HONG KONG MONETARY AUTHORITY
香 港 金 融 管 理 局

HALF-YEARLY MONETARY AND FINANCIAL STABILITY REPORT

September 2023

This Report reviews statistical information between the end of February 2023 and the end of August 2023.

Half-Yearly Monetary and Financial Stability Report
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1. Summary and overview

The global economy has been resilient, but as major advanced economies (AEs) are travelling the last mile of disinflation, the "high for longer" interest rate outlook will likely continue to cloud the global growth prospects, while exposing hidden vulnerabilities accumulated during the earlier low interest rate environment.

Hong Kong's exchange rate and interbank market continued to trade in a smooth and orderly manner. Along with successive US policy rate hikes, local interbank rates generally headed higher, in line with the design and operation of the Linked Exchange Rate System (LERS), and many banks further raised their Best Lending Rates. With total deposits remaining stable during the review period, there was no notable sign of outflows from the Hong Kong banking system. In part reflecting weaker loan demand, bank credit declined slightly during the same period. Meanwhile, the residential property market consolidated after experiencing a strong rebound in the first quarter of 2023.

In the period ahead, uncertainties on the future US interest rate path and the associated impact on local interest rates, concerns about the growth prospects for major AEs and the pace of economic recovery of the Mainland economy, and the lingering geopolitical risks will continue to pose challenges to the banking sector. Banks should carefully assess how the possible intensification of these risk factors could impact the asset quality of their loan portfolios.

The external environment

With swift policy responses and last-minute compromises in the US Congress, the recent US and Swiss banking sector problems and the US debt ceiling brinkmanship did not result in systemic repercussions to global financial stability. Yet, risks to global growth remain tilted to the downside, as the still-tight labour markets across major AEs prompted their central banks to signal a "high for longer" policy rate outlook, which could weigh on the global economy, render financial markets sensitive to inflation surprises, and expose hidden vulnerabilities that were accumulated during the earlier low interest rate environment.

In emerging Asia, economic growth softened amid subdued export performance due to weak global demand and a tech down cycle. Headline Consumer Price Index (CPI) inflation eased in the first half of 2023 along with lower food and energy prices, though core inflationary pressures remained firm amid the still-elevated service inflation. In the near term, to curb inflationary pressures and maintain the interest rate differential vis-à-vis the US to reduce foreign exchange pressures, regional central banks may need to keep interest rates "high for longer".

However, as the debt levels in the region have increased in recent years, “high for longer” interest rates will pose loan repayment challenges. Such development warrants close monitoring in view of the signs that the cash buffer of regional corporates has decreased somewhat.

In Mainland China, economic activities recorded faster year-on-year growth during the first half of the year, thanks to the post-COVID reopening and a favourable base effect. However, the recovery was uneven, with the services sector generally outperforming the goods sector. The sequential recovery momentum also slowed during the second quarter, reflecting fragile private-sector confidence, renewed weakness in the property market and a slowdown in exports (Box 1 discusses the export competitiveness of Mainland China). Looking ahead, economic activities are expected to recover, but the economy is still facing headwinds from the challenging external environment and soft domestic demand. To support the economic recovery, the authorities introduced countercyclical policy adjustments, including cuts in interest rates and the required reserve ratio, and pledged to invigorate the capital market, boost consumption and push forward the development of the private economy to support confidence.

The domestic economy

The Hong Kong economy experienced a sharp rebound in the first quarter of 2023 on the back of the reopening of Mainland China and Hong Kong, and continued to recover in the second quarter, although the momentum softened. After contracting for four consecutive quarters, real gross domestic product (GDP) expanded by 2.9% and 1.5% year on year in the first and second quarters respectively. Private consumption improved markedly with the support provided by the relaxation of COVID-19 restrictions and the disbursement of the first instalment of consumption vouchers. Overall investment spending picked up in the first quarter alongside the revival in economic activities, although there was a mild decline in the second quarter amid tightened financial conditions. Box 2 uses granular data to examine the effectiveness of the enhancements to the SME Financing Guarantee Scheme (SFGS) and provides evidence that the SFGS helped lift the size of loans granted to small-to-medium-sized enterprises (SMEs), thereby supporting them through the pandemic. Externally, inbound tourism bounced back following the full resumption of cross-boundary travel, driving growth in Hong Kong’s exports of services. In contrast, merchandise exports plummeted further amid a challenging external environment.

Looking ahead, Hong Kong’s economic activities are expected to recover further in the second half of 2023. Although merchandise exports are likely to be dampened by lackluster external demand, inbound tourism and domestic demand are expected to strengthen, given (i) the improvement in transportation and handling capacity; (ii) the improved labour market conditions; and (iii) the disbursement of the second instalment of consumption vouchers in July. In view of the softened business sentiment in recent months, the Government has also been exploring various measures to further strengthen the sustainability of the economic recovery. Taking into account the actual outturn in the first half of the year, the Government revised the real GDP growth forecast for 2023 to 4.0%–5.0%. That said, the growth outlook is subject to a number of risks and uncertainties, including those relating to the US policy rate path, the pace of the Mainland economic recovery, the prospects for global economic growth, and risks stemming from geopolitical tensions.

Local labour market conditions continued to improve in recent months, with the unemployment rate declining to a decade-low of

2.8% in August 2023. Total employment increased further, albeit still below its pre-pandemic level. In view of the labour shortage, the Government launched the labour importation schemes in July 2023 for the construction and transport sectors, and introduced the Enhanced Supplementary Labour Scheme (ESLS) in September 2023 for other sectors. Alongside the continued recovery in domestic economic activities, the labour market is expected to improve further for the rest of this year.

The underlying inflation rate in Hong Kong remained modest at around 1.8% in the first eight months of this year. In the near term, the domestic business costs may edge up given the upward pressures stemming from the economic recovery and improving labour market. Nevertheless, overall inflation is expected to stay moderate as the price pressures on the external front may recede further. The Government projections for the underlying and headline inflation rates for 2023 are 2.0% and 2.4% respectively.

Monetary conditions and capital flows

The Hong Kong dollar (HKD) traded close to the weak-side Convertibility Undertaking (CU) from March to early May, reflecting market expectation of a "high for longer" US policy rate and a cautious sentiment for the local stock market. From early May to July, the HKD exchange rate regained some strength, mainly driven by dividend payment-related demand from listed companies and half-year-end funding needs by corporates. Towards the end of August, the HKD softened to close to the weak-side CU again amid weak equity sentiment. During the review period, the weak-side CU was triggered six times, five times in April and once in early May. In accordance with the design of the LERS, the HKMA bought a total of HK$32.45 billion. Accordingly, the Aggregate Balance of the banking system declined from HK$77.1 billion at the end of February to HK$44.9 billion at the end of August, but the day-to-day interbank operations and settlement activities continued to operate in a smooth and orderly manner.

During the review period, the overnight and one-month Hong Kong Interbank Offered Rates (HIBORs) generally tracked their USD counterparts, in line with the design and operation of the LERS. Alongside the successive US policy rate hikes and market expectation of a "high for longer" US policy rate, the HIBORs generally headed higher, before some easing towards the end of the review period. On the retail front, following the US policy rate hikes, many banks raised their Best Lending Rates twice or by 25 basis points (bps) in total from May to July 2023. At the end of the review period, the Best Lending Rates in the market ranged from 5.875-6.375%. Accordingly, the average lending rate for new mortgages increased slightly from 3.50% in January 2023 to 3.57% in July 2023. Banks will decide when and by how much to adjust their lending and savings rates, taking into account the structure of their funding costs and other relevant considerations.

Hong Kong's offshore renminbi (CNH) liquidity pool expanded further during the review period, with the total outstanding amount of renminbi customer deposits and certificates of deposit increasing to RMB1,067.0 billion at the end of July 2023. Both the outstanding amount of renminbi loans and renminbi trade settlement continued to grow steadily in the first seven months of 2023. The average daily turnover of the renminbi Real Time Gross Settlement (RTGS) system stayed high at RMB1,704.0 billion during the same period.

Looking ahead, the continuing development of Hong Kong's CNH ecosystem will further reinforce Hong Kong's role as the leading CNH business hub. On liquidity, the enhanced

Currency Swap Agreement with the People's Bank of China (PBoC) will provide the necessary liquidity support to the offshore market through the renminbi liquidity facilities set up by the HKMA. This provides a favourable environment for financial institutions to expand their renminbi-related activities and services. On products, the continuous efforts to upgrade and expand the family of Connect schemes between the Mainland and Hong Kong, including the Swap Connect, the two-way Stock, Bond, and Cross-boundary Wealth Management Connects, will widen the spectrum of renminbi products and tools for asset allocation and risk management, enabling two-way traffic between the two markets. The financial infrastructure is also being upgraded with the Central Moneymarkets Unit (CMU) undergoing a major overhaul to enhance its operational capacity and product offerings, with the aim of better supporting the growth of renminbi bond issuances and associated custodian services. With these developments, Hong Kong will continue to play a unique role in supporting China's capital account opening, the development of the green finance market, as well as the Belt and Road and the Guangdong-Hong Kong-Macao Greater Bay Area initiatives.

Asset market

In contrast to the buoyant global equity market led by the technology sector, performance of the Hong Kong equity market during the review period was clouded by concerns over the pace of the Mainland economic recovery. Overall, the Hang Sang Index declined by 7.1% from the end of February 2023 to the end of August 2023. Equity market funds registered net flows into Hong Kong from February to July 2023.

Supported by the steady issuance, the HKD and CNH debt markets in Hong Kong continued to register stable growth in the first half of 2023. Although an agreement on raising the US government debt limit was reached on 27 May, bond yields in the US as well as those in Hong Kong have remained at a high level amid possible further rate hikes in the US.

Looking ahead, the local equity market is subject to the downside risks of a global economic slowdown, a "high for longer" interest rate environment and an escalation of geopolitical tensions, while further policy measures that may be rolled out by the Mainland authorities to support the Mainland economic recovery could help lift sentiment in the local equity market. Meanwhile, the near-term prospect for the local debt market will continue to hinge on global economic and interest rate outlooks.

During the review period, policy initiatives were introduced to develop an infrastructure financing securitisation platform and promote the green and sustainable debt market in Hong Kong. Moreover, the issuance of the first 10-year RMB green bond by the Hong Kong Government helps to extend the CNH yield curve and continues to enrich CNH product offerings, promoting the RMB internationalisation in an orderly manner.

In early 2023, the Government issued the world's first government-issued tokenised green bond to promote the application of innovative technologies in the debt market. Box 3 analyses how the global tokenised bond market has evolved and assesses the potential benefits of bond tokenisation for issuers and investors.

The residential property market consolidated after experiencing a strong rebound in the first quarter of 2023, due in part to more cautious market sentiment amid rising local mortgage rates. The average monthly housing transaction volume dropped to 3,702 units in April – August from 4,674 units in the first quarter, despite primary-market sales being supported by property developers' competitive pricing strategies for their new project launches. Reflecting subdued market activities, the secondary-market housing prices retreated by 3.7% between April and August after surging by 5.3% in the first quarter.

Taking into consideration all relevant factors, the HKMA announced on 7 July 2023 the first relaxation of the countercyclical macroprudential measures for residential properties since their introduction in 2009. The relaxation, which took effect on the same day, enables the public to take out property mortgage loans at higher loan-to-value (LTV) ratios. The HKMA will continue to closely monitor market developments and introduce necessary measures to ensure banks' proper risk management of their property mortgage loans, thereby safeguarding banking stability.

Following the relaxation of the macroprudential measures, the average LTV ratio for new residential mortgage loans (RMLs) remained largely stable at about 53% in July and the corresponding debt-servicing ratio stayed below 40%. Meanwhile, the estimated number of RMLs in negative equity dropped to 3,341 cases at end-June 2023 from 12,164 cases at end-December 2022, mainly reflecting the increase in housing prices in the first half of this year. Given that over half of the private housing units did not carry any outstanding mortgages at the end of 2022, and that the mortgage delinquency ratio remained at a very low level of 0.07% in July 2023, the systemic risks relating to banks' RMLs are properly managed on various fronts.

In the near term, the residential property market is subject to a number of uncertainties and risks as discussed previously. In particular, rising mortgage rates, weaker global economic prospects, and increased short-term private housing supply, may continue to pose headwinds to the housing market. That said, the continued economic recovery in Hong Kong, coupled with the Government's measures to attract businesses, investments and talents, may provide support to housing demand. Over the longer term, the outlook for the housing market will depend on the supply-demand gap. The Government projects that private housing supply will remain high in the coming years.

Thanks to the revival in domestic economic activities, the non-residential property market saw signs of recovery in the first half of 2023. The prices of commercial and industrial buildings bottomed out alongside the increase in transactions during the period. Rentals of retail premises and flatted factories also recovered gradually, resulting in a mild increase in the rental yields. The near-term outlook for the non-residential property market is expected to vary across segments. On the one hand, the robust recovery in domestic consumption and inbound tourism will likely provide support to the retail segment. On the other hand, the capital values of commercial properties could continue to be dragged down by the high vacancy rates and the increased supply in the near term.

Taking into account the correction in non-residential property prices following the COVID-19 pandemic, the rising interest rate environment, as well as other relevant factors discussed above, the HKMA also adjusted the countercyclical macroprudential measures for non-residential property mortgage loans by raising the maximum LTV ratio to 60% from 50%. The adjustment was announced on 7 July 2023 with immediate effect.

Banking sector performance

The profitability of retail banks improved notably in the first half of 2023, attributable to higher net interest income and income from investments held for trading. Specifically, the aggregate pre-tax operating profit of retail banks increased substantially by 120.5% in the first half of 2023 compared with the same period in 2022, while the return on assets rose notably to 1.15% in the first half of 2023.

Amid continued US interest rate hikes, the overall funding costs of retail banks increased at a gradual pace in the first half of 2023. Despite the rapid rise in global interest rates in the past year, the interest rate risk impact on banks in Hong Kong remained relatively small and contained. The classified loan ratios of all authorized institutions (AIs) increased during the first half of 2023, but remained at a healthy level.

Overall, the Hong Kong banking sector remained resilient, underpinned by the robust capital and liquidity positions. The consolidated total capital ratio of locally incorporated AIs stood high at 21.0% at the end of June 2023, well above the minimum international standard. The average Liquidity Coverage Ratio of category 1 institutions and the average Liquidity Maintenance Ratio of category 2 institutions were 169.8% and 63.8% respectively in the second quarter of 2023, well above their statutory minimum requirements. The latest Net Stable Funding Ratio of banks also stayed at levels well exceeding their statutory minimum requirements.

In part reflecting weaker loan demand amid higher borrowing costs and slower global growth outlook, total loans and advances of all AIs declined slightly by 0.5% during the first half of 2023. The decline was mostly driven by a decrease in loans for use outside Hong Kong, which more than offset an increase in domestic loans (comprising loans for use in Hong Kong and trade financing).

Box 4 presents a refined framework for stress testing the credit risk of Hong Kong's banking sector. By incorporating the default risk and key financial performance ratios of Hong Kong corporate sector into the macro stress testing framework, the refined framework will strengthen our capacity to obtain a clearer and fuller assessment on the resilience of the banking sector.

In the period ahead, uncertainties on the future US interest rate path and the associated impact on local interest rates, concerns about the growth prospects for major AEs and the pace of economic recovery of the Mainland economy, and the lingering geopolitical risks will continue to pose challenges to the banking sector. Banks should carefully assess how the possible intensification of these risk factors could impact the asset quality of their loan portfolios.

The Half-Yearly Report on Monetary and Financial Stability is prepared by the staff of the Research Department of the Hong Kong Monetary Authority.

2. Global setting and outlook

Swift policy responses to contain the US and Swiss banking sector problems, and a successful resolution of the US debt ceiling brinkmanship, both contributed to reducing the immediate threats to global financial stability. However, risks to global growth remain tilted to the downside, as major central banks continued to signal a "high for longer" policy rate outlook in view of the sticky core inflation. A sustained period of restrictive global monetary policy could weigh on the global economy, sow the seeds to financial market volatility in case of inflation surprises, and expose vulnerabilities built up during earlier periods of accommodative monetary policy.

In emerging Asia, economic growth continued to be dragged by lacklustre external demand. Headline inflation moderated significantly along with lower food and energy prices, but core inflation remained firm in some economies. This, together with the major AEs' "high for longer" interest rate outlooks, suggests that regional interest rates may also end up being "high for longer" and increase the debt service burden on indebted sectors.

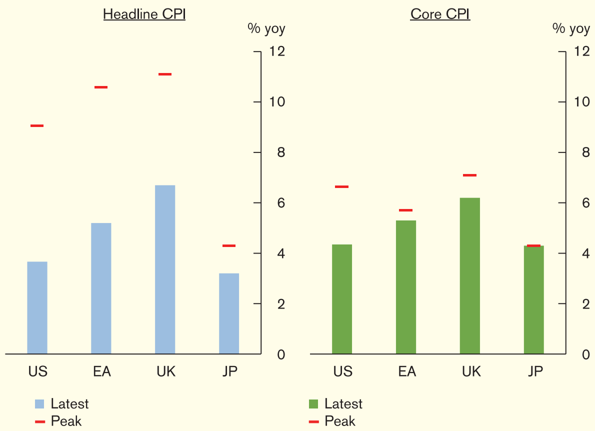
In Mainland China, while the economy saw faster year-on-year growth in the first half of the year, its sequential recovery momentum moderated during the second quarter alongside fragile private-sector confidence, renewed weakness in the property market and a slowdown in exports. Looking ahead, economic recovery is expected to continue, but the economy is still facing headwinds from the challenging external environment and soft domestic demand. The authorities introduced counter-cyclical policy adjustments including cuts in interest rates and the required reserve ratio and pledged to invigorate the capital market, boost consumption and push forward the development of the private economy to support confidence.

2.1 External environment

During the review period, two immediate threats to global financial stability, namely, the banking sector problems in the US and Switzerland and a potential US sovereign default amid another debt ceiling brinkmanship, were successfully averted by swift policy responses and by last-minute compromises in the US Congress respectively.

However, downside risks to global growth persist. Even though global headline inflation has eased, thanks to lower commodity prices and normalising supply chains, the fight against inflation continued as core inflation remained sticky on the back of tight labour markets (Chart 2.1). Against this background, major central banks generally signalled that "high for longer" interest rates were likely necessary to achieve a timely return of inflation to target, which would likely weigh on global growth. In July, the International Monetary Fund projected a slowdown in global growth from 3.5% in 2022 to 3.0% in 2023, partly reflecting the impact of the cumulated interest rate hikes.

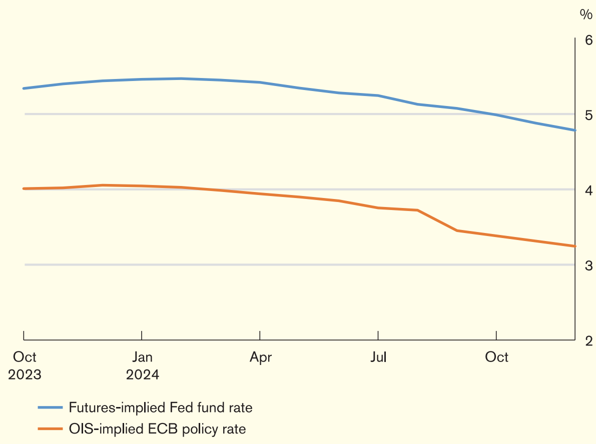
Chart 2.1
Headline and core consumer price index (CPI) inflation in selected major advanced economies



Note: EA = Euro area, JP = Japan. Latest data as of August 2023.
Source: CEIC.

Going forward, the "last mile" of disinflation in major advanced economies could prove tricky. If the cumulated monetary tightening is unable to cool down wage growth and its pass-through to services inflation in a timely manner, core inflation could be stickier than expected. In this scenario, central banks may not have much leeway to adjust monetary policy even if growth slows markedly later on. Given that financial markets have already priced in rate cuts starting next year (Chart 2.2), upside surprises to inflation may trigger a repricing of risky assets and a spike in market volatility.

Chart 2.2
Market expectations of policy rate paths of the US Federal Reserve (Fed) and the European Central Bank (ECB)

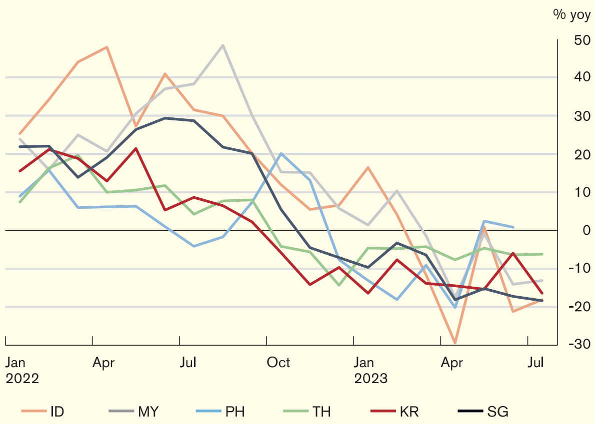


Note: Market expectations as of 22 September 2023, derived from Fed funds futures (for the Fed) and the Euro Area overnight indexed swap (OIS) forward curve (for ECB).
Source: Bloomberg.

In addition, there is a risk that the high interest rate environment could expose hidden vulnerabilities in the financial system that were accumulated during the earlier low interest rate environment. As a case in point, the US commercial real estate (CRE) sector has been under pressure in the midst of rising interest rates and post-pandemic structural changes (e.g. shift towards hybrid working), leading to rising delinquency rates in commercial mortgage-backed securities since early 2023. Given small US banks' high degree of exposure to CRE loans, a sharper-than-expected CRE downturn may lead to stress in some US banks.

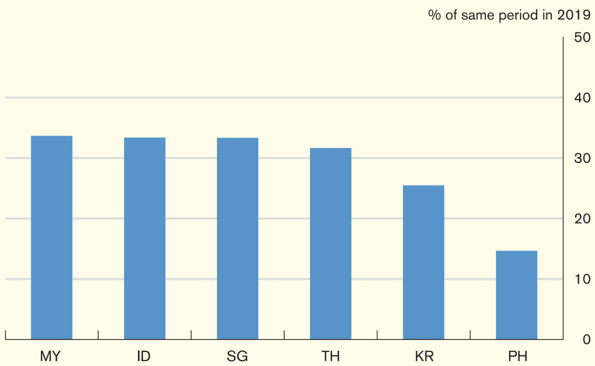
The growth of most emerging Asian economies softened in the first half of 2023 amid weak external demand, with regional exporters of electrical machinery, consumer electronics and semiconductors being the hardest hit (Chart 2.3). On services trade, the release of pent-up demand for tourism services in Mainland China rendered support to the region's services exports (Chart 2.4). This positive impact would be felt increasingly by more economies alongside the improvement in the international flight capacity of Mainland China.

Chart 2.3
Emerging Asia: Goods exports



Note: Latest observation is Jun 2023 for the Philippines, Jul 2023 for the other economies.
Source: CEIC.

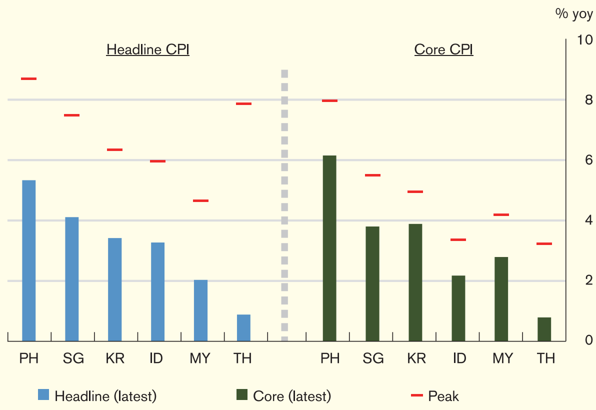
Chart 2.4
Visitor arrivals from Mainland China



Note: For Malaysia, the period refers to Feb-May 2023; for the other economies, the period refers to Feb-Jul 2023.
Sources: CEIC and staff calculations.

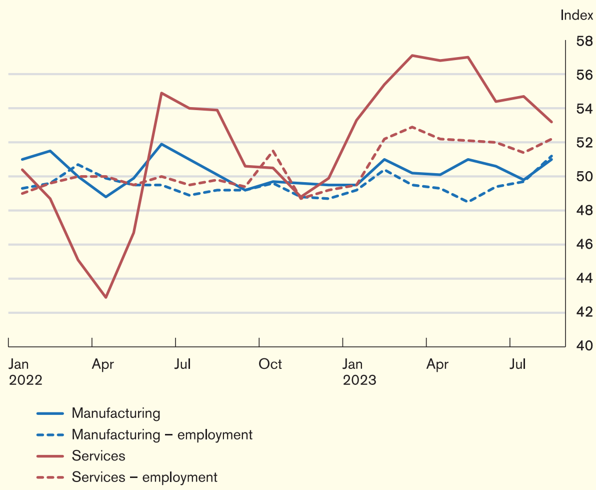
The headline CPI inflation of regional economies eased in the first half of 2023 alongside lower global food and energy prices. However, core inflationary pressures remained firm in some regional economies amid the still-elevated service inflation (Chart 2.5). Given that both the service Purchasing Managers' Index (PMI) and its employment sub-index remained high, service inflation may persist in the near term (Chart 2.6).

Chart 2.5
Emerging Asia: Headline and core Consumer Price Index (CPI) inflation



Note: Latest observation is Jul 2023 for Malaysia and Singapore, Aug 2023 for the other economies. Peak refers to the highest level of headline/core inflation since Jan 2022.
Sources: CEIC and HKMA staff calculations.

