4. Monetary and financial conditions

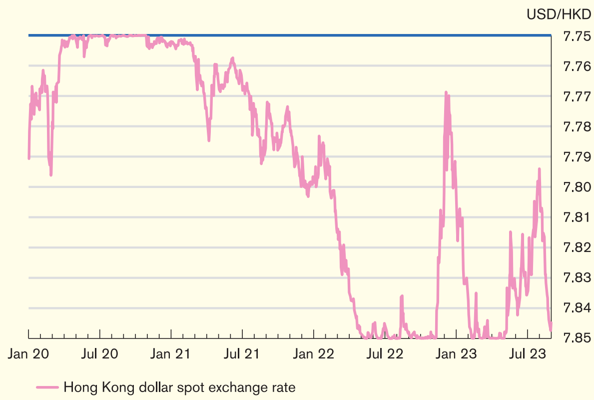
The HKD traded close to the weak-side Convertibility Undertaking (CU) from March to early May before regaining some strength, mainly driven by dividend payment-related demand from listed companies and half-year-end funding needs by corporates. Towards the end of August, the HKD softened to close to the 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).

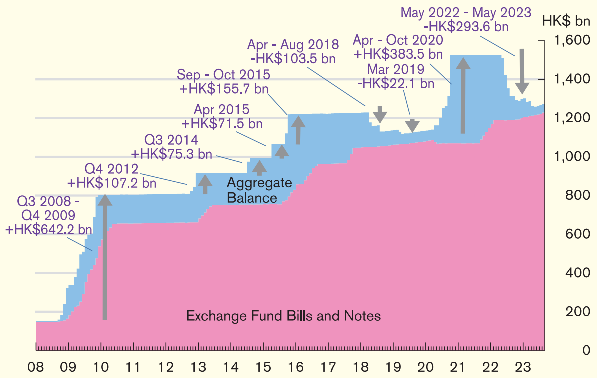
The weak-side CU was triggered five times in April and once in early May. Under the weak-side CU, the HKMA bought a total of HK$32.45 billion. Accordingly, the Aggregate Balance of the banking system declined from HK$77.1 billion at the end of February to HK$44.9 billion at the end of August. The day-to-day 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



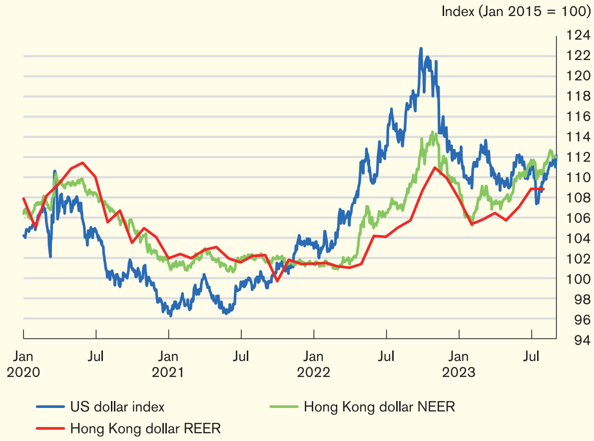
Source: HKMA.

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.

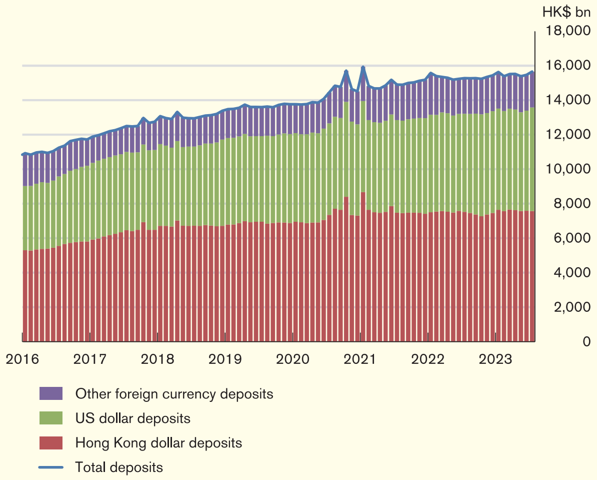
Looking ahead, fund flows remain subject to uncertainties surrounding the outlook for the US policy rate, the pace of the Mainland economic recovery, global economic environment and geopolitical tensions. Nonetheless, with the ample foreign reserves position and a robust financial system, Hong Kong is 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.

