013 onwards are therefore not directly comparable with those up to December 2012.

Source: HKMA.

## 5.2 Liquidity and interest rate risks

### Liquidity and funding

The liquidity positions of the banking sector, as measured by the Basel III Liquidity Coverage Ratio (LCR)<sup>52</sup>, remained sound during the review period. The average LCR of category 1 institutions remain at a similar level of 154.0% in

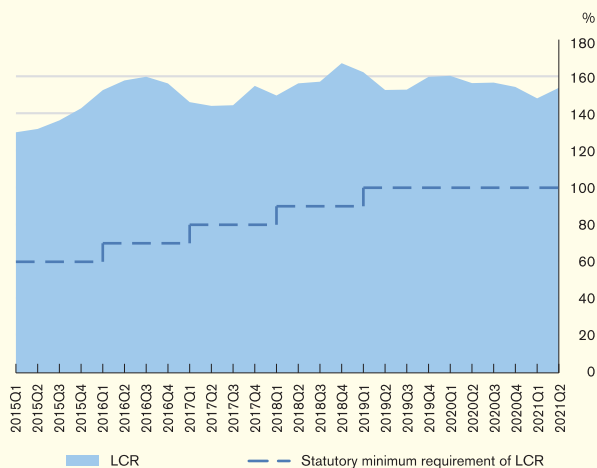
<sup>51</sup> The Basel III non-risk-based LR requirement acts as a "backstop" to restrict the build-up of excessive leverage in the banking sector. For details, see Banking (Capital) Rules (Cap. 155L).

<sup>52</sup> The Basel III LCR requirement is designed to ensure that banks have sufficient high-quality liquid assets to survive a significant stress scenario lasting 30 calendar days. In Hong Kong, AIs designated as category 1 institutions adopt the LCR, while category 2 institutions adopt the LMR. For details, see the HKMA's Supervisory Policy Manual (SPM) LM-1, "Regulatory Framework for Supervision of Liquidity Risk".

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the second quarter of 2021 (Chart 5.7), staying well above the statutory minimum requirement of 100%. The average Liquidity Maintenance Ratio (LMR) of category 2 institutions was 58.1% during the same period, also well above the statutory minimum requirement of 25%.

**Chart 5.7**  
**Liquidity Coverage Ratio**



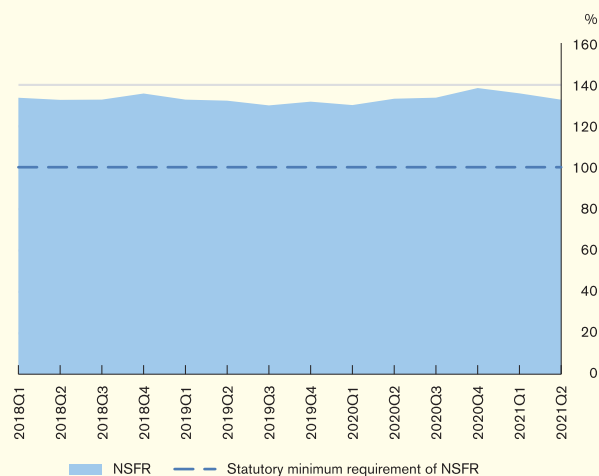
## Notes:

1. Consolidated basis.
2. Quarterly average figures.

Source: HKMA.

The latest ratios of the Net Stable Funding Ratio (NSFR)<sup>53</sup> requirement also indicated a stable funding position of AIs. The average NSFR of category 1 institutions remained at a high level of 132.6% in the second quarter of 2021 (Chart 5.8), well above the statutory minimum requirement of 100%. The average Core Funding Ratio (CFR) of category 2A institutions stood at a high level of 142.7%, which also exceeded the statutory minimum requirement of 75%. The strong liquidity and stable funding positions of AIs suggest the Hong Kong banking sector should be well positioned to withstand liquidity shocks.

**Chart 5.8**  
**Net Stable Funding Ratio**

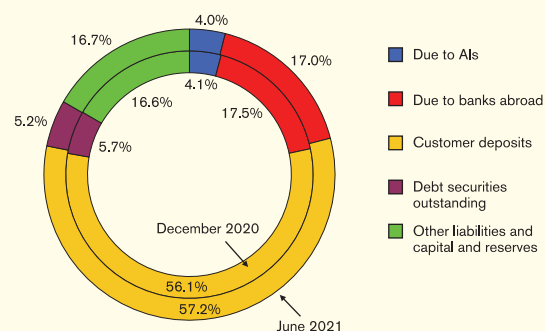


Note: Consolidated basis.

Source: HKMA.

Customer deposits continued to be the primary funding source for AIs, underpinning a stable funding structure in the banking system. At the end of June 2021, the share of customer deposits to all AIs' total liabilities increased to 57.2%, from 56.1% six months ago (Chart 5.9).

**Chart 5.9**  
**The liability structure of all AIs**



## Notes:

1. Figures may not add up to total due to rounding.
2. Figures refer to the percentage of total liabilities, including capital and reserves.
3. Debt securities comprise negotiable certificates of deposit and all other negotiable debt instruments.

Source: HKMA.

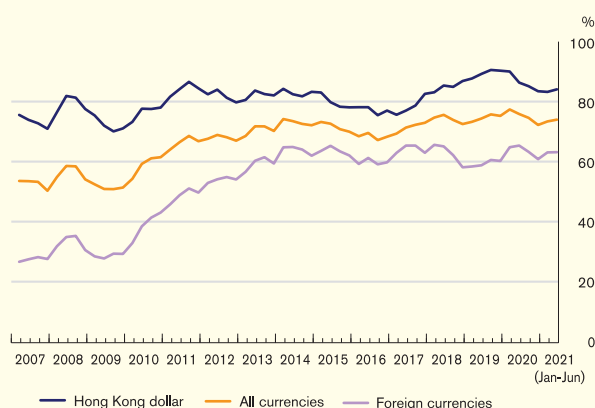
Due to faster growth in loans and advances than in deposits for both the Hong Kong dollar and foreign currencies, the average Hong Kong dollar loan-to-deposit (LTD) ratio and foreign currency LTD ratio of all AIs increased to 84.2% and 63.3% at the end of June 2021, compared with 83.5%

<sup>53</sup> The Basel III NSFR requires banks to maintain a stable funding profile in relation to the composition of their assets and off-balance-sheet activities. In Hong Kong, category 1 institutions are required to comply with the NSFR; while category 2 institutions designated as category 2A institutions must comply with the requirements relating to the local CFR. For details, see Banking (Liquidity) Rules (Cap. 155Q).

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and 61.0% at the end of 2020 (Chart 5.10). Overall, the average all-currency LTD ratio of all AIs rose to 74.1% at the end of June 2021 from 72.3% six months ago.

**Chart 5.10**  
Average loan-to-deposit ratios of all AIs



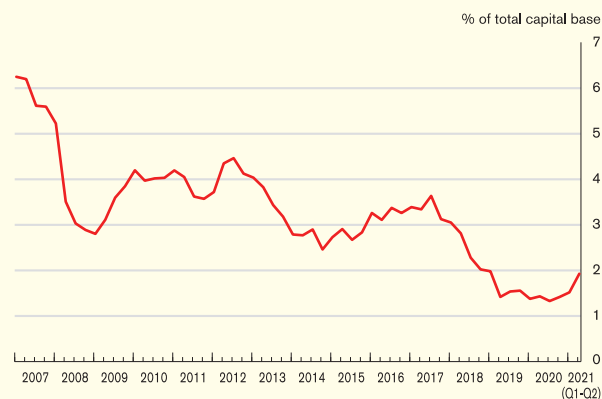
Note: End-of-quarter figures.

Source: HKMA.

## Interest rate risk

The interest rate risk exposure of locally incorporated licensed banks remained relatively low in the second quarter of 2021. Under a hypothetical shock of an across-the-board 200-basis-point increase in Hong Kong dollar and US dollar interest rates, the economic value of locally incorporated licensed banks' interest rate positions is estimated to decline to the extent equivalent to 1.93% of their total capital base at the end of June 2021 (Chart 5.11)<sup>54</sup>.

