



HONG KONG MONETARY AUTHORITY  
香港金融管理局

# HALF-YEARLY MONETARY AND FINANCIAL STABILITY REPORT

*March 2018*

*This Report reviews statistical information between the end of August 2017 and the end of February 2018.*



# Half-Yearly Monetary and Financial Stability Report

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#### Glossary of terms

#### Abbreviations

# 1. Summary and overview

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*Global financial markets started the year with a return of volatility triggered by a reappraisal of inflation risk in the US. Equity markets around the world fell sharply from their peaks in late January, wiping out the gains in early 2018, while the benchmark 10-year US Treasury yield rose to a four-year high. The long period of global equity market rallies and low volatility over the past two years was built upon expectations of a continued “Goldilocks” environment of solid growth with low inflation and low interest rates. However, such expectations are subject to risks of tighter global monetary conditions, rising trade protectionist sentiment and geopolitical tensions.*

*The Hong Kong dollar exchange rate eased and continued to trade in an orderly manner. Total loans continued to expand in the second half of 2017, albeit at a more moderate pace. Both housing price growth and transaction volumes picked up in the fourth quarter of 2017 after some moderation in the middle of the year. That said, going forward, a return of volatility in the global and local financial markets means that fund flows in Hong Kong could become more volatile down the road.*

*With uncertainties in the financial markets amid the continuing normalisation of US monetary policy and lingering geopolitical risks, banks should remain vigilant against the risks of more volatile interest rates and possible capital outflows. In particular, given the rising levels of corporate leverage and household debt-servicing burdens, banks should assess the possible impacts of sharper-than-expected interest rate rises on their asset quality.*

## **The external environment**

Global financial markets started the year with a return of volatility after the Chicago Board Options Exchange Market Volatility Index (VIX) had remained low for more than two years. Equity markets around the world fell sharply from their peaks in late January, with the S&P 500 tumbling by more than 10% at one point, wiping out the gains in early January. The turn in market sentiment was triggered by signs that the global recovery may revive the long-dormant pressure on US wages and prices that

could cause the US Federal Reserve (Fed) to quicken the pace of interest rate hikes. The benchmark 10-year US Treasury yield also rose to a four-year high.

The long period of global equity market rallies over the past two years was built upon expectations of a continued “Goldilocks” environment. Global economic growth continued to gain momentum in the second half of 2017, with a synchronised pick-up in economic activities in both advanced and emerging market economies. Towards the end of

the year, the US Congress passed a tax reform bill encompassing tax cuts and sweeping changes to corporate and individual taxation rules, raising expectations that the burgeoning US expansion would receive an additional cyclical boost in the near term. Despite strengthening activity, core inflation remained modest across major advanced economies, fostering expectations of a continuation of the “low-for-long” global interest rate environment. Against this background, global asset markets posted strong gains in 2017, with the US equity markets in particular repeatedly hitting new highs.

Nonetheless, global equity markets experienced a reappraisal of inflation risks on the release of stronger-than-expected US wage growth data for January. Beyond the short-term financial market volatility, the risks of tighter global monetary conditions will likely cloud the global economic outlook. In the US, with the economy operating at full potential, there is a risk that the expected cyclical boost to domestic demand provided by the tax cuts may hasten a rebound in inflation, thereby prompting the Fed to tighten monetary policy at a faster-than-expected pace. At the same time, higher fiscal deficits resulting from tax cuts would likely translate into greater US Treasury issuance going forward, which could amplify upward pressure on longer-term yields as the Fed continues with balance sheet normalisation. Elsewhere, strengthening growth momentum in other major advanced economies has fostered market expectations that their central banks may scale down their quantitative easing programmes. If this materialises, it would point to a synchronised global tightening of monetary conditions.

Policy and event risks arising from international politics and geopolitical tensions may also cloud the global growth outlook. The US administration appears to be increasingly inclined to resort to trade protectionist measures to shield domestic industries from competition, recent examples being the announcements to impose import tariffs on solar panels, washing

machines, steel and aluminium, raising fears of retaliatory responses from its trading partners. In addition, any unexpected escalation in geopolitical tensions could affect global trade flows and heighten global financial market volatility.

These uncertainties hanging over the global economic outlook raise questions about the sustainability of the elevated global asset market valuations. More fundamentally, it remains to be seen whether the cyclical upswing in global demand and the expected rise in fiscal deficit due to US tax cuts would drive up the natural rate of interest ( $R^*$ ). This, together with an expected increase in term premia amid the Fed’s balance sheet normalisation, could point to higher long-term interest rates and thus pose a headwind to asset market valuations.

In East Asia, regional economies are also experiencing solid growth and subdued inflation. This sound economic performance and positive outlook have been accompanied by accelerated capital inflows and financial markets rallies. Nevertheless, the favourable outlook is subject to downside risks stemming from a tightening of global liquidity amid simultaneous monetary policy normalisation by major central banks, more inward-looking US trade policies, geopolitical tensions, and the one-time “deemed repatriation” provision under the US tax reform (which may increase incentives for US corporations to repatriate their profits back to the US which could tighten offshore US dollar liquidity).

In Mainland China, the economy fared well in the second half of 2017, underpinned by solid consumption as well as robust infrastructure and a rebound in industry spending towards the end of the year. Meanwhile, there are increasing signs of the emergence of the “new economy”, with strong business expansion in sectors such as high value-added manufacturing and services in the past quarters. Looking ahead, the near-term growth prospects remain positive but

uncertainties remain. In particular, it is unclear to what extent the rapid growth of the “new economy” could help offset the short-term pressure of further structural reforms on growth. Mainland authorities announced to continue to adopt a proactive fiscal policy stance in 2018, which may help cushion adverse economic developments if necessary.

During the review period, some progress has been made on both structural reforms and containment of systemic risks. In particular, Mainland property markets showed signs of cooling down during the review period amid tightening measures, especially in first-tier cities. Meanwhile, the exposure of banks to firms in overcapacity sectors was kept in check thanks to the tightened bank loan underwriting standards, while shadow banking activities also decelerated amid financial deleveraging. In addition to these positive developments, our analyses suggest that capital allocation efficiency in Mainland China appeared to have improved. In particular, the borrowing constraint of state-owned enterprises (SOEs) with weaker repayment abilities has been hardened, likely driven by declined support from local governments (please see more details in Box 2, page 31). On the external front, capital outflow pressures, amid stabilised economic conditions and subsided risks, stayed subdued during much of 2017.

### **The domestic economy**

The Hong Kong economy sustained its sequential growth momentum during the second half of 2017. For the year as a whole, real Gross Domestic Product (GDP) grew by 3.8% in 2017, the fastest in 6 years. Growth in private consumption in the second half remained robust alongside favourable employment and earnings conditions as well as booming asset prices. Overall investment spending also rebounded on stronger business capital spending. On the external front, Hong Kong’s export performance improved further on the back of better global

trade growth and a gradual recovery in inbound tourism. That said, net exports of goods still detracted from GDP growth as imports expanded even faster than exports, while net exports of services contributed positively to GDP growth.

Economic growth for 2018 is expected to remain solid. In particular, private consumption, building and construction, as well as exports are expected to remain growth-supportive. In view of the eventual rises in Hong Kong dollar interest rates, Box 3 examines the effect of a higher mortgage debt service burden on private consumption. The Government and market consensus forecasts of real GDP growth for 2018 are 3–4% and 3.0% respectively. However, this growth outlook is subject to various uncertainties and risks arising from the external environment as discussed above, and those relating to Mainland’s economic performance amid financial tightening, and developments in the local asset markets.

Local inflationary pressures were still well contained in the second half of 2017 although the unemployment rate declined lately to a near 20-year low of 2.9%. However, the sequential momentum showed signs of a moderate pick up in inflation rates in recent months, driven by price increases in both tradables and services. Looking ahead, the underlying inflation rate is likely to pick up slightly to a still-moderate level, partly reflecting the gradual feed-through from rising fresh-letting private residential rentals.

### **Monetary conditions and capital flows**

The Hong Kong dollar spot exchange rate strengthened between September and November 2017, alongside an increase in the covering of short Hong Kong dollar positions amid tighter liquidity conditions due to equity-related and seasonal funding demand. As liquidity conditions eased and interest rate arbitrage activities resumed, the Hong Kong dollar exchange rate softened again in December 2017.

Moving into early 2018, despite increased volatility in the global financial markets, in particular the stock markets, the Hong Kong dollar remained broadly stable. The Hong Kong dollar eased further in early March but the Convertibility Undertaking was not triggered.

The Hong Kong dollar interbank interest rates saw more upward pressure between September and December 2017, largely driven by initial public offering (IPO)-related funding demand and banks' prudent stance on liquidity management towards year-end. Comparing with six months ago, the overnight and three-month Hong Kong Interbank Offered Rate (HIBOR) fixings picked up by 14 and 50 basis points to 0.25% and 1.26% respectively in December (in monthly average terms). After easing slightly in early January 2018, the HIBOR stayed largely steady despite recent global financial market corrections. Along with the rise in the short-term HIBOR, banks' average lending rate for new mortgages also increased to 2.16% in December, regardless of the keen competition in the mortgage lending business. On the other hand, while there was a brief pick-up in October due to IPO-related funding demand, retail banks' funding costs generally remained low, with the composite interest rate closing at 0.38% in December.

In the near term, the Hong Kong dollar interest rate is likely to face more upward pressure amid ongoing US monetary policy normalisation, while fund flows could be subject to more volatility should global market sentiment swing sharply.

Banks' total loans expanded solidly by 16.1% in 2017 as a whole, but grew at a decelerated pace of 5.3% in the second half following a strong 10.2% expansion in the preceding half-year period. In particular, domestic loans in most business sectors and loans for use outside Hong Kong witnessed slower expansion. Foreign currency loans recorded much slower increases

due in part to a rise in US dollar funding costs, while Hong Kong dollar loans continued to register fast growth on the back of the favourable domestic economic environment and relatively lower Hong Kong dollar funding costs.

As Hong Kong dollar loans grew faster than Hong Kong dollar deposits, the Hong Kong dollar loan-to-deposit (LTD) ratio rose in the second half to 82.7% at the end of 2017, the highest since March 2015. On the other hand, the foreign currency LTD ratio declined to 63.1% at the end of the year due to the relatively slow expansion in foreign currency loans.

After showing some signs of stabilisation between September and November, both the onshore and the offshore renminbi exchange rates strengthened somewhat against the US dollar from December alongside a noticeable weakening of the US dollar against most major currencies. Largely reflecting the shift in the renminbi exchange rate expectation, Hong Kong's offshore renminbi liquidity pool (including outstanding customer deposits and certificates of deposit) recovered moderately in the second half after a slight decline in the preceding half-year period. In other offshore renminbi business, while renminbi loans continued to decline, the renminbi trade settlements handled by banks in Hong Kong rebounded in the second half, with the average daily turnover of the renminbi real time gross settlement system remaining high. Looking ahead, Hong Kong's offshore renminbi business is expected to benefit from the further development of the Belt and Road Initiative and continuing internationalisation of the renminbi.

## **Asset markets**

The Hong Kong equity market extended its rally before taking a sharp downward adjustment towards the end of the review period. Over the past six months, the global economy has strengthened markedly. This, coupled with the

passing of the tax cuts in the US, kept market sentiment buoyant with corporate performance expectations rising globally. In addition, more investors are pinning their optimism on another IT boom, this time through vigorous application of data technology and artificial intelligence across a wide spectrum of economic activities. The local equity market also benefited from a considerable increase in southbound investment through its Stock Connect with the two exchanges in Mainland China. Nevertheless, local equities corrected sharply towards the end of the review period amid heightened concerns about rising bond yields.

Indeed, significant uncertainties remain over the market outlook, not the least being whether monetary policies in major economies will tighten more sharply than anticipated, and whether the concepts that investors have bought into can be realised. For example, can the current IT boom deliver the expected productivity growth? Box 4 (see page 55) examines the potential impact on the Asia Pacific equity markets, including Hong Kong, of shocks originating from both within and outside the region.

The Hong Kong dollar debt market expanded slightly last year, with yields climbing gradually amid continued monetary normalisation in the US. Higher borrowing cost reduced incentives to issue debt in Hong Kong dollar in the review period, leading to a small reduction in non-Exchange Fund Bills and Notes issuance. On the demand side, there was a decline in net bond fund inflows, reflecting diminishing attractiveness of local currency debt. Meanwhile, the offshore renminbi debt market in Hong Kong contracted further in 2017 as primary market activity remained in the doldrums. While the relative onshore-offshore yield has moved in favour of offshore issuance, the outlook critically depends on a wide range of other forces at work such as exchange rate expectations for the renminbi and the current drive of the Mainland authorities to deleverage the economy.

Amid an improvement in economic conditions and market sentiment, transactions in the residential property market picked up again after a brief moderation in mid-2017, following the eighth round of macro-prudential measures implemented in May. Housing price growth has also accelerated since the fourth quarter, causing housing affordability to stretch further.

The outlook for the residential property market remains uncertain. In the near term, the current favourable domestic economic conditions, perceived housing shortage, low mortgage rates and alternative sources of home financing will continue to support the demand for property, but the recent sell-offs in global financial markets may dampen property market sentiments. Over the longer term, the property market will continue to face a number of headwinds. In particular, as the US monetary policy normalisation process continues, domestic mortgage rates will rise eventually, and the increase in Hong Kong dollar interest rates could quicken should sizeable capital outflows from Hong Kong occur amid heightened global financial market volatility. In addition, on the back of the Government's effort to increase the supply of land and residential properties, the housing demand-supply gap is expected to narrow gradually, which will ease the upward pressure on property prices in the longer term.

### **Banking sector performance**

The profitability of retail banks continued to improve, with the return on assets rising to 1.15% in the second half of 2017 compared with 1.11% in the same period of 2016. The improvement was mainly due to the increase in net interest income and a reduction in loan impairment charges.

Banks have maintained strong capital positions, with the consolidated total capital ratios of locally incorporated authorized institutions (AIs) increased to 19.1%. To enhance banks' resilience to systemic risks, the countercyclical capital buffer ratio for Hong Kong will rise to 2.5% with effect from 1 January 2019 from the current 1.875%. In addition, the HKMA has recently published a consultation paper on prescribing loss-absorbing capacity (LAC) requirements for AIs as envisaged by the Financial Institutions (Resolution) Ordinance. Box 5 (see page 77) provides a cost-benefit assessment of the potential impact of LAC requirements on Hong Kong. Our assessment suggests that the implementation of LAC requirements is likely to bring net benefits to the Hong Kong economy.

Partly due to IPO-related funding demand and the two US rate hikes in June and December, the Hong Kong dollar interbank interest rates increased notably in the second half of 2017. Nonetheless, the Hong Kong dollar funding costs of retail banks, as reflected by the composite interest rate, remained low and stable supported by the low retail deposit interest rate. The liquidity positions of AIs were generally sound by Basel III standards. Both the average Liquidity Coverage Ratio for category 1 institutions and the average Liquidity Maintenance Ratio of category 2 institutions remained high at 155.1% and 49.4% respectively in the fourth quarter of 2017 and were well above their regulatory minimums. To strengthen banks' ability to fund their activities with sufficiently stable sources of funding, the HKMA introduced the Net Stable Funding Ratio as part of the Basel III liquidity requirements on 1 January 2018. The implementation of the new requirement by AIs will reduce their funding risk over a longer time horizon.

Credit growth moderated to 5.3% in the second half of 2017 after growing rapidly by 10.2% in the first half of 2017. The asset quality remained sound by historical standards and improved further during the review period. As banks' asset

quality could be more sensitive to the external environment given the rapid rise in loans for use outside Hong Kong in recent years, the credit risk of these loans should warrant close monitoring. Banks should also remain vigilant against the risks of more volatile interest rates, possible abrupt capital outflows amid further US rate hikes and the ongoing reduction in the Fed's balance sheet, and geopolitical risks. In particular, banks should assess the possible impacts of sharper-than-expected interest rate rise on their asset quality, given the rising levels of corporate leverage and household debt-servicing burdens.

## 2. Global setting and outlook

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The synchronised global economic upswing underway since late 2016 continued unabated. Global equity markets staged a rally in 2017 and early 2018 on improving growth prospects, but a reappraisal of US inflation risks triggered a sell-off and a spike in market volatility in February, marking an end to the financial market tranquillity that prevailed over the past two years. Looking ahead, the global outlook will be clouded by risks of tighter monetary conditions, as well as a number of policy and event risks. US tax cuts amid a tight labour market might hasten the cyclical rebound in inflation and result in a faster pace of tightening by the Federal Reserve, while increased issuance of US Treasuries to finance the tax cuts could amplify upward pressures on longer-term yields amid the Fed's balance sheet normalisation. The spectre of a rise in trade barriers, as well as any unexpected escalation in geopolitical tensions, could also threaten the nascent recovery in global trade.

In East Asia, real economic growth continued to pick up in the second half of 2017 on the back of a strong export performance and steady domestic demand. Nevertheless, the positive economic prospects are vulnerable to multiple downside risks, including a sharper-than-expected tightening of global monetary conditions, more inward looking US trade policies and geopolitical tensions. These downside risks, if materialised, could also increase the risk of sharper capital flow reversal. Policy makers are therefore facing the challenge of guarding against risks to growth while limiting the impact of the prolonged easy financial conditions on inflation and balance sheet vulnerabilities.

In Mainland China, the economy fared well in the second half of 2017. During the review period, some progress has been made on both structural reforms and containment of systemic risks. The near-term growth prospects remain positive but uncertainties remain, in part depending on to what extent the rapid growth of the "new economy" can help offset the short-term pressure of further structural reforms on growth. Reflecting stabilised economic conditions and subsided risks, capital outflow pressures stayed subdued during much of 2017.

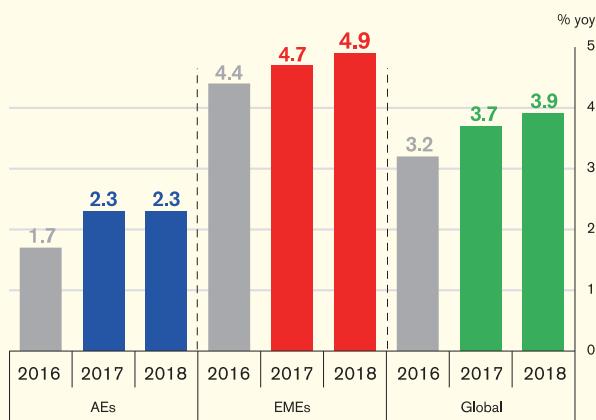
### 2.1 External environment

With the cyclical economic upturn gaining further traction, major advanced economies (AEs) and emerging market economies (EMEs) experienced synchronised growth acceleration in 2017. Among major AEs, the US saw a robust

pick-up in investment and exports supported by buoyant private sector sentiment and a marked depreciation of the US dollar, while the euro area and Japan also enjoyed broad-based cyclical recovery. EME exports benefited from stabilising global commodity prices and increased import demand from major AEs. In the near term, the

approval of the tax reform bill in the US is expected to provide an additional boost to investment and consumption through their responses to corporate and individual income tax cuts. In view of the strength of the current cyclical upswing and the expansionary effect of the US tax overhaul, the International Monetary Fund (IMF) in January projected global growth to accelerate from an estimated 3.7% in 2017 to 3.9% in 2018 (Chart 2.1).

**Chart 2.1**  
**Real Gross Domestic Product (GDP) growth projections**



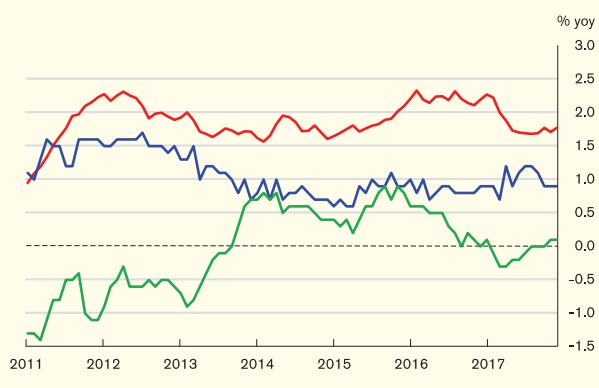
Source: IMF.

As growth momentum in the euro area and Japan strengthened, expectations of global monetary policy divergence diminished. This, coupled with the brighter global growth outlook that encouraged risk-on sentiment and capital flows into EMEs, weighed on the US dollar. Despite three interest rate hikes and the commencement of balance sheet normalisation by the Fed during the year, the US dollar index fell close to 10% in 2017.

At the same time, core inflation remained subdued across major AEs in spite of the broad-based growth acceleration, and stayed below their central banks' target, which, until recently, fostered market expectations that global interest rates would remain low (Chart 2.2). Against this background, global equity markets rallied in 2017 and early 2018. In particular, the S&P 500

index repeatedly reached new highs, driving the cyclically adjusted price-earnings (P/E) ratio to 33.8 in January 2018, the highest since the "dot-com" bubble in the early 2000s.

**Chart 2.2**  
**Core inflation in major AEs**

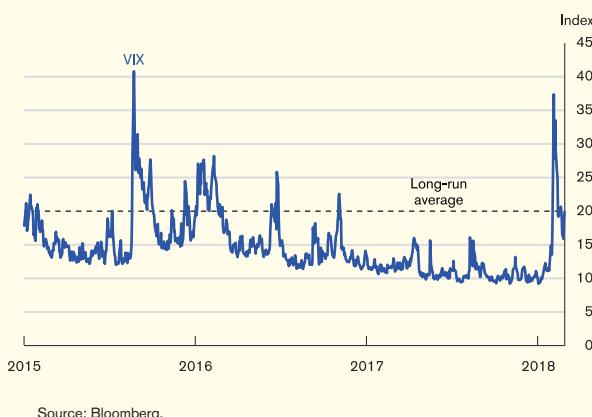


Note: Data shown for Japan is the "core-core" inflation and has been adjusted for the one-off effects of the sales tax hike in 2014.

Sources: CEIC and HKMA staff estimates.

Nonetheless, with longer-term US Treasury yields on the rise since the latter half of 2017 amid concerns of tax cuts resulting in higher fiscal deficits and inflation, the increasingly rich asset market valuations have been called into question. Global equity markets underwent a correction in early February 2018, triggered by market reappraisal of US inflation risks on the release of stronger-than-expected growth in average hourly earnings in January 2018. The S&P 500 index at one point tumbled by more than 10% from its peak on 26 January, wiping out the sharp gains at the start of the year, and faced renewed downward pressures when the US administration announced new trade protectionist measures in early March. The benchmark 10-year US Treasury yield also rose to a four-year high in mid-February. Market volatility increased sharply, with the Chicago Board Options Exchange Market Volatility Index (VIX) at one point surging to a two-year high of 37.3, marking an end to the low-volatility environment that prevailed over the past two years (Chart 2.3).

**Chart 2.3**  
**VIX**

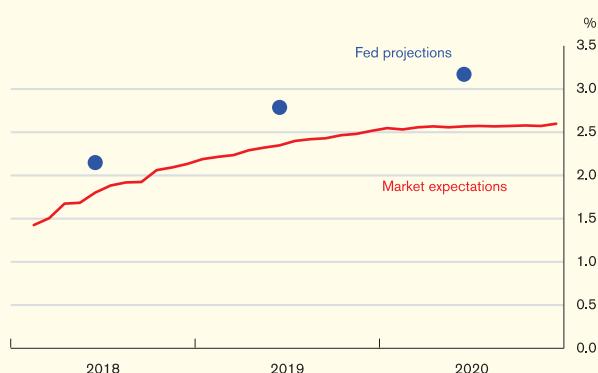


Looking beyond the short-term equity market volatility, the risk of tighter global monetary conditions stemming from the US inflation risks, the upside risks to longer-term US yields and the possible tightening by other major central banks will likely continue to cloud the global economic outlook.

First, on US inflation risks, the recently passed tax reform plan includes a number of provisions expected to provide a short-term cyclical boost to private consumption and investment. Key among them include: reductions in corporate and individual income tax rates, a temporary allowance of full expensing of capital investment, and a one-off “deemed repatriation” provision that neutralises incentives for US companies to hoard their overseas earnings abroad. While it is still uncertain how strongly domestic demand and inflation will respond to the tax cuts, with the US economy now operating at full potential, there is a risk they would push US output further above potential, resulting in an overheating economy and a cyclical rebound in inflation.<sup>1</sup> A sharper-than-expected strengthening of inflationary pressures

could prompt the Fed to tighten monetary policy at a faster pace. With financial markets currently still pricing in a much flatter Fed funds rate path than the Federal Reserve (Fed)’s projections, the risks of an abrupt re-pricing of rate hike expectations cannot be ruled out in case of a surprise rebound in inflation (Chart 2.4).

**Chart 2.4**  
**Fed funds rate projections**



Note: Market expectations are derived from prices of Fed funds futures contracts as at 28 February 2018, while the Fed projections are based on December 2017 Federal Open Market Committee projection materials.

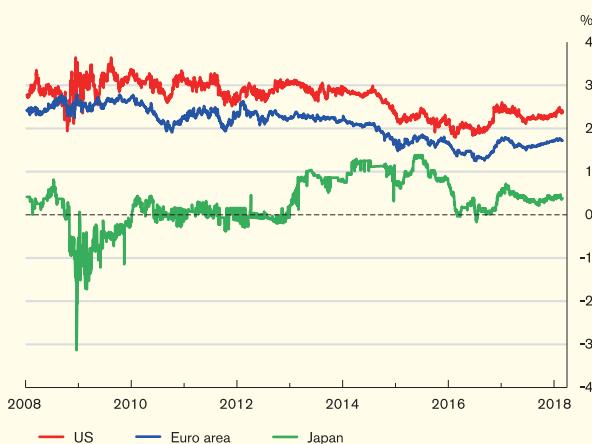
Sources: Datastream and Fed.

Second, given the deficit-generating nature of the tax reform plan, a higher issuance of US Treasuries can be expected.<sup>2</sup> This could amplify the upward pressure on longer-term yields at a time when the Fed continues with its balance sheet normalisation programme, which is expected to result in an increase in term premia. Inflation expectations in the US has also been rising since the latter part of 2017 amid increasing odds of the passage of the tax reform bill (Chart 2.5). After staying low for most of 2017, the benchmark 10-year US Treasury yield has risen by more than 70 basis points since the third quarter, partly reflecting market concerns over increasing Treasury supply pressures as well as rising inflation expectations.

<sup>1</sup> US output gap has turned positive since the third quarter of 2017 according to estimates by the Congressional Budget Office, and the unemployment rate, at 4.1% in February 2018, is below many estimates of its natural rate. See also New York Fed Governor Dudley’s speech, “The Outlook for the U.S. Economy in 2018 and Beyond”, delivered on 11 January 2018.

<sup>2</sup> The Joint Committee on Taxation estimated the tax plan would result in an increase of more than US\$1 trillion in the fiscal deficit by 2027, even after taking into account the possibility of stronger growth having a boosting effect on tax revenues.

**Chart 2.5**  
5-year, 5-year forward inflation expectations



Source: Bloomberg.

Separately, a key question is whether the natural rate of interest ( $R^*$ ), which is a key component of the long-term interest rate, would continue to remain low for a long period as commonly envisaged.<sup>3</sup> While estimates of  $R^*$  differ, it is generally agreed that it has fallen sharply since the global financial crisis (GFC).<sup>4</sup> Nevertheless, there are upside risks to  $R^*$  in the US in the period ahead, stemming from a lower national savings rate due to the expected increase in fiscal deficits, and a possible increase in the investment rate supported by corporate tax cuts and a more favourable tax treatment for capital expenditures. A higher  $R^*$ , together with an expected increase in term premia amid the normalisation of the Fed's balance sheet, could point to higher long-term interest rates going forward, thereby posing a headwind to asset valuations.

**Chart 2.6**  
Laubach-Williams estimate of  $R^*$  in the US



Source: Bloomberg.

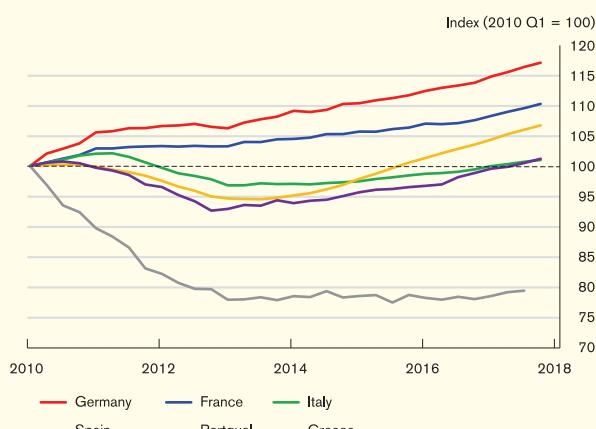
Thirdly, strengthening growth momentum in the euro area and Japan has fostered market expectations that their central banks may reduce monetary accommodation going forward, which, if materialised, could presage a synchronised tightening of global monetary conditions. In the euro area, the cyclical expansion has turned more broad-based across member economies (Chart 2.7), while in Japan the recovery has also gained traction, with real GDP expanding for the eighth straight quarter in the fourth quarter of 2017. While the European Central Bank (ECB) and the Bank of Japan continued to signal an accommodative monetary policy in view of subdued inflationary pressures, the brighter growth outlook (and the sustained tightening of labour market conditions in Japan) has already led some market participants to foresee a further scaling down of their quantitative easing (QE) programmes in the near term.<sup>5</sup>

<sup>3</sup> Loosely defined,  $R^*$  is the inflation-adjusted (i.e. real) interest rate that would prevail when actual output equals potential output, and as such represents an equilibrium concept that cannot be observed directly.  $R^*$ , together with expected inflation and term premia, jointly determine the equilibrium long-run interest rate.

<sup>4</sup> It is possible that  $R^*$  has been driven down by structural factors such as a global savings glut and slower trend productivity growth since GFC. For details, see Williams, J. C. (2016), "Monetary Policy in a Low R-star World", *Economic Letter*, Federal Reserve Board of San Francisco.

<sup>5</sup> Nonetheless, the ECB's acknowledgement that the recent euro exchange rate volatility is a concern likely suggests a more cautious approach in tapering its QE programme.

**Chart 2.7**  
**Real GDP of selected member countries of the euro area**



Source: Datastream.

Policy and event risks arising from international politics and geopolitical tensions may also pose a threat to the nascent recovery in global growth and trade flows. The US administration appears to be more inclined to inward-looking trade policies in an attempt to protect domestic industries. Recent examples included the announcements of imposition of import tariffs on solar panels and washing machines in January 2018, and on steel and aluminium in early March, raising fears of retaliatory responses from its trading partners. At the same time, there are uncertainties regarding the post-Brexit trade arrangements between the UK and the rest of the European Union, which are currently under negotiation. If these developments result in an increase in trade frictions, they could hamper global trade flows and reduce global production efficiency. In addition, any unexpected escalation in geopolitical tensions (for example, risks of military conflicts on the Korean Peninsula, political instability in the Middle East and lingering risks of terrorist attacks) could heighten global financial market volatility.

In East Asia<sup>6</sup>, growth gained further momentum in the second half of 2017, ending the year on a strong note. Real growth accelerated to 4.3% in 2017, marking the fastest expansion since 2012. The external sector remained the primary driver for growth, while domestic demand provided steady support (Chart 2.8). The accelerated recovery in advanced economies, stronger-than-expected growth in Mainland China and the upturn in global demand for tech products boosted exports in the region.

**Chart 2.8**  
**East Asia: Domestic demand and exports**

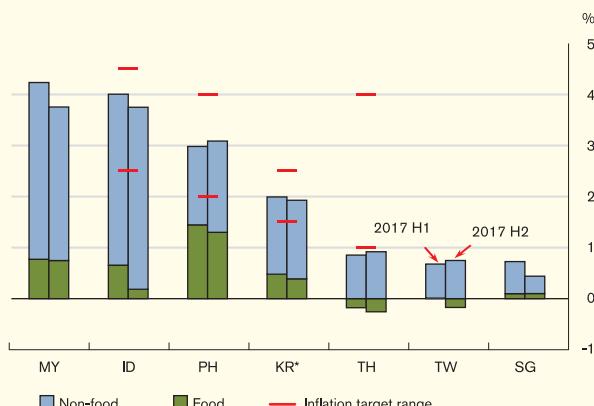


Sources: CEIC and IMF.

Inflationary pressures have so far been contained. Headline inflation in East Asia has softened somewhat in the second half of 2017, influenced by lower food price inflation and stabilised energy prices (Chart 2.9). Core consumer price index inflation (excluding food and energy) remained subdued, amid sluggish wage growth in multiple economies.