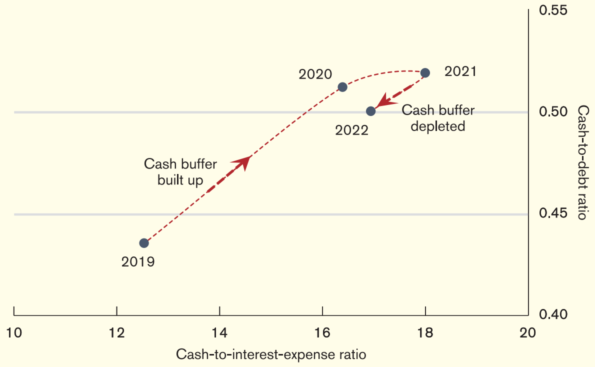
Chart 2.6
Asia: Manufacturing and services Purchasing Managers' Index (PMI)



Source: CEIC.

Looking ahead, to curb the still-elevated core inflationary pressures and maintain the interest rate differentials vis-à-vis the US to reduce foreign exchange pressures, regional central banks may need to keep interest rates "high for longer". However, there is a risk that high interest rates could stabilise inflation at the cost of raising the debt-servicing burden, triggering a further correction in the housing price and dampening growth. As the debt levels in the region have increased in recent years, the "high for longer" interest rates may pose loan repayment and refinancing challenges down the road. Such development warrants close monitoring especially given signs that the cash buffer of regional corporates has eroded somewhat due to tightening monetary conditions and subdued earnings growth (Chart 2.7).

Chart 2.7
Asia Pacific: Corporate cash buffers



Note: The sample includes about 10,000 non-financial listed firms in 11 Asia Pacific economies. The same set of firms are used in the calculation of all the years shown in the chart. Each dot shows the median of the sample in the corresponding year. The cash-to-debt ratio is the ratio of firm's cash and equivalent to total debt; the cash-to-interest expense is the ratio of firm's cash and equivalent to total interest expense.
Sources: S&P Capital IQ and HKMA staff calculations.

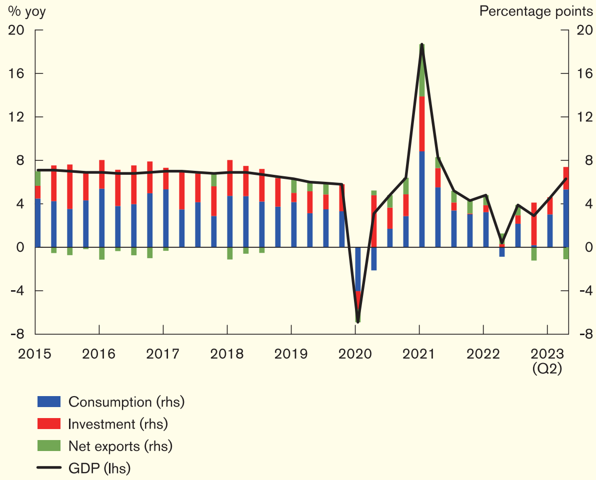
2.2 Mainland China

Economic performance and policy responses

Mainland China's year-on-year real GDP growth recovered to 4.5% in the first quarter and 6.3% in the second quarter due to the post-COVID reopening and a favourable base effect (Chart 2.8). However, the economic recovery was uneven, with the services sector generally outperforming the goods sector. Sequentially, the pace of recovery moderated during the second quarter reflecting fragile private sector confidence, renewed weakness in the property market and a slowdown in exports.[1] Altogether, the Mainland economy grew by 5.5% year on year in the first half of 2023, slightly above the official target of around 5% set for the whole year.

[1] On a quarter-on-quarter basis with seasonal adjustments, real GDP growth slowed from 2.2% in the first quarter to 0.8% in the second quarter.

Chart 2.8
Mainland China: Contribution to GDP growth by demand component



Sources: CEIC, National Bureau of Statistics of China (NBS) and HKMA staff estimates.

In the period ahead, Mainland's economic recovery is expected to continue but the economy is still facing headwinds from the challenging external environment and soft domestic demand. On the external front, exports may stay sluggish amid faltering external demand and ongoing worries about geo-economic fragmentation, even though exports of certain items, such as automobiles and new-energy products, showed some strength (Box 1 discusses how Mainland China can maintain export competitiveness in more sophisticated goods as the economy moved up the value chain alongside its expanding domestic market). Domestically, the property market is likely to remain soft, as it may take time for homebuyers' confidence to return. According to the latest consensus forecasts, the Mainland economy is expected to grow by 5.0% in 2023.

After a slight pickup at the beginning of the year following the economic reopening, headline consumer price index inflation edged down to around zero in recent months as goods inflation declined amid decreased pork and energy price pressures, and services inflation also stayed moderate.[2]

In light of recent headwinds facing the economy, the Mainland authorities reduced interest rates and the required reserve ratio (RRR)[3], boosted domestic consumption of electric vehicles, and emphasised the need to boost consumption of durable goods such as automobiles and electronics as well as services such as recreation and tourism. To strengthen business confidence, the authorities pushed forward the development and growth of the private economy through a series of measures[4] and announced measures to invigorate the capital market and shore up investors' confidence[5].

Asset and credit markets

Despite a small rebound in the first quarter due to pent-up demand, Mainland property market conditions weakened in the second quarter along with impaired homebuyers' confidence and the stalled economic recovery. Housing prices softened in all tiers of cities recently (Chart 2.9), while residential floor space sold, real estate investment and government land sales revenue saw deepened declines (Chart 2.10). Amid decreased revenues from land sales, some pressure on local government financing vehicles (LGFVs) emerged[6], raising concerns about their second-round effects on the real economy.

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[2] This, combined with the weak consumer confidence lately, has raised concerns that Mainland China may enter a deflationary downward spiral. However, given that (i) the slowing inflation may be attributed to temporary factors such as seasonality and drops in certain food and energy prices, which are not expected to persist in the long term; (ii) the economy continues to grow and monetary supply is expanding, two key features that do not support a deflationary environment, the foundation of persistent deflation does not appear to exist in Mainland China.

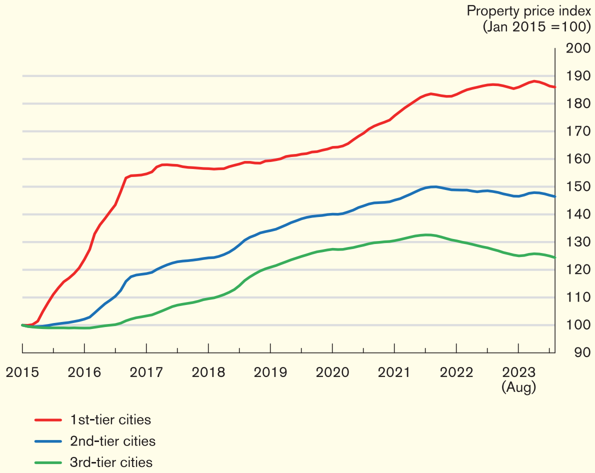
[3] The PBoC cut both the seven-day reverse repo rate and the Standing Lending Facility rates by 10 basis points each on 13 June and 15 August, and lowered the one-year Medium-term Lending Facility rate to 2.65% on 15 June and further to 2.50% on 15 August. The one-year and five-year Loan Prime Rates (LPRs) were also reduced to 3.55% and 4.2% respectively on 20 June to support economic recovery. On 21 August, the one-year LPR was reduced by 10 basis points to 3.45%, while the five-year LPR remained unchanged. On 14 September, the PBoC announced a second cut this year in the RRR for financial institutions by 25 basis points, effective from 15 September.

[4] See the State Council's recent "guideline on boosting the growth of the private economy", which included 31 measures on removing barriers in market access, fully implementing policies and mechanisms for fair competition, protecting legal rights of private business and entrepreneurs, and facilitating their financing via share listings, bond sales and overseas expansion. In addition, the National Development and Reform Commission along with other seven departments released a document with 28 measures including (i) encouraging the participation of POEs in identified industries and key projects; (ii) extending a package of tax-relief measures; and (iii) expanding debt financing tools to all eligible POEs.

[5] The Ministry of Finance and the State Taxation Administration cut stamp duty on stock trades by half on 27 August. Meanwhile, the China Securities Regulatory Commission also announced three measures to stabilise the stock market, including tightening the launch of IPOs and refinancing, restricting major shareholders' reductions of shareholdings, and lowering the margin requirements for financing.

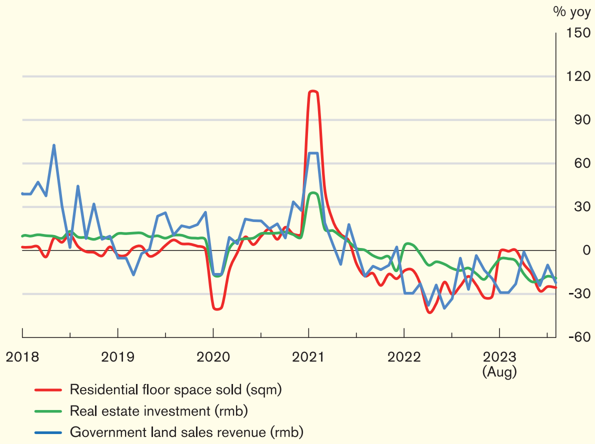
[6] In particular, the LGFV bond yield spread over policy bank bonds picked up recently in some provinces such as Yunnan and Guizhou. Regarding policies, the Central Government continued to emphasise controlling incremental debt, resolving existing debt (e.g. debt swapping), strengthening the governance of financing platforms and facilitating their transformation (through commercialising), while the local governments indicate stronger efforts to resolve the debt problem, including lowering interest rate burden, loan extension or restructuring and consolidation of financing vehicles. At the July meeting, the Politburo pledged to roll out a comprehensive local government debt resolution plan.

Chart 2.9
Mainland China: Residential property prices by tier of cities



Sources: CEIC and HKMA staff estimates.

Chart 2.10
Mainland China: Residential property market activities



Sources: CEIC and HKMA staff estimates.

In response to the sluggish property market, the authorities implemented a range of policies to secure delivery of presold homes, support the demand for first-time purchases and upgrades, and shore up market confidence. Such policies include the establishment of relending facilities to ensure home delivery[7], the extension of two measures[8] from the "16 measures" released in last November and a tax rebate scheme introduced in last October[9], cuts in the interest rates for both new and existing mortgages as well as reductions in the minimum down payment ratios for both first- and second-home purchases[10]. The Politburo also pledged at the July meeting to adapt to the new demand and supply conditions of the property market and adjust or optimise property policies in a timely manner. At the city level, local authorities continued to lift restrictions on both home purchases and sales, recognised homebuyers who have repaid their mortgages as first-time buyers, and introduced pilot schemes for selling ready-for-occupancy homes to boost homebuyers' confidence[11]. To help build a new development mode for the real estate sector in the long run, the authorities also rolled out policies aimed at broadening the direct funding channels for developers[12].

7 In January, two relending facilities were established by the PBoC to (i) back the mergers and acquisitions activities by asset management companies with stalled projects and (ii) support the purchase of existing apartments for rental housing in eight pilot cities.

8 On 10 July, the PBoC and the National Financial Regulatory Administration (NFRA) jointly announced to extend the expiration date of the two measures to end-2024, essentially facilitating (i) the extension of developers' outstanding loans and (ii) the conditional exemption of lenders' liabilities in extending special loans to support the completion of pre-sold houses with delivery delay. The remaining "16 measures" without expiration date were announced to be long-term effective.

9 On 25 August, the Ministry of Finance, the State Administration of Taxation, and the Minstry of Housing and Urban-Rural Development jointly announced the extension of a tax refund programme for residents who sell their homes and buy another within a year.

10 For new mortgages, the five-year LPR (i.e. the benchmark rate for new mortgages) was lowered by 10 basis points on 20 June. Regarding existing mortgages, the PBoC and the NFRA announced on 31 August the cuts of existing mortgage rates, effective from 25 September. The minimum down payment ratios for first- and second-home purchases were lowered nationwide to 20% and 30%, respectively.

11 Recently, Shenzhen and Beijing have imposed ready-for-occupancy conditions for land transfer transactions.

12 In February, the authorities announced a pilot programme to allow qualified private equity funds and foreign investors to invest in commercial properties, residential units and infrastructure projects.

The overall risk in the Mainland banking sector remained manageable. The non-performing loan (NPL) ratios of state-owned banks further declined to 1.29% in June 2023 from 1.31% six months earlier. Moreover, the provision coverage ratio of large Mainland banks improved to 250% in June 2023 from 245% in December 2022, well above the regulatory requirement. That said, the non-performing loan ratio of some smaller banks, such as rural commercial banks, increased slightly, but remained at a manageable level (Table 2.A).

Table 2.A
Mainland China: non-performing loan (NPL) ratio by bank type

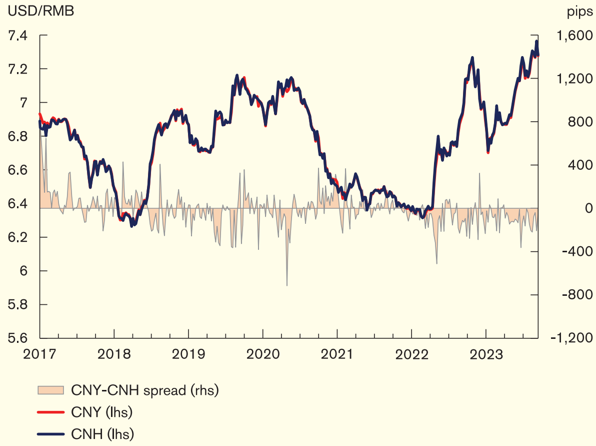
NPL ratio (%)	Jun 2022	Dec 2022	Jun 2023
State-owned commercial banks	1.34	1.31	1.29
Joint-stock commercial banks	1.35	1.32	1.29
City commercial banks	1.89	1.85	1.90
Rural commercial banks	3.30	3.22	3.25

Source: CEIC.

Exchange rate

Amid concerns about the weaker-than-expected domestic economic recovery and widened interest rate differentials vis-a-vis the US, the onshore RMB (CNY) generally depreciated against the USD during the review period with its offshore counterpart (CNH) generally trading lower during the same period (Chart 2.11). With renewed depreciation pressure, the PBoC announced to lower the foreign exchange RRR by 2 percentage points to 4%, effective from 15 September. On 1 August, the PBoC and the State Administration of Foreign Exchange (SAFE) pledged to strengthen the dual management of "macro-prudential and micro-supervision" in the foreign exchange market to ensure RMB exchange rate stability during the work conference for the second half of 2023. The central bank also reiterated that it will firmly prevent large fluctuations in the RMB exchange rate and correct the pro-cyclical, one-sided market actions when necessary. In addition, the PBoC and the SAFE raised the cross-border macro-prudential adjustment ratio for corporates and financial institutions to 1.5 from 1.25 on 20 July, making it easier for domestic companies to raise USD funds from overseas.

Chart 2.11
Mainland China: Onshore and offshore RMB exchange rates against the USD



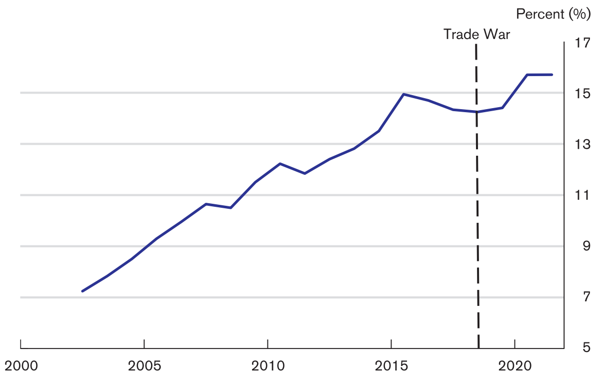
Sources: Bloomberg and HKMA staff estimates.

Box 1
Does Mainland China's competitiveness in exports benefit from its large domestic market?

Introduction

Since joining the World Trade Organization (WTO), Mainland China has grown to become the world's leading manufacturer, with its share in global merchandise exports rising to more than 15% by the end of 2021 (Chart B1.1). Amid headwinds from dwindling global demand, relocation of supply chains and prolonged trade tensions between China and the US, Mainland's exports saw notable declines in recent months, which raised some questions on whether Mainland China can remain as a global export hub over the longer term.

Chart B1.1
Mainland China's share in global exports since accession to World Trade Organization (WTO)



Note: Shares are calculated in terms of value for each year.
Sources: Base Analytique du Commerce International (BACI) and HKMA staff estimates.

There is a view that the large and still expanding Mainland domestic market may help Mainland manufacturers achieve economies of scale, thereby maintaining a competitive edge in exports. This argument resonates with the idea of "home-market effect" in international trade literature[13]. In this box, we examine ways in which an economy's export competitiveness, at both aggregate and product level, is related to the size of its domestic market. We then discuss how Mainland China's export success over the past two decades, especially in more sophisticated goods, can be connected with international experiences.

What do cross-country regressions tell us about the home-market effect on export competitiveness?

We adopt a simple and intuitive measure of export competitiveness: a country's share of total global exports in a given year. It operates at two levels: the aggregate level $Share_{c,t}$, and the product level $Share_{c,p,t}$. The size of a country's domestic market $Market\ Size_{c,t}$ is measured by the country's domestic absorption or the two key components of GDP, income per capita and population, all in real (purchasing power parity) terms. Additionally, we are interested in whether the relationship between export competitiveness and market size varies across products of different levels of complexity, $PCI_{p,t}$ (see footnote 14 below for explanation).

[13] The large literature on the home-market effect dates back to the influential work of Linder (1961) and Krugman (1980), who hypothesised and formalised the idea that strong domestic demand for certain goods can stimulate exports of those goods. More recent studies, such as Fajgelbaum, Grossman, and Helpman (2011), Fieler (2011) and Matsuyama (2015), focus on how growth of income per capita could generate the changes in patterns of trade and specialisation between countries under non-homothetic consumer preference.

Specifically, we estimate the following two equations to examine the empirical relationship at the aggregate and the product level separately:

$$Share_{c,t} = \alpha + \beta\ Market\ Size_{c,t} + \delta_c + \lambda_t + \varepsilon_{c,t} \quad (1)$$

$$Share_{c,p,t} = \alpha + \beta_1\ Market\ Size_{c,t} + \beta_2\ PCI_{p,t} + \beta_3\ Market\ Size_{c,t} \times PCI_{p,t} + \delta_c + \xi_p + \lambda_t + \varepsilon_{c,p,t} \quad (2)$$

We control for country and year fixed effects (FE), which capture time-invariant unobserved country characteristics and time-varying shocks common to all countries, respectively. Product fixed effects are also added in the second equation to control for unobserved product characteristics that might influence the results[14].

Table B1.1
Export performance and size of domestic market: country and product level evidence

Dependent variable	$Share_{c,t}$		$Share_{c,p,t}$	
	(1)	(2)	(3)	(4)
Market Size	0.326*** (0.031)		0.334*** (0.011)	
Income		0.330*** (0.031)		0.334*** (0.011)
Population		0.378*** (0.080)		0.260*** (0.027)
PCI			-1.092*** (0.022)	-2.117*** (0.022)
Market Size x PCI			0.091*** (0.001)	
Income x PCI				0.216*** (0.002)
Population x PCI				0.032*** (0.001)
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Product FE	N/A	N/A	Yes	Yes
R-squared	0.97	0.97	0.31	0.32
Observations	2,214	2,214	2,186,727	2,186,727

Note: The sample period is 2002 to 2019. Shares are in % terms. PCI ranges from -3 to 3. All other variables are in log terms. Standard errors in parentheses.
* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Regression results of equation (1) are reported in columns (1) and (2) of Table B1.1. Not surprisingly, countries with greater domestic expenditure, higher income per capita and larger population size tend to acquire greater shares in global exports. The coefficients (β) suggest that a 100% increase in any of these three variables is associated with an increase of 0.3–0.4 percentage points in a country's share in global exports.

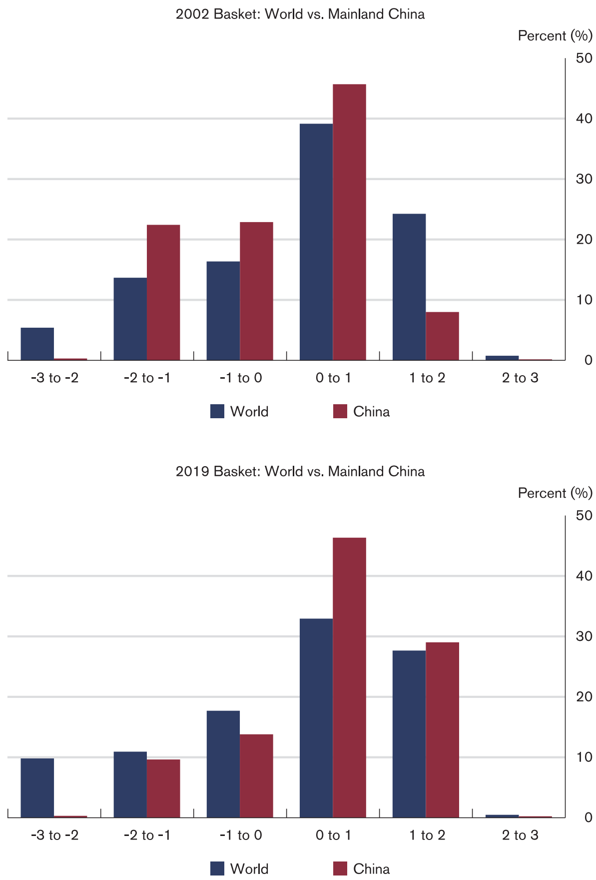
Columns (3) and (4) report the regression results of equation (2). While the positive correlation between export shares and market sizes holds strongly at the product level, the positive coefficient on the interaction term (β_3) in column (3) suggests that the impact of market size on export share is larger for products with higher PCI, i.e., the more sophisticated goods. Moreover, coefficients in column (4) indicate that it is mainly the income component of market size that drives the latter relationship, though population also plays a positive albeit much smaller role. In other words, it is higher income per capita, rather than bigger population

[14] Exports shares are constructed using the BCAI dataset, which provides data on bilateral trade flows for over 200 countries and 5000 products at the Harmonized System six-digit (HS6) level. The dataset has an annual frequency and we consider trade data since 2002, the year following Mainland China's accession to the WTO. Data on market size-related variables are sourced from Penn World Table (PWT) 10.0. Product Complexity Index (PCI) measures the sophistication of know-how required to produce each HS4 product, which is taken from Atlas of Economic Complexity (AEC) database constructed by Harvard's Growth Lab. Countries with population less than one million or the average annual trade volume less than US$1 billion, or countries that do not exist in any of our three main data sources, are excluded from our sample. The consolidated dataset is a panel comprising of 123 countries and 1,234 products over the period of 2002–2019.

size, that dictates the export shares of more complex products.

To illustrate the importance of owning a larger export share in sophisticated products and how it can benefit Mainland China, in Chart B1.2 we divide the export baskets of the world and Mainland China respectively into six bins by product complexity (measured by PCI), and compare their distribution of value shares in 2002 versus 2019. In both years, the more sophisticated products (with PCI > 0) make up for a larger share of global trade in terms of value, implying that all else equal, countries that specialise in exporting higher PCI products can increase their shares of the pie in global trade. Relative to the world distribution, Mainland China's export basket was clearly restructured towards the higher complexity segments (i.e. PCI in between 1 to 2) over this period, which contributes to the increase in its global export share through raising its share in higher-valued products.

Chart B1.2
Distribution of products by Product Complexity Index (PCI) in Mainland China and world export basket: 2002 vs 2019



Note: Shares are calculated in terms of value.
Sources: BACI, AEC and HKMA staff estimates.

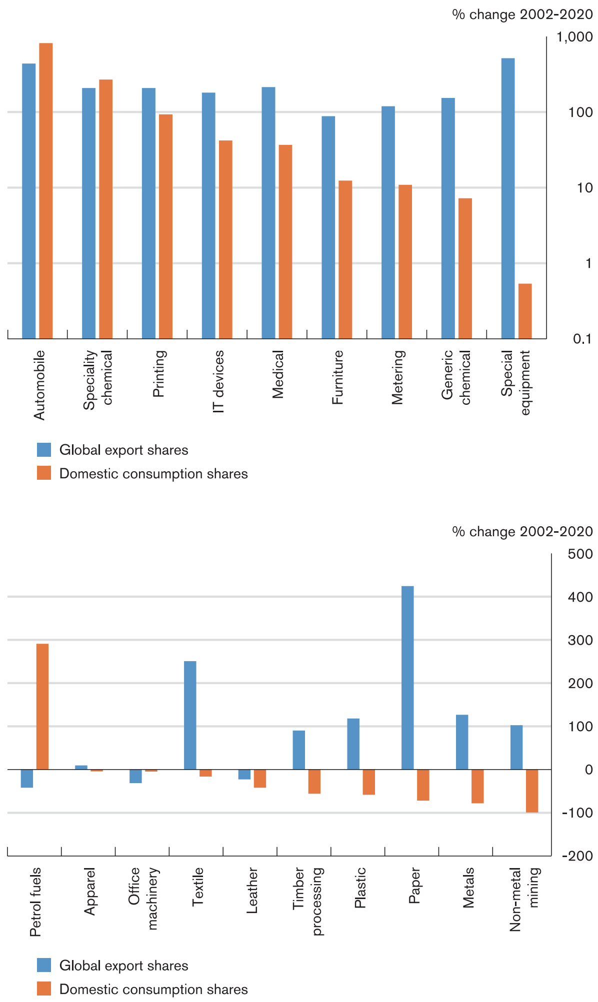
Connecting Mainland China's experiences with cross-country evidence

A major empirical challenge facing our cross-country analysis is that a country's measured market size may depend on not just its domestic demand conditions, but also the supply-side factors such as the size of labour force and productivity. Therefore, it is arguable that the positive link between the export performance and market sizes cannot be simply interpreted as a home-market effect. However, exogenous shifters that can be used to distinguish demand and supply-side drivers of home market sizes are rarely observable in practice, especially at the country level[15].

To investigate the potential role that the domestic market forces may have played in shaping Mainland's export patterns, we delve further into industry-level data on domestic consumption expenditure sourced from the National Bureau of Statistics (NBS) Input-Output tables and match the industry classification to our trade data using a concordance provided by Brandt et al. (2017).