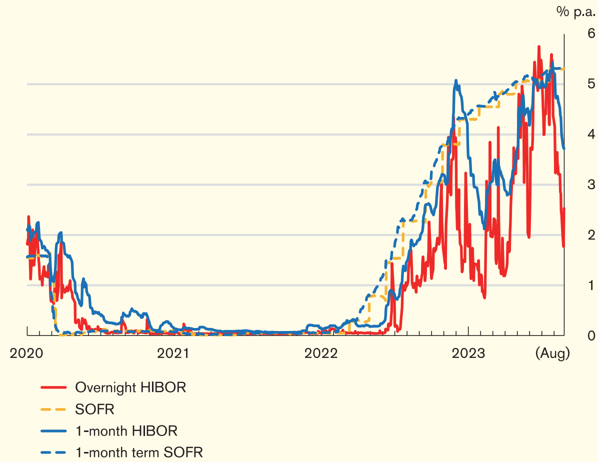
In the first seven months of 2023, there was no notable sign of outflows from the Hong Kong banking system, with total deposits with authorized institutions (AIs) increasing by 1.4%. Among the total, HKD deposits and foreign currency deposits increased by 1.5% and 1.4% respectively (Chart 4.4). It should 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.

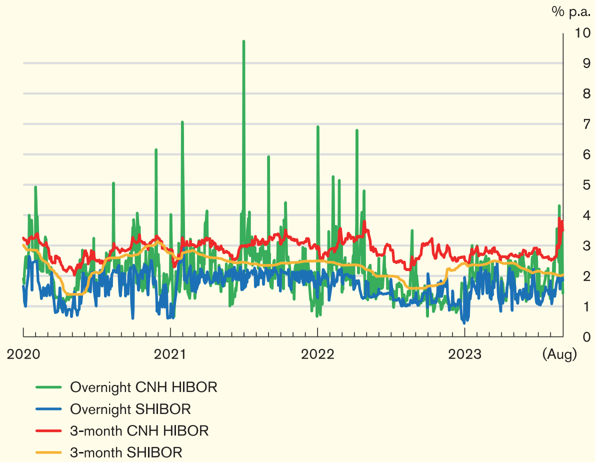
In the near term, the HKD interbank rates may stay relatively high, and occasionally experience some volatility. The HKMA continues to closely engage with banks, reminding them to properly manage their liquidity, including keeping in close contact with their large clients to understand their HKD funding 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).

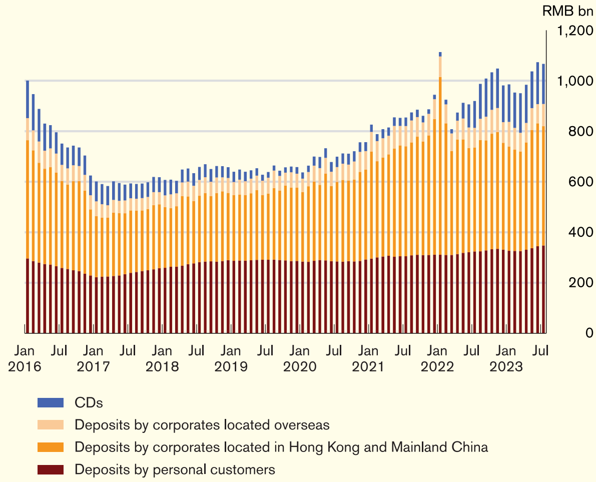
Chart 4.6
Overnight and 3-month offshore renminbi (CNH) HIBOR fixings



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	

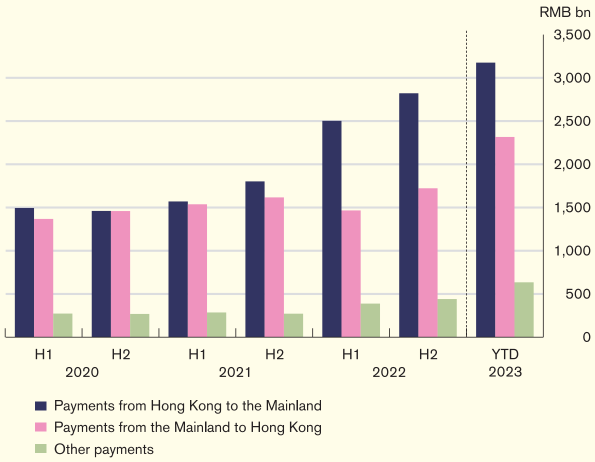
Source: HKMA.

