

5. Banking sector performance

Retail banks registered thinner profit in the second half of 2021. Classified loan ratio slightly increased during the review period, but remained low and sound by historical and international standards. The Hong Kong banking sector remained resilient, underpinned by robust capital and liquidity positions. During the review period, the HKMA extended various support measures to further help the economy ride out this difficult period. In the near term, the rapid spread of the Omicron variant could threaten the economic recovery. This, coupled with risks of a faster-than-expected pace of US monetary policy normalisation, will pose challenges to banks' credit risk management. Banks should therefore remain vigilant and carefully assess the potential impacts on the asset quality of their loan portfolios.

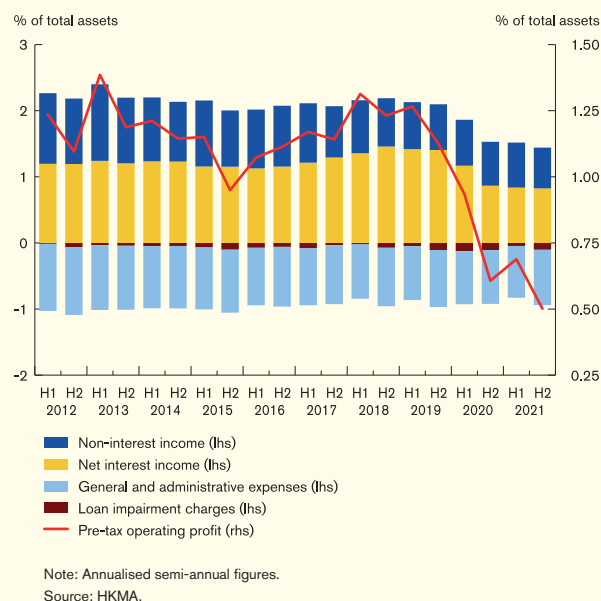
5.1 Profitability and capitalisation

Profitability

The aggregate pre-tax operating profit of retail banks⁴⁸ decreased by 16.1% in the second half of 2021, compared with the same period in 2020. The lacklustre earnings performance was driven by decreases in both net-interest and non-interest incomes, and an increase in operating expenses. As a result, the return on assets declined to 0.50% in the second half of 2021, compared with 0.61% in the same period in 2020 (Chart 5.1).

For 2021 as a whole, the aggregate pre-tax operating profit decreased by 18.6% compared with 2020, while the return on assets dropped from 0.77% to 0.59%.

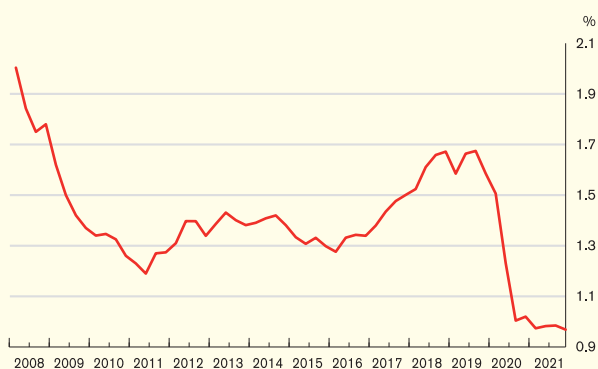
Chart 5.1
Profitability of retail banks



Amid the prolonged low interest rate environment, the net interest margin (NIM) of retail banks also stayed at a low level of 0.98% in the second half of 2021 (Chart 5.2).

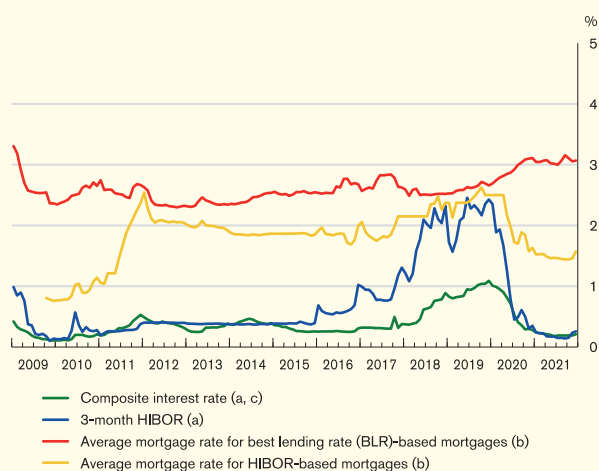
⁴⁸ Throughout this chapter, figures for the banking sector relate to Hong Kong offices only, unless otherwise stated.

Chart 5.2
Net interest margin of retail banks



Note: Annualised quarterly figures.
Source: HKMA.

Chart 5.3
Interest rates



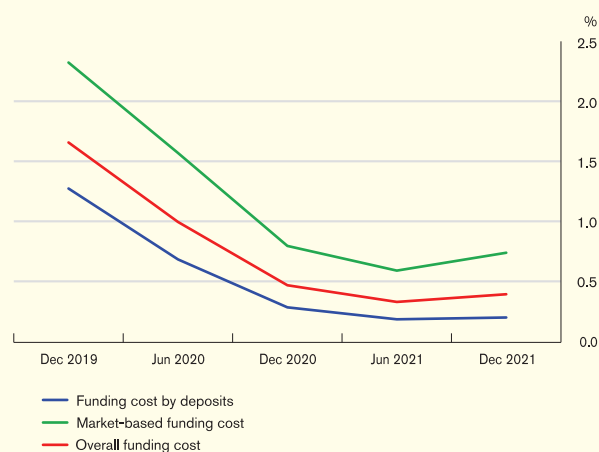
Notes:
(a) End-of-period figures.
(b) Period-average figures for newly approved loans.
(c) Since June 2019, the composite interest rate has been calculated based on the new local "interest rate risk in the banking book" (IRRBB) framework. As such, figures from June 2019 onwards are not strictly comparable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

Reflecting year-end funding demand and a lower level of the Aggregate Balance (AB) after the increased issuances of Exchange Fund Bills (EFBs) by the HKMA,⁴⁹ Hong Kong interbank interest rates picked up mildly in the last quarter of 2021. Nevertheless, they remained at relatively low levels amid the still very ample liquidity in the banking system. Specifically, the three-month Hong Kong Interbank Offered Rate (HIBOR) registered a mild increase of 9 basis points from six months ago to 0.26% at the end of December 2021 (blue line in Chart 5.3).

Funding costs of retail banks remained stable during the review period. In particular, the average Hong Kong dollar funding costs for retail banks, as measured by the composite interest rate, increased mildly by 3 basis points to 0.21% at the end of 2021 from 0.18% six months ago (green line in Chart 5.3).

More broadly, the overall Hong Kong dollar and US dollar funding costs for licensed banks in Hong Kong edged up by 6 basis points during the second half of 2021 (red line in Chart 5.4).

Chart 5.4
Hong Kong dollar and US dollar funding costs 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 has been calculated as the weighted averages of the respective funding costs 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.

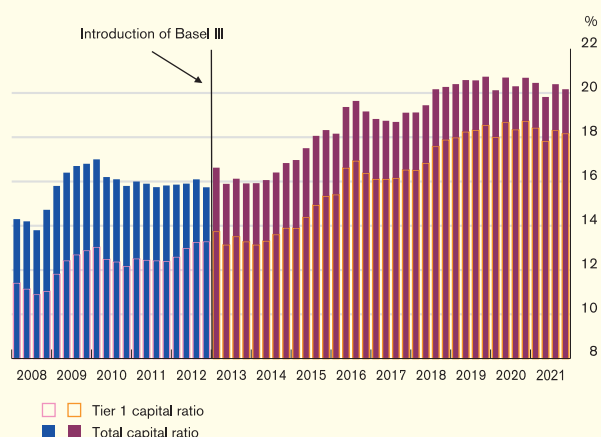
⁴⁹ The HKMA increased the issuances of EFBs by HK\$120 billion to meet the demand by banks in the second half of 2021.

While the prospect of the US monetary policy normalisation may point to a better outlook on banks' profitability, the near-term improvement may be partially offset by two factors. First, although the Fed will have multiple rate hikes in 2022, past experience⁵⁰ suggests that the pass through to domestic interest rates may be lagging, particularly when the domestic interbank liquidity condition remains abundant. Thus, it may take time to see the positive impacts on banks' NIMs. In addition, the surge of Omicron variant cases could pose uncertainties on economic recovery, weighing on banks' asset quality and thus 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 20.2% at the end of 2021 (Chart 5.5), considerably above the international minimum requirement of 8%. The Tier 1 capital ratio and Common Equity Tier 1 (CET1) capital ratio were 18.2% and 16.2% respectively in the same period. In addition, the non-risk-based Leverage Ratio⁵¹ (LR) of locally incorporated AIs recorded a healthy level of 7.9% at the end of 2021, exceeding the statutory minimum of 3%.

