4. Monetary and financial conditions

Exchange rate, capital flows and monetary developments

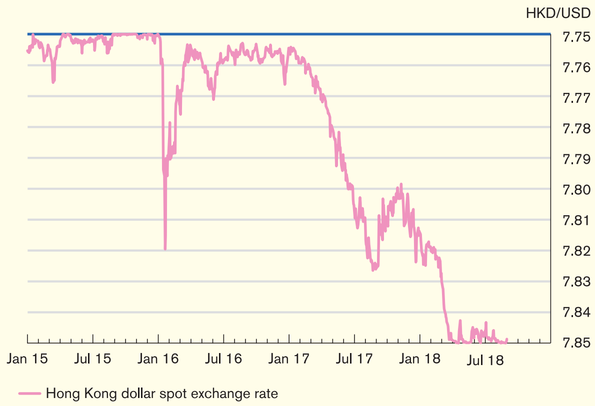
Mainly reflecting increased interest carry trade activities, the Hong Kong dollar spot exchange rate eased gradually from March and the weak-side Convertibility Undertaking was triggered 27 times in April, May and August. Despite this, the Hong Kong dollar remained traded in a smooth and orderly manner near the weak side Convertibility Undertaking rate of 7.85. Hong Kong Interbank Offered Rates broadly picked up since the second quarter, reflecting the reduced interbank liquidity following the triggering of the weak-side Convertibility Undertaking, initial public offering-related funding demand, and seasonal liquidity needs. Looking ahead, fund flow volatility is likely to increase amid tensions over the US-China trade dispute and the associated risk-off sentiment. Meanwhile, the outflow of funds from Hong Kong dollar is a normal and inevitable process for Hong Kong dollar interest rate normalisation under the Linked Exchange Rate System. The banking sector is holding a vast amount of Exchange Fund papers, which can be used by banks to obtain HKD liquidity via the discount window, serving as an effective cushion against any excessive volatility in interest rates. The HKMA also stands ready to calibrate the issuance of Exchange Fund papers to release liquidity in order to deal with possible sharp outflow from the Hong Kong dollar.

4.1 Exchange rate and capital flows

Mainly reflecting increased interest carry trade activities, the Hong Kong dollar eased gradually since March, with the spot exchange rate trading in a narrow range between 7.815 and 7.850 against the US dollar in the first eight months of 2018 (Chart 4.1). The weak-side Convertibility Undertaking (CU) was triggered 13 times between 12 and 18 April and 6 times between 15 and 18 May. Thereafter, the Hong Kong dollar firmed against the US dollar since late May, in part underpinned by seasonal demand for the Hong Kong currency (e.g. corporate demand for dividend payments) and interbank funding demand in preparation for sizable initial public offering (IPO) activities. Moving into July and August, the Hong Kong dollar remained broadly stable and traded close to the weak-side CU, with the weak-side CU being triggered 8 times in August amid increased carry trade activities, repatriation of funds raised in recent IPOs and equity-related outflows.

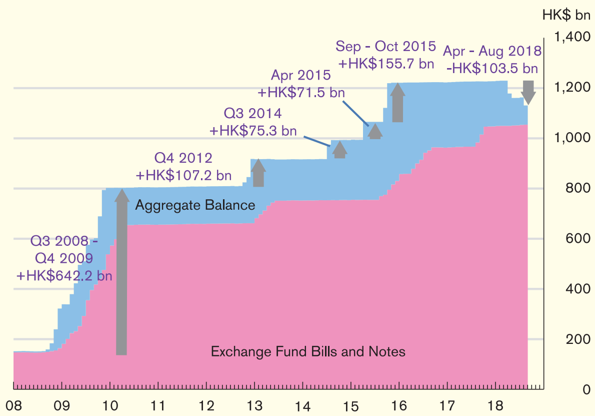
Overall, the weak-side CU was triggered 27 times in April, May and August. Since the first instance of the weak-side CU being triggered on 12 April, the HKMA has purchased a total of HK$103.5 billion (as at the end of August) on request from banks at the weak-side CU of 7.8500 according to the design of the Linked Exchange Rate System (LERS). As a result of these purchases, which ranged from HK$800 million to HK$10.2 billion each time, the Aggregate Balance of the banking system declined from HK$179.7 billion at the end of March to HK$76.4 billion at the end of August (Chart 4.2).

Chart 4.1
Hong Kong dollar exchange rate



Source: HKMA.

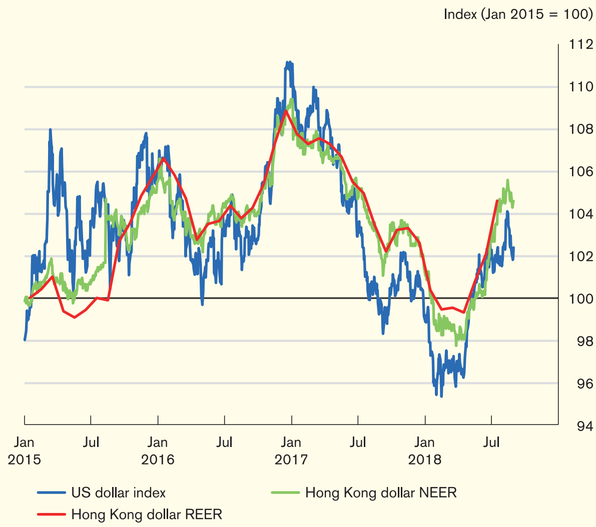
Chart 4.2
Fund flow indicators



Source: HKMA.

Broadly consistent with the movements of the US dollar, the Hong Kong dollar nominal effective exchange rate index (NEER) moved sideways between March and mid-April, but strengthened thereafter (Chart 4.3). The Hong Kong dollar real effective exchange rate index (REER) showed a similar trend as the NEER, as the small inflation differential between Hong Kong and its trading partners had only a limited impact on the movement of the REER.

Chart 4.3
Nominal and real effective exchange rates



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

Portfolio investment saw outflows in the first quarter of 2018. According to the latest Balance of Payments (BoP) statistics, the equity portfolio investment outflows by residents accelerated while the inflows for non-residents turned into outflows in the first quarter amid weak market sentiment across the region (Table 4.A).[21] As for debt securities, the BoP statistics registered outflows by residents which more than offset the inflows by non-residents. Data based on a global mutual funds survey also pointed to a broad-based outflow picture (Chart 4.4). While the equity market experienced some inflows in the first five months, before seeing outflows since June, bond-related investment outflows were evident from the beginning of the year, which was largely similar to capital flow developments in the Asia region.

[21] At the time of writing, the second-quarter BoP statistics were not yet available.

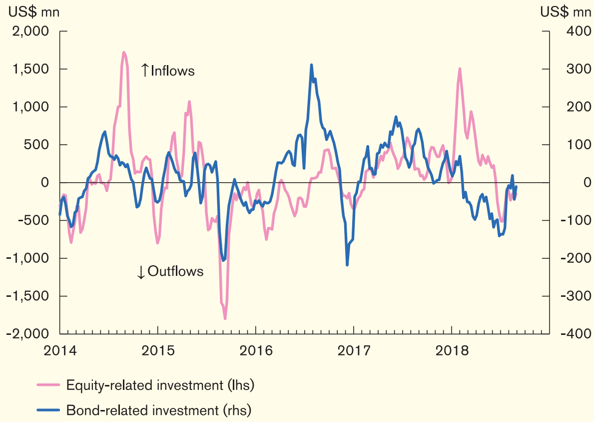
Table 4.A
Cross-border portfolio investment flows

(HK$ bn)	2015	2016	2017 Q1	2017 Q2	2017 Q3	2017 Q4	2018 Q1
By Hong Kong residents							
Equity and investment fund shares	-420.2	-354.7	-64.1	-17.3	0.6	-22.7	-101.2
Debt securities	-241.0	-175.5	108.0	128.0	-68.3	-41.0	-108.0
By non-residents							
Equity and investment fund shares	-329.7	19.3	14.2	28.1	27.2	19.3	-77.3
Debt securities	20.0	41.3	44.9	90.4	27.0	30.8	40.9

Note: A positive value indicates capital inflows.
Source: C&SD.

Looking ahead, fund flow volatility may increase given the heightened uncertainties related to the US-China trade tensions and risk-off sentiments. In addition, as the US Federal Reserve (Fed) is expected to continue to increase interest rates, the possibility of a further widening of spreads between the Hong Kong dollar and the US dollar interest rates will again encourage interest carry trade activities and lead to capital outflows. The outflow of funds from Hong Kong dollar is a normal and inevitable process for Hong Kong dollar interest rate normalisation under the LERS. Since the massive inflows into the Hong Kong dollar over the past years have been invested by the Exchange Fund in highly liquid US dollar assets, funds would be readily available for meeting the triggering of weak-side CU by market participants in the event of capital outflows.