**Chart 5.11**  
Impact of a Hong Kong dollar and US dollar interest rate shock on locally incorporated licensed banks



Notes:

1. Interest rate shock refers to a 200-basis-point parallel increase in both Hong Kong dollar and US dollar yield curves to institutions' interest rate risk exposure. The two currencies accounted for a majority of interest-rate-sensitive assets, liabilities and off-balance-sheet positions for locally incorporated licensed banks at the end of June 2021.
2. The impact of the interest rate shock refers to its impact on the economic value of the banking and trading book<sup>55</sup>, expressed as a percentage of the total capital base of banks.
3. Since June 2019, the interest rate risk exposure has been calculated based on the new local IRRBB framework. As such, the figures for June 2019 onwards are not strictly comparable with those of previous periods.

Source: HKMA.

## 5.3 Credit risk

### Overview

Bank credit recorded a notable expansion in the first half, driven mainly by the improved domestic economic conditions, coupled with an increase in initial public offering (IPO)-related loans straddled at the end of June 2021. The asset quality of banks' loan portfolios also remained sound and stable during the review period.

On a half-yearly basis, the total loans and advances of all AIs increased notably by 7.2% in the first half of 2021, after declining by 1.8% in the second half of 2020 (Chart 5.12). Excluding the IPO-related loans straddled at the end of June, total loans and advances rose by 4.4% during the same period. Total loan growth

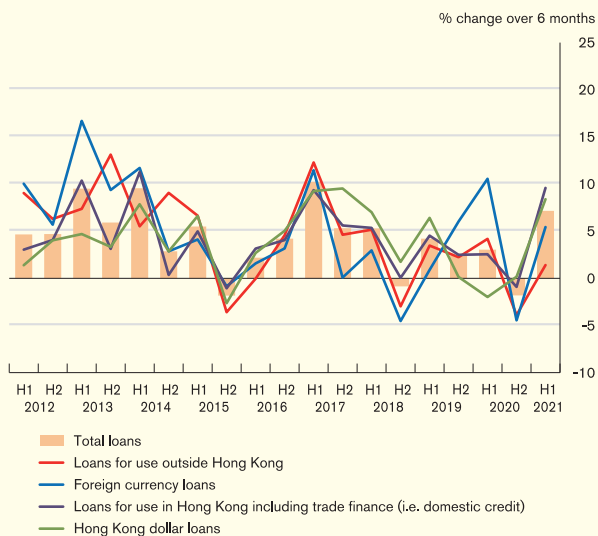
<sup>54</sup> This estimation does not take into account the effect of any mitigating action by banks in response to the shock. The impact will be smaller if mitigating action is taken.

<sup>55</sup> Locally incorporated AIs subject to the market risk capital adequacy regime are required to report positions in the banking book only. Other locally incorporated AIs exempted from the market risk capital adequacy regime are required to report aggregate positions in the banking book and trading book.

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(excluding IPO-related loans) was largely driven by growth in domestic loans (comprising loans for use in Hong Kong and trade financing), which grew by 5.6%<sup>56</sup>, while loans for use outside Hong Kong increased by 1.8% during the same period.

**Chart 5.12**  
**Loan growth**



Note: Since December 2018, figures for loans for use in or outside of Hong Kong have been restated to reflect AIs' reclassification of working capital loans. The reported % changes over six months for 2019 and onwards are calculated based on the reclassified loan data, while the historical % changes until the second half of 2018 are calculated based on the data without such reclassification.

Source: HKMA.

The credit demand outlook is likely to remain stable in the near term. According to the results of the HKMA Opinion Survey on Credit Condition Outlook in June 2021, the share of surveyed AIs expecting loan demand to remain the same in the following three months increased to 67% from 50% six months ago, while the share expecting loan demand to be lower for the same period decreased to 3%.

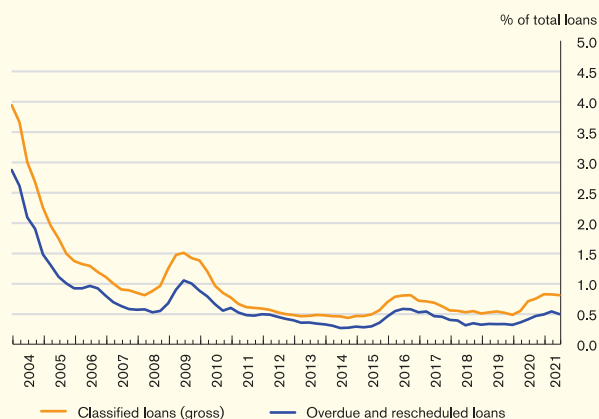
**Table 5.A**  
**Expectations of loan demand in the next three months**

% of total respondents	Sep-20	Dec-20	Mar-21	Jun-21
Considerably higher	0	3	7	7
Somewhat higher	33	33	30	23
Same	43	50	57	67
Somewhat lower	23	13	7	3
Considerably lower	0	0	0	0
Total	100	100	100	100

Note: Figures may not add up to total due to rounding.  
Source: HKMA.

The asset quality of banks' loan portfolios was stable in the first half of 2021. The gross classified loan ratio (CLR) of all AIs edged down to 0.86% at the end of June 2021 from 0.9% six months ago, while the ratio of overdue and rescheduled loans of all AIs rose slightly to 0.58% in the same period from 0.57% at the end of December 2020. For retail banks, the gross CLR decreased slightly to 0.81% compared with six months ago, while the ratio of overdue and rescheduled loans rose slightly to 0.50% (Chart 5.13). On the whole, these ratios have stayed low by both historical and international standards.

**Chart 5.13**  
**Asset quality of retail banks**



Notes:

- Classified loans are those loans graded as "sub-standard", "doubtful" or "loss".
- Figures prior to December 2015 were related to retail banks' Hong Kong offices and overseas branches. Starting from December 2015, the coverage was expanded to include the banks' major overseas subsidiaries as well.

Source: HKMA.

<sup>56</sup> Domestic loans would have increased by 9.4% in the first half of 2021 if IPO-related loans were included.



## Banking sector performance

*Household exposure<sup>57</sup>*

Household debt grew by 4.4% in the first half of 2021, slightly faster than the 3.9% in the second half of 2020, but slower than the growth in 2019 (Table 5.B). A breakdown of the data shows that the growth of personal loans accelerated from 2.2% in the second half of 2020 to 5.3% in the first half of 2021, while the growth of residential mortgage loans slowed from 4.7% to 4.0%.

**Table 5.B**  
**Half-yearly growth of loans to households of all AIs**

(%)	2018		2019		2020		2021
	H1	H2	H1	H2	H1	H2	H1
Residential mortgages	4.5	2.8	4.7	5.5	3.5	4.7	4.0
Personal loans	7.3	5.1	11.2	5.9	-2.4	2.2	5.3
of which:							
Credit card advances	-5.0	10.6	-3.8	4.1	-9.0	0.0	-0.4
Loans for other private purposes	10.5	3.9	14.9	6.2	-1.1	2.6	6.4
Total loans to households	5.4	3.5	6.8	5.6	1.5	3.9	4.4

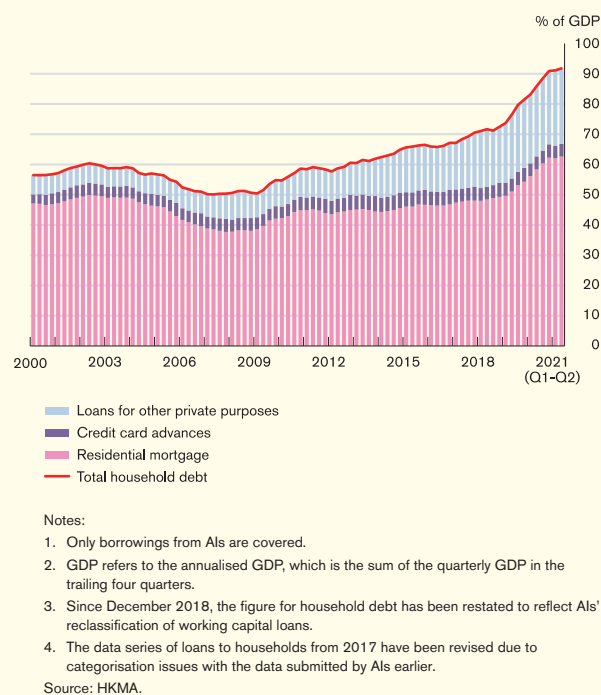
## Notes:

1. Since December 2018, figures for loans to households have been restated to reflect AIs' reclassification of working capital loans. The half-yearly growth rates for the first half of 2019 and onwards are calculated based on the reclassified loan data, while the historical growth rates until the second half of 2018 are calculated based on the data without such reclassification.
2. The data series of loans to households from 2017 have been revised due to categorisation issues with the data submitted by AIs earlier.