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

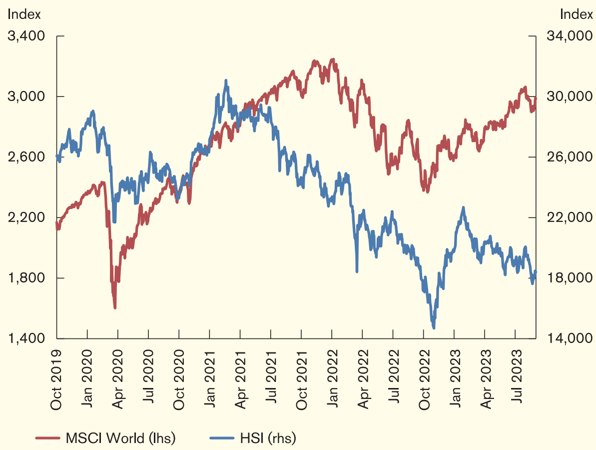
In contrast to the buoyant global equity market led by the technology sector, the performance of the Hong Kong equity market during the review period was clouded by concerns over the pace of the Mainland economic recovery. Supported by the steady issuance, the local debt market continued to register 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]

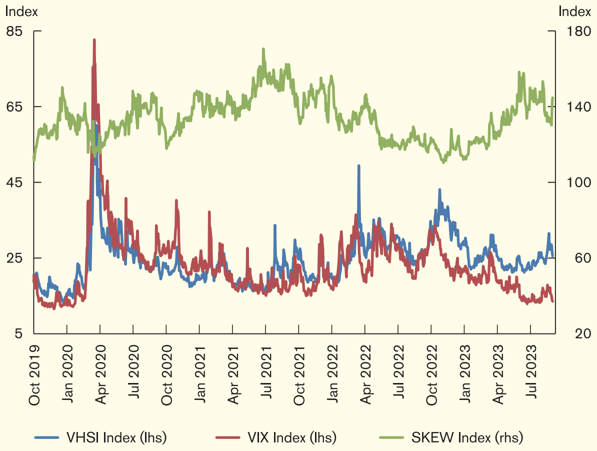
Chart 4.9
The Hang Seng Index and the MSCI World Index



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.

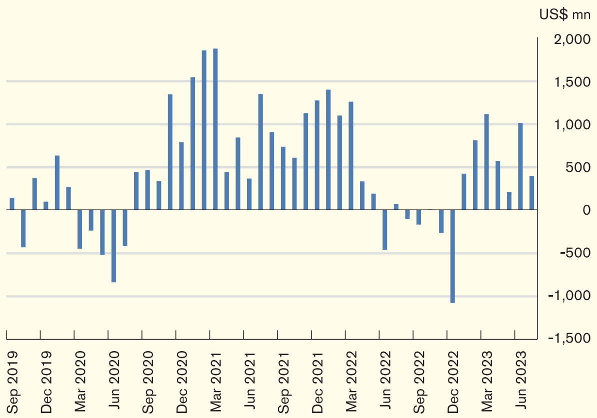
Chart 4.10
Option-implied volatilities of the Hang Seng Index and the S&P 500 Index, and the SKEW Index



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).