Chart 5.5
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

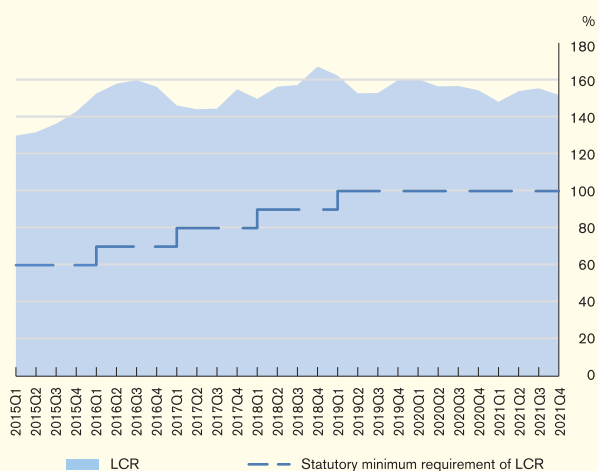
The liquidity positions of the banking sector, as measured by the Basel III Liquidity Coverage Ratio (LCR)⁵², remained sound during the review period. The average LCR of category 1 institutions maintained at 151.9% in the fourth quarter of 2021 (Chart 5.7), staying well above the statutory minimum requirement of 100%. The average Liquidity Maintenance Ratio (LMR) of category 2 institutions was 59.1% during the same period, also well above the statutory minimum requirement of 25%.

⁵⁰ In the previous US interest rate upcycle between 2016 and 2018, Hong Kong dollar interest rates started to increase notably only after multiple US policy rate hikes and a sizable reduction in the AB.

⁵¹ 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).

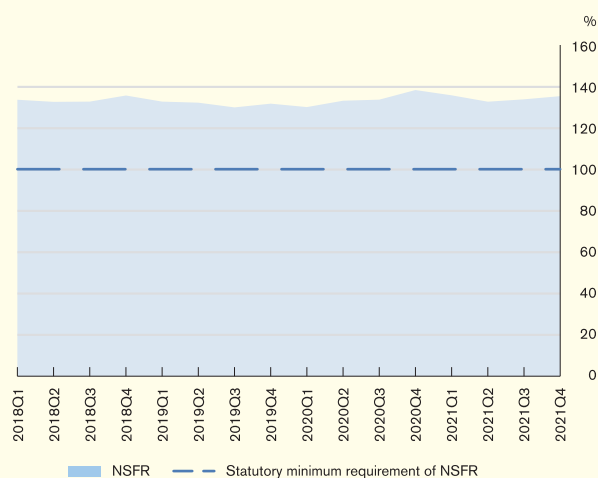
⁵² The Basel III LCR requirement is designed to ensure that banks have sufficient high-quality liquid assets to survive a significant stress scenario lasting 30 calendar days. In Hong Kong, AIs designated as category 1 institutions adopt the LCR; while category 2 institutions adopt the LMR. For details,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

Chart 5.6
Liquidity Coverage Ratio



Notes:
1. Consolidated basis.
2. Quarterly average figures.
Source: HKMA.

Chart 5.7
Net Stable Funding Ratio

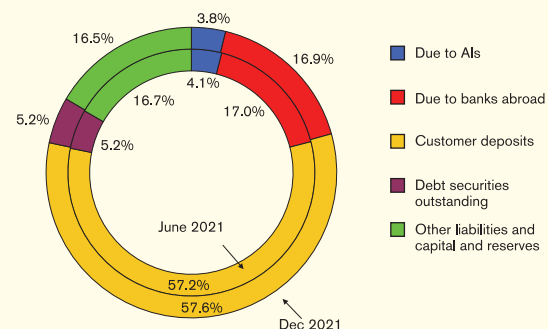


Note: Consolidated basis.
Source: HKMA.

The latest ratios of the Net Stable Funding Ratio (NSFR)⁵³ requirement also reflected a stable funding position of AIs. The average NSFR of category 1 institutions remained at a high level of 135.3% in the fourth quarter of 2021 (Chart 5.7), well above the statutory minimum requirement of 100%. The average Core Funding Ratio (CFR) of category 2A institutions also registered a high level of 150.4%, exceeding the statutory minimum requirement of 75%. These indicate that the Hong Kong banking sector is well positioned to withstand liquidity shocks.

Customer deposits continued to be the primary source of funding for AIs. At the end of 2021, the share of customer deposits to all AIs' total liabilities hovered around 57.6%, which is similar to 57.2% six months ago (Chart 5.8).

Chart 5.8
The liability structure of all AIs



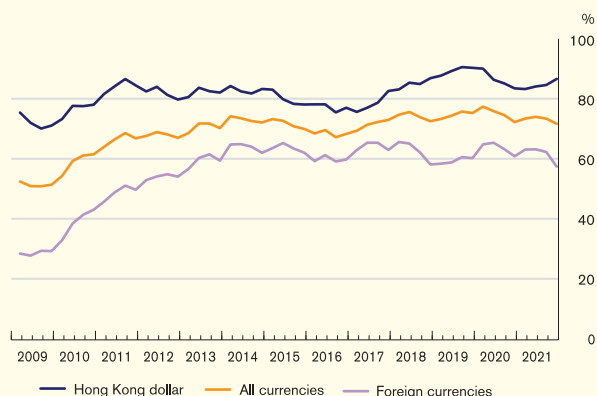
Notes:
1. Figures may not add up to total due to rounding.
2. Figures refer to the percentage of total liabilities, including capital and reserves.
3. Debt securities comprise negotiable certificates of deposit and all other negotiable debt instruments.
Source: HKMA.

⁵³ 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).

In the second half of 2021, while total deposits of the banking sector flattened, total loans and advances declined moderately. As a result, the average all-currency loan-to-deposit (LTD) ratio for the banking sector declined moderately to 71.8% at the end of 2021 from 74.1% at the end of June 2021 (Chart 5.9).

The decline in all-currency LTD was mainly driven by a decrease in foreign currency LTD ratio, which more than offset the increase in the Hong Kong dollar LTD. Reflecting a decline in foreign currency loans and a rise in corresponding deposits, the average foreign currency LTD ratio dropped to 57.5% at the end of 2021, from 63.3% six months ago. By contrast, as the decline in Hong Kong dollar deposits outweighed the drop in Hong Kong dollar loans, the Hong Kong dollar LTD ratio increased moderately to 86.7% from 84.2% six months ago.

Chart 5.9
Average loan-to-deposit ratios of all AIs

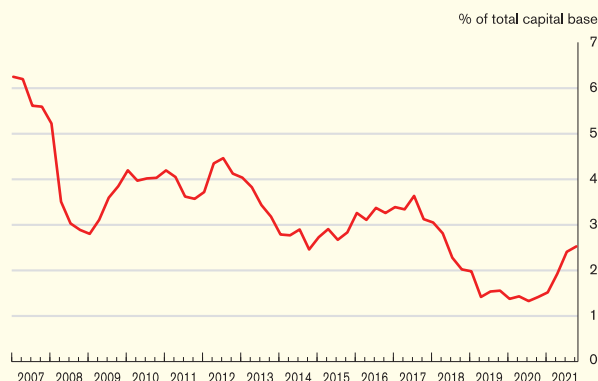


Note: End-of-quarter figures.
Source: HKMA.

Interest rate risk

The interest rate risk exposure of locally incorporated licensed banks increased slightly, but still remained at a relatively low level in the fourth 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 by an amount equivalent to 2.53% of their total capital base at the end of 2021 (Chart 5.10).⁵⁴

Chart 5.10
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 2021.
2. The impact of the interest rate shock refers to its impact on the economic value of the banking and trading book⁵⁵, 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

Mainly due to the high base effect arising from IPO-related loans straddled at the end of June, bank credit recorded a decrease in the second half of 2021. However, for 2021 as a whole, total credit of the banking sector still recorded an annual growth rate of 3.8%, up from 1.2% in 2020.

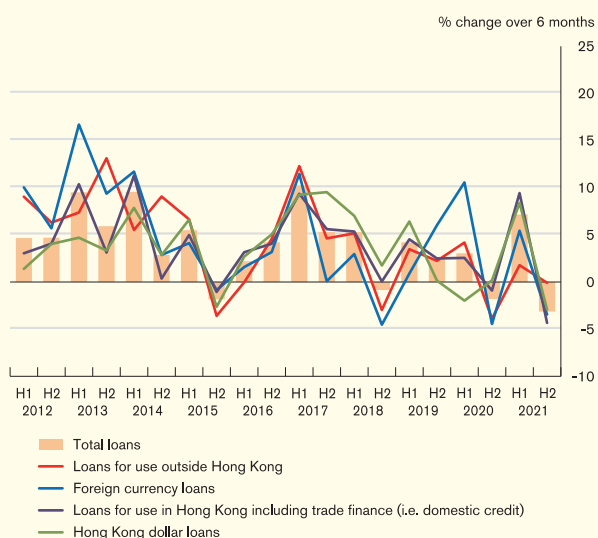
On a half-yearly basis, total loans and advances of all AIs decreased by 3.1% in the second half of 2021 (Chart 5.11). Excluding the IPO-related loans straddled at the end of June 2021, total loans and advances edged down by 0.6% during the same period. This slight decline (excluding IPO-related loans) was mainly driven by a mild decrease in domestic loans (comprising loans for

⁵⁴ 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.