Chart 4.4
Market survey of equity and bond-related flows

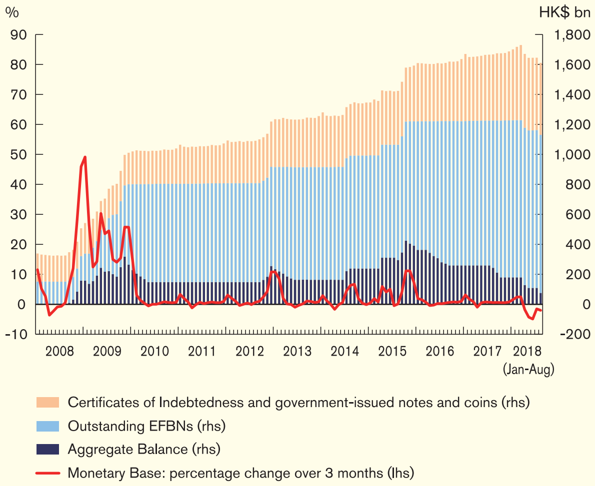


Note: Data refer to moving four-week sums.
Source: EPFR Global.

4.2 Monetary environment and interest rates

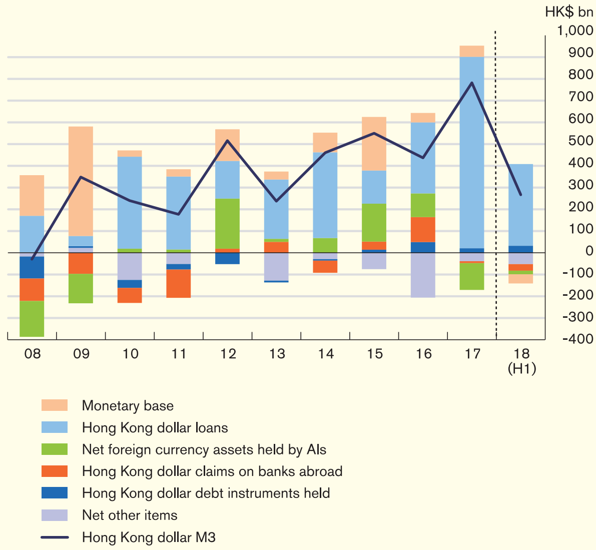
Despite the ongoing US monetary policy normalisation and the repeated triggering of the weak-side CU, Hong Kong's monetary environment remained accommodative in the first half of 2018, and in recent months. While the Hong Kong dollar Monetary Base decreased by 2.5% during the first half, it remained sizeable at HK$1,644.8 billion at the end of June (Chart 4.5). Reflecting the HKMA's purchase of Hong Kong dollars under the weak-side CU in accordance with LERS, the Aggregate Balance declined from HK$179.8 billion at the end of December 2017 to HK$109.5 billion at the end of June 2018. As for other components of the Monetary Base, the outstanding Exchange Fund Bills and Notes (EFBNs) were little changed, while Certificates of Indebtedness and government-issued notes and coins increased moderately. Stepping into the second half, the Hong Kong dollar Monetary Base decreased moderately, with the Aggregate Balance declining further to HK$76.4 billion at end-August amid the triggering of the weak-side CU.

Chart 4.5
Monetary Base components



Source: HKMA.

Chart 4.6
Changes in the HK$M3 and the asset-side counterparts

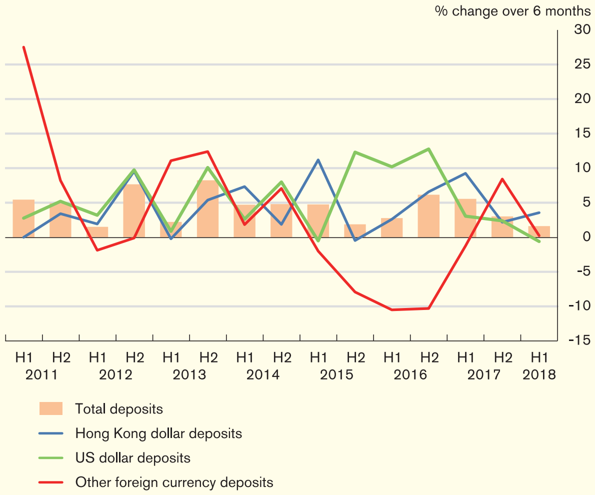


Note: The HK$M3 in the monetary survey has been adjusted to include foreign currency swap deposits and to exclude government deposits and Exchange Fund deposits with licensed banks.
Source: HKMA staff estimates.

Regardless of the decline in the Monetary Base, the Hong Kong dollar monetary aggregate continued to record relatively steady growth, underpinned by favourable domestic economic conditions. The Hong Kong dollar broad money (HK$M3) increased moderately by 3.6% in the first half, faster than the 2.5% increase recorded in the preceding half-year period. Correspondingly, Hong Kong dollar deposits, as a major component of the HK$M3, grew by 3.6% during the first half, with Hong Kong dollar time deposits rebounding as banks raised their preferential interest rates for these deposits. Analysed by the asset-side counterparts, the increase in HK$M3 mainly reflected the expansion in the Hong Kong dollar loans (Chart 4.6), while the decline in the Monetary Base arising from the triggering of the weak-side CU exerted a drag on the HK$M3.

On the other hand, movement in foreign currency deposits was rather mixed. In contrast to the steady increase in Hong Kong dollar deposits, US dollar deposits saw a slight decline of 0.6% during the first half (Chart 4.7), partly due to the reduction of US dollar deposits held by Hong Kong residents. After seeing a strong rebound in the second half of 2017, other foreign currency deposits increased by a decelerated pace of 0.2% in the first half, reflecting slower growth in the non-renminbi component, while renminbi deposits registered a strong increase. Overall, total deposits with authorized institutions (AIs) continued to grow modestly by 1.6% in the first half compared with a 3.0% increase in the preceding half-year period.

Chart 4.7
Deposit growth

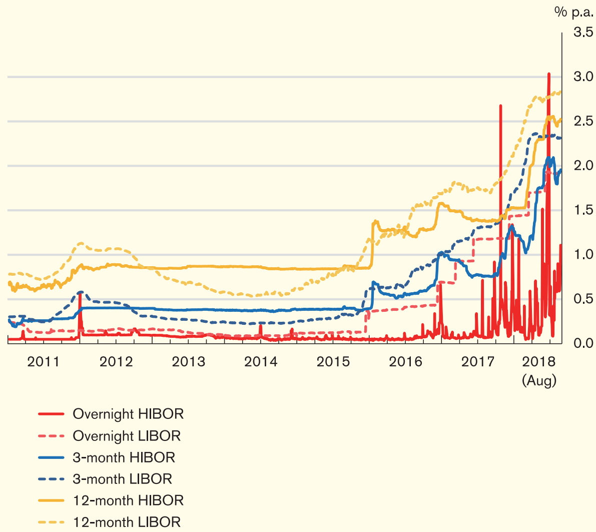


Source: HKMA.

While the Hong Kong dollar Monetary Base and deposits remained sizeable, Hong Kong dollar interbank interest rates (HIBOR) witnessed more upward pressure since the second quarter. This reflected market expectations of US interest rate hikes, as well as the reduced interbank liquidity following the triggering of the weak-side CU. IPO-related funding demand and seasonal liquidity needs occasionally drove short-term interbank rates[22] significantly higher, with the overnight HIBOR fixing rising notably to 3.0% during Xiaomi's IPO subscription period (Chart 4.8). On the other hand, the HIBOR at longer maturities was less volatile, but gradually caught up with its US counterpart, which narrowed the HIBOR-London Interbank Offered Rate (LIBOR) spreads. Compared with six months ago, the three-month and 12-month HIBOR fixings moved up by 72 and 93 basis points to 1.98% and 2.45% (monthly average term) respectively in June.

Moving into the second half, short-term Hong Kong dollar interest rates declined subsequent to the completion of a few large-scale IPO activities at the end of June. The overnight HIBOR once eased back to a recent low of 0.08% in mid-July before picking up to around 0.9% at the end of August. The HIBOR at longer maturities remained broadly stable. Overall, the three-month and 12-month HIBOR fixings averaged 1.88% and 2.49% in August.

Chart 4.8
Hong Kong dollar and US dollar interbank interest rates

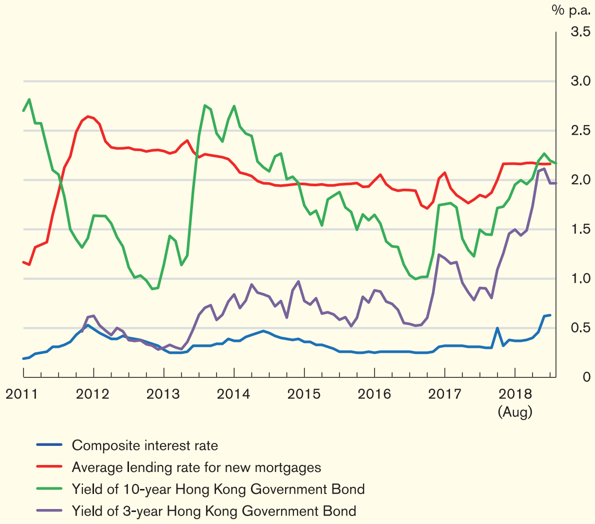


Source: CEIC.