<sup>6</sup> East Asian economies refer to Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand.

**Chart 2.9**  
**East Asia: Headline CPI inflation**



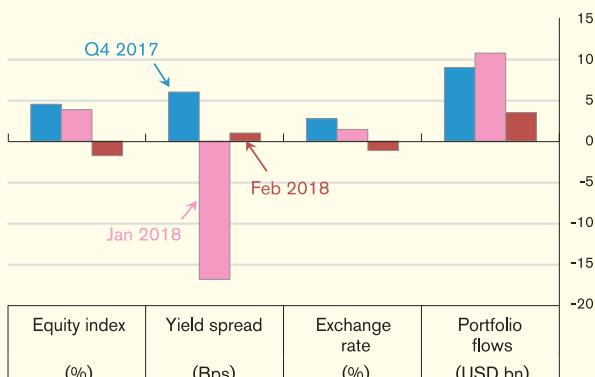
\*Note: MY – Malaysia, ID – Indonesia, PH – the Philippines, KR – South Korea, TH – Thailand, TW – Taiwan, SG – Singapore. South Korea set 2% as its inflation target point since 2016, with +/- 0.5% as accountability range.

Sources: CEIC and central banks.

Favourable economic conditions were accompanied by sizable capital inflows and a remarkable rally in financial assets in 2017 and early 2018 (blue and pink bars, Chart 2.10). In 2017, capital inflows rebounded strongly throughout the year, with total annual portfolio flows reaching their highest level since 2010. After the strong financial market rallies, valuations have risen across asset classes in the region. Compensation for credit risks further narrowed in the second half of 2017, while benchmark equity indices rose across the region. Regional currencies generally appreciated against the US dollar.

The strong rally in financial assets halted in early February, however, led by the global equity sell-off and a sudden reversal of market sentiment (see the red bars in Chart 2.10). Asian equities suffered sharp and broad losses in February. Bond yield spreads widened across countries and sectors, portfolio inflows slowed and regional currencies weakened slightly.

**Chart 2.10**  
**East Asia: Financial market performance**



Note: The chart shows the average changes in (1) benchmark equity indices, (2) 10-year local sovereign bond yield spread over the US Treasury bond yield, (3) regional currencies' exchange rate against USD; and (4) total EPFR portfolio flows, including bond and equity funds, in seven East Asian economies. The economies are Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand.

Sources: Bloomberg, CEIC and EPFR.

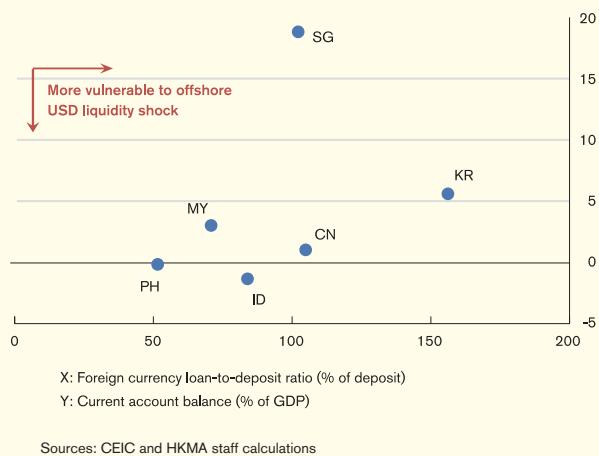
Barring any shocks, the near-term outlook for East Asia is expected to remain favourable, along with the cyclical upswing and broadly accommodative monetary conditions. Nevertheless, positive economic prospects are vulnerable to a number of downside risks.

- *Sharper-than-expected tightening of global monetary conditions* – In addition to uncertainties in the pace of the Fed's monetary policy normalisation and the possibility of simultaneous tightening by major central banks, the “deemed repatriation” provision under the newly-passed US tax reform could also tighten off-shore US dollar liquidity, though the impact is likely to be manageable based on past experience.<sup>7</sup> Any sharper-than-expected tightening in global monetary conditions

<sup>7</sup> The 2004 Homeland Investment Act established a one-time tax holiday for accumulated overseas profits of US corporates. Over 2004-2006, about one-third of accumulated global non-repatriated profits (around US\$362 billion) have been repatriated, and a handful tax haven economies were responsible for a large portion of the repatriation. During that episode, repatriation originated from Asia was at a lower level (around US\$30 billion), likely reflecting Asia's position as a destination for foreign direct investment more than a tax haven. Compared with the 2004 episode, Asia seems to remain a favorable destination for foreign direct investment. In addition, the potential repatriation might be more gradual as the current “deemed repatriation” provision does not have a specified time-frame. For details about the 2004 episode, see Redmiles, M. (2008). “The one-time received dividend deduction”, *Statistics of Income Bulletin*, Spring, p.102-114.

could pose risks to growth and asset markets. In particular, economies with fast growth in US dollar debt, higher levels of foreign currency mismatch, and weak external balances are likely to be more vulnerable to a tightening in offshore US dollar liquidity (Chart 2.11).

**Chart 2.11**  
**East Asia: Foreign currency loan-to-deposit ratio and current account balance**



- *Inward-looking US trade policies* – The US government shifts towards more inward-looking trade policies could trigger global protectionist sentiment, and put a brake on the region's export recovery. Tougher trade measures against economies in the region would directly reduce cross border trade flows in East Asia. In addition, with the increasing trade and investment ties with other regions, any US policy changes in these regions could also affect East Asia's trade flows.
- *Geopolitical risks* – Geopolitical tensions remain elevated on multiple fronts globally. Despite continuous efforts to resolve these tensions, the unsettled situation continues to pose threats to global stability. Any sharp escalation of conflicts could cause massive disruptions to the global economy and financial markets.

These risk factors, if materialised, would not only dampen growth and cause volatility in the asset markets, they could also increase the risk of sharper capital outflows, particularly given the massive capital inflows into emerging Asian economies over the past several years.

Nevertheless, some existing factors might help mitigate the risks. The relatively strong fundamentals of most regional economies and the buffers provided by the macroprudential measures put in place in recent years might help alleviate pressures from external shocks. The rise in the share of institutional investors' inflows in the region's bond market in recent years may also reduce volatility of portfolio inflows as institutional investors are found to be more sticky when market stress is low.<sup>8</sup> In addition, as discussed in Box 1 on page 17, although the outflow of EME bond funds is expected during market downturn, its pace is likely to be less drastic than the episodes of inflows in the past.

Looking ahead, with the prospect of strong growth, a moderate yet steady increase in inflation, and asset price pressures, regional central banks are likely to face the challenge of guarding against risks to growth while limiting the prolonged easy financial conditions on inflation and balance sheet vulnerabilities.

<sup>8</sup> For details, see HKMA Research Memorandum 08/2016, "Determinants of Portfolio Flows to Emerging Asian Economies: Are there any Differences between Institutional and Retail Investors?"

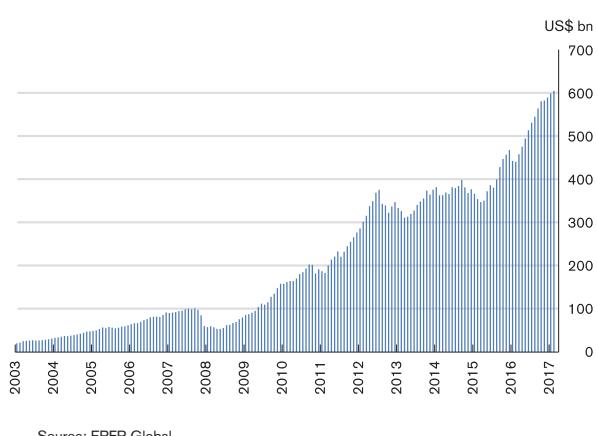
## Box 1

### Response of fund flow to fund performance for emerging market bonds: is it symmetric?<sup>9</sup>

#### *Introduction*

Mutual funds investing in EME bonds have increased almost seven-fold since the GFC (Chart B1.1).<sup>10</sup> From the financial stability perspective, it is important for policy makers to understand how a good fund performance attracts inflow and how a bad fund performance causes outflow. In this box, we examine the relationship between net inflow to these funds and their past performance, in particular whether there is any difference in fund flow response between good and bad performances.<sup>11</sup>

**Chart B1.1**  
**Total net assets of EME bond funds**



#### *Why flow-performance relationship matters?*

It is a well known fact that the relationship between fund flow and fund performance is positive, other things being equal.<sup>12</sup> Good

<sup>9</sup> The box is based on Leung and Kwong (2018), “The flow-performance relationship in emerging market bond funds”, *Hong Kong Institute for Monetary Research Working Paper No.04/2018*.

<sup>10</sup> According to the EPFR Global, the assets under management of EME bond funds totalled US\$604 billion at the end of 2017 compared to US\$88 billion at the end of 2009.

<sup>11</sup> There is no difference between net inflow and net outflow other than their sign.

<sup>12</sup> Christoffersen et al. (2014), “Investor flows to asset managers: causes and consequences”, *Annual Review of Financial Economics*, 6(1), 289–310.

performance attracts inflow and bad performance encourages outflow. What is important, but often ignored, is whether this positive relationship is asymmetric. There are two possibilities. First, it is *concave*: there is more outflow in response to bad performance than inflow to good performance. Second, it is *convex*: there is less outflow in response to a bad performance than inflow to good performance. This is important because without this knowledge, there is a tendency to underestimate or overestimate the potential capital flow reversal when market conditions change abruptly.<sup>13</sup>

#### *Methodology*

We use a fixed effect panel data model, which is defined as:

$$FF_{i,t} = \alpha_0 + \beta_1 RR_{i,t-1} + \beta_2 D(RR_{i,t-1} \leq 0)RR_{i,t-1} + \sum_{k=1}^n \gamma_k Z_{k,i,t} + \varepsilon_{i,t}$$

where  $FF_{i,t}$  is the net fund flow to an EME bond fund  $i$  at time  $t$  and  $RR_{i,t-1}$  is the fund's prior-period total return.<sup>14</sup> To enable comparability across funds,  $FF_{i,t}$  is specified as the value of the net subscription to the fund in the current period divided by the fund size of the preceding period.

The convexity of the flow-performance relationship is estimated by an interaction term of  $RR_{i,t-1}$  and a dummy variable  $D(RR_{i,t-1} \leq 0)$  that equals one if the prior-period fund return is less than or equal to zero, and zero if otherwise. Under this specification, a positive (negative)  $\beta_2$

<sup>13</sup> For example, based on the amount of inflow in a bull market, one will underestimate (overestimate) the potential size of the outflow in a bear market if the relationship is concave (convex).

<sup>14</sup> For robustness check, we also use benchmarked return as an alternative measure of fund performance and the results are very similar. Benchmark return is defined as a fund's total return subtracting the return of the market benchmark index, with both rates of returns in US dollar terms.

would indicate that fund flow is more (less) sensitive to a negative return. In addition to fund performance, other explanatory variables ( $Z_{k,i,t}$ ) are included in the model to control for various factors that can affect fund flow, including the age of a fund, level of market risk aversion, lagged fund flow, fund size and volatility of its past return.

### Data

Our sample consists of 1,784 EME bond funds domiciled around the world.<sup>15</sup> For each fund, data about its net fund flow, net asset value, fund return and other fund-specific details are retrieved from the Morningstar database at monthly frequency. The data of market-level explanatory variables are obtained from Bloomberg. Subject to data availability, the sample period runs from January 2000 to December 2016.

### Empirical results

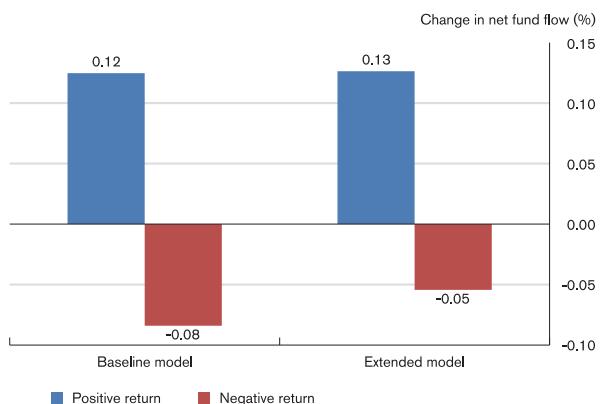
Our findings suggest a *convex* flow-performance relationship for EME bond funds. As shown in Table B1.A, in the baseline model, fund flow reacts positively to past return as  $\beta_1$  is found to be positive at 0.12 and significant. The coefficient of the interaction term ( $\beta_2$ ) is found to be negative at -0.04 and significant, implying a convex relationship. This relationship remains unchanged in the extended model where other control variables are added. Fund flow sensitivities towards positive and negative performance are shown in Chart B1.2.

**Table B1.A**  
**Summary of fund level regression result**

	Dependent variable: $FF_{it}$ Emerging market bond fund flow	Baseline model	Extended model
<i>Constant</i>	-0.07	3.87	
$RR_{i,t-1}$	0.12	0.13	
$RR_{i,t-1} \times D(RR_{i,t-1} \leq 0)$	-0.04	-0.07	
$LN(TNA_{i,t})$		-0.13	
$VIX_t$		-0.03	
$LN(Fund\ Age_{i,t})$		-0.81	
No. of observations	79,288	79,288	
Adjusted R-squared	0.255	0.259	

Note: All coefficients in the table are significant at 99% level.

**Chart B1.2**  
**Sensitivities of net fund flow towards positive and negative returns**



Note: The bars represent the corresponding changes in net fund flow when fund return increases (decreases) by one percentage point.

### Reasons for a convex flow-performance relationship

Broadly speaking, there are three possible explanations for the shape of the asymmetric flow-performance relationship in EME bond funds.

- (1) The first explanation lies in the practices taken by asset management companies to pre-empt a fire sale risk. The risk is notable for funds holding illiquid assets as fund managers have to accept a large discount in selling these assets to meet investors' redemption. Since these extra costs are borne by the remaining investors, the first batch of redeeming investors have a first mover advantage over others. Such an advantage will motivate investors to redeem

<sup>15</sup> The funds are chosen on the basis that they are under the Morningstar category “Emerging Markets Fixed Income”.

their funds once market conditions deteriorate, potentially leading to a large outflow. There is evidence that such incentive results in a concave flow-performance relationship for funds investing in illiquid assets.<sup>16</sup>

As the assets held by EME bond funds are generally low in liquidity, managers of these funds have adopted practices to pre-empt fire sales. One practice is the precautionary holding of cash that could help avoid selling its underlying illiquid assets at deep discounts when there are large redemptions. As cash holding is typically reported in the fund factsheets that are publicly available, a higher level of cash holding is expected to alleviate investors' concern about fire sales. The higher cash holding ratio of EME bond funds seems to support this conjecture (Table B1.B).<sup>17</sup>

**Table B1.B**  
**Cash holding positions of US and EME bond funds**

Cash holding position (2016)	EME bond funds	US bond funds
Mean (%)	13.86	9.52
Median (%)	6.88	5.46
SD (%)	10.89	7.91
No. of funds	1,251	1,360

Source: Morningstar.

Notes:

1. Cash holding position is the proportion of fund assets held in cash in per cent. Cash encompasses both actual cash and cash equivalents (fixed-income securities with a maturity of one year or less) held by the portfolio plus receivables minus payables.
2. EME bond funds cover funds categorised as "Emerging Markets Fixed Income" according to Morningstar Global Category Classifications (MGCC). US bond funds cover funds under MGCC "US Fixed Income".

Another practice to mitigate the fire sale risk is the swing pricing mechanism, which is the adjustment of a fund's net asset value to pass on the dilution costs of trading to investors associated with purchasing or redeeming the fund. It is found that the mechanism can internalise the transaction costs and liquidation costs incurred by investors who redeem their shares, and neutralise their first-mover advantage from redeeming earlier than others.<sup>18</sup> Note that the EME bond funds in our sample are mostly domiciled in jurisdictions that allow swing pricing (e.g., Luxembourg, Ireland, UK, and Cayman Islands).<sup>19</sup> This may explain why a convex flow-performance relationship is identified.

- (2) The second explanation is related to the bias of media coverage, notably mutual fund advertisements, towards outperforming funds.<sup>20</sup> As these advertisements serve as powerful drivers for inflow into the advertised funds, the attention of fund investors is driven towards the top-performing funds whereas the worst-performing funds are often overlooked, leading to a convex relationship.<sup>21</sup> Investors from EMEs are probably more influenced by media as they are, on average, less sophisticated.<sup>22</sup> Meanwhile, investors from developed countries are typically less familiar with EME markets and more likely to be influenced by advertisements and media reporting.

<sup>18</sup> For empirical evidence about the effect of swing pricing, see Lewrick and Schanz (2017), "Is the price right? Swing pricing and investor redemptions", *BIS Working Papers*, No. 664.

<sup>19</sup> Mutual funds domiciled in the US are allowed to adopt swing pricing only starting from 2018, which is beyond our sample period. For details, refer to: <https://www.sec.gov/rules/final/2016/33-10234.pdf>

<sup>20</sup> For details, see Sirri and Tufano (1998), "Costly search and mutual fund flows", *Journal of Finance*, 53(5), 1589–1622.

<sup>21</sup> For the powerful influence of mutual fund advertisements on fund flow, see Jain and Wu (2000), "Truth in mutual fund advertising: evidence on future performance and fund flows", *Journal of Finance*, 55(2), 937–958.

<sup>22</sup> According to the *OECD/INFE International Survey of Adult Financial Literacy Competencies 2016*, EME based investors generally have a lower level of financial knowledge.

<sup>16</sup> For example, US corporate bonds are relatively illiquid. For the flow-performance relationship of US corporate bond funds, see Goldstein et al. (2017), "Investor flows and fragility in corporate bond funds", *Journal of Financial Economics*, 126(3), 592–613.

<sup>17</sup> To further verify the effect of cash holding on fund flow sensitivity, a sub-sample analysis between EME bond funds with high cash holding and low cash holding is performed. The result suggests that the fund flow sensitivity of high cash holding funds is 16% lower than that of low cash holding funds at negative return on average.

(3) The third explanation concerns the higher participation costs of EME bond funds.<sup>23</sup> A rational investor will invest in a fund only if its expected return exceeds participation costs. As the expected return of a fund is often based on its past performance, mutual funds with higher participation costs can attract inflow only when they have a track record of outperforming returns.<sup>24</sup> On the other hand, higher participation costs reduce the incentive of existing investors to unwind their positions in reaction to bad performance. While it is difficult to exactly measure participation costs due to the unobservable nature of certain components, we may still estimate their relative magnitudes by looking at the summary statistics of bond fund net expense ratios in Table B1.C. Together with the higher average transaction costs in emerging markets, it seems reasonable to conclude that investors in EME bond funds face higher participation costs when making fund investments.<sup>25</sup>

**Table B1.C**  
**Net expense ratios of EME and US bond funds**

Net expense ratios	EME bond funds	US bond funds
Eightieth Percentile	0.88	0.40
Sixtieth Percentile	1.05	0.58
Fortieth Percentile	1.25	0.78
Twentieth Percentile	1.56	0.97
No. of funds	410	939
Median	1.17	0.66

Source: Morningstar.

Note: The expense ratio is the percentage of fund assets paid for operating expenses and management fees in 2016. It is used as a proxy for transaction fees involved in investing in mutual funds.

<sup>23</sup> Participation costs consist of (1) information cost of collecting and analysing information about a mutual fund before investing and (2) transaction cost of subscribing or redeeming fund units. For details, see Huang and Yan (2007), "Participation costs and the sensitivity of fund flows to past performance", *Journal of Finance*, 62(3), 1273–1311.

<sup>24</sup> For empirical evidence about how the expected return of a fund is related to its past performance, see Goetzmann and Peles (1997), "Cognitive dissonance and mutual fund investors", *Journal of Financial Research*, 20(2), 145–158.

<sup>25</sup> For details about average transaction costs in emerging markets, see Ferreira et al. (2012), "The flow-performance relationship around the world", *Journal of Banking & Finance*, 36(6), 1759–1780.

### Concluding Remarks

We find that EME bond funds display a *convex* flow-performance relationship. On the one hand, the potential concavity of these funds is mitigated by practices taken by fund management companies to dampen fund investors' incentives to redeem in reaction to bad performance. On the other hand, the bias of media coverage towards outperforming funds and the relatively high participation costs of EME bond funds increase the convexity of the relationship.

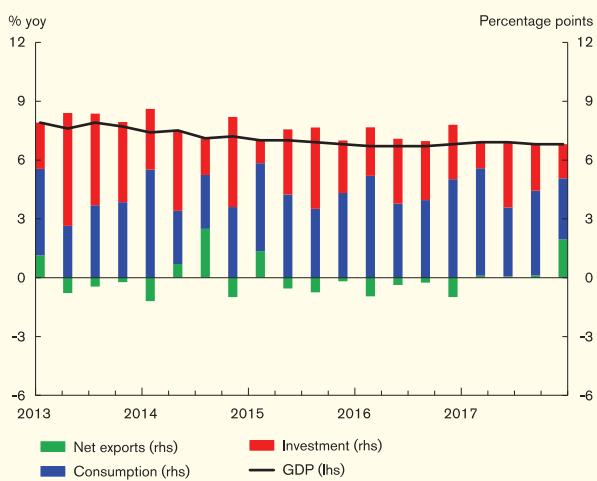
While our findings might to some extent relieve concerns about the fragility of EME bond funds, it is crucial to note that such a convexity critically depends on government regulations, investor base, policies of fund management companies and other factors. Any changes in these factors should be closely watched to ensure a correct assessment of fund flow sensitivity.

## 2.2 Mainland China

### Real sector

Notwithstanding short-term pressures on growth from the ongoing structural reforms and tightening measures in place to contain potential systemic risks, the Mainland economy fared well in the second half of 2017, underpinned by solid consumption as well as robust infrastructure and a rebound in industry spending. In the second half of 2017, real GDP expanded by 6.8% year on year, after growing by 6.9% in the first half (Chart 2.12). For 2017 as a whole, the Mainland economy registered 6.9% GDP growth, higher than the market expectation of 6.8% and the government's growth target of around 6.5%.

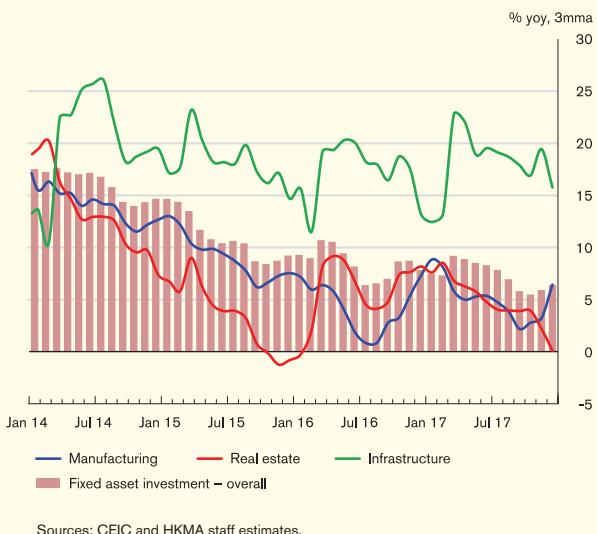
**Chart 2.12**  
**Mainland China: Contribution to GDP growth by demand component**



On the expenditure front, consumption remained robust in the second half of 2017 and continued to be the most important driver for economic growth, albeit showing some signs of moderation in the last quarter. On gross capital formation, overall business spending slowed amid the cooling of the real estate market. In contrast, manufacturing investment rebounded

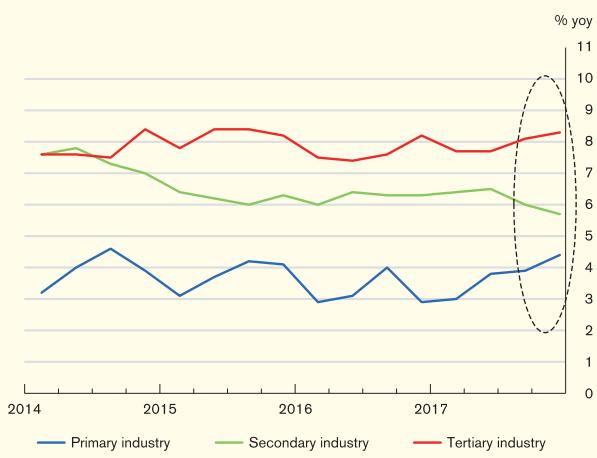
in late 2017, while infrastructure expenditure remained strong (Chart 2.13). Externally, as import growth decelerated at a faster pace than export growth towards the end of the year, the contribution of net exports to overall growth increased in the second half.

**Chart 2.13**  
**Mainland China: Fixed asset investment by industry**



In value added terms, tertiary industry growth edged higher in the second half of 2017 despite a slowdown in the real estate sector (Chart 2.14). Strong business expansion in the service sector was underpinned by fast growth in subsectors, such as financial and information technology industries as well as the rapid development of the internet-related economy. In comparison, growth in the secondary industry slowed, in part reflecting slower construction activities amid the cooling of the property market, and further de-capacity and deleveraging in lower value-added and less efficient sectors, such as commodity-related mining and processing. Some higher value-added sectors such as electronic equipment and pharmaceuticals, continued to record strong growth.

**Chart 2.14**  
**Mainland China: GDP growth by industry**



Sources: CEIC, NBS and HKMA staff estimates.

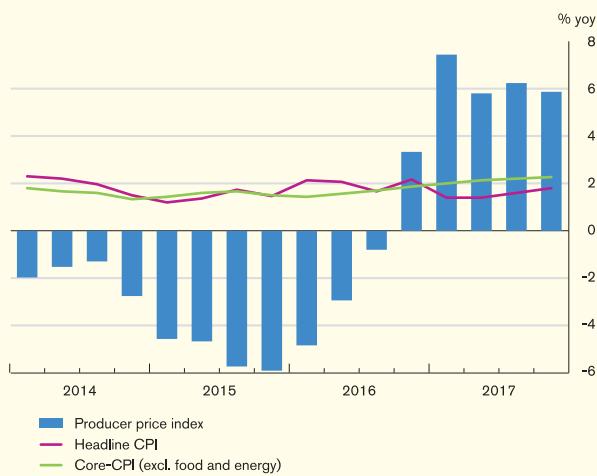
Looking ahead, the near-term growth prospects remain positive. In 2018, the authorities will continue to adopt a proactive fiscal policy stance, which may help cushion adverse economic developments, if necessary. In addition, there are increasing signs of the emergence of the “new economy” in past quarters, with strong business expansion in sectors such as high value-added manufacturing and services. However, it remains to be seen to what extent such positive business expansion could help offset the downward pressures exerted by the cooling of the property market and continued deleveraging and de-capacity of inefficient manufacturers if Mainland authorities push ahead further with structural reforms and contain potential systemic risks through tightening measures.

Despite better-than-expected economic performance in 2017, policymakers continued to set the economic growth target for 2018 at around 6.5%. This may reflect a higher tolerance of Mainland authorities for slower growth and a shift in policy focus to growth quality from speed. To achieve this, the government announced that containing financial risks, reducing poverty and tackling environmental pollution would be the key priorities for economic policy in the coming three years, along with the policy agenda to further push ahead

with the supply-side reforms. Latest consensus forecasts by market analysts expect real GDP to grow by 6.5% in 2018.

In the second half of 2017, consumer price inflation remained benign amid stable economic conditions, though increasing slightly from the first half. Headline consumer price inflation increased from 1.4% year on year in the first six months of 2017 to 1.7% in the second half, as declines in food prices narrowed from -2.2% year on year to -0.8% during the same period (Chart 2.15). Core inflation, after excluding food and energy prices, edged higher from 2.1% in the first half to 2.3% in the second half. At the wholesale level, producer price inflation hovered at a range of around 5–7% year on year in the second half amid elevated commodity prices.

**Chart 2.15**  
**Mainland China: Consumer price and producer price inflation**



Sources: CEIC, NBS and HKMA staff estimates.

In the near term, elevated upstream price inflation may continue to pass through to consumer prices, while the low-base effect of food prices could also add upward pressures on headline inflation. However, offsetting factors such as the structural reforms and tightening policies in place aimed at containing systemic risk may further weigh on domestic demand and thereby help alleviate inflationary pressures.

## Asset Markets

During the review period, the tightening measures introduced by the authorities to contain systemic risks continued to affect asset market performance in Mainland China. For instance, the equity market remained largely benign amid tightened liquidity conditions, with margin transactions staying at low levels (Chart 2.16).

**Chart 2.16**  
Mainland China: Major stock market indices

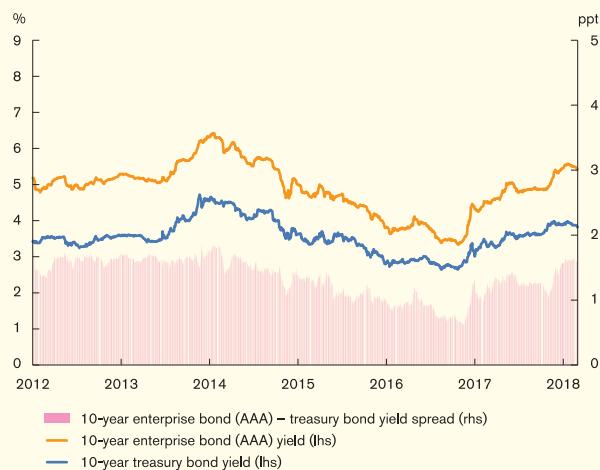


Sources: CEIC and HKMA staff estimates.

In the bond market, tightened interbank liquidity conditions continued to drive up issuance costs, with both 10-year government and enterprise bond yields picking up to a new high since 2015 (Chart 2.17). The yield spread between corporate bonds and government bonds also increased, despite improved corporate financial positions amid better-than-expected economic activities. Increased corporate bond yield spread might have in part reflected stronger financing needs of Mainland firms during the recent tightening in bank lending, as well as further reduced risk appetite of investors amid continued financial deleveraging.

**Chart 2.17**

### Mainland China: 10-year enterprise and government bond yields

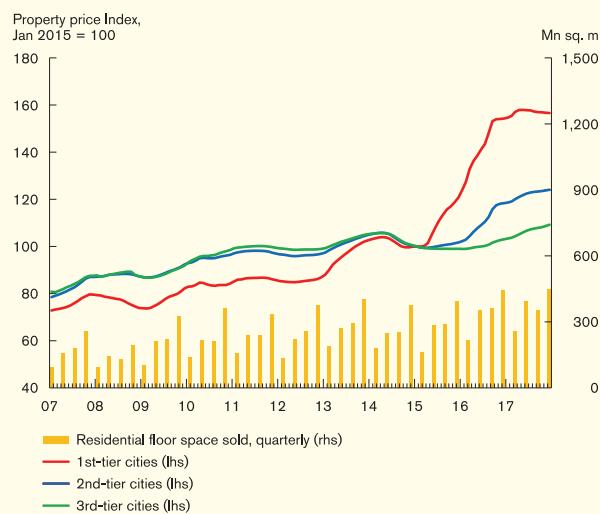


Sources: Wind and HKMA staff estimates.

With the tightening measures in place, including increased down-payment requirements and home purchase and sale restrictions, Mainland property markets showed signs of cooling down during the review period, especially in first-tier cities. Housing prices in these cities have stabilised since mid-2017 (Chart 2.18), while property transactions were less active.

**Chart 2.18**

### Mainland China: Residential prices by tier of cities and floor space sold



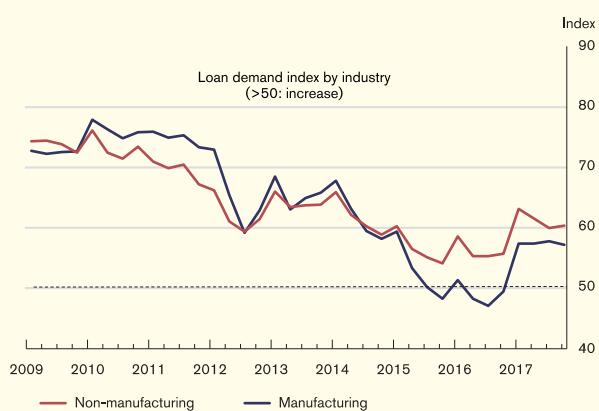
Sources: CEIC and HKMA staff estimates.

In lower-tier cities, property prices inched up further, but at a slower pace. Despite weaker market sentiment, housing oversupply issues, which plagued third-tier cities in previous years, remained largely in check. By the end of 2017, the inventory-to-sales ratio in third-tier cities declined to 14 months from the peak of 25 months in early 2015. There has been some cooling in the property market, but whether housing prices can be sustained at the current level, given stretched affordability, remains a key risk for Mainland financial stability. To contain the risk and promote a stable and healthy development of the property market, the authorities accelerated the construction of indemnificatory housing, while planning to speed up the development of the rental market along with a more flexible system to increase land supply, as proposed at the Central Economic Work Conference in December 2017.