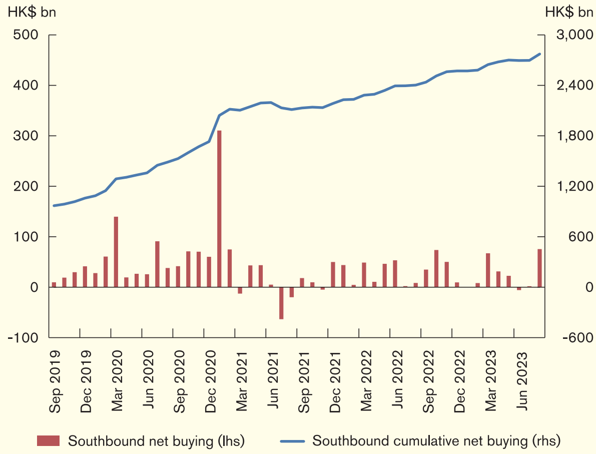
Chart 4.11
Equity market fund flows into Hong Kong



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

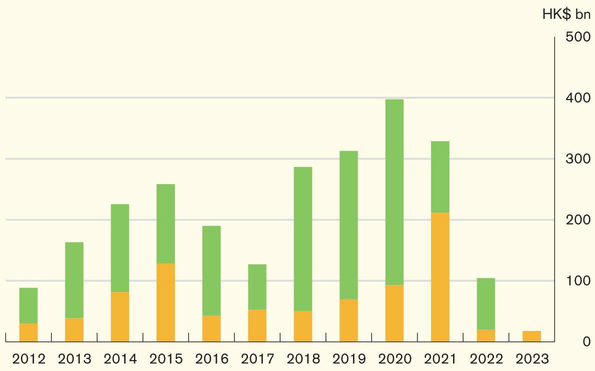


Note: Southbound net buying is the sum of such buying on the Shanghai-Hong Kong Stock Connect and the Shenzhen-Hong Kong Stock Connect.
Sources: CEIC and HKMA staff estimates.

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



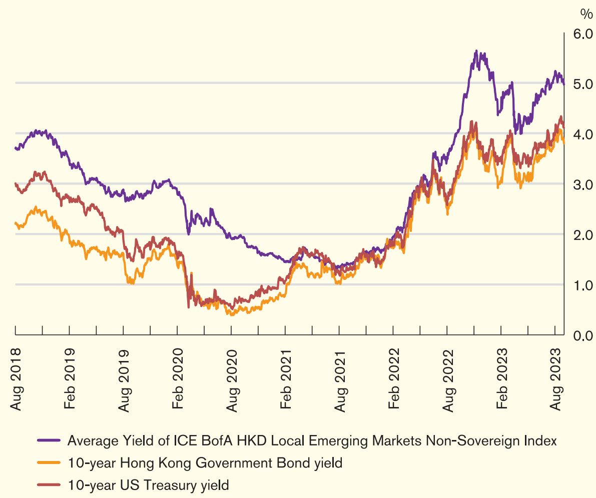
Source: HKEX.

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

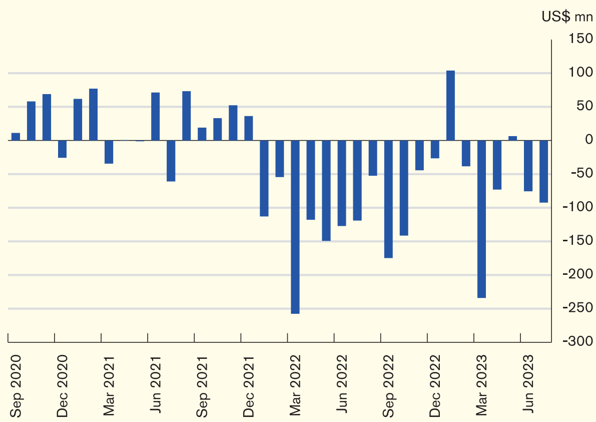


Note: The ICE BofA HKD Local Emerging Market Non-Sovereign Index, which covers HKD bonds issued by corporates and quasi government entities, captures the movement in yields of HKD corporate bonds.

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

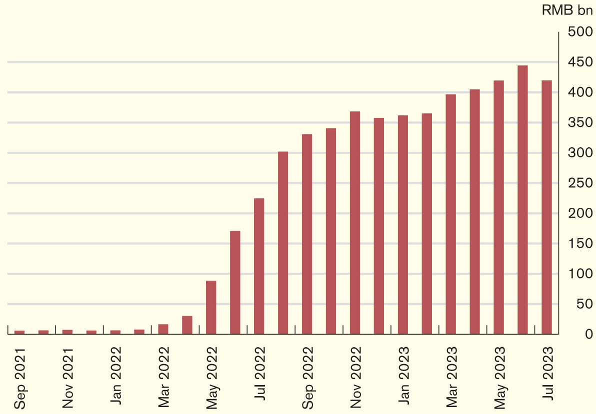


Source: EPFR Global.