In Chart B1.3, we plot for each industry the change in domestic consumption shares against the change in global export shares over the period of 2012 to 2020. First, domestic expenditure shares of sophisticated industries (top chart) such as automobiles, specialty chemicals and IT devices tend to rise over time, while those of more basic industries (bottom chart) such as shoes and clothing tend to see declines. Second, for the sophisticated industries, their growth in export shares was often accompanied by expansions in domestic expenditure shares, while there is no obvious correlation between the two among basic industries.

Chart B1.3
Long-run changes in domestic consumption shares and global export shares: "sophisticated" vs "basic" industries



Note: The blue bars represent % changes in Mainland China's shares of global exports for each industry. The orange bars represent % changes in Mainland China's domestic consumption shares for each industry.
Sources: NBS, BACI and HKMA staff estimates.

As a natural consequence of the rising income level, the accompanied shift in Mainland's demand structure towards higher-end goods may have in turn induced a "home-market" effect on its exports: the fast-expanding domestic markets for sophisticated goods attract more competition and research and development (R&D) investments (Chart B1.4) into those sectors, bringing higher productivity growth and lower costs of production, which ultimately leads to greater competitiveness in exports of those goods. In comparison, exports of the basic goods

15 Recent studies have attempted to construct exogenous demand shifters to identify the causal impact of local demand on exports. For example, Costinot et al. (2019) developed a simple test of the home-market effect using detailed drug sales data from the global pharmaceutical industry based on cross-country variation in demographic characteristics.

sectors would rely more on external demand as their domestic markets shrink on a relative basis, resulting in a lower correlation between exports and domestic expenditure.

Chart B1.4
R&D spending: "sophisticated" vs "basic" industries

Source: NBS.

Conclusion

Our cross-country analysis indicates a positive correlation between a country's share of global exports and its home market size. Once we look beneath the aggregate level, our analysis points to the crucial role of income growth in explaining Mainland China's success in exports, especially of more sophisticated goods over the past two decades. In particular, the substantial increase in the income level has shifted domestic demand in Mainland China towards more sophisticated goods, which in turn leads to higher R&D and productivity growth in those industries and hence greater competitiveness in exports. In this sense, Mainland China will likely be able to remain as an export hub in the longer term by sustaining its export competitiveness in sophisticated products, as its domestic market for those products continues to expand along with a rising income level.

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3. Domestic economy

Hong Kong's economy rebounded visibly in the first quarter of 2023, thanks to the revival of inbound tourism and domestic demand, and continued to recover in the second quarter although the momentum softened. The economic recovery is expected to continue for the rest of 2023, but this positive outlook is subject to risks and uncertainties stemming from the US policy rate path, the pace of the Mainland economic recovery, global economic environment and geopolitical tensions. The labour market is expected to improve further along with the ongoing economic recovery. This may exert some upward pressures on domestic business costs, although local inflation should remain largely moderate as external price pressures will likely recede further in the near term.

3.1 Real activities

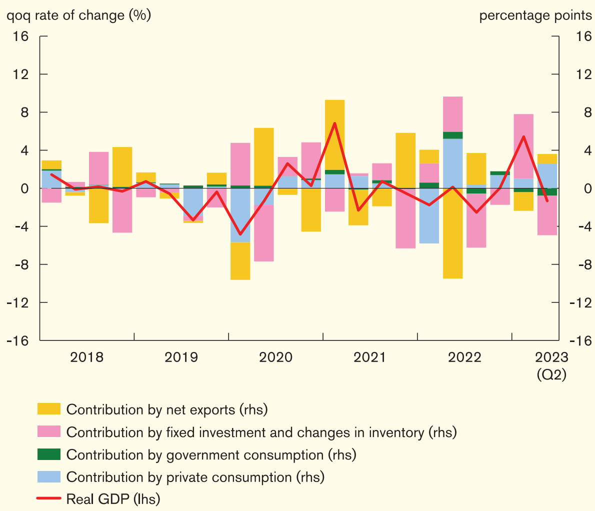
With the full resumption of normalcy in Mainland China and Hong Kong, the domestic economy experienced a sharp rebound in the first quarter of 2023. The recovery continued in the second quarter, although the momentum softened. Real GDP resumed growth of 2.9% and 1.5% on a year-on-year basis in the first and second quarters respectively, following contractions in the preceding four quarters (Table 3.A). On a quarter-on-quarter basis, economic growth reached 5.4% in the first quarter before declining to -1.3% in the second quarter against the high base of comparison (Chart 3.1).

Table 3.A
Real GDP growth

		Year-on-year growth rate (%)	Seasonally adjusted quarter-on-quarter growth rate (%)
2022	Q1	-3.9	-1.8
	Q2	-1.2	0.1
	Q3	-4.6	-2.5
	Q4	-4.1	0.0
2023	Q1	2.9	5.4
	Q2	1.5	-1.3

Source: Census and Statistics Department (C&SD).

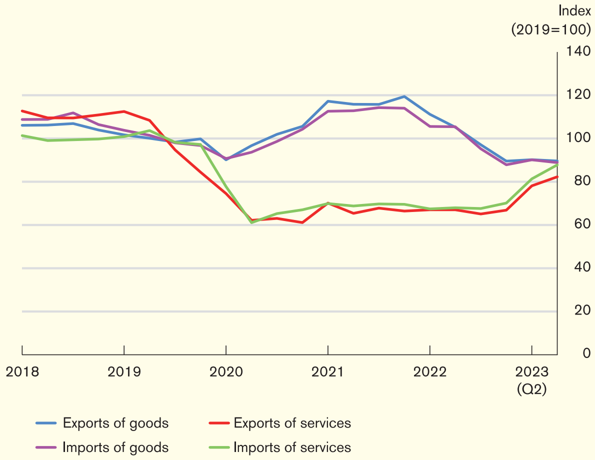
Chart 3.1
Real GDP growth and contribution by major expenditure component



Note: Growth rates are seasonally adjusted.
Sources: C&SD and HKMA staff estimates.

The economic growth was supported by the robust revival of inbound tourism and domestic demand. Domestically, private consumption expanded notably in the first half of the year on the back of the relaxation of COVID-19 restrictions as well as the disbursement of the first instalment of consumption vouchers. Investment spending picked up in the first quarter as business sentiment improved[16] alongside the return of normalcy in economic activities, although declining mildly in the second quarter amid tightened financial conditions. Box 2 uses granular data to evaluate the effectiveness of the enhancements to the SFGS. The study provides evidence that the SFGS helped lift the size of loans granted to local SMEs, thereby helping them to navigate through the pandemic. On the external front, exports of services revived, thanks to the strong recovery in inbound tourism following the resumption of normal cross-boundary travel[17] (Chart 3.2). In contrast, merchandise exports remained sluggish amid a challenging external economic environment. Overall, net trade contributed negatively to GDP growth in the first half of the year.

Chart 3.2
Export and import volume



Note: The data are seasonally adjusted.
Source: C&SD.

In the period ahead, Hong Kong's economic recovery is expected to continue for the rest of 2023, with inbound tourism and local consumption continuing to be the major growth drivers. The revival of inbound tourism will be sustained by further improvement in transportation and handling capacity. Meanwhile, improved labour market conditions, coupled with the disbursement of the second instalment of consumption vouchers in July, will render support to private consumption. The Government has also been exploring various measures to further strengthen the sustainability of the economic recovery given the softened business sentiment in recent months. On the other hand, merchandise trade may continue to face intense pressure as external demand is expected to remain weak.

Overall, in view of the actual outturn in the first half of this year, the Government revised the real GDP growth forecast for 2023 to 4.0%–5.0%.[18] That said, this positive economic outlook will hinge on a number of factors, including the US policy rate path, the pace of the Mainland economic recovery, the prospects for global economic growth and risks stemming from geopolitical tensions.

3.2 Labour market conditions

The labour market conditions improved further in the past few months alongside the rebound in economic activities. The seasonally adjusted unemployment rate declined further to a decade-low level of 2.8% in August 2023 (Chart 3.3). Total employment has also been picking up since February, albeit still below its pre-pandemic level. To address acute manpower shortages, the Government launched the labour importation schemes in July 2023 for the construction and transport sectors, with the first

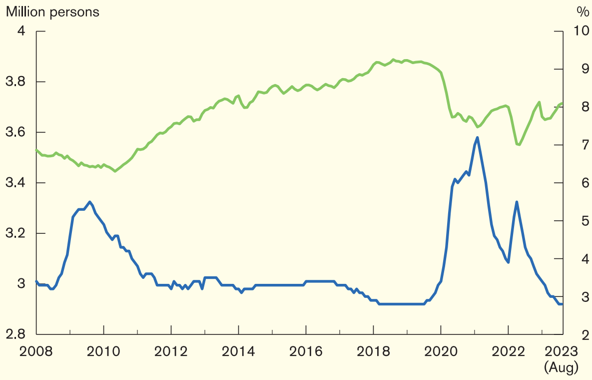
[16] The PMI stayed in the expansionary territory (above 50) in the first half of 2023 before easing slightly in July and August.

[17] The average number of inbound tourist arrivals has recovered to about 132 thousand per day in August, equivalent to 88% of the pre-pandemic average daily level in 2019. On a year-to-date basis, total inbound tourist arrivals amounted to 41% (up to 25 September) of the annual inbound tourist arrivals in 2019.

[18] Private-sector analysts have also revised their forecasts to an average of 4.2%.

batch being expected to arrive in the fourth quarter. Additionally, the Government also introduced the ESLS in September 2023 with a view to help temporarily fill the manpower gap in other sectors, such as retail and food services. Looking ahead, the labour market is expected to continue improving amid the ongoing economic recovery.

Chart 3.3
Labour market conditions

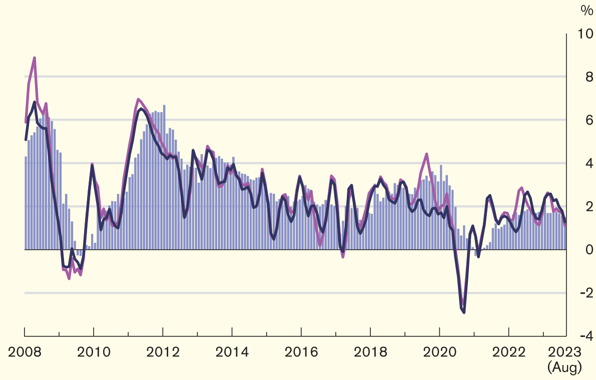


Source: C&SD.

3.3 *Inflation*

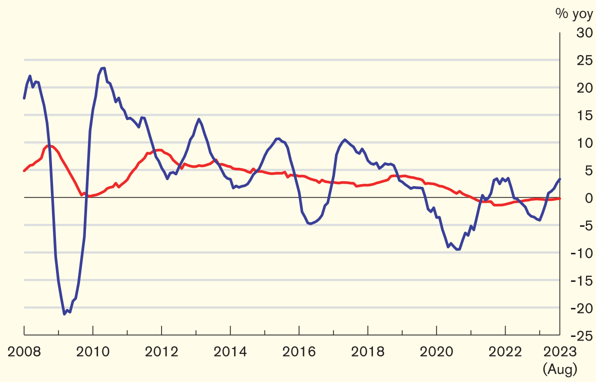
Local inflationary pressures remained mild in recent months. On a year-on-year comparison, the underlying composite consumer price index (CCPI) increased by 1.9% and 1.7% in the first and second quarters of 2023 respectively, and by 1.5% in August 2023.[19] Inflation momentum, as measured by the annualised three-month-on-three-month underlying inflation rate, also stayed moderate (Chart 3.4). Prices of energy-related items, meals out and takeaway food, and clothing and footwear saw a sharp year-on-year increase. By contrast, the housing rental component continued to weigh on overall inflation given the feed-through of earlier consolidation in fresh-letting residential rentals (Chart 3.5). Real unit labour costs also declined in the first quarter of 2023 (Chart 3.6). External price pressures were still notable, but their pace of increase eased in recent months (Chart 3.7).

Chart 3.4
Different measures of consumer price inflation



Sources: C&SD and HKMA staff estimates.

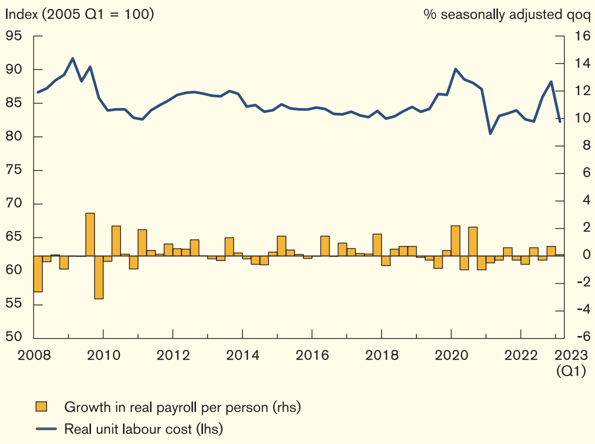
Chart 3.5
CCPI rental component and market rental



Sources: C&SD and Rating and Valuation Department (R&VD).

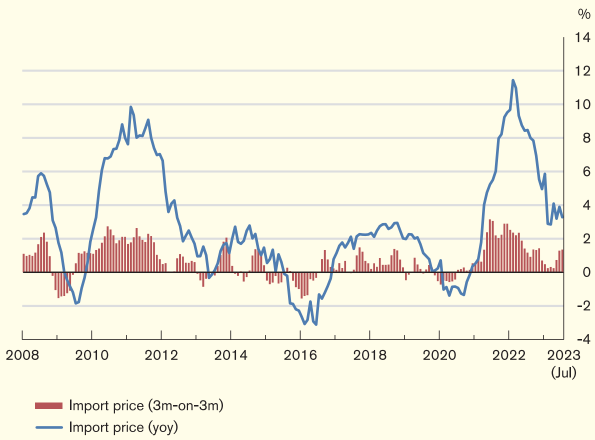
[19] Inclusive of the effects of the Government's relevant one-off relief measures, the year-on-year headline inflation rate was 1.9% and 2.0% in the first and second quarters of 2023, and 1.8% in August 2023.

Chart 3.6
Unit labour cost



Sources: C&SD and HKMA staff estimates.

Chart 3.7
Hong Kong's import prices



Source: C&SD.

In the near term, local inflation is expected to remain moderate for the rest of 2023. While the domestic economic recovery and improving labour market may put some upward pressure on business costs, external price pressures may recede further. The Government projections for the underlying and headline inflation rates for 2023 are 2.0% and 2.4% respectively.

Box 2
Assessing the effectiveness of SME Financing Guarantee Scheme using granular data and deep learning

Introduction

The SFGS was launched in 2011 by the Hong Kong Mortgage Corporation Limited (HKMC) to assist SMEs and non-listed enterprises in obtaining financing from participating lenders. After being transferred to the HKMC Insurance Limited in 2018, the SFGS has introduced time-limited guarantee coverage products, such as the 90% guarantee coverage scheme, and the special 100% loan guarantee scheme.

While the scheme has gained popularity, previous studies examined only the aggregate effect of the SFGS enhancements and there is limited granular evidence on the effectiveness across different SME borrowers.[20] To fill this knowledge gap, our study examines the effectiveness of SFGS enhancements on increasing credit to Hong Kong SMEs. To achieve this objective, the study will leverage on the granular data from the HKMA Granular Data Reporting (GDR) scheme and apply a deep neural network (DNN) model to identify the factors influencing the size of bank loans to SMEs. In particular, we perform scenario analyses to estimate the hypothetical SME loan amounts with and without the SFGS's coverage, so as to evaluate the benefits derived from the SFGS.

[20] Tan et al. (2019) analysed the SFGS's impact on the supply of SME loans by banks in Hong Kong following the global financial crisis. Utilising a difference-in-differences model, they studied regulatory banking returns submitted to the HKMA by banks, discovering that public sector loan guarantee schemes significantly mitigated funding difficulties faced by SMEs. More recently, Wong et al. (2022) used aggregate data obtained from banking returns and demonstrated that banks with higher exposures to the SFGS registered greater year-on-year growth of loans to hard-hit sectors compared to other banks during the post-pandemic period.

Data and Methodology

The GDR programme requires pilot authorized institutions (AIs) to submit transaction-level corporate loan data to the HKMA on a monthly basis. This enables us to carry out a comprehensive, bottom-up analysis of the SFGS scheme's effect on bank lending to SMEs. The dataset covers information on over 350,000 outstanding corporate loans, totalling HK$6.6 trillion (around 90% of the outstanding corporate loans in Hong Kong) as of March 2023.

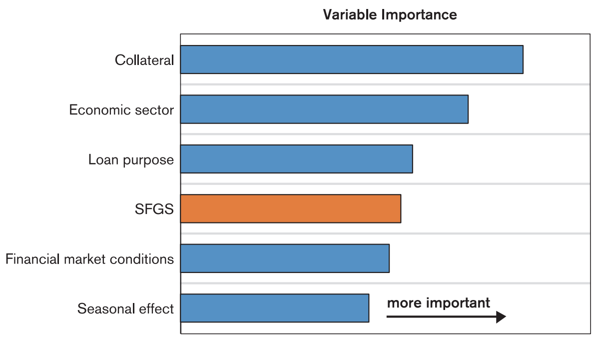
While this study concentrates on a specific subset of the GDR data, the sample size remains huge and poses considerable challenges to traditional econometric approaches. To address this issue, this study uses deep learning techniques that offer several advantages over conventional Ordinary Least Squares (OLS) regression models. In particular, deep learning algorithms are more capable than OLS models in discerning nonlinear and complex relationships between variables. Moreover, deep learning models can derive higher-level features from raw data and provide more accurate predictions without requiring a knowledge of the relevant features in advance.

Nevertheless, as DNN models employ complex, nonlinear functions and weightings, the predictions of DNN models are usually difficult to interpret intuitively compared to linear models like OLS regression. As a result, DNN models can give rise to the so-called "black box" problem. To overcome this problem, this study will employ reverse engineering tools to gain a deeper understanding of the decision-making process of the DNN model. Specifically, by analysing the impact of removing a given variable on the model's performance while keeping all other things constant, we can ascertain the relative importance of each variable and identify critical factors that can influence the loan amounts granted by banks to SMEs.

Empirical results

I. *Which factors influence the size of SME loans the most?*

Chart B2.1
Contribution of variables to loan amount predictions



Source: HKMA staff estimates.

Chart B2.1 highlights some of the most influential factors that are estimated to affect the size of SME loans. These factors include:

(i) **Collateral:** Consistent with experiences, the provision of collateral emerges as the most crucial determinant of the SME loan amount. Intuitively, collateral serves as a safeguard that banks can liquidate to recover a portion or the entirety of the loan amount if a borrower defaults. Consequently, lenders are more likely to offer larger loan amounts to SME borrowers who can provide collaterals.

(ii) **Economic sector:** Different industries have different funding requirements and risk levels, which can directly affect SME loan sizes. Capital-intensive sectors, like manufacturing, may require larger loans for equipment, while service-based industries may need smaller loans for operating expenses. Banks may also exercise caution when lending to sectors that are prone to economic volatility.

(iii) **Loan purpose:** The intended use of a loan can significantly affect its size. For example, loans for long-term investments, such as expanding operations, may be more appealing to lenders since these loans can contribute to the growth of business. Conversely, the size of loans for short-term needs, like working capital or cash flow management, may be smaller as these loans address mainly temporary liquidity challenges and therefore may be deemed riskier to lenders.

(iv) **SFGS:** Although not as influential as the other factors, our model shows that the SFGS can notably affect SME loan amounts. By guaranteeing part of the loan, the SFGS encourages lenders to lend to individuals or businesses that may otherwise be deemed too risky to qualify for a larger loan.

II. *How substantial is the impact of the SFGS on the size of SME loans?*

Our findings suggest that the SFGS plays a significant role in influencing the size of loans extended to SME borrowers. To explore the SFGS's effect quantitatively, we conducted a hypothetical scenario analysis using our trained DNN model (Chart B2.2). Specifically, we randomly selected a data point from our sample and generated two SME loans with identical attributes.[21] We then artificially modified a single characteristic of the loans, namely the SFGS coverage status, while holding all other things constant. By comparing how this change in the SFGS coverage status would affect our model's prediction, we can infer the effect of the SFGS on the loan amount.

[21] To verify the reliability of our results, we conducted several additional trials using distinct, randomly selected subsets of the data. These repetitions of the analysis yielded consistent findings.

Chart B2.2
Graphical illustration of scenario analysis

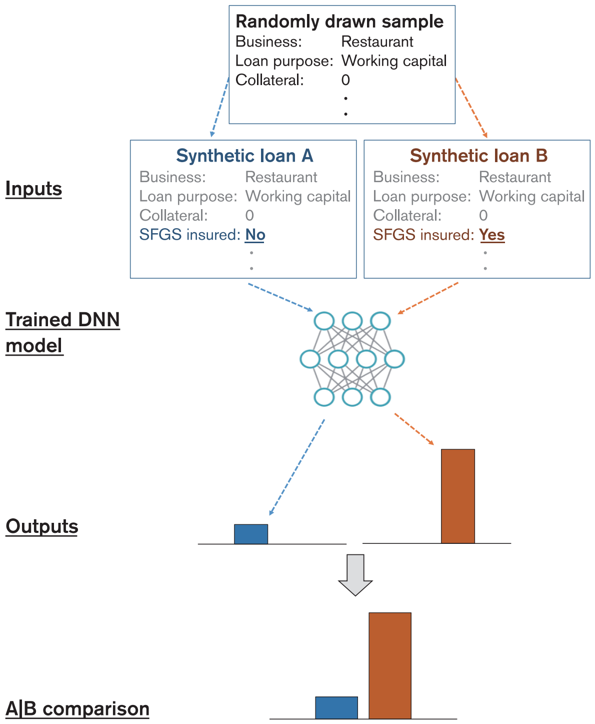
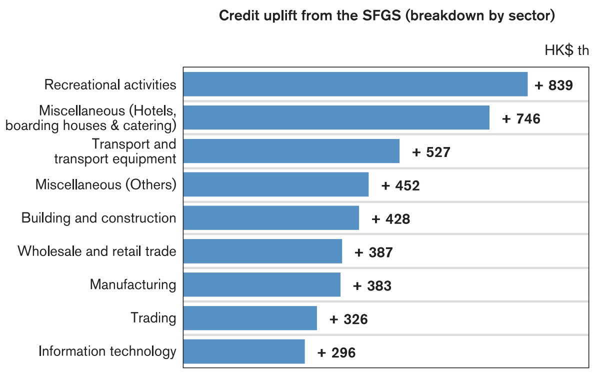


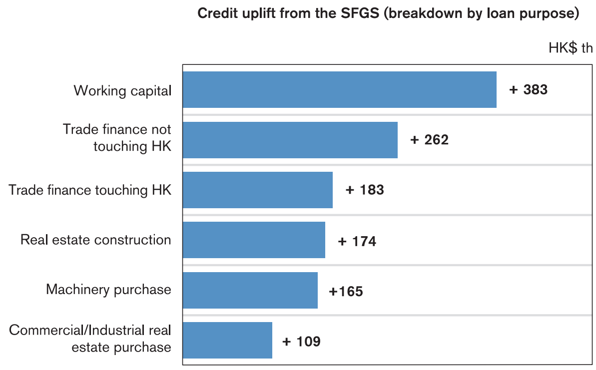
Chart B2.3
An illustration of the effect of the SFGS on SME loan amount (by sector)[22]



Source: HKMA staff estimates.

Chart B2.3 shows the estimated effect of the SFGS on SME borrowers across major industry sectors. As expected, SFGS can provide relatively more credit support to those industries that were hardest hit by the pandemic, such as recreation, hospitality, and food services. In contrast, the SFGS can provide relatively modest but still significant supports to industries that were more stable and less affected, such as manufacturing.

Chart B2.4
An illustration of the effect of the SFGS on SME loan amount (by loan purpose)[22]



Source: HKMA staff estimates.

Chart B2.4 displays the effect of SFGS on loans for different purposes. The SFGS is estimated to provide the greatest support for working capital loans, while loans for equipment see relatively less benefits. This disparity suggests lenders view uncertainty and risk as more significant for cash flow-related expenses than for those with collateral values. By guaranteeing the loans and therefore reducing uncertainty and risk facing the lenders, the SFGS can provide relatively more support to the size of working capital loans.

Conclusion

This study analyses the effectiveness of the SFGS in Hong Kong using granular data obtained from the HKMA's GDR programme and a DNN model. Our findings suggest that the SFGS can significantly affect the size of loans granted to SMEs, with factors such as collateral, economic sector, and loan purpose also playing critical roles in determining the loan sizes. Our scenario analysis further illustrates the varying degrees of credit uplift provided by the SFGS to loans across different industries and purposes.

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22 To enable cross-sectional comparisons, the above credit uplifts are derived using a standard uncollateralised loan amount of HK$200,000. This closely aligns with the median value of uncollateralised loans in the training set.

Overall, our results suggest that the SFGS has been effective in supporting SMEs, particularly those operating in industries most affected by the pandemic, or industries that require loans for purposes deemed as rendering more uncertainties to lenders. This support has been particularly valuable during the pandemic, when businesses faced heightened uncertainty and financial challenges.

Our findings contribute to the existing literature on the effect of the SFGS on SME financing and provide insights for policymakers on the effectiveness of such guarantee schemes in promoting credit access and fostering inclusive finance. However, it is important to note that our study only provides an approximation of the SFGS's impact based on a DNN model and may not capture the full complexity of the lending process.

References

Tan, E., Wong, E., Ho, K. and Wong, A., (2019). "Evaluation of the Effects of Bank Regulatory Reforms and Loan Guarantee Schemes on Loans to Small and Medium-Sized Enterprises", *HKMA Research Memorandum*, No. 2019/11, The Hong Kong Monetary Authority, 18 November 2019.