⁵⁵ 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.

use in Hong Kong and trade financing). Domestic loans (excluding IPO-related loans at June 2021) contracted by 0.8%⁵⁶ during the second half, after recording a robust growth of 5.6% in the preceding six months. Loans for use outside Hong Kong remained broadly steady during the review period.

Chart 5.11
Loan growth



Note: Since December 2018, figures for loans for use in or outside 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 stay stable in the near term. According to the results of the HKMA Opinion Survey on Credit Condition Outlook in December 2021, the share of surveyed AIs expecting loan demand to remain the same in the following three months increased from 67% to 70% compared to the results conducted six months ago (Table 5.A).

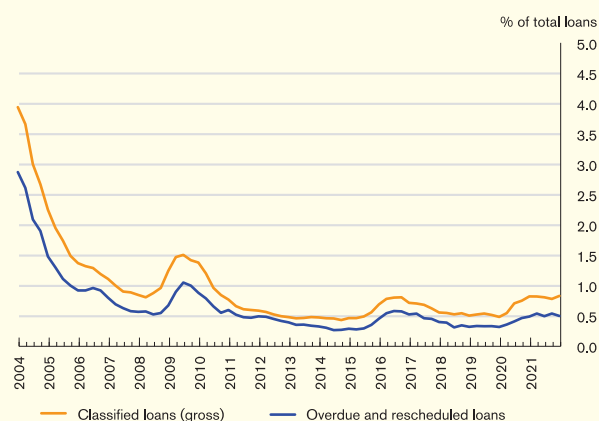
Table 5.A
Expectations of loan demand in the next three months

% of total respondents	Mar-21	Jun-21	Sep-21	Dec-21
Considerably higher	7	7	3	0
Somewhat higher	30	23	30	23
Same	57	67	60	70
Somewhat lower	7	3	7	7
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 gross classified loan ratio (CLR) of all AIs increased slightly to 0.88% at the end of 2021 from 0.86% in June, while the ratio of overdue and rescheduled loans of all AIs edged down to 0.56% from 0.58%. For retail banks, the gross CLR increased slightly to 0.83%, while the ratio of overdue and rescheduled loans stayed at a low level of 0.50% (Chart 5.12). Despite the slight increases, asset quality remained sound by both historical and international standards.

Chart 5.12
Asset quality of retail banks



Notes:
1. Classified loans are those loans graded as "sub-standard", "doubtful" or "loss".
2. 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.

⁵⁶ Domestic loans would have decreased by 4.3% in the second half of 2021 if IPO-related loans were included.

*Household exposure*⁵⁷

Household debt grew steadily by 4.4% in both the first half and second half of 2021 (Table 5.B). A breakdown of the data shows that the growth of personal loans slowed to 1.6% in the second half from 5.3% in the first half of 2021, while the growth of residential mortgage loans accelerated to 5.7% from 4.0%.

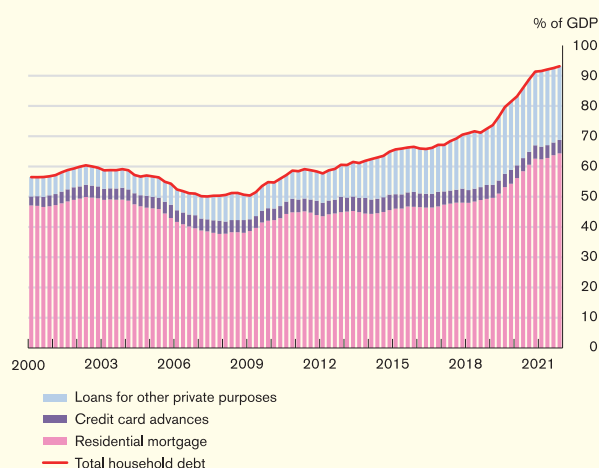
Table 5.B
Half-yearly growth of loans to households of all AIs

(%)	2019		2020		2021	
	H1	H2	H1	H2	H1	H2
Residential mortgages	4.7	5.5	3.5	4.7	4.0	5.7
Personal loans	11.2	5.9	-2.4	2.2	5.3	1.6
of which:						
Credit card advances	-3.8	4.1	-9.0	0.0	-0.4	8.1
Loans for other private purposes	14.9	6.2	-1.1	2.6	6.4	0.5
Total loans to households	6.8	5.6	1.5	3.9	4.4	4.4

Source: HKMA.

The household debt-to-GDP ratio edged up to 93.1% in the second half of 2021 from 92.1% in the first half (Chart 5.13), due to the growth in household debt (driving the ratio up by 4.1 percentage points), which was partly offset by the growth in the nominal GDP (offsetting 3.1 percentage points).

Chart 5.13
Household debt-to-GDP and its components



Notes:

1. Only borrowings from AIs are covered.
2. GDP refers to the annualised GDP, which is the sum of the quarterly GDP in the trailing four quarters.
3. Since December 2018, the figure for household debt has been restated to reflect AIs' reclassification of working capital loans.

Source: HKMA.

It is noteworthy that the household debt-to-GDP ratio is a widely-used measure for gauging the financial soundness of households due to its simplicity. When interpreting this ratio, it is important to take into account that: (1) the denominator of the ratio uses nominal GDP as a proxy for the household income for ease of comparison across economies, and is thus not the actual income of the households with borrowing. Therefore, the household debt-to-GDP ratio does not reflect the actual debt-servicing burden of households in the economy; and (2) the numerator takes into account only the gross debts of households (instead of the net debts which take into account household assets).

As such, a full and objective assessment of the risks associated with household debt requires the consideration of other factors, including the actual debt servicing ratio and the asset side of the household balance sheet. In fact, the average debt servicing ratio of new mortgages remained at a healthy level of 36.0% in January 2022. The household net worth has also stayed at a high level. Specifically, both the net worth-to-liabilities ratio and safe asset-to-liabilities ratio of Hong Kong's household sector remained high at

⁵⁷ 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 comprises mainly loans to private banking and wealth management customers secured by financial assets, credit card advances and unsecured personal loans. At the end of 2021, household lending made up 34.5% of domestic lending.

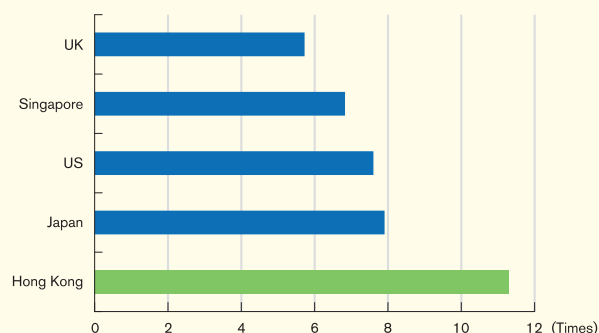
11.3 times and 2.96 times respectively in 2020 (Charts 5.14 and 5.15), which are much higher than those of most other developed economies. This suggests that Hong Kong’s households, on aggregate, are financially sound and have a strong buffer to cushion potential financial and economic shocks.

The HKMA has been closely monitoring household indebtedness and regularly collecting data from banks. The majority of household debts are residential mortgage loans, which are governed by the macroprudential policy framework, as well as collateralised loans to wealth management customers against financial assets. These two types of loans accounted for about 90% of the household debt. Coupled with the fact that household net worth remaining at a high level, the HKMA considers the household balance sheet is healthy and the associated credit risk is manageable.

For residential mortgages, the average LTV ratio and average debt-servicing ratio of newly approved mortgage loans have stayed at healthy levels following the introduction by the HKMA of several rounds of countercyclical macro-prudential measures since 2009. 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.

The HKMA also requires banks to conduct prudent operations on credit card advances 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.

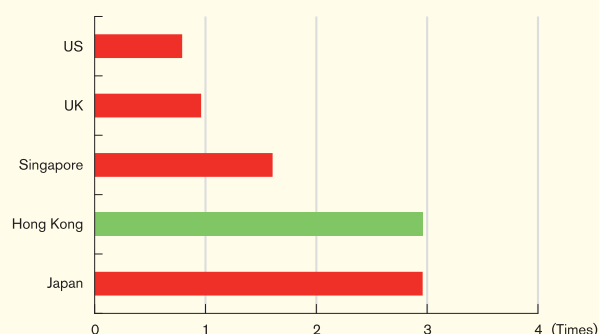
Chart 5.14
Household net worth-to-liabilities ratio for selected economies



Note: Japan figures refer to those at end-2019, while other figures refer to those at end-2020.