Broadly tracking the movements of the US dollar yield curve, the Hong Kong dollar yield curve shifted upwards and flattened during the first half. The yield of the 10-year Hong Kong Government Bond picked up by 36 basis points to 2.19% at the end of August (Chart 4.9), while the yield of the three-year Government Bond posted a larger increase of 54 basis points, reaching 2.06% at the end of August.

[22] As measured by the overnight and one-week Hong Kong Interbank Offered Rates (HIBORs).

Chart 4.9
Yields of Government Bonds, the composite interest rate, and the average lending rate for new mortgages



Sources: HKMA and staff estimates.

At the retail level, the composite interest rate, which measures the average Hong Kong dollar funding costs of retail banks, saw more upward pressure since the second quarter alongside the pick-up in HIBORs. Underpinned by rises in both interbank and deposit funding costs, the composite interest rate moved up to 0.63% at the end of July from 0.38% at the end of March (Chart 4.9). During the first half, the average lending rate for new mortgages was relatively stable at around 2.15%, as the average interest rate of HIBOR-based mortgages stayed at the prevailing Prime-based cap despite a pick-up in HIBORs. Stepping into August, banks have increased their effective mortgage rates by raising the cap for newly approved HIBOR-based mortgages.

Looking ahead, as the monetary policy normalisation continues in the US, the Hong Kong dollar interest rates will inevitably continue to rise, with the pace depending crucially on the path of US dollar interest rates, fund flow patterns and domestic market activities (e.g. IPOs). Given that the Hong Kong dollar Monetary Base remained sizeable with the banking sector holding vast amounts of Exchange Fund papers, it is expected that the pace of interest rate increases should not be too rapid as banks can use the Exchange Fund papers as collateral to obtain Hong Kong dollar liquidity via the discount window. Moreover, the HKMA also stands ready to calibrate the issuance of Exchange Fund papers to release liquidity in order to deal with possible sharp outflow from the Hong Kong dollar.

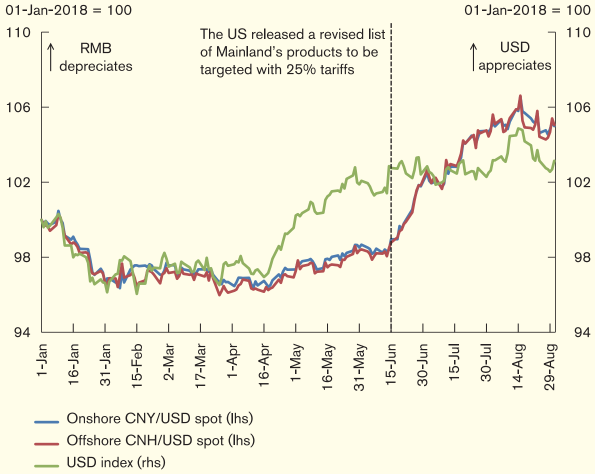
(With a view to streamline the Report, the discussion on bank credit, including household debt, has been moved to Chapter 5 – Banking Sector Performance. Please refer to Section 5.3 on credit risk.)

Offshore renminbi banking business

As the trade tensions between the US and Mainland China intensified, the offshore (CNH) and the onshore (CNY) renminbi depreciated sharply against the US dollar since the middle of June (Chart 4.10). This interrupted the stable relationships of the CNH and CNY with the US dollar as observed during the first five months of 2018. The exchange rate stabilised again in August after the counter-cyclical factor was re-instated gradually in the daily fixing of the CNY[23]. The depreciation pressure since mid-June also saw the CNH being mostly traded at a discount against its onshore counterpart (Chart 4.11). Nevertheless, the spread remained moderate by historical standards.

[23] Details can be referred to the press release by China Foreign Exchange Trade System (Chinese version only),' http://www.chinamoney.com.cn/chinese/rdgz/20180824/1154562.html?cp=rdgz

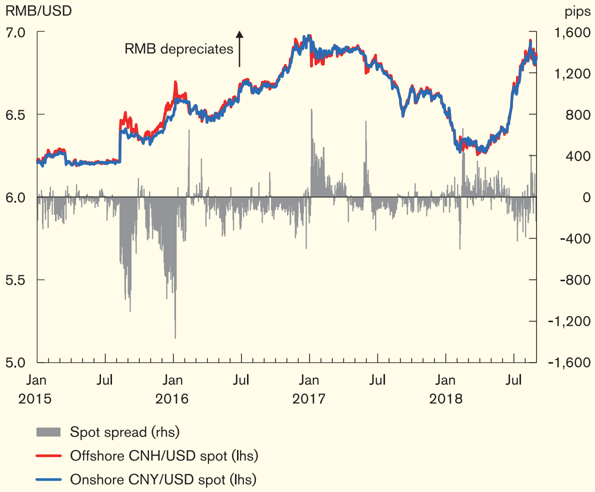
Chart 4.10
Renminbi and US dollar exchange rates in 2018



Notes:
1. CNY/USD, CNH/USD and USD index are normalised with value at 1 January 2018 equals 100.
2. USD index is a trade-weighted index which measures USD against a basket of currencies of its major trading partners. A higher value of the index indicates USD is strengthening against these currencies.

Source: Bloomberg.

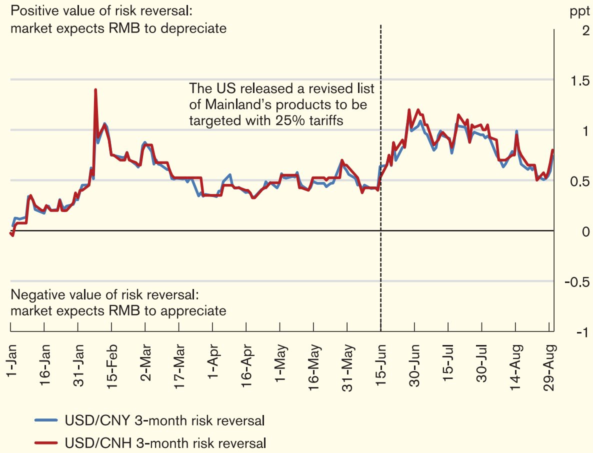
Chart 4.11
CNY and CNH exchange rates



Source: Bloomberg.

As uncertainty over the US-China trade tensions remains, the depreciation expectation on the renminbi has intensified since mid-June, as reflected by the rising risk reversal of both the CNY and CNH against the US dollar, before easing somewhat in August (Chart 4.12).

Chart 4.12
Risk reversal of renminbi against US dollar in 2018



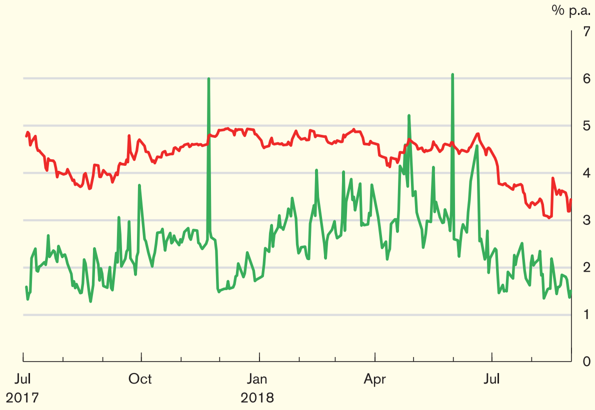
Note: The risk reversal quote refers to the implied volatilities of a 3-month 25-delta USD call option minus the implied volatilities of a 3-month 25-delta USD put option. A positive (negative) value of risk reversal indicates market is expecting a higher likelihood of depreciation (appreciation) of the renminbi against the USD.

Sources: Bloomberg and JP Morgan.

Despite the sharp movement in the spot exchange rate market, the US-China trade tensions have not had an adverse impact on the funding condition in the offshore interbank market. The overnight CNH HIBOR mostly traded below 4% in the first eight months of 2018 (Chart 4.13), with only occasional pick-ups due to seasonal factors. The 3-month CNH HIBOR hovered around 4.5% between January and June, before easing to 3.4% at the end of August 2018, which may reflect the latest monetary easing measures by the People's Bank of China.[24] Looking ahead, it remains to be seen how the development of the US-China trade relationship will affect the CNH interbank market liquidity in the coming months.

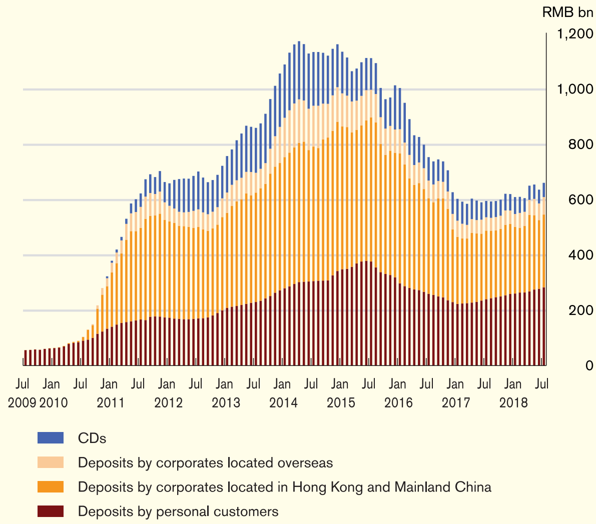
[24] For details of the measures, please see the section "Fiscal and Monetary policy" under Chapter 2.2 in this Report.