Wong, E., Ho, K., Wong, A., & Lo, V. (2022). "The Effects of Covid-19 Support Measures on Bank Lending: Lessons from the Release of the Countercyclical Capital Buffer and Loan Guarantee Schemes in Hong Kong", *HKMA Research Memorandum*, No. 2022/03, The Hong Kong Monetary Authority, 2 June 2022.

4. Monetary and financial conditions

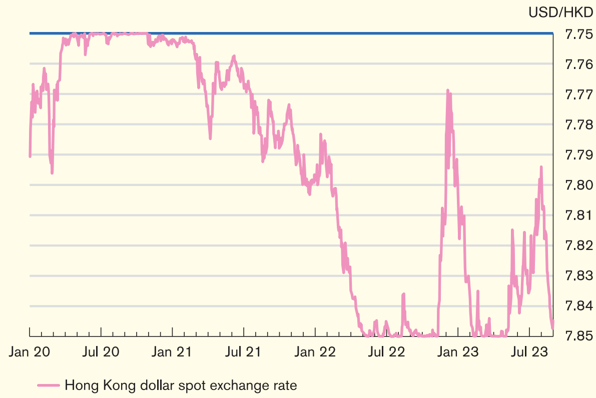
The HKD traded close to the weak-side Convertibility Undertaking (CU) from March to early May before regaining some strength, mainly driven by dividend payment-related demand from listed companies and half-year-end funding needs by corporates. Towards the end of August, the HKD softened to close to the weak-side CU again amid weak equity sentiment. Hong Kong Interbank Offered Rates (HIBORs) generally headed higher and remained at relatively high levels after the half-year-end, before some easing towards the end of the review period. With total deposits being stable during the review period, there was no notable sign of outflows from the Hong Kong banking system. Overall, the HKD exchange and money markets continued to trade in a smooth and orderly manner. Looking ahead, uncertainties surrounding the US monetary policy outlook, the pace of the Mainland economic recovery, global economic environment and the lingering geopolitical tensions may heighten fund-flow volatility. Nonetheless, with the ample foreign reserves position and a robust financial system, Hong Kong is able to withstand the volatilities in fund flows without compromising its financial stability.

4.1 Exchange rate and capital flows

The HKD traded close to the weak-side CU from March to early May, reflecting market expectation of a "high for longer" US policy rate, and a cautious sentiment in the local stock market. From early May to July, the HKD exchange rate regained some strength, mainly driven by dividend payment-related demand from listed companies and half-year-end funding needs by corporates. Towards the end of August, the HKD softened to close to the weak-side CU again amid weak equity sentiment. During the review period, the HKD traded within a range between 7.7940 and 7.8500 against the USD (Chart 4.1).

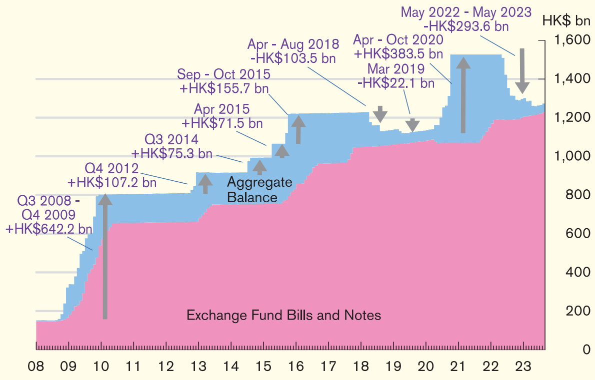
The weak-side CU was triggered five times in April and once in early May. Under the weak-side CU, the HKMA bought a total of HK$32.45 billion. Accordingly, the Aggregate Balance of the banking system declined from HK$77.1 billion at the end of February to HK$44.9 billion at the end of August. The day-to-day interbank operations and settlement activities continued to operate in a smooth and orderly manner (Chart 4.2).

Chart 4.1
Hong Kong dollar exchange rate



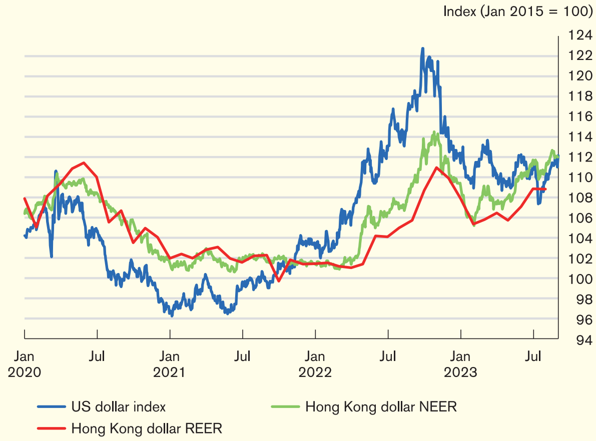
Source: HKMA.

Chart 4.2
Aggregate balance and exchange fund bills and notes (EFBNs)



Source: HKMA.

Chart 4.3
Effective exchange rate index (NEER) and real effective exchange rate index (REER)



Note: The REER is seasonally adjusted and available only on a monthly basis.
Sources: CEIC, C&SD and HKMA staff estimates.

Broadly tracking the movements of the US dollar, the Hong Kong dollar nominal effective exchange rate index (NEER) strengthened during the review period (Chart 4.3). The Hong Kong dollar real effective exchange rate index (REER) generally followed the movement of the NEER.

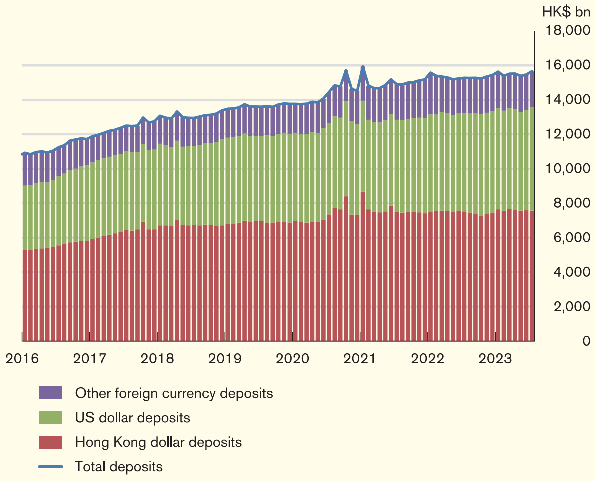
Looking ahead, fund flows remain subject to uncertainties surrounding the outlook for the US policy rate, the pace of the Mainland economic recovery, global economic environment and geopolitical tensions. Nonetheless, with the ample foreign reserves position and a robust financial system, Hong Kong is able to withstand the volatilities in fund flows without compromising its financial stability.

4.2 Monetary environment and interest rates

Despite the triggering of the weak-side CU and the ongoing US monetary policy tightening during the review period, the HKD Monetary Base remained sizeable and broadly stable, at HK$1,876.3 billion at the end of August 2023.

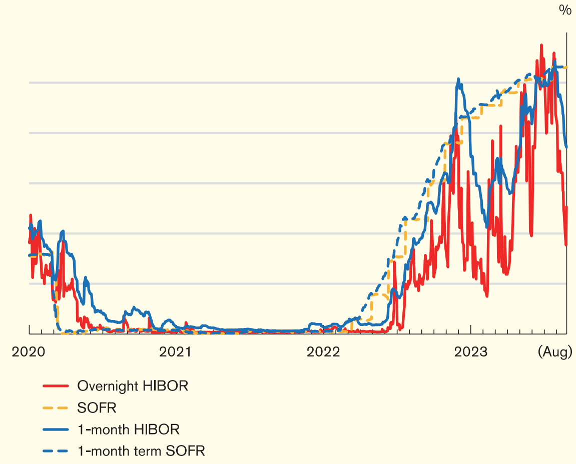
In the first seven months of 2023, there was no notable sign of outflows from the Hong Kong banking system, with total deposits with authorized institutions (AIs) increasing by 1.4%. Among the total, HKD deposits and foreign currency deposits increased by 1.5% and 1.4% respectively (Chart 4.4). It should be noted that monetary statistics are subject to volatility due to a wide range of transient factors, such as seasonal and initial public offering (IPO) related funding demand as well as business and investment related activities. Therefore it is more appropriate to observe the longer-term trends.

Chart 4.4
Deposits with authorized institutions (AIs) by currency



Source: HKMA.

Chart 4.5
Hong Kong Interbank Offered Rates (HIBORs) and US dollar Secured Overnight Financing Rates (SOFRs)



Sources: Bloomberg and HKMA.

During the review period, the overnight and one-month HIBORs generally tracked their USD counterparts[23], in line with the design and operation of the LERS (Chart 4.5). Alongside the successive US policy rate hikes and market expectation of a "high for longer" US policy rate, the HIBORs generally headed higher, with all tenors temporarily rising above 5% at some points during June to early August, before some easing towards the end of the review period. While the HIBORs are affected by the trend of their USD counterparts, they are also influenced by the supply and demand in the local market for HKD funding. Indeed, the Hong Kong interbank market saw some relatively large fluctuations in the review period, partly reflecting the reduction in the Aggregate Balance.

On the retail front, following the US policy rate hikes, many banks raised their Best Lending Rates twice or by 25 bps in total from May to July 2023. Specifically, they raised the Best Lending Rates by 12.5 bps in early May and another 12.5 bps in late July. At the end of the review period, the Best Lending Rates in the market ranged from 5.875-6.375%. Accordingly, the average lending rate for new mortgages increased slightly from 3.50% in January 2023 to 3.57% in July 2023. Banks will decide when and by how much to adjust their lending and savings rates, taking into account the structure of their funding costs and other relevant considerations.

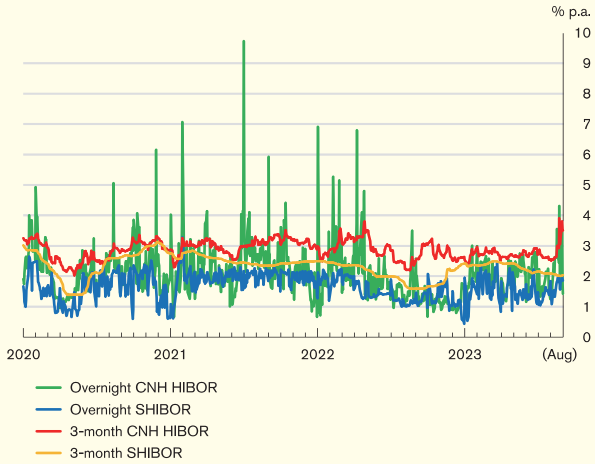
In the near term, the HKD interbank rates may stay relatively high, and occasionally experience some volatility. The HKMA continues to closely engage with banks, reminding them to properly manage their liquidity, including keeping in close contact with their large clients to understand their HKD funding plans and arrangements. This helps banks to plan and avoid any hoarding of HKD. The HKMA has also reminded banks not to be concerned about the perceived "stigma effect" of tapping into its liquidity facilities. Indeed, banks should feel free to use the HKMA's various liquidity facilities whenever required.

23 The USD London Interbank Offered Rate (LIBOR) has been discontinued since 1 July 2023 and replaced by the Secured Overnight Financing Rate (SOFR) as its alternative reference rate.

Offshore RMB banking business

The offshore renminbi (CNH) interbank market continued to function normally during the review period. [24] As the liquidity conditions in the CNH interbank market remained stable, the three-month CNH HIBOR continued to hover around 3%. The overnight CNH HIBOR mostly traded below 3% (Chart 4.6).

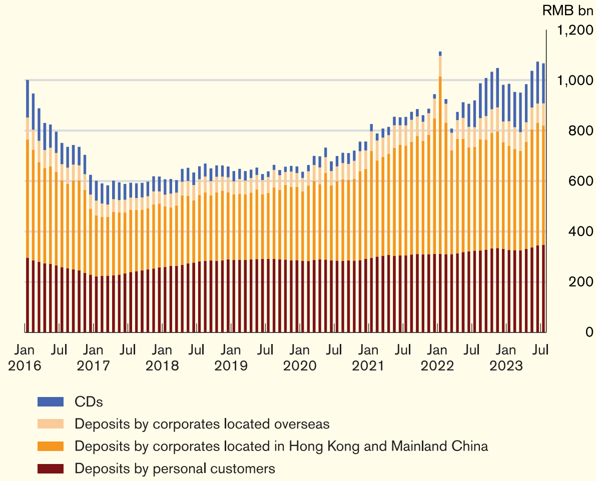
Chart 4.6
Overnight and 3-month offshore renminbi (CNH) HIBOR fixings



Source: CEIC.

Hong Kong's CNH liquidity pool expanded further during the first seven months of 2023. The total outstanding amount of renminbi (RMB) customer deposits and certificates of deposit (CDs) grew moderately by 8.7% to RMB1,067.0 billion at the end of July 2023 (Chart 4.7 and Table 4.A). Among the total, RMB customer deposits picked up by 8.6%, mainly led by corporate customers' deposits. With the continued increase in the issuance of RMB CDs, outstanding CDs expanded by 9.1% during the same period.

Chart 4.7
Renminbi customer deposits and certificates of deposit (CDs) in Hong Kong



Source: HKMA.

Table 4.A
Offshore renminbi banking statistics

	Dec 2022	Jul 2023
Renminbi deposits & CDs (RMB bn)	981.7	1,067.0
Of which:		
Renminbi deposits (RMB bn)	835.9	907.9
Share of renminbi deposits in total deposits (%)	6.1	6.3
Renminbi CDs (RMB bn)	145.8	159.1
Renminbi outstanding loans (RMB bn)	191.7	333.6
Number of participating banks in Hong Kong's renminbi clearing platform	211	210
Amount due to overseas banks (RMB bn)	130.8	138.8
Amount due from overseas banks (RMB bn)	138.8	168.3

	Jan - Jul 2023
Renminbi trade settlement in Hong Kong (RMB bn)	6,126.4
Of which:	
Inward remittances to Hong Kong (RMB bn)	2,315.6
Outward remittances to Mainland China (RMB bn)	3,175.9
Turnover in Hong Kong's RMB real time gross settlement (RTGS) system (Daily average during the period; RMB bn)	1,704.0

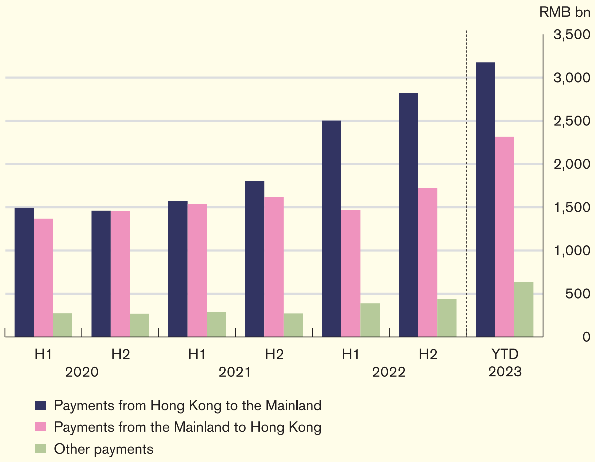
Source: HKMA.

Other CNH business continued to grow. The outstanding amount of renminbi loans expanded by 74.0% in the first seven months of 2023. Hong Kong's renminbi trade settlement also continued to pick up. Transactions handled by banks in Hong Kong amounted to RMB6,126.4 billion in the first seven months of 2023 (Chart 4.8), up by 20.4% compared with RMB5,090.0 billion during the same period last year. The deep renminbi liquidity pool in Hong Kong and the capability and extensive network

[24] See Chapter 2.2 for the development of offshore and onshore renminbi exchange rates.

of Hong Kong banks continued to support a large amount of renminbi payments and financing transactions. During the first seven months of 2023, the average daily turnover of the renminbi RTGS system stayed high at RMB1,704.0 billion, compared with RMB1,669.5 billion in the same period in 2022.

Chart 4.8
Flows of renminbi trade settlement payments



Source: HKMA.

Looking ahead, the continuing development of Hong Kong's CNH ecosystem will further reinforce Hong Kong's role as the leading CNH business hub. On liquidity, the enhanced Currency Swap Agreement with the PBoC will provide the necessary liquidity support to the offshore market through the RMB liquidity facilities set up by the HKMA. This provides a favourable environment for financial institutions to expand their RMB-related activities and services. On products, the continuous efforts to upgrade and expand the family of Connect schemes between the Mainland and Hong Kong, including the Swap Connect, the two-way Stock, Bond, and Cross-boundary Wealth Management Connects, will widen the spectrum of RMB products and tools for asset allocation and risk management, enabling two-way traffic between the two markets. As to financial infrastructure, the Central Moneymarkets Unit is also undergoing a major overhaul to enhance its operational capacity and product offerings, to better support the growth of RMB bond issuances and associated custodian services. With these developments, Hong Kong will continue to play a unique role in supporting China's capital account opening, the development of the green finance market, as well as the Belt and Road and the Guangdong-Hong Kong-Macao Greater Bay Area initiatives.

Asset markets

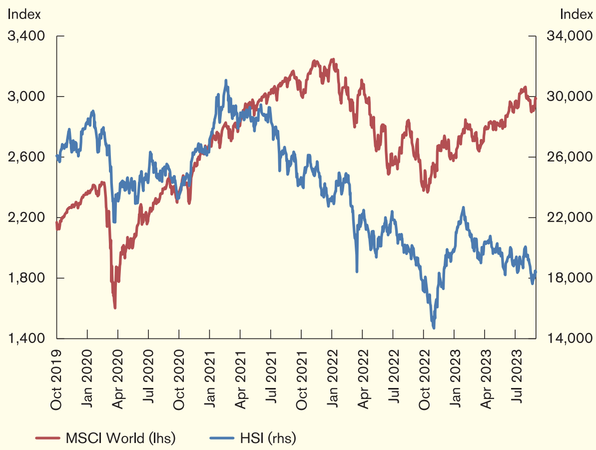
In contrast to the buoyant global equity market led by the technology sector, the performance of the Hong Kong equity market during the review period was clouded by concerns over the pace of the Mainland economic recovery. Supported by the steady issuance, the local debt market continued to register stable growth in the first half of 2023. After a visible revival in the first quarter, the residential property market softened in subsequent months as market sentiment turned cautious amid further mortgage rate hikes.

4.3 Equity market

Shortly after recovering from the market stress triggered by the banking sector problems in the US and Switzerland in March 2023, the Hang Seng Index declined sharply in May and continued the downward trend amid concerns over the pace of the Mainland economic recovery. This is in contrast to the buoyant global equity market led by the technology sector. Overall, the Hang Sang Index declined by 7.1% from the end of February 2023 to the end of August 2023, while the MSCI World Index registered an increase of 10% during the same period (Chart 4.9).

In tandem with the positive global equity performance, market volatility as measured by the option-implied volatilities of the S&P 500 Index declined noticeably, and once reached the lowest level since the March 2020 financial market turmoil (Chart 4.10). Local equity market volatility also trended down despite its relatively sluggish performance, before rising towards the end of the review period. The SKEW Index, a measure of investors' willingness to pay for downside protection, has risen during the review period, suggesting that investors may be wary of abrupt equity market corrections amid the current lower level of market volatility.[25]

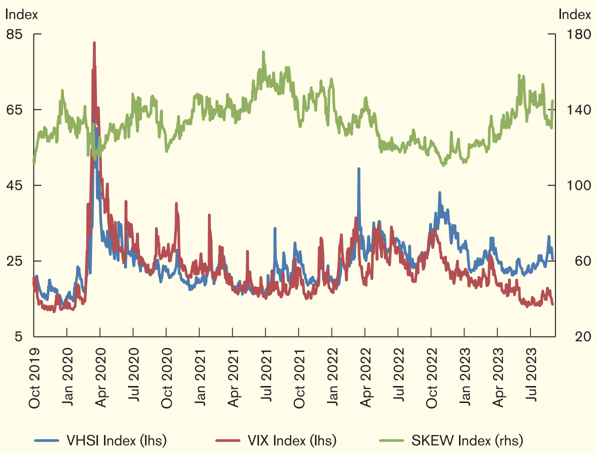
Chart 4.9
The Hang Seng Index and the MSCI World Index



Source: Bloomberg.

25 The SKEW Index is calculated by the Chicago Board Options Exchange from the prices of the S&P 500 out-of-the-money options. A SKEW value of 100 means that the probability of outlier negative returns on a 30-day horizon is negligible. As the SKEW rises above 100, the left tail of the S&P 500 returns distribution acquires more weight, suggesting that the probability of outlier negative returns has become more significant. For details, see https://www.cboe.com/products/vix-index-volatility/volatility-indicators/skew.

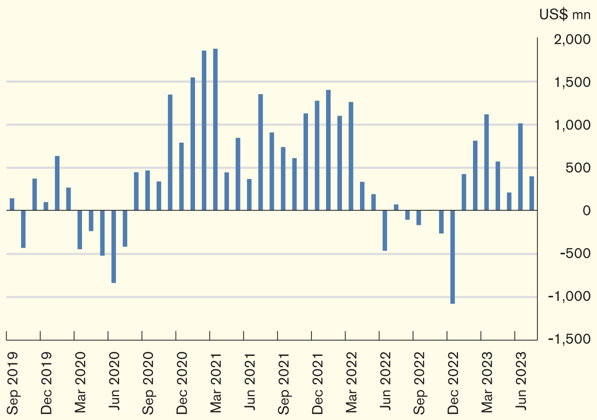
Chart 4.10
Option-implied volatilities of the Hang Seng Index and the S&P 500 Index, and the SKEW Index



Source: Bloomberg.

Equity market funds registered net flows into Hong Kong from February to July 2023, with the amount of net inflows totalling US$4,091.3 million (Chart 4.11).

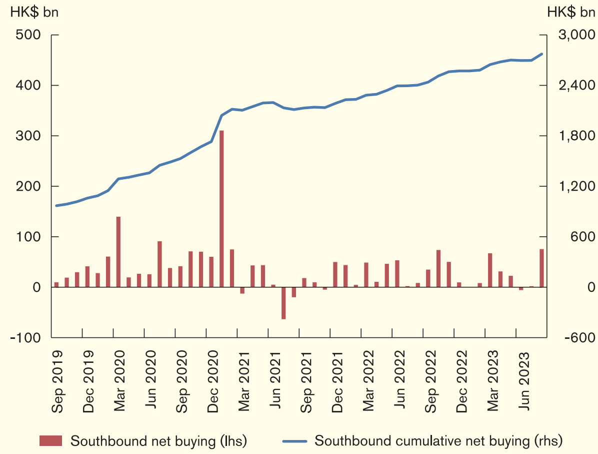
Chart 4.11
Equity market fund flows into Hong Kong



Source: EPFR Global.

The net investments in the Hong Kong equity market by Mainland investors through the Southbound Stock Connect amounted to HK$192.5 billion from the end of February to the end of August 2023 (Chart 4.12), resulting in an increase in cumulative net buying by 7.5% to HK$2,772.9 billion at the end of August 2023.

Chart 4.12
Net buying through southbound Stock Connect over time

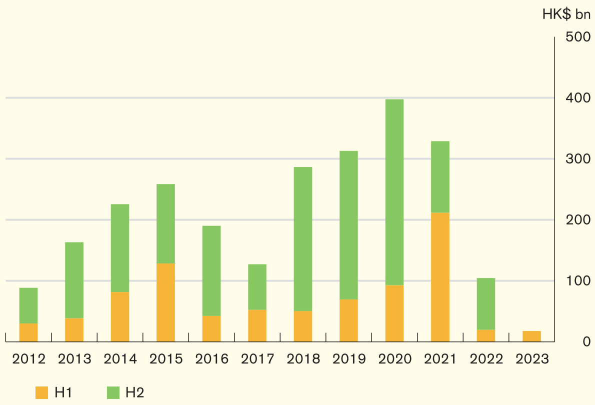


Note: Southbound net buying is the sum of such buying on the Shanghai-Hong Kong Stock Connect and the Shenzhen-Hong Kong Stock Connect.
Sources: CEIC and HKMA staff estimates.

Clouded by sluggish global IPO activities amid uncertain economic outlook and tight monetary conditions, the amount of funds raised through IPOs in Hong Kong dropped by 9.9% year on year during the first half of 2023 (Chart 4.13). Meanwhile, the first listing application via the new listing regime that lowers the bar for Specialist Technology Companies (STCs) with high growth potential to list on the Hong Kong Stock Exchange (HKEX) (i.e. Chapter 18C under the Main Board Listing rules of HKEX) was filed in June 2023.[26] The new listing regime is expected to attract more listings of STCs with high growth potential in the long run.

[26] STCs are companies primarily engaged in research, development, and commercialisation and/or sales of products and/or services that apply science and/or technology within an acceptable sector of a Specialist Technology Industry (for example, advanced hardware, next energy and environmental protection).

Chart 4.13
IPO market in Hong Kong



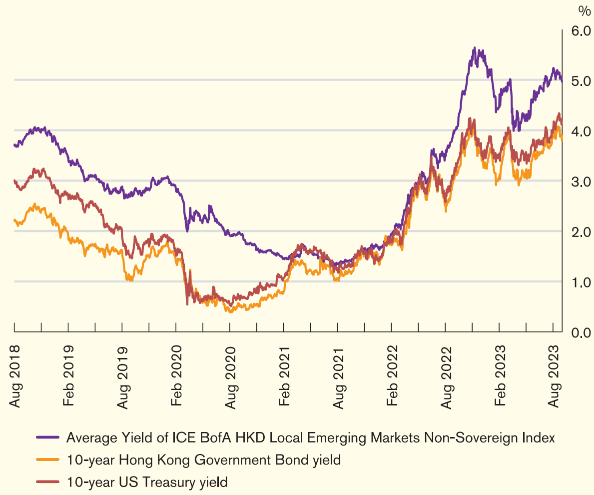
Source: HKEX.