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

Chart 5.15
Safe assets-to-liabilities ratio for selected economies

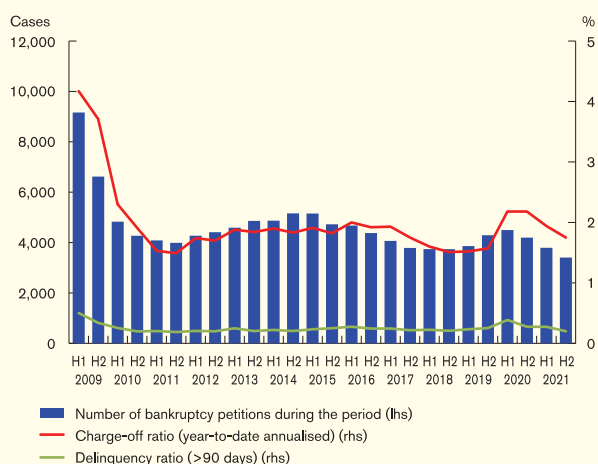


Note: Safe assets comprise deposits, as well as currencies if data is available. In the case of Hong Kong, safe assets refer to deposits only. Japan figures are from end-2019, while all other reported figures are from end-2020.

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

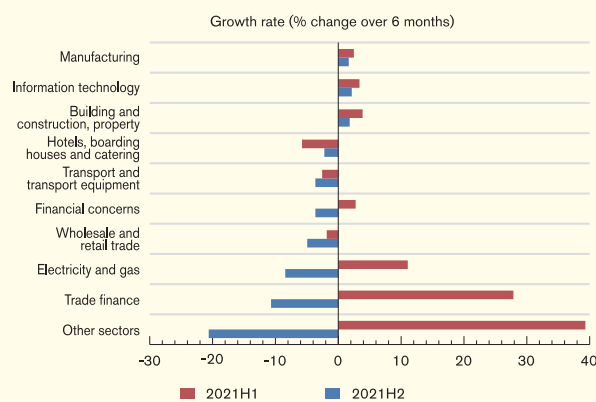
For unsecured household exposure, the associated credit risk remained contained during the review period. The year-to-date annualised credit card charge-off ratio decreased to 1.75% in the fourth quarter of 2021 from 1.94% in the second quarter of 2021, while the delinquency ratio dropped to 0.20% in the same period (Chart 5.16). The number of bankruptcy petitions decreased further in the second half of 2021 compared with the preceding six months.

Chart 5.16
Charge-off ratio and delinquency ratio for credit card lending and bankruptcy petitions



Sources: Official Receiver's Office and HKMA.

Chart 5.17
Growth in domestic corporate loans by selected sector



Source: HKMA.

Corporate exposure⁵⁸

Domestic corporate loans (excluding IPO-related loans straddled at end-June) declined by 3.4%⁵⁹ on a half-yearly basis at the end of 2021, after recording a strong growth of 6.4% during the first half. In particular, trade finance and loans for use in the electricity and gas sector decreased notably in the second half, after registering a strong expansion in the first half. Loans to economic sectors mostly affected by the pandemic, such as transportation, wholesale and retail, and hotel and accommodation services, continued to decline in the review period (Chart 5.17).

The demand-side survey on the credit conditions of SMEs showed that SME's perception remained stable in the fourth quarter of 2021, with 13% of the respondents perceiving credit approval as "more difficult" relative to six months ago, broadly similar to the 12% registered in the third quarter of 2021 (Chart 5.18), and down from an average 29% in the first half of 2021. Of the respondents with existing credit lines, 5% indicated a tighter stance by banks in the fourth quarter of 2021, virtually unchanged from the previous quarter (Chart 5.19).

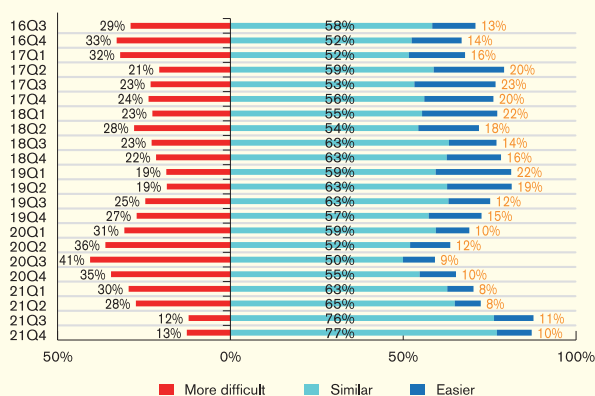
Continuing its support to SMEs, in February 2022, the HKMA announced the extension of the Pre-approved Principal Payment Holiday Scheme (the Scheme) to the end of October 2022. At the same time, the Scheme offered an option to corporates which are financially capable and willing to resume principal repayment gradually, to repay 20% of the original principal repayment amount over a period of one year on a voluntary basis. By the end of February 2022, over 86,000 credit relief cases had been granted to corporate customers under the Scheme and other initiatives implemented by banks during the pandemic, involving an aggregate amount of over HK\$930 billion. In addition, the Hong Kong Mortgage Corporation Limited has extended the application period for the 80% Guarantee Product, the 90% Guarantee Product and the

⁵⁸ Excluding interbank exposure. At the end of 2021, the share of corporate loans in domestic lending was 65.4%.

⁵⁹ If IPO loans straddled at the end of June 2021 were included, domestic corporate loans would have decreased by 8.3% in the second half of 2021.

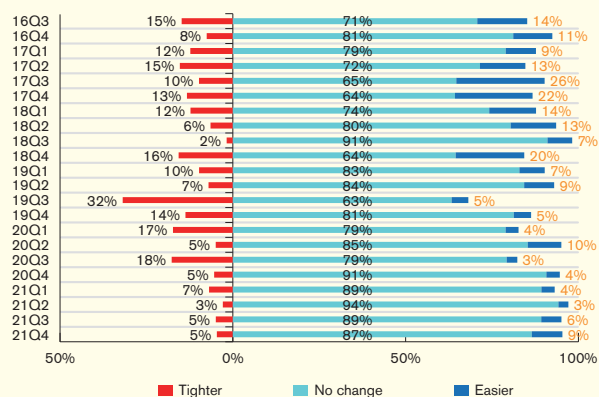
Special 100% Loan Guarantee of the SME Financing Guarantee Scheme to end-June 2023. The maximum loan amount per enterprise under the Special 100% Loan Guarantee was raised from the total amount of employee wages and rents for 18 months to that for 27 months, subject to a ceiling of HK\$9 million (originally HK\$6 million), and the maximum repayment period was extended from eight years to ten years. The principal moratorium arrangement under the SME Financing Guarantee Scheme has been extended by six months to a total of 30 months, and the application period for the principal moratorium has also been extended to the end of December 2022. Meanwhile, an option for borrowers to resume making partial principal repayment for one year was provided, allowing borrowers to resume normal repayment gradually if they are willing and capable. By the end of February 2022, over 48,000 applications involving more than HK\$85 billion in loans had been approved under the Special 100% Loan Guarantee. With the overarching objective of maintaining banking stability, the HKMA will from time to time review the case for further extension of the various relief measures.

Chart 5.18
SMEs' perception of banks' credit approval stance relative to six months ago



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

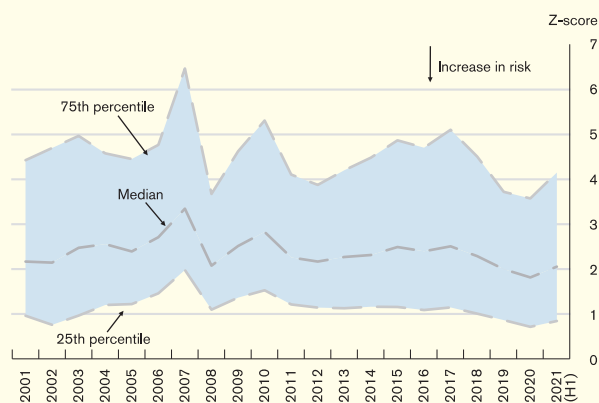
Chart 5.19
SMEs' reported change in banks' stance on existing credit lines



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

There were signs of improvement in the financial health of corporates amid the notable economic recovery in 2021. Based on accounting data for all non-financial corporates listed in Hong Kong, the Altman's Z score (a default risk measure for non-financial corporates) saw an across-the-board increase during the first half of 2021, reflecting a lower default risk of these corporates (Chart 5.20).