Chart 4.13
The overnight and the three-month CNH HIBOR fixings



Source: Treasury Markets Association.

Chart 4.14
Renminbi deposits and CDs in Hong Kong



Source: HKMA.

Hong Kong's CNH liquidity pool continued to pick up during the review period. The total outstanding amount of renminbi customer deposits and certificates of deposit (CDs) increased by 2.6% during the first half of 2018 to RMB634.2 billion at the end of June (Chart 4.14 and Table 4.B). The renminbi customer deposits grew by 4.5% in total, but its contribution to the liquidity pool was partially offset by a contraction in the outstanding amount of CDs, which saw a decline of 16.2% in the first half of 2018. The growth in renminbi customer deposits was contributed by both personal and corporate customers, which grew by 7.3% and 2.2% respectively.

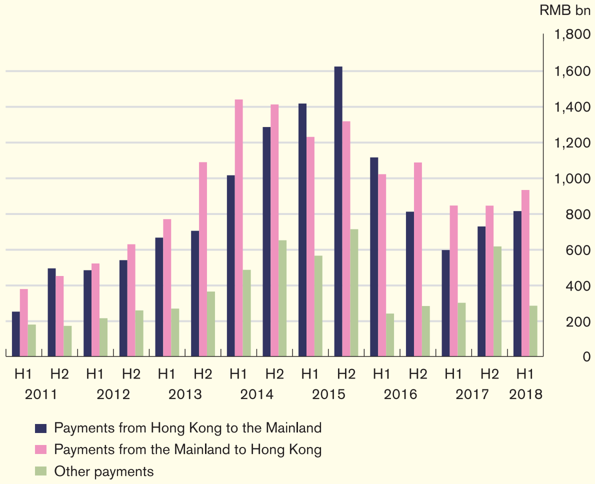
Table 4.B
Offshore renminbi banking statistics

	Dec 2017	Jun 2018
Renminbi deposits & CDs (RMB bn)	618.4	634.2
Of which:		
Renminbi deposits (RMB bn)	559.1	584.5
Share of renminbi deposits in total deposits (%)	5.3	5.3
Renminbi CDs (RMB bn)	59.3	49.7
Renminbi outstanding loans (RMB bn)	144.5	123.3
Number of participating banks in Hong Kong's renminbi clearing platform	203	200
Amount due to overseas banks (RMB bn)	95.4	106.3
Amount due from overseas banks (RMB bn)	131.3	147.8
	Jan - Jun 2018	
Renminbi trade settlement in Hong Kong (RMB bn)	2,021.6	
Of which:		
Inward remittances to Hong Kong (RMB bn)	928.1	
Outward remittances to Mainland China (RMB bn)	810.5	
Turnover in Hong Kong's RMB RTGS system (Daily average during the period; RMB bn)	935.0	

Source: HKMA.

Hong Kong's renminbi financing activities moderated further during the first half of 2018, albeit at a slower pace, with the outstanding amount of renminbi bank loans declining by 14.7% in the first half to RMB123.3 billion. Meanwhile, Hong Kong's renminbi trade settlement consolidated after a strong rebound in the second half of 2017. Transactions handled by banks in Hong Kong amounted to RMB2,021.6 billion during the first half of 2018, down by 7.3% compared with the preceding half-year period (Chart 4.15). The average daily turnover of the renminbi real time gross settlement system stayed at a high level of RMB935.0 billion, compared with RMB886.2 billion in the same period in 2017.

Chart 4.15
Flows of renminbi trade settlement payments



Source: HKMA.

Going forward, the development of the CNH market in Hong Kong will depend on market expectations on the renminbi exchange rate due to the US-China trade tensions and Mainland's macro-financial conditions. Nevertheless, Hong Kong's offshore renminbi business is expected to benefit from the progress of Mainland's capital account liberalisation, the development of the Stock and Bond Connect schemes, and enhanced regional economic co-operation under the Belt and Road and Guangdong-Hong Kong-Macao Bay Area initiatives.

Asset markets

The Hong Kong equity market came under pressure during the review period amid heightened concerns over the effects of trade wars and tightening monetary conditions in major advanced economies. The Hong Kong dollar debt market expanded at a steady pace during the first half of 2018, despite an increasingly difficult external environment. The residential property market remained buoyant in the first half of the year amid robust economic conditions. Property prices increased further and the volume of transactions remained robust. But signs of moderation emerged stepping into the third quarter.

4.3 Equity market

The Hong Kong equity market came under pressure amid escalated trade conflicts and a faster-than-expected pace of monetary normalisation in advanced economies (Chart 4.16). While geopolitical tensions on the Korean Peninsula eased after the North Korean authorities reaffirmed their commitment to de-nuclearisation in June, global equity markets were quickly overshadowed by intensifying trade tensions between the US and its major trading partners. In particular, the local market corrected sharply in July and August after the US introduced several rounds of punitive tariffs on Mainland exports, and Mainland China responded with equivalent retaliatory measures, igniting concerns that tougher action might follow, thus making the conflict harder to resolve.

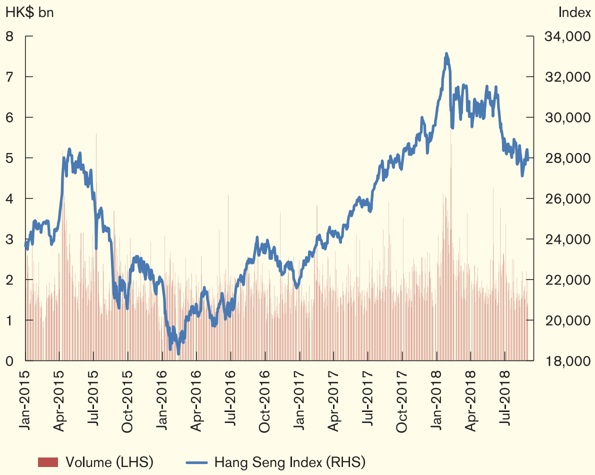
The improving economic outlook for developed economies also prompted major central banks to tighten their monetary policies faster than expected. The Federal Open Market Committee meeting in June saw the summary of economic projections predicting a total of four rate hikes this year instead of three previously. The Governing Council of the European Central Bank also planned to end net asset purchases in December 2018, while the Bank of England announced a 25 basis points hike in August, lifting the policy rate to its highest since March 2009. As monetary policy expected to become less accommodative, bond yields gradually climbed worldwide, rendering riskier asset classes less attractive. This dampened the appetite for the Hong Kong stocks, as reflected in the retreating net inflow in the Hong Kong equity funds (Chart 4.17). During the review period, the local stock market also recorded mild outflows from Mainland investors via the Shanghai-Hong Kong Stock Connect and the Shenzhen-Hong Kong Stock Connect, with cumulative southbound net buying edging down by 5% compared with the level at the end of February (Chart 4.18).

While market risk aversion as measured by option-implied volatilities declined from their earlier peak in February, the SKEW Index (sometimes referred to as the “Black Swan Index”, a measure of the tail risk for the US market) soared towards the end of the review period.[25] This reflected that investors were

[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 at a 30-day horizon is negligible. As 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 become more significant. For details, see https://www.cboe.com/products/vix-index-volatility/volatility-indicators/skew.

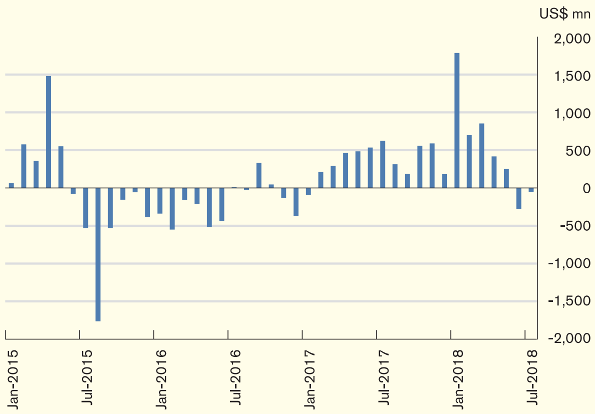
increasingly conscious about rising tail risk and hence were willing to pay more for downside protection (Chart 4.19). Overall, the Hang Seng Index (HSI) and the Hang Seng China Enterprises Index, also known as the H-share index, decreased by 10.2% and 12.5% respectively from March to August 2018.