#### Credit and asset quality

Amid robust economic performance, loan demand from Mainland companies remained strong in the second half of 2017. According to a quarterly survey by the People's Bank of China (PBoC), strong loan demand appeared to be across the board, coming from both manufacturers and service providers (Chart 2.19).

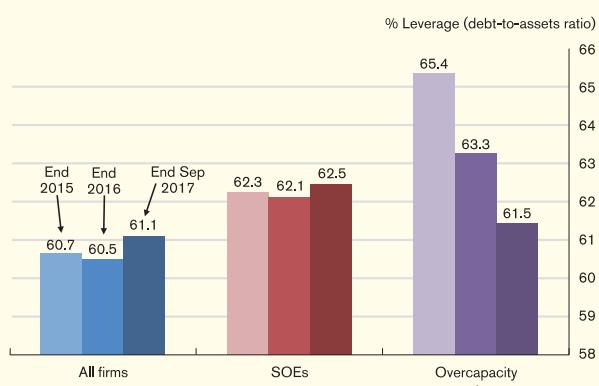
**Chart 2.19**  
**Mainland China: Loan demand index by industry**



Sources: PBoC and HKMA staff estimates.

Despite the elevated loan demand, year-on-year growth in renminbi loans remained largely stable during the review period at around 13% amid the tightening measures aimed at corporate deleveraging. In particular, banks continued to strengthen their loan underwriting standards on vulnerable borrowers, which helped to keep in check the exposure of banks to firms in overcapacity sectors. As a result, the leverage ratio of firms in overcapacity sectors further declined with stronger growth in corporate earnings amid the recent economic recovery (Chart 2.20).

**Chart 2.20**  
**Mainland China: Corporate leverage of SOEs and overcapacity sectors**

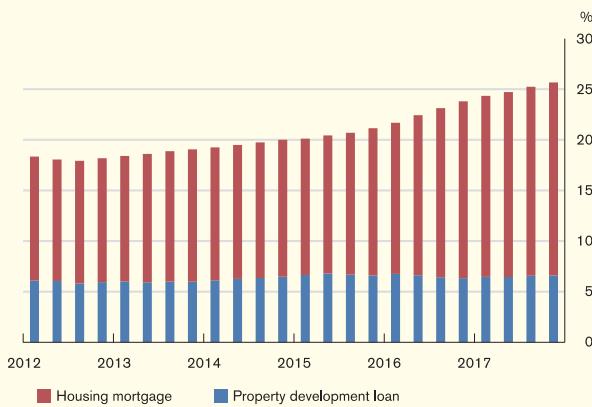


Sources: Bloomberg and HKMA staff estimates.

In comparison, the overall leverage ratio of SOEs picked up slightly in the first three quarters of 2017 amid strong infrastructure spending. Although this may suggest that Mainland banks' exposure to SOEs increased, there is also reason to believe that credit allocation efficiency among SOEs actually improved, probably as more bank loans were granted to SOEs with better repayment ability. Specifically, Box 2 shows that the borrowing constraint of SOEs with weaker repayment ability appeared to have hardened in recent years against those with better repayment ability. Although, in general, SOEs still enjoyed more favourable borrowing conditions than private firms. The tighter borrowing constraints were likely due to a drop in support, for example through implicit guarantees from local governments amid recent SOE reforms.

In view of the risks associated with recent developments in the property market, banks also further strengthened credit underwriting requirements to smaller and more vulnerable developers. As a result, the direct exposure of banks to property developers remained largely stable in 2017 at around 7% of total bank loans (Chart 2.21).

**Chart 2.21**  
**Mainland China: Share of mortgages and developer loans in total bank loans**



Sources: CEIC and Wind.

In contrast, Mainland banks' exposure to mortgages continued to pick up despite tightening measures in place, such as increased down payment requirements. That said, the size of the exposure remained not large at around 19% of total outstanding bank loans. In addition, the pace of expansion in such exposure slowed in tandem with a deceleration in mortgage loan growth amid a cooling property market in recent quarters.

However, while growth in mortgage loans slowed, some market analysts suggested that tightened loan-to-value ratios might have led home purchasers to use short-term loans to finance their mortgage down payment in recent quarters. Latest data shows that newly increased short-term household loans picked up notably from RMB650 billion in 2016 to RMB1,830 billion in 2017 (Chart 2.22). While the overall household leverage, measured by the total household loans over total household

deposits, remained low at around 49% in 2017, the fast expansion of household borrowing should still warrant close monitoring if the trend continues.<sup>26</sup>

**Chart 2.22**  
**Mainland China: Short- and long-term newly increased household loans**



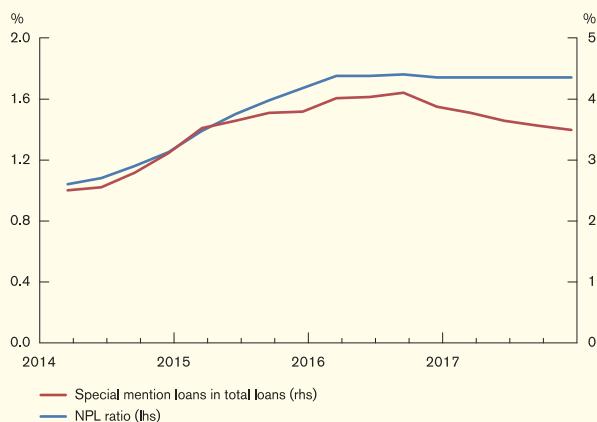
Sources: CEIC and HKMA staff estimates.

The asset quality of banks showed signs of improvement during the review period, thanks to subsided financial risks amid tightening measures and stable economic conditions. In particular, while the overall non-performing loan (NPL) ratio of Mainland banks stayed largely unchanged in the second half of 2017, the share of special mention loans in total bank loans continued to decline (Chart 2.23). Meanwhile, the bad debt coverage ratio of banks also improved slightly to 181% in the fourth quarter of 2017 from 176% at the end of 2016.

<sup>26</sup> Total household loans used in calculating Mainland household leverage include only consumption loans but not operating loans.

**Chart 2.23**

**Mainland China: NPL ratio and the share of special mention loans in total bank loans**



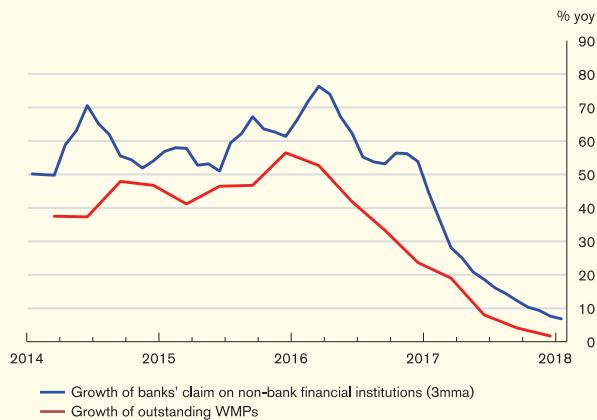
Sources: CBRC and HKMA staff estimates.

Despite the improvement in overall banking soundness, some weak links remained especially the asset quality of a number of smaller banks. For instance, the NPL ratios of rural commercial banks slightly increased to 3.2% at the end of 2017 from 2.8% in June.

During the review period, authorities stepped up oversight in the banking sector to reduce financial risks associated with shadow banking activities. In particular, authorities continued to push ahead with financial deleveraging to limit the involvement of banks in shadow banking activities. As a result, the expansion in banks' claim on non-bank financial institutions further slowed to a single-digit pace amid tighter liquidity conditions and higher interbank funding costs towards early 2018 (Chart 2.24), with the share of banks' claim on non-bank financial institutions in the total bank assets stabilising at around 12%.

**Chart 2.24**

**Mainland China: Growth of bank's claim on non-bank financial institutions and outstanding wealth management products (WMPs)**



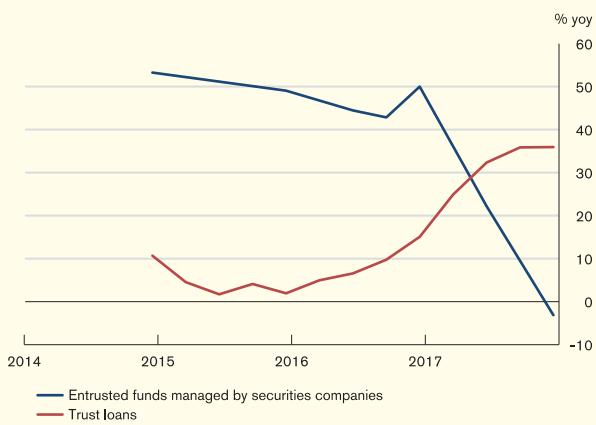
Sources: CEIC, Wind and HKMA staff estimates.

In Mainland China, shadow banking activities are also financed by WMPs in addition to interbank funding. One reason for the rapid expansion of WMPs in the past few years is that Mainland investors tend to believe they will be bailed out no matter what happens, especially when the WMPs are issued by large banks. By the end of 2017, the outstanding size of bank issued WMPs totalled some RMB30 trillion, or 12% of total banking liabilities. In view of this, containing the potential systemic risk associated with the involvement of banks in WMP issuance and promoting a sustainable development of the wealth management business have become the key focus of authorities in Mainland China.

To this end, the authorities announced last November a plan to end the implicit guarantee underpinning asset management business including WMPs. This, together with other tightening measures in place, further weighed on the expansion of WMPs (Chart 2.24). Following the stabilisation in banks' exposure to non-bank financial institutions as well as WMP issuance, the expansion of shadow banking activities, such as trust lending and entrusted funds management by securities companies, also moderated notably in 2017 (Chart 2.25).

**Chart 2.25**

**Mainland China: Growth of trust loans and entrusted funds managed by securities companies**



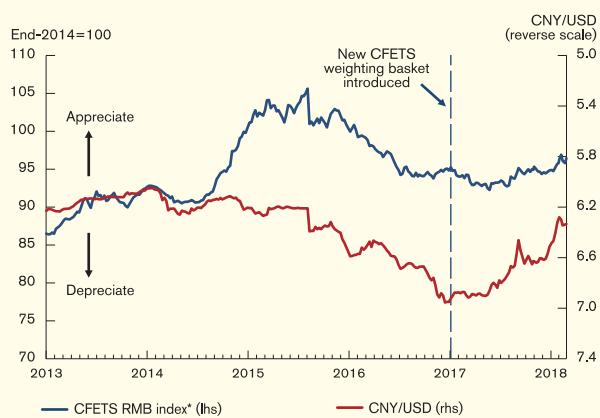
Sources: CEIC and Securities Association of China.

### Exchange rate and cross-border capital flows

After having appreciated in the first three quarters of 2017 along with the weakening of the US dollar, the renminbi was traded in a narrow range between 6.5–6.7 against the US dollar for the rest of the year before rising further by 2.8% in the first two months of 2018 (Chart 2.26). The renminbi exchange rate strengthened against a basket of currencies, with the China Foreign Exchange Trade System (CFETS) RMB index rising by 2.9% during the review period. In early 2018, the PBoC announced that market makers contributing to the onshore renminbi (CNY) fixing formation could decide on their own whether to consider the counter-cyclical factor when submitting the CNY fixing quotation.

**Chart 2.26**

**Mainland China: The CFETS RMB index and the renminbi exchange rate against the US dollar**



\* Index before December 2015 is estimated according to the weight of the CFETS RMB basket.

Sources: CEIC and HKMA staff estimates.

Amid the stable economic conditions and subdued financial risks, capital outflow pressures eased notably during the review period. Specifically, headline foreign reserves in Mainland China had increased for twelve months before retreating slightly to US\$3,134 billion in February 2018. In addition, the two most commonly-used measures for cross-border capital flows – the changes in foreign reserves excluding valuation effects as well as in the PBoC foreign exchange (FX) purchase position – both became notably less volatile in the second half of 2017 compared with the first half (Chart 2.27).

**Chart 2.27**

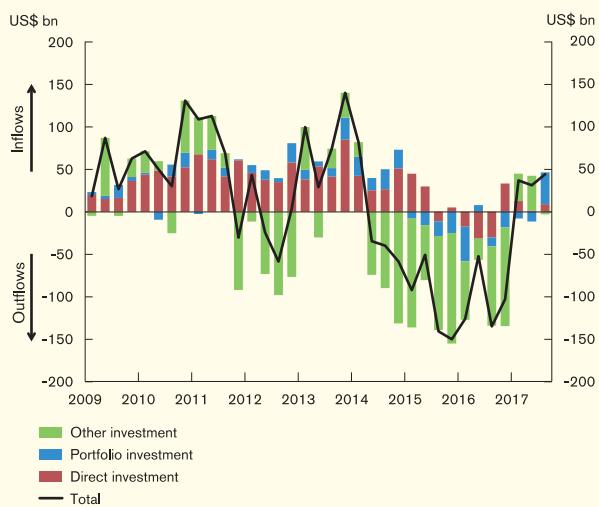
**Mainland China: Changes in PBoC FX purchase position and foreign reserves**



Sources: CEIC, SAFE and HKMA staff estimates.

The latest statistics on the balance of payments also pointed to reduced capital outflow pressures, with the net cross-border capital flows staying positive in the first three quarters of the year (Chart 2.28). In particular, while net cross-border flows through direct investment remained benign in the first three quarters of 2017, the notable net inflows through other investment in the first half were replaced by strong net inflows through portfolio investment in the third quarter.

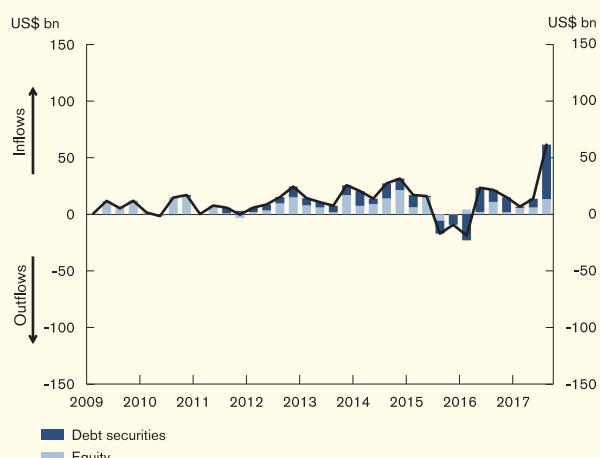
**Chart 2.28**  
**Mainland China: Net cross-border capital flows by type of flows**



Sources: CEIC, SAFE and HKMA staff estimates.

A further breakdown of portfolio investment suggests the strong net inflows in the third quarter were likely driven by elevated offshore bond issuance by Mainland firms amid tightened onshore liquidity conditions, and increased foreign investment in onshore debt securities following the launch of the Bond Connect in July last year (Chart 2.29).

**Chart 2.29**  
**Mainland China: Cross-border capital flows through portfolio investment: liability side**



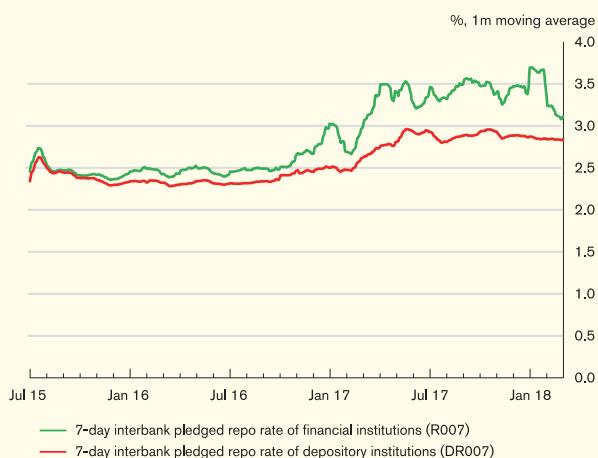
Sources: CEIC, SAFE and HKMA staff estimates.

Looking ahead, while capital outflow pressures may continue to stay subdued over the short term amid improved market sentiment, the uncertainties in monetary conditions among major advanced economies, future movements in the US dollar exchange rates as well as the potential impact of US tax reforms on fund repatriation would also affect the future outlook for cross-border fund flows in Mainland China.

### Fiscal and monetary policy

On the monetary policy front, the PBoC continued to maintain a prudent and neutral policy stance during the review period. Reflecting authorities' determination to contain potential systemic risks through financial deleveraging, the interbank borrowing costs stayed elevated during the review period for both banks and non-bank financial institutions (Chart 2.30).

**Chart 2.30**  
**Mainland China: Interbank repo rates**



Sources: Wind and HKMA staff estimates.

Tight interbank liquidity conditions continued to push up the financing cost of end users during the review period, with the weighted average interest rate of loans offered to non-financial enterprises and other sectors further rising to around 5.7% in the fourth quarter of 2017 from 5.5% nine months earlier. With the increased interest rate, M2 growth as well as expansion in outstanding aggregate financing further slipped to 8.8% and 11.2% year on year respectively at the end of February 2018 from 9.5% and 12.8% at the end of June.

To offset the adverse effect of tightened liquidity conditions on the overall economy, the central bank continued to utilise targeted measures to support bank lending to the private sector, especially small- and medium-sized enterprises (SMEs). Since the second half of 2017, the outstanding size of the Medium-term Lending Facility (MLF) further expanded by 13.1% to RMB4,780 billion at the end of February 2018. The central bank also implemented a targeted cut in the required reserve ratio in January for banks providing sufficient support to inclusive financing, such as loans to small firms. As a result, bank loans extended to small firms expanded at a much faster pace than the overall bank lending growth in 2017 (Chart 2.31).

**Chart 2.31**  
**Mainland China: Growth of bank loans to small firms and total bank loans**



Source: Wind.

Along with targeted easing by the central bank, authorities continued to adopt a proactive fiscal policy stance to stabilise the economy in view of the downward pressures exerted by the ongoing structural reforms in the short run. Apart from the 3.0% budget deficit, the authorities continued to draw down government extra-budgetary funds to finance increased public spending during the review period. Excluding the support from these funds, the gap between public spending and public revenue in 2017 was estimated to be around 3.7% of GDP, 0.7% higher than the budget deficit (Chart 2.32).

**Chart 2.32**  
**Mainland China: Budget deficit and difference between public spending and public revenue**



Sources: Government Work Report, Wind and HKMA staff estimates.

In 2018, fiscal policy will remain proactive. The Mainland government announced to maintain the budget deficit at RMB2.38 trillion, the same as in 2017, but the budget deficit to GDP ratio declined from 3% in 2017 to 2.6% in 2018 as GDP expands further.

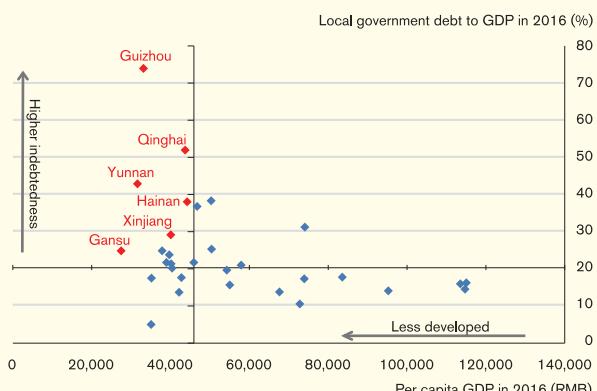
In particular, to shore up private investment and consumption, the authorities will further cut business and household taxes by some RMB800 billion, and reduce business fees and costs by RMB300 billion this year. On the expenditure side, the authorities pledged to further invest in infrastructure projects in 2018. For instance, the government planned to funnel RMB732 billion in railway construction and RMB1.8 trillion in highway and waterway projects.

Reflecting the proactive fiscal policy, the liability of the Mainland government further increased. In 2017, Mainland local government debt expanded by 7.5% to RMB16.5 trillion, compared with an increase of 3.8% a year earlier. Thanks to the stronger nominal growth of GDP, the debt to GDP ratio for local governments actually declined slightly from 21% in 2016 to 20% in 2017.

Despite the decline in debt to GDP ratio, the risk associated with local government debt should not be ignored, especially for provinces with weaker fiscal positions. Our analyses suggest provinces such as Guizhou, Qinghai, and Yunnan, are likely to face greater repayment pressures given their relatively higher debt to GDP ratio and weaker economic fundamentals (Chart 2.33). Their repayment ability could be further worsened if land sales revenue declines in 2018 amid a further cooling in the property market.

**Chart 2.33**

### Local government debt to GDP ratio and per capita GDP in 2016 by province



Sources: Wind and HKMA staff estimates.

To better contain the risk associated with local government debt, the authorities strengthened supervision of the irregular financing activities of local governments. In particular, in November 2017 the Ministry of Finance required local authorities to audit the existing public-private partnership projects which may help disguise local government borrowing activities. Meanwhile, the China Insurance Regulatory Commission also jointly issued a guideline with the Ministry of Finance in January 2018 to forbid local governments from conducting irregular financing activities through the insurance channels.

## Box 2

### Are SOE reforms in China going anywhere? Evidence from corporate borrowing constraints

#### *Introduction*

The misallocation of credit between SOEs and private firms has been a key distortion in the Mainland economy. While the private sector in total contributed around 60% of GDP, it only occupied around 40% of the outstanding bank loans in recent years<sup>27</sup>.

This misallocation is mainly due to the fact that Mainland SOEs, compared with private firms, have generally been less productive but, with support from governments, usually enjoy better access to the credit market, especially bank loans. Therefore, hardening the borrowing constraint of inefficient SOEs by removing the implicit guarantee from governments has become a major focus of the ongoing structural reforms in Mainland China. These reforms are the key to successfully containing financial risks and promoting sustainable economic growth.

Despite the importance of addressing this credit misallocation, little information is available for policy makers to assess the progress being made, likely due to the fact that the borrowing constraint of SOEs, or indeed for any firm, cannot be directly observed. One way to measure the borrowing constraint of firms is to estimate how sensitive their investment is to the cash flow the firm generates. In general, a firm is deemed to be more financially constrained if it has to rely more on internal cash flows rather than borrowing to invest.

By estimating the investment-cash flow sensitivity of Mainland firms, this study examines the evolution of the borrowing constraints faced by Mainland SOEs and private

firms during recent economic transition. In addition, the study explores whether the changes in the borrowing constraints of SOEs, if any, could be due to reduced support from governments. This may shed some light on the recent progress of the SOE reforms in Mainland China.

#### *An empirical framework to measure the borrowing constraint of firms*

To estimate the borrowing constraint of Mainland firms, we follow the methodology first introduced by Fazzari, Hubbard and Petersen (1988) to measure the investment sensitivity of firms to the availability of the internally generated cash flows<sup>28</sup>. The idea is that firms with tighter borrowing constraints usually have to rely more on internally generated cash flows to invest, and therefore tend to have higher investment-cash flow sensitivity. Our baseline regression specification is detailed as follows,

$$Inv_i = \beta_0 + \beta_1 CF_i + \beta_2 SOE_i + \beta_3 SOE_i * CF_i + \beta_4 X_i + u_i,$$

where  $Inv_i$  is newly increased investment, proxied by the change in tangible assets for firm  $i$ , and  $CF_i$  is firm  $i$ 's internally generated cash flow, measured by earnings before interest, tax, depreciation and amortisation. Both  $Inv_i$  and  $CF_i$  are normalised by the book value of firms' tangible assets.

<sup>27</sup> Loan figures were reported by the PBoC. Contribution of the private sector to GDP was cited from the State Council Circular on Private Investment, Circular no. 2016–12.

<sup>28</sup> Similar methodology for estimating borrowing constraints has been adopted in the literature to analyse Mainland firms. For example, Xu, Xu and Yuan (2013) used this to study the role of political connections in the investment behaviour of family firms, while Héricourt and Poncet (2009) investigated whether foreign direct investment helps alleviate domestic firms' credit constraints.

To compare the borrowing constraints facing SOEs and private firms, a dummy variable  $SOE_i$  and its interaction term with cash flow are added into the specification.  $X_i$  is the set of controlling variables in the specification, which captures other factors that could affect the investment of a firm, such as industry, leverage, size of sales, revenue growth, age of the firm and the firm's repayment ability<sup>29</sup>.

The coefficients of key interest are  $\beta_1$  and  $\beta_3$ , which capture firms' investment-cash flow sensitivity. In particular,  $\beta_1$  measures the investment-cash flow sensitivity of private firms, while the sum of  $\beta_1$  and  $\beta_3$  captures the sensitivity of SOEs. A higher value of the coefficient therefore suggests greater sensitivity, and thus a tighter borrowing constraint facing firms.

#### Data and empirical results

Our dataset consists of around 2,500 non-financial listed firms in Mainland China, covering the period between 2010 and 2016. The investment-cash flow sensitivity of both SOEs and private firms are estimated with a rolling two-year window, which allows us to study the dynamics of the borrowing constraints of Mainland firms over time<sup>30</sup>.

Our results suggest that SOEs tended to have notably lower investment-cash flow sensitivity compared with private firms for most of the time during the period 2010 – 2016, even after controlling for the differences in firm characteristics such as credit risk (Chart B2.1). Our finding seems to confirm the common belief that SOEs in general have better access to the credit markets than private firms in Mainland China.

**Chart B2.1**  
**Estimated investment-cash flow sensitivity of SOEs and private firms**

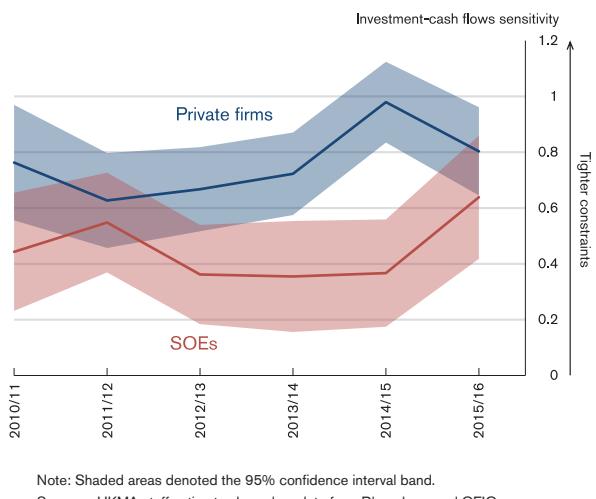
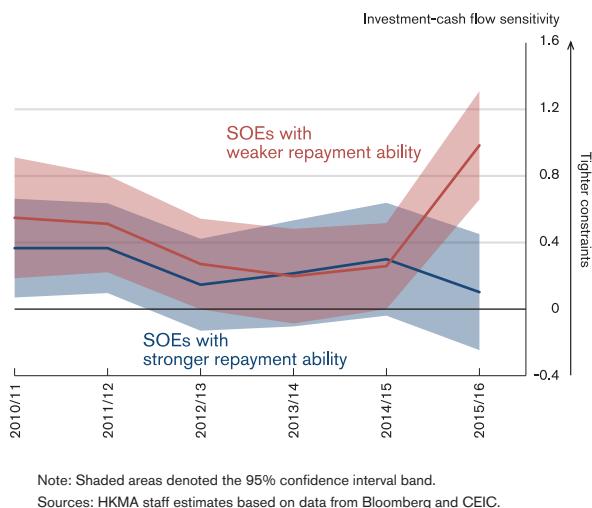


Chart B2.1 points to some signs of hardening in the borrowing constraint of SOEs in 2015 – 16, as the investment-cash flow sensitivity of SOEs picked up and became closer to the level of the sensitivity of private firms. Further analysis suggests that such result is likely driven by a significant hardening in the borrowing constraint of SOEs with weaker repayment ability. Specifically, the investment-cash flow sensitivity of SOEs with an interest coverage ratio below the sample median seemed to have increased notably in 2015 – 16 compared to those with a higher interest coverage ratio<sup>31</sup> (Chart B2.2).

<sup>29</sup> The repayment ability of a firm is proxied by interest coverage ratio.

<sup>30</sup> In order to get smooth and less volatile estimates for each year, we use the two-year average for each variable for estimation.

<sup>31</sup> As a robustness check, we examined other ways of identifying the weak borrowers, such as using an absolute cut-off point of interest coverage ratio or singling out the group of borrowers whose interest coverage ratios were consistently below the sample median during the entire sample period. We find that such alternations do not affect our conclusion.

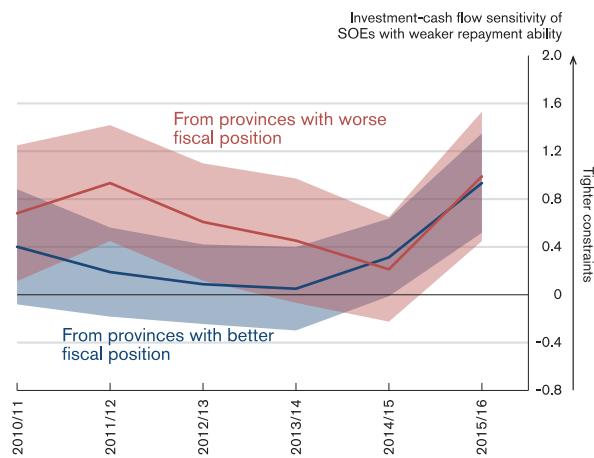
**Chart B2.2****Estimated investment-cash flow sensitivity of SOEs with higher and lower repayment ability**

There are two competing explanations behind the hardening in the borrowing constraint of SOEs with weaker repayment ability. The first explanation is that Mainland banks have become increasingly sensitive to credit risk when lending to SOEs because of the structural reforms which have successfully reduced government support to SOEs in the form of implicit guarantees.

Alternatively, the hardening in the borrowing constraint of SOEs with weaker repayment ability could simply reflect the situation that these enterprises happened to be located in provinces with worse fiscal positions and thus received less support from their local governments in recent years. Therefore, the hardening of the SOEs' borrowing constraints may not necessarily be related to SOE reforms.

Further examination of the location of Mainland firms provides little evidence that weaker SOEs were more concentrated in provinces with worse fiscal positions in 2015 – 16. In fact, the distribution of weaker SOEs across different provinces remained largely stable in recent years, with around half found to be located in the coastal area where for years local governments have enjoyed better economic performance, a lower debt burden and smaller fiscal deficits.

To explore whether reduced government support explains the hardening in borrowing constraints of SOEs with weaker repayment ability, we take a further look at weaker SOEs only and examine the dynamics of the borrowing constraint facing these SOEs in provinces with different fiscal positions.<sup>32</sup> Our results suggest that in the early sample period, fiscal positions of local governments seemed to be an important factor in determining to what extent they could support SOEs to get credit. Therefore, weaker SOEs in provinces with better fiscal positions appeared to have enjoyed a relatively lower borrowing constraint than those located in provinces with worse fiscal positions (Chart B2.3).

**Chart B2.3****Estimated investment-cash flow sensitivity of weaker SOEs in provinces with different fiscal positions**

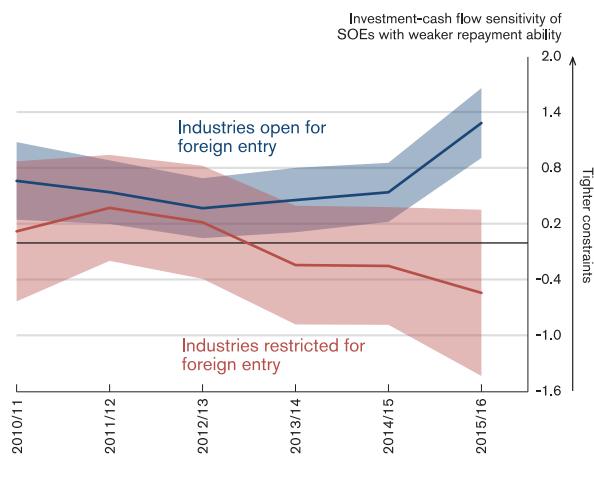
The gap between the borrowing constraints facing weaker SOEs in provinces with different fiscal positions, however, has disappeared in recent years, accompanied by a significant increase in their investment-cash flow sensitivity.

<sup>32</sup> In this study, the fiscal position of a province is defined by the indebtedness of this province, proxied by the debt-to-GDP ratio of the provincial government. In particular, Beijing, Shanghai and provinces with debt-to-GDP ratio less than 30% are classified as provinces with better fiscal positions, while the remaining 17 provinces are classified as provinces with worse fiscal positions.

This seems to indicate that Mainland China has made some progress with SOE reforms. Indeed, provincial governments with better fiscal positions appear to have chosen in recent times to lower the implicit guarantee for less efficient SOEs even if these governments were in a better financial position to do so.