The outlook for the local equity market is subject to a number of risk factors. On the downside, a global economic slowdown, a "high for longer" interest rate environment, as well as an escalation of geopolitical tensions, could dampen market sentiments and long-term prospects for corporates. On the upside, the Mainland authorities may roll out further policy measures to support the Mainland economic recovery, which could help lift sentiment in the local equity market.

4.4 Debt market[27]

The US government bond yield plummeted in March 2023 amid the US banking sector problem, before rising sharply in May 2023 as the deadline for resolving the US debt ceiling issue approached. Although an agreement on raising the US government debt limit was reached on 27 May, the 10-year US Treasury yield continued to stay near 4% as market attention shifted back to possible further rate hikes in the US. Bond yields in Hong Kong followed the movements of those in the US, with yields of HKD corporate bonds rising by a larger margin from the recent low recorded in early April (Chart 4.14).

Chart 4.14
Yields of 10-year US Treasury, 10-year Hong Kong Government Bond, and Hong Kong dollar corporate bonds

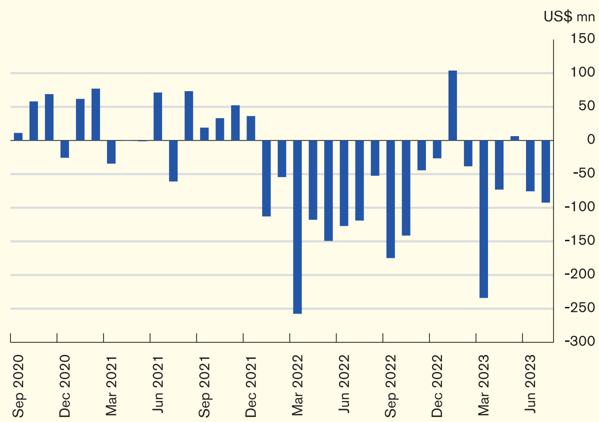


Note: The ICE BofA HKD Local Emerging Market Non-Sovereign Index, which covers HKD bonds issued by corporates and quasi government entities, captures the movement in yields of HKD corporate bonds.

Sources: ICE Data Indices, Bloomberg and HKMA.

In tandem with the sharp outflows from global corporate bond funds during the recent US and Switzerland banking sector problems, there were noticeable outflows from Hong Kong by bond funds in March 2023, which eased afterwards (Chart 4.15).

Chart 4.15
Bond market fund flows into Hong Kong

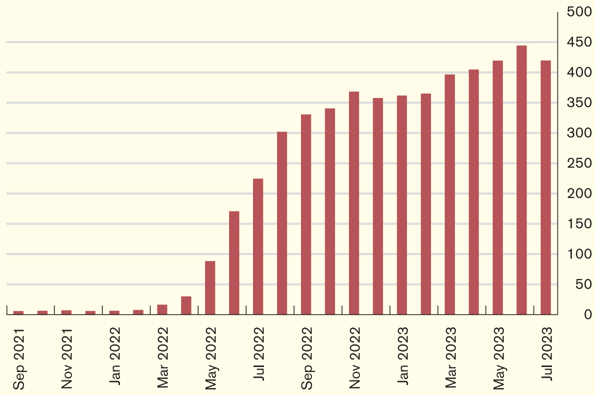


Source: EPFR Global.

27 Debt securities statistics reported in this section include bills, bonds, notes, negotiable CDs, commercial paper, debentures, asset-backed securities, and similar instruments normally traded in the financial markets that serve as evidence of a debt.

Mainland investors continued to invest in the Hong Kong debt market through the Southbound Bond Connect. This can be seen from the steady growth in the outstanding amount of bonds held by eligible Mainland investors through the Southbound Bond Connect CSD-CSD settlement link that are settled by the Shanghai Clearing House (SHCH), one of the Mainland central securities depositories (CSDs) that settle Southbound Bond Connect CSD-CSD settlement link's transactions with the CMU.[28] In particular, the amount reached RMB 419.1 billion at the end of July 2023, rising by 16% from RMB 361.4 billion at the end of January 2023 (Chart 4.16).

Chart 4.16
Outstanding amount of bonds held by eligible Mainland investors through the Southbound Bond Connect CSD-CSD settlement link that are settled by the Shanghai Clearing House (SHCH)

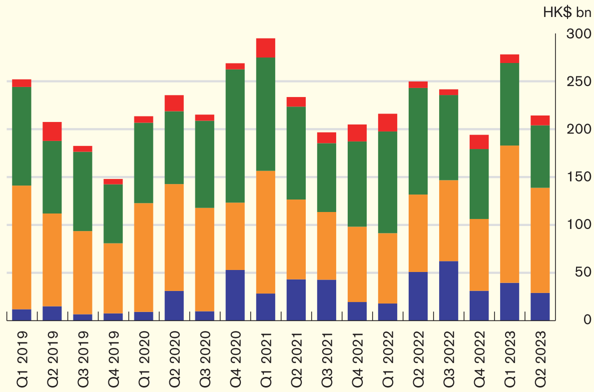


Note: The figures refer to the outstanding amount of bonds held by eligible Mainland investors through the Southbound Bond Connect CSD-CSD settlement link that are settled by the SHCH, and do not represent the full amount of bond holdings by Mainland investors through the Southbound Bond Connect. Figures are expressed in RMB as reported by source.

Source: SHCH.

In spite of the high interest rate, the total issuance of HKD debt securities grew by 4.8% year on year to HK$2,465.3 billion in the first half of 2023, mainly driven by the rise in issuance from overseas borrowers including multilateral development banks (MDBs) (Chart 4.17).

Chart 4.17
New issuance of non-Exchange Fund Bills and Notes (EFBN) Hong Kong dollar debt securities

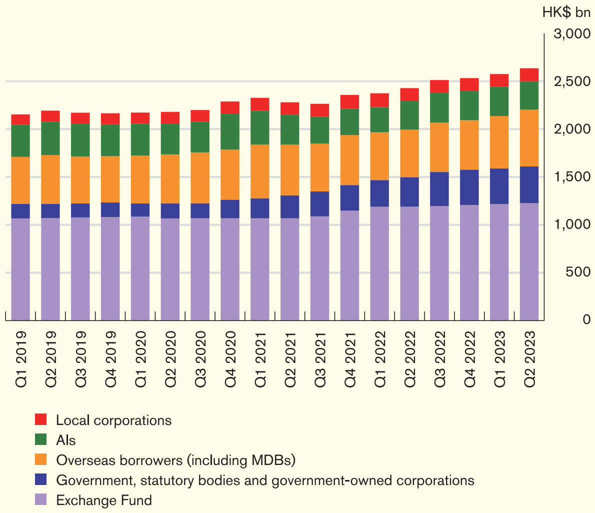


Source: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

[28] Under the current arrangement of the Southbound Bond Connect, Mainland institutional investors can invest in eligible bonds via either the trading link or CSD-CSD settlement link. Under the trading link, Mainland investors can directly trade any eligible bond with market makers in Hong Kong. Under the CSD-CSD settlement link, eligible Mainland investors can invest in debt securities lodged with the CMU through the Mainland CSDs. Specifically, Mainland CSDs including SHCH have opened nominee accounts with CMU to settle Southbound Bond Connect transactions and hold the CMU debt securities on behalf of eligible Mainland investors. At the same time, the eligible Mainland investors (or the designated custodians) would open an account at the Mainland CSDs to record the outstanding amount of bonds they invested through the Southbound Bond Connect CSD-CSD settlement link. While Chart 4.16 only covers the CSD-CSD settlement link transactions through the SHCH and therefore does not represent the full amount of bond holdings by Mainland investors through the Southbound Bond Connect, it may nevertheless help reveal the trends of Southbound Bond Connect activities over time.

With the growth in HKD debt securities issuance, the outstanding amount of HKD debt securities increased by 8.5% year on year at the end of June 2023 to HK$2,635.2 billion (Chart 4.18). The amount was equivalent to 32% of Hong Kong dollar M3, and to 25.3% of the HKD-denominated assets of the banking sector. The outstanding amount of non-EFBN HKD debt securities rose by 13.7% year on year to HK$1,408.1 billion.

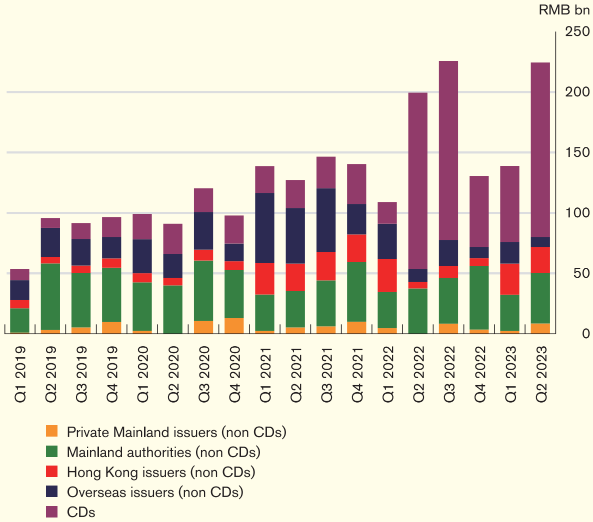
Chart 4.18
Outstanding Hong Kong dollar debt securities by issuer



Sources: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

The CNH debt market in Hong Kong also continued to grow in the first half of 2023. The total new issuance rose by 17.8% to RMB363.4 billion over the first half of 2023 compared with the same period last year supported by the active issuance of CNH CDs (Chart 4.19).

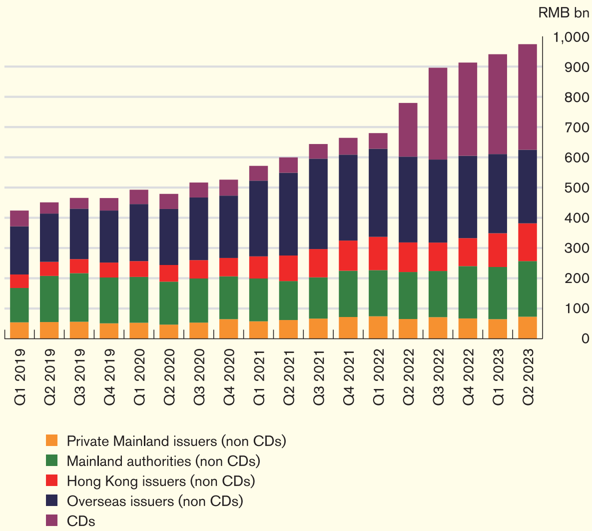
Chart 4.19
New issuance of CNH debt securities in Hong Kong



Sources: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

As a result, the total outstanding amount of CNH debt securities recorded a 24.9% year-on-year increase to RMB974.2 billion at the end of June 2023 (Chart 4.20).

Chart 4.20
Outstanding CNH debt securities in Hong Kong



Sources: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

The near-term prospect of the local debt market will continue to hinge on global economic and interest rate outlooks. Meanwhile, uncertainty over the RMB exchange rate movements and the pace of the Mainland economic recovery may weigh on the offshore RMB debt market activities in Hong Kong.

During the review period, policy initiatives were introduced to foster local debt market developments. In particular, on 30 May 2023 the Hong Kong Mortgage Corporation (HKMC) announced the successful completion of the first infrastructure loan-backed securities issuance, with an aggregate principal of US$364.4 million, under its pilot scheme on infrastructure financing securitisation. The successful issuance marks an important step towards developing an infrastructure financing securitisation platform in Hong Kong.

In addition, the issuance also includes an US$100 million sustainability tranche that aligns with the Green Bond Principles, Social Bond Principles and Sustainability Bond Guidelines released by the International Capital Market Association, demonstrating Hong Kong's commitment to green and sustainable development.

To further promote the development of the green and sustainable debt market in Hong Kong, the Government announced on 1 June 2023 the successful offering of close to US$6 billion worth of green bonds, denominated in USD, Euro and RMB, under the Government Green Bond Programme. The offering also includes the first 10-year RMB green bond issued by the Hong Kong Government. The issuance helps to extend the CNH yield curve and continues to enrich CNH product offerings, promoting RMB internationalisation in an orderly manner.

Likewise, to promote the application of innovative technologies in the debt market, the Government issued the world's first government-issued tokenised green bond in early 2023. Box 3 analyses how the global tokenised bond market has evolved and assesses the potential benefits of bond tokenisation for issuers and investors.

Box 3
An assessment on the benefits of bond tokenisation

Introduction[29]

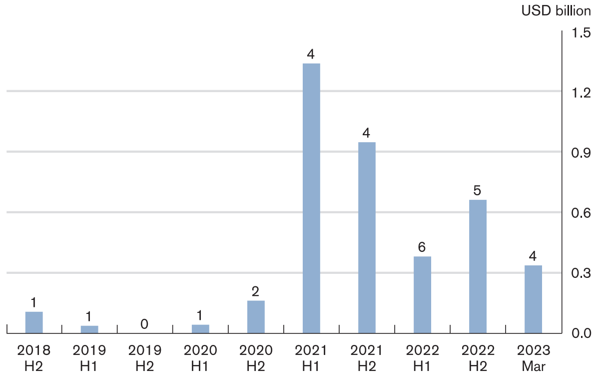
Bond tokenisation[30] is a rapidly evolving innovation in global bond markets. Since the World Bank issued the world's first tokenised bond in 2018, dozens of tokenised bonds have been issued around the world. These include the debut sale of the world's first government-issued tokenised green bond by the Hong Kong Government in early 2023.

By bringing the issuance and trading processes to a digital platform, bond tokenisation has the potential to boost issuance efficiency and market liquidity. But, possibly due to a lack of comprehensive data on this evolving market, the extent to which tokenisation can deliver benefits to issuers and investors has not been studied empirically. As such, this box aims to provide fresh analysis on the global tokenised bond market and discusses our empirical findings on the benefits of bond tokenisation.

How has the tokenised bond market evolved recently?

Using our novel dataset covering 28 tokenised bonds issued by 23 different issuers since 2018[31], we reveal that the total issuance amount of tokenised bonds globally had reached US$3.9 billion at the end of March 2023, with nine-tenths of the issuances occurring in and after 2021 (Chart B3.1). Among the bond issuances, financial industries are the leading issuers in terms of the issuance amount, with most being banks, asset managers, financial exchanges or specialised finance service providers (Chart B3.2). The public sector, such as the World Bank and the Hong Kong Government, has also issued tokenised bonds. For geographic distribution, a majority (around 70%) were issued by Asian institutions, while European counterparts accounted for most of the rest.

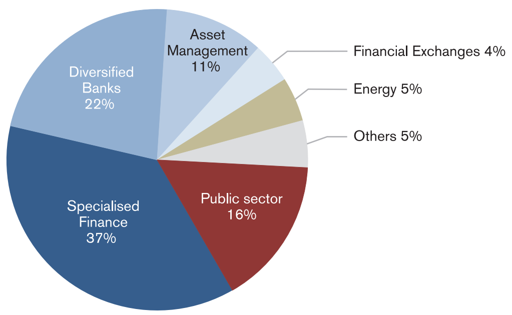
Chart B3.1
Total issuance amount of tokenised bonds in the world



Note: This bar chart depicts the total issuance amount (y-axis) and number of deals (figures above the bars) of tokenised bonds in the world up until the end of March 2023.

Sources: Bloomberg, Refinitiv Eikon and HKMA staff estimates.

Chart B3.2
Share of tokenised bonds in terms of issuance amount, by issuer type



Note: This pie chart depicts the share of tokenised bonds issued globally since 2018 in terms of issuance amount, by issuer type.

Sources: Bloomberg, Refinitiv Eikon and HKMA staff estimates.

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29 For details, please refer to Leung et al. (forthcoming): "An assessment on the benefits of bond tokenisation", *HKMA Research Memorandum*.

30 Bond tokenisation refers to the recording of beneficial interests in a bond as tokens on a digital platform.

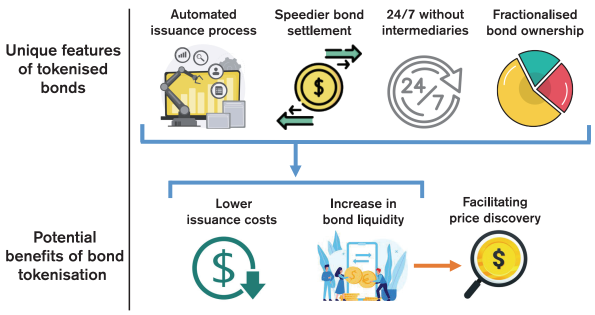
31 The dataset is constructed based on data sourced from Bloomberg and Refinitiv Eikon. The sample is representative of the global position for issuance amount, compared with the level reported by Damak et al. (2023) from S&P Global Ratings, which is one of the mainstream rating agencies for tokenised bonds. To further verify the tokenised nature of our sample, we made reference to a number of news items, press releases, reports, announcements, and other official documents published by the issuers or third-party specialists, such as the International Capital Market Association (2023).

In summary, while bond tokenisation is still in its early stage of development, some Asian and European institutions have taken steps to embrace this innovation. The next section studies to what extent tokenisation could benefit issuers and investors in the bond markets.

Does tokenisation benefit bond issuers and investors?

Theoretically, tokenisation may enhance issuance efficiency by automating the multi-step process for issuance, interest payment and principal repayment through the use of smart contracts. The issuers may also be able to issue tokenised bonds at lower yields as investors may favour their unique features, such as faster settlement cycles, round-the-clock trading without intermediaries, and fractionalised bond ownership which allows for an unrestricted small amount in transactions. In addition, tokenisation may improve market liquidity, as the aforementioned features of tokenised bonds may reduce the transaction costs and broaden the investor base. Theoretically, as tokenised bonds can be traded with greater liquidity, this may also facilitate the price discovery of conventional bonds issued by the same issuers (Chart B3.3).

Chart B3.3
Illustration of unique features and potential benefits of tokenised bonds



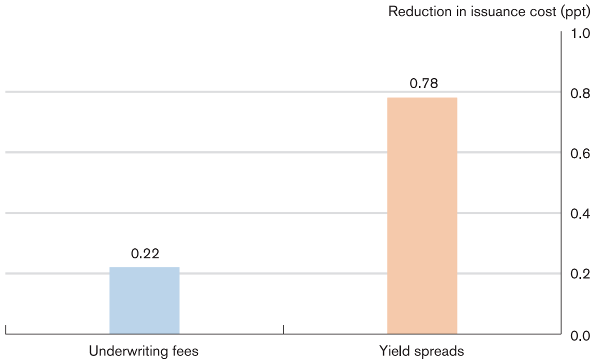
To empirically examine the economic significance of these potential benefits, we match each tokenised bond with the most similar conventional bond issued by the same issuer to control for differences in bond characteristics, such as maturity and issue date.[32] This ensures that the estimated differences in issuance costs or liquidity between tokenised and conventional bonds could be attributed to bond tokenisation. The estimation results on the two potential benefits are presented below.

a) <u>Improving efficiency of bond issuance</u>
Conventional bond issuance involves multiple intermediaries, such as underwriters, who charge fees for their services. In contrast, tokenisation automates the manual process and eliminates paper trails, thereby reducing the operational cost of bond issuance, including the underwriting fees. Our empirical findings confirm this conjecture and show that underwriting fees for issuing a tokenised bond were lower than those of a conventional bond by an average 0.22 ppt of the bond's par value (blue bar, Chart B3.4).

Theoretically, the issuers may be able to issue tokenised bonds at a lower yield, if the investors favour their unique features. Our empirical results show that investors recognised the benefits of tokenisation and were willing to accept a lower yield spread of 0.78 ppt on average when investing in tokenised bonds, compared to their most similar conventional bonds (orange bar, Chart B3.4).

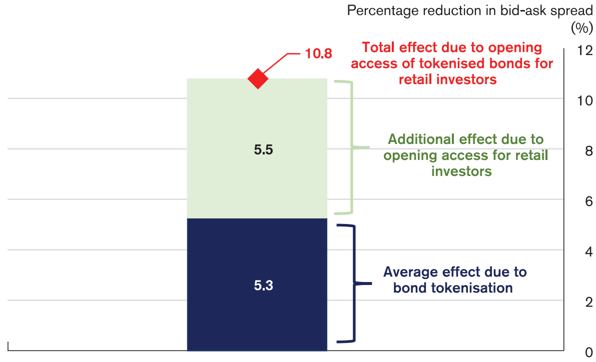
[32] There are 6,090 conventional bonds issued by the tokenised bond issuers. These bonds exhibit a high degree of heterogeneity in key bond characteristics with the tokenised bonds in our sample. Our matching procedure reduces the heterogeneity to the level widely acceptable in academic literature. For details of the matching procedure, please refer to the *HKMA Research Memorandum*.

Chart B3.4
Estimation results of the efficiency gains from bond tokenisation



Notes:
(i) This bar chart depicts the estimated reductions in underwriting fees and yield spreads by tokenisation; and
(ii) All estimates are statistically significant at 10% level.
Source: HKMA staff estimates.

Chart B3.5
Estimation results of the liquidity gains from bond tokenisation



Notes:
(i) This bar chart depicts the estimated reductions in bid-ask spreads of bonds by tokenisation, by investor base of the bonds; and
(ii) All estimates are statistically significant at 1% level.
Source: HKMA staff estimates.

b) Enhancing bond liquidity in secondary markets

Tokenised bonds may exhibit a greater liquidity than conventional bonds in the secondary market as the former can be settled faster, traded without intermediaries, and fractionalised into an unrestricted small amount in transactions, thereby lowering the entry barrier. In addition, the extent of liquidity improvement is likely greater for those bonds open to retail investors, as they may benefit more from the lower entry barrier.

We proxy bond liquidity with its bid-ask spread. The lower the spread is, the higher is the liquidity, and vice versa. Our empirical results suggest that the bid-ask spread of tokenised bonds was on average tighter than that of conventional bonds by 5.3% (blue bar, Chart B3.5). If the bonds are accessible to retail investors, our estimation results find that the reduction in the bid-ask spread could double to 10.8% (red dot, Chart B3.5).

Tokenisation may also improve the market liquidity of those conventional bonds by facilitating their price discovery process. As tokenised bonds are traded with greater liquidity, they are more conducive to informative prices. This facilitates the discovery of the fair value of the less liquid conventional bonds issued by the same issuers. Our empirical findings support a significant benefit for tokenisation through this channel. In particular, we find that the average bid-ask spread of conventional bonds would be reduced by 8.5%, after their issuers issued a tokenised bond.

Conclusion and implications

To conclude, this box shows that tokenisation has significant operational benefits for bond issuers as it can lower their underwriting fees and borrowing costs. It can also benefit bond investors by enhancing the liquidity of bonds in the secondary market, especially for those bonds open to retail investors.

These findings offer two important implications for the development of the global bond market. First, a wider usage of tokenisation in bond issuance may be considered to enhance the efficiency and liquidity of bond markets.

Second, policies to broaden the investor base of the tokenised bond market would pave the way for unlocking the potential benefits of tokenisation. As the tokenised bond market is still developing, the sample used in this box is small, albeit already representative of the market position. Readers should interpret our results with caution.

References

Damak, M., Birry, A., Schmaus, M. W. & Guadagnuolo, L. (2023, February 27). Digital bonds: The disruption is underway. S&P Global Ratings. https://www.spglobal.com/ratings/en/research/articles/230227-digital-bonds-the-disruption-is-underway-12651017

International Capital Market Association (2023). New FinTech applications in bond markets. https://www.icmagroup.org/market-practice-and-regulatory-policy/fintech-and-digitalisation/fintech-resources/new-fintech-applications-in-bond-markets/

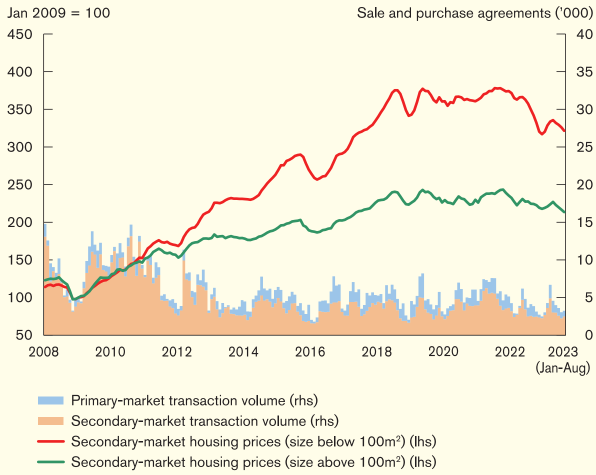
4.5 Property markets

Residential property market

The residential property market has softened after experiencing a strong recovery in the first quarter of 2023. Secondary-market flat-viewing activities picked up in the first quarter as market sentiment improved following the full resumption of normal travel between Hong Kong and Mainland China earlier this year. With pent-up demand unleashed, property developers also hastened their new project launches and boosted sales with competitive pricing. However, market sentiment softened after the first quarter as local mortgage rates rose. In particular, major banks further raised their Best Lending Rates by 12.5 bps each in both May and July 2023, following the successive rate hikes by the US Fed.[33] Besides, some banks also further raised the cap rates for their new HIBOR-based mortgage lending in September 2023. While secondary-market flat-viewing activities eased visibly after the first quarter of 2023, property developers remained generally active and continued to offer new projects for sale. As a whole, the average monthly housing transaction volume eased to 3,702 units in April – August from 4,674 units in the first quarter. The secondary market was the major contributor to the decline in the overall transaction volume (Chart 4.21).

Secondary-market housing prices softened by 3.7% between April and August after picking up by 5.3% in the first quarter of 2023, partly reflecting an increasing willingness by homeowners to cut their asking prices in view of the competition from developers' new launches. Analysed by size, the price for large flats (with a saleable area of at least 100m²) consolidated at a slightly faster pace than that for small and medium-sized flats (with a saleable area of less than 100m²) (Chart 4.21). More timely market data indicated that housing prices moderated further in early September 2023.

Chart 4.21
Residential property prices and transaction volumes



Sources: Rating and Valuation Department (R&VD) and Land Registry.