Source: HKMA.

Compared with the second half of 2020, the household debt-to-GDP ratio edged up slightly by 0.8 percentage points to 91.8% in the first half of 2021 (Chart 5.14). The increase was contributed by the growth in household debt (+4.0 percentage points), which was almost offset by the rebound in the nominal GDP (-3.2 percentage points).

**Chart 5.14**  
**Household debt-to-GDP and its components**

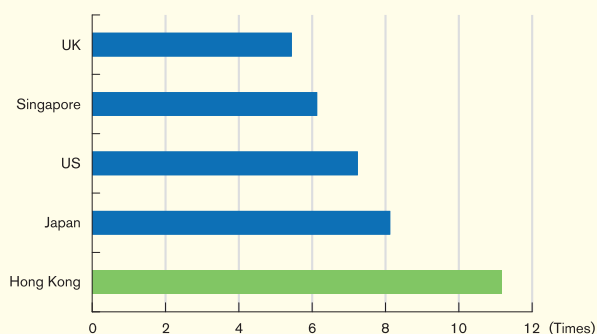


Although the household debt-to-GDP ratio is a widely used indicator in evaluating households' financial position, a full assessment requires considering the entire household balance sheet as well, including the level of assets and the composition of assets and liabilities. In this regard, both the net worth-to-liabilities ratio and the safe assets-to-liabilities ratio of Hong Kong's household sector remained high at 11.2 times and 2.88 times respectively in 2019 (Charts 5.15 and 5.16), which are much higher than those of most other developed economies. This suggests that Hong Kong's households, on aggregate, are financially sound and have strong buffers to cushion potential financial and economic shocks.

<sup>57</sup> Loans to households constitute lending to professional and private individuals, excluding lending for other business purposes. Mortgages account for a major proportion of household loans, while the remainder consists of mainly loans to private banking and wealth management customers secured by financial assets, credit card advances and unsecured personal loans. At the end of June, household lending made up 31.6% of domestic lending.

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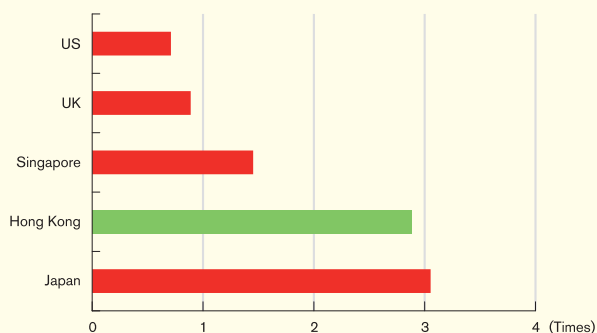
**Chart 5.15**  
Household net worth-to-liabilities ratio for selected economies



Note: Figures as at end-2018 for Japan figures; figures as at end-2019 for other economies.

Sources: Statistical agencies or central banks of selected economies, and HKMA staff estimates.

**Chart 5.16**  
Safe assets-to-liabilities ratio in selected economies



Note: Safe assets comprise deposits, as well as currencies if data is available. In the case of Hong Kong, safe assets refer to deposits only. Japan figures are from end-2018, while all other reported figures are from end-2019.

Sources: Statistical agencies or central banks of selected economies, and HKMA staff estimates.

Given the prudent risk management and sound credit quality of these loans, the HKMA considers the associated credit risk as manageable. More than 90% of the household debt were collateralised loans, mainly residential mortgages and wealth management advances secured by financial assets.

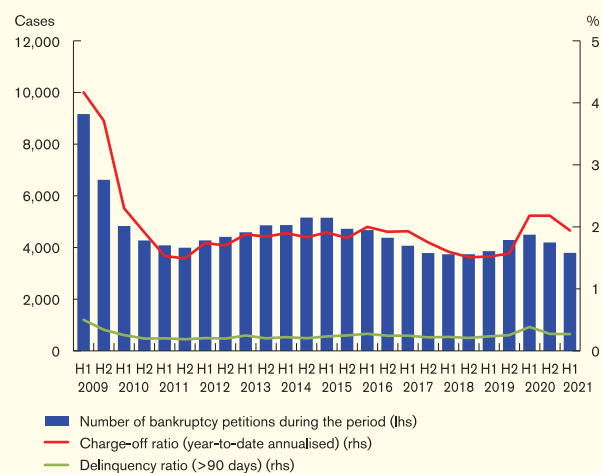
Regarding residential mortgages, following several rounds of countercyclical macro-prudential measures introduced by the HKMA since 2009, the average LTV ratio and average debt-servicing ratio of newly approved mortgage loans have been staying at healthy levels. For personal loans to wealth management customers secured by financial assets, the HKMA requires

banks to adopt prudent and effective credit risk management measures on this type of business. Such measures include imposing a cap on LTV ratios for financial assets pledged as collateral, issuing prompt margin calls and adopting forced liquidation mechanisms.

Besides, the HKMA also requires banks to conduct prudent operations on credit card advance and unsecured personal loan businesses. In reviewing credit applications, banks should understand borrowers' credit and financial conditions and carefully assess their repayment ability. As for post-lending, banks should implement effective monitoring that includes regular assessment of the asset quality of the loan portfolios. The HKMA will continue to monitor changes in banks' loan quality closely.

On unsecured household exposure, the associated credit risk remained contained during the review period. The number of bankruptcy petitions presented decreased in the first half of 2021 compared with six months ago (Chart 5.17). The year-to-date annualised credit card charge-off ratio decreased from 2.18% in the fourth quarter of 2020 to 1.94% in the second quarter of 2021, while the delinquency ratio hovered at 0.27% in the same period, similar to the preceding two-quarter position.

**Chart 5.17**  
Charge-off ratio and delinquency ratio for credit card lending and bankruptcy petitions



Sources: Official Receiver's Office and HKMA.

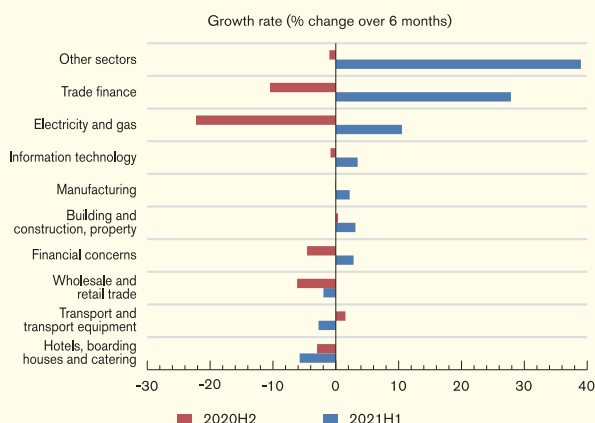


## Banking sector performance

*Corporate exposure<sup>58</sup>*

As the economic conditions improved, domestic corporate loans (excluding IPO-related loans straddled at end-June) grew notably by 6.2%<sup>59</sup> in the first half of 2021 (Chart 5.18). Analysed by economic sectors, trade financing loans grew significantly by 27.9% in the first half of 2021, partly reflecting the strong merchandise export performance in Hong Kong alongside the global economic recovery. However, loan growth in sectors that were hard hit by the pandemic, including the wholesale and retail, accommodation services and transport sectors, remained sluggish.

**Chart 5.18**  
Growth in domestic corporate loans by selected sector

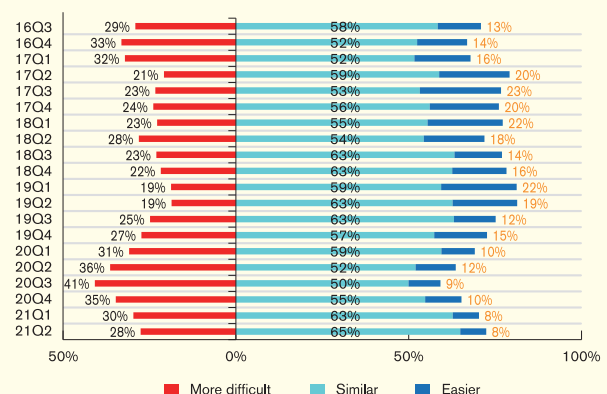


Source: HKMA.

A demand-side survey on the credit conditions of small and medium-sized enterprises (SMEs) showed that SME's perception improved further in the second quarter of 2021, with 28% of the respondents perceiving credit approval as "more difficult" relative to six months ago, down from 30% in the previous quarter (Chart 5.19). Of the respondents with existing credit lines, 3% indicated a tighter stance by banks, compared with 7% found in the first quarter (Chart 5.20).