Despite reduced support by governments for weaker SOEs at the provincial level, government support seemed to remain strong in industries with restricted foreign entry. For instance, our analyses found that weaker SOEs generally appeared to have faced tighter borrowing constraints in industries open to foreign entry than in restricted industries (Chart B2.4).<sup>33</sup> In addition, such difference is found to have significantly widened in 2015 – 16, mainly due to a further hardening in the borrowing constraint of weaker SOEs in industries open to foreign entry. In comparison, the borrowing constraint of weaker SOEs in restricted industries appeared to have remained largely unchanged.

#### Chart B2.4 Estimated investment-cash flow sensitivity of weaker SOEs in industries open to/restricted for foreign entry



Little improvement in soft budget constraints facing weaker SOEs in industries with restricted foreign entry may suggest that government support remained strong for these protected industries. Thus, weaker SOEs in these industries could continue to enjoy more favourable borrowing conditions. In view of this, further SOE reforms are still needed to improve credit allocation efficiency in Mainland China.

#### Conclusion

This study analyses whether credit allocation efficiency has improved recently amid the ongoing SOE reforms in Mainland China by exploring the dynamics of the borrowing constraint facing Mainland SOEs. Non-financial listed Mainland firm data suggests that while SOEs in general still enjoyed better access to credit compared with private firms in recent years, there are some signs of a hardening in the borrowing constraint of SOEs, especially those with weaker repayment ability.

The tightened borrowing constraints was found likely driven by reduced support from local governments, which suggests that Mainland China has made some progress in the reforms aimed at lowering implicit guarantees for inefficient SOEs. However, further reforms are still needed as the soft budget constraint of weaker SOEs in protected industries with restricted foreign entry remains largely unchanged.

<sup>33</sup> Industry with restricted foreign entry is defined by the “Catalogue of Industries for Guiding Foreign Investment” released by the National Development and Reform Commission and the Ministry of Commerce in March 2015, including rare materials, public transportation, telecommunication, media and etc.

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### 3. Domestic economy

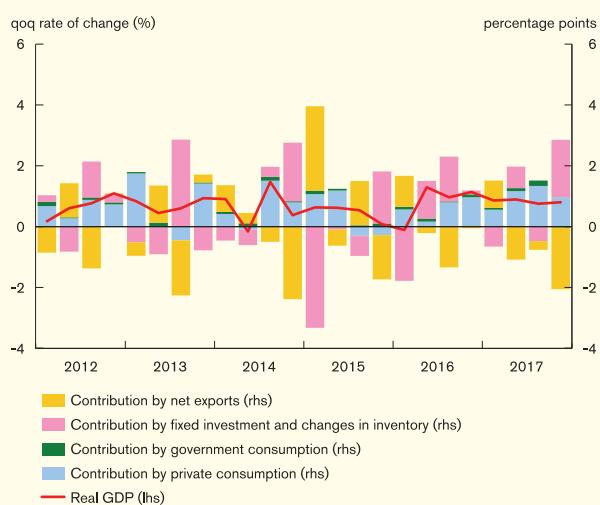
The Hong Kong economy maintained its steady growth momentum in the second half of 2017 amid strong domestic demand and improving export performance. Economic growth for 2018 is expected to remain solid. This outlook is subject to various uncertainties and risks, including those relating to central banks' monetary policy normalisation and global financial market stability, as well as heightened protectionism sentiments and geopolitical tensions. Local inflationary pressures will likely stay moderate in the near future, though some upside risks remain.

#### 3.1 Real activities

The Hong Kong economy sustained its growth momentum during the second half of 2017. On a seasonally adjusted quarter-on-quarter basis, real Gross Domestic Product (GDP) increased by 0.8% in both the third and fourth quarters, similar to the average growth rate of 0.9% over the preceding two quarters (Chart 3.1).

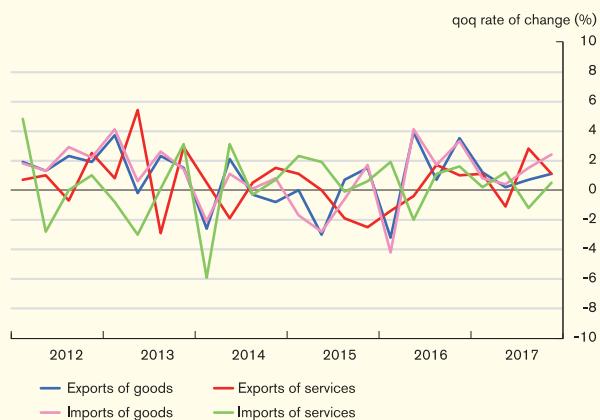
Compared with the first half of the year, growth in private consumption remained robust and continued to be one of the major drivers of GDP growth. The solid consumption growth reflected favourable job and income conditions, the still-confident consumer sentiment, and booming asset prices which provided impetus through positive wealth effect. After being roughly stable for three quarters of the year, overall investment spending rebounded visibly in the final quarter due to stronger business capital expenditure despite softer building and construction activities. On the external front, Hong Kong's export performance improved further on the back of better global trade growth and a gradual recovery in inbound tourism (Chart 3.2). That said, net exports of goods still detracted from GDP growth as imports expanded even faster than exports, while net exports of services contributed positively to GDP growth.

**Chart 3.1**  
**Real GDP growth and contribution by major expenditure components**



Sources: C&SD and HKMA staff estimates.

**Chart 3.2**  
**Exports and imports in real terms**



Source: C&SD.

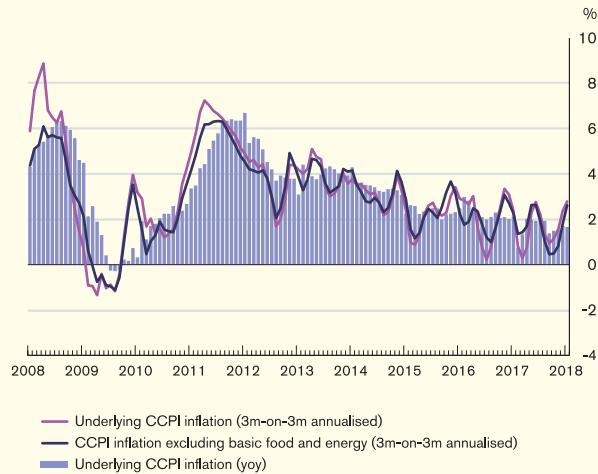
The sustained growth momentum continued to support job creation in the second half of 2017. Total employment grew by around 0.7% during the period, to over 3,850,000, led by increases in the construction sector, the financial and business services sector, and the public administration, social and personal services sector. With real output growth outpacing employment growth, labour productivity showed signs of further improvement.

Economic growth for 2018 is expected to remain solid. Externally, Hong Kong's export performance will continue to benefit from the improving global growth outlook and the gradual recovery in inbound tourism. On the domestic front, private consumption is expected to hold up mainly because of favourable labour market conditions. In view of the eventual rises in Hong Kong dollar interest rates, Box 3 examines the effect of a higher mortgage debt service burden on private consumption. As for fixed capital formation, building and construction activities should progress steadily on the back of rising housing supply and continuing infrastructure projects. While improved economic conditions will support business capital spending, headwinds may come from potential rises in interest rates. For 2018 as a whole, the Government forecasts real GDP growth in the range of 3–4%, while the growth forecasts by international organisations and private-sector analysts range between 2.0% and 4.0%. However, this growth outlook is subject to various uncertainties and risks arising from the external environment as discussed in the previous chapter, as well as those relating to Mainland's economic performance amid financial tightening, and developments in the local asset markets.

### 3.2 Inflation and unemployment

Local inflationary pressures remained well contained in the second half of 2017, although the sequential momentum showed signs of a mild pick up in recent months. On a year-on-year comparison, the underlying composite consumer price index (CCPI) increased by 1.7% in the third quarter and 1.6% in the fourth quarter, comparable with the average rate of around 1.7% during the first half of the year. However, inflation momentum, as measured by the annualised three-month-on-three-month underlying inflation rate, picked up moderately to 2.8% in January 2018 (Chart 3.3). The mild increase in inflation momentum was fairly broad-based, driven by price increases in both tradables and services. In particular, the renewed upward trend in fresh-letting private residential rentals since mid-2016 may have somewhat pushed up the sequential inflation momentum (Chart 3.4). Meanwhile, labour cost pressures continued to be modest in recent quarters (Chart 3.5).

**Chart 3.3**  
**Different measures of consumer price inflation**



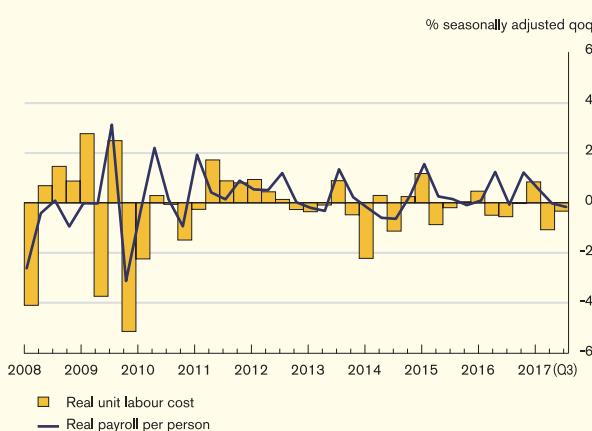
Sources: C&SD and HKMA staff estimates.

### Chart 3.4 CCPI rental component and market rental



Sources: C&amp;SD and R&amp;VD.

### Chart 3.5 Unit labour cost and payroll per person



Sources: C&amp;SD and HKMA staff estimates.

With still-moderate global inflation and steady rises in local costs, inflationary pressures in Hong Kong are expected to remain moderate in 2018, but the underlying inflation rate is likely to pick up gradually from the eight-year low of 1.7% in 2017. For example, the rental component of inflation may gather momentum in the latter part of 2018 because of the feed-through from the increases in fresh-letting private residential rentals. Market consensus predicts the headline inflation rate at a still-moderate level of 2.2% for the year, and the Government projects the underlying inflation rate to be 2.5%.

Nevertheless, this benign inflation outlook is subject to upside risks. Externally, faster-than-expected increases in global inflation or commodity prices could bolster local inflation momentum. Domestically, the labour market tightened recently, with the seasonally adjusted unemployment rate declining from 3.4% in 2016 to 2.9% in December 2017, below 3% for the first time in nearly 20 years (Chart 3.6). Should the labour market strengthen much further, this may exert additional upward pressures on inflation, given that the current output gap is estimated to be near zero.

### Chart 3.6 Unemployment rate



Source: C&amp;SD.

### Box 3

## Measuring the effect of mortgage debt service burden on private consumption

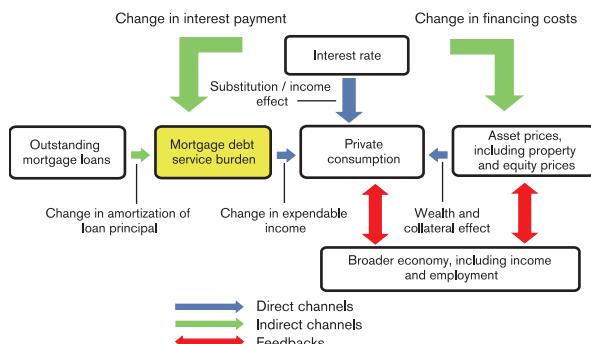
#### *Introduction*

Hong Kong households' mortgage debt has expanded amid the post crisis low-interest rate environment. As Hong Kong dollar interest rates will eventually increase along with the US interest rate normalisation process, it is expected the mortgage debt service burden on households will pick up, posing headwinds to household consumption. As such, this Box examines the effect of a higher mortgage debt service burden on Hong Kong's private consumption.<sup>34</sup>

#### *Measuring the mortgage debt service burden*

The mortgage debt service burden refers to the mortgage debt service payment (i.e. interest payment plus amortisation of loan principal) as a share of income. Chart B3.1 shows the transmission of an interest rate shock to private consumption, highlighting the role of the mortgage debt service burden in the transmission process. Apart from the well-known substitution/income effect and wealth/collateral effects (through influencing asset prices), interest rate shocks in the presence of a mortgage debt service burden could also affect private consumption through changing mortgage interest payments and, therefore, households' expendable income. Such impact is expected to increase with the size of the outstanding mortgage loans. The amortisation of loan principal also changes along with the size of the outstanding mortgage loans, which can affect private consumption through households' expendable income.

**Chart B3.1**  
**Determinants of private consumption**



Source: HKMA staff illustration.

To measure the effect of the mortgage debt service burden on private consumption, we construct a mortgage debt service ratio based on outstanding mortgage debt – namely the outstanding mortgage debt service ratio (OMDSR). The OMDSR covers the total outstanding stock of mortgage debt of all households which is more relevant to aggregate private consumption, whereas the existing timely indicators refer only to new mortgage debt. Largely following the approach adopted by the Bank for International Settlements (BIS),<sup>35</sup> we measure the OMDSR using the standard formula of fixed instalment loans:

$$OMDSR_t = \frac{r_t}{(1 - (1 + r_t)^{-s_t})} \times \frac{D_t}{Y_t}$$

Where  $D_t$  denotes the outstanding amount of residential mortgage loans in the banking sector,  $Y_t$  denotes the total income of owner-occupier households (proxied by multiplying the median income of owner-occupier households with the

<sup>34</sup> A longer version of the analysis can be found in the paper by Chan et al. (2017), "Measuring the effect of mortgage debt service burden on private consumption", *HKMA Research Memorandum 16/2017*.

<sup>35</sup> See, for example, BIS (2016), "BIS database for debt service ratios for the private non-financial sector", *BIS data documentation* ([http://www.bis.org/statistics/dsr/dsr\\_doc.pdf](http://www.bis.org/statistics/dsr/dsr_doc.pdf)).

number of owner-occupier households), and  $r_t$  and  $s_t$  denote respectively the average interest rate and the maturity of the outstanding mortgage loans.

To assess whether the OMDSR can be a reliable measure of the mortgage debt service burden for the aggregate household sector, it is useful to compare the OMDSR with two commonly-used indicators of debt service burden.

Chart B3.2 shows the estimated OMDSR from 1985 – mid-2017, together with the actual median mortgage payment and loan repayment-to-income ratio estimated by the Census and Statistics Department (C&SD)'s quinquennial population census. Both ratios trended down during the early 2000s, consistent with the decline in aggregate household mortgage borrowings following the bursting of the housing bubble in 1997 and the noticeable drop in mortgage interest rates during that period. Despite the sharp rise in property prices in the post-global financial crisis (GFC) period, both ratios remained steady, as the aggregate household leverage on mortgages was constrained by the HKMA's macro-prudential measures on banks' mortgage loans, while the lengthened tenors of new mortgage loans brought down the actual amount of mortgage debt service.

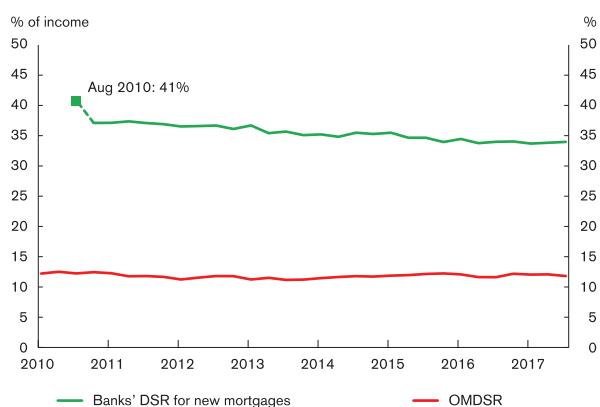
**Chart B3.2**  
**The OMDSR and the median mortgage payment and loan repayment-to-income ratio**



Sources: C&SD and HKMA staff estimates.

The OMDSR is also compared with the banks' debt-servicing ratio (DSR), which is the actual debt repayment-to-income ratio for banks' new mortgage applicants. As shown in Chart B3.3, the OMDSR was lower than the banks' DSR, partly reflecting the fact that the OMDSR covers mortgage repayments on "old" mortgages in addition to that on new mortgages. As "old" mortgages were made at a time when housing prices were lower, the mortgage repayment on these mortgages would accordingly be lower than that on new mortgages. As such, a debt service burden indicator on the outstanding mortgage (i.e. the OMDSR), which covers both "old" and new mortgages, would be lower than an indicator on new mortgage applicants alone (i.e. banks' DSR). In addition, the higher level of the banks' DSR also reflects the inclusion of non-mortgage loan repayment in calculating the banks' DSR in accordance with the HKMA's prudential requirements. Reflecting the prudential limits on the banks' DSR, which should also help restrain the OMDSR, both the OMDSR and the banks' DSR were steady in the post-GFC period.

**Chart B3.3**  
**The OMDSR and banks' DSR for new mortgages**



Note: The HKMA has been compiling banks' DSR since August 2010. For the purpose of comparison, the monthly time series of banks' DSR is transformed into the quarterly average data.

Source: HKMA staff estimates.

Overall, the OMDSR is broadly in line with those commonly-used indicators of the debt service burden, but is more timely and refers to the burden on the total outstanding mortgage debt rather than new mortgage debt only. This gives us confidence in using the OMDSR to assess the influence of the mortgage debt service burden on private consumption.

### *Empirical analysis*

To assess the impact of the mortgage debt service burden on Hong Kong's private consumption, we follow Lai and Lam (2002)<sup>36</sup> and Kang (2016)<sup>37</sup> to estimate an error correction model, where the long-run relationship between real private consumption (proxied by real private consumption per household (PCEH)) and its determinants is expressed as an error correction term in the short run equation. In accordance with theory and empirical evidence, we include real income (proxied by median household income deflated by the CCPI), real housing and financial wealth (proxied by residential property prices and Hang Seng Index respectively deflated by CCPI), and OMDSR as the long-run determinants.

Table B3.A shows the estimation results of the error-correction model based on quarterly data from the first quarter of 1985 to the fourth quarter of 2016. For the long-run equation, all coefficients have the correct signs, with real income, real housing prices and real equity prices having a positive and statistically significant impact on real private consumption, while the OMDSR has a negative and statistically significant impact. According to the estimates, a one-percentage point rise in the OMDSR would reduce household consumption by 0.76% in the long run, affirming the fact that indebtedness

could further render consumption more vulnerable to interest rate rises.<sup>38</sup>

**Table B3.A**  
**Estimated results of the error-correction model**

Explanatory variables	Long-run equation	Short-run equation
Constant	0.53 *	0.00 ***
Error correction term ( $\alpha$ )		-0.14 **
Real median household income <sup>a</sup>	0.63 ***	0.14 ***
Real housing prices <sup>a</sup>	0.28 ***	0.11 ***
Hang Seng Index in real terms <sup>a</sup>	0.03 **	0.05 ***
OMDSR	-0.76 ***	-0.20 <sup>(1)</sup>

Note: <sup>a</sup>denotes log-transformed variables.  
\*\*\*, \*\* and \* denote the estimated coefficient is statistically significant at 1%, 5% and 10% respectively.  
(1) p-value = 0.1911  
Source: HKMA staff estimates.

As for the short-run equation, the error-correction term is negative and significant, indicating the tendency for consumption to adjust to the long-run equilibrium. All the short-run determinants have the expected signs and are statistically significant except for the OMDSR. Overall, our results show that the OMDSR can influence the long-run equilibrium level of real private consumption, while not appearing to have significant impact on the growth of real private consumption in the short run.

### *Policy implications*

Our empirical findings suggest that the HKMA's macro-prudential measures, while aiming to strengthen banks' resilience, can alleviate the impact of interest rate hikes on private consumption through the debt service burden channel. Specifically, the macro-prudential measures can dampen the growth of the

<sup>36</sup> Lai, Kitty and Raphael Lam (2002), "The nexus of consumer credit, household debt service and consumption", *HKMA Quarterly Bulletin*, November 2002.

<sup>37</sup> Kang, Joong Shik (2016), "Private sector activity in Hong Kong SAR and the Fed: transmission effects through the currency board", *IMF Working Paper 16/35*.

<sup>38</sup> We also estimate a long-run equation which includes real interest rate (proxied by 3-month Hong Kong Interbank Offered Rate minus CCPI inflation) as the long-run determinant of real private consumption. The estimated coefficient of real interest rate is positive but not statistically significant, which may reflect the offsetting income and substitution effects. Including real interest rate as the long-run determinants will not affect the size of other long-run coefficients. See Chan et al. (2017) for more estimation details.

aggregate household leverage on mortgages and thereby restrain the mortgage debt service burden in the event of interest rate hikes, thus helping to alleviate the consequent impact on private consumption.<sup>39</sup>

To illustrate, Table B3.B shows the estimated impact of a 200-basis point increase in the mortgage rate on the OMDSR and PCEH, under different counterfactual scenarios with higher outstanding mortgage loans. Based on the current level of the outstanding mortgage loans, a mortgage rate hike of 200 basis points would increase the OMDSR by 2.9 percentage points from 12.0% to 14.9%. If the outstanding mortgage loans were 40% larger than the current level (last row of Table B3.B), the OMDSR would rise from 12.0% to 16.7% in the absence of any rate hike, and increase further by 4.1 percentage points to 20.9% in the event of a 200-basis-point rise in the mortgage rate. As such, higher outstanding mortgage loans would not only raise the OMDSR, but also make it more susceptible to the impact of mortgage rate hikes.

**Table B3.B**  
**Numerical illustration of counterfactual scenarios**

Had the outstanding mortgage loans been higher than the current level by (%)	The OMDSR (%)		Increase in OMDSR (ppt)	Decrease in real private consumption per household (%)
	No rate hike	200-bp rate hike		
(A)	(B)	(C) = (B) - (A)	(D) = -0.76* (C)	
0 (current level)	12.0	14.9	2.9	-2.2
10	13.1	16.4	3.2	-2.5
20	14.3	17.9	3.5	-2.7
30	15.5	19.4	3.8	-2.9
40	16.7	20.9	4.1	-3.1

Source: HKMA staff estimates.

A rise in the OMDSR as a result of the mortgage rate hike would dampen consumption spending, and the effect would be larger if the outstanding mortgage loans were higher. Based on its estimated long-run elasticity with respect to the OMDSR (i.e. -0.76 estimated from the long-run equation), real consumption spending per household would drop by 3.1% if the outstanding mortgage loans were 40% higher, compared with a relatively smaller decline of 2.2% if the outstanding mortgage loans stayed at the current level.<sup>40</sup>

### Concluding remarks

In summary, our empirical findings show that the mortgage debt service burden can influence private consumption. This implies that macro-prudential measures, which help restrain the burden through dampening the growth of the aggregate household leverage on mortgages, may indirectly help alleviate the potential drag on private consumption in the event of interest rate rises.

<sup>39</sup> Wong et al. (2014) showed that macro-prudential measures can restrain the level of household leverage on mortgages. Wong, Eric et al. (2014), "How does loan-to-value policy strengthen banks' resilience to property price shocks – evidence from Hong Kong", *Hong Kong Institute for Monetary Research Working Paper No. 03/2014*.

<sup>40</sup> For simplicity, we hold other variables constant in this illustration.

## 4. Monetary and financial conditions

### Exchange rate, capital flows and monetary developments

The Hong Kong dollar exchange rate eased, and the local interbank markets continued to function in an orderly manner. Total loans continued to expand in the second half of 2017, albeit at a more moderate pace than the first half. Looking ahead, Hong Kong dollar interest rates are likely to face more upward pressure amid the ongoing US monetary policy normalisation, while fund flows could be subject to more volatility should global financial market sentiment swing sharply.

#### 4.1 Exchange rate and capital flows

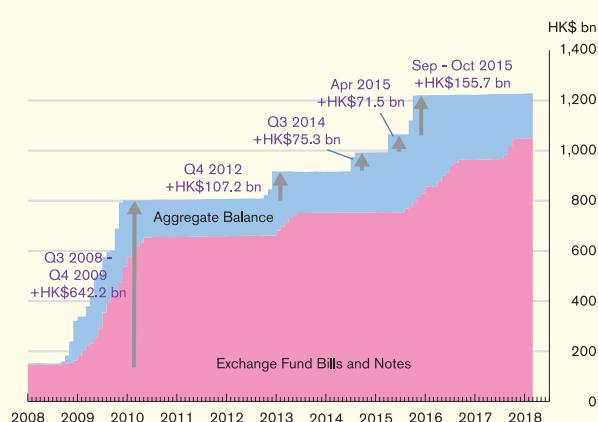
The Hong Kong dollar spot exchange rate moved between 7.799 and 7.827 against the US dollar in the second half of 2017 (Chart 4.1). It briefly strengthened between September and November staying around 7.80, mainly driven by the slower momentum of interest rate arbitrage activities and an increase in covering of short Hong Kong dollar positions amid tighter liquidity conditions. These conditions were induced by initial public offering (IPO)-related funding demand and banks' prudent stance on managing liquidity ahead of the month-end and year-end demand. As Hong Kong dollar liquidity conditions eased slightly and year-end commercial demand for the US dollar rose, the spot exchange rate softened again in mid-December 2017.

Moving into 2018, despite increased volatility in the global financial markets, in particular the stock markets, the Hong Kong dollar continued to trade in an orderly manner. During the review period, the Hong Kong dollar eased against the US dollar, but the Convertibility Undertaking (CU) was not triggered (Chart 4.2).

**Chart 4.1**  
**Hong Kong dollar exchange rate**



**Chart 4.2**  
**Fund flow indicators**



Broadly tracking the movements of the US dollar against most major currencies, the Hong Kong dollar nominal effective exchange rate index (NEER) generally moved sideways in the second half of 2017, but faced more downward pressure recently as the US dollar weakened further (Chart 4.3). The Hong Kong dollar real effective exchange rate index (REER) continued to move closely with the NEER, as the small inflation differential between Hong Kong and its trading partners had limited impact on the REER movement.

**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 inflows by non-residents in the second half of 2017. According to the latest Balance of Payments (BoP) statistics, there were equity portfolio investment inflows by both residents and non-residents in the third quarter, reflecting better economic prospects and bullish market sentiment across the region (Table 4.A).<sup>41</sup> As for debt portfolio investment, the BoP statistics registered inflows by non-residents which were

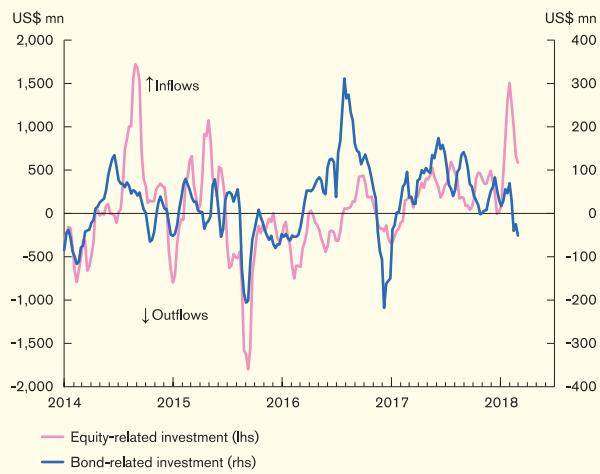
offset by outflows by residents in the third quarter. Data based on a global mutual funds survey indicated equity and debt portfolio inflows in the last quarter of 2017 on the back of optimism over economic outlook and corporate earnings. In more recent weeks, the survey from global mutual funds saw some mild debt portfolio outflows but continued to show equity portfolio inflows in spite of corrections in global equity markets (Chart 4.4).

**Table 4.A**  
**Cross-border portfolio investment flows**

(HK\$ bn)	2015		2017		
	Q1	Q2	Q3	Q1	Q2
<b>By Hong Kong residents</b>					
Equity and investment fund shares	-420.2	-354.7		-64.1	-17.3
Debt securities	-241.0	-175.5		108.0	128.0
<b>By non-residents</b>					
Equity and investment fund shares	-329.7	19.3		14.2	28.1
Debt securities	20.0	41.3		44.9	90.4
					27.0

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

**Chart 4.4**  
**Market survey of equity and bond-related flows**



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

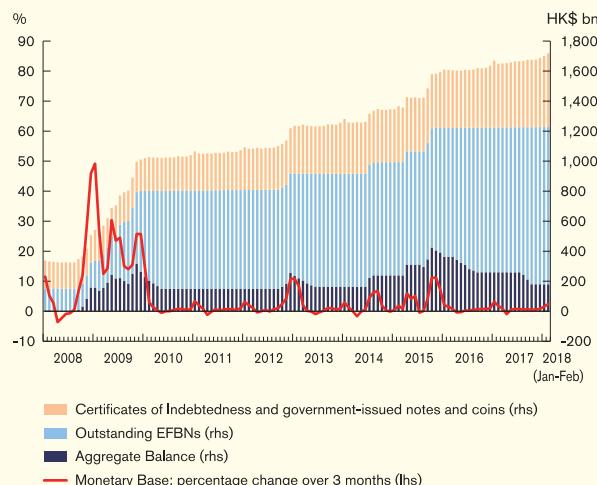
<sup>41</sup> At the time of writing, the fourth-quarter BoP statistics were not yet available.

Looking ahead, as US monetary policy normalisation continues, the widening negative interest rate spread between the Hong Kong dollar and US dollar may lead to more arbitrage activities. The possibility of triggering the weak-side CU should not be ruled out. This is a natural process under the Linked Exchange Rate System. At the same time, the uncertain pace of the normalisation process, together with rapidly-changing global macro-financial conditions and market sentiment, could lead to rising volatility in Hong Kong dollar fund flows and the Hong Kong dollar exchange rate. The HKMA will continue to ensure the stability of the Hong Kong dollar exchange rate in accordance with the Currency Board arrangements.

#### 4.2 Money and credit

Hong Kong's monetary environment continued to stay largely accommodative in the second half of 2017 and in more recent months, despite the US Federal Reserve (Fed)'s interest rate hikes and ongoing balance sheet reduction. The Hong Kong dollar Monetary Base registered a further 1.4% increase during the second half, mainly driven by the increase in Certificates of Indebtedness for banknote issuances (Chart 4.5). As the CUs were not triggered, the total of the Aggregate Balance and the outstanding Exchange Fund Bills and Notes (EFBNs) remained virtually unchanged at around HK\$1,226.8 billion during the second half. Within the total, the Aggregate Balance contracted and the outstanding EFBNs expanded correspondingly due to the issuance of additional Exchange Fund Bills (amounting to HK\$80 billion) to meet the increased demand by banks for liquidity management purposes.<sup>42</sup> Stepping into 2018, the Monetary Base remained largely steady despite the equity market corrections.

**Chart 4.5**  
**Monetary Base components**

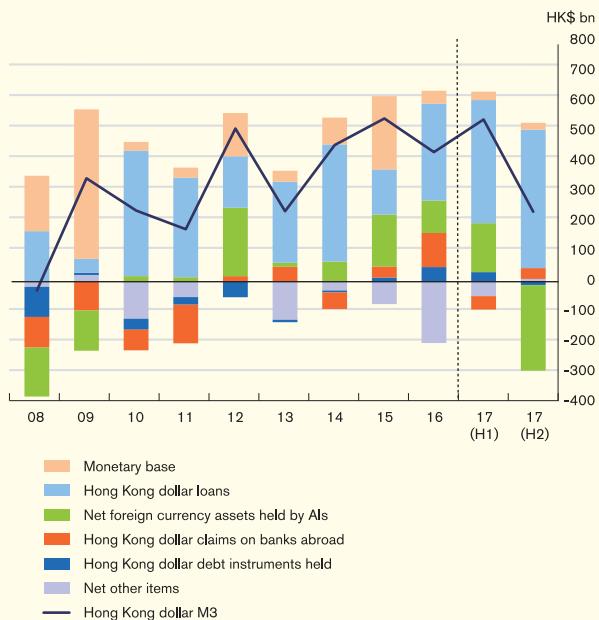


Source: HKMA.

Meanwhile, the Hong Kong dollar monetary aggregate increased further in the second half of 2017, albeit at a slower pace. Growth in the Hong Kong dollar broad money supply (HK\$M3) decelerated to 2.5% in the second half from 8.9% in the first half. As the major component of HK\$M3, Hong Kong dollar deposits increased modestly by 2.2% in the second half (Chart 4.7), with demand deposits growing at a faster pace, partly underpinned by rising investment demand as reflected in the buoyant asset markets. Analysis by the asset-side counterparts indicates that the growth in HK\$M3 was largely supported by the strong expansion in Hong Kong dollar loans (Chart 4.6), but dragged down by the shrinkage in banks' net foreign currency assets alongside net Hong Kong dollar outflows from the non-bank private sector.

<sup>42</sup> The issuance of additional Exchange Fund Bills is consistent with Currency Board Principles, representing a change in composition of the Monetary Base from the Aggregate Balance to the outstanding EFBNs. The interbank liquidity remained largely abundant after the issuance of additional Exchange Fund Bills.