[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)

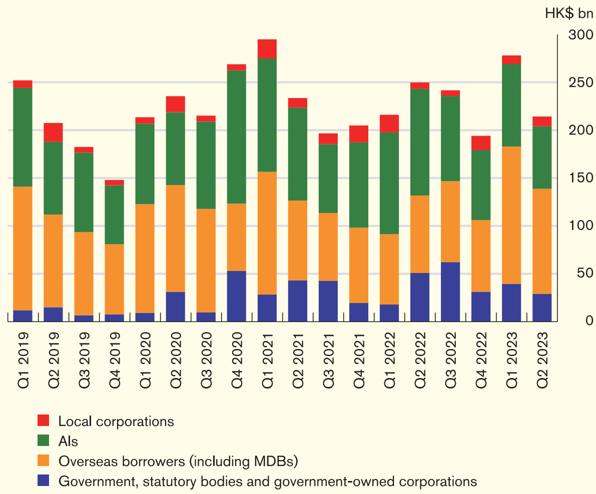


Note: The figures refer to the outstanding amount of bonds held by eligible Mainland investors through the Southbound Bond Connect CSD-CSD settlement link that are settled by the SHCH, and do not represent the full amount of bond holdings by Mainland investors through the Southbound Bond Connect. Figures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

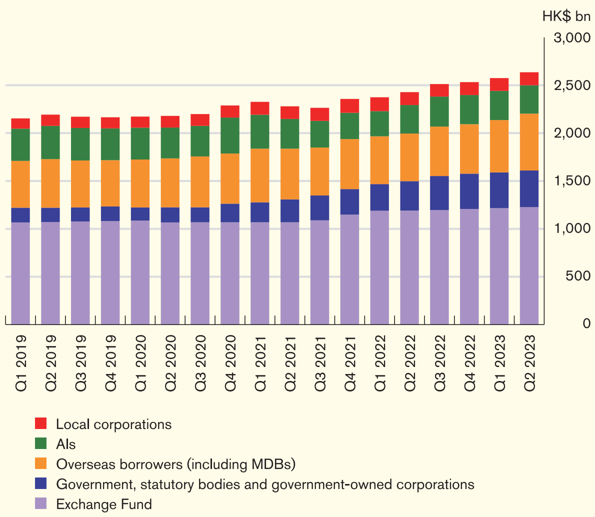


Source: HKMA staff estimates based on data from Bloomberg, CMU, Dealogic and Reuters.

[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.

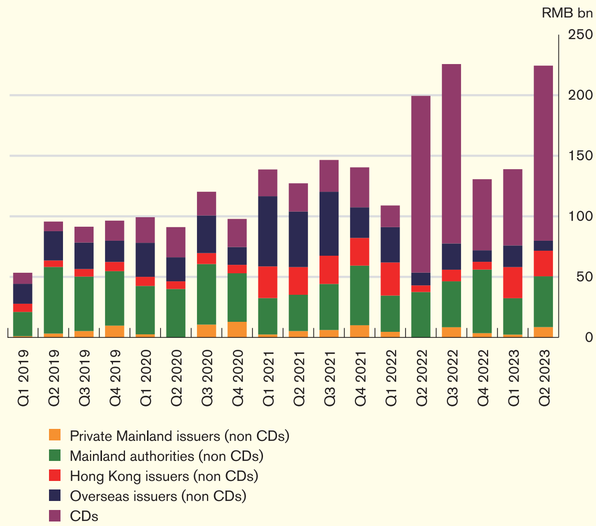
Chart 4.18
Outstanding Hong Kong dollar debt securities by issuer



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).