To continue the support to SMEs, the HKMA extended the Pre-approved Principal Payment Holiday Scheme (PPPHS) to April 2022. By the end of July 2021, a total of over 74,000 cases of credit relief have been granted to corporate customers under the PPPHS and other initiatives rolled out by banks amid the pandemic, involving an aggregate amount of HK\$860 billion. Compared with the participation rate of 16% when the PPPHS was first launched in May last year, the participation rate further dropped to 2.4% in July 2021, indicating SMEs' needs for relief measures might have declined along with the economic recovery in Hong Kong. In addition, the Hong Kong Mortgage Corporation Limited extended the application period of the Special 100% Loan Guarantee to 30 June 2022. As at end-July, over 40,000 applications involving more than HK\$65 billion in loans had been approved under the 100% Guarantee Product. With the overarching objective of maintaining banking stability, the HKMA will from time to time review the case for further extension of the various measures<sup>60</sup>.

**Chart 5.19**  
SMEs' perception of banks' credit approval stance relative to six months ago



Note: Excluding respondents who answered "no idea/don't know".  
Source: HKMA.

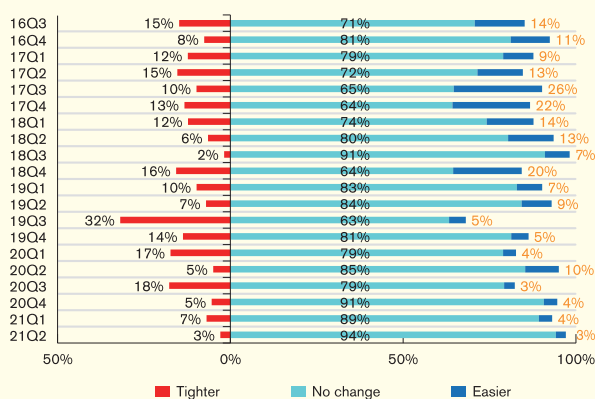
<sup>58</sup> Excluding interbank exposure. At the end of June 2021, the share of corporate loans in domestic lending was 68.3%.

<sup>59</sup> If IPO loans straddled at the end of June 2021 were included, domestic corporate loans would have grown by 11.9% in the first half of 2021.

<sup>60</sup> The Government announced further enhancements to the support measures under the SME Financing Guarantee Scheme (SFGS) on 21 September. The maximum duration of principal moratorium for the 80% Guarantee Product, the 90% Guarantee Product and the Special 100% Loan Guarantee under the SFGS will be extended from 18 months to 24 months, and the application period for principal moratorium will also be extended to end-June 2022.

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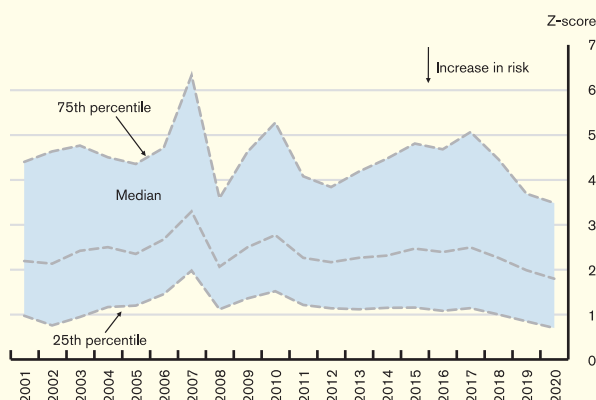
**Chart 5.20**  
SMEs' reported change in banks' stance on existing credit lines



Note: The data covers only respondents with existing credit lines.  
Source: HKMA.

An assessment based on the latest accounting data of all non-financial corporates listed in Hong Kong shows that the financial health of listed corporates deteriorated slightly in 2020 as the negative impacts arising from the pandemic continued to weigh on corporates' fundamentals. The Altman's Z-score (a default risk measure for non-financial corporates) declined across-the-board during 2020, reflecting a broad-based weakening in the financial health of these corporates (Chart 5.21).

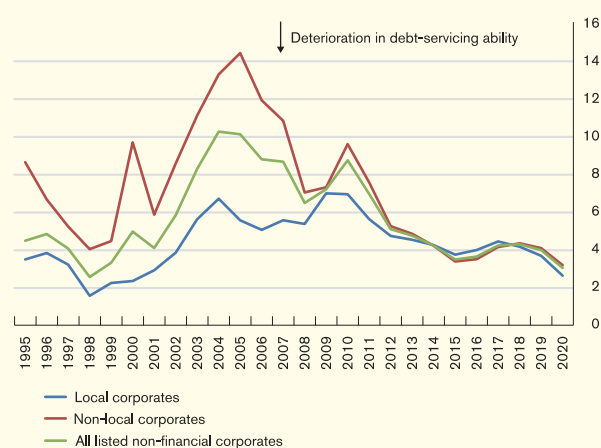
**Chart 5.21**  
Altman's Z-score of listed non-financial corporates in Hong Kong



Notes:  
1. All non-financial corporates listed on the Hong Kong Stock Exchange are selected.  
2. Figures are calculated based on information up to end-August 2021.  
Source: HKMA staff calculations based on estimates compiled by Bloomberg.

Consistent with the decrease in the Altman's Z-score, the debt-servicing ability of non-financial corporates listed in Hong Kong deteriorated during the same period. The weighted average interest coverage ratios for both local and non-local firms fell (the blue and red lines in Chart 5.22) due mainly to general decline in corporate earnings amid the pandemic.

**Chart 5.22**  
Interest coverage ratio of listed non-financial corporates in Hong Kong

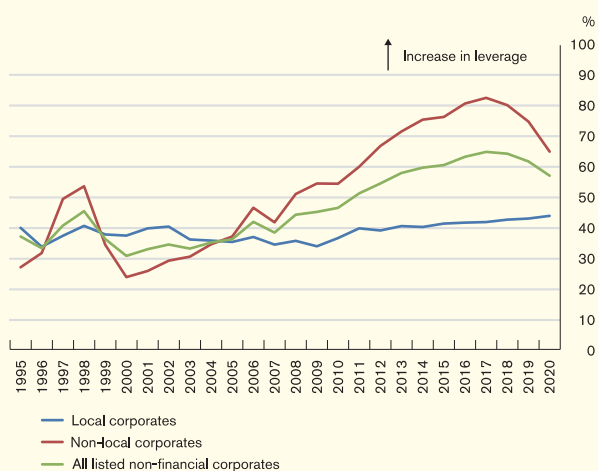


Notes:  
1. Weighted average figures.  
2. The ICR is calculated by dividing the earnings before interest and tax (EBIT) by total interest expenses. A lower value indicates deterioration of debt servicing ability.  
3. All non-financial corporates listed on the Hong Kong Stock Exchange are selected. Local and non-local corporates refer to listed firms that are domiciled in and outside Hong Kong, respectively.  
4. Figures are calculated based on information up to end-August 2021.  
Source: HKMA staff estimates based on data from Bloomberg.

Nevertheless, corporate leverage, measured by the weighted average debt-to-equity ratio, decreased moderately in 2020 for listed non-financial corporates in Hong Kong (the green line in Chart 5.23), driven by continued deleveraging of non-local corporates (the red line in Chart 5.22). While the average leverage for local corporates increased mildly (the blue line in Chart 5.23), the current level may not cause immediate systemic concerns.

## Banking sector performance

**Chart 5.23**  
Leverage ratio of listed non-financial corporates in Hong Kong



## Notes:

1. Weighted average figures.
2. The leverage ratio is defined as the ratio of debt to equity. A higher value indicates higher leverage.
3. All non-financial corporates listed on the Hong Kong Stock Exchange are selected. Local and non-local corporates refer to listed firms that are domiciled in and outside Hong Kong, respectively.
4. Figures are calculated based on information up to end-August 2021.

Source: HKMA staff estimates based on data from Bloomberg.

It should be noted that due to a time lag in the availability of accounting data, the above assessment does not capture the positive effects of improved economic conditions in the first half of 2021 on corporates' fundamentals. There were some signs that the recent improvement in economic conditions and the policy effect of relief measures had reduced corporate default risk. In particular, the number of petitions presented for the compulsory winding-up of companies decreased from 255 cases in the second half of 2020 to 236 cases in the first half of 2021.