Housing affordability remained stretched in the first half of 2023. The housing price-to-income ratio remained comparable to the high level of about 15 in 1997, albeit easing slightly to 15.9 in the second quarter as the growth of household income exceeded that of housing prices. Mainly reflecting the impact of rising mortgage rates, the income gearing ratio also stayed elevated at 77.4%, well above the long-term average (Chart 4.22).[34] As economic activities continued to return to normalcy, housing rentals registered a solid growth after the Chinese New Year, increasing by 6.8% between February and August

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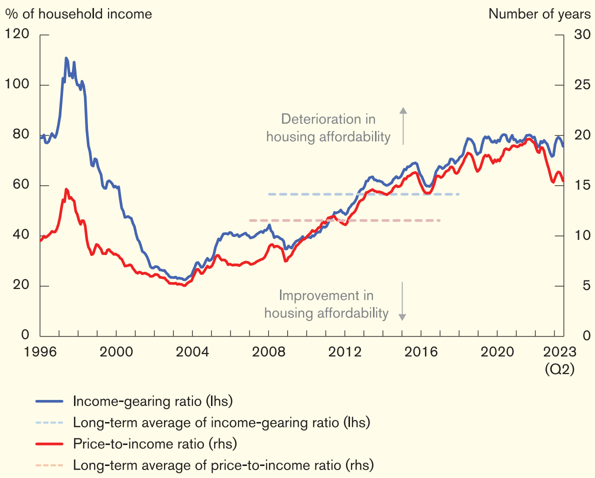
33 It was reported in June 2023 that some banks offered higher cash rebates for their new mortgage customers to compete for market share. As a supervisory authority, the HKMA has always been requiring banks to operate their mortgage businesses prudently, including calibrating the interest rates and offers in a prudent manner, to ensure the long-term sustainability of their businesses and to have sufficient earnings to withstand the risk of bad debt that may arise during an economic downturn.

34 The price-to-income ratio measures the average price of a typical 50m² flat relative to the median income of households living in private housing. Alternately, the income-gearing ratio compares mortgage payment for a typical 50m² flat (under a 20-year mortgage scheme with a 70% LTV ratio) to the median income of households living in private housing. The income-gearing ratio is not the same as a borrower's actual debt servicing ratio, which is subject to a maximum cap under HKMA prudential measures.

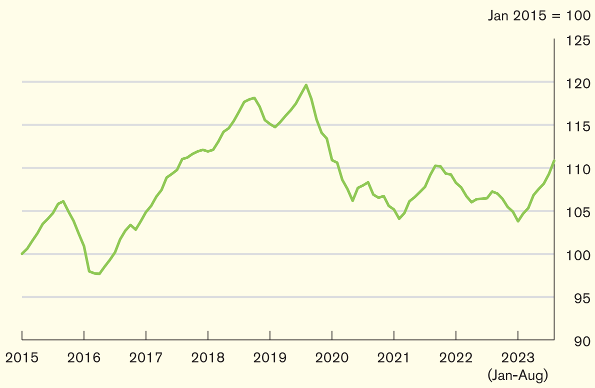
2023 (Chart 4.23).[35] In tandem, the residential rental yield also rose modestly to 2.6% in July from 2.5% in January.

Chart 4.22
Indicators of housing affordability



Sources: R&VD, C&SD and HKMA staff estimates.

Chart 4.23
Residential property rental index



Source: R&VD.

Taking all relevant factors into account, the HKMA announced on 7 July 2023 the first relaxation of the countercyclical macroprudential measures for residential properties since their introduction in 2009. After the relaxation, which took effect on the same day, the public would be able to take out property mortgage loans at higher LTV ratios.[36] The HKMA will continue to monitor market developments closely and introduce necessary measures to ensure banks' proper risk management of their property mortgage loans, thereby safeguarding banking stability.[37]

Following the relaxation of the macroprudential measures, the average LTV ratio for new mortgages remained largely stable at about 53% in July, below the prevailing ratio of 64% before the countercyclical macroprudential measures were first introduced in 2009. The average DSR also stayed below 40% and borrowers are stress-tested to ensure their ability to withstand rising interest rates.

The estimated number of RMLs in negative equity decreased to 3,341 cases at end-June 2023 from 12,164 cases at end-December 2022 (Chart 4.24), mainly reflecting the increase in housing prices in the first half of this year. These cases were related to bank staff housing loans or RMLs under the MIP, which generally have a higher LTV ratio. With over half of the private housing units not carrying any outstanding mortgages as of end-2022, and with the mortgage delinquency ratio remaining at a very low level

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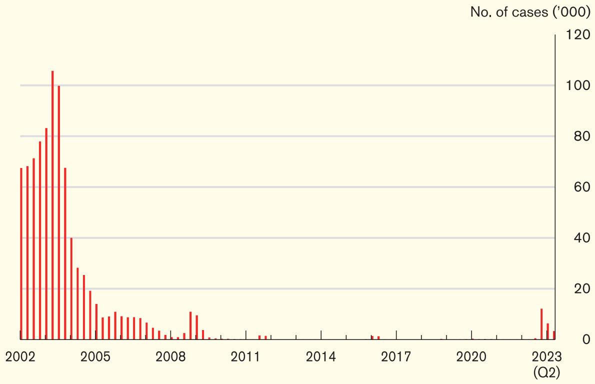
35 Market analysts also attributed the rise in housing rentals to the increased demand for accommodations driven by the return of expatriates and non-local students.

36 For details, see the circular "Prudential Measures for Property Mortgage Loans" issued by the HKMA on 7 July 2023. Having considered the HKMA's amendments to the countercyclical macroprudential measures for mortgage loans as well as its business and risk factors, the HKMC Insurance Limited (HKMCI) also announced on the same day that amendments were made to the Mortgage Insurance Programme (MIP) for completed residential properties, and announced in September that the MIP would also cover residential properties under construction in order to further promote homeownership. For details, see the press release "Amendments to the Mortgage Insurance Programme" issued by HKMCI on 7 July 2023 and 22 September 2023 respectively.

37 Since the countercyclical measures for property mortgage loans were implemented in 2009, the HKMA has been assessing conditions in the property market by monitoring factors including property prices and transaction volumes, and the local and external economic environment. The aim is to evaluate the need for appropriate adjustments to these measures to ensure that banks maintain effective risk management in their property mortgage lending business and sufficient capacity to cope with challenges arising from a sharp correction in property prices.

of 0.07% in July 2023, the systemic risks relating to banks' RMLs are properly managed on various fronts. The HKMA reminds the public that buying a property is an important life decision. Prospective buyers should carefully assess their own ability to afford a property and prudently manage the financial risks involved in making a property purchase.

Chart 4.24
Residential mortgage loans in negative equity



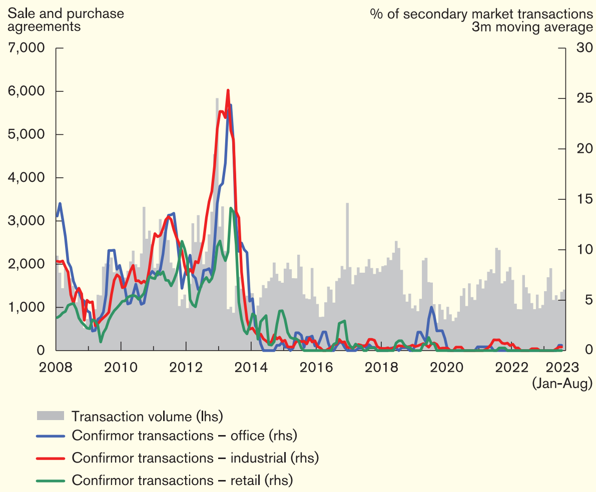
Source: HKMA.

The residential property market outlook is subject to a number of uncertainties and risks as discussed in the previous chapters. Specifically, rising mortgage rates, a weaker global economic outlook, and increased short-term private housing supply, may continue to weigh on market sentiment. On the other hand, improved domestic economic conditions, coupled with the Government's measures to attract businesses, investments and talents, may lend some support to housing demand. Over the longer term, the outlook for the housing market will depend on the supply-demand gap. The Government projects that private housing supply will remain high in the coming years.[38]

Non-residential property market

The non-residential property market stabilised somewhat in the first half of 2023 on the back of the reviving domestic economy. Average monthly transactions increased to 1,433 units during the period, while speculative activities remained subdued (Chart 4.25). Prices of commercial and industrial buildings also showed preliminary signs of bottoming out (Chart 4.26). In the leasing market, rentals of retail premises and flatted factories recovered gradually, while rentals of office spaces remained subdued amid the still-high vacancy rates[39] (Chart 4.27). Overall, the rental yields across segments edged up to 2.8%–3.2% in July 2023.

Chart 4.25
Transactions in non-residential properties

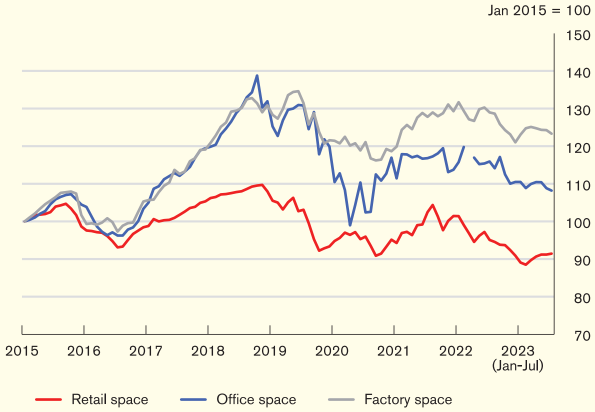


Sources: Land Registry and Centaline Property Agency Limited.

38 As estimated by the Housing Bureau at end-June 2023, total private first-hand flat supply in the coming three to four years would stay at a high level of 105,000 units. With the objectives of tapping into the market forces and promoting public-private partnership to encourage private developers to participate in the development of subsidised sale flats, the Housing Bureau also launched the Private Subsidised Sale Flat – Pilot Scheme in June 2023 to enhance the construction capacity, save the time required for development, and unleash the development potential of private land.

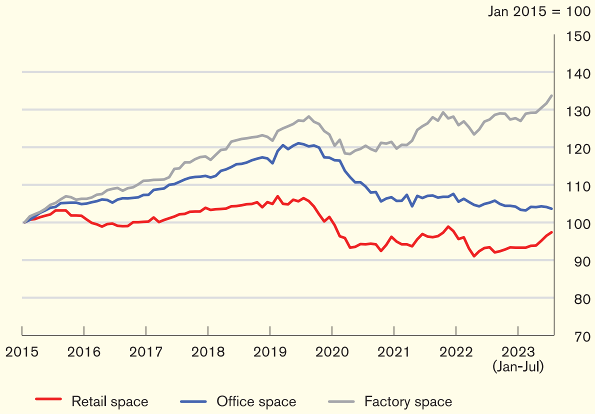
39 According to R&VD, the vacancy rate of office spaces reached 14.4% at end-2022, the highest since 1998. Market data from surveyor firms also indicated that Grade A office vacancy increased to 12.6% in June 2023 from 12.1% in December 2022.

Chart 4.26
Non-residential property price indices



Note: The price index of office space cannot be compiled in March 2022 due to insufficient transaction data for analysis.
Source: R&VD.

Chart 4.27
Non-residential property rental indices



Source: R&VD.

The near-term prospect for the non-residential property market will vary across segments. For example, the retail segment is expected to be supported by a further improvement in domestic consumption and the revival of inbound tourism. On the other hand, global economic slowdown and further tightening in financial conditions may continue to dampen business and investment sentiment, thereby dragging the demand for commercial properties. The high vacancy rates and increased supply going forward may also exert downward pressures on the capital values of office spaces.

Taking into account the correction in non-residential property prices following the COVID-19 pandemic, the rising interest rate environment, as well as other relevant factors discussed above, the HKMA also adjusted the countercyclical macroprudential measures for non-residential property mortgage loans. With effect from 7 July 2023, the maximum LTV ratio for non-residential properties was adjusted to 60% from 50%.[40]

[40] For details, see the circular "Prudential Measures for Property Mortgage Loans" issued by the HKMA on 7 July 2023.

5. Banking sector performance

The profitability of retail banks improved notably in the first half of 2023 compared with the same period in 2022, mainly contributed by higher net interest income amid the widening of net interest margins. The overall funding costs of retail banks continued to rise at a gradual pace in the first half of 2023 amid further US interest rate hikes. The classified loan ratio increased during the review period, but remained at a healthy level. Overall, the Hong Kong banking sector remained robust and resilient, underpinned by strong capital and liquidity buffers. In the period ahead, uncertainties on the future US interest rate path and the associated impact on local interest rates, concerns about the growth prospects for major advanced economies and the pace of economic recovery of the Mainland economy, and the lingering geopolitical risks will continue to pose challenges to the banking sector. Banks should carefully assess how the possible intensification of these risk factors could impact the asset quality of their loan portfolios.

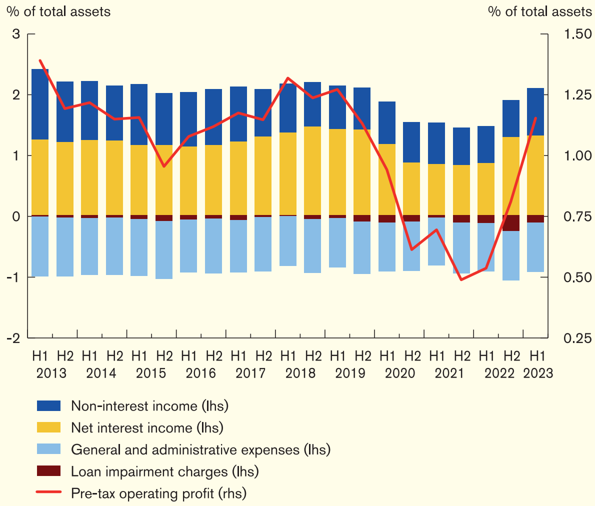
5.1 Profitability and capitalisation

Profitability

The aggregate pre-tax operating profit of retail banks[41] increased significantly by 120.5% in the first half of 2023 compared with the same period in 2022, while the return on assets rose notably to 1.15% from 0.53% (Chart 5.1). The improvement in profit was mainly contributed by increases in net interest income and income from investments held for trading.

Against the higher interest rate environment, the net interest margins of retail banks increased notably to 1.62% in the first half of 2023 from 1.03% a year ago (Chart 5.2).

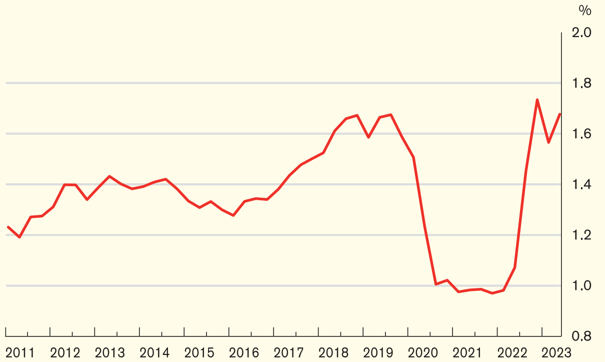
Chart 5.1
Profitability of retail banks



Note: Annualised semi-annual figures.
Source: HKMA.

41 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

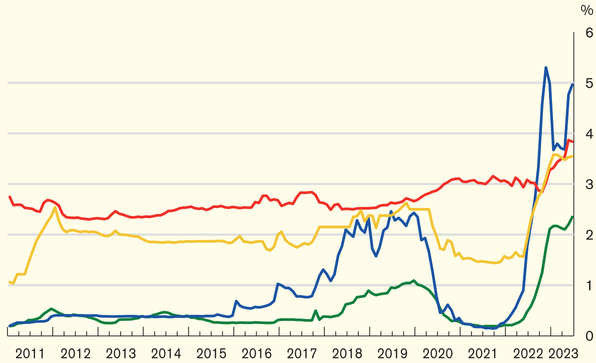


Note: Annualised quarterly figures.
Source: HKMA.

During the review period, HKD interbank interest rates hovered in a wider range driven by seasonal factors. In particular, the three-month Hong Kong Interbank Offered Rate (HIBOR) saw a notable decline by 128 basis points (bps) in the first quarter of 2023 after reaching a high level of 4.99% at the end of 2022. However, it rebounded to 4.97% at the end of June 2023 after the US interest rate hike in May (blue line in Chart 5.3).

On the retail front, the HKD deposit funding cost increased as more current and savings deposits switched to term deposits, and many banks raised their savings deposit rates along with the corresponding rise in Best Lending Rate (BLR) by 12.5 bps after the US Federal Reserve (Fed) rate hike in May 2023. Reflecting the development for wholesale and retail funding costs, the composite interest rate (a measure of the average cost of HKD funds for retail banks) increased by 24 bps over the past six months, reaching 2.35% in June 2023 (green line in Chart 5.3).

Chart 5.3
Interest rates

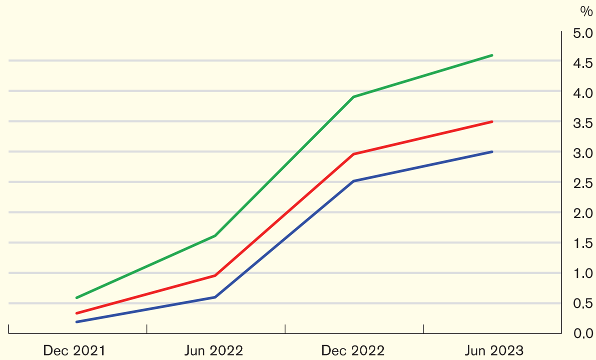


- Composite interest rate (a, c)
- 3-month HIBOR (a)
- Average mortgage rate for BLR-based mortgages (b)
- Average mortgage rate for HIBOR-based mortgages (b)

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 HKD and USD funding cost for licensed banks in Hong Kong increased by 53 bps in the first six months of 2023 (red line in Chart 5.4).

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



- Funding cost by deposits
- Market-based funding cost
- Overall funding cost

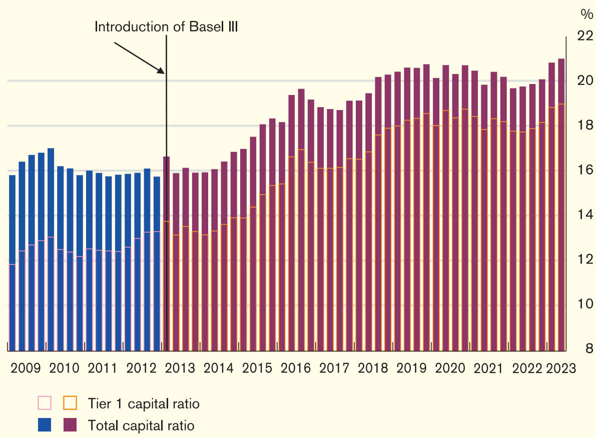
Note: Since June 2019, licensed banks not exempted from the new local IRRBB framework report under the new framework, while exempted licensed banks continue to report under the existing interest rate risk exposure framework. The overall funding cost has been calculated as the weighted averages of the 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.

Looking ahead, while the higher interest rate environment would benefit banks' earnings, the future improvement in net interest income may be capped by the upward pressures in funding costs and lower loan demands. In addition, heightened uncertainties in the external environment may continue to cloud the profitability outlook. In particular, as a "high for longer" interest rate environment may be one possible scenario in advanced economies, the tighter global financing conditions for a longer period, and the associated negative impacts on global economic growth might worsen borrowers' debt repayment abilities. This could increase banks' loan loss provisions and thus weigh on 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 21.0% at the end of June 2023 (Chart 5.5), well above the international minimum requirement of 8%. The Tier 1 capital and the Common Equity Tier 1 (CET1) capital ratios were 19.0% and 17.0%, respectively. In addition, the non-risk-based Leverage Ratio[42] (LR) of locally incorporated AIs recorded a healthy level of 8.0% at the end of June 2023, 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)[43], remained sound during the review period. The average LCR of category 1 institutions rose to 169.8% in the second quarter of 2023 from 161.8% in the fourth quarter of 2022 (Chart 5.6), staying well above the statutory minimum requirement of 100%. The average Liquidity Maintenance Ratio (LMR) of category 2 institutions was 63.8% during the same period, also well above the statutory minimum requirement of 25%.

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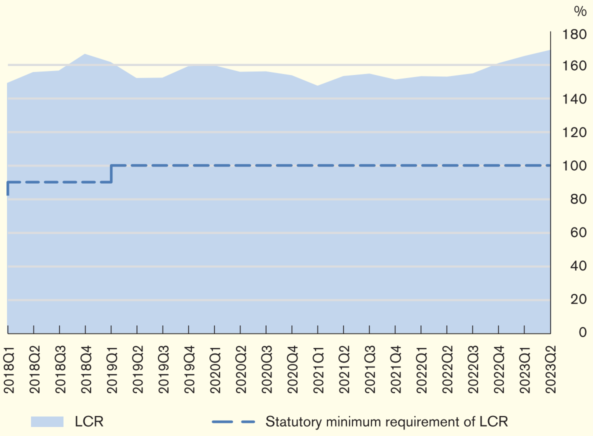
42 The Basel III non-risk-based LR requirement acts as a "backstop" to restrict the build-up of excessive leverage in the banking sector. For details, see Banking (Capital) Rules (Cap. 155L).

43 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*".

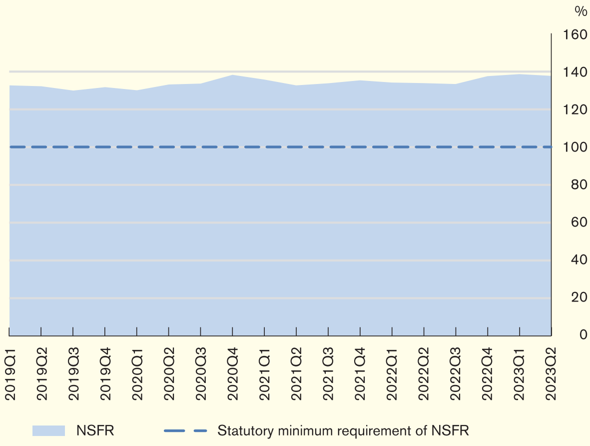
Chart 5.6
Liquidity Coverage Ratio



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

The latest ratios of the Net Stable Funding Ratio (NSFR)[44] requirement also reflected a stable funding position of AIs. The average NSFR of category 1 institutions remained at a high level of 137.6% in the second quarter of 2023 (Chart 5.7), well above the statutory minimum requirement of 100%. The average Core Funding Ratio (CFR) of category 2A institutions also stayed at a high level of 154.0%, exceeding the statutory minimum requirement of 75%. The strong liquidity buffers and stable funding positions of AIs suggest that the Hong Kong banking sector is well positioned to withstand liquidity shocks.

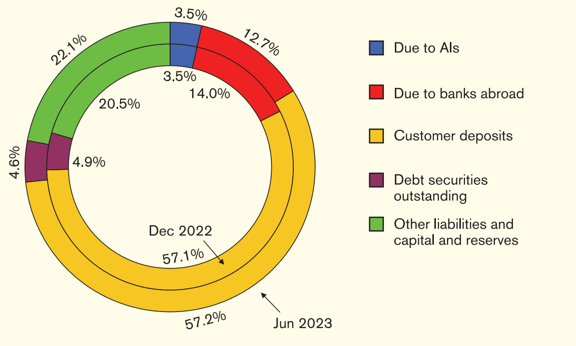
Chart 5.7
Net Stable Funding Ratio



Note: Consolidated basis.
Source: HKMA.

Customer deposits continued to be the primary source of funding for AIs, underpinning a stable funding structure in the banking system. At the end of June 2023, the share of customer deposits to all AIs' total liabilities stayed largely unchanged at 57.2%, compared to 57.1% six months ago (Chart 5.8).

Chart 5.8
The liability structure of all AIs



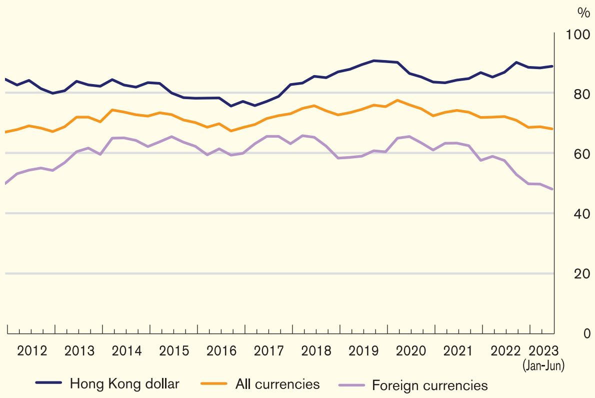
Notes:
1. Figures may not add up to total due to rounding.
2. Figures refer to the percentage of total liabilities, including capital and reserves.
3. Debt securities comprise negotiable certificates of deposit and all other negotiable debt instruments.
Source: HKMA.

The average all-currency loan-to-deposit (LTD) ratio of all AIs decreased mildly from 68.5% at the end of 2022 to 68.0% at the end of June 2023 (Chart 5.9). The decrease in all currency LTD ratio is largely driven by a decrease in foreign

44 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).

currency portion, while the HKD LTD ratio was broadly unchanged. Specifically, the HKD LTD ratio and foreign currency LTD ratio were 88.7% and 48.0% at the end of June 2023 respectively, compared with 88.4% and 49.8% six months ago.

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



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

Interest rate risk

While the recent US banking turmoil in March 2023 raised concern over the impacts of a rapid tightening of monetary policy on banks' interest rate risk management, the latest assessment suggested that the interest rate risk exposure of banks in Hong Kong remained at a relatively low level in the second quarter of 2023.

Under a hypothetical shock of an across-the-board 200-basis-point increase in HKD and USD interest rates[45], the economic value of locally incorporated licensed banks' interest rate positions is estimated to decrease by an amount equivalent to 1.87% of their total capital base at the end of June 2023.[46] The relatively moderate impact suggests that banks in Hong Kong should be well positioned to withstand interest rate shocks.