Chart 4.16
Equity prices in Hong Kong



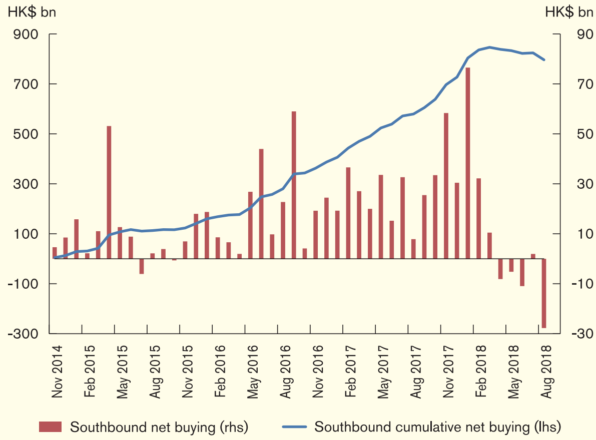
Source: Bloomberg.

Chart 4.17
Equity fund flows into Hong Kong



Source: EPFR Global.

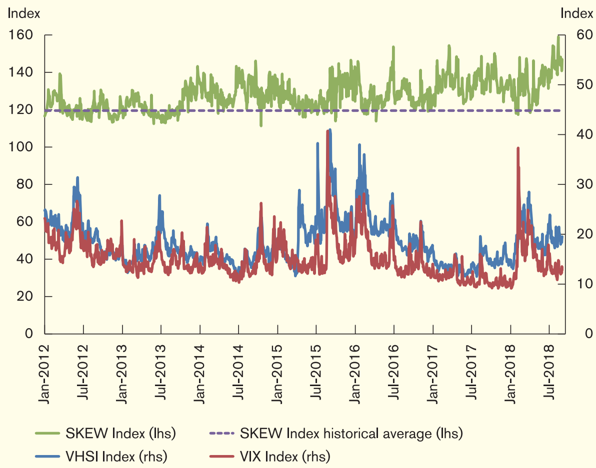
Chart 4.18
Cumulative southbound net buying from Stock Connect schemes



Note: The southbound net buying represents a sum of the southbound net buying from the Shanghai-Hong Kong Stock Connect and that of the Shenzhen-Hong Kong Stock Connect

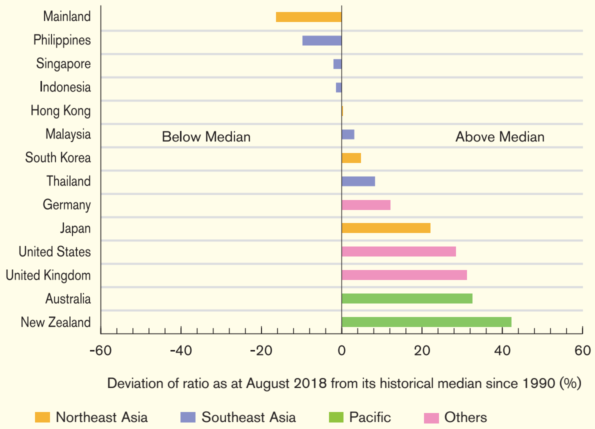
Sources: CEIC, HKEx and HKMA staff estimates.

Chart 4.19
Option-implied volatilities of the HSI and S&P 500, and the SKEW Index



Sources: Bloomberg and HKMA staff estimates.

Chart 4.20
Cyclically-adjusted price-earnings (CAPE) ratios of Asia Pacific and other major markets



Sources: Bloomberg, CEIC and HKMA staff estimates.

Looking ahead, the local market remains highly susceptible to external factors, particularly the ever-evolving trade conflict and the pace at which major central banks tighten monetary policy. As outturns for earnings generally fell within market expectations over the past six months, the valuation after the recent correction has actually improved for most stocks. According to the CAPE metric, the Hong Kong equity market continued to be attractive compared with other major markets, rendering it more resilient to external shocks (Chart 4.20). The relatively more attractive valuation may trigger value-driven purchases by long-term institutional investors (LTIIs), providing a cushion to the market, especially if further correction occurs from the current levels. Box 3 discusses the participation of these investors in the local equity market and the implications for the financial stability of Hong Kong.

Box 3
Do long-term institutional investors contribute to financial stability in Hong Kong?

Introduction[26]

The contributions of LTIIs to financial stability are debatable in literature. On the one hand, the LTIIs rebalance their portfolios away from safer assets and towards riskier ones to chase for long-term investment returns during market downturns. Such a value-trading strategy can temper movements in asset prices, contributing a counter-cyclical impact to financial systems. On the other hand, the LTIIs will behave pro-cyclically (i.e., rebalancing their portfolios away from riskier assets and towards safer ones) in the face of financial market turbulence to meet regulatory requirements or short-term liquidity needs. Such a flight-to-quality strategy can overvalue short-term investment returns and undervalue long-term investment returns, which could cause or exacerbate financial instability.

Over the past decades, the LTIIs have managed a substantial part of global financial assets that could have a profound impact on financial market sentiment, particularly during periods of financial turmoil. Since 2009, their assets appear to have grown robustly, with average growth rates of 6% and 18% for AEs and EMEs respectively.[27]

As a result, this box studies the investment behaviour of LTIIs that invest in the Hong Kong stock market, with the aim of shedding light on the potential impact these investors' portfolio rebalancing activities have on Hong Kong.

Methodology and data

One way of identifying the investment behaviour of LTIIs in the literature is to check whether the LTIIs will increase or decrease their equity investment substantially when equity prices decline.[28] If the LTIIs increase (decrease) their equity investments during a stock market slump, changes in the LTIIs' exposures will be negatively (positively) correlated with the stock market returns, and thus, the contribution of LTIIs is regarded as counter-cyclical (pro-cyclical) to the stock market.

To measure changes in their exposure to Hong Kong equities, we use the percentage change in the LTIIs' total net assets invested in the stock market in excess of the market return. This measure reflects changes in quantity (i.e., fund flows that rule out the price effect) which is more in line with changes in the funds' asset allocation. Thus, a positive (negative) change in the fund flow of the LTIIs means they increase (decrease) their exposure to Hong Kong equities.

Our full sample consists of 6,872 pension and insurance funds that have equity exposures to the Hong Kong stock market between the first quarter of 2001 and the first quarter of 2017. After screening out a large number of small funds to avoid overwhelming the final results, we consider a total of 1,010 funds, which already hold 95% of the total assets. These then constitute the final sample. At the end of 2016, these funds had two-thirds of their assets invested in global equities (Chart B3.1), reflecting that equities are their primary investment assets. Of these global equities, Hong Kong's share is

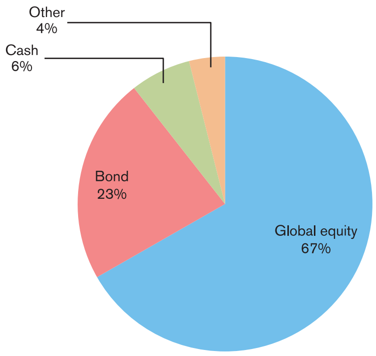
[26] The detailed results in this box are in Fong et al. (2018) "Do long-term institutional investors contribute to financial stability? – Evidence from equity investment in Hong Kong and international markets", *HKIMR working paper* (forthcoming).

[27] The growths are according to the Financial Stability Board's global shadow banking monitoring report 2017. In 2016, the financial assets of insurance corporations and pension funds in 29 reporting jurisdictions totalled US$60 trillion, some 18% of global financial assets.

[28] The method is also employed by Abbassi et al. (2016) "Security trading by banks and credit supply: micro-evidence from the crisis", *Journal of Financial Economics*, 121, 569-594; and Timmer (2018) "Cyclical investment behavior across financial institutions", *Journal of Financial Economics*, 129, 268-286.

about 1%. This is a small share, but the asset size is comparable to the stock market's daily turnover in Hong Kong. As of the fourth quarter of 2016, the asset size represented 79% of the average daily turnover of stocks listed on the Main Board of the Hong Kong Stock Exchange.[29]

Chart B3.1
LTIIs' exposure to global financial markets

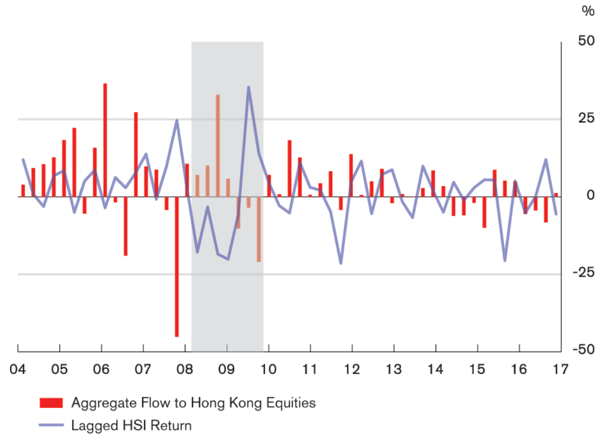


Source: Morningstar[30].