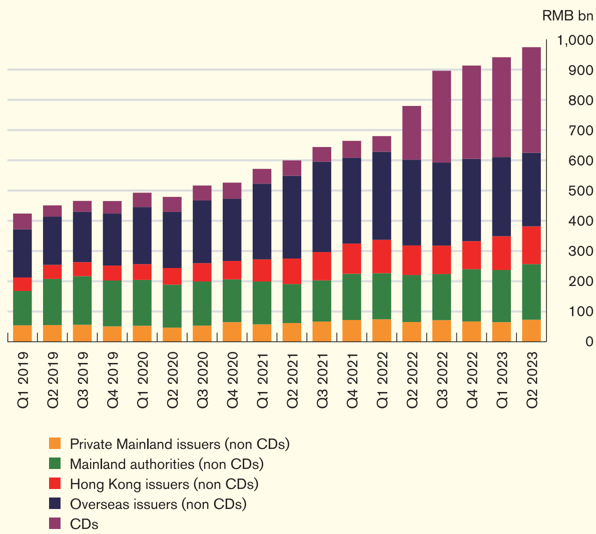
Chart 4.19
New issuance of CNH debt securities in Hong Kong



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]

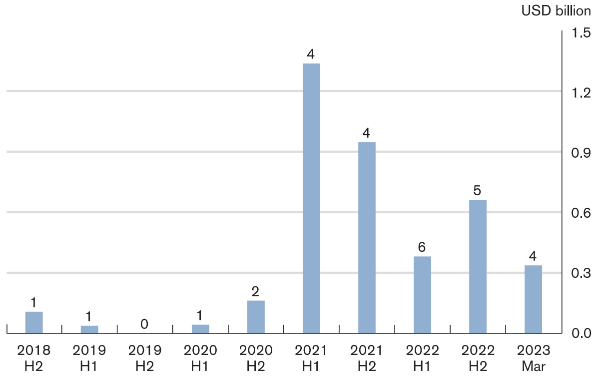
Bond tokenisation[30] is a rapidly evolving innovation in global bond markets. Since the World Bank issued the world's first tokenised bond in 2018, dozens of tokenised bonds have been issued around the world. These include the debut sale of the world's first government-issued tokenised green bond by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

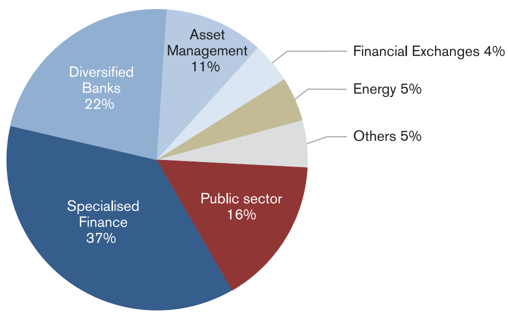
Chart B3.1
Total issuance amount of tokenised bonds in the world



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.

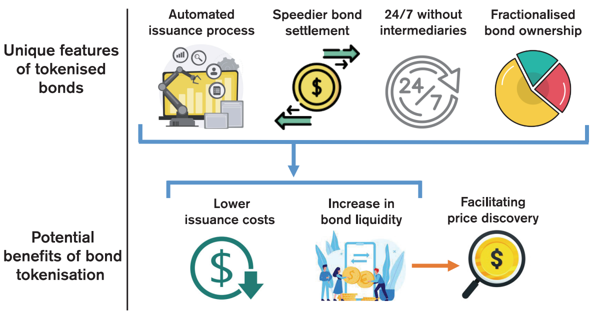
31 The dataset is constructed based on data sourced from Bloomberg and Refinitiv Eikon. The sample is representative of the global position for issuance amount, compared with the level reported by Damak et al. (2023) from S&P Global Ratings, which is one of the mainstream rating agencies for tokenised 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



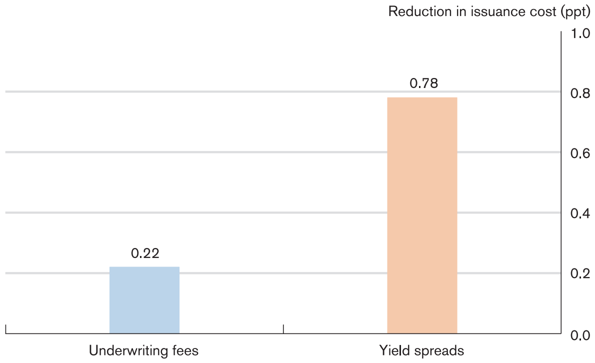
To empirically examine the economic significance of these potential benefits, we match each tokenised bond with the most similar conventional bond issued by the same issuer to control for differences in bond characteristics, such as maturity and issue date.[32] This ensures that the estimated differences 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).