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

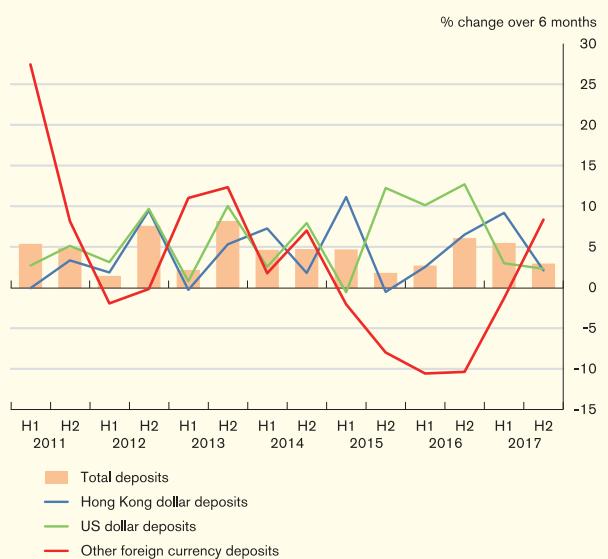


Note: The HK\$M3 in the monetary survey has been adjusted to include foreign currency swap deposits and to exclude government deposits and Exchange Fund deposits with licensed banks.

Source: HKMA staff estimates.

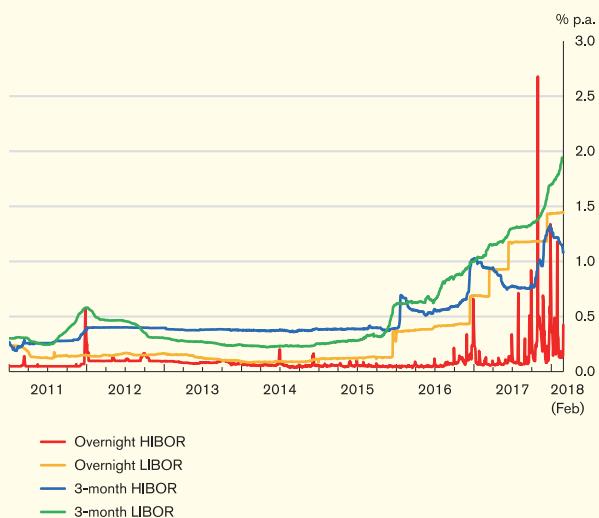
On the other hand, growth in foreign currency deposits showed mixed performance. Partly reflecting the weakening of the US dollar against most major currencies, growth in US dollar deposits receded from 3.0% in the first half to 2.4% in the second half (Chart 4.7). By contrast, other foreign currency deposits witnessed a noticeable rebound of 8.4% after registering declines for more than two years. The rebound was led mainly by the recent pick up in renminbi deposits. With slower expansion in Hong Kong dollar and US dollar deposits, total deposits with authorized institutions (AIs) grew by a modest 3.0% in the second half of 2017 compared with 5.6% growth in the first half. For 2017 as a whole, total deposits expanded moderately by 8.7%, roughly at the same pace as in 2016.

**Chart 4.7**  
Deposit growth



The Hong Kong dollar interbank interest rates saw more upward pressure between September and December 2017, driven by IPO-related funding demand and banks' prudent stance on liquidity management ahead of month-end and year-end demands (Chart 4.8). Compared with six months ago, the overnight and three-month Hong Kong Interbank Offered Rate (HIBOR) fixings rose by 14 and 50 basis points to 0.25% and 1.26% respectively in December (in monthly average terms). The negative spreads between the Hong Kong dollar and the US dollar interbank rates narrowed somewhat for the maturities between one-month and three-month.

**Chart 4.8**  
**Hong Kong dollar and US dollar interbank interest rates**



Sources: CEIC and HKMA.

The Hong Kong dollar yield curve also moved upwards, but flattened along with the US dollar yield curve. During the second half, the yield of the 3-year Government Bond rose by 63 basis points to 1.52% at the end of 2017, while the yield of the 10-year Hong Kong Government Bond increased by a smaller 33 basis points to 1.83% at the end of the year (Chart 4.9).

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



Source: HKMA.

Moving into 2018, the Hong Kong dollar interbank market continued to operate smoothly. The Hong Kong dollar interbank interest rates declined in early January as the year-end funding demand receded and stayed broadly steady thereafter, despite corrections in the global and local equity markets. The overnight and three-month HIBORs closed at 0.43% and 1.08% respectively at the end of February 2018.

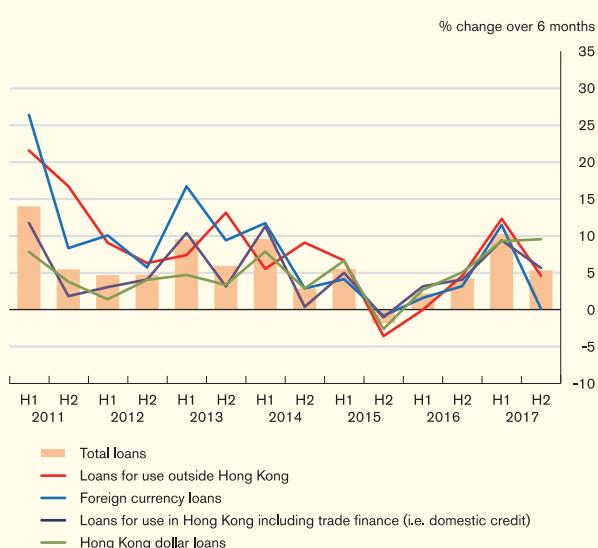
On the retail front, while banks' lending rates picked up somewhat alongside the rise in HIBORs, banks' funding costs generally stayed low as the deposit base remained sizable. Banks' average lending rate for new mortgages increased gradually by 36 basis points to 2.16% in December, largely tracking the rise in the one-month HIBOR despite keen competition in the mortgage lending business (Chart 4.9). The composite interest rate, which measures retail banks' Hong Kong dollar funding costs, mostly stayed soft in the second half and closed at 0.38% at the end of December, though picking up briefly in October due to IPO-related funding demand.

Going forward, the Hong Kong dollar interest rates could likely face more upward pressure as the monetary policy normalisation in the US continues and other major economies may start to normalize their interest rates. Sharp swings in global market sentiment and rapidly-changing macro-financial conditions may heighten fund flow volatility. Nonetheless, the sizeable Hong Kong dollar Monetary Base can help cushion the Hong Kong dollar interest rates from rising too rapidly. In addition, banks' prudent liquidity management along with their access to the Discount Window would also help limit excessive volatility in interbank interest rates.

Bank credit expanded strongly in 2017, by 10.2% in the first half, but moderated to 5.3% in the second half (Chart 4.10). Slower growth was seen in both loans for use in and outside Hong Kong. Analysed by currency, while Hong Kong dollar loans continued to expand at a fast pace of

9.5% in the second half amid the favourable domestic economic environment and relatively lower Hong Kong dollar funding costs, foreign currency loans edged up by only 0.1%, with US dollar loan growth slowing to 1.8% due, in part, to rising US dollar funding costs. For the whole of 2017, total loans recorded a robust growth of 16.1%, compared with 6.5% in 2016.

**Chart 4.10**  
Loan growth

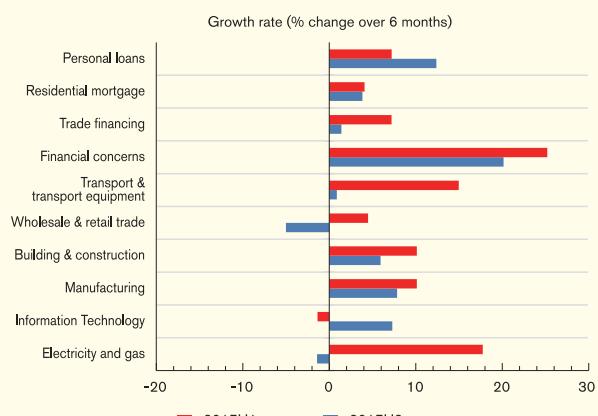


Source: HKMA.

Growth in loans for use in Hong Kong (including trade finance) moderated from 9.4% in the first half to 5.6% in the second half, with mixed performance across major business sectors (Chart 4.11). Loans for building, construction, and property development and investment grew at a slower pace during the second half, in part reflecting the strengthened risk management for loans to property developers starting from June 2017.<sup>43</sup> Despite further improvement in merchandise trade and retail sales, trade finance and loans for transport witnessed only a relatively modest increase, while loans to wholesale and retail trade posted a decline. Conversely, growth in loans to financial concerns remained strong, to some extent reflecting solid expansion in the financial services industry.

<sup>43</sup> For details, see "Circular on Risk management for lending to property developers" issued by the HKMA on 12 May 2017.

**Chart 4.11**  
Growth in domestic loans by selected sectors

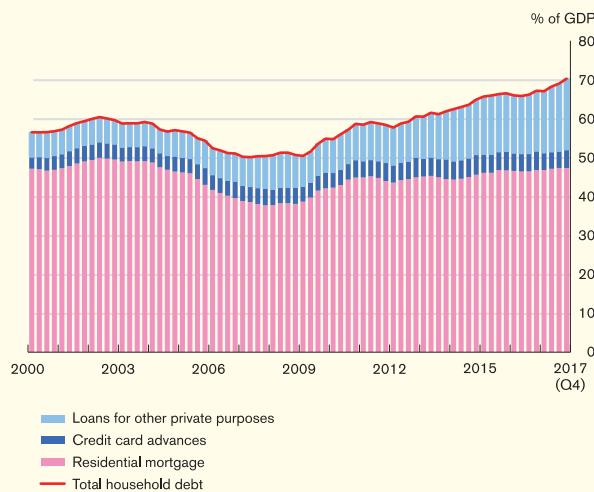


Source: HKMA.

Household debt recorded 6.5% growth in the second half of 2017 compared with 5.0% in the first half. Within the household debt, growth in personal loans (which comprise credit card advances and loans for other private purposes), accelerated to 12.4% during the second half. The strong growth of personal loans was mainly reflected in lending secured by financial assets granted to private banking and wealth management customers. Such lending growth has been largely in line with a continuous rise in assets under management in the banking sector. The risks of such collateralised lending are considered to be manageable. In addition, the HKMA issued guidance to banks in January 2014 to strengthen their risk management on personal lending business, including requirements on maximum loan tenor and debt-servicing ratio (DSR) limit.

On the other hand, despite a pick-up in housing transactions, growth in residential mortgage loans moderated slightly to 3.8% in the second half with a lower loan-to-value (LTV) ratio for new mortgages. Overall, the household debt-to-Gross Domestic Product (GDP) ratio went up from 68.2% in the second quarter of 2017 to 70.2% in the fourth quarter (Chart 4.12).

**Chart 4.12**  
**Household debt-to-GDP ratio and its components**



Note: Only borrowings from AIs are covered.  
Source: HKMA.

Growth in loans for use outside Hong Kong slowed to 4.6% in the second half compared with the sharp rise of 12.3% in the preceding half-year period. For the banking sector as a whole<sup>44</sup>, Mainland-related lending recorded a slower 4.9% increase during the second half of 2017, compared with 12.0% in the preceding half-year period. The credit risk of Mainland-related lending continued to be manageable, with 76% of borrowers being Mainland state-owned enterprises and non-Mainland multinational companies by year end. For those lending to Mainland private entities, the majority of loans were secured by collaterals or guarantees.

As Hong Kong dollar loans grew at a faster pace than deposits, the Hong Kong dollar loan-to-deposit (LTD) ratio moved up from 77.1% at end-June to 82.7% at year end, the highest since March 2015 (Chart 4.13). By contrast, the overall foreign currency LTD ratio declined from 65.5% to 63.1% at year end, within which the US dollar LTD ratio was little changed at 68.4%.

**Chart 4.13**  
**LTD ratios**



Source: HKMA.

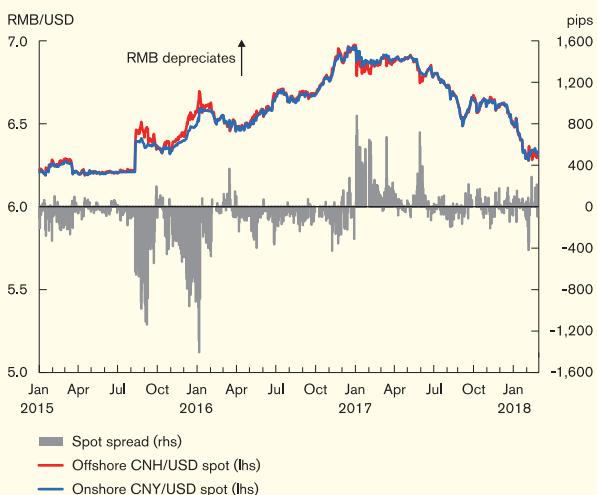
In the near term, credit growth may be supported by continued economic growth and potential infrastructure financing. According to the HKMA Opinion Survey on Credit Condition Outlook, banks expect to see robust credit demand in the near term (see Table 5.A in Chapter 5). However, the US monetary policy normalisation and rising volatility in global and local financial markets could also pose a drag on credit growth in Hong Kong.

#### Offshore renminbi banking business

The offshore renminbi (CNH) market traded in an orderly manner during the second half of 2017 and in recent months, closely tracking the movements in the onshore renminbi (CNY) exchange rate. Both the CNH and the CNY were largely stable between September and November (Chart 4.14). Since December, the CNH and the CNY strengthened somewhat against the US dollar, mainly reflecting the noticeable weakness in the US dollar against major currencies. During the review period the spread between the CNY and the CNH was largely muted.

<sup>44</sup> Including authorized institutions (AIs)' Hong Kong offices, Mainland branches and subsidiary banks in Mainland China.

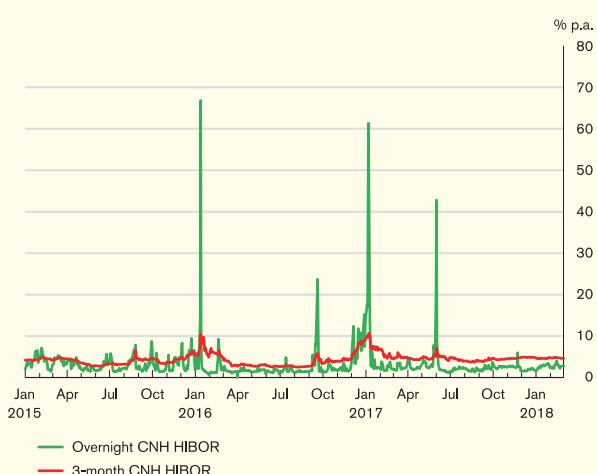
### Chart 4.14 CNY and CNH exchange rates



Source: Bloomberg.

As liquidity conditions in the offshore market remained largely stable, the overnight CNH HIBOR mostly traded below 4% in the second half of 2017 and in recent months (Chart 4.15), with only occasional fluctuations due to seasonal liquidity demand. The 3-month CNH HIBOR increased at a gradual pace from around 4.0% in early September to 4.65% at the end of February 2018.

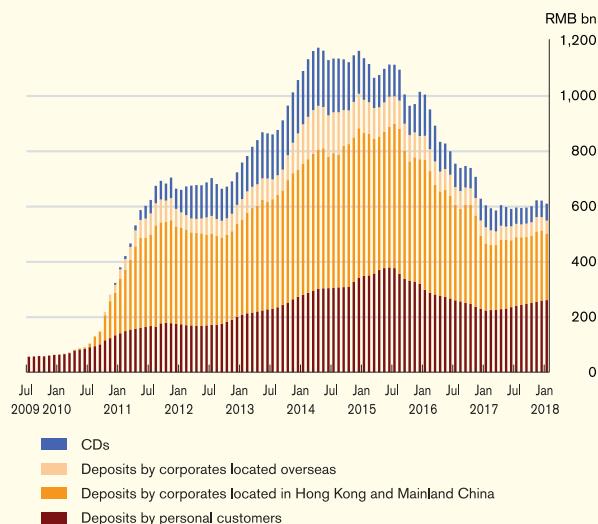
### Chart 4.15 The overnight and the three-month CNH HIBOR fixings



Source: Treasury Markets Association.

Following a slight decline in the first half of 2017, Hong Kong's CNH liquidity pool regained some strength in the second half on the back of improved market sentiment towards the renminbi exchange rate movement. The total outstanding amount of renminbi customer deposits and certificates of deposit (CDs) reverted to a moderate 5.1% increase in the second half to RMB618.4 billion at the end of the year (Chart 4.16 and Table 4.B). Among the total, renminbi customer deposits grew by 6.3%, mainly led by growth in personal customer deposits alongside the pick-up in preferential renminbi deposit rates. On the other hand, outstanding CDs decreased by 5.3% during the second half, albeit at a slower pace compared with the preceding half-year period.

### Chart 4.16 Renminbi deposits and CDs in Hong Kong



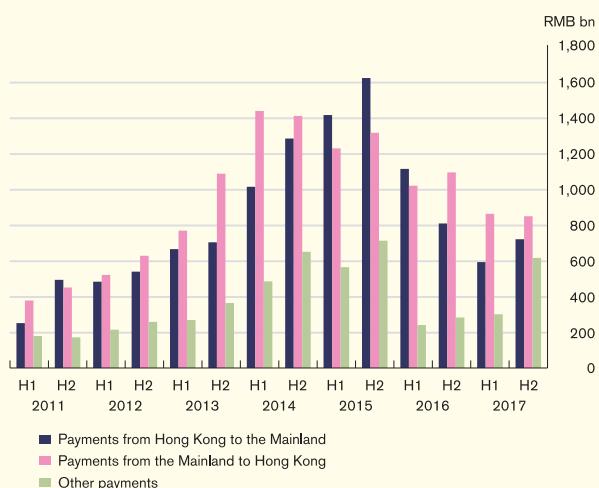
Source: HKMA.

Hong Kong's renminbi financing activities stayed weak during the review period, with the outstanding amount of renminbi bank loans declining by 30.0% in the second half to RMB144.5 billion. This was partly attributable to the high renminbi funding costs relative to those in US dollars and Hong Kong dollars.

By contrast, Hong Kong's renminbi trade settlement rebounded in the second half of 2017 after consolidating in the first half. Transactions handled by banks in Hong Kong rose to RMB2,177.1 billion in the second half, up 24.5% from the previous six months (Chart 4.17).

Overall, the size of the renminbi liquidity pool remained adequate, and continued to support a large amount of renminbi financial intermediation activities. For 2017 as a whole, the average daily turnover of the renminbi real time gross settlement system stayed at a high level of RMB903.6 billion.

**Chart 4.17**  
**Flows of renminbi trade settlement payments**



Source: HKMA.

In the near term, the development of the CNH market in Hong Kong continues to depend on market expectations about the future path of the renminbi exchange rate and the evolution of Mainland's macro-financial conditions. Nevertheless, Hong Kong's offshore renminbi business is expected to benefit from the progress in Mainland's capital account liberalisation and enhanced regional economic co-operation under the Belt and Road Initiative.

**Table 4.B**  
**Offshore renminbi banking statistics**

	Dec 2016	Dec 2017
Renminbi deposits & CDs (RMB bn)	625.1	618.4
Of which:		
Renminbi deposits (RMB bn)	546.7	559.1
Share of renminbi deposits in total deposits (%)	5.2	5.3
Renminbi CDs (RMB bn)	78.3	59.3
Renminbi outstanding loans (RMB bn)	294.8	144.5
Number of participating banks in Hong Kong's renminbi clearing platform	210	203
Amount due to overseas banks (RMB bn)	69.0	95.4
Amount due from overseas banks (RMB bn)	91.6	131.3
	2016	2017
Renminbi trade settlement in Hong Kong (RMB bn)	4,542.1	3,926.5
Of which:		
Inward remittances to Hong Kong (RMB bn)	2,106.1	1,705.3
Outward remittances to Mainland China (RMB bn)	1,915.2	1,308.0
Turnover in Hong Kong's RMB RTGS system (Daily average during the period; RMB bn)	863.6	903.6

Source: HKMA.

## Asset markets

The Hong Kong equity market's strong performance suffered a sharp downward adjustment towards the end of the review period amid heightened concerns over rising bond yields. The Hong Kong dollar debt market maintained steady growth, while the offshore renminbi debt market contracted further in 2017. Transaction volumes in the residential property market picked up again after a brief moderation in mid-2017. Housing price growth has also accelerated since the fourth quarter.

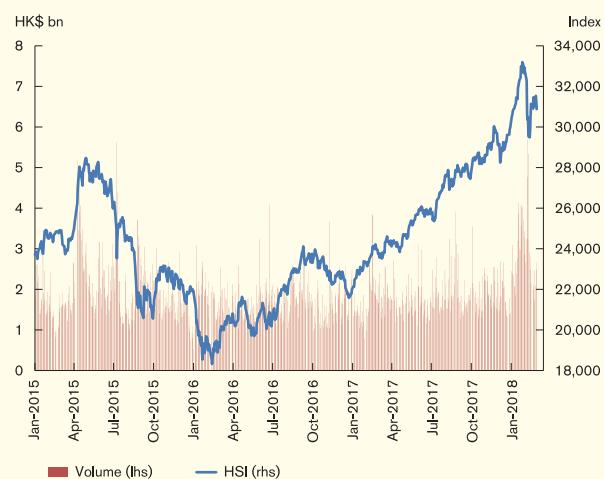
### 4.3 Equity market

The Hong Kong equity market extended its rally in 2017 before taking a sharp downward adjustment towards the end of the review period (Chart 4.18). The earlier rally was propelled by the markedly improved macroeconomic performances in the US, Mainland China and Europe, as well as in a number of emerging markets in the second half of 2017. The passing of the tax reform bill in the US provided further impetus to global equities. International investors also appeared to be banking on a much wider application of data technology and artificial intelligence across a broad spectrum of activities, including education, health care, finance and transportation that could lead to another wave of significant productivity increases, and ultimately translate into a prolonged and sustainable period of economic prosperity. The Fed's plan to normalise its balance sheet and the European Central Bank's announcement on the scaling back of its asset purchase programme confirmed that major central banks were also similarly confident of the economic outlook.

The Hong Kong stock market registered substantial fund inflows from Mainland investors through the Shanghai-Hong Kong Stock Connect and the Shenzhen-Hong Kong Stock Connect, with cumulative southbound net buying totalling HK\$835.8 billion at the end of February, an 89% increase over a year earlier (Chart 4.19).

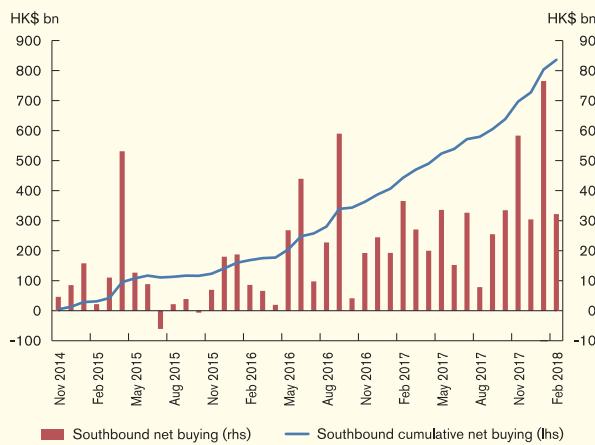
However, all these favourable factors could not prevent local equities from correcting sharply towards the end of the review period amid heightened concerns over rising bond yields. An escalation of risk aversion also triggered spikes in option-implied volatilities (Chart 4.20). Overall, the correction measured a hefty 7% from its all-time high achieved in January, although the Hang Seng Index (HSI) still managed to gain by 10% between September 2017 and February 2018. On valuation, the local market still compares favourably with other major markets in terms of cyclically-adjusted price-to-earnings, which should help lessen the impact of future headwinds to some extent (Chart 4.21).

**Chart 4.18**  
**Equity prices in Hong Kong**



Source: Bloomberg.

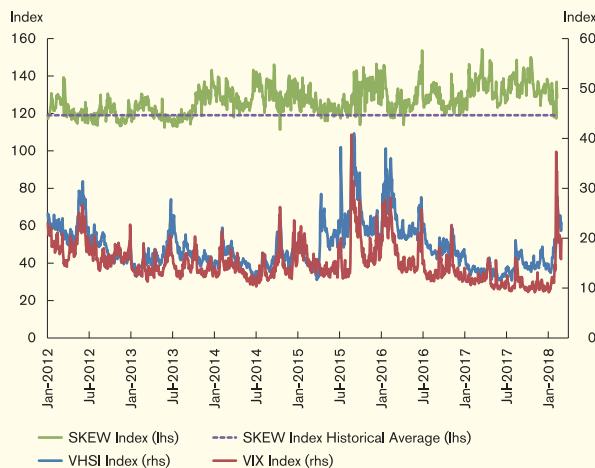
**Chart 4.19**  
Cumulative southbound net buying from Stock Connect schemes



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

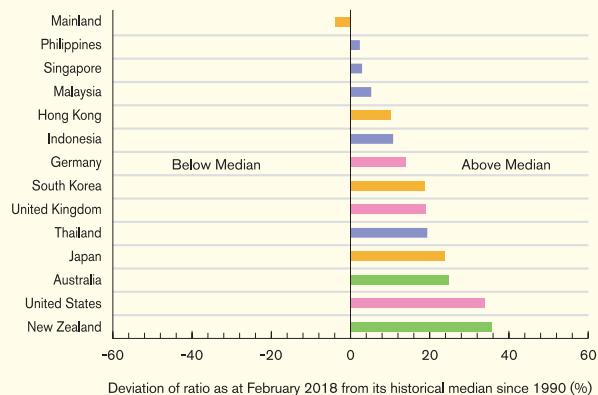
Sources: CEIC, HKEx and HKMA staff estimates.

**Chart 4.20**  
Option-implied volatilities of the HSI and S&P 500, and the SKEW Index



Sources: Bloomberg and HKMA staff estimates.

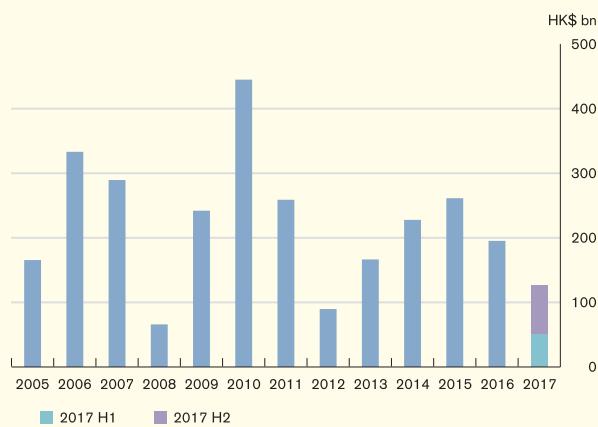
**Chart 4.21**  
Cyclically-adjusted price-earnings ratios of Asia Pacific and other major markets



Sources: Bloomberg, CEIC and HKMA staff estimates.

The performance of the primary listing market in Hong Kong in 2017 was rather lacklustre. While funds raised through IPO in the second half grew by more than 40% from the first half, the total IPO proceeds raised from the Hong Kong Stock Exchange recorded a decline from HK\$195 billion in 2016 to HK\$127 billion in 2017 (Chart 4.22).

**Chart 4.22**  
The IPO market in Hong Kong



Sources: CEIC and HKEx.

#### **Monetary and financial conditions**

The market remains highly susceptible to external factors, such as how sharply major economies might tighten their monetary policies. Box 4 provides an assessment of the potential spillovers to Hong Kong and other Asia Pacific markets from shocks originating from both within and outside the region. Macro risks aside, it also remains to be seen how confident investors are about the potential economic benefits that can be realised through wider application of new technologies.

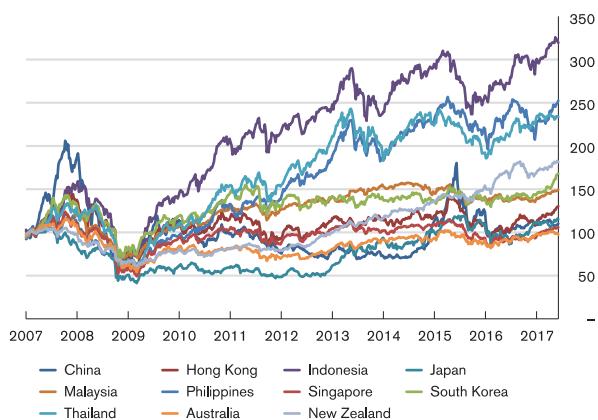
## Box 4

### Tail risk spillover impact in Asia Pacific stock markets

#### *Introduction<sup>45</sup>*

Stock prices in the Asia Pacific region have risen considerably since 2009, partly due to the spillovers from the quantitative easing programme adopted by the Fed. (Chart B4.1). During this bull market run, however, there were two notable stock market corrections in 2013 and 2015, with prices in some economies falling by over 20% in a week. With these acute episodes as background, a natural question is, “what was the major source of contagion to Asia Pacific stock markets during these sell-offs?” The answers to this question are important for policymakers in seeking to avoid international financial contagion and to preserve financial stability because shocks from foreign stock markets could have ramifications for domestic stock markets and, in turn, affect domestic currency markets and ultimately sovereign creditworthiness.

**Chart B4.1**  
**Stock market prices in Asia Pacific**



<sup>45</sup> The detailed results in this box are in Fong et al. (2017) “Tail risk spillover impact on Asia Pacific – Evidence from stock market co-movement”, HKMA Research Memorandum 14/2017.

The extant empirical literature offers extensive evidence regarding spillovers between cross-country stock market returns.<sup>46</sup> However, much of the work overwhelmingly focused on evaluating the mean relationship between stock market returns. This kind of analysis reflects mostly risks during tranquil periods which could underestimate the real effects of an international shock in times of financial crises. A more relevant analysis of contagion should evaluate relationships between extremely negative returns, which are more likely to be associated with bear markets, periods of crises and financial distress.

In this box, we examine the financial linkages among Asia Pacific stock markets and those between these stock markets and other global markets. Through estimating these linkages, it is possible to identify major sources of risk spillovers to Asia Pacific at the mean (namely, mean risk spillovers) and at the tail (namely, tail risk spillovers), and to distinguish the difference between the two spillovers.

#### *Methodology and data*

Econometrically, we use a quantile vector autoregressive (QVAR) model to capture the dynamics among stock price returns.<sup>47</sup> We then employ the Diebold and Yilmaz (2009, 2012) approach to evaluate the strength of financial linkages between economies.<sup>48</sup> We measure the

<sup>46</sup> See Forbes (2013) for a recent survey on the contagion and spillovers between cross-country stock market returns.

<sup>47</sup> Three exogenous variables are used to control for the effect of global factors. They are (i) the Chicago Board Options Exchange Standard & Poor's 500 Implied Volatility Index (VIX) which proxies for the global risk appetite; (ii) the 10-year US Treasury term premium estimated by the Federal Bank of New York which proxies for the effect of unconventional monetary policies (UMP) adopted by the Fed; and the US dollar (DXY) index which controls for the effect of the USD appreciation and depreciation.

<sup>48</sup> These linkages are measured by a 10-week-ahead generalised forecast error variance decomposition of the QVAR model in the analysis. In estimation, we consider the QVAR with an AR order 1 and we choose a quantile of 0.5 (i.e. median,  $\tau = 0.5$ ) to measure the mean risk spillovers and a quantile of 0.05 (i.e.  $\tau = 0.05$ ) to examine the tail risk spillovers among stock markets.

stock market spillovers among 36 economies in this analysis (Table B4.A). The sample of weekly stock market returns covers a period from 2 January 2009 to 30 June 2016, and includes a total of 391 observations.<sup>49</sup>

**Table B4.A**  
36 economies as the endogenous variables

Group	Economy
Advanced Economies (AEs)	Australia, Canada, Denmark, France, Germany, Italy, Norway, Spain, Sweden, Switzerland, UK, US
Asia Pacific (AP)	Australia, China, Hong Kong, Indonesia, Japan, Malaysia, New Zealand, the Philippines, Singapore, South Korea, Thailand
Emerging Europe, the Middle East and Africa (EMEA)	Czech Republic, Hungary, Israel, Poland, Russia, Slovakia, South Africa, Turkey
Latin America	Brazil, Chile, Colombia, Mexico, Peru

### Empirical results

There are three major findings. First, we find that the tail risk spillovers are larger than mean risk spillovers to AP. This can be seen from Table B4.B which reports the spillover impact estimated for the mean and tail risks. The impact is measured by the model's variance decomposition which indicates the variation that each economy can be explained by shocks originating from another economy. Focusing on mean risk spillovers to the AP region, the estimated impact is 17.1% on average, with the spillovers within the region being the largest (i.e., 25.6%). On tail risk spillovers, the estimated impact is higher at 24.1% on average. Individual impacts vary to a smaller extent, with that originating from Latin America (27.4%) being the largest and AEs being the smallest (22.9%).