Empirical evidence

Chart B3.2 depicts the fund flows in aggregate and the lagged HSI return in quarterly frequency during 2004-2017[31]. As shown in the chart, the two variables appear to move in opposite directions very often throughout the whole period, with a simple correlation of -0.32. Their negative correlation appears to be more apparent during the global financial crisis from 2008 to 2009 (the shaded area), with a correlation of -0.44. The negative correlation preliminarily suggests that declines in the Hong Kong stock market in the previous quarter are associated with an increase in LTIIs' exposures to Hong Kong equities in aggregate in the current quarter.

Chart B3.2
Aggregate flows and lagged market return of Hong Kong



Note: The correlation between aggregate flow and lagged market return are -0.32 for the whole sample period and -0.44 for crisis period.

Sources: Morningstar, Bloomberg and HKMA staff calculation.

We also test the negative relationship more rigorously in two steps: (i) filtering out the effects of major fund-specific variables[32] and macro factors[33] from the fund flows ; and (ii) building a fixed-effect panel data regression model of this adjusted fund flows on past market returns. To differentiate the effects between normal market periods and market downturns, we introduce a dummy variable based on the VIX[34] to the regression as a proxy for global stock market uncertainty.

29 Sourced from *HKEx Securities and Derivatives Markets Quarterly Report*, the average daily turnover is HK$63.9 billion during the quarter.

30 Morningstar is a private data vendor tracking a vast number of funds invested in global financial markets. Morningstar's data providers do not guarantee the accuracy, completeness or timeliness of any information provided by them and shall have no liability for their use.

31 Aggregate flow is defined by the percentage change in aggregate Hong Kong equity assets in the sample in excess of the return of HSI.

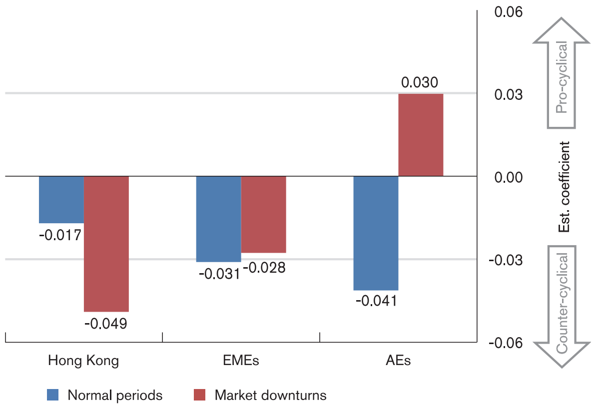
32 Fund-specific variables include individual fund return, cash ratio, debt-to-capital ratio and fund size.

33 Macro factors include the regional weighted average of the 10-year government bond yield, inflation rate, real GDP growth and short term interbank rate.

34 The index is the implied volatility of the S&P 500 index options over the next 30 day period. It also reflects global liquidity conditions. Details can be found in Bruno and Shin (2014) "Cross-border banking and global liquidity", *The Review of Economic Studies*, 82(2), 535-564.

Chart B3.3 summarises the regression coefficients of the past stock market return for the two market conditions. For comparison, we also estimate the effects of flows to AEs and EMEs equities based on the sample funds' global equity exposures in the same portfolios.[35] All the variables are in normalised scale, thus we can compare the relative importance of the variables based on the magnitude of the coefficients.

Chart B3.3
Responsiveness of the fund flows to stock market returns in Hong Kong, AEs and EMEs



Note: These AEs and EMEs cover seven regions including developed Asia, emerging Asia, Australasia, EMEA, developed Europe, Latin America, and North America.
Source: HKMA staff estimates.

Focusing on Hong Kong, we find that the coefficient is estimated to be negative in a normal period, with the coefficient being -0.017. In times of market downturns, the coefficient is -0.049, significantly larger in magnitude than that during the normal period.[36] These suggest that LTIIs increase their equity exposures to Hong Kong when the stock market declines in any period, other things being equal.

Considering the two economy groups, we consistently find that all estimated coefficients during the normal period are negative (i.e., -0.031 and -0.041 for EMEs and AEs respectively). Nevertheless, during a stressful period, the estimated coefficient for AEs is positive (i.e., 0.030), suggesting that the LTIIs decrease their equity exposures to AEs, *ceteris paribus*, when stock markets slump.

Summary and discussion

In summary, our empirical findings show that the LTIIs contribute a counter-cyclical effect to stock markets in Hong Kong and EMEs in general. This effect could be significantly stronger during financial turmoil. Such a value-trading strategy could temper drastic movements in asset prices and have a positive contribution to financial stability in these economies.

In comparison, the LTIIs will be pro-cyclical for equities in AEs in times of financial turbulence, which is also evidenced in several studies.[37] Given that these economies were at the epicentre of several major stock market crashes triggered by recessions in Europe and the US in the early 2000s, the 2008 global financial crisis and the European debt crisis, our findings suggest the pro-cyclical effect depends on where the shock originates from. In addition, the influence of pro-cyclicality is reinforced by the LTIIs' herding

35 The original data source covers 56 AEs and 181 EMEs. Instead of individual economies, we use the regional data grouped by the data provider, including developed Asia, emerging Asia, Australasia, Emerging Europe, Middle East and Africa (EMEA), developed Europe, Latin America, and North America.

36 The estimated fund flows are 0.9% and 2.5% respectively during the two market conditions, given a one-standard-deviation (SD) decline in the stock market (i.e., by around 10%) in one quarter. They are obtained by multiplying the estimated coefficients concerned by the SD of the flows to Hong Kong equities, given all the variables in the regression are normalized in estimation, and so, the coefficients represent the number of SDs of the fund flows when the stock market declines by one SD.

37 For examples, the effect is found apparent in pension funds of the US, Portugal, and Spain, and in insurers of the US, France, and the UK, although LTIIs in some Organisation for Economic Co-operation and Development (OECD) countries (e.g. Norway, Italy, Poland, Turkey, etc.) behaved counter-cyclically during 2008-2009. Details can be seen in IMF (2013) "Pro-cyclical behavior of institutional investors during the recent financial crisis: causes, impacts, and challenges", *IMF Working Paper WP/13/193*; and OECD (2015) "OECD Business and Finance Outlook 2015".

behaviour. In some AEs, the herding effect could be the result of similar industry practices for the LTIIs' asset allocation decisions.[38]

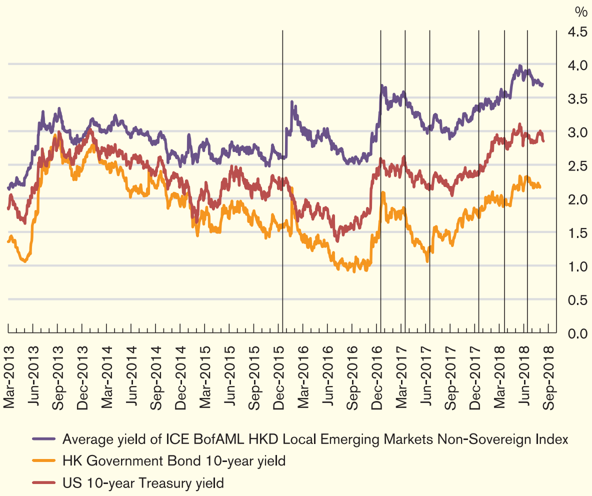
In conclusion, this study underscores the potential outcomes of the investment behaviour of these investors, which could be important for individual investors and policyholders as well as for the economy as a whole. How these investors contribute to financial stability should, therefore, come under careful scrutiny.

[38] Based on UK's experience, these practices include: (i) the LTIIs have similar liability structure; (ii) the LTIIs use asset managers who manage LTIIs assets as agents according to specific mandates which may include benchmarks that reference either other asset managers in the industry or industry-wide indices; (iii) the investment decisions of LTIIs are influenced by investment consultants who could have a significant effect on institutional asset allocation; and (iv) the LTIIs may face similar regulatory constraints. Details can be seen in Bank of England (2014) "Pro-cyclicality and structural trends in investment allocation by insurance companies and pension funds", *Bank of England Discussion Paper*.

4.4 Debt market

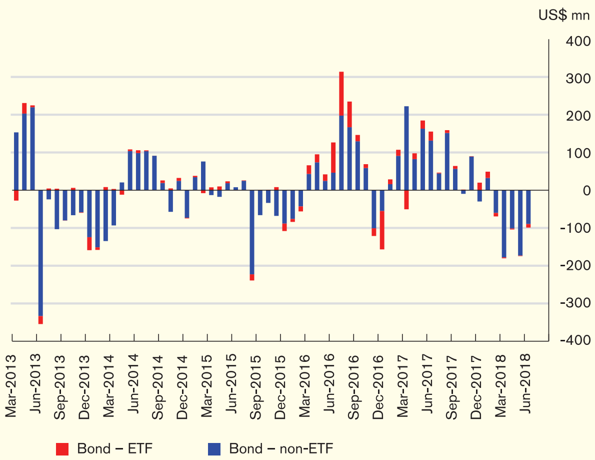
The Hong Kong dollar debt market registered robust growth in the first half of 2018 despite an increasingly difficult external environment. As monetary normalisation gained further momentum in the US, bond yields continued to rise across the board. For Hong Kong, given the LERS, the review period saw yields in both the sovereign and non-sovereign sectors move in tandem with their US counterparts (Chart 4.21). This dampened investor appetite, leading to net outflows of bond funds (Chart 4.22).