### Mainland-related lending and non-bank exposures

The banking sector's total Mainland-related lending increased by 7.3% to HK\$4,881 billion (16.3% of total assets) at the end of June 2021, from HK\$4,548 billion (15.6% of total assets) at the end of 2020 (Table 5.C). Other non-bank exposures increased by 8.1% to HK\$1,971 billion (Table 5.D).

**Table 5.C**  
Mainland-related lending

HK\$ bn	Sep 2020	Dec 2020	Mar 2021	Jun 2021
Mainland-related loans	4,827	4,548	4,747	4,881
Mainland-related loans excluding trade finance	4,523	4,287	4,435	4,501
Trade finance	304	261	312	380
By type of Als:				
Overseas incorporated Als	1,882	1,733	1,776	1,769
Locally incorporated Als*	2,208	2,043	2,157	2,262
Mainland banking subsidiaries of locally incorporated Als	737	772	814	850
By type of borrowers:				
Mainland state-owned entities	1,978	1,804	1,959	1,980
Mainland private entities	1,371	1,312	1,440	1,509
Non-Mainland entities	1,478	1,432	1,348	1,392

## Notes:

1. \* Including loans booked in Mainland branches of locally incorporated Als.
2. Figures may not add up to the total due to rounding.

Source: HKMA.

**Table 5.D**  
Other non-bank exposures

HK\$ bn	Sep 2020	Dec 2020	Mar 2021	Jun 2021
Negotiable debt instruments and other on-balance sheet exposures	1,232	1,350	1,368	1,461
Off-balance sheet exposures	434	473	492	510
<b>Total</b>	<b>1,666</b>	<b>1,823</b>	<b>1,860</b>	<b>1,971</b>

Note: Figures may not add up to the total due to rounding.

Source: HKMA.

Largely reflecting the notable recovery in the Mainland economy, the gross CLR of Mainland-related lending of all Als<sup>61</sup> decreased to 0.84% at the end of June 2021 from 0.96% at the end of 2020.

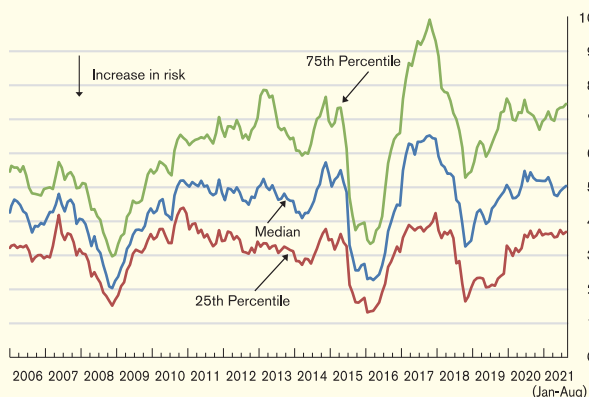
Consistently, the distance-to-default (DTD) index<sup>62</sup> (a forward-looking market-based indicator) continued to suggest a stabilisation in the default risk of the Mainland corporate sector. More specifically, the 75th and 25th percentiles of the DTD index hovered at levels similar to six months ago (Chart 5.24).

<sup>61</sup> Figures cover Als' Hong Kong offices and Mainland branches and subsidiaries.

<sup>62</sup> The DTD is a market-based default risk indicator based on the framework by R. Merton (1974), "On the pricing of corporate debt: the risk structure of interest rates", *Journal of Finance*, Vol. 29, pages 449–470, in which equity prices, equity volatility, and companies' financial liabilities are the determinants of default risk. In essence, it measures the difference between the asset value of a firm and a default threshold in terms of the firm's asset volatility.

## Banking sector performance

**Chart 5.24**  
Distance-to-default index for the Mainland corporate sector



Note: The DTD index is calculated based on the non-financial constituent companies (i.e. excluding investment companies and those engaged in banking, insurance and finance) of the Shanghai Stock Exchange 180 A-share index.

Source: HKMA staff estimates based on data from Bloomberg.

Nevertheless, in view of potential economic headwinds facing the Mainland economy arising from the uncertainties over the pandemic development, given the outbreak of the Delta variant in some provinces, and the lingering China-US geopolitical tensions, banks should stay attentive to the credit risk management of their Mainland-related exposures.

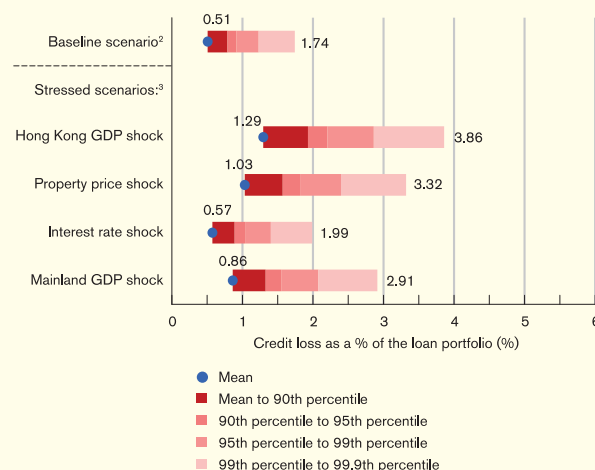
### Macro stress testing of credit risk<sup>63</sup>

Results of the latest macro stress testing on retail banks' credit exposure suggest the Hong Kong banking sector remains resilient and should be able to withstand severe macroeconomic shocks similar to those experienced during the Asian financial crisis. Chart 5.25 presents a simulated future credit loss rate of retail banks in the second quarter of 2023 under four specific macroeconomic shocks<sup>64</sup> using information up to the second quarter of 2021.

In the stressed scenarios, the expected average credit losses two years after different macroeconomic shocks are estimated to be moderate, ranging from 0.57% (Interest rate shock) to 1.29% (Hong Kong GDP shock).

Taking into account tail risk, banks' credit losses (at the confidence level of 99.9%) under the stress scenarios range from 1.99% (Interest rate shock) to 3.86% (Hong Kong GDP shock), which are significant, but smaller than the estimated loan loss of 4.39% following the Asian financial crisis.

**Chart 5.25**  
The mean and value-at-risk statistics of simulated credit loss distributions<sup>1</sup>



Notes:

- The assessments assume the economic conditions in 2021 Q2 as the current environment. The Monte Carlo simulation method is adopted to generate the credit loss distribution for each scenario.
- Baseline scenario: no shock throughout the two-year period.
- Stressed scenarios:
  - Hong Kong GDP shock:** reductions in Hong Kong's real GDP by 2.7%, 2.4%, 1.7% and 1.6% respectively in each of the four consecutive quarters starting from 2021 Q3 to 2022 Q2.
  - Property price shock:** Reductions in Hong Kong's real property prices by an average of 12% in each of the four consecutive quarters starting from 2021 Q3 to 2022 Q2.
  - Interest rate shock:** A rise in real interest rates (HIBORs) by 300 basis points in the first quarter (i.e. 2021 Q3), followed by no changes in the second and third quarters, and another rise of 300 basis points in the fourth quarter (i.e. 2022 Q2).
  - Mainland GDP shock:** An average year-on-year real GDP growth rate of 2% for the four consecutive quarters starting from 2021 Q3.

Source: HKMA staff estimates.

<sup>63</sup> Macro stress testing refers to a range of techniques used to assess the vulnerability of a financial system to "exceptional but plausible" macroeconomic shocks. The credit loss estimates presented in this report are obtained based on a revised framework from J. Wong et al. (2006), "A framework for stress testing banks' credit risk", *Journal of Risk Model Validation*, Vol. 2(1), pages 3–23. All estimates in the current report are not strictly comparable to estimates from previous reports.

<sup>64</sup> These shocks are calibrated to be similar to those that occurred during the Asian financial crisis, except the Mainland GDP shock.

## 5.4 Systemic risk

Reflecting improved economic conditions and the policy effect of relief measures, systemic risks in the Hong Kong banking sector remained contained during the review period.

However, the global economic recovery is subject to uncertainties, particularly those arising from the development of the pandemic, the pace and direction of monetary policies in major economies, and geopolitical risks. Downside risks to the global economy may pose challenges to banks in managing the credit risks of their loan portfolios.

Specifically, concerns have been rising about the resurgence of the pandemic, given the widespread transmission of the Delta variant. Any retightening of containment measures in response to a resurgence of the pandemic could delay the recovery for many corporates. Importantly, given that many corporates may have thinner financial buffers than before, their resilience to a prolonged pandemic may be called into question. Banks should therefore continue to uphold their credit risk management and assess the potential impacts of the ongoing pandemic developments on the financial fundamentals of their corporate borrowers.