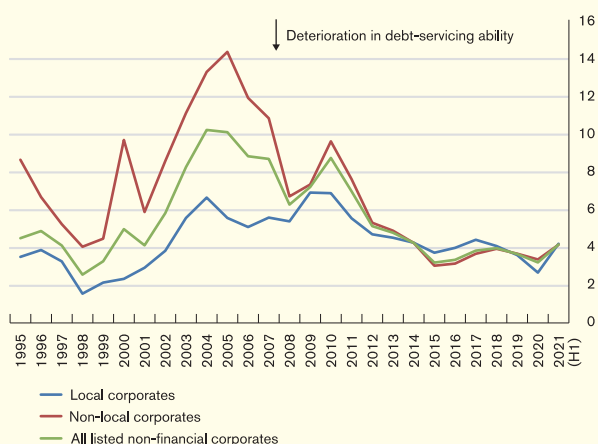
Chart 5.20
Altman's Z-score of listed non-financial corporates in Hong Kong



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-February 2022.
Source: HKMA staff calculations based on estimates compiled by Bloomberg.

Consistent with the observation in the Altman’s Z-score, listed non-financial corporates’ debt servicing ability also recorded an improvement during the same period. The weighted average interest coverage ratios (ICRs) for both local and non-local corporates rebounded in the first half of 2021 (the blue and red lines in Chart 5.21), mainly due to a recovery in corporate earnings.

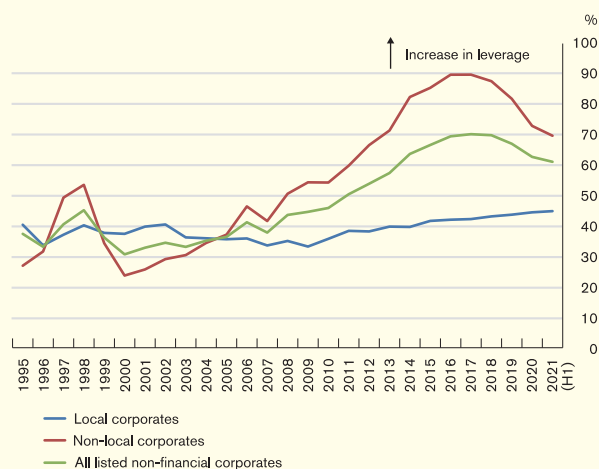
Chart 5.21
Interest coverage ratio of listed non-financial corporates in Hong Kong



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-February 2022.
 Source: HKMA staff estimates based on data from Bloomberg.

The weighted average debt-to-equity ratio, a common measure of corporate leverage, decreased slightly in the first half of 2021 for listed non-financial corporates in Hong Kong (the green line in Chart 5.22), as non-local corporates continued to deleverage (the red line in Chart 5.22). While the average leverage for local corporates increased mildly (the blue line in Chart 5.22), the current level remained relatively low.

Chart 5.22
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-February 2022.
 Source: HKMA staff estimates based on data from Bloomberg.

The financial fundamentals of corporates improved in 2021, but how long this may persist will hinge on the development of several downside risk factors, including uncertainties over the spread of new variants and the pace of the US monetary policy tightening. These risk factors, if intensified, can again drag on business sentiment and weigh on firms’ financial fundamentals. Therefore, banks should continue to stay vigilant and assess the potential impact of these risk factors on the credit risk of their corporate exposures.

Mainland-related lending and non-bank exposures

The banking sector’s total Mainland-related lending decreased by 3.2% to HK\$4,725 billion (15.8% of total assets) at the end of December 2021, from HK\$4,880 billion (16.3% of total assets) at the end of June 2021 (Table 5.C). Other non-bank exposures increased by 0.5% to HK\$1,984 billion (Table 5.D).

Banking sector performance

Table 5.C
Mainland-related lending

HK\$ bn	Mar 2021	Jun 2021	Sep 2021	Dec 2021
Mainland-related loans	4,747	4,880	4,918	4,725
Mainland-related loans excluding trade finance	4,435	4,500	4,511	4,410
Trade finance	312	380	407	315
By type of AIs:				
Overseas incorporated AIs	1,776	1,769	1,824	1,678
Locally incorporated AIs*	2,157	2,261	2,232	2,172
Mainland banking subsidiaries of locally incorporated AIs	814	850	861	875
By type of borrowers:				
Mainland state-owned entities	1,959	1,983	2,007	1,844
Mainland private entities	1,440	1,493	1,484	1,472
Non-Mainland entities	1,348	1,403	1,426	1,409

Notes:

- * Including loans booked in Mainland branches of locally incorporated AIs.
- Figures may not add up to the total due to rounding.

Source: HKMA.

Table 5.D
Other non-bank exposures

HK\$ bn	Mar 2021	Jun 2021	Sep 2021	Dec 2021
Negotiable debt instruments and other on-balance sheet exposures	1,368	1,465	1,481	1,494
Off-balance sheet exposures	492	510	526	490
Total	1,860	1,974	2,006	1,984

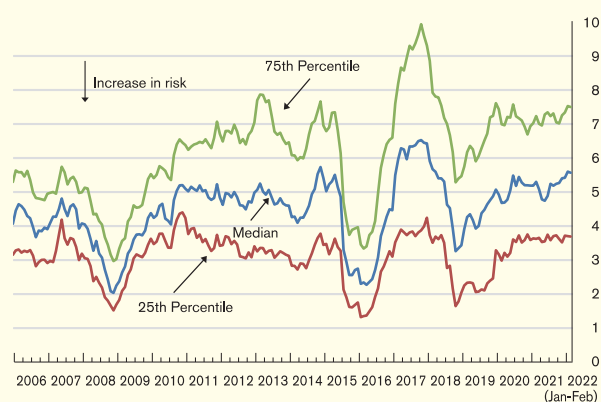
Note: Figures may not add up to the total due to rounding.

Source: HKMA.

The gross CLR of Mainland-related lending of all AIs⁶⁰ was 0.85% at the end of 2021, a level largely similar to 0.84% at end-June 2021.

The distance-to-default (DTD) index⁶¹ (a forward-looking market-based indicator) also suggested a stabilisation in the default risk of the Mainland corporate sector during the review period. More specifically, the median and 75th percentiles of the DTD index slightly improved compared with six months earlier (Chart 5.23).

Chart 5.23
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.

However, in view of the economic headwinds facing the Mainland economy arising from the recent outbreak of Omicron variant cases in some provinces, and the property market downturn, banks should stay attentive to the credit risk management of their Mainland-related exposures.

Macro stress testing of credit risk⁶²

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 5.24 presents a simulated future credit loss rate of retail banks in the fourth quarter of 2023 under four specific macroeconomic shocks⁶³ using information up to the fourth quarter of 2021.

⁶⁰ Figures cover AIs' Hong Kong offices and Mainland branches and subsidiaries.

⁶¹ 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.

⁶² 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.

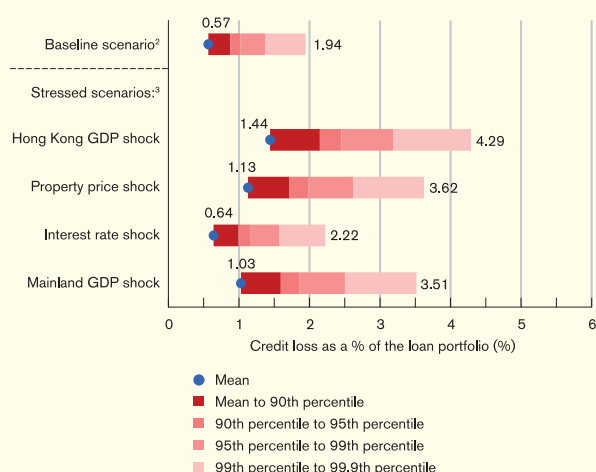
⁶³ These shocks are calibrated to be similar to those that occurred during the Asian financial crisis, except the Mainland GDP shock.

Banking sector performance

In stressed scenarios, the expected average credit losses two years after different macroeconomic shocks are estimated to be moderate, ranging from 0.64% (Interest rate shock) to 1.44% (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 2.22% (Interest rate shock) to 4.29% (Hong Kong GDP shock), which are significant, but smaller than the estimated loan loss of around 4.5% following the Asian financial crisis.

Chart 5.24
The mean and value-at-risk statistics of simulated credit loss distributions¹



Notes:

- The assessments assume the economic conditions in Q4 2021 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 Q1 2022 to Q4 2022.
 - 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 Q1 2022 to Q4 2022.
 - Interest rate shock:** A rise in real interest rates (HIBORs) by 300 basis points in the first quarter (i.e. Q1 2022), followed by no changes in the second and third quarters, and another rise of 300 basis points in the fourth quarter (i.e. Q4 2022).
 - Mainland GDP shock:** An average year-on-year real GDP growth rate of 2% for the four consecutive quarters starting from Q1 2022.