<sup>49</sup> Weekly returns are used to address the different time-zones problem given that the selected economies are located in different continents, and higher frequency data are too noisy and may generate distortion in the estimation.

**Table B4.B**  
Spillover impact on Asia Pacific at the mean and tail risks

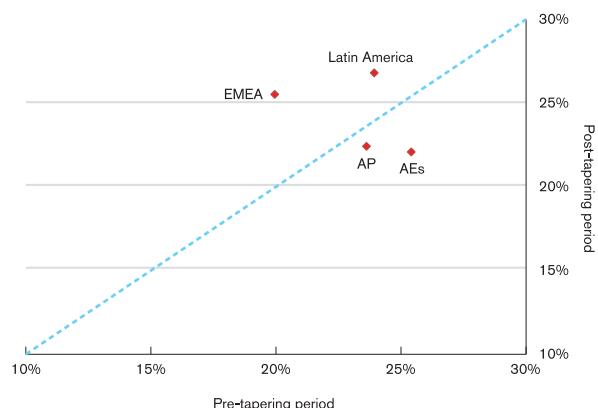
Economy group	Shock origin				Row average
	AEs	Asia Pacific*	EMEA	Latin America	
Mean risk	16.2	25.6	12.5	14.2	17.1
Tail risk	22.9	23.1	23.2	27.4	24.1

Note: \* The spillover effect excludes the economy's own effect when computing the average impact of the group.

Source: HKMA staff estimates.

Secondly, we find that spillovers from EMEA and Latin America are substantially larger after the "taper tantrum". This can be seen from Chart B4.2 which compares tail risk spillovers to individual AP economies in the pre- and post-tapering periods. EMEA and Latin American economies scatter above the 45-degree line, suggesting that spillovers from these economies are stronger in the post-tapering period than in the pre-tapering period. AEs and AP economies scatter slightly below the 45-degree line, suggesting that their spillovers are smaller in the post-tapering period, but still substantial at around 20%.

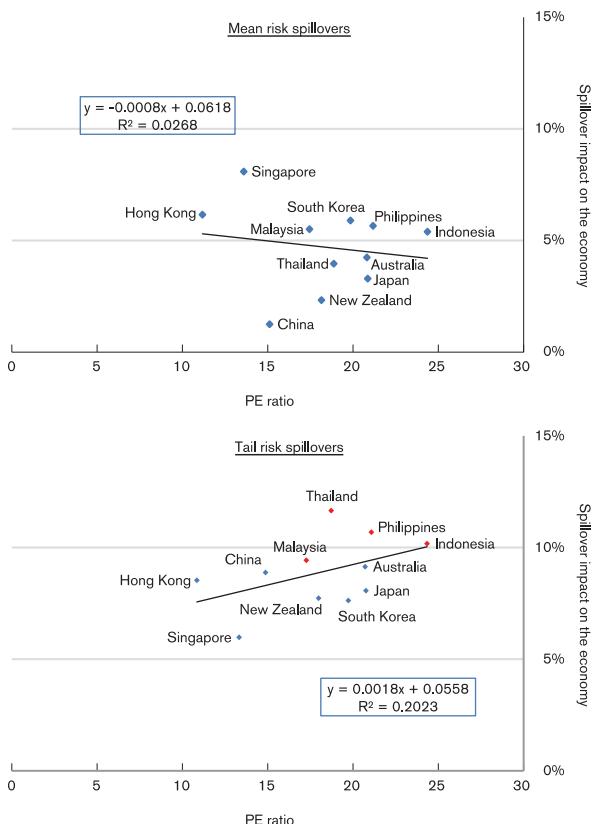
**Chart B4.2**  
Spillover impact on AP at the tail risk



Finally, a stronger response from AP economies to tail risk spillovers is likely to be associated with their over-valued stock markets. Chart B4.3 depicts scatters of the average spillover impact on AP economies against the price-earnings (PE) ratio of the economies based on samples in the post-tapering period. As can be seen, the explanatory powers of a simple linear regression

(i.e., the value of  $R^2$ ) under mean and tail dependence are 2.7% (upper panel) and 20.2% (lower panel) respectively, suggesting that the PE ratio of an economy tends to be linearly correlated with the economy's responsiveness to tail risk spillovers, but not to mean risk spillovers.

**Chart B4.3**  
**Scatters of spillover impact on Asia Pacific economies against PE ratios of the economies**



Sources: Bloomberg and HKMA staff estimates.

### Conclusion

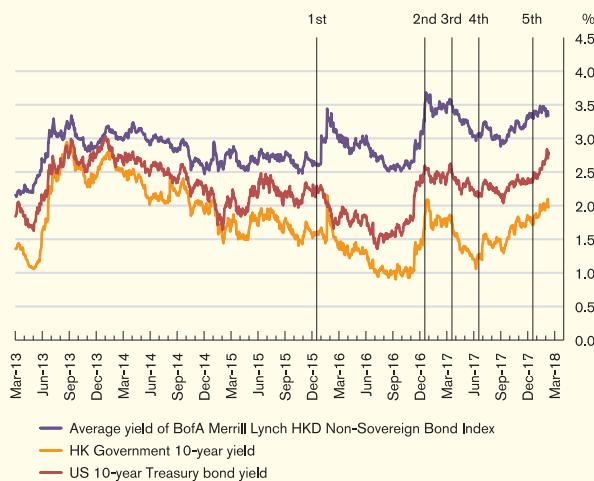
This box assesses spillovers from other stock markets to Asia Pacific markets. Using data on 36 stock markets, we find that mean risk spillovers to Asia Pacific markets are mainly driven by shocks originating from the Asia Pacific region. However, shocks originating from regional and non-regional markets are equally important to Asia Pacific stock markets under tail risk spillovers. We also find that shocks from Latin America and EMEA have increased notably following the taper tantrum. Finally, our results

suggest that a stronger responsiveness of one economy's stock market to tail risk spillovers from other markets tends to be associated with higher PE ratios in the domestic stock market.

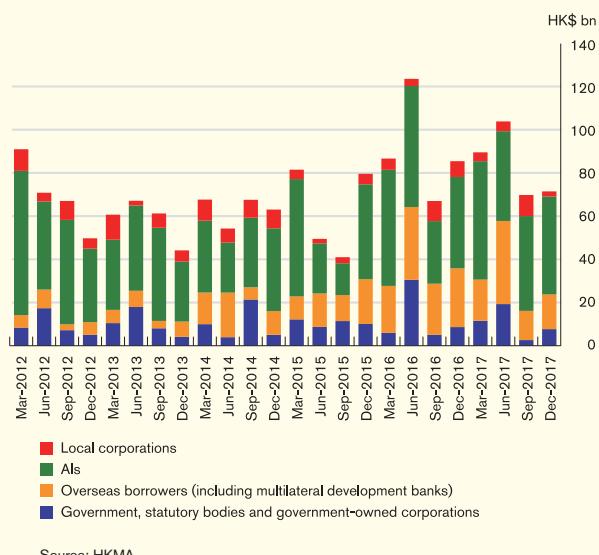
## 4.4 Debt market

The Hong Kong dollar debt market sustained moderate growth in 2017, albeit at a slower pace than in the previous year. A slowdown in primary market activity mainly reflected a decline in non-EFBN issuance in the second half, which could be attributed to Hong Kong dollar bond yields tracking the rise in US Treasury yields amid the Fed's continued monetary policy normalisation (Charts 4.23 and 4.24). The reduced attractiveness of Hong Kong dollar debt also led to a deceleration in net bond fund inflows in recent months (Chart 4.25).

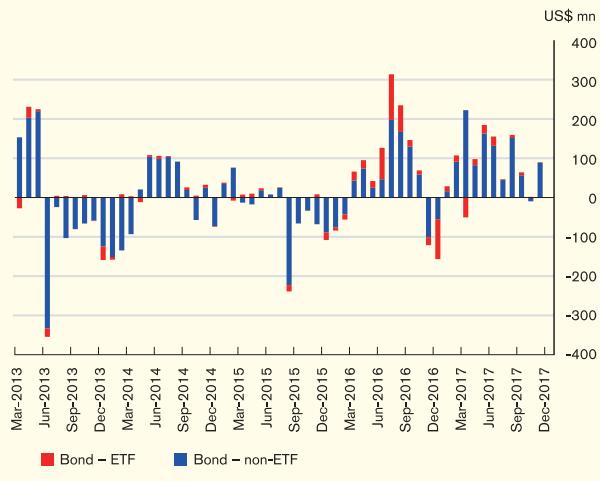
**Chart 4.23**  
Hong Kong dollar sovereign and non-sovereign bond yields and US 10-year Treasury yield



**Chart 4.24**  
New issuance of non-EFBN Hong Kong dollar debt



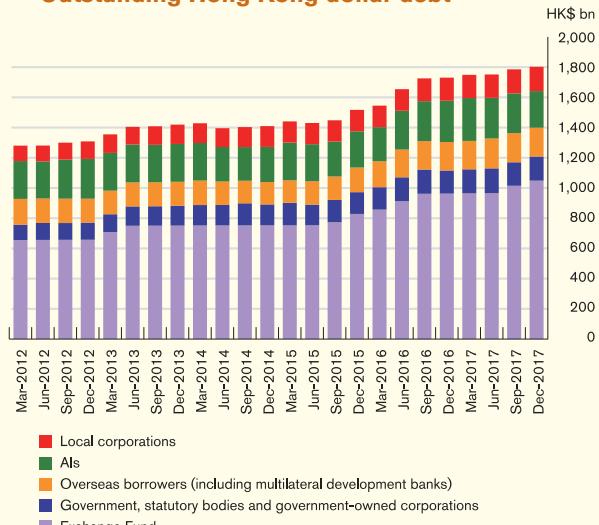
**Chart 4.25**  
Exchange Traded Fund (ETF) and non-ETF bond fund flows into Hong Kong



The total issuance of Hong Kong dollar debt amounted to HK\$3,335.3 billion in 2017, an increase of 9.3% over the preceding year, mainly driven by the Exchange Fund's strong issuance. Within the total, the 11.0% year-on-year increase in new debt issued by the public sector more than offset the 17.9% decline by the overseas borrowers (including Multilateral Development Banks). Domestic private sector issuance remained almost unchanged. At the end of 2017, the Hong Kong dollar debt outstanding

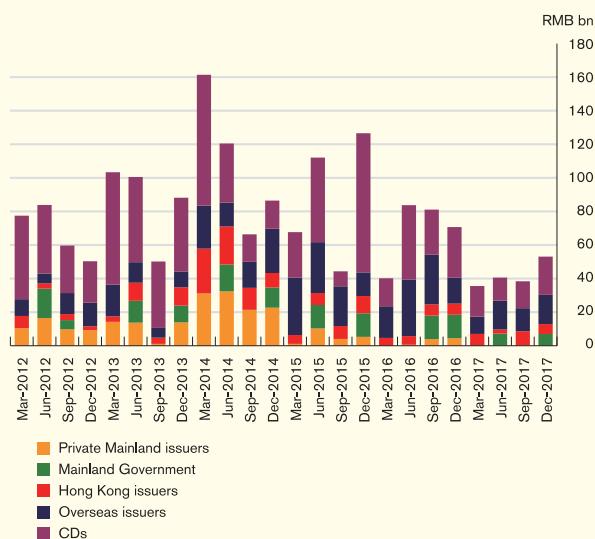
amount stood at HK\$1,802.2 billion, up 4.1% from the preceding year (Chart 4.26). The amount was equivalent to 25.7% of HK\$M3 or 21.5% of Hong Kong dollar-denominated assets of the banking sector. The outstanding amount of non-EFBN Hong Kong dollar debt decreased year on year for the first time in three years, mainly reflecting the 11.2% reduction in debt outstanding by AIs.

**Chart 4.26**  
**Outstanding Hong Kong dollar debt**



The offshore renminbi debt market in Hong Kong contracted further in 2017, with total issuance falling sharply by 39.2% to RMB167.5 billion (Chart 4.27). Non-CD debts issued by Mainland and foreign financial corporations dropped by 41.4% to RMB56.2 billion, more than offsetting the 2.9% increase in those issued by Hong Kong corporations. This is despite the fact that issuance picked up in the final quarter amid a reversal in the onshore-offshore yield gap such that the average funding cost became lower in the offshore market (Chart 4.28).

**Chart 4.27**  
**New issuance of offshore renminbi debt securities**



Sources: Newswires and HKMA staff estimates.

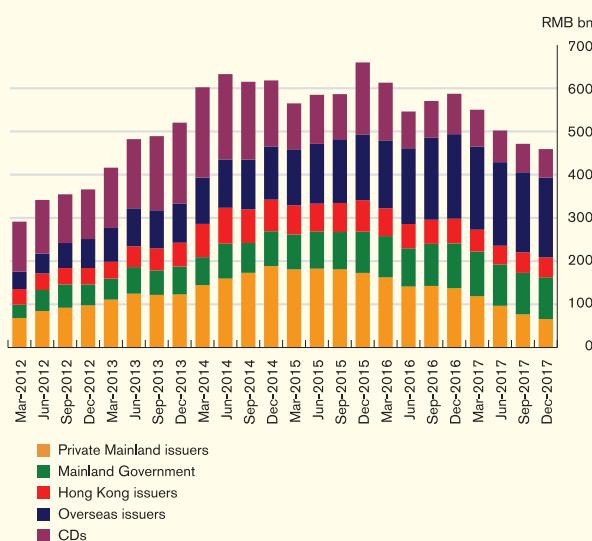
**Chart 4.28**  
**Average yields of onshore vs. offshore renminbi bond indices**



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

As a result of the lukewarm primary market activities, the outstanding amount of offshore renminbi debt securities in Hong Kong continued its downward trend, registering an 8.1% decline year on year to RMB459.2 billion at the end of 2017 (Chart 4.29).

**Chart 4.29**  
**Outstanding amount of offshore renminbi debt securities**



Sources: Newswires and HKMA staff estimates.

Meanwhile, the Bond Connect scheme was launched last July, with Northbound Trading coming into operation in the first phase. The scheme has attracted increasing interest from international investors to participate in Mainland's domestic bond market through Hong Kong's market. At the end of December 2017, a total of 247 international investors registered in the scheme. Looking ahead, the HKMA and relevant institutions in Hong Kong and Mainland China will work to refine the Northbound Trading operation and explore Southbound Trading.

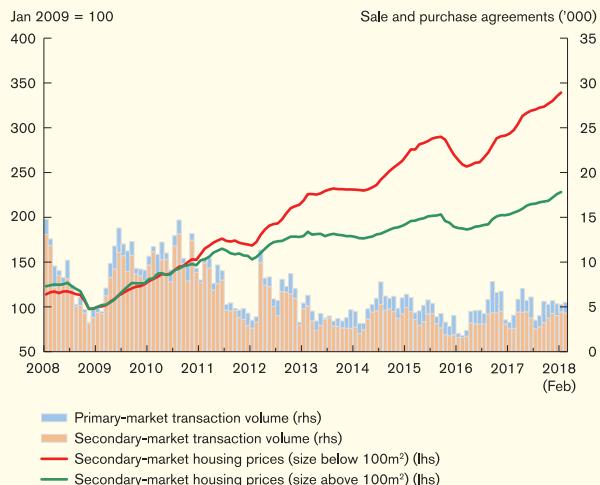
For Mainland issuers, the relatively higher onshore funding cost may encourage issuance offshore in the foreseeable future. However, the incentives for issuers to tap the offshore market remains susceptible to a wide range of other factors such as the outlook for the renminbi exchange rate, the Mainland economy, and policy directions, particularly in relation to the current deleveraging drive.

## 4.5 Property markets

### Residential property market

Transactions in the residential property market picked up again after a brief moderation in mid-2017. Amid an improvement in economic conditions and market sentiment, average monthly housing transactions in the final quarter of 2017 gradually recovered to the level shortly before the eighth round of prudential measures was implemented in May. In particular, average monthly transactions in the secondary market increased from 2,670 units in July–August (Chart 4.30) to around 4,020 units in the fourth quarter, a level not far below the average monthly transactions of 4,220 units in the second quarter. Transactions in the primary market also rebounded in August, but softened towards the end of 2017.

**Chart 4.30**  
**Residential property prices and transaction volume**



Sources: R&VD and Land Registry.

The growth in housing prices accelerated in the fourth quarter after moderating for five months (Chart 4.30). And, the growth momentum carried over into the first two months of 2018. For 2017 as a whole, housing prices increased by 14.8%. The price of small and medium-sized flats (with a saleable area of less than 100m<sup>2</sup>) continued to increase faster than that of large flats (with a saleable area of at least 100m<sup>2</sup>).

As prices rose, housing affordability was stretched even further. The housing price-to-income ratio rose from 15.9 in the fourth quarter of 2016 to 16.4 in the fourth quarter of 2017, higher than the 1997 peak of 14.6, while the income-gearing ratio increased to 74.1%, much higher than the long-term average of about 50% (Chart 4.31).<sup>50</sup> The buy-rent gap as a measure of relative user costs remained at a high level of 169.4% as the residential rental yields remained low at 2.0–2.7% in the last quarter of 2017 (Chart 4.32).<sup>51</sup>

**Chart 4.31**  
**Indicators of housing affordability**

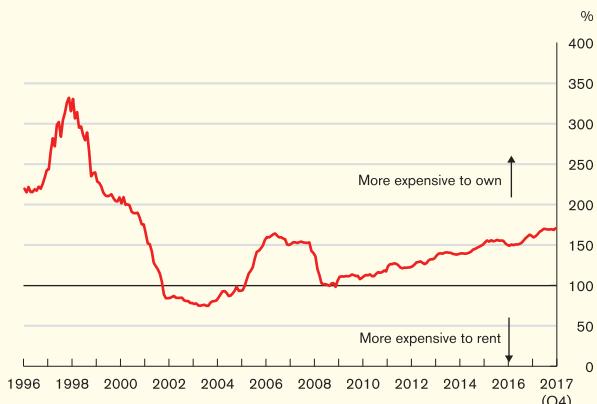


Sources: R&VD, C&SD and HKMA staff estimates.

<sup>50</sup> The price-to-income ratio measures the average price of a typical 50m<sup>2</sup> flat relative to the median income of households living in private housing. Alternately, the income-gearing ratio compares the amount of mortgage payment for a typical 50m<sup>2</sup> 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 DSR, which is subject to a maximum cap by the HKMA prudential measures.

<sup>51</sup> 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.

**Chart 4.32**  
**Buy-rent gap**



Note: This indicator is calculated as the ratio of the cost of purchasing and maintaining a 50m<sup>2</sup> flat with that of renting it.

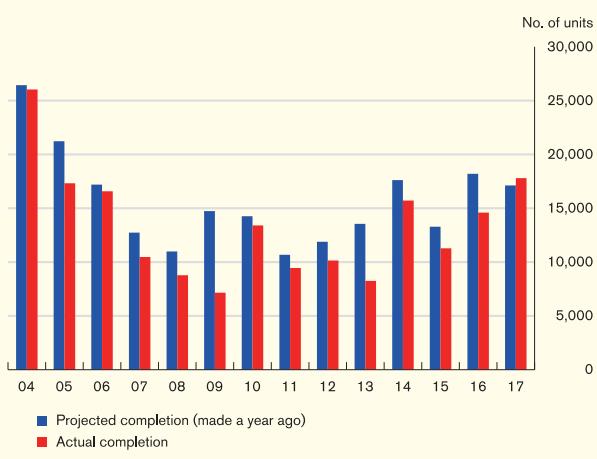
Sources: R&VD, C&SD and HKMA staff estimates.

Since late 2009, the HKMA has implemented eight rounds of macro-prudential measures to strengthen the risk management of banks for mortgage lending. These measures have helped to enhance the banking sector's resilience to property market shocks. Reflecting this policy effect, the average LTV ratio for newly approved mortgages declined to 49% in December 2017 from 64% before the measures were first introduced, and the DSR decreased to 34.7%.

The outlook for the residential property market remains uncertain. In the near term, the current favourable domestic economic conditions, perceived housing shortage, low mortgage rates and alternative sources of home financing (including mortgage loans provided by property developers and financial support from parents), will continue to support the demand for property. However, the recent sell-off in global financial markets may dampen sentiments. Over the longer term, the property market will continue to face a number of headwinds. In particular, as the US monetary policy normalisation continues, domestic mortgage rates will rise eventually and the increase in Hong Kong interest rates could quicken should large capital outflows from Hong Kong occur amid heightened global financial market volatility. In addition, on the back of the Government's effort to increase the supply of

land and residential properties, the housing demand-supply gap is expected to narrow gradually, which would ease the upward pressure on property prices over a longer term. Indeed, reflecting the Government's effort and responses by property developers to strong housing demand, actual completion of new private residential properties increased by 22% yearly to 17,800 units in 2017 (Chart 4.33), slightly higher than the official projection of 17,100 made a year ago.

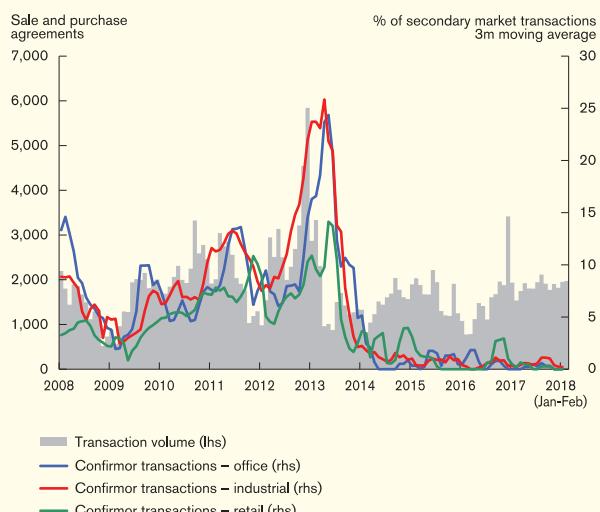
**Chart 4.33**  
**Projected and actual private flat completion**



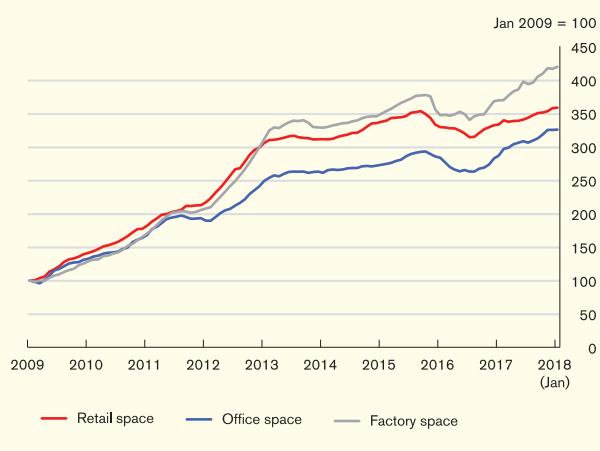
### Non-residential property market

The non-residential property market remained buoyant in the second half of 2017. Average monthly transactions increased slightly to 1,910 units, while speculative activities as indicated by confirmor transactions stayed low (Chart 4.34). Market sentiment became more optimistic about the prospects for office space in prime locations following the record sale of an office tower in Central. Following this, prices for office space increased at a fast pace of 5.5% in the second half of 2017 (Chart 4.35). Prices for factory space rose by 4.8%, and price growth for retail premises accelerated. Rises in rentals for non-residential properties lagged behind that of the respective prices, particularly for retail shops. As a result, the overall rental yields across segments declined slightly to 2.4–2.9%.

**Chart 4.34**  
**Transactions in non-residential properties**



**Chart 4.35**  
**Non-residential property price indices**



The attractiveness of prime retail locations may improve in the near term given the better outlook for retail sales and inbound tourism. The demand for office space will remain strong as the expansion of Mainland and foreign companies continues. Initiatives to revitalise industrial buildings proposed in the Policy Address may potentially increase the investment value of factory spaces. Nevertheless, the risk of rising domestic interest rates, heightened global financial market volatility, uncertainties surrounding global monetary conditions and capital flows could restrain the investment demand for non-residential properties.

## 5. Banking sector performance

The profitability of retail banks improved in the second half of 2017 as compared with the same period of 2016 mainly due to higher net interest income. Capital and liquidity conditions remained sound and robust. Credit growth moderated in the second half of 2017 after strong growth in the first half, and asset quality remained sound by historical standards. Despite notable rises in Hong Kong dollar interbank interest rates, Hong Kong dollar funding costs of retail banks remained low, underpinned by low retail deposit interest rates. However, banks should remain vigilant against the risks of more volatile interest rates, possible capital outflows amid the normalisation of US monetary policy, and geopolitical risks. Banks should assess the possible impacts of sharper-than-expected interest rate rises on their asset quality given the rising corporate leverage and high levels of household debt-servicing burdens. To strengthen banks' resilience against systemic risks, the countercyclical capital buffer ratio for Hong Kong will rise to 2.5% with effect from 1 January 2019.

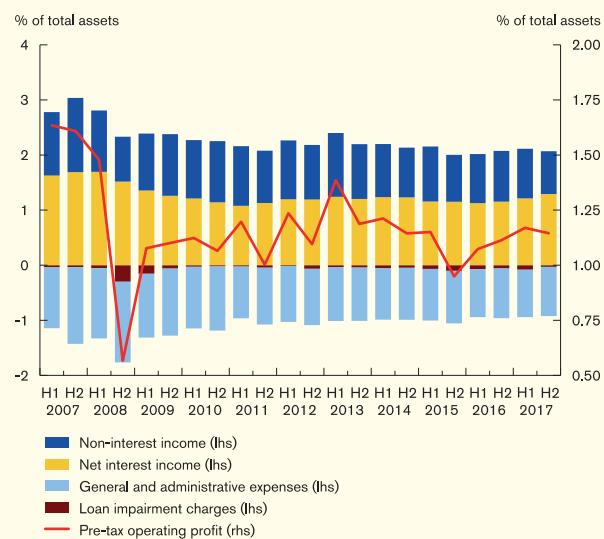
### 5.1 Profitability and capitalisation

#### Profitability

The aggregate pre-tax operating profit of retail banks<sup>52</sup> rose by 13.6% in the second half of 2017 compared with the same period last year. The improvement was mainly driven by a significant increase in net interest income and a reduction in loan impairment charges, which more than offset the fall in non-interest income. However, reflecting the relatively faster growth in assets than earnings, the return on assets of retail banks receded slightly to 1.15% in the second half of 2017 from 1.17% in the first half. Yet, the return on assets in the second half was still higher than 1.11% in the same period of 2016 (Chart 5.1).

For 2017 as a whole, the aggregate pre-tax operating profits of retail banks increased by 15.8%, with the return on assets rising to 1.16% from 1.09% in 2016.

**Chart 5.1**  
**Profitability of retail banks**



Note: Semi-annually annualised figures.

Source: HKMA.

<sup>52</sup> Throughout this chapter, figures for the banking sector relate to Hong Kong offices only unless otherwise stated.

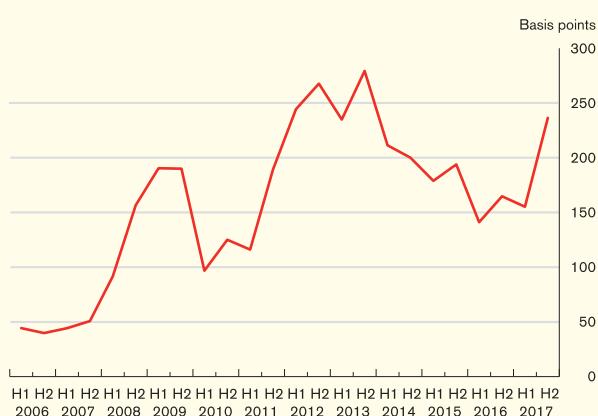
The net interest margin (NIM) of retail banks widened further to 1.5% in the fourth quarter of 2017 from 1.34% in the same period of 2016 (Chart 5.2). The improvement in NIM was in line with anecdotal evidence of a rising average spread of Hong Kong dollar corporate loans that emerged from the syndicated loan market in Hong Kong (Chart 5.3).

**Chart 5.2**  
NIM of retail banks



Note: Quarterly annualised figures.  
Source: HKMA.

**Chart 5.3**  
Average spread of Hong Kong dollar syndicated loans

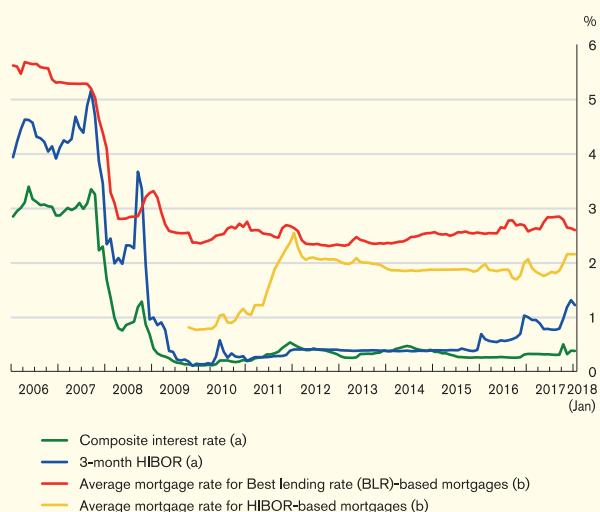


Note: The spread refers to the average spread over HIBOR for HIBOR-based Hong Kong dollar loans syndicated in Hong Kong, weighted by loan amounts.  
Source: HKMA staff estimates based on data from LoanConnector.

There was a broad-based increase in Hong Kong Interbank Offered Rates (HIBORs) from September 2017, largely driven by initial public offering (IPO)-related funding demand and banks' liquidity needs towards year-end, as well as the expectation of US interest rate hikes. In particular, the three-month HIBOR rose by 53 basis points from the end of June 2017 to a post-crisis high of 1.31% at the end of December. However, the level was still low by historical standards (the blue line in Chart 5.4). Entering 2018, HIBORs appeared to stabilise as banks' year-end liquidity needs eased.

Despite the recent rise in HIBORs, the Hong Kong dollar funding costs for retail banks remained accommodative. This was largely attributable to the low retail deposit interest rates during the review period. Reflecting this, the composite interest rate, a measure of the average cost of Hong Kong dollar funds for retail banks, stayed at a low level of around 0.3% throughout most of the second half of 2017, until recently when it edged up to 0.38% at the end of December (the green line in Chart 5.4).<sup>53</sup>

**Chart 5.4**  
Interest rates

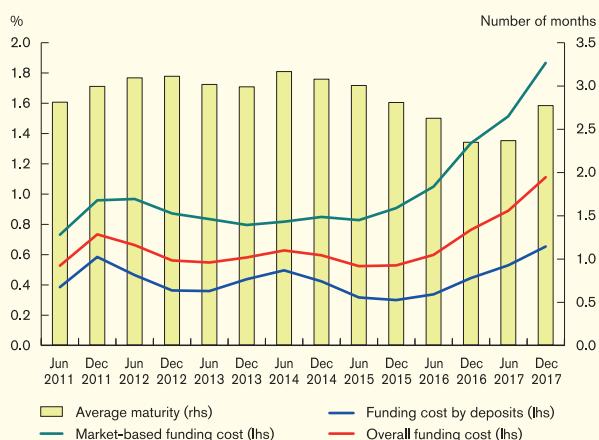


Notes:  
(a) End of period figures.  
(b) Period-average figures for newly approved loans.  
Sources: HKMA and staff estimates.

<sup>53</sup> The spike at the end of October was due to an increase in the weighted funding cost for short-term deposits as a result of IPO straddling the month-end. The composite interest rate returned to the previous level at the end of November.

The aggregate Hong Kong and US dollar funding cost of licensed banks in Hong Kong also exhibited a similar picture. The banks' average market-based Hong Kong and US dollar funding cost increased by 35 basis points during the second half, while their average deposit funding cost saw a mild increase of 12 basis points. On the whole, their average overall Hong Kong and US dollar funding cost increased by 22 basis points (the red line in Chart 5.5).