Uncertainty over the future pace and direction of monetary policy is another key risk factor to watch for. If the global inflation, particularly in the US, turns out to be more persistent than expected, the monetary policy stance could be tightened earlier than expected. This could put the credit risk of banks' loan portfolios under the test, particularly in view of the weakening debt-repayment ability of corporates and households amid the prolonged pandemic.

Geopolitical risks, especially those related to the China-US tensions, still merit close attention. Any escalation in tensions between the world's two largest economies could adversely affect

business environments, and thus the Hong Kong banking sector.

That said, the robust capital and liquidity positions of the Hong Kong banking sector should provide strong buffers against the downside risks.

From the perspective of a longer horizon, climate change is a major emerging risk to financial stability. For instance, a disorderly transition to a low-carbon economy could have a destabilising effect on the financial system. Box 4, which explores a sample of syndicated loans in Asia Pacific, finds that banks in the region have started to price in climate transition risk for loans to emission-intensive sectors since the Paris Agreement, suggesting that banks have begun to incorporate climate risk considerations into their existing risk management framework.

Nonetheless, in view of the highly challenging task in managing climate risks given their distinctive nature<sup>65</sup> and data gaps, banks should keep abreast of the latest developments on climate risk management practices when considering their own risk management approach. In this regard, the HKMA actively engages with the banking industry to facilitate AIs' inclusion of climate risk management practices into their operations.

### *The countercyclical capital buffer (CCyB) for Hong Kong*

The CCyB is part of the internationally agreed Basel III standards and is designed to enhance the resilience of the banking sector against system-wide risks associated with excessive aggregate credit growth. This buffer can be deployed in times of a downturn, allowing banks

<sup>65</sup> Climate risks (which include physical and transition risks), are the products of multiple interacting forces (e.g. natural, technological and societal), and are thus inherently uncertain and prone to changes. In addition, compared to the traditional risk types, climate risks are more susceptible to non-linearity and fat-tailed distributions.



## Banking sector performance

to continue providing credit to support the real economy. The latest applicable jurisdictional CCyB ratio for Hong Kong, announced on 5 August 2021, was 1.0%<sup>66</sup>.

In setting the CCyB rate, the Monetary Authority considered a series of indicators (Table 5.E), including an “indicative buffer guide” (which is a metric providing a guide for CCyB rates based on the gap between the ratio of credit-to-GDP and its long term trend, and between the ratio of residential property prices to rentals and its long term trend)<sup>67</sup>. The setting of the CCyB for Hong Kong is however not a mechanical exercise and the Monetary Authority will always consider a broad range of reference indicators (“Comprehensive Reference Indicators”) in addition to the indicative buffer guide<sup>68</sup>.

For the latest situation, the indicative buffer guide, calculated based on the first-quarter data of 2021, signals a CCyB of 2.50%. The projection, based on all available data at the decision date, suggests the indicative buffer guide is likely to signal a lower CCyB when all relevant data for the second quarter of 2021 becomes available.

Nevertheless, information drawn from the series of Comprehensive Reference Indicators, along with all relevant information available at the time of the decision in August 2021, suggests that there have been some signs of economic recovery in Hong Kong, but uncertainties about the global pandemic situation have remained. The Monetary Authority therefore considered

that it is appropriate to keep the CCyB unchanged at 1.0% and continue to monitor the situation for a few more quarters.

The Monetary Authority will continue to closely monitor credit and economic conditions in Hong Kong and review the CCyB ratio on a quarterly basis or more frequently.

**Table 5.E**  
**Information related to the Hong Kong jurisdictional CCyB rate**

	28-Jan-21	17-May-21	5-Aug-21
Announced CCyB rate	1.0%	1.0%	1.0%
Date effective	28/1/2021	17/5/2021	5/8/2021
Indicative buffer guide	2.5%	2.3%	2.5%
Basel Common Reference Guide	2.5%	2.5%	2.5%
Property Buffer Guide	2.2%	1.8%	2.5%
Composite CCyB Guide	2.5%	2.3%	2.5%
Indicative CCyB Ceiling	None	None	None
<i>Primary gap indicators</i>			
Credit/GDP gap	24.1%	23.9%	13.8%
Property price/rent gap	9.0%	7.8%	10.3%
<i>Primary stress indicators</i>			
3-month HIBOR spread* (percentage points)	0.21%	0.18%	0.15%
Quarterly change in classified loan ratio (percentage points)	0.04%	0.07%	0.00%

## Notes:

1. The values of all CCyB guides, the Indicative CCyB Ceiling and their respective input variables are based on public data available prior to the corresponding review/announcement date, and may not be the most recent available as of each quarter end (refer to SPM CA-B-1 for explanations of the variables). If there is a CCyB announcement, the date of the announcement is shown at the top of the respective column. If there is no CCyB announcement, the quarter in which a CCyB review takes place (normally close to quarter end) is shown at the top of the column.
2. \* Following a review of the appropriate risk-free rate benchmark (previously identified as the 3-month OIS rate), the HKMA has decided to amend the definition of the interbank market spread to the difference between the 3-month HIBOR and 3-month Exchange Fund Bill yield, effective from April 2017.

Source: HKMA.

Key performance indicators of the banking sector are provided in Table 5.F.

<sup>66</sup> For details, see the Announcement of the CCyB to AIs on 5 Aug 2021 (<https://www.hkma.gov.hk/eng/key-functions/banking/banking-legislation-policies-and-standards-implementation/countercyclical-capital-buffer-ccyb/>).

<sup>67</sup> The credit-to-GDP gap is the gap between the ratio of credit to GDP and its long-term trend, while the property price-to-rent gap is the gap between the ratio of residential property prices to rentals and its long-term trend.

<sup>68</sup> These include measures of bank, corporate and household leverage; debt servicing capacity; profitability and funding conditions within the banking sector and macroeconomic imbalances.



## Banking sector performance

**Table 5.F**  
**Key performance indicators of the banking sector<sup>1</sup> (%)**

	Jun 2020	Mar 2021	Jun 2021
<b>Interest rates</b>			
1-month HIBOR fixing <sup>2</sup> (quarterly average)	1.02	0.14	0.09
3-month HIBOR fixing (quarterly average)	1.35	0.24	0.18
BLR <sup>3</sup> and 1-month HIBOR fixing spread (quarterly average)	3.98	4.86	4.91
BLR and 3-month HIBOR fixing spread (quarterly average)	3.65	4.76	4.82
Composite interest rate <sup>4</sup>	0.71	0.22	0.18
<b>All AIs</b>			
<b>Balance sheet developments<sup>5</sup></b>			
Total deposits	2.2	1.2	3.4
Hong Kong dollar	2.7	2.7	4.8
Foreign currency	1.8	-0.4	2.0
Total loans	0.2	2.8	4.3
Domestic lending <sup>6</sup>	-0.8	3.6	5.7
Loans for use outside Hong Kong <sup>7</sup>	2.5	0.9	0.8
Negotiable instruments			
Negotiable certificates of deposit (NCDs) issued	-0.7	-8.0	-4.5
Negotiable debt instruments held (excluding NCDs)	5.2	-0.8	2.5
<b>Asset quality</b>			
As a percentage of total loans <sup>8</sup>			
Pass loans	97.47	97.50	97.67
Special mention loans	1.74	1.60	1.47
Classified loans <sup>9</sup> (gross)	0.79	0.89	0.86
Classified loans (net) <sup>10</sup>	0.43	0.50	0.47
Overdue > 3 months and rescheduled loans	0.49	0.61	0.58
Classified loan ratio (gross) of Mainland related lending <sup>11</sup>	0.94	0.88	0.84
<b>Liquidity ratios (consolidated)</b>			
Liquidity Coverage Ratio — applicable to category 1 institutions (quarterly average)	156.5	148.2	154.0
Liquidity Maintenance Ratio — applicable to category 2 institutions (quarterly average)	57.0	56.9	58.1
Net Stable Funding Ratio — applicable to category 1 institutions	133.1	135.7	132.6
Core Funding Ratio — applicable to category 2A institutions	138.1	142.3	142.7
<b>Retail banks</b>			
<b>Profitability</b>			
Loan impairment charges as a percentage of average total assets (year-to-date annualised)	0.13	0.03	0.05
Net interest margin (year-to-date annualised)	1.37	0.97	0.98
Cost-to-income ratio (year-to-date)	42.0	49.6	51.9
<b>Surveyed institutions</b>			
<b>Asset quality</b>			
Delinquency ratio of residential mortgage loans	0.04	0.04	0.04
Credit card lending			
Delinquency ratio	0.39	0.28	0.27
Charge-off ratio — quarterly annualised	2.82	2.08	1.87
— year-to-date annualised	2.18	2.08	1.94
<b>All locally incorporated AIs</b>			
<b>Capital adequacy (consolidated)</b>			
Common Equity Tier 1 capital ratio	16.6	16.4	15.9
Tier 1 capital ratio	18.7	18.4	17.8
Total capital ratio	20.7	20.5	19.8
Leverage ratio	8.2	8.1	7.9