Source: HKMA staff estimates.

5.4 Systemic risk

Underpinned by the continued economic recovery and an easing of local epidemic situation in the second half of 2021, the systemic risk of Hong Kong banking sector has thus far been contained.

Nevertheless, the global and domestic economic outlooks have been clouded by several downside risks, most eminently the uncertainties surrounding the development of the pandemic and the pace of US monetary policy normalisation. The escalating Russian-Ukraine geopolitical tensions may also increase the downside risks to the global economy. These risk factors, if intensified, would pose challenges to banks in Hong Kong on various fronts.

In particular, if the widespread transmission of the Omicron variant leads to a more stringent and prolonged tightening of social distancing measures, it could drag down economic activities and delay the recovery for many corporates. Particularly, given that many corporates have still not fully recovered from their pre-pandemic positions and that some also have a thinner financial buffer than before, their resilience to a deterioration of the epidemic situation could be called into question. Banks should therefore continue to uphold their credit risk management and reassess the potential impacts of the pandemic on the financial fundamentals of their corporate borrowers.

The pace of US interest rate hikes is another key risk factor to be watched carefully. In view of rising inflationary pressure in the US,⁶⁴ their interest rate hikes could become faster than initially expected. Any abrupt surge in US interest rates could potentially trigger a sharp tightening in global financial conditions and may lead to heightened volatility in capital flows and interest rates in the region.

⁶⁴ Related discussions are provided in Chapter 2.1.

While rising interest rates may help banks to improve their NIMs, the resulting higher funding costs for corporates could weaken corporate profitability amid the renewed outbreak of the pandemic. This could put the debt servicing ability of corporates (particularly those highly leveraged) under the test. This would pose challenges to banks' credit risk management for their corporate exposures.

Notwithstanding this, the strong capital and liquidity positions of the Hong Kong banking sector should provide strong buffers to withstand shocks arising from these risk factors.

From a longer term perspective, climate-related risks will likely have significant implications for financial stability. In particular, the transition towards a low-carbon economy will inevitably affect many economies and sectors on various fronts. Therefore, it is vital to strengthen the climate risk assessment and monitoring framework globally. In this regard, the HKMA has recently conducted and published the results of the first pilot climate risk stress test exercise (CRST) on the Hong Kong banking sector.⁶⁵

Correspondingly, Box 5 develops a top-down analytical framework to assess the financial impacts of climate-related risks on non-financial corporates listed in Hong Kong, based mainly on two climate reference scenarios by the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). The analysis strengthens our systemic risk analysis on climate-related issues and shows the HKMA's commitment to supporting the NGFS Glasgow Declaration.⁶⁶

An important finding from our analysis is that the longer-term impacts of climate transition risks on firms' default risks would be significantly smaller in the "orderly transition" scenario than in the "disorderly transition" scenario. In addition, the impact of physical risks under these two transition scenarios is found to be lower than the "no action" case. The results together support that there are clear benefits to taking climate action, and acting early.

The countercyclical capital buffer for Hong Kong

The countercyclical capital buffer (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 to continue providing credit to support the real economy. The latest applicable jurisdictional CCyB for Hong Kong, announced on 28 January 2022, was 1.0%.⁶⁷

In setting the CCyB, 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 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).⁶⁸ 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.⁶⁹

⁶⁵ The pilot climate risk stress test exercise (CRST) was launched in January 2021 with 27 participating banks. For details, see "Pilot Banking Climate Risk Stress Test", HKMA, 30 December 2021.

⁶⁶ The HKMA issued a statement in November to support the NGFS Glasgow Declaration. For details, see "Supporting the Central Banks and Supervisors Network for Greening the Financial System Glasgow Declaration", HKMA, 3 November 2021.

⁶⁷ For details, see the Announcement of the CCyB to AIs on 28 January 2022 (<https://www.hkma.gov.hk/eng/key-functions/banking/banking-legislation-policies-and-standards-implementation/countercyclical-capital-buffer-ccyb/>).

⁶⁸ 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.

⁶⁹ 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

For the latest situation, the indicative buffer guide, calculated based on the third-quarter data of 2021, signals a CCyB of 1.50%. 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 last 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 January 2022, suggests that although the latest economic indicators point to a continued recovery in Hong Kong in the fourth quarter of 2021, uncertainties about the global and domestic pandemic situations remained elevated. Therefore, the Monetary Authority considered that it is appropriate to keep the CCyB unchanged at 1.0% and continue to monitor the situation closely.

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

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

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

	5-Aug-21	28-Oct-21	28-Jan-22
Announced CCyB rate	1.0%	1.0%	1.0%
Date effective	05/08/2021	28/10/2021	28/01/2022
Indicative buffer guide	2.5%	2.3%	1.6%
Basel Common Reference Guide	2.5%	2.5%	2.5%
Property Buffer Guide	2.5%	1.8%	0.8%
Composite CCyB Guide	2.5%	2.3%	1.6%
Indicative CCyB Ceiling	None	None	None
<i>Primary gap indicators</i>			
Credit/GDP gap	13.8%	18.6%	10.7%
Property price/rent gap	10.3%	7.8%	4.7%
<i>Primary stress indicators</i>			
3-month HIBOR spread (percentage points)	0.15%	0.12%	0.08%
Quarterly change in classified loan ratio (percentage points)	0.00%	-0.01%	-0.03%

Notes:

- 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 the end of each quarter (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 the end of the quarter) is shown at the top of the column.
- Following a review of the appropriate risk-free rate benchmark (previously identified as the three-month Overnight Index Swap (OIS) rate), the HKMA amended the definition of the interbank market spread to the difference between the three-month HIBOR and the three-month Exchange Fund Bill yield on April 2017.

Source: HKMA.

Table 5.F
Key performance indicators of the banking sector¹ (%)

	Dec 2020	Sep 2021	Dec 2021
Interest rates			
1-month HIBOR fixing ² (quarterly average)	0.27	0.07	0.11
3-month HIBOR fixing (quarterly average)	0.42	0.15	0.20
BLR ³ and 1-month HIBOR fixing spread (quarterly average)	4.73	4.93	4.89
BLR and 3-month HIBOR fixing spread (quarterly average)	4.58	4.85	4.80
Composite interest rate ⁴	0.28	0.19	0.21
All AIs			
Balance sheet developments⁵			
Total deposits	-1.8	-1.2	+1.2
Hong Kong dollar	-4.4	-4.9	-0.9
Foreign currency	+1.1	+2.8	+3.3
Total loans	-4.8	-2.0	-1.2
Domestic lending ⁶	-5.6	-3.6	-0.7
Loans for use outside Hong Kong ⁷	-2.9	+2.2	-2.3
Negotiable instruments			
Negotiable certificates of deposit (NCDs) issued	+3.9	-1.5	+1.1
Negotiable debt instruments held (excluding NCDs)	+3.9	+1.0	+3.7
Asset quality			
As a percentage of total loans ⁸			
Pass loans	97.29	97.69	97.59
Special mention loans	1.81	1.49	1.53
Classified loans ⁹ (gross)	0.90	0.81	0.88
Classified loans (net) ¹⁰	0.50	0.43	0.48
Overdue > 3 months and rescheduled loans	0.57	0.60	0.56
Classified loan ratio (gross) of Mainland related lending ¹¹	0.96	0.77	0.85
Liquidity ratios (consolidated)			
Liquidity Coverage Ratio — applicable to category 1 institutions (quarterly average)	154.4	155.5	151.9
Liquidity Maintenance Ratio — applicable to category 2 institutions (quarterly average)	57.7	58.2	59.1
Net Stable Funding Ratio — applicable to category 1 institutions	138.2	133.8	135.3
Core Funding Ratio — applicable to category 2A institutions	139.5	147.6	150.4
Retail banks			
Profitability			
Loan impairment charges as a percentage of average total assets (year-to-date annualised)	0.12	0.04	0.07
Net interest margin (year-to-date annualised)	1.18	0.98	0.98
Cost-to-income ratio (year-to-date)	47.0	51.7	54.7
Surveyed institutions			
Asset quality			
Delinquency ratio of residential mortgage loans	0.04	0.03	0.04
Credit card lending			
Delinquency ratio	0.27	0.22	0.20
Charge-off ratio — quarterly annualised	2.17	1.84	1.53
— year-to-date annualised	2.18	1.90	1.75
All locally incorporated AIs			
Capital adequacy (consolidated)			
Common Equity Tier 1 capital ratio	16.7	16.3	16.2
Tier 1 capital ratio	18.7	18.3	18.2
Total capital ratio	20.7	20.4	20.2
Leverage ratio	8.2	8.0	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 5

Assessing the financial impacts of climate-related risks on listed non-financial firms in Hong Kong using NGFS scenarios

Introduction

Climate change is one of the most pressing challenges facing the world today. For example, the transition towards a low-carbon economy will inevitably affect many economies and sectors on various fronts. This highlights the growing importance of strengthening climate risk assessment and monitoring framework globally.