45 The impact of the interest rate shock refers to its impact on the economic value of the banking and trading book, expressed as a percentage of the total capital bases of banks.

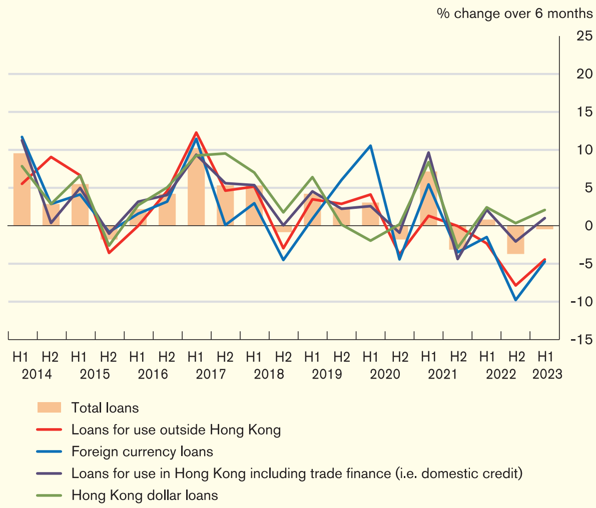
46 This estimation does not take into account the effect of any mitigating action by banks in response to the shock. The impact will be smaller if mitigating action is taken.

5.3 Credit risk

Overview

In part reflecting weaker loan demand amid higher borrowing costs and a weakened global economic outlook, total loans and advances of all AIs declined slightly by 0.5% during the first half of 2023 (Chart 5.10). The decline was mainly driven by a decrease in loans for use outside Hong Kong by 4.5% during the review period, which more than offset an increase in domestic loans (comprising loans for use in Hong Kong and trade financing) by 1.0%.

Chart 5.10
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 percentage changes over six months for 2019 and onwards are calculated based on the reclassified loan data, while the historical percentage changes until the second half of 2018 are calculated based on the data without such reclassification.
Source: HKMA.

The credit demand is likely to stay weak in the near term. According to the results of the HKMA Opinion Survey on Credit Condition Outlook in June 2023, the share of surveyed AIs expecting loan demand to be lower in the following three months increased to 23% compared to 13% in the previous survey conducted six months ago (Table 5.A).

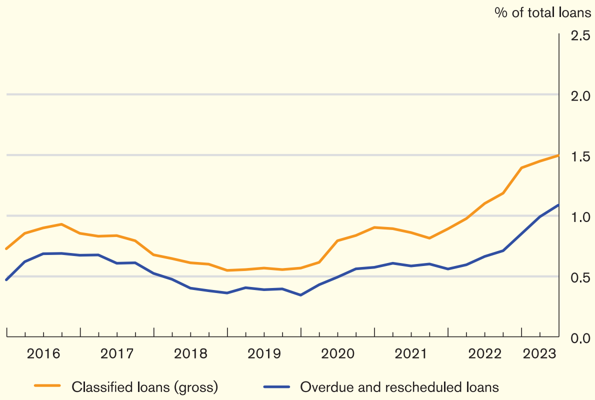
Table 5.A
Expectations of loan demand in the next three months

% of total respondents	Sep-22	Dec-22	Mar-23	Jun-23
Considerably higher	0	0	0	0
Somewhat higher	20	27	37	20
Same	70	60	53	57
Somewhat lower	10	10	10	20
Considerably lower	0	3	0	3
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 deteriorated slightly. The gross classified loan ratio (CLR) of all AIs rose to 1.50% in the end of June 2023 from 1.39% at the end of 2022. Similarly, the ratio of overdue and rescheduled loans of all AIs also rose from 0.85% at the end of 2022 to 1.09% at the end of June 2023 (Chart 5.11). Despite the increase in CLR, the asset quality of the Hong Kong banking sector stayed healthy.

Chart 5.11
Asset quality of all AIs



Note: Classified loans are those loans graded as "sub-standard", "doubtful" or "loss".
Source: HKMA.

Household exposure[47]

Household debt grew by 2.2% in the first half of 2023, faster than the 0.7% increase in the second half of 2022, but slower than the 4.4% increase in both the first and second halves of 2021 (Table 5.B). A breakdown of the data shows that the growth of residential mortgage loans increased to 2.6% in the first half of 2023 due to the higher number of residential property transactions during the period, compared with the second half of 2022. Personal loans reverted to positive growth of 1.4% after contracting by 2.2% in the second half of 2022.

Table 5.B
Half-yearly growth of loans to households of all authorized institutions (AIs)

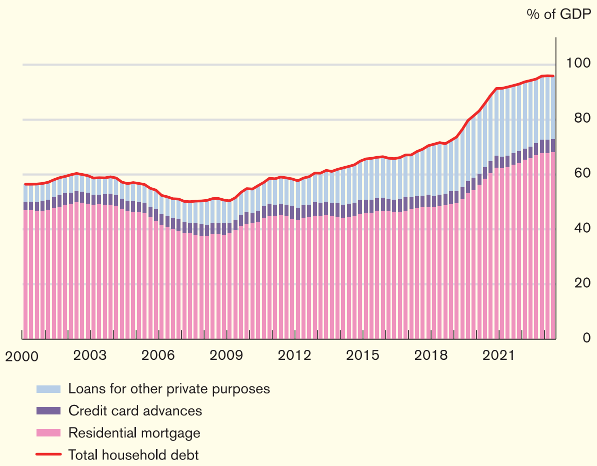
	2020		2021		2022		2023
(%)	H1	H2	H1	H2	H1	H2	H1
Residential mortgages	3.5	4.7	4.0	5.7	2.1	1.9	2.6
Personal loans	-2.4	2.2	5.3	1.6	-2.5	-2.2	1.4
of which:							
Credit card advances	-9.0	0.0	-0.4	8.1	-5.3	14.4	0.2
Loans for other private purposes	-1.1	2.6	6.4	0.4	-2.0	-5.1	1.6
Total loans to households	1.5	3.9	4.4	4.4	0.7	0.7	2.2

Source: HKMA.

The household debt-to-GDP ratio remained virtually unchanged at 95.8% in the first half of 2023 (Chart 5.12), compared to the second half of 2022. The contribution from growth in household debt (+2.1 percentage points), was completely offset by the expansion in Hong Kong's nominal gross domestic product (GDP) (-2.1 percentage points).

47 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. As of end-June 2023, household lending accounted for 35.5% of domestic lending.

Chart 5.12
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: (i) 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 borrowings. Therefore, the household debt-to-GDP ratio does not reflect the actual debt servicing burden of households in the economy; and (ii) 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 39.8% in July 2023. Household net worth has also stayed at a high level. Specifically, both the net worth-to-liabilities ratio and the safe asset-to-liabilities ratio of Hong Kong's household sector remained high at 10.9 times and 2.91 times respectively in 2021 (Charts 5.13 and 5.14), 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.

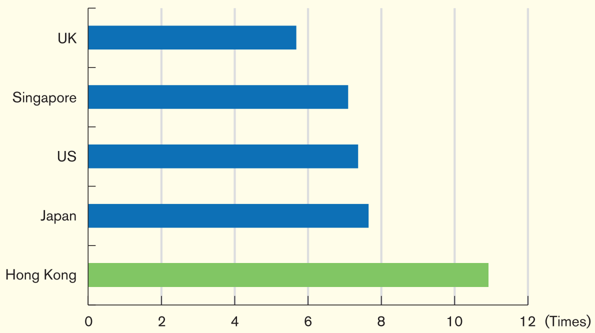
The HKMA has been closely monitoring household indebtedness and regularly collects data from the banks. The majority of the household debts are residential mortgage loans, which are governed by the macroprudential policy framework, as well as collateralised loans to wealth management customers against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

For residential mortgages, the average loan-to-value (LTV) ratio and average debt servicing ratio of newly approved mortgage loans have stayed at healthy levels following several rounds of countercyclical macroprudential measures introduced by the HKMA since 2009. In July 2023, the HKMA adjusted the countercyclical macroprudential measures by increasing the maximum loan-to-value ratios for both residential and non-residential properties, after taking into account a range of factors including recent changes in market conditions.[48] 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.

48 For details, see the press release "Countercyclical Macroprudential Measures for Property Mortgage Loans" on 7 July 2023 (https://www.hkma.gov.hk/eng/news-and-media/press-releases/2023/07/20230707-4).

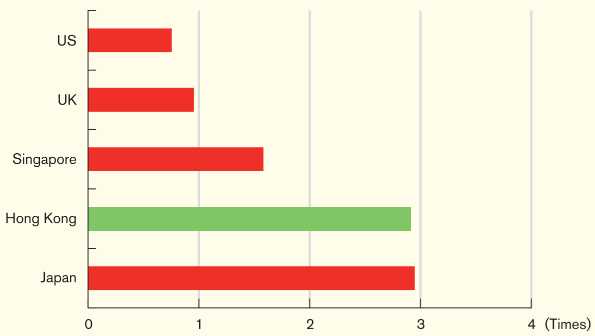
The HKMA also requires banks to adopt prudent underwriting standards for credit card advance and unsecured personal loan businesses. In reviewing credit applications, banks should understand borrowers' credit and financial conditions and carefully assess their repayment ability. As for post-lending, banks should implement effective monitoring that includes regular assessment of the asset quality of the loan portfolios.

Chart 5.13
Household net worth-to-liabilities ratio for selected economies



Note: Figures for Singapore, the UK and the US refer to those at end-2022, while figures for other economies (including Hong Kong) refer to those at end-2021.
Sources: Statistical agencies or central banks of selected economies, and HKMA staff estimates.

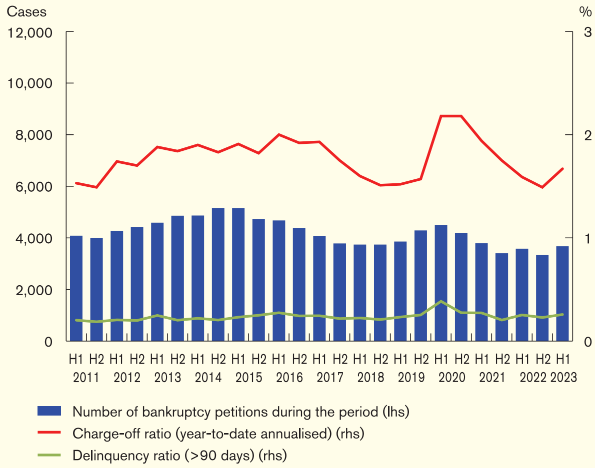
Chart 5.14
Safe assets-to-liabilities ratio for selected economies



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. Figures for Singapore, the UK and the US refer to those at end-2022, while figures for other economies (including Hong Kong) refer to those at end-2021.
Sources: Statistical agencies or central banks of selected economies, and HKMA staff estimates.

For unsecured household exposure, while the associated credit risk has deteriorated slightly, it remained contained during the review period. The number of bankruptcy petitions increased in the first half of 2023 compared with the preceding six months. The year-to-date annualised credit card charge-off ratio increased from 1.49% in the fourth quarter of 2022 to 1.67% in the second quarter of 2023, while the delinquency ratio increased to 0.26% in June 2023 (Chart 5.15).

Chart 5.15
Charge-off ratio and delinquency ratio for credit card lending and bankruptcy petitions



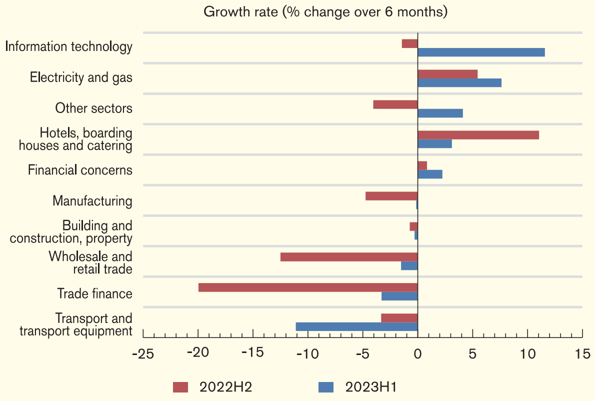
Sources: Official Receiver's Office and HKMA.

Corporate exposure[49]

Domestic corporate loans grew mildly by 0.4% during the first half of 2023, after registering a decline in the second half of 2022. Analysed by economic sectors, loans to information technology, electricity and gas sectors registered relatively larger growth in the first half of 2023. By contrast, loans to wholesale and retail trade, transport sectors and trade finance continued to decline during the review period (Chart 5.16).

49 Excluding interbank exposure. At the end of June 2023, the share of corporate loans in domestic lending was 64.5%.

Chart 5.16
Growth in domestic corporate loans by selected sector

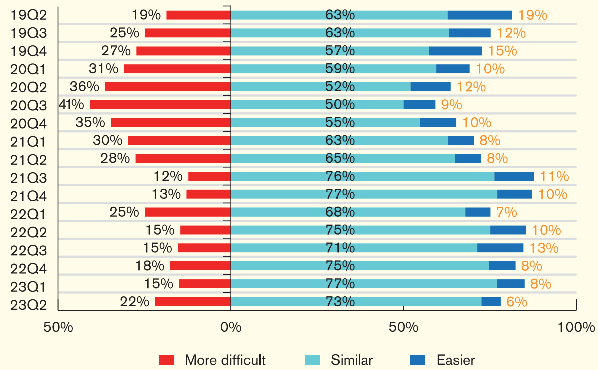


Source: HKMA.

The demand-side survey on the credit conditions of small and medium-sized enterprises (SMEs) showed that the credit conditions of SMEs remained largely stable with little signs of prevalent stress. SMEs' perception of banks' credit approval stance weakened in the second quarter of 2023, with 22% of respondents perceiving more difficult credit approval (Chart 5.17).[50]

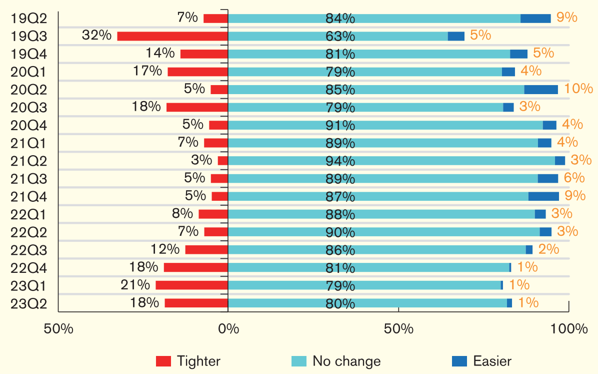
Of respondents with existing credit lines, 18% indicated a tighter stance by banks in 2023Q2, down from 21% registered in the previous quarter (Chart 5.18). As a tighter stance on existing credit lines denotes a range of possible measures or arrangements (e.g. reducing unused and used credit lines, raising the interest rate, imposing additional collateral requirements, or shortening loan tenor), respondents' indication of banks' stance on existing credit lines may not directly reflect banks' supply of credit to SMEs. The HKMA together with the Banking Sector SME Lending Coordination Mechanism (Mechanism) launched the Pre-approved Principal Payment Holiday Scheme (Scheme) in May 2020 to tide customers over the pandemic. Up to the end of July 2023, banks had granted over 119,000 applications for loan tenor extensions and other forms of relief to corporate customers, involving an aggregate amount of HK$1.2 trillion. As the pandemic has passed, the HKMA together with the Mechanism announced in July 2023 the commencement of an orderly exit from the Scheme when it expired at the end of July 2023. Meanwhile, the application period for the principal moratorium arrangement under the SME Financing Guarantee Scheme (SFGS) was further extended by three months to end in end-September 2023. The maximum principal moratorium period remained at 42 months.

Chart 5.17
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 5.18
SMEs' reported change in banks' stance on existing credit lines



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

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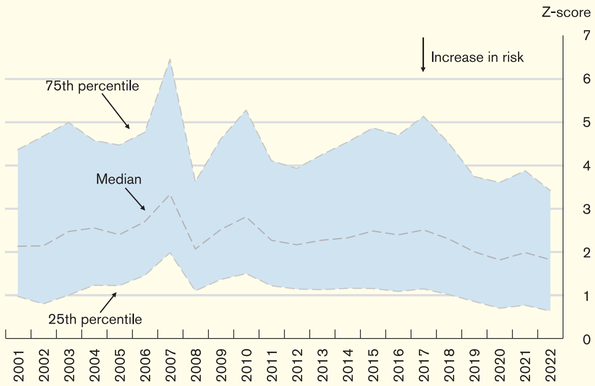
[50] The perception of a more difficult credit approval stance may not necessarily reflect actual difficulties faced by SMEs in obtaining bank credit as the perception could be affected by a number of factors, such as media or news reports, business conditions, and opinions of relatives and friends.

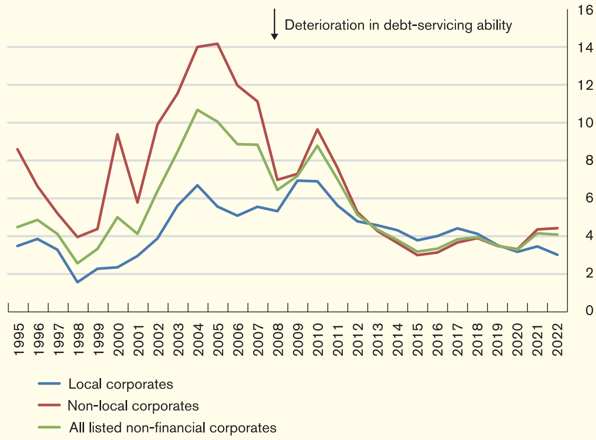
The financial health of listed corporates has shown signs of deterioration based on the latest available financial information.[51] Based on accounting data for all non-financial corporates listed in Hong Kong up to end-2022, the Altman's Z-score (a default risk measure for non-financial corporates based on accounting data) saw an across-the-board decline in 2022 (Chart 5.19). Their debt servicing ability, as indicated by the weighted average interest coverage ratio (ICR), also deteriorated mildly in 2022 (Chart 5.20).

Chart 5.19
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 2023.
Source: HKMA staff calculations based on estimates compiled by Bloomberg.

Chart 5.20
Interest coverage ratio of listed non-financial corporates in Hong Kong

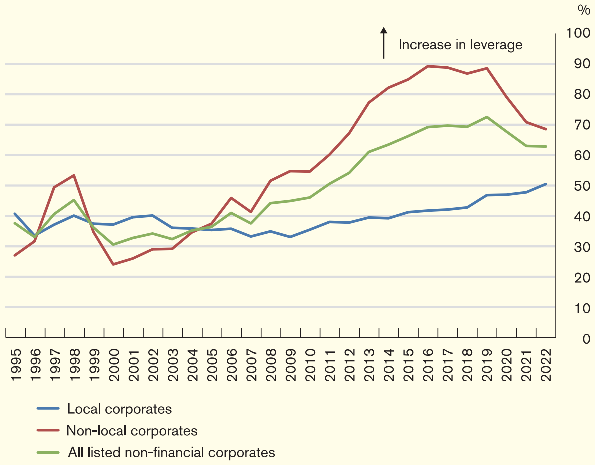


Notes:
1. Weighted average figures.
2. The ICR is calculated by dividing the earnings before interest and tax (EBIT) by total interest expenses. A lower value indicates deterioration of debt servicing ability.
3. All non-financial corporates listed on the Hong Kong Stock Exchange are selected. Local 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 2023.
Source: HKMA staff estimates based on data from Bloomberg.

The weighted average debt-to-equity ratio, a common measure of corporate leverage, remained largely stable in 2022 for all listed non-financial corporates in Hong Kong (the green line in Chart 5.21). The leverage ratio for non-local corporates decreased slightly during 2022 (the red line in Chart 5.21), while that for local corporates increased moderately (the blue line in Chart 5.21).

[51] The analysis is based on financial disclosures of listed firms up to the financial positions of end-2022, as the 2023H1 financial positions are not available for most listed firms as of end-August 2023 due to a time lag in the availability of accounting data.

Chart 5.21
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 2023.

Source: HKMA staff estimates based on data from Bloomberg.

Looking ahead, the possible "high for longer" interest rate environment in major advanced economies may put pressure on corporates' debt repayment abilities, not only because of a higher cost of debt repayment, but also the weaker growth prospect under the scenario. Banks should therefore stay alert to the credit risk of their corporate exposures.

Mainland-related lending and non-bank exposures

The banking sector's total Mainland-related lending decreased by 3.0% to HK$4,388 billion (14.4% of total assets) at the end of June 2023, from HK$4,522 billion (14.9% of total assets) at the end of December 2022 (Table 5.C). Other non-bank exposures increased by 2.3% to HK$1,884 billion (Table 5.D). The gross CLR of Mainland-related lending of all AIs[52] increased to 2.40% at the end of June from 2.24% at the end of 2022.

[52] Figures cover AIs' Hong Kong offices and Mainland branches and subsidiaries.

Table 5.C
Mainland-related lending

HK$ bn	Sep 2022	Dec 2022	Mar 2023	Jun 2023
Mainland-related loans	4,714	4,522	4,551	4,388
Mainland-related loans excluding trade finance	4,388	4,254	4,247	4,107
Trade finance	326	268	303	281
By type of AIs:				
Overseas incorporated AIs	1,702	1,604	1,605	1,573
Locally incorporated AIs*	2,207	2,104	2,137	2,061
Mainland banking subsidiaries of locally incorporated AIs	805	814	809	754
By type of borrowers:				
Mainland state-owned entities	1,908	1,825	1,918	1,838
Mainland private entities	1,446	1,404	1,375	1,335
Non-Mainland entities	1,360	1,293	1,258	1,215

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

Source: HKMA.

Table 5.D
Other non-bank exposures

HK$ bn	Sep 2022	Dec 2022	Mar 2023	Jun 2023
Negotiable debt instruments and other on-balance sheet exposures	1,344	1,337	1,432	1,389
Off-balance sheet exposures	521	504	474	494
Total	**1,865**	**1,841**	**1,906**	**1,884**

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

Source: HKMA.

In view of the heightened uncertainty surrounding the pace of economic recovery in the Mainland economy as well as the risk associated with the property market downturn, banks should stay attentive to the credit risk management of their Mainland-related exposures.

Macro stress testing of credit risk

Because of the importance of corporate lending on banks' total loan exposures, Box 4 presents a refined framework for stress testing the credit risk of Hong Kong's banking sector and reports the latest assessment results. By incorporating the default risk and key financial performance ratios of Hong Kong corporate sector into the macro stress-testing framework, the refined framework would strengthen our capacity to obtain a clearer and fuller assessment on the resilience of the banking sector.

5.4 Systemic risk

Amid the improvement in domestic economic conditions in the first half of 2023, the systemic risk in the Hong Kong banking sector has remained contained. Nevertheless, several downside risk factors may continue to pose challenges to the Hong Kong banking sector going forward.

First, the uncertainty on the future US interest rate movements will remain a key risk factor to watch for. While there have been some signs of progress in combating inflationary pressure in the US in the first half of the year, it remains to be seen when the US inflation rate can reach the Fed's targeted level. If the core inflation rate in the US remains sticky, the "high for longer" interest rate environment may transmit to the region, including Hong Kong, which may exert pressure on borrowers' repayment ability.

In addition, the "high for longer" interest rate outlook and the associated tighter global financial conditions could weigh on global growth outlook and weaken external demand. Any further deterioration in the external economic environment, coupled with a slower pace of economic recovery in the Mainland economy, would put pressures on the earnings of corporates in the region. This, together with higher debt servicing costs, would put corporates' debt repayment abilities to the test. This, in turn, may pose challenges to banks' credit risk management for their corporate exposures.

Besides credit risk concerns, the rapid rise in global interest rates could also expose banks to significant interest rate risk as witnessed in the recent US banking turmoil in March 2023. Also, as learnt from the episode, the subsequent abrupt erosion of market confidence could trigger significant contagion risks to other jurisdictions even without strong direct linkages to the failed banks. Although the interest risk exposures of the Hong Kong banking sector have remained relatively low and the contagion risks stemming from the US regional bank failures have moderated recently, banks should still stay vigilant to these risks and maintain a prudent interest rate and liquidity management in view of the "high for longer" interest rate outlook.

Geopolitical risks will continue to warrant monitoring. Any intensification in geopolitical conflicts could further amplify the downside risks to the global economy.

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

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. This buffer can be reduced 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 13 July 2023, is 1.0%[53].

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 the 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).[54] The setting of the CCyB for Hong Kong is, however, not a mechanical exercise and

53 For details, see the Announcement of the CCyB to AIs on July 2023 (https://www.hkma.gov.hk/eng/key-functions/banking/banking-legislation-policies-and-standards-implementation/countercyclical-capital-buffer-ccyb/).

54 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.

the Monetary Authority will always consider a broad range of reference indicators ("Comprehensive Reference Indicators") and all relevant information available in addition to the indicative buffer guide.[55]

In the latest assessment based on the first quarter data of 2023, the indicative buffer guide signals a CCyB of 0%. The projection, based on all available data at the decision date, suggests the indicative buffer guide is likely to signal a CCyB of 0% when all relevant data for the second quarter of 2023 become available.

The information drawn from the series of Comprehensive Reference Indicators, along with all relevant information available at the time of the decision in June 2023, suggests that the latest economic indicators point to further stabilisation of economic activities in Hong Kong in the second quarter of 2023, but uncertainties about the global economic environment remain high. In view of the planned transition to a Positive Neutral CCyB[56] of 1% in 2024, the Monetary Authority considers that it is appropriate to keep the CCyB ratio at the current level for the time being and continue to monitor the situation closely.

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

	8-Feb-23	4-May-23	13-Jul-23
Announced CCyB rate	1.0%	1.0%	1.0%
Date effective	08/02/2023	04/05/2023	13/07/2023
Indicative buffer guide	0.0%	0.0%	0.0%
Basel Common Reference Guide	0.8%	1.3%	0.0%
Property Buffer Guide	0.0%	0.0%	0.0%
Composite CCyB Guide	0.0%	0.0%	0.0%
Indicative CCyB Ceiling	None	None	None
Primary gap indicators			
Credit/GDP gap	4.6%	6.0%	-4.8%
Property price/rent gap	-5.5%	-10.7%	-6.7%
Primary stress indicators			
3-month HIBOR spread (percentage points)	0.43%	0.76%	0.49%
Quarterly change in classified loan ratio (percentage points)	0.12%	0.24%	0.06%

Note: 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).