## Notes:

- Figures are related to Hong Kong offices only except where otherwise stated.
- The Hong Kong Interbank Offered Rates are released by the Hong Kong Association of Banks.
- With reference to the rate quoted by The Hongkong and Shanghai Banking Corporation Limited.
- The composite interest rate is a weighted average interest rate of all Hong Kong dollar interest-rate-sensitive liabilities, which include deposits from customers, amounts due to banks, negotiable certificates of deposit and other debt instruments, and all other liabilities that do not involve any formal payment of interest but the values of which are sensitive to interest rate movements (such as Hong Kong dollar non-interest bearing demand deposits) on the books of banks. Further details can be found on the HKMA website.
- Quarterly change.
- Loans for use in Hong Kong plus trade finance.
- Including "others" (i.e. unallocated).
- Figures are related to all AIs' Hong Kong offices, as well as locally incorporated AIs' overseas branches and major overseas subsidiaries.
- Classified loans are those loans graded as "substandard", "doubtful" or "loss".
- Net of specific provisions/individual impairment allowances.
- Figures are related to all AIs' Hong Kong offices, as well as locally incorporated AIs' Mainland branches and subsidiaries.

## Box 4

### Effect of climate-related risk on the pricing of bank loans: Evidence from syndicated loan markets in Asia Pacific

#### Introduction

Climate change has been receiving increasing attention in recent years. Policymakers worldwide have shown strong commitment to tackle climate change. Most notably, over 190 countries ratified the 2015 Paris Agreement, under which countries aim to reach the global peak of greenhouse gas (GHG) emissions as soon as possible to achieve a climate-neutral world by mid-century. The transition towards a low-carbon economy is likely to have large financial implications for a wide range of industries, as their future business operations could be significantly affected by changes in climate policy and climate-related technology.

The transition towards a low-carbon economy could also have strong implications for banks. For example, governments could adopt carbon pricing to incentivise corporates to reduce GHG emissions. This could cause the future cash flows and valuation of banks' corporate borrowers, particularly for those from the largest-emitting sectors, to fall significantly, which could in turn affect the credit risks of banks' loan portfolios. It is thus important to assess how far banks have taken the associated climate-related risks, particularly transition risks<sup>69</sup>, into their lending considerations.

Against this background, this box sheds light on the issue by assessing whether banks in Asia Pacific have taken the associated transition risks into their loan pricing.<sup>70</sup>

#### Data

To study the loan pricing of transition risk, this study compiles a novel dataset by combining multiple data sources to construct a sample of syndicated loans originated in the Asia Pacific market, with the corresponding financial and environmental characteristics of the borrowers and lenders being matched. The data sources are described briefly below:

##### *a. Syndicated loan and balance sheet data*

Our analysis covers a sample of syndicated loans that were syndicated in major Asia Pacific markets (i.e. where the majority of funds were sourced to finance the loan) over the period 2010 to March 2021. The loan-level information was obtained from the *Thomson Reuters LPC DealScan* database. In addition, the financial characteristics of the borrowers and lenders are obtained from *S&P Capital IQ*, and further merged with the data of syndicated loans.

##### *b. Carbon emission data*

We gauge firms' exposure to the transition risk by their carbon emissions<sup>71</sup>. The carbon emission data of the corporates is obtained from *S&P Trucost*. The data available in Trucost are consistent with standards set out by the GHG Protocol<sup>72</sup>. Three types of carbon emission data of a corporate are available – namely scopes 1 to 3 emissions. Generally speaking, scope 1 emissions are direct emissions generated during fuel combustion activities by a firm, while scope 2 emissions are indirect emissions relating to the purchase of energy. Scope 3 emissions

<sup>69</sup> Transition risk is a financial risk which can result from the process of adjustment towards a lower-carbon economy prompted by, for example, changes in climate policy, technological changes or a change in market sentiment.

<sup>70</sup> For details, see Ho and Wong (2021) "Effect of climate-related risk on the pricing of bank loans: Evidence from syndicated loan markets in Asia Pacific", *HKMA Research Memorandum* 06/2021.

<sup>71</sup> Given that carbon dioxide constitutes a major part of total GHG emissions, we are using the term "carbon emissions" interchangeably with "GHG emissions" in this box.

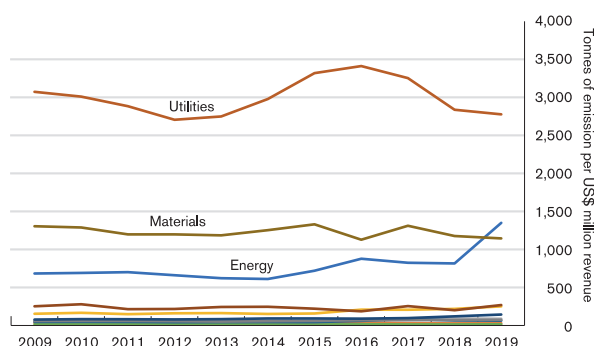
<sup>72</sup> GHG Protocol, a partnership between World Resources Institute and the World Business Council for Sustainable Development, establishes comprehensive global standardized frameworks to measure and manage GHG emissions from private and public sector operations, value chains and mitigation actions.

## Banking sector performance

comprise all other indirect emissions that occur in the company's value chain. As firms' scope 3 emissions are prone to double-counting, our analysis thus disregards firms' scope 3 emissions. To further ensure the comparability of carbon emissions across firms, the level of carbon emissions of a firm is scaled by its revenue (also referred to carbon emission intensity).

Chart B4.1 presents the average emission intensity of firms across economic sectors over time. As shown, utilities, materials and energy sectors are the largest emitting sectors (denoted as emission-intensive sectors hereafter). This observation leads us to investigate whether loan pricing of transition risk could be different for borrowers from the emission-intensive sectors versus those in other sectors, as the transition risk for the former may be much higher than the latter.

**Chart B4.1**  
Average scopes 1 and 2 carbon emission intensity across economic sectors

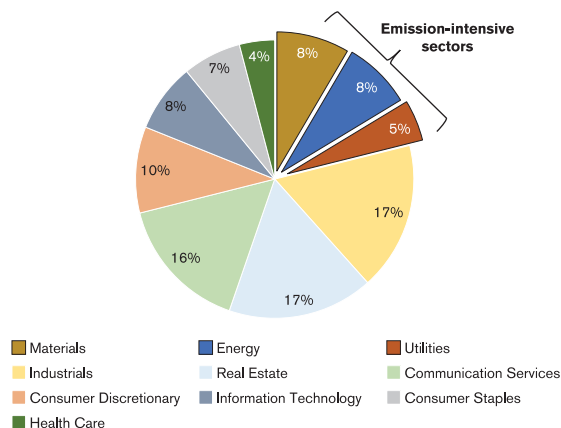


Note: Figures are calculated as the simple average of firms' scopes 1 and 2 carbon emission intensity (measured by tons of CO<sub>2</sub>e to revenues in millions of US dollars) by Global Industry Classification Standard economic sector. Other sectors include communication services, consumer discretionary, consumer staples, financials, health care, industrials, information technology and real estates.

Source: HKMA staff calculations based on S&P Trucost data.

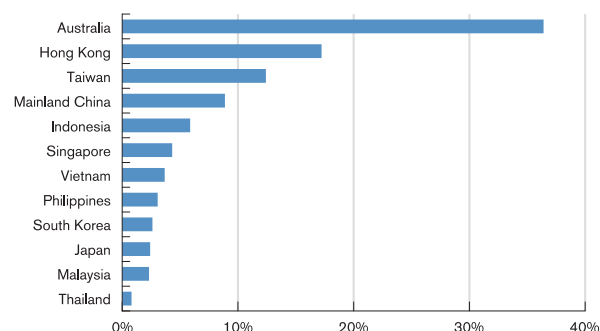
Our final sample consists of 2,842 loans for estimation, which span over 704 unique borrowing firms and 157 unique banking corporations. As seen in Chart B4.2, lending to borrowers from emission-intensive sectors accounted for a tangible share (21%) of the total amount of sampled syndicated loans over the sample period. These loans were mostly syndicated in Australia, Hong Kong and Taiwan markets (Chart B4.3).

