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香港金融管理局

HALF-YEARLY MONETARY AND FINANCIAL STABILITY REPORT

March 2017

This Report reviews statistical information between the end of August 2016 and the end of February 2017.

Half-Yearly Monetary and Financial Stability Report

March 2017

Table of Contents

1. Summary and overview	4
2. Global setting and outlook	9
2.1 External environment	9
2.2 Mainland China	19
3. Domestic economy	35
3.1 Real activities	35
3.2 Consumer prices	36
4. Monetary and financial conditions	39
4.1 Exchange rate and capital flows	39
4.2 Money and credit	41
4.3 Equity market	50
4.4 Debt market	52
4.5 Property markets	54
5. Banking sector performance	57
5.1 Profitability and capitalisation	57
5.2 Liquidity and interest rate risks	59
5.3 Credit risk	61
5.4 Systemic risk	66
Box 1. Term premium spillovers from the US to international markets	15
Box 2. Is the Mainland economy entering a liquidity trap?	28
Box 3. Divergence between M1 and M2 growth in Mainland China	31
Box 4. Financial conditions indexes for Hong Kong	47
Box 5. Changes in the business models of banks in Hong Kong after the crisis and their implications	70

Glossary of terms

Abbreviations

1. Summary and overview

The global economy is entering a period of greater uncertainty after Donald Trump's victory in the US presidential election. A paradigm shift in US policy under the new US administration is possible in two major areas that might have a profound impact on the global economic landscape – the shift from monetary easing to fiscal expansion and from globalisation to deglobalisation. In particular, risks facing emerging market economies have intensified amid faster US interest rate hikes and a stronger US dollar, as well as possible protectionist measures from the US.

The Hong Kong dollar exchange rate remained broadly stable while the Hong Kong dollar interbank rates picked up alongside the movements in their US dollar counterparts. Despite this, liquidity conditions remained favourable, and growth in total loans picked up further in the second half of 2016. The residential property market showed signs of consolidation immediately after the introduction of the new stamp duty measure before picking up more recently. Going forward, banks should carefully assess the implications of possible faster-than-expected US rate rises and, on a broader scale, policy uncertainties in the US, particularly the risk of drastic capital outflows and their potential impact on local interest rates.

The external environment

The global economy is entering a period of greater uncertainty following the election of Donald Trump as the new US president. Not only has the election outcome surprised the market, but the associated reaction was also largely unexpected. In particular, global equity markets rallied on expectation of a reflationary effect on the US economy from Donald Trump's pro-growth policies of tax reforms, infrastructure spending and deregulation.

Indeed, the new US administration is likely to lead to a paradigm shift in US policy in two major areas that could have a profound impact on the global economic landscape, namely the shift in policy stimulus from monetary easing to fiscal expansion and the shift in trade policy from globalisation to deglobalisation. However, the

much-anticipated Trump tax cuts may not provide as much of a boost to US growth as markets may have been expecting. In particular, with the US economy now operating close to its potential, fiscal stimulus may provide only a small cyclical boost to growth while adding further upside risks to US inflation. It remains uncertain whether the US Federal Reserve (Fed) will hasten the pace of monetary tightening markedly in response, but long-term bond yields have already risen sharply, partly reflecting expectations of higher inflation risk. Meanwhile, trade protectionist measures will be a “lose-lose” proposition for the US and the rest of the world. More barriers to trade will create welfare-reducing distortion, hamper global trade flows, weaken global supply chain efficiency and pose downside risks to the global economic outlook. At the same time, political instability remains a major risk and headwind, particularly to the fragile recovery in Europe.

For emerging market economies (EMEs), the risks stemming from a faster rise in US interest rates and further strengthening of the US dollar on capital outflows have intensified. This could dampen economic growth and heighten the risks of sharp capital outflows. Indeed, the repricing of inflationary risk amid expectations of large-scale fiscal expansion under the Trump administration and concerns over surging energy inflation have led to widespread and notable increases in long-term yields, not only in advanced economies (AEs) but also in many EMEs. Box 1 (see Page 15) assesses the potential spillover impact of higher interest rate expectations in the US on the sovereign bond markets in 26 selected economies. The findings suggest that the influence of the US Treasury bond market on sovereign bond markets has increased since the “taper tantrum” in 2013, and that higher interest rates and tighter financial conditions in the US will significantly affect many AEs and EMEs.

In East Asia, growth improved marginally in the second half of 2016, supported by a rebound in exports, but the spillover from concerns about policy changes by the new US administration led to currency depreciation and rises in sovereign bond yields before the situation stabilised early this year. Looking ahead, growth in East Asia is likely to be stable in 2017, but the risks and uncertainties have intensified. A combination of higher US interest rates, weaker currencies and more volatile financial markets could lead to tighter financial conditions. The potential protectionist policies in the US are also a threat to regional economies, although there is considerable uncertainty over their actual impact.

In Mainland China, economic growth crept up in the second half of 2016 amid robust infrastructure investment and improved private sector business spending. While there have been increased signs of stabilisation, Mainland growth

outlook remains uncertain. In particular, the real estate sector would likely extend less support to growth this year if property markets continue to cool down along with the authorities’ determination to rein in the housing price rally. Meanwhile, the ongoing economic restructuring and the dynamics in the Sino-US trade relations may add uncertainty to the near-term economic outlook. On the external front, capital outflow pressures increased towards the end of 2016 amid the strengthening of the US dollar and an interest rate hike in the US before appearing to have eased somewhat in early 2017, despite the stability of the renminbi against the currencies in the China Foreign Exchange Trade System (CFETS) basket during the review period.

Despite signs of stabilisation in economic activities in the private sector, there were concerns about deterioration in the effectiveness of monetary