**Chart 5.5**  
**Hong Kong and US dollar funding cost and maturity of licensed banks**



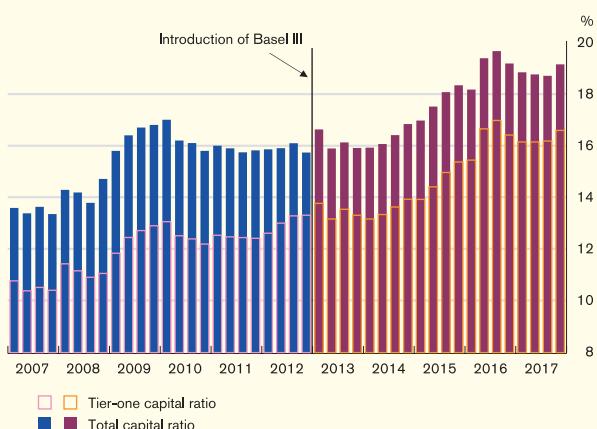
Source: HKMA.

The steeper rise in HIBORs than the overall funding cost of banks in Hong Kong would likely improve banks' margins on HIBOR-based assets. However, such an improvement in lending margins could be partially offset by keen competition in the mortgage market. In particular, market information suggests that some banks reduced their mortgage rate spreads or promoted fixed rate mortgage terms to attract new customers. With further US interest rate hikes expected this year, banks may soon face a more significant upward pressure on their funding costs. This could potentially weigh on banks' NIMs if the increased costs are not fully passed on to their customers given the competition in the loan markets.

## Capitalisation

The consolidated capital adequacy ratios (CARs) of locally incorporated AIs remain well above the minimum international standards, indicating the Hong Kong banking sector is well capitalised. The total capital ratio increased to 19.1% at the end of December 2017 from 18.7% at the end of June (Chart 5.6). The tier-one capital ratio<sup>54</sup> also rose to 16.6%, whereby 15.4% was contributed by common equity tier-one (CET1) capital.<sup>55</sup>

**Chart 5.6**  
**Capitalisation of locally incorporated AIs**



Notes:

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

Source: HKMA.

The HKMA recently published a consultation paper on prescribing loss-absorbing capacity (LAC) requirements for AIs as envisaged by the Financial Institutions (Resolution) Ordinance. While increasing the LAC of AIs is likely to benefit the society generally by reducing the probability of financial crises, it will inevitably incur costs. Box 5 provides a cost-benefit assessment of the potential impact of LAC requirements on Hong Kong. Our assessment suggests that the implementation of these requirements is likely to provide net benefits for Hong Kong's economy.

<sup>54</sup> The ratio of tier-one capital to total risk-weighted assets.

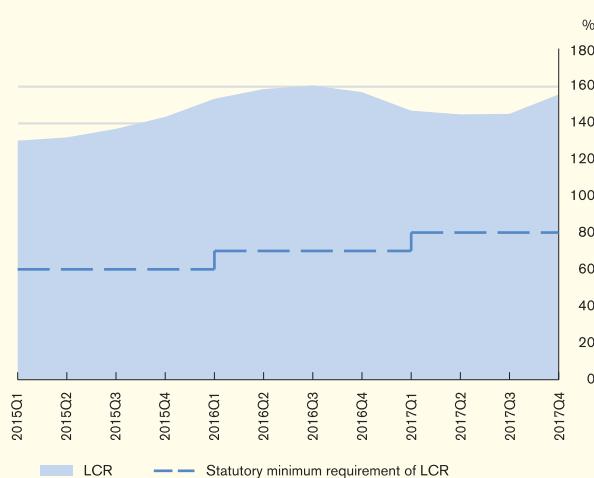
<sup>55</sup> CET1 capital comprises the core capital of an authorized institution (AI) including ordinary shares and retained earnings. Details of the definition can be found in the Banking (Capital) Rules, which are available online on the Hong Kong e-legislation website.

## 5.2 Liquidity and interest rate risks

### Liquidity and funding

The liquidity position of the banking sector, as measured by the Basel III Liquidity Coverage Ratio (LCR)<sup>56</sup> requirement, remained sound during the review period. The average LCR of category 1 institutions rose to 155.1% in the fourth quarter of 2017 from 144.2% in the second quarter (Chart 5.7), which were well above the statutory minimum requirement of 80% applicable in 2017. Although the average Liquidity Maintenance Ratio (LMR) of category 2 institutions declined slightly to 49.4% in the fourth quarter from 49.7% in the second quarter, it remained well above the statutory minimum requirement of 25%. The strong liquidity positions of AIs suggest the Hong Kong banking sector will be able to withstand liquidity shocks arising from possible capital outflows from Hong Kong.

**Chart 5.7**  
**Liquidity Coverage Ratio (LCR)**



- Notes:
1. Consolidated positions.
  2. Quarterly average figures.

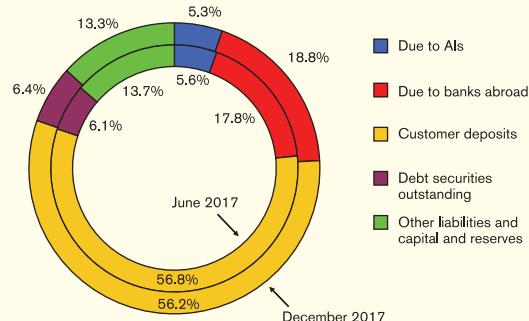
Source: HKMA.

<sup>56</sup> The Basel III LCR requirement, phased-in from 1 January 2015, is designed to ensure that banks have sufficient high quality liquid assets to survive a significant stress scenario lasting 30 calendar days. In Hong Kong, AIs designated as category 1 institutions adopt the LCR; while category 2 institutions adopt the LMR. For details, see the HKMA's Supervisory Policy Manual (SPM) LM-1, "Regulatory Framework for Supervision of Liquidity Risk".

The Net Stable Funding Ratio (NSFR) came into effect on 1 January 2018 as part of the Basel III liquidity requirements. The NSFR is designed to reduce banks' funding risk over a longer time horizon by requiring banks to fund their activities with sufficient stable sources of funding. Specifically, category 1 institutions must at all times maintain an NSFR ratio of not less than 100%.<sup>57</sup>

Customer deposits continued to be the primary funding source for AIs, underpinning a stable funding structure in the banking system. At the end of December 2017, the share of customer deposits to all AIs' total liabilities remained largely unchanged at 56.2% from six months ago (Chart 5.8).

**Chart 5.8**  
**The liability structure of all AIs**



Notes:

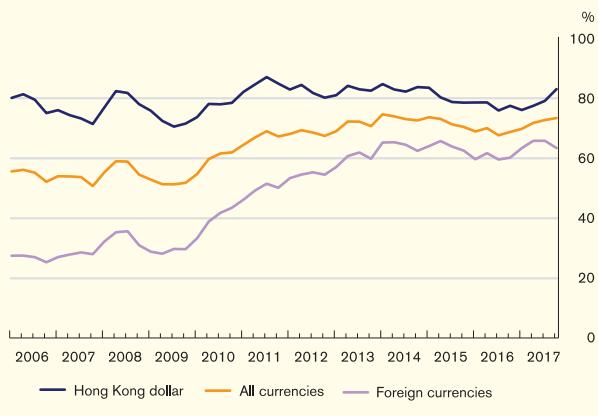
1. Figures may not add up to total due to rounding.
2. Figures refer to the percentage of total liabilities (including capital and reserves).
3. Debt securities comprise negotiable certificates of deposit and all other negotiable debt instruments.

Source: HKMA.

<sup>57</sup> In Hong Kong, category 1 institutions are required to comply with the NSFR; while category 2 institutions designated as category 2A institutions must comply with the requirements relating to the local Core Funding Ratio (CFR). According to the Banking (Liquidity) Rules, a category 1 institution must at all times maintain an NSFR of not less than 100%. A category 2A institution must maintain a CFR of not less than 50% on average in each calendar month of the year. The minimum CFR will rise to 75% on 1 January 2019. For details, see Banking (Liquidity) Rules (Cap. 155Q).

The Hong Kong dollar loan-to-deposit (LTD) ratio of all AIs increased to 82.7% at the end of December 2017 from 77.1% at the end of June (Chart 5.9), reflecting a faster growth in Hong Kong dollar loans and advances than deposits during the review period. Meanwhile, as foreign currency-denominated deposits grew faster than the loans, the foreign currency LTD ratio fell to 63.1% at the end of December 2017 from 65.5% at the end of June. Overall, the all-currency LTD ratio increased to 73.0% from 71.4% six months ago. Banks should assess how the rises in the LTD ratios affect their liquidity management.

**Chart 5.9**  
**Average LTD ratios of all AIs**



Source: HKMA.

### Interest rate risk

The interest rate risk exposure of locally incorporated licensed banks remained low. It is estimated that under a hypothetical shock of an across-the-board 200-basis-point increase in interest rates, the economic value of locally incorporated licensed banks' interest rate positions could be subject to a decline equivalent to 3.45% of their total capital base at the end of December 2017 (Chart 5.10).<sup>58</sup> Nevertheless, with expected US interest rate hikes and the Fed's balance sheet reduction, banks should assess the implications for their interest rate risk management.

<sup>58</sup> This estimation does not take into account the effects of any mitigating action by banks in response to the shock. The impact would be smaller if mitigating action is taken.

**Chart 5.10**  
**Impact of an interest rate shock on locally incorporated licensed banks**



Notes:

1. Interest rate shock refers to a standardised 200-basis-point parallel rate shock to institutions' interest rate risk exposure.
2. The impact of the interest rate shock refers to its impact on the economic value of the banking and trading book<sup>59</sup>, expressed as a percentage of the total capital base of banks.

Source: HKMA.

## 5.3 Credit risk

### Overview

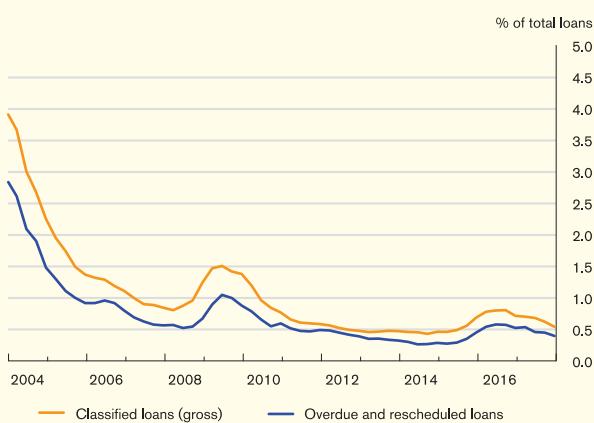
Amid the moderating but still benign economic environment, total loans and advances of all AIs expanded at a slower pace of 5.3% in the second half of 2017, after growing strongly by 10.2% in the first half. For 2017 as a whole, total loans registered solid growth of 16.1% after two years of slower growth.

The asset quality of banks' loan portfolios was sound and continued to improve in the second half of 2017. The gross classified loan ratio and the ratio of overdue and rescheduled loans of all AIs reduced to 0.67% and 0.52% at the end of December 2017 respectively, compared with 0.84% and 0.61% at the end of June. For retail banks, both the gross classified loan ratio and the

<sup>59</sup> Locally incorporated AIs subject to the market risk capital adequacy regime are required to report positions in the banking book only. Other locally incorporated AIs exempted from the market risk capital adequacy regime are required to report aggregate positions in the banking book and trading book.

ratio of overdue and rescheduled loans fell to 0.54% and 0.4% respectively (Chart 5.11). Nevertheless, the credit risk of banks should warrant close monitoring, as their asset quality could be more sensitive to the external environment given the rapid rise in loans for use outside Hong Kong in recent years.

**Chart 5.11**  
Asset quality of retail banks



Notes:

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

Source: HKMA.

Robust credit growth is likely to be sustained, as expectations for the near term have become more optimistic. The results of the HKMA Opinion Survey on Credit Condition Outlook in December 2017 showed that 29% of surveyed AIs expected loan demand to be higher in the next three months, while the remaining 71% were expecting loan demand to remain the same (Table 5.A).

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

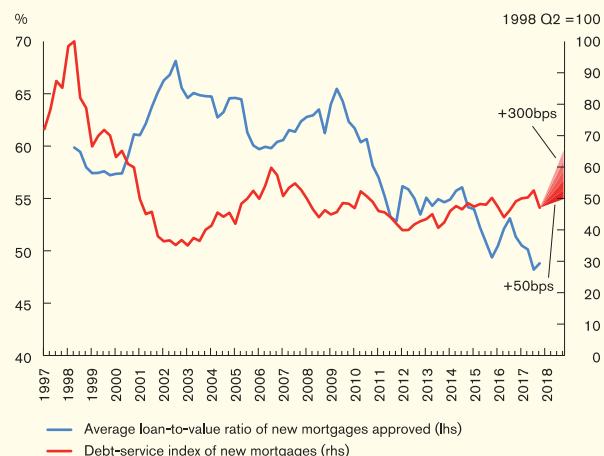
% of total respondents	Mar-17	Jun-17	Sep-17	Dec-17
Considerably higher	0	0	0	0
Somewhat higher	5	5	24	29
Same	81	86	71	71
Somewhat lower	14	10	5	0
Considerably lower	0	0	0	0
Total	100	100	100	100

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

### Household exposure<sup>60</sup>

The credit risk of household loans stayed low during the review period. Banks' mortgage portfolios remained healthy, with the delinquency ratio staying at a low level of 0.03% at the end of 2017. The average loan-to-value ratio (LTV) of new mortgage loans approved decreased further to 48.8% in the fourth quarter of 2017 from 50.1% in the second quarter (Chart 5.12). The figure was well below the ratio of 64% in September 2009, just before the implementation of the first round of countercyclical macro-prudential measures by the HKMA.

**Chart 5.12**  
Average LTV ratio and household debt-servicing burden for new mortgage loans



Note: The calculation of the index is based on the average interest rate for BLR-based mortgages.

Sources: HKMA and staff estimates.

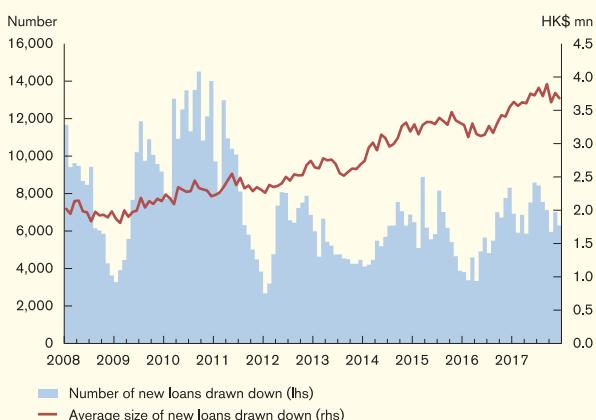
The debt-service index of new mortgages<sup>61</sup> reduced to 47.0 in the fourth quarter of 2017, after rising to 52.5 in the third quarter from 50.2 in the second quarter (the red line in Chart 5.12).

<sup>60</sup> Loans to households constitute lending to professional and private individuals, excluding lending for other business purposes. Mortgage lending accounts for a major proportion of household loans, while the remainder comprises mainly unsecured lending through credit card lending and other personal loans for private purposes. At the end of December, the share of household lending in domestic lending was 28.7%.

<sup>61</sup> A higher value of the debt-service index indicates there is either a drop in household income, or an increase in interest rates, or an increase in the average mortgage loan amount drawn by households. Historical movements in the index suggest that a sharp rise in the index may lead to a deterioration in the asset quality of household debt.

The recent drop in the index mainly reflected a slight decline in the average size of new mortgage loans in the fourth quarter of 2017 (Chart 5.13). However, as the average mortgage rate for new loans saw more upward pressure in the second half, along with the rise in HIBORs, the continuing US rate hikes and the potential pass through to domestic interest rates could weigh on the household debt-servicing burden going forward. In particular, a sensitivity test suggests that the index could rise significantly to 65.3 in a four-quarter period if interest rates were to increase by 300 basis points<sup>62</sup>, other things being constant. Therefore, the affordability of households could be under significant pressure if interest rates were to rise rapidly. Banks should stay alert to the risks associated with a rising level of household debt-servicing burden.

**Chart 5.13**  
New mortgage loans of surveyed AIs

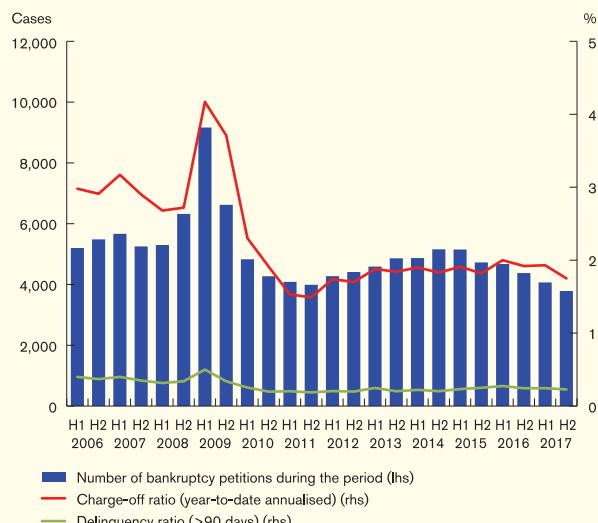


Source: HKMA Residential Mortgage Survey.

The credit risk of unsecured household exposure remained contained in the second half of 2017, with the annualised credit card charge-off ratio and the delinquency ratio reduced to 1.75% and 0.23% (Chart 5.14) at the end of 2017 respectively. In addition, the number of bankruptcy petitions continued to fall.

<sup>62</sup> The assumption of a 300-basis-point rise in interest rates is consistent with the prudential measure that requires AIs to have a 3-percentage-point mortgage rate upward adjustment for stress testing property mortgage loan applicants' debt servicing ability.

**Chart 5.14**  
Charge-off ratio and delinquency ratio for credit card lending and bankruptcy petitions



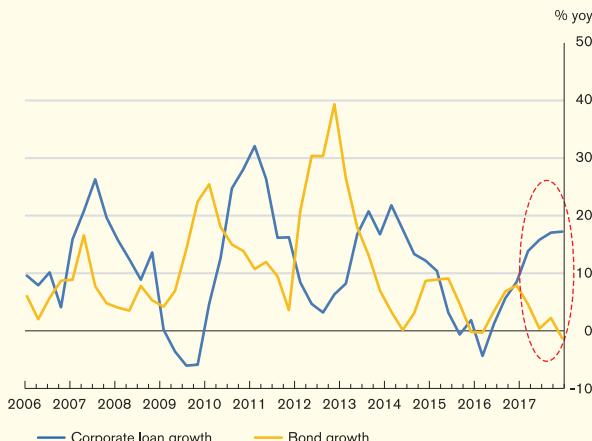
Sources: Official Receiver's Office and HKMA.

### Corporate exposure<sup>63</sup>

The growth in corporate loans moderated somewhat to 5.3% in the second half of the year on a half-yearly basis, after growing strongly by 11.3% in the first half.<sup>64</sup> For 2017 as a whole, the growth in corporate loans accelerated to 17.2% from 8.5% in 2016. However, at the same time, the acceleration in corporate loan growth coincided with a slowdown of growth in Hong Kong's non-bank corporate debt market (Chart 5.15), suggesting that the total credit for Hong Kong's corporates may not have expanded as rapidly as expected.

<sup>63</sup> Excluding interbank exposure. At the end of December, the share of corporate loans in domestic lending was 71.2%.

<sup>64</sup> Corporate loans comprise domestic lending except lending to professional and private individuals.

**Chart 5.15****Growth in outstanding amount of corporate loans and non-bank corporate debt in Hong Kong**

## Notes:

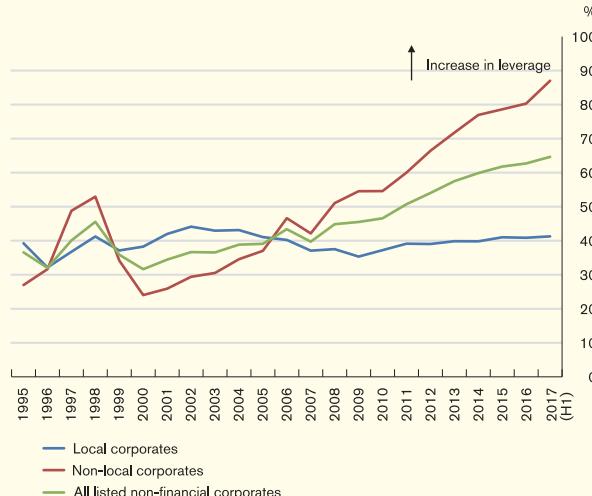
1. We follow Dealogic's definition of deal nationality which is based on the nationality of the issuer's parent if there is a credit support or guarantee for the issuing subsidiary. For deals without that support or guarantee, the nationality of the deal refers to that of the issuing subsidiary.
2. The outstanding amounts are estimated based on data about the issuance of debt securities by assuming that all debt securities will be matured on their original maturity date.

Sources: HKMA and staff estimates based on data from Dealogic.

Nevertheless, the tangible rise in corporate loans raise concerns about the level of corporate leverage and the associated credit risk in relation to banks' corporate exposures, particularly with the continuing US interest rate normalisation. Based on accounting data for non-financial corporates listed in Hong Kong, the weighted average debt-to-equity ratio, as a measure of corporate leverage, picked up further in the first half of 2017 (the green line in Chart 5.16), which was largely driven by non-local corporates (the red line). In contrast, the leverage for local corporates remained broadly stable at low levels, suggesting their credit risks were largely contained.

Non-local corporates also registered a deterioration in their debt-servicing ability in the same period, as indicated by the decline in the interest coverage ratio (Chart 5.17). The higher levels of leverage and the debt-servicing burden for non-local corporates imply these corporates would be more vulnerable to interest rate shocks. Therefore, banks should assess how the faster-than-expected US interest rate rises stemming from the Federal Reserve (Fed) balance sheet

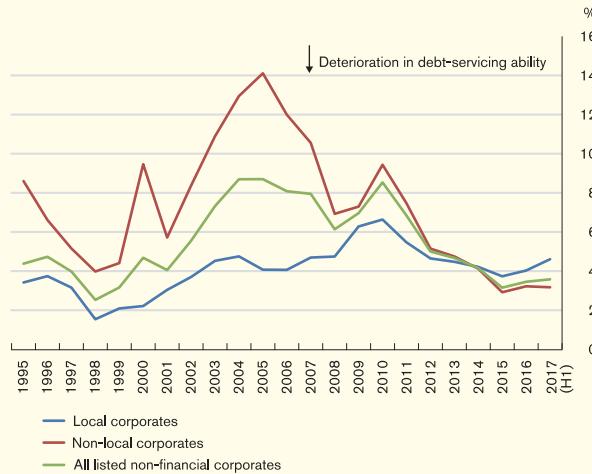
reduction and the US tax reform will affect the credit risk in relation to their exposure to non-local corporates.

**Chart 5.16****Leverage ratio of listed non-financial corporates in Hong Kong**

## Notes:

1. Weighted average figures.
2. The leverage ratio is defined as the ratio of debt to equity. A higher value indicates higher leverage.
3. All non-financial corporates listed on the Hong Kong Stock Exchange are selected. Local and non-local corporates refer to listed firms that are domiciled in and outside Hong Kong respectively.
4. Figures are calculated based on information up to end-February 2018.

Source: HKMA staff estimates based on data from Bloomberg.

**Chart 5.17****Interest coverage ratio of listed non-financial corporates in Hong Kong**

## Notes:

1. Weighted average figures.
2. The interest coverage ratio is calculated by the earnings before interest and tax divided by the total interest expenses. A lower value indicates deterioration of debt-servicing ability.
3. All non-financial corporates listed on the Hong Kong Stock Exchange are selected. Local and non-local corporates refer to listed firms that are domiciled in and outside Hong Kong respectively.
4. Figures are calculated based on information up to end-February 2018.

Source: HKMA staff estimates based on data from Bloomberg.

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

The banking sector's total Mainland-related lending increased by 4.9% to HK\$4,188 billion (16.7% of total assets) at the end of December 2017, from HK\$3,992 billion (16.6% of total assets) at the end of June (Table 5.B).

Other non-bank exposures also edged up by 1% to HK\$1,311 billion (Table 5.C).

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

HK\$ bn	Mar 2017	Jun 2017	Sep 2017	Dec 2017
Mainland-related loans	3,808	3,992	4,073	4,188
Mainland-related loans excluding trade finance	3,509	3,695	3,755	3,878
Trade finance	299	297	318	310
By type of AIs:				
Overseas incorporated AIs	1,686	1,777	1,785	1,853
Locally incorporated AIs*	1,548	1,613	1,663	1,691
Mainland banking subsidiaries of locally incorporated AIs	574	603	625	644
By type of borrowers:				
Mainland state-owned entities	1,545	1,660	1,672	1,711
Mainland private entities	921	972	972	1,017
Non-Mainland entities	1,342	1,361	1,429	1,460

Notes:

1. \* Including loans booked in Mainland branches of locally incorporated AIs.

2. Figures may not add up to total due to rounding.

Source: HKMA.

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

HK\$ bn	Mar 2017	Jun 2017	Sep 2017	Dec 2017
Negotiable debt instruments and other on-balance sheet exposures	764	815	871	920
Off-balance sheet exposures	483	483	503	411
<b>Total</b>	<b>1,248</b>	<b>1,298</b>	<b>1,374</b>	<b>1,311</b>

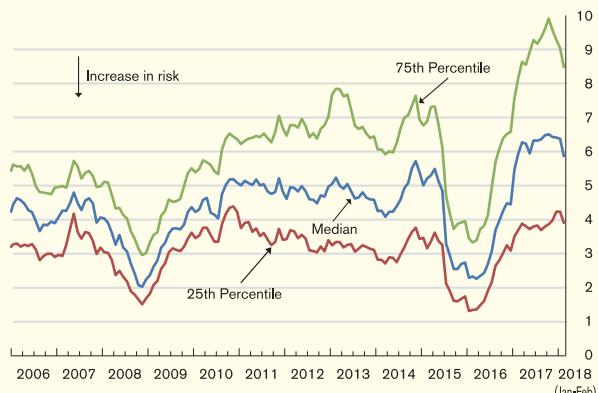
Note: Figures may not add up to total due to rounding.

Source: HKMA.

Despite the rising share of banks' Mainland-related lending, the associated credit risks should remain manageable as 76% of the Mainland-related lending at the end of 2017 was for state-owned enterprises and non-Mainland multinational companies, with the majority of loans to Mainland private entities being secured with collaterals or guarantees.

In addition, reflecting the recent strong market sentiment in Mainland China due to the country's solid economic performance, the distance-to-default index,<sup>65</sup> a market-based default risk indicator, remained steady at a low risk level during the review period. This suggests a low default risk for the Mainland corporate sector (Chart 5.18). The gross classified loan ratio of Mainland-related lending of all AIs<sup>66</sup> edged down to 0.67% at the end of December 2017 from 0.88% at the end of June.

**Chart 5.18**  
**Distance-to-default index for the Mainland corporate sector**



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

Source: HKMA staff estimates based on data from Bloomberg.

However, the overall corporate leverage in Mainland China continued to trend upwards (the blue line in Chart 5.19), despite the progress of deleveraging in overcapacity sectors since mid-2016.<sup>67</sup> In view of this rising trend, banks are reminded to maintain prudent credit risk management for their Mainland-related lending.

<sup>65</sup> The distance-to-default is a market-based default risk indicator based on the framework by R. Merton (1974), "On the pricing of corporate debt: the risk structure of interest rates", *Journal of Finance*, Vol. 29, pages 449–470, in which equity prices, equity volatility, and companies' financial liabilities are the determinants of default risk. In essence, it measures the difference between the asset value of a firm and a default threshold in terms of the firm's asset volatility.

<sup>66</sup> Figures cover AIs' Hong Kong offices and Mainland branches and subsidiaries.

<sup>67</sup> Overcapacity industries include glass, cement, steel, photovoltaic, aluminium, shipbuilding and coal chemical.

**Chart 5.19**  
**Leverage ratio for the Mainland corporate sector**



Notes:

1. The leverage ratio is defined as the ratio of total liabilities to total assets.
2. It is calculated based on all non-financial corporates listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange.
3. Overcapacity industries include glass, cement, steel, photovoltaic, aluminium, shipbuilding and coal chemical.
4. Figures are calculated based on information up to end-February 2018.

Source: HKMA staff estimates based on data from Bloomberg.

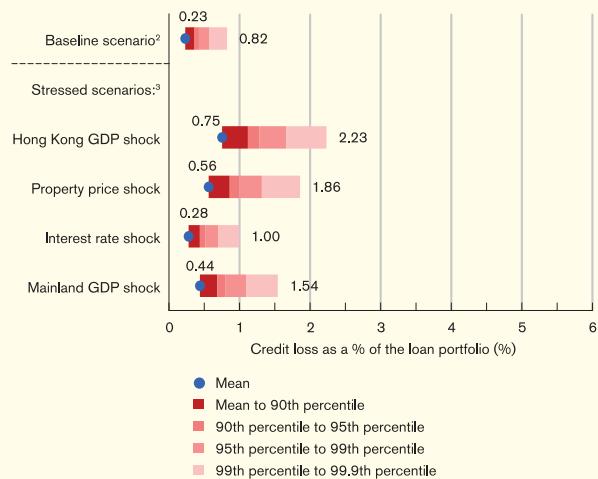
**Macro stress testing of credit risk<sup>68</sup>**

Results of the latest macro stress testing on retail banks' credit exposure suggest that the Hong Kong banking sector remains resilient and should be able to withstand rather severe macroeconomic shocks similar to those experienced during the Asian financial crisis. Chart 5.20 presents the simulated future credit loss rate of retail banks in the second quarter of 2019 under four specific macroeconomic shocks<sup>69</sup> using information up to the fourth quarter of 2017.

Taking account of tail risk, banks' credit losses (at the confidence level of 99.9%) under the stress scenarios range from 1% (Interest rate shock) to

2.23% (Hong Kong GDP shock), which are significant, but smaller than the estimated loan loss of 4.39% following the Asian financial crisis.

**Chart 5.20**  
**The mean and value-at-risk statistics of simulated credit loss distributions<sup>1</sup>**



Notes:

1. The assessments assume the economic conditions in 2017 Q4 as the current environment. The Monte Carlo simulation method is adopted to generate the credit loss distribution for each scenario.
2. Baseline scenario: no shock throughout the two-year period.
3. Stressed scenarios:
  - Hong Kong GDP shock:** reductions in Hong Kong's real GDP by 2.3%, 2.8%, 1.6%, and 1.5% respectively in each of the four consecutive quarters starting from 2018 Q1 to 2018 Q4.
  - Property price shock:** Reductions in Hong Kong's real property prices by 4.4%, 14.5%, 10.8%, and 16.9% respectively in each of the four consecutive quarters starting from 2018 Q1 to 2018 Q4.
  - Interest rate shock:** A rise in real interest rates (HIBORs) by 300 basis points in the first quarter (i.e. 2018 Q1), followed by no change in the second and third quarters and another rise of 300 basis points in the fourth quarter (i.e. 2018 Q4).
  - Mainland GDP shock:** Slowdown in the year-on-year annual real GDP growth rate to 4% in one year.

Source: HKMA staff estimates.

## 5.4 Systemic risk

The external environment appeared to be favourable during the review period, as reflected by the synchronised global economic growth and strong market sentiment in equity markets. However, policy uncertainties in major advanced economies could potentially affect the global outlook which in turn may affect the systemic risk of the Hong Kong banking sector.

In the US, while the tax reform measures are expected to provide a boost to economic output, they may pose an upward inflationary pressure given the US economy is now operating at its full potential. Should this lead to a sharp rise in

<sup>68</sup> Macro stress testing refers to a range of techniques used to assess the vulnerability of a financial system to "exceptional but plausible" macroeconomic shocks. The credit loss estimates presented in this report are obtained based on a revised framework from J. Wong et al. (2006), "A framework for stress testing banks' credit risk", *Journal of Risk Model Validation*, Vol. 2(1), pages 3–23. All estimates in the current report are not strictly comparable to those estimates from previous reports.

<sup>69</sup> These shocks are calibrated to be similar to those that occurred during the Asian financial crisis, except the Mainland GDP shock.

inflation, it could trigger a faster pace of US interest rate normalisation. The possible sharper-than-expected rises in US interest rates could pose challenges to the Hong Kong banking sector as it could translate into higher financing costs for both corporates and households, which affect their debt servicing ability. This could in turn put pressure on banks' credit risk management in view of the rising levels of leverage among non-local corporates and high levels of household debt servicing burdens.

Despite the recent market concerns over US inflation, the current Fed funds futures market is still expecting a flatter interest rate path than the Fed's projections (Chart 2.4). If the pace of US rate hikes is faster than expected, this could lead to an abrupt repricing of interest rate expectation. This in turn could heighten the risk of a significant reversal of capital flows which would result in an overshooting of interest rates in Hong Kong.