To facilitate the development of the framework for central banks and regulators, the NGFS⁷⁰ has developed and published a granular database of reference climate scenarios for a wide range of countries and sectors. This database provides key inputs for central banks, regulators, and other stakeholders to evaluate the effects of climate change on a consistent and comparable basis.

Building on the contributions of the NGFS and related analysis by major central banks,⁷¹ this box aims to develop an analytical framework to assess the financial impacts of climate-related risks on non-financial corporates listed in Hong Kong.⁷² The framework enables a top-down analysis on how climate transition and physical risks may adversely affect firms' default risks over a 30-year horizon through different transmission channels. It also attempts to show how the NGFS climate scenario data together with firm-specific data

may help assess the potential impact of climate-related risks on the corporate sector.⁷³

Overview of the NGFS scenarios

This section introduces the NGFS scenarios considered in this box. We focus on two of the climate scenarios, the “orderly” and “disorderly” transition scenarios. Specifically, they both assume the target of limiting global warming to below 2 °C will be achieved by the end of 2050, but they vary in terms of policy timing and policy stringency. The outcomes of both scenarios can be assessed against a baseline case (referred to as “business-as-usual” (BAU) scenario), in which policymakers are assumed to follow only those climate policies that were already implemented, implying no additional transition risks by the end of 2050.^{74, 75} Comparing the transition scenarios to the baseline case may give a clearer picture of the impact of risks under the transition scenarios.

Chart B5.1 displays the projected average world carbon price (in bars) and the corresponding projected path of the annual world greenhouse gas (GHG) emission levels (in lines) under the three scenarios respectively.

⁷⁰ The NGFS, consisting of hundreds of members and observers, aims at strengthening the global response required to meet the goals of the Paris agreement.

⁷¹ The European Central Bank (ECB) and several other central banks have also conducted climate stress-testing initiatives to assess the climate resilience of the financial system in recent years. (See Alogoskoufis et al. “ECB economy-wide climate stress test”, *ECB Occasional Paper Series*, No. 281, September 2021.)

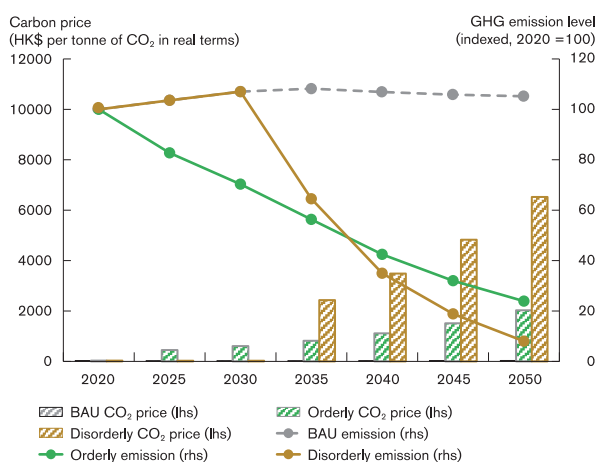
⁷² For details, we refer readers to Ho et al. (2022): “Assessing the financial impacts of climate-related risks on HK-listed non-financial firms: A forward-looking analysis based on NGFS scenarios”, *HKMA Research Memorandum 01/2022*.

⁷³ It should be emphasised that this analysis is an initial attempt to study the issue, and further refinements could be made in future.

⁷⁴ It should be noted that there is a number of alternative projections by other institutions. Due to different projection methodologies, their estimates may differ from those under the NGFS reference scenarios.

⁷⁵ In the Phase II of the NGFS data and in the full research paper, “orderly”, “disorderly” and “BAU” scenarios are respectively named as “Below 2°C”, “Delayed transition” and “Current Policies” scenarios.

Chart B5.1
Projected average world carbon price and world GHG emission levels across time



Note: "BAU", "orderly" and "disorderly" stand for "Business-as-usual" scenario, orderly transition scenario and disorderly transition scenario respectively.
 Source: HKMA staff calculation based on data in NGFS climate scenarios.

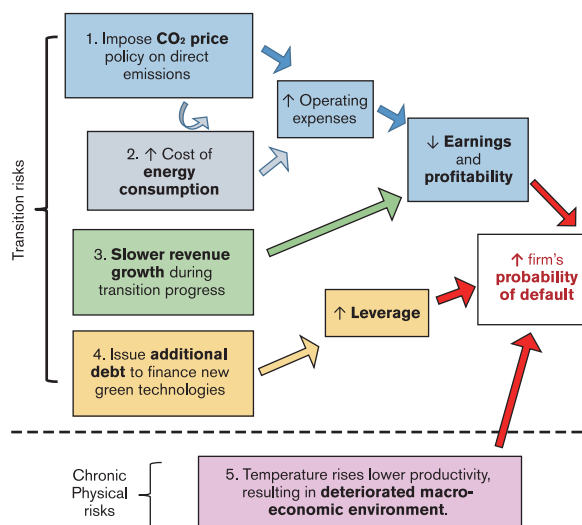
Under the orderly scenario, climate policies (such as carbon tax) are assumed to be imposed immediately and then gradually increased over time in an orderly manner. Thus, the projected carbon price will rise gradually from 2020 onwards (the green bar in Chart B5.1). In response to the imposition of carbon prices, the annual GHG emissions are projected to decline in an orderly manner over time, as shown by the green line in the same chart.

By contrast, under the disorderly scenario, due to delayed actions by policymakers, more stringent policies will be imposed from 2030 to meet the same target as the orderly scenario by the end of 2050. The brown bars in Chart B5.1 show the carbon price will remain largely near zero before 2030, followed by an abrupt rise with the imposition of more stringent climate policies. Accordingly, the annual GHG emissions will only start declining after 2030, but in a disruptive manner given the significant rise in the carbon price (the brown line in Chart B5.1). As such, the transition risk will likely be higher under the disorderly scenario than in the orderly case between 2030 and 2050.

Discussion on the transmission channels

Chart B5.2 graphically overviews the analytical framework that captures several key transmission channels through which transition and physical risks could affect the financial fundamentals of firms, and thus their default risk.

Chart B5.2
Flow diagram on key channels through which climate-related risks affect firms' financial fundamentals



Indeed, climate transition risks could affect the profitability and leverage of firms in several ways. First, as carbon prices are assumed to be imposed on firms' direct GHG emissions (i.e. carbon tax) under the NGFS scenarios, they will not only face higher operating expenses directly from the carbon tax on their emissions, but also indirectly from higher energy consumption costs.⁷⁶ Both could put downward pressure on firms' profitability.⁷⁷ In response, firms are assumed to lower their emissions and shift towards using more green energy in their productions to mitigate the impacts on their profitability.

⁷⁶ Higher carbon taxes will increase the price of energy generated from fossil fuel combustion. If consumers cannot easily substitute by switching to cheaper and greener renewable energy sources, they will then face higher energy consumption costs.

⁷⁷ The resource reallocations arising from the climate transition may prompt adjustments in economic activities, which may slow economic momentum relative to the "BAU" case. This, in turn, may lead to a slower firm revenue growth.

Second, firms are assumed to invest in more sustainable production technologies to achieve the target of reducing GHG emissions. Such investment is assumed to be financed by new debt, leading to higher leverage.

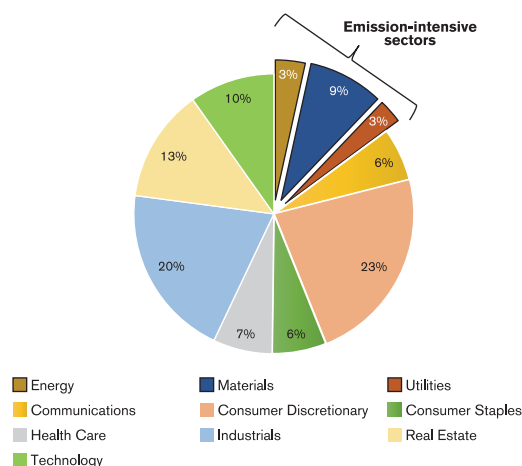
On physical risks, our analysis captures the macro impact of global temperature rises, which leads to lower productivity and output loss, thereby affecting firms' financial fundamentals. While the specific exposure of firms to physical risks is important, the impact cannot be assessed in the current analysis due to data limitations.⁷⁸ However, further refinements are possible if the data gaps are addressed.