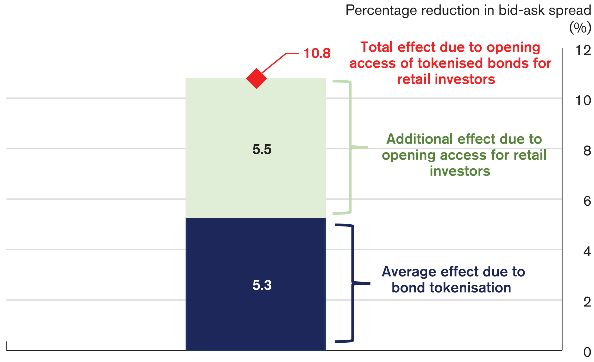
[32] There are 6,090 conventional bonds issued by the tokenised bond issuers. These bonds exhibit a high degree of heterogeneity in key bond characteristics with the tokenised bonds in our sample. Our matching procedure reduces the heterogeneity to the level widely acceptable in academic literature.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

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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/

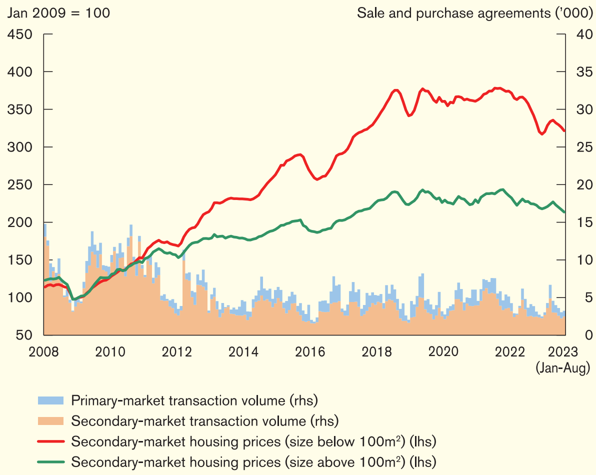
4.5 Property markets

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 100m^2) consolidated at a slightly faster pace than that for small and medium-sized flats (with a saleable area of less than 100m^2) (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.

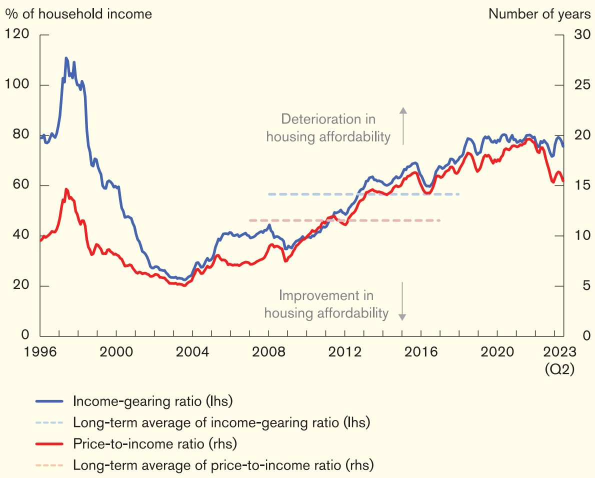
Housing affordability remained stretched in the first half of 2023. The housing price-to-income ratio remained comparable to the high level of about 15 in 1997, albeit easing slightly to 15.9 in the second quarter as the growth of household income exceeded that of housing prices. Mainly reflecting the 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

[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 50m^2 flat relative to the median income of households living in private housing. Alternately, the income-gearing ratio compares mortgage payment for a typical 50m^2 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.

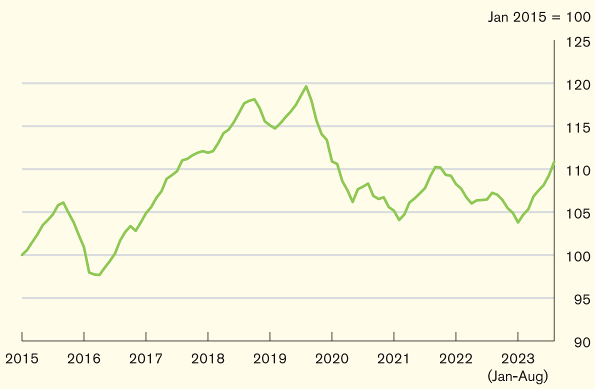
2023 (Chart 4.23).[35] In tandem, the residential rental yield also rose modestly to 2.6% in July from 2.5% in January.