Chart 4.21
Hong Kong dollar sovereign and non-sovereign bond yields and US 10-year Treasury yield



Note: Vertical lines indicate the announcement dates of US Fed rate hikes.
Sources: HKMA and ICE Data Indices.

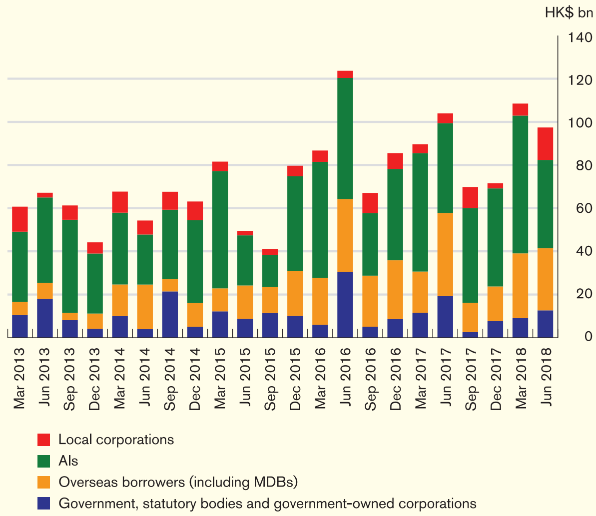
Chart 4.22
Exchange traded fund (ETF) and non-ETF bond fund flows into Hong Kong



Sources: EPFR Global.

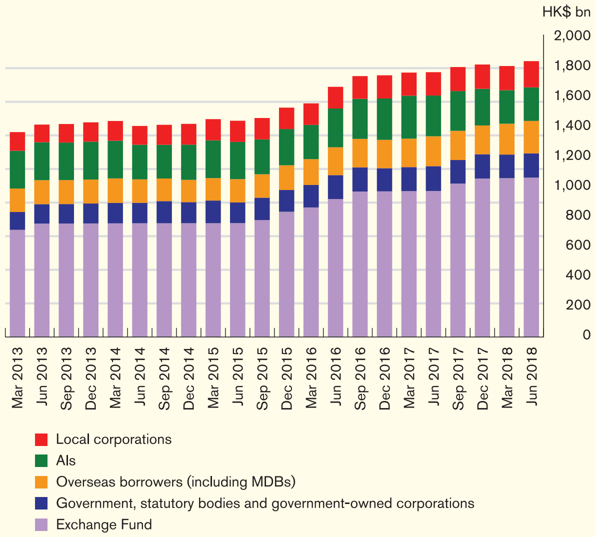
Nevertheless, total issuance of Hong Kong dollar debt rose by 11.2% year on year in the first six months of 2018 to HK$1,803.2 billion, mainly driven by the 11.9% and 19.4% increase in issuance by the Exchange Fund and the domestic private sector respectively (Chart 4.23). As a result, the outstanding amount of Hong Kong dollar debt rose by 4.2% year-on-year to HK$1,824.5 billion at the end of June (Chart 4.24). The amount was equivalent to 25.1% of HK$M3 or 20.4% of Hong Kong dollar-denominated assets of the banking sector. Within the total, overseas borrowers including multilateral development banks (MDBs) saw their debt outstanding increase by 8.4% from a year ago to HK$214.4 billion, more than offsetting the 6.7% year-on-year decline in outstanding debt by the local private sector, which was due to the reduced amount outstanding by AIs.

Chart 4.23
New issuance of non-Exchange Fund Bills and Notes Hong Kong dollar debt



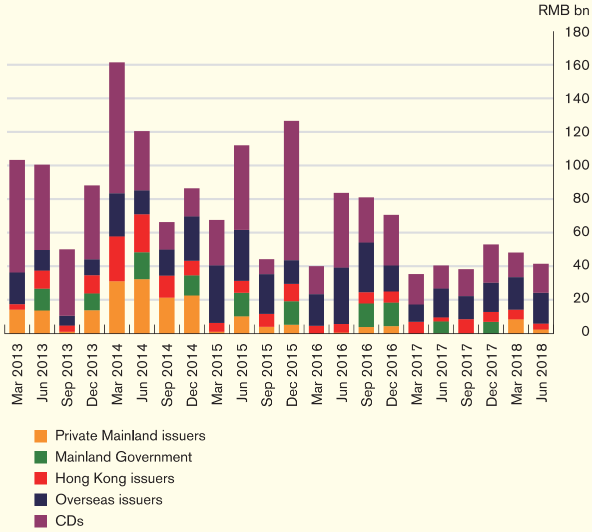
Source: HKMA.

Chart 4.24
Outstanding Hong Kong dollar debt



Source: HKMA.

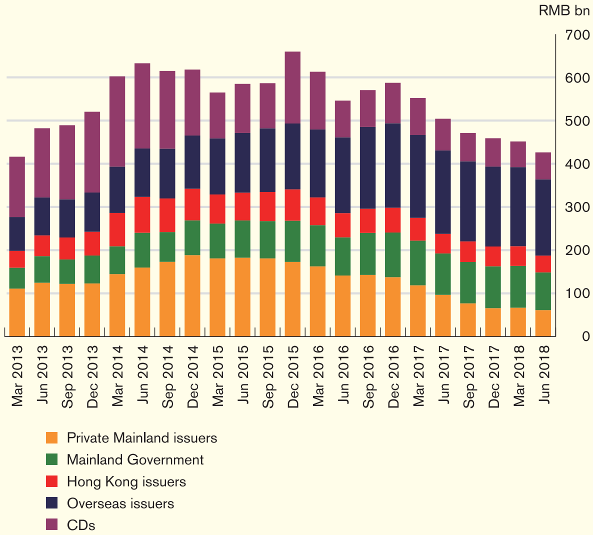
Chart 4.25
New issuance of offshore renminbi debt securities



Sources: Newswires and HKMA staff estimates.

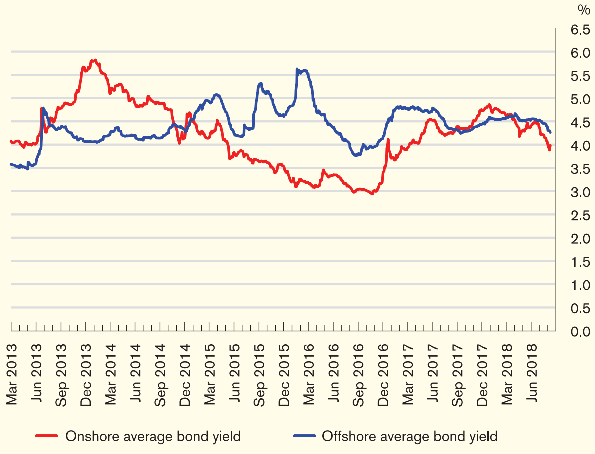
The primary offshore renminbi debt market in Hong Kong showed signs of stabilisation in the first half of 2018, despite a continuous downward trend in total outstanding amount. In the primary market, total issuance increased by 18.2% year on year to RMB89.9 billion over the first half of 2018, mainly driven by a rebound in the issuance by private Mainland issuers as well as overseas issuers (Chart 4.25). However, the total outstanding amount of offshore renminbi debt securities in Hong Kong has declined for six quarters in a row, registering a 15.4% year-on-year decline to RMB426.3 billion at the end of June 2018 (Chart 4.26). Meanwhile, the cost of funding onshore remained below its offshore counterpart during the review period (Chart 4.27).

Chart 4.26
Outstanding amount of offshore renminbi debt securities



Sources: Newswires and HKMA staff estimates.

Chart 4.27
Average yields of onshore vs. offshore renminbi bond indices



Sources: Bloomberg, Hang Seng Indexes Company Ltd, and China Central Depository & Clearing Co., Ltd.

Looking ahead, the near-term development of the local bond market, including offshore renminbi debt, is subject to headwinds from the potential escalation of the US-China trade war, because of Hong Kong's close economic and financial ties with Mainland China as well as the international market.