With the transmission channels discussed, we can assess how different NGFS scenarios will likely impact firms' profitability, leverage and macro environments over a 30-year horizon. Using these estimates, we can further assess the impact on a firm's 1-year default probability (PD)⁷⁹ based on a satellite model that empirically explains the PD of a firm by its returns on assets, debt-to-assets, size and the macro environments measured by the output gap.

Data

The analysis covers non-financial firms listed in Hong Kong (around 2200 firms in total⁸⁰). Chart B5.3 presents the share of firms by sector using the Global Industry Classification Standard. While firms from consumer discretionary, industrial and real estate sectors accounted for over half the samples, firms from the energy, materials and utilities sectors, which are more subject to climate transition risks, made up around 15% of the total samples.

Chart B5.3
Distribution of sampled firms by sector



Source: HKMA staff calculation based on S&P Capital IQ data.

There is a large variation in firms' GHG emission intensities (measured by firms' emissions relative to their revenues) across different sectors. Each bar in Chart B5.4 presents the 10th, median and 90th percentiles of the sampled firms' emission intensities. As shown, utilities, materials and energy sectors are the highest GHG emitting sectors (denoted as emissions-intensive sectors hereafter), while other sectors generally have low emissions intensity. It is also noteworthy that there is a large variation in emission intensities among firms within the emission-intensive sectors, suggesting the extent of transition risks and the potential impacts could vary significantly even among firms from the emission-intensive sectors.

⁷⁸ Apart from chronic risk, physical risks can also arise from extreme weather events (e.g. storm, drought-risks) which pose direct financial losses on firms' assets that are exposed to these extreme events. However, quantifying such financial impact requires detailed location data of firms' assets and activities, which are not readily available.

⁷⁹ One-year ahead probability of default by Bloomberg is chosen to proxy for the default risk.

⁸⁰ Among them, around 790 of listed firms are domiciled in Hong Kong, while the rest are domiciled outside Hong Kong.

Chart B5.4
Emissions intensity by sector

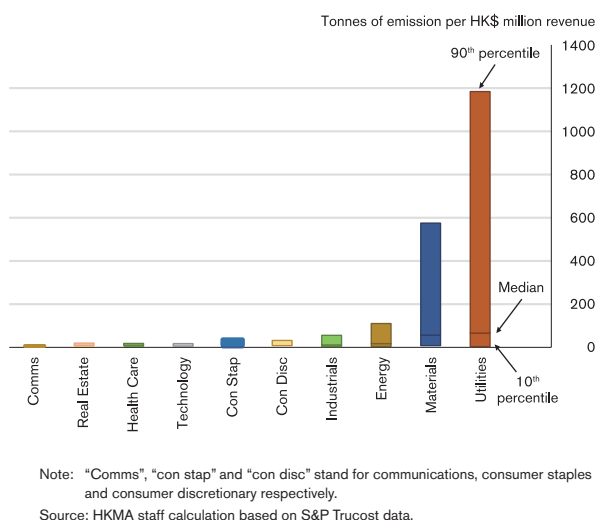
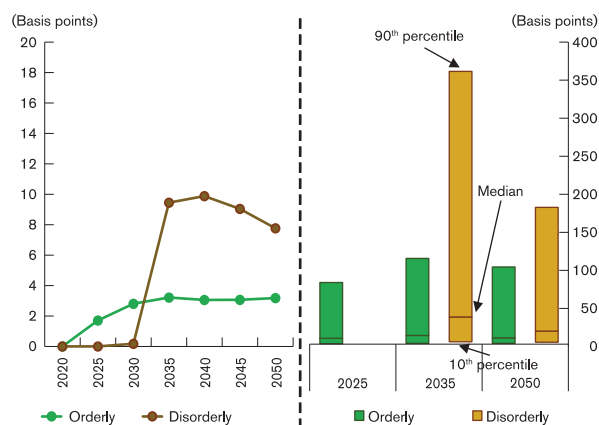


Chart B5.5
Projected median change in probability of default for all HK-listed firms (left panel) and projected change in probability of default for firms from emissions-intensive sectors only (right panel)



Key findings

a. Impact of transition risks

Our assessment finds that the transition towards a low carbon economy will generally lead to lower profitability and higher leverage in firms, which in turn translates into a higher average PD of firms relative to the baseline scenario (i.e. BAU scenario which assumes no transition risks).

We first assess how the default risk of a typical firm will be affected under the two transition scenarios by focusing on the median impact on PD of all sampled firms over time (left panel of Chart B5.5). Although the impact on default risk is found to be mild under the two scenarios, it is found that under the disorderly transition scenario, the median impact on PD (the brown line) is significantly higher than that under the orderly transition scenario (the green line) in the longer-term (i.e. 8 basis points (bps) versus 3 bps at the end of 2050). This suggests the long-term benefit of an orderly transition.

It is important to note, however, that the mild median impact on PD under both scenarios may be primarily driven by the fact that the vast majority of firms listed in Hong Kong are not from emission-intensive sectors (See Chart B5.3), and thus they may be less subject to high transition risks.

When assessing firms from emissions-intensive sectors, the median impact on PD (see middle marks of the bars in the right panel of Chart B5.5) is found to be much higher than the full sample estimates presented in the left panel of Chart B5.5. In particular, in a disorderly transition scenario, the median impact on PD around 2035 may reach its peak at around 37 bps, while the corresponding estimate under the orderly scenario is around 12 bps.⁸¹ Importantly, comparing the median impact on PD for firms from emission-intensive sectors under the two scenarios would see even stronger evidence of supporting an orderly transition.

Another noteworthy finding is the large cross-sectional variations in the rise of PD among firms from emissions-intensive sectors. Taking the “disorderly” case in 2035 as an example (brown bar in the right panel of Chart B5.5), the change in PD could range widely from 4 bps at the 10th percentile to around 360 bps at the 90th percentile. One important implication is that it is vital to take into account the environmental data and business nature of firms, to have a more

⁸¹ The corresponding full-sample estimates are 10 bps and 3 bps respectively.

accurate assessment of climate-related risks on firms.

b. Impact of chronic physical risks

We also assess the impact of physical risks through the macro channel (as discussed in Chart B5.2) on firms' PD under the two transition scenarios and compare the results with the baseline "BAU" scenario. Our assessment shows that the impact of physical risk under the two transition scenarios would be much lower than the baseline case.

In particular, the temperature rise is assumed to exceed 3°C under the baseline "BAU" scenario, in which the associated physical risk could lead to a significant rise in firms' median PD by around 130 bps in 2050. By contrast, under both orderly and disorderly scenarios where climate policy actions will help keep the rise in global temperature to well below 2°C by 2050, the corresponding rises in firms' median PD is found to be lower than that under the baseline scenario by around 65 bps, pointing to a long-term benefit of adapting a green transition as opposed to a "no action" case.

Conclusion

This box presents a framework for assessing the impact of climate-related risks on firms' credit risks using the NGFS reference scenarios. Overall, our analysis suggests that the credit risks arising from climate-related risks should be relatively manageable for most of the firms in Hong Kong. That said, some firms, especially those from emissions-intensive sectors, could face material transition risks and therefore may be subject to a notable rise in credit risks under the disorderly transition scenario. Regarding the implications for the Hong Kong banking sector, while the transition risks may become a source of credit risks of banks' loan portfolios, the impact could be different across banks depending on the sectoral composition of their loan portfolios. Nonetheless, the Hong Kong banking sector as a whole is not heavily exposed to emission-

intensive sectors. Importantly, underpinned by the strong capital position, the Hong Kong banking sector should remain resilient to the climate transition risks.

Our findings also show that from a long-term perspective, the impacts of climate transition risks on firms' default risks would be significantly smaller in the "orderly transition" scenario than the "disorderly" one. In addition, the impact of physical risks under these two transition scenarios would be lower than the "no action" case. The results together support the position that there are clear benefits to taking climate action, and acting early.

This analysis also demonstrates the HKMA's support for the NGFS Glasgow Declaration⁸² and commitment to integrating climate-related risks into financial stability monitoring and using NGFS climate scenarios in our analyses.

Nevertheless, our analysis comes with caveats. First, data gap issues preclude us from fully assessing the climate-related risks, particularly in assessing firm specific exposure to physical risks.⁸³ Second, the estimates for a long time horizon (up to 2050) could be subject to large uncertainties. As such, caution should be exercised when interpreting the results.

⁸² The HKMA issued a statement in November to support the NGFS Glasgow Declaration. For details, see "Supporting the Central Banks and Supervisors Network for Greening the Financial System Glasgow Declaration", HKMA, 3 November 2021.

⁸³ Apart from data gap related to physical risk, other key data gaps may include the opportunities in transition, such as higher demand driven by consumer green preferences, improved energy efficiency and operational flexibility. These factors could potentially result in improvement in firms' profitability.