**Chart B4.2**  
Distribution of sampled loans by sector



Source: HKMA staff calculations based on data from S&P Capital IQ and S&P Trucost.

**Chart B4.3**  
Share of loan amounts to borrowers from emission-intensive sectors by market of syndication



Note: The chart displays the share of loan amount to emission-intensive sectors by market of syndication. Market of syndication is defined as the place where the majority of funds are raised to finance the syndicated loans.

Source: HKMA staff calculations based on data from S&P Capital IQ and S&P Trucost.

### Empirical analysis and baseline findings

To assess whether banks would impose a risk premium on loans to firms with a higher emission intensity, we compare the loan spread charged to a highly emitting firm with an otherwise similar firm in the same industry but with a lower emission intensity, after controlling for other relevant loan-level, borrower and lender characteristics. Specifically, the following regression model is employed:

$$y_{i,t} = \alpha + f_{i,t} + \beta_1 High_{CO2_{i,t-1}} + \beta_2 High_{CO2_{i,t-1}} * Paris_t + \mu Paris_t + \delta' Z_{i,t} + \gamma' X_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

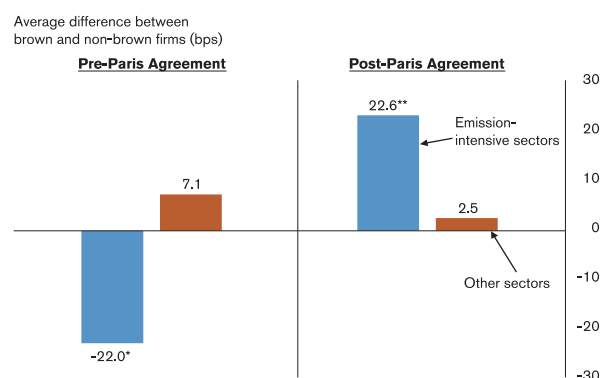
## Banking sector performance

The dependent variable ( $y_{i,t}$ ) is the lending spread over reference rates in basis points (bps) for loan  $i$  issued in year  $t$ .  $High_{CO2,i,t-1}$  is a dummy variable which takes a value of one if the borrower's emission intensity is higher than its industry average at year  $t-1$ . We classify this group of borrowers as “brown” firms.  $Z_{i,t}$  are vectors of the loan-level, while  $X_{i,t-1}$  are borrower and lender control variables.<sup>73</sup> We also include a vector of fixed effects ( $f_{i,t}$ ) over various dimensions to control for unobserved differences in the cost of bank loans.<sup>74</sup> The coefficient on  $High_{CO2,i,t-1}$  is our parameter of interest which captures the additional loan spread imposed on a “brown” borrower relative to its industry-peers. To further assess whether banks have started to price in the transition risk since the Paris Agreement in December 2015, the regression included a time dummy variable  $Paris_t$  (i.e. equals one if loans were issued in or after 2016, and is zero otherwise) and its associated interaction term with  $High_{CO2,i,t-1}$ .

The estimation results are presented in Chart B4.4.<sup>75</sup> The bars in the chart represent the estimated difference in loan spread charged to a brown borrower relative to its non-brown counterparts, after accounting for all relevant control variables. As mentioned earlier, the regression model is run separately on firms from emission-intensive sectors, (i.e. blue bars) and those from other sectors (orange bars).

Chart B4.4

## Estimated differences in loan spreads between brown and non-brown firms



## Notes

- Each bar shows the estimated average loan rate charged on brown firms minus the estimated average loan rate charged on non-brown firms in the same sector.
- \*\*, \* denote statistical significance at 5 and 10% respectively.

Source: HKMA staff calculations.

Our results suggest a large difference in the loan pricings of transition risk across the two groups of borrowers. For loans extended to borrowers in emission-intensive sectors (blue bars in the chart), banks appear to underprice the transition risk for loans that originated before the Paris Agreement, as brown firms are found to borrow at a cheaper term relative to their counterparts in the estimation. However, probably reflecting increased global awareness of climate-related risk since the Paris Agreement, banks have on average charged a higher lending rate to brown firms by 23 bps, as compared to that of non-brown firms in the post-Paris Agreement period.<sup>76</sup> Importantly, the additional loan premium is not only statistically significant but also economically meaningful. Given the average loan spread over the reference rate in our sample is 166 bps, the estimated impact is equivalent to a 14% rise in the average loan spread. We also find that the environmental attitude of banks matters in determining the extent of the transition risk premium for loans to brown firms. Based on results from a separate regression

<sup>73</sup> Loan-level control variables include logarithms of loan size, loan maturity, the number of lead arrangers in the syndicate, and dummies for the existence of financial covenants or being secured by collateral. Borrower control variables include the borrower's return on assets, the debt-to-asset ratio, logarithm of the borrower's total assets, and state-owned-enterprise dummy. Lender control variables include the average profitability, Tier-1 capital ratio and asset size of the lead arranger consortium.

<sup>74</sup> These, among others, include borrower's country, sector, loan currency and time fixed effects.

<sup>75</sup> The estimation results are based on firms' scope 1 emission intensity. The results are also quantitatively robust and similar if firms' scopes 1 and 2 emission intensity is considered. For details, see the HKMA Research Memorandum version.

<sup>76</sup> Apart from pricing in transition risk by banks, lower credit supply to brown firms due to exclusion policy (e.g. exit thermal coal financing) of some banks may also contribute to a higher lending rate to brown firms. Data limitations, however, preclude an analysis of the relative contributions of these two factors.

specification<sup>77</sup>, a “green” bank<sup>78</sup> would charge an additional loan spread of around 9 bps compared with other banks, on the same brown firm in the post-Paris Agreement period.

By contrast, for loans extended to firms in other sectors (orange bars in the chart), there is no statistically significant difference in the loan spread with respect to firms’ carbon emission intensity, both in the pre- and post-Paris Agreement periods. A plausible explanation is that, given these firms in general have relatively low level of emission intensity (see chart B4.1), the associated transition risk may be less significant, such that banks may not take the carbon emission intensity of these firms as an important determinant in their loan pricing considerations.

### Conclusion

Our analysis suggests that banks in the region have started to price-in transition risks for loans to emission-intensive sectors since the Paris Agreement<sup>79</sup>, probably reflecting their increased awareness of the climate-related risks of corporate borrowers that are more subject to the transition risk. Importantly, the findings may suggest that banks in the region started to incorporate climate risk considerations into their existing risk management framework.

Nonetheless, managing climate risks would remain one key challenge for banks due to the different natures from traditional risk types<sup>80</sup> and data gaps. Banks therefore should keep abreast of

latest developments on climate risk management practices when considering their own risk management approach. In this regard, the HKMA has actively engaged with the banking industry to facilitate AIs’ inclusions of climate risk management practices into their operations.<sup>81</sup>

<sup>77</sup> A modified model of equation (1) is conducted by including a time-varying bank-level dummy variable (“Green Bank  $b,t$ ”), which takes a value of one if the bank is classified as a green bank at time  $t$  and zero otherwise to capture the additional impact of the bank’s green attitude on loan spreads.

<sup>78</sup> Green banks are defined as members of the United Nations Environment Programme Finance Initiative and regularly self-disclosing GHG footprints at the same time.

<sup>79</sup> Ehlers et al., (2021) found similar conclusion by studying the global syndicated loan market.

<sup>80</sup> Compared to the traditional risk types, climate risks are more susceptible to non-linearity and fat-tailed distributions.

<sup>81</sup> The HKMA has been actively pushing ahead with its initiatives to address climate-related issues and promote green and sustainable banking. For instance, the HKMA published the White Paper on Green and Sustainable Banking in June 2020, which set out its initial thoughts on supervisory expectations for the management of climate risks. In addition, the HKMA issued a circular in July 2020 to share with banks a range of practices of management of climate risks adopted by the more advanced banks. The intention of the circular is to inspire rather than prescribe how banks should develop their approach to the management of climate risks. Furthermore, the HKMA has invited some banks to participate in a pilot climate stress testing exercise with a view to assessing the climate resilience of the banking sector as a whole. For details, see <https://www.hkma.gov.hk/eng/key-functions/banking/banking-regulatory-and-supervisory-regime/green-and-sustainable-banking/>.