In addition to the effects on US interest rates, the US tax reforms may affect the global dollar liquidity when US corporates begin to repatriate their corporate profits that are currently parked overseas. This together with the continuing US monetary policy normalisation could drain dollar liquidity from offshore markets. However, during the review period, the cross-currency basis swap between major currencies and the US dollar remained broadly stable, suggesting the dollar liquidity has so far not been affected by the tax reform measures (Chart 5.21).<sup>70</sup>

**Chart 5.21**

**1-year cross-currency basis swap spreads of major currencies against the US dollar**



Source: Bloomberg.

Across the Atlantic, the uncertainty related to the Brexit negotiations is one of the geopolitical risks that merits close monitoring. If the Brexit negotiations lead to an abrupt shift in cross-border banking flows between the UK and euro-area economies, the subsequent impact of spillover risks to the Hong Kong banking sector could be large, given the unmatched role of the UK banking system in distributing international banking flows and the significant interbank linkage between Hong Kong and the UK.

Nevertheless, during the review period, there was no major deterioration in interbank funding conditions. The spread between the three-month US dollar LIBOR and its corresponding overnight index swap (OIS) rate<sup>71</sup>, a common indicator of systemic liquidity risks in the short-term dollar funding market, widened to around 40 basis points at the end of February 2018 which was still a low level by historical standards (Chart 5.22).

<sup>70</sup> For illustration, in a cross currency basis swap for EUR/USD, a party borrowing US dollars (which lends EUR at the same time to the counterparty) will pay US dollar London Interbank Offered Rate (LIBOR) and receive EUR LIBOR plus a spread (shown in Chart 5.21) during the contract. When the contract expires, these two parties exchange the principal. A negative spread means that the US dollar borrower accepts a lower EUR interest rate paid by the counterparty than EUR LIBOR. Therefore, a negative spread indicates a tighter US dollar funding condition, which could reflect differences in demand and supply of the two currencies involved, monetary policies and counterparty risks.

<sup>71</sup> An OIS is an interest rate swap in which the floating leg is linked to an index of daily overnight rates. The two parties agree to exchange at maturity, on an agreed notional amount, the difference between interest accrued at the agreed fixed rate and interest accrued at the floating index rate over the life of the swap. The fixed rate is a proxy for expected future overnight interest rates. As overnight lending generally bears lower credit and liquidity risks, the credit risk and liquidity risk premiums contained in the OIS rates should be small. Therefore, the LIBOR-OIS spread generally reflects the credit and liquidity risks in the interbank market.

**Chart 5.22**  
**3-month US dollar LIBOR-OIS spreads**



Source: Bloomberg.

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

The CCyB is part of the internationally agreed Basel III standards and is designed to enhance the resilience of the banking sector against system-wide risks associated with excessive aggregate credit growth. Hong Kong is implementing the CCyB in line with the Basel III implementation schedule. The Monetary Authority announced on 10 January 2018 that the CCyB ratio for Hong Kong will increase to 2.5% with effect from 1 January 2019, from the current 1.875%.<sup>72</sup> This reflects the fact that, under the Basel III phase-in arrangements, the maximum CCyB under Basel III will increase to 2.5% of banks' risk-weighted assets on 1 January 2019 from 1.875% effective from 1 January 2018.<sup>73</sup>

In setting the CCyB rate, the Monetary Authority considered a series of indicators (Table 5.D), including an “indicative buffer guide” (which is a metric providing a guide for CCyB rates based on credit-to-GDP and property price-to-rent gaps<sup>74</sup>). Based on the information up to the latest announcement date, the credit-to-GDP gap and the property price-to-rent gap were 19.3% and 8.3% respectively. Both gaps remained at elevated levels and a simple mapping from the indicative buffer guide of 2.4% would signal a CCyB rate of 2.25%, 25 basis points lower than the current CCyB ratio absent the Basel III phase-in mechanism.<sup>75</sup>

Nevertheless, the indicative buffer guide only provides guidance for CCyB decisions, and the determination of a CCyB ratio is not a mechanical exercise. In addition to the indicative buffer guide, the Monetary Authority also reviewed a range of other reference indicators.<sup>76</sup> The information drawn from these indicators, in the view of the Monetary Authority, suggests that a CCyB of 2.5% would be more appropriate at this stage.

<sup>72</sup> Further details of the decision may be found in the press release “Monetary Authority Announces Countercyclical Capital Buffer for Hong Kong” issued on 10 January 2018 which is available on the HKMA website.

<sup>73</sup> Under the Basel III phase-in arrangements, the maximum CCyB rate was capped at 0.625% on 1 January 2016, with the cap rising by 0.625 percentage points each subsequent year until it reaches 2.5% on 1 January 2019.

<sup>74</sup> The credit-to-GDP gap is the gap between the ratio of credit to GDP and its long term trend, while the property price-to-rent gap is the gap between the ratio of residential property prices to rentals and its long-term trend.

<sup>75</sup> According to section 3.2.5 of the HKMA’s SPM CA-B-1, the CCyB rate will be expressed in multiples of 25 basis points (without rounding up). Thus, the indicative buffer guide would signal an extant CCyB rate to increase or decrease in multiples of 25 basis points.

<sup>76</sup> These included measures of bank, corporate and household leverage; debt servicing capacity; profitability and funding conditions within the banking sector and macroeconomic imbalances.

## Banking sector performance

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

	27-Jan-17	Q2-2017	10-Jan-18
Announced CCyB rate	1.875%		2.5%
Date effective	01/01/2018		01/01/2019
Indicative buffer guide	2.4%	2.5%	2.4%
Basel Common Reference Guide	2.5%	2.5%	2.5%
Property Buffer Guide	2.0%	2.5%	2.0%
Composite CCyB Guide	2.4%	2.5%	2.4%
Indicative CCyB Ceiling	None	None	None
<i>Primary gap indicators</i>			
Credit/GDP gap	11.5%	13.4%	19.3%
Property price/rent gap	8.2%	10.0%	8.3%
<i>Primary stress indicators</i>			
3-month HIBOR spread (percentage points)	0.75%	0.47%*	0.06%
Quarterly change in classified loan ratio (percentage points)	0.01%	-0.02%	-0.06%

Notes:

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

Source: HKMA.

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

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

	Dec 2016	Sep 2017	Dec 2017
<b>Interest rates</b>			
1-month HIBOR fixing <sup>2</sup> (quarterly average)	0.43	0.45	0.84
3-month HIBOR fixing (quarterly average)	0.71	0.76	1.04
BLR <sup>3</sup> and 1-month HIBOR fixing spread (quarterly average)	4.57	4.55	4.16
BLR and 3-month HIBOR fixing spread (quarterly average)	4.29	4.24	3.96
Composite interest rate <sup>4</sup>	0.31	0.30	0.38
	<b>All AIs</b>		
<b>Balance sheet developments<sup>5</sup></b>			
Total deposits	0.9	1.0	2.0
Hong Kong dollar	1.3	2.3	-0.1
Foreign currency	0.4	-0.4	4.3
Total loans	2.5	2.3	2.9
Domestic lending <sup>6</sup>	2.5	2.7	2.8
Loans for use outside Hong Kong <sup>7</sup>	2.7	1.4	3.2
Negotiable instruments			
Negotiable certificates of deposit (NCDs) issued	2.1	0.9	3.3
Negotiable debt instruments held (excluding NCDs)	-0.6	4.5	3.0
<b>Asset quality</b>			
As a percentage of total loans <sup>8</sup>			
Pass loans	97.32	97.79	97.98
Special mention loans	1.82	1.41	1.35
Classified loans <sup>9</sup> (gross)	0.85	0.79	0.67
Classified loans (net) <sup>10</sup>	0.51	0.42	0.35
Overdue > 3 months and rescheduled loans	0.67	0.61	0.52
Classified loan ratio (gross) of Mainland related lending <sup>11</sup>	0.80	0.84	0.67
<b>Liquidity ratios (quarterly average, consolidated)</b>			
Liquidity Coverage Ratio — applicable to category 1 institutions	156.3	144.5	155.1
Liquidity Maintenance Ratio — applicable to category 2 institutions	51.0	50.2	49.4
	<b>Retail banks</b>		
<b>Profitability</b>			
Loan impairment charges as a percentage of average total assets (year-to-date annualised)	0.07	0.06	0.06
Net interest margin (year-to-date annualised)	1.32	1.43	1.45
Cost-to-income ratio (year-to-date)	43.2	41.2	41.9
	<b>Surveyed institutions</b>		
<b>Asset quality</b>			
Delinquency ratio of residential mortgage loans	0.03	0.02	0.03
Credit card lending			
Delinquency ratio	0.24	0.23	0.22
Charge-off ratio — quarterly annualised	1.89	1.95	1.64
— year-to-date annualised	1.92	1.91	1.75
	<b>All locally incorporated AIs</b>		
<b>Capital adequacy (consolidated)</b>			
Common Equity Tier 1 capital ratio	15.5	15.1	15.4
Tier 1 capital ratio	16.4	16.1	16.6
Total capital ratio	19.2	18.7	19.1

Notes:

1. Figures are related to Hong Kong offices unless otherwise specified.
2. The Hong Kong Interbank Offered Rates are released by the Hong Kong Association of Banks.
3. With reference to the rate quoted by The Hongkong and Shanghai Banking Corporation Limited.
4. The composite interest rate is a weighted average interest rate of all Hong Kong-dollar interest-bearing liabilities, which include deposits from customers, amounts due to banks, negotiable certificates of deposit and other debt instruments, and Hong Kong-dollar non-interest-bearing demand deposits on the books of banks. Further details can be found on the HKMA website.
5. Quarterly change.
6. Loans for use in Hong Kong plus trade finance.
7. Including "others" (i.e. unallocated).
8. Figures are related to all AIs' Hong Kong offices, as well as locally incorporated AIs' overseas branches and major overseas subsidiaries.
9. Classified loans are those loans graded as "substandard", "doubtful" or "loss".
10. Net of specific provisions/individual impairment allowances.
11. Figures are related to all AIs' Hong Kong offices, as well as locally incorporated AIs' Mainland branches and subsidiaries.

## Box 5

### A cost-benefit assessment of loss-absorbing capacity requirements for authorized institutions in Hong Kong

#### *Introduction*

The HKMA recently published a consultation paper (CP) setting out proposals for rules prescribing loss-absorbing capacity (LAC) requirements for AIs as subsidiary legislation under the Financial Institutions (Resolution) Ordinance.<sup>77</sup> As discussed in the CP and an earlier issue of the *HKMA Quarterly Bulletin*, requiring AIs to have sufficient LAC resources (consisting of regulatory capital and certain other liabilities that meet specific eligibility criteria), is a key precondition to achieving an orderly resolution, as LAC can be used to absorb losses of an AI should it fail or to recapitalise the AI or its transferee.<sup>78</sup>

While increasing the LAC of AIs likely brings economic benefits by enhancing AIs' resilience to shocks and their resolvability, it will also inevitably incur costs. In particular, where AIs are required to issue more LAC, their funding costs could rise, which in turn could lead to higher costs of financial services if the increased funding costs are passed on to AIs' customers, and may dampen investment and output. Against this background, this box provides a cost-benefit assessment to examine whether increases in the LAC-to-RWA (risk-weighted assets) ratios (LAC ratios) of locally incorporated AIs would bring net benefits to the Hong Kong economy. The analysis largely follows the methodology adopted in other studies, in particular those conducted by the Bank of England and the US Federal Reserve Board.<sup>79</sup>

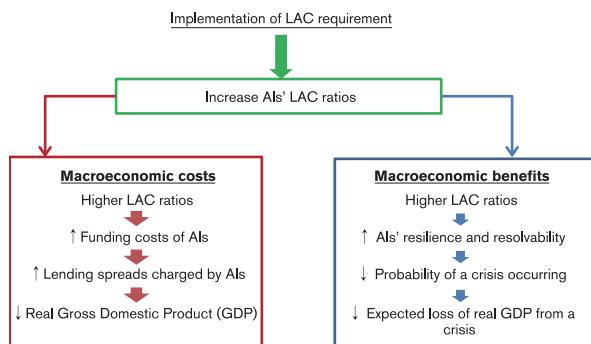
<sup>77</sup> See “Consultation paper on rules prescribing loss-absorbing capacity requirements for authorized institutions”, issued by the HKMA on 17 January 2018.

<sup>78</sup> See “Developing rules on loss-absorbing capacity requirements for authorized institutions in Hong Kong”, *HKMA Quarterly Bulletin*, September 2017.

<sup>79</sup> Brooke, M. et al., (2015), “Measuring the macroeconomic costs and benefits of higher UK bank capital requirements”, *Bank of England Financial Stability Paper* No. 35. Firestone, S. et al., (2017), “An empirical assessment of the costs and benefits of bank capital in the US”, *Finance and Economics Discussion Series* 2017-034. Board of Governors of the Federal Reserve System.

The structure of the assessment is summarised in Chart B5.1.

**Chart B5.1**  
**The structure of the cost-benefit assessment**



#### *Macroeconomic costs of increased LAC ratios for locally incorporated AIs*

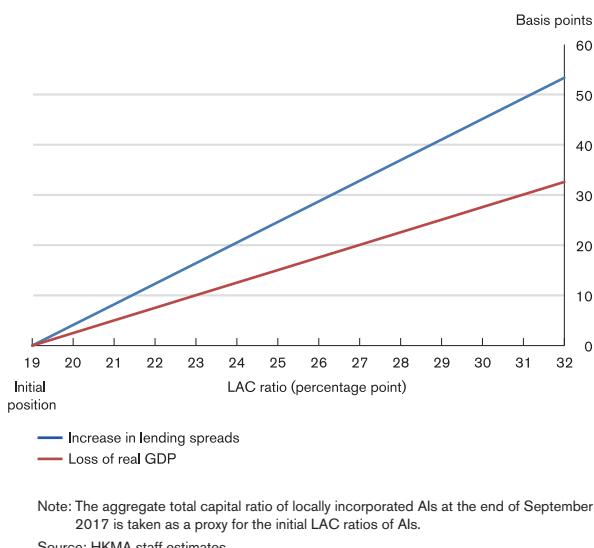
We first focus our analysis on the macroeconomic costs of higher LAC ratios. To gauge the effect of higher LAC ratios on the funding costs of AIs, the following assumptions are made. First, it is assumed that increases in LAC ratios are met two-thirds with equity and one-third with non-capital LAC eligible debt (LAC debt), and this new LAC funding replaces the most expensive non-LAC funding currently on AIs' balance sheets. We also account for the forgone tax-shield cost to the extent that the additional LAC funding is met by replacing non-LAC funding with equity. Based on data submitted to the HKMA by locally incorporated AIs, it is estimated that the weighted average funding cost of AIs would rise by 1.81 basis points in response to a one-percentage-point rise in LAC ratios.<sup>80</sup> Secondly, the resulting increases

<sup>80</sup> The annual cost of equity, LAC debt and the next most expensive non-LAC funding currently on AIs' balance sheets are assumed to be 9%, 4% and 1.7% respectively.

in AIs' funding cost are assumed to be fully passed on to their customers through higher lending spreads.<sup>81</sup>

An error-correction model is employed to translate the impact of higher lending spreads on Hong Kong's real GDP.<sup>82</sup> Using the aggregate consolidated total capital ratio of locally-incorporated AIs at the end of September 2017 (i.e. 18.7%) as a proxy of the initial LAC ratios, Chart B5.2 presents the estimated rise in lending spreads and the associated loss of real output in response to an increase in the LAC ratios. Specifically, our estimation result suggests that in response to a one-percentage-point rise in the LAC ratios, the lending spreads would rise by 4.11 basis points, which leads to a decline of real GDP by 2.51 basis points.

**Chart B5.2**  
**Estimated impact of higher LAC ratios on lending spreads and Hong Kong's real GDP**



<sup>81</sup> In practice, AIs are unlikely to be able to pass on 100% of the increased costs. To the extent AIs do not pass on all the costs (for example, as a result of competitiveness considerations, or improved efficiency), the estimates of the macroeconomic costs would be smaller. Therefore, the estimated increase in lending spreads should be treated as the upper bound estimates.

<sup>82</sup> The error-correction model of Wong et al. (2010), "An assessment of the long-term economic impact of the new regulatory reform on Hong Kong", *HKMA Research Note 05/2010*, is updated for the period from 1998 to 2017.

### Macroeconomic benefits of increased LAC ratios for locally incorporated AIs

The macroeconomic benefits of increased LAC ratios are assumed to take place mainly through reducing the probability of financial crises occurring. As such, the benefit is estimated by multiplying (i) the reduction in the probability of a crisis with (ii) the impact of a crisis.

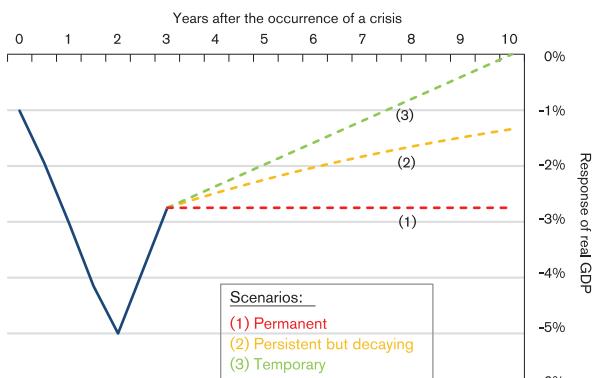
For (i) the reduction in the probability of a crisis, we employ an econometric model on a dataset of Organisation for Economic Co-operation and Development (OECD) and Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) economies (including Hong Kong) to estimate the probability of a crisis. This probability is assumed to be determined by LAC ratios and other factors including the credit-to-GDP gap, real GDP growth, real exchange rate growth, Chicago Board Options Exchange Market Volatility Index and the LTD ratio.<sup>83</sup> In line with our expectation, the probability of a crisis is found to be negatively correlated with the level of LAC ratios. Based on the estimation result, a schedule of estimated probabilities of a crisis for different levels of LAC ratios can be obtained. Following the approach taken in Firestone et al. (2017), the modelled probabilities of a crisis are reduced by 30% to account for the potential effect of an operational resolution regime in Hong Kong.<sup>84</sup>

<sup>83</sup> Using Hong Kong's experience alone may not be adequate as the occurrence of a financial crisis in Hong Kong is rare and the impact of a crisis is typically much milder than in other economies. To improve reliability of the estimates for the probability as well as the severity of a crisis, we include crisis episodes in both OECD and EMEAP economies in our estimation.

<sup>84</sup> This is justified by the fact that an operational resolution regime would result in stronger market discipline (i.e. AI shareholders and other investors are less willing to tolerate excessive risk-taking if they envisage a bail-in instead of bail-out). It should be noted that the adjustment made to the probability of a crisis in this analysis of the cost of higher LAC requirements has an element of circularity, because higher LAC requirements themselves make a major contribution to enhancing the credibility of a resolution regime. However, this will lead to an understatement, rather than an overstatement, of the net benefits of higher LAC ratios, and so is in keeping with the conservative approach adopted in the cost-benefit assessment.

For (ii) the impact of a crisis, we apply the model of Romer and Romer (2017)<sup>85</sup> on a dataset of OECD and EMEAP economies to project the short-to-medium term adverse impact on real GDP following an occurrence of a crisis.<sup>86</sup> For the longer term impact, three different scenarios are assumed, i.e. (1) a permanent output loss; (2) a persistent but decaying output loss with a 5% rate of decay; and (3) a temporary output loss that would be fully dissipated ten years after the onset of a crisis, which is similar to Hong Kong's experience following the Asian financial crisis. Chart B5.3 illustrates the output loss under the three scenarios. To represent the cost of a crisis in a net present value term, we discount the projected loss of real GDP with the average real yield of 10-year Exchange Fund Notes.

**Chart B5.3**  
**Estimated impact of a crisis under three different scenarios**



Notes:

1. The blue line represents the short-to-medium term impact of a crisis, which is estimated based on the empirical model of Romer and Romer (2017) and the impact has been adjusted following the approach adopted in Firestone et al. (2017).
2. For longer term impact, three different scenarios are considered in this analysis. They include (i) a permanent output loss (red line); (ii) a persistent but decaying output loss with a 5% decaying rate (orange line); and (iii) a temporary output loss fully dissipated in ten years after the occurrence of a crisis, which is similar to the experience for Hong Kong after the Asian financial crisis (green line).

Source: HKMA staff estimates.

<sup>85</sup> Romer, C. D. and D. H. Romer (2017), "New evidence on the aftermath of financial crisis in advanced countries", *American Economic Review*, 107(10), 3072–3118.

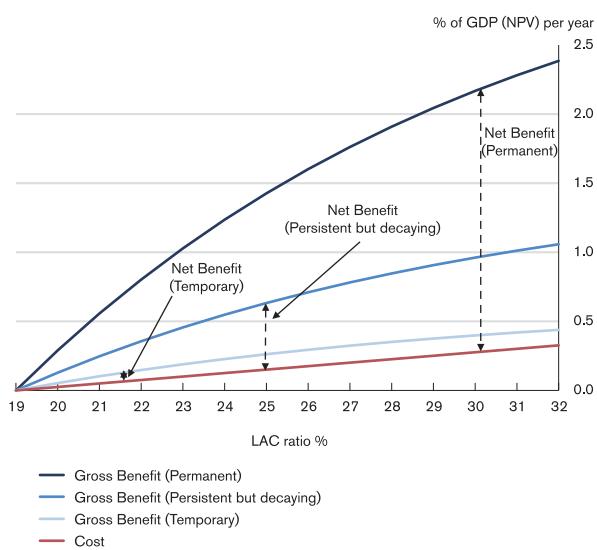
<sup>86</sup> Following similar adjustments made in Firestone et. al (2017), the duration of crisis effect has been shortened to three years from five years to account for the prompt recapitalisations that are facilitated by an operational resolution regime. Again, the adjustment will lead to an understatement, rather than an overstatement, of the net benefits of higher LAC ratios, and so is in keeping with the conservative approach adopted in the cost-benefit assessment.

The gross macroeconomic benefit of higher LAC ratios is calculated for each of the three scenarios by multiplying the adjusted reduction in the modelled probability of a crisis by the net present value of the cost of a crisis for each scenario.

**Net economic impact of the LAC requirements for Hong Kong**

Chart B5.4 illustrates the results of the cost-benefit assessment for each of the three scenarios. The value of the net benefit is the difference between the blue line (gross benefit) and the red line (cost) for each scenario. The net benefit of a higher LAC ratio is positive across all three scenarios, although the extent of the estimated net benefit is highly dependent on whether the adverse impact of a crisis on output is temporary or not. For instance, in the temporary output loss scenario, increasing the LAC ratio higher than 30% would lead to a smaller marginal net benefit.

**Chart B5.4**  
**Net economic benefit of higher LAC ratios for three scenarios**



Notes:

1. The aggregate total capital ratio of locally incorporated AIs at the end of September 2017 is taken as a proxy for AIs' initial LAC ratios.
2. See footnote 2 in Chart B5.3 for the details of the three scenarios of output loss from a crisis.

Source: HKMA staff estimates.

However, it should be noted that this cost-benefit assessment has not exhaustively incorporated all possible channels through which higher LAC ratios would affect the economy due to difficulties in their empirical quantification.<sup>87</sup> Therefore, this assessment can at best only provide a broad assessment of the likely net impact of higher LAC ratios. Nevertheless, the fact that this assessment indicates a positive net economic benefit for higher LAC ratios across all three scenarios provides supportive evidence for introducing LAC requirements for AIs in Hong Kong.

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<sup>87</sup> Brooke et al. (2015) lists a number of other possible channels, including the contagion effect of resolution, the effect of non-crisis downturn and the impact on total factor productivity growth, etc.

# Glossary of terms

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## **Aggregate Balance**

The sum of balances in the clearing accounts and reserve accounts maintained by commercial banks with the central bank. In Hong Kong, this refers to the sum of the balances in the clearing accounts maintained by the banks with the HKMA for settling interbank payments and payments between banks and the HKMA. The Aggregate Balance represents the level of interbank liquidity, and is a part of the Monetary Base.

## **Authorized Institution (AI)**

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

## **Best Lending Rate**

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

## **Certificates of Indebtedness (CIs)**

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

## **Composite Consumer Price Index (CCPI)**

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

## **Composite Interest Rate**

The composite interest rate is a weighted average interest rate of all Hong Kong dollar interest bearing liabilities, which include deposits from customers, amounts due to banks, negotiable certificates of deposit and other debt instruments, and Hong Kong dollar non-interest bearing demand deposits on the books of banks. Data from retail banks, which account for about 90% of the total customers' deposits in the banking sector, are used in the calculation. It should be noted that the composite interest rate represents only average interest expenses. There are various other costs involved in the making of a loan, such as operating costs (e.g. staff and rental expenses), credit cost and hedging cost, which are not covered by the composite interest rate.

## **Convertibility Undertaking (CU)**

An undertaking by a central bank or currency board to convert domestic currency into foreign currency and vice versa at a fixed exchange rate. In Hong Kong, the HKMA operates Convertibility Undertakings on both the strong side and the weak side. Under the strong-side Convertibility Undertaking, the HKMA undertakes

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

### **Convertibility Zone**

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

### **Exchange Fund Bills and Notes (EFBNs)**

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

### **Monetary Base**

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

### **Nominal and Real Effective Exchange Rate (NEER and REER)**

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

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# Abbreviations

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<b>1m moving average</b>	One-month moving average
<b>3m moving average</b>	Three-month moving average
<b>3m-on-3m</b>	Three-month-on-three-month
<b>AEs</b>	Advanced economies
<b>AFC</b>	Asian Financial Crisis
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>Als</b>	Authorized institutions
<b>BIS</b>	Bank for International Settlements
<b>bn</b>	Billion
<b>BLR</b>	Best lending rate
<b>BoJ</b>	Bank of Japan
<b>BoP</b>	Balance of Payments
<b>BSD</b>	Buyer's stamp duty
<b>CAPE</b>	Cyclically-adjusted price-to-earnings
<b>CAR</b>	Capital Adequacy Ratio
<b>CBO</b>	Congressional Budget Office
<b>CBRC</b>	China Banking Regulatory Commission
<b>CCPI</b>	Composite Consumer Price Index
<b>CCyB</b>	Countercyclical capital buffer
<b>CDs</b>	Certificates of deposits
<b>CDS</b>	Credit default swap
<b>CET1</b>	Common equity tier-one
<b>CFETS</b>	China Foreign Exchange Trade System
<b>CFR</b>	Core Funding Ratio
<b>ChiNext</b>	The start-ups board in the Shenzhen Stock Exchange
<b>CIs</b>	Certificates of Indebtedness
<b>CNH</b>	Offshore renminbi in Hong Kong
<b>CNY</b>	Onshore renminbi
<b>C&amp;SD</b>	Census and Statistics Department
<b>CP</b>	Consultation paper
<b>CPI</b>	Consumer Price Index

<b>CU</b>	Convertibility Undertaking
<b>DF</b>	Deliverable forward
<b>DI</b>	Direct investment
<b>DSD</b>	Doubling of the ad valorem stamp duty rates
<b>DSR</b>	Debt-servicing ratio
<b>EBIT</b>	Earnings before interest and tax
<b>EBITDA</b>	Earnings before interest, taxes, depreciation and amortization
<b>ECB</b>	European Central Bank
<b>EFBNs</b>	Exchange Fund Bills and Notes
<b>EMEAP</b>	Executives' Meeting of East Asia-Pacific Central Banks
<b>EMEs</b>	Emerging Market Economies
<b>EPIFs</b>	External primary income flows
<b>EPU</b>	Economic policy uncertainty
<b>ETFs</b>	Exchange traded funds
<b>EU</b>	European Union
<b>EUR</b>	Euro
<b>FDI</b>	Foreign direct investment
<b>Fed</b>	Federal Reserve
<b>FOMC</b>	Federal Open Market Committee
<b>FSB</b>	Financial Stability Board
<b>FX</b>	Foreign exchange
<b>GBP</b>	British Pound Sterling
<b>GBs</b>	Government Bonds
<b>GDP</b>	Gross Domestic Product
<b>GFC</b>	Global financial crisis
<b>G-SIBs</b>	Global systemically important banks
<b>HIBOR</b>	Hong Kong Interbank Offered Rate
<b>HK</b>	Hong Kong
<b>HKD</b>	Hong Kong dollar
<b>HKEEx</b>	The Hong Kong Exchanges and Clearing Limited
<b>HKMA</b>	Hong Kong Monetary Authority
<b>HK\$M3</b>	Hong Kong dollar broad money supply
<b>HSCEI</b>	Hang Seng China Enterprises Index
<b>HSI</b>	Hang Seng Index
<b>IFC</b>	International Finance Corporation

<b>IMF</b>	International Monetary Fund
<b>IPO</b>	Initial Public Offering
<b>IT</b>	Information technology
<b>JPY</b>	Japanese Yen
<b>LCR</b>	Liquidity Coverage Ratio
<b>LEI</b>	Composite index of leading economic indicators
<b>LIBOR</b>	London Interbank Offered Rate
<b>LERS</b>	Linked Exchange Rate System
<b>LMR</b>	Liquidity Maintenance Ratio
<b>lhs</b>	Left-hand side
<b>IRB</b>	Internal Ratings-Based Approach
<b>LAC</b>	Loss-absorbing capacity
<b>LTD</b>	Loan-to-deposit
<b>LTV</b>	Loan-to-value
<b>mn</b>	Million
<b>MDBs</b>	Multilateral Development Banks
<b>MLF</b>	Medium-term Lending Facility
<b>MPA</b>	Macro Prudential Assessment
<b>MRF</b>	Mutual Recognition of Funds
<b>MSCI</b>	Morgan Stanley Capital International
<b>MTN</b>	Medium-term Note
<b>NBER</b>	National Bureau of Economic Research
<b>NBS</b>	National Bureau of Statistics
<b>NCD</b>	Negotiable certificate of deposit
<b>NEER</b>	Nominal effective exchange rate
<b>NIE</b>	Newly industrialised economies
<b>NIM</b>	Net interest margin
<b>NPL</b>	Non-performing loan
<b>NPV</b>	Net Present value
<b>NSFR</b>	Net Stable Funding Ratio
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OIS</b>	Overnight indexed swap
<b>OMDSR</b>	Outstanding mortgage debt service ratio
<b>OTC</b>	Over-the-counter
<b>p.a.</b>	Per annum

<b>P2P</b>	Peer-to-peer
<b>PBoC</b>	People's Bank of China
<b>PCE</b>	Private consumption expenditure
<b>PMI</b>	Purchasing Managers' Index
<b>PPI</b>	Producer Price Index
<b>PSL</b>	Pledged Supplementary Lending
<b>qoq</b>	Quarter-on-quarter
<b>qoqa</b>	Quarter-on-quarter annualised
<b>QE</b>	Quantitative Easing
<b>QQE</b>	Quantitative and Qualitative Easing
<b>R&amp;VD</b>	Rating and Valuation Department
<b>REER</b>	Real effective exchange rate
<b>Repo</b>	Repurchase operation
<b>rhs</b>	Right-hand side
<b>RMB</b>	Renminbi
<b>RQFII</b>	Renminbi Qualified Foreign Institutional Investor
<b>RTGS</b>	Real Time Gross Settlement
<b>SAFE</b>	State Administration of Foreign Exchange
<b>SDR</b>	Special Drawing Rights
<b>SHIBOR</b>	Shanghai Interbank Offered Rate
<b>SKEW</b>	Chicago Board Options Exchange Skew Index
<b>SLO</b>	Short-term Liquidity operation
<b>SMEs</b>	Small and medium-sized enterprises
<b>SOEs</b>	State-owned enterprises
<b>SPM</b>	Supervisory Policy Manual
<b>SSD</b>	Special stamp duty
<b>SSE</b>	Shanghai Stock Exchange
<b>SWIFTs</b>	Society for Worldwide Interbank Financial Telecommunication
<b>S&amp;P</b>	Sale and Purchase Agreements of Building Units
<b>S&amp;P 500</b>	Standard & Poor's 500 Index
<b>TLTRO</b>	Targeted Longer-Term Refinancing Operation
<b>TWI</b>	Trade Weighted Index
<b>UK</b>	United Kingdom
<b>US</b>	United States
<b>USD</b>	US dollar

<b>VAR</b>	Vector autoregressive
<b>VHSI</b>	HSI Volatility Index
<b>VIX</b>	Chicago Board Options Exchange Market Volatility Index
<b>WMP</b>	Wealth management product
<b>yoY</b>	Year-on-year

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Printed in Hong Kong  
ISSN 2221-5727 (Print version)  
ISSN 2222-1514 (Online version)  
HK\$60