Source: HKMA.

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

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

56 Under the Positive Neutral CCyB approach, authorities aim for a positive CCyB when risks are judged to be neither subdued nor elevated. Please refer to (https://www.bis.org/publ/bcbs_nl30.htm) for more information.

Table 5.F
Key performance indicators of the banking sector[1] (%)

	Jun 2022	Mar 2023	Jun 2023
Interest rates			
1-month HIBOR fixing[2] (quarterly average)	0.31	3.01	3.98
3-month HIBOR fixing (quarterly average)	0.88	3.82	4.28
BLR[3] and 1-month HIBOR fixing spread (quarterly average)	4.69	2.62	1.72
BLR and 3-month HIBOR fixing spread (quarterly average)	4.12	1.81	1.42
Composite interest rate[4]	0.47	2.13	2.35
		All AIs	
Balance sheet developments[5]			
Total deposits	-0.7	+0.5	-0.3
Hong Kong dollar	+0.1	+2.6	-0.9
Foreign currency	-1.5	-1.4	+0.2
Total loans	-0.4	+0.9	-1.3
Domestic lending[6]	+0.1	+1.4	-0.4
Loans for use outside Hong Kong[7]	-1.7	-0.4	-4.1
Negotiable instruments			
Negotiable certificates of deposit (NCDs) issued	+8.1	-2.0	-5.4
Negotiable debt instruments held (excluding NCDs)	-1.2	+3.8	+0.8
Asset quality			
As a percentage of total loans[8]			
Pass loans	97.11	96.57	96.58
Special mention loans	1.79	1.98	1.92
Classified loans[9] (gross)	1.10	1.45	1.50
Classified loans (net)[10]	0.63	0.83	0.84
Overdue > 3 months and rescheduled loans	0.66	0.99	1.09
Classified loan ratio (gross) of Mainland related lending[11]	1.50	2.25	2.40
Liquidity ratios (consolidated)			
Liquidity Coverage Ratio — applicable to category 1 institutions (quarterly average)	153.6	166.0	169.8
Liquidity Maintenance Ratio — applicable to category 2 institutions (quarterly average)	58.4	64.2	63.8
Net Stable Funding Ratio — applicable to category 1 institutions	133.8	138.6	137.6
Core Funding Ratio — applicable to category 2A institutions	147.7	153.5	154.0
		Retail banks	
Profitability			
Loan impairment charges as a percentage of average total assets (year-to-date annualised)	0.14	0.06	0.13
Net interest margin (year-to-date annualised)	1.03	1.56	1.62
Cost-to-income ratio (year-to-date)	53.9	38.2	38.8
		Surveyed institutions	
Asset quality			
Delinquency ratio of residential mortgage loans	0.05	0.06	0.07
Credit card lending			
Delinquency ratio	0.25	0.25	0.26
Charge-off ratio — quarterly annualised	1.88	1.60	1.76
— year-to-date annualised	1.59	1.60	1.67
		All locally incorporated AIs	
Capital adequacy (consolidated)			
Common Equity Tier 1 capital ratio	15.8	16.9	17.0
Tier 1 capital ratio	17.7	18.8	19.0
Total capital ratio	19.7	20.8	21.0
Leverage ratio	7.7	8.0	8.0

Notes:
1. Figures are related to Hong Kong offices only except where otherwise stated.
2. The Hong Kong Interbank Offered Rates are released by the Hong Kong Association of Banks.
3. With reference to the rate quoted by The Hongkong and Shanghai Banking Corporation Limited.
4. 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.
5. Quarterly change.
6. Loans for use in Hong Kong plus trade finance.
7. Including "others" (i.e. unallocated).
8. Figures are related to all AIs' Hong Kong offices, as well as locally incorporated AIs' overseas branches and major overseas subsidiaries.
9. Classified loans are those loans graded as "substandard", "doubtful" or "loss".
10. Net of specific provisions/individual impairment allowances.
11. Figures are related to all AIs' Hong Kong offices, as well as locally incorporated AIs' Mainland branches and subsidiaries.

Box 4
Incorporating the non-financial corporate sector into the macro stress testing framework for banks' credit risk

Introduction

Stress testing of banks' credit risk is one important tool to assess the resilience of the banking sector under "extreme but plausible" shocks. A conventional macro stress testing framework generally focuses on the assessment of shocks to different macroeconomic or financial variables. However, as shown during the COVID-19 pandemic, earning and liquidity shocks to the non-financial corporate ("corporate") sector, together with the risk transmission to the broader economy through the macroeconomic channels, could expose banks to significant credit risk. To further improve the banking stability surveillance, this box presents a refined macro stress testing framework by incorporating the corporate sector into the analysis. Apart from facilitating the assessment of conventional macroeconomic stressed scenarios, the refined framework broadens the scope of analysis to investigate (i) how deterioration in the financial performance of Hong Kong's corporate sector may affect the default risk of this sector, and (ii) how the resulting impact on default risk of the corporates may be transmitted to the broader economy, and affect the credit risk of the Hong Kong banking sector.

The framework

Chart B4.1
Schematic view of the refined macro stress testing framework

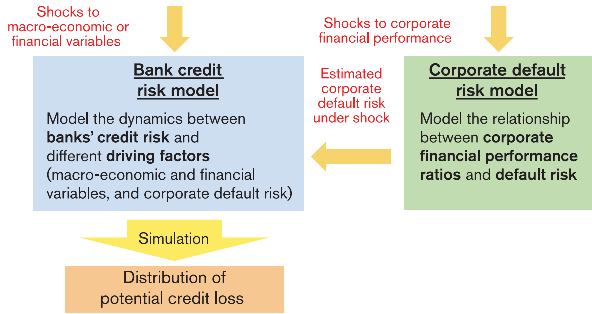


Chart B4.1 provides a schematic view of the refined macro stress testing framework. The left block (in light blue) is a bank credit risk model that captures the dynamics between the credit risk of retail banks in Hong Kong and key driving factors. These driving factors include the four major macroeconomic and financial variables captured by our previous macro stress testing framework, and a newly added default risk indicator of the Hong Kong corporate sector (Table B4.1). The empirical relationships between these driving factors are modeled using a vector autoregressive (VAR) model, such that the interaction between these factors can be captured in the analysis.

Table B4.1
Indicators in the bank credit risk model

Indicator	Definition
Banks' credit risk	Quarterly change in aggregated banks' specific loan loss provision to total loan ratio ("specific provision ratio") of retail banks in Hong Kong
Driving factors of banks' credit risk	
Domestic economic growth	Year-on-year percentage growth of Hong Kong's real GDP
Property price growth	Quarter-on-quarter percentage changes in real property price (Rating and Valuation Department nominal property price index deflated by CPI)
Interest rate	Quarterly change in real interest rate (3-month HIBOR minus inflation rate)
Mainland economic growth	Year-on-year percentage growth of Mainland real GDP
Corporate default risk	The median value of the quarterly change in the market-based one-year ahead probability of default (PD) for corporates listed in Hong Kong[57]

With the first four driving factors resembling those used in the previous framework, conventional macro-economic shocks can be analysed using the refined framework. The newly added driving factor, i.e. the median quarterly change in the probability of default for corporates listed in Hong Kong can facilitate the analysis of the impact of financial stress of corporates in Hong Kong.

One important feature of the refined framework is a satellite empirical model linking the default risk of corporates to key financial performance ratios (i.e. the corporate default risk model, the green block in Chart B4.1). The model is estimated using financial data of corporates listed in Hong Kong, covering the period from 2000 to 2022. Table B4.2 summarises the estimation results of the corporate default risk model. Specifically, the default risk of corporates listed in Hong Kong is estimated to increase with higher leverage (measured by the debt-to-asset ratio, DTA), lower profitability (measured by return on assets, ROA), and lower liquidity (measured by a net cash buffer, NCB). In addition, the estimation result indicates that when ROA and NCB are negative, the default risk would be higher. Overall, the estimation results are in line with economic intuition.

Table B4.2
Estimated relationships between corporates' financial ratios and default risk

Explanatory Variable	Estimated relationship
DTA	+
ROA	–
$ROA^{Negative}$	+
NCB	–
$NCB^{Negative}$	+
Size	–

Notes:
1. This table reports the signs of the estimated coefficients of a fixed effect panel regression model with corporate default risk as dependent variable and selected financial performance ratios as explanatory variables. The data sample covers 1,196 corporates listed in Hong Kong, with quarterly data spanning from 2000 Q1 to 2022 Q4.
2. Net cash buffer (NCB) is calculated as the difference between gross cash buffer (i.e. sum of cash and equivalent and total revenue) and cash outlay (i.e. sum of interest expense, other operating expense and short-term debt repayment).
3. $ROA^{Negative}$ and $NCB^{Negative}$ are dummy variables that equal to one when a corporate's ROA and NCB is negative in a particular quarter respectively, and zero otherwise.
4. All estimated relationships are statistically significant at 1% level.

Source: HKMA staff estimates.

Stress testing results

Macro-economic shocks

We first assess the potential credit loss under four conventional macro-economic shocks. The shocks are calibrated by referencing to the extreme episodes observed in the past:[58]

1. ***Hong Kong GDP shock:*** reductions in Hong Kong's real GDP by 3.2%, 3.6%, 9.3% and 9.4% year-on-year respectively in each of the four consecutive quarters starting from 2023 Q3;

[57] The one-year ahead PD is obtained from Bloomberg's DRSK module. It refers to the probability that a corporate will default over a one-year horizon from now. According to Bloomberg, the PD is derived from first estimating the distance-to-default (DTD) based on the Black-Cox model. The estimated DTD is then transformed into one-year ahead PD by applying a logistic regression of historical realised defaults against the DTD and additional risk factors such as profitability and insolvency.

[58] In particular, the Hong Kong GDP shock scenario replicates the significant economic downturn recorded from 2019 Q3 to 2020 Q2. The property price shock and interest rate shock scenarios resemble the movements in real interest rate and property prices during the Asian Financial Crisis, while the Mainland GDP shock scenario makes reference to the Mainland's economic slowdown in 2020 amid the COVID-19 pandemic.

2. ***Property price shock:*** Reductions in Hong Kong's real property price by an average of 12% in each of the four consecutive quarters starting from 2023 Q3;

3. ***Interest rate shock:*** a rise in real interest rates by 0.1, 0.9, 1.8 and 3.2 percentage points (ppts) respectively in each of the four consecutive quarters starting from 2023 Q3; and

4. ***Mainland GDP shock:*** an average year-on-year growth rate of 2% for Mainland real GDP in the four consecutive quarters starting from 2023 Q3.

Using 2023 Q2 as the current environment, we simulate the specific provision ratio over a two-year horizon (i.e., 2023 Q3 to 2025 Q2) under these scenarios using the Monte Carlo method.[59] Based on the estimated specific provision ratio, we further estimate the credit loss rate at the end of the stress horizon (i.e. 2025 Q2):

Table B4.3 reports the simulation results.[60] For comparison purpose, the table also includes a baseline scenario where no shock is applied. The results suggest that the average expected credit loss (as % of loan portfolio) under the four macroeconomic shocks are moderate, ranging from 0.95% (Interest rate shock and property price shock) to 1.37% (Hong Kong GDP shock).

Taking into account tail risk, the Value-at-risk (VaR) at 99% confidence level (CL) of bank credit loss would increase noticeably in all four scenarios, ranging from 2.51% (Property price shock) to 3.42% (Hong Kong GDP shock).

Table B4.3
The mean and VaR statistics of simulated credit loss distributions under macro-economic shocks

Scenario	Estimated credit loss (% of the loan portfolio)	
	Mean	VaR at 99% CL
Baseline[1]	0.65	1.73
Stressed scenarios		
Hong Kong GDP shock[2]	1.37	3.42
Property price shock[3]	0.95	2.51
Interest rate shock[4]	0.95	2.52
Mainland GDP shock[5]	1.22	3.01

Notes:
1. No shock throughout the two-year stress period.
2. Reductions in Hong Kong's real GDP by 3.2%, 3.6%, 9.3% and 9.4% year-on-year respectively in each of the four consecutive quarters starting from 2023 Q3.
3. Reductions in Hong Kong's real property prices by an average of 12% in each of the four consecutive quarters starting from 2023 Q3.
4. A rise in real interest rates (HIBORs) by 0.1, 0.9, 1.8 and 3.2 ppts respectively in each of the four consecutive quarters starting from 2023 Q3.
5. An average year-on-year Mainland real GDP growth rate of 2% for the four consecutive quarters starting from 2023 Q3.

Shocks to the corporate sector

We next consider shocks to corporates' financial performance. Specifically, we consider a shock to corporates' liquidity by assuming that their short-term (ST) debts cannot be rolled over during the first year, while their revenue is also assumed to reduce by 50% year-on-year in each of the four consecutive quarters starting from 2023 Q3. This scenario simulates the extreme financial stress facing the corporate sector amid the COVID-19 pandemic.[61] Based on the estimation results of the corporate default risk model (Table B4.2), the combined earning and liquidity shocks would translate into a higher default risk for the Hong Kong corporate sector. Using the estimated default risk of the Hong Kong corporate sector under this stress scenario, we further simulate the credit loss rates of retail banks in Hong Kong using the bank credit risk model.

[59] We adopt the same simulation procedure as used in J. Wong et al. (2006), "A framework for stress testing banks' credit risk", *Journal of Risk Model Validation*, Vol. 2(1), pages 3–23. We refer readers to this paper for details of the simulation procedure.

[60] While the same types of macro-economic shocks in our previous framework are considered under the refined framework, the credit loss estimates produced by the two frameworks are not directly comparable for two reasons. First, the stressed scenarios have been re-calibrated with reference to the more recent stress episodes where appropriate. Second, the inclusion of corporate default risk in the refined stress testing framework would capture fuller transmissions of macro-economic shocks through the corporate sector.

[61] In particular, the assumed revenue decline (50%) references the average year-on-year percentage change in the lowest 10th percentile of sampled corporates from 2020 Q1 to 2020 Q4.

Table B4.4 reports the distribution of simulated credit loss rates under this scenario. In particular, the results show that the potential credit loss under this scenario is comparable to those under conventional macro-economic shocks, with the average estimated credit loss and the VaR estimate at 99% CL being 1.13% and 2.74% respectively. The results indicate that corporate sector shocks would also be an important driver of banks' credit risk in Hong Kong.

Table B4.4
The mean and VaR statistics of simulated credit loss distributions under corporate shock

Scenario	Estimated credit loss (% of the loan portfolio)	
	Mean	VaR at 99% CL
Baseline[1]	0.65	1.73
Stressed scenario		
Corporate shock[2]	1.13	2.74

Notes:
1. No shock throughout the two-year stress period.
2. A shock to corporates' liquidity where all corporates' ST debts cannot be rolled over during the first year, together with a reduction in revenue for all corporates by 50% year-on-year in each of the four consecutive quarters starting from 2023 Q3.

Conclusion

This box presents a refined framework for stress testing the credit risk of Hong Kong's banking sector. Given that the corporate sector is one important part of the Hong Kong economy, shocks to the corporate sector or conventional macro shocks transmitting through the corporate sector could have important implications for credit loss of loan portfolios of banks in Hong Kong. By incorporating the Hong Kong corporate sector into the macro stress testing framework, the refined framework would strengthen our capacity to obtain a clearer and fuller assessment on the resilience of the banking sector.

Glossary of terms

Aggregate Balance
The sum of balances in the clearing accounts and reserve accounts kept with the central bank. In Hong Kong, this refers to the sum of the balances in the clearing accounts kept with the HKMA. The Aggregate Balance is a part of the Monetary Base.

Authorized Institution (AI)
An institution authorized under the Banking Ordinance to carry on the business of taking deposits. Hong Kong maintains a Three-tier Banking System, which comprises licensed banks, restricted licence banks and deposit-taking companies.

Best Lending Rate
A benchmark interest rate that banks use to price loans. In Hong Kong, the Best Lending Rate is used as a base for quoting interest rates on mortgage loans.

Certificates of Indebtedness (CIs)
Certificates issued by the Financial Secretary under the Exchange Fund Ordinance, to be held by note-issuing banks as cover for the banknotes they issue.

Composite Consumer Price Index (CCPI)
The main consumer price index (CPI) for Hong Kong. The Census and Statistics Department compiles three separate CPI series relating to households in different expenditure ranges. The CPI(A) relates to about 50% of households in the relatively low expenditure range; the CPI(B) relates to the next 30% of households in the medium expenditure range; and the CPI(C) relates to the next 10% of households in the relatively high expenditure range. The Composite CPI is compiled based on the aggregate expenditure pattern of all of the above households taken together.

Composite Interest Rate
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. Data from retail banks, which account for the majority of the Hong Kong dollar deposits in the banking sector, are used in the calculation. It should be noted that the composite interest rate represents only average interest expenses. There are various other costs involved in the making of a loan, such as operating costs (e.g. staff and rental expenses), credit cost and hedging cost, which are not covered by the composite interest rate.

Convertibility Undertaking (CU)
An undertaking by a central bank or Currency Board to convert domestic currency into foreign currency and vice versa at a fixed exchange rate. In Hong Kong, the HKMA operates Convertibility Undertakings on both the strong side and the weak side of the Linked Rate of 7.80. Under the strong-side Convertibility

Undertaking, the HKMA undertakes to buy US dollars from licensed banks at 7.75. Under the weak-side Convertibility Undertaking, the HKMA undertakes to sell US dollars at 7.85. Within the Convertibility Zone between 7.75 and 7.85, the HKMA may choose to conduct market operations consistent with Currency Board principles with the aim of promoting the smooth functioning of the money and foreign exchange markets.

Convertibility Zone

The Hong Kong dollar-US dollar exchange rate band, defined by the levels of the strong- and weak-side Convertibility Undertakings, within which the HKMA may choose to conduct market operations consistent with Currency Board principles.

Exchange Fund Bills and Notes (EFBNs)

Debt instruments issued by the HKMA for the account of the Exchange Fund. These instruments are fully backed by the foreign reserves. The HKMA has undertaken that new Exchange Fund paper will only be issued when there is an inflow of funds, thus enabling the additional paper to be fully backed by the foreign reserves. Since 1 April 1999, interest payments on Exchange Fund paper have been allowed to expand the Monetary Base. Additional Exchange Fund paper is issued to absorb such interest payments. This is consistent with the Currency Board discipline since interest payments on Exchange Fund paper are backed by interest income on the US dollar assets backing the Monetary Base.

Monetary Base

A part of the monetary liabilities of a central bank. The Monetary Base is defined, at the minimum, as the sum of the currency in circulation (banknotes and coins) and the balance of the banking system held with the central bank (the reserve balance or the clearing balance). In Hong Kong, the Monetary Base comprises Certificates of Indebtedness (for backing the banknotes issued by the note-issuing banks), government-issued currency in circulation, the sum of the balances of the clearing accounts kept with the HKMA (the Aggregate Balance), and Exchange Fund Bills and Notes.

Money supply

The total stock of money available in the economy. Hong Kong has three measures of money supply: Money Supply definition 1 (M1) is defined as the sum of legal tender notes and coins held by the public plus customers' demand deposits placed with licensed banks. Money Supply definition 2 (M2) is defined as M1 plus customers' savings and time deposits with licensed banks plus negotiable certificates of deposit (NCDs) issued by licensed banks held outside the banking sector. Money Supply definition 3 (M3) is defined as M2 plus customers' deposits with restricted licence banks and deposit-taking companies plus NCDs issued by these institutions held outside the banking sector.

Nominal and Real Effective Exchange Rate (NEER and REER)

An indicator of the overall exchange rate value of the Hong Kong dollar against a basket of currencies of Hong Kong's principal trading partners. The nominal effective exchange rate (NEER) is a weighted average of the exchange rates between Hong Kong and its principal trading partners. The real effective exchange rate (REER) is obtained by adjusting the NEER for relative movements in the seasonally adjusted consumer price indices of those selected trading partners.

Abbreviations

1m moving average	One-month moving average
3m moving average	Three-month moving average
3m-on-3m	Three-month-on-three-month
AB	Aggregate Balance
AEs	Advanced economies
AIs	Authorized institutions
APAC	Asia Pacific
ASEAN	Association of Southeast Asian Nations
AU	Australia
BAU	Business-as-usual
BIS	Bank for International Settlements
bn	Billion
BLR	Best Lending Rate
bps	basis points
CAR	Capital Adequacy Ratio
CBIRC	China Banking and Insurance Regulatory Commission
CPI	Consumer Price Index
CCDC	China Central Depository & Clearing Co., Ltd.
CCPI	Composite Consumer Price Index
CCyB	Countercyclical capital buffer
CDs	Certificates of deposits
CET1	Common equity tier-one
CFR	Core Funding Ratio
CIs	Certificates of Indebtedness
CLR	Classified Loan Ratio
CMBS	Commercial mortgage-backed securities
CMU	Central Moneymarkets Unit
CN	Mainland China
CNH	Offshore renminbi in Hong Kong
CNY	Onshore renminbi
COVID	Coronavirus Disease

CRE	Commercial real estate
CRST	Climate Risk Stress Test
C&SD	Census and Statistics Department
CSDs	Central Securities Depositories
CU	Convertibility Undertaking
DI	Direct investment
DID	Difference-in-differences
DSR	Debt-servicing ratio
DTD	Distance-to-default
EA	Euro area
EBIT	Earnings before interest and tax
EBITDA	Earnings before interest, taxes, depreciation and amortization
ECB	European Central Bank
EFBNs	Exchange Fund Bills and Notes
EM	Emerging-market
EMEAP	Executive's Meeting of East Asia-Pacific Central Banks
EMEs	Emerging Market Economies
EPS	Earnings per share
ESG	Environmental, Social and Governance
ESLS	Enhanced Supplementary Labour Scheme
ETFs	Exchange traded funds
EU	European Union
EUR	Euro
F&B	Food and Beverage
Fed	Federal Reserve
FI	Financial Institution
FOMC	Federal Open Market Committee
FX	Foreign exchange
GBP	British Pound Sterling
GDP	Gross Domestic Product
GICS	Global Industry Classification Standard
HIBOR	Hong Kong Interbank Offered Rate
HK	Hong Kong
HKD	Hong Kong dollar
HKEX	The Hong Kong Exchanges and Clearing Limited

HKFRS	Hong Kong Financial Reporting Standard
HKMA	Hong Kong Monetary Authority
HKMCI	HKMC Insurance Limited
HKPC	Hong Kong Productivity Council
HK$M3	Hong Kong dollar broad money supply
HSCEI	Hang Seng China Enterprises Index
HSI	Hang Seng Index
ICR	Interest Coverage Ratio
ICSD	International Central Securities Depository
ID	Indonesia
IFC	International Finance Corporation
IIF	Institute of International Finance
IMF	International Monetary Fund
IPO	Initial Public Offering
IRRBB	Interest rate risk in the banking book
IT	Information technology
JP	Japan
JPY	Japanese Yen
KR	South Korea
LCR	Liquidity Coverage Ratio
LIBOR	London Interbank Offered Rate
LERS	Linked Exchange Rate System
LGFVs	Local Government Financing Vehicles
lhs	Left-hand side
LMR	Liquidity Maintenance Ratio
LPR	Loan Prime Rate
LR	Leverage Ratio
LTD	Loan-to-deposit
LTV	Loan-to-value
mn	Million
MDBs	Multilateral Development Banks
MIP	Mortgage Insurance Programme
MRF	Mutual Recognition of Funds
MY	Malaysia
MSCI	Morgan Stanley Capital International

NASDAQ	National Association of Securities Dealers Automated Quotations
NBS	National Bureau of Statistics of China
NCD	Negotiable certificate of deposit
NEER	Nominal effective exchange rate
NFCs	Non-financial corporates
NFRA	National Financial Regulatory Administration
NIM	Net interest margin
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
NPL	Non-performing loan
NSFR	Net Stable Funding Ratio
OECD	Organisation for Economic Corporation and Development
PH	The Philippines
OIS	Overnight indexed swap
OTC	Over-the-counter
p.a.	Per annum
P2P	Peer-to-peer
PBoC	People's Bank of China
PD	Probability of default
PMI	Purchasing Managers' Index
POEs	Private-owned enterprises
ppt	percentage point
qoq	Quarter-on-quarter
qoqa	Quarter-on-quarter annualised
R&VD	Rating and Valuation Department
REER	Real effective exchange rate
Repo	Repurchase operation
rhs	Right-hand side
RMB	Renminbi
RML	Residential mortgage loan
ROA	Return on assets
ROE	Return on equity
RRR	Required reserve ratio
RTGS	Real Time Gross Settlement

RWA	Risk-weighted assets
SAFE	State Administration of Foreign Exchange
SDR	Special Drawing Rights
SFGS	SME Financing Guarantee Scheme
SG	Singapore
SHCH	Shanghai Cleaning House
SHIBOR	Shanghai Interbank Offered Rate
SKEW	Chicago Board Options Exchange Skew Index
SMEs	Small-to-medium-sized enterprises
SOEs	State-owned enterprises
SOFR	Secured Overnight Financing Rate
SPM	Supervisory Policy Manual
STCs	Specialist Technology Companies
S&P 500	Standard & Poor's 500 Index
TH	Thailand
th	Thousands
tn	trillion
TNA	Total net assets
TWI	Trade Weighted Index
UK	United Kingdom
US	United States
USD	US dollar
VAR	Vector Autoregression
VaR	Value-at-risk
VHSI	HSI Volatility Index
VIX	Chicago Board Options Exchange Market Volatility Index
wk	Week
WMP	Wealth management product
yoy	Year-on-year

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