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

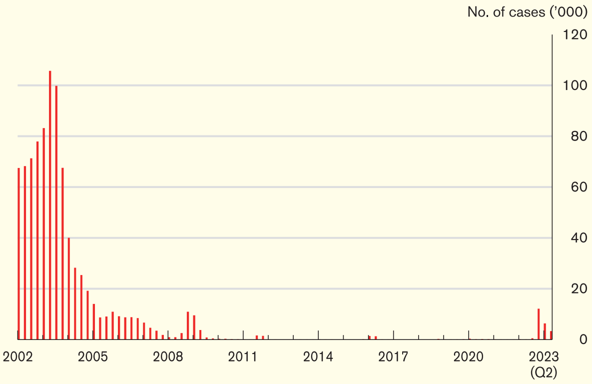
[35] Market analysts also attributed the rise in housing rentals to the increased demand for accommodations driven by the return of expatriates and non-local students.

[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



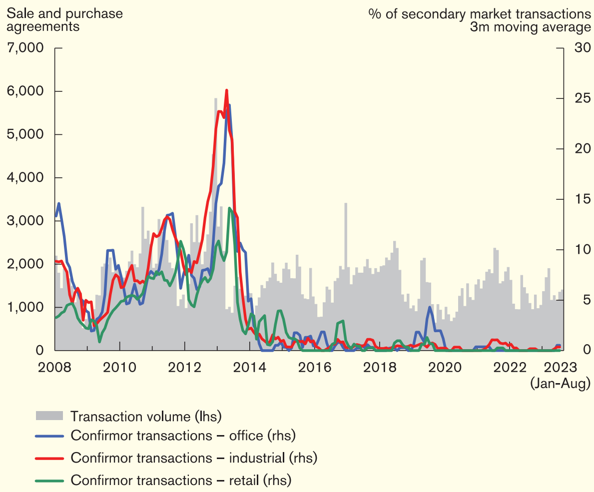
Source: HKMA.

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

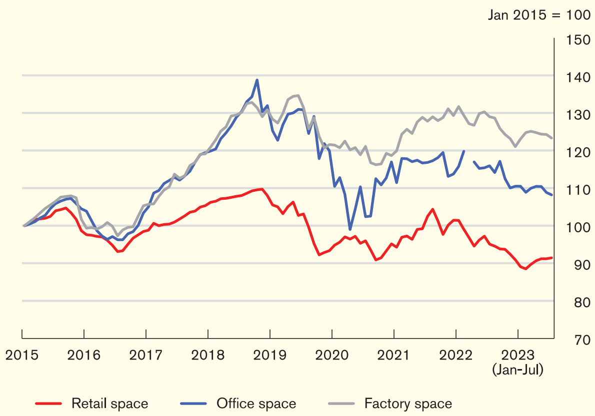


Sources: Land Registry and Centaline Property Agency Limited.

[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.

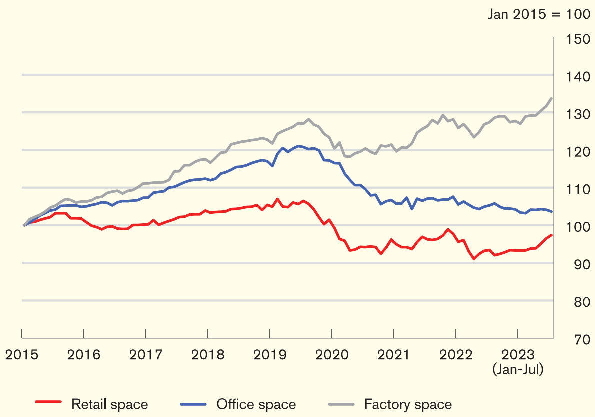
[39] According to R&VD, the vacancy rate of office spaces reached 14.4% at end-2022, the highest since 1998. Market data from surveyor firms also indicated that Grade A office vacancy increased to 12.6% in June 2023 from 12.1% in December 2022.

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.