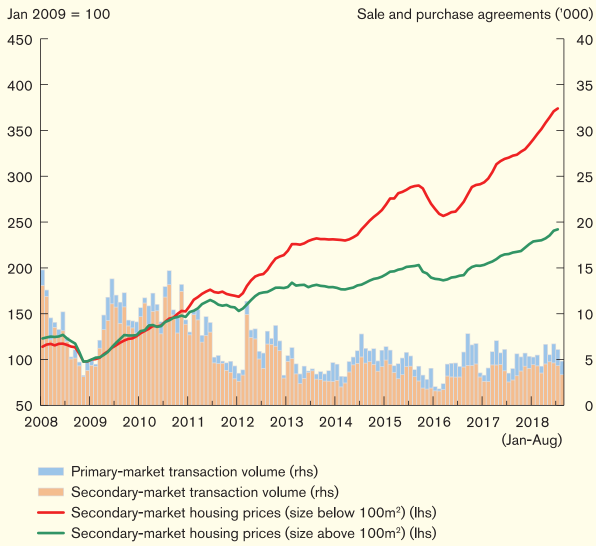
However, in the medium term, a number of policy initiatives are in place to promote market development. In particular, a three-year Pilot Bond Grant Scheme was launched in May to encourage first-time corporate issuers to issue bonds in Hong Kong. And, to enhance Hong Kong's profile in green finance globally, the Government plans to launch the Government Green Bond Programme with a borrowing ceiling of HK$100 billion. While the local green bond market is relatively small in its current phase, it is strategically positioned to attract issuances denominated in multiple currencies, capitalising on Hong Kong's strengths as an international financial centre.[39]

4.5 *Property markets*

Residential property market

The residential property market remained buoyant in the first half of the year. Compared with the second half of 2017, average monthly housing transactions increased by 15% to 5,649 units (Chart 4.28) amid robust economic conditions and the low mortgage rate environment. Positive market sentiment was partly supported by a record price for the sale land in Kai Tak in May. Housing price growth accelerated to 10.7% in the first half of 2018, compared with 4.9% growth in the second half of 2017 (Chart 4.28). But signs of moderation emerged stepping into the third quarter. Prices for small and medium-sized flats (with a saleable area of less than 100m^2) continued to increase faster than that for large flats (with a saleable area of at least 100m^2).

Chart 4.28
Residential property prices and transaction volume



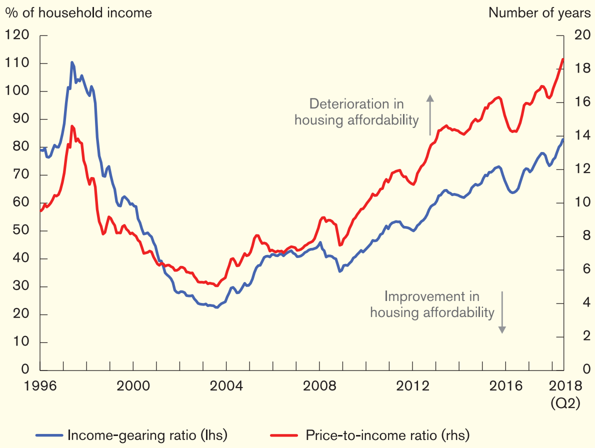
Sources: Rating and Valuation Department (R&VD) and Land Registry.

As housing price growth outpaced that of household incomes during the review period, housing affordability was stretched further. The housing price-to-income ratio climbed to 18.2 years in the second quarter of 2018 compared with the previous peak in 1997 of 14.6, while the income-gearing ratio was at 81.3%, much higher

39 According to Dealogic, green bonds listed in Hong Kong totalled US$5.9 billion at the end of June 2018, with nearly all of them denominated in foreign currencies, such as the US dollar (74.2%), euro (19.6%) and renminbi (5.5%).

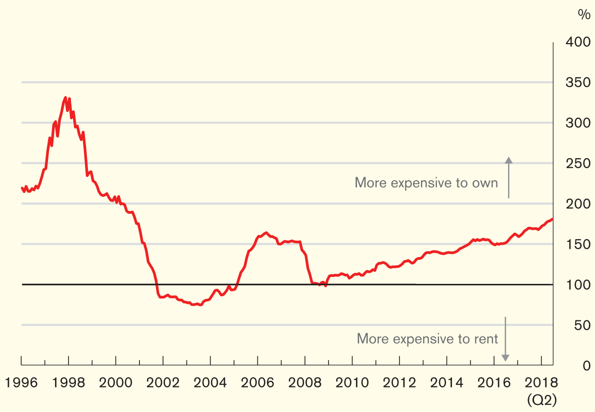
than the long-term average of about 50% (Chart 4.29).[40] The buy-rent gap, a measure of relative costs between buying and renting a typical housing unit[41], remained at a high level of 188.4% as the residential rental yields were low at 2.0–2.6% in July (Chart 4.30).

Chart 4.29
Indicators of housing affordability



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

Chart 4.30
Buy-rent gap



Note: This indicator is calculated as the ratio of the cost of purchasing and maintaining a 50m² flat with that of renting it.
Sources: R&VD, C&SD and HKMA staff estimates.

Nevertheless, the eight rounds of macroprudential measures implemented by the HKMA since late 2009 have helped to enhance the banking sector's resilience to property market shocks. The average LTV ratio for newly approved mortgages declined to 47% in July from 64% before the measures were first introduced, and the DSR also decreased to 34.7% from 40.8%.

Reflecting the Government's efforts in addressing land and housing supply issues, the government-appointed Task Force on Land Supply launched a five-month public engagement exercise in late-April to invite stakeholders to offer views on land supply options and other land supply-related issues. In late June, the Government announced six new housing initiatives. These include revising the pricing policy for subsidised sale flats to make them more affordable. To increase the supply of public housing, some private housing sites will be reallocated for public housing in order to provide more than 10,000 units in the coming four years. To encourage a more timely supply of private flats in the primary market, the Government proposed "special-rates" on vacant first-hand private residential units.

A variety of factors make the outlook for the residential property market uncertain. On the one hand, the current favourable employment and income conditions might provide some support for the demand for property. On the other hand, the property market is likely to face a number of headwinds. In particular, if the US-China trade tensions persist or intensify, the positive market sentiments could turn quickly. Furthermore, as the US monetary policy normalisation process continues, domestic mortgage rates are set to increase along with the rising funding costs of the banks. Indeed, banks increased their effective mortgage rates by raising the cap for newly approved HIBOR-based mortgages in August. In addition, the supply-demand gap is expected to narrow in the longer term, as the supply of residential property is likely to increase on the back of the

[40] 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. The income-gearing ratio compares the amount of mortgage payment for a typical 50m² flat (under a 20-year mortgage scheme with a 70% loan-to-value (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 (DSR), which is subject to a maximum cap by the HKMA's prudential measures.

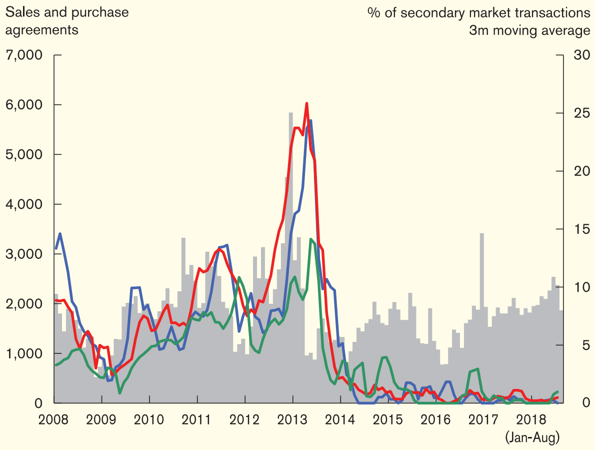
[41] The buy-rent gap estimates the cost of owner-occupied housing (under a 20-year mortgage scheme with a 70% LTV ratio) relative to rentals.

Government's effort to address land and housing shortages.

Non-residential property market

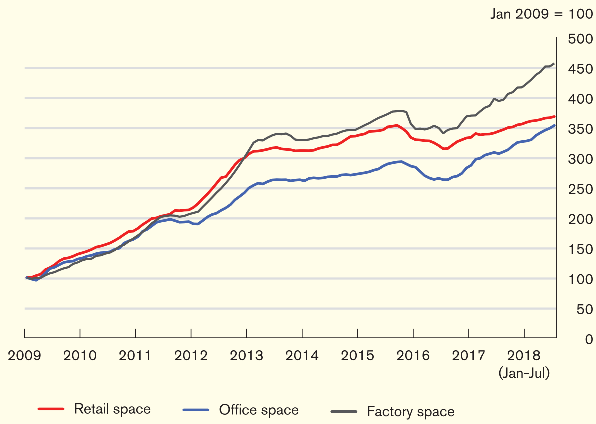
The non-residential property market saw robust activity in the first half of 2018. The average monthly transactions rose to 2,163 units, the highest level since the doubling of ad valorem stamp duties on non-residential properties in 2013. Nevertheless, speculative activities, as indicated by confirmor transactions, remained low (Chart 4.31). Along with the increase in transactions, prices of office space, factory space and retail premises rose by 8.2%, 9.6% and 3.5% respectively in the seven months through July (Chart 4.32). The growth of rentals in non-residential properties also accelerated compared with the second half of 2017. The overall rental yields across segments remained at a low range of 2.4–2.7%.

Chart 4.31
Transactions in non-residential properties



Sources: Land Registry and Centaline Property Agency Limited.

Chart 4.32
Non-residential property price indices



Source: R&VD.

Regarding the outlook for non-residential property, a number of offsetting forces are at play. For example, steady growth in retail sales and inbound tourism may support the demand for retail premises in the near term. The demand for office space may be sustained by continuing business expansion in some high value-added services, such as financial and professional services sectors. However, the uncertainty arising from the US-China trade tensions and the risk of rising domestic interest rates could restrain the overall demand for non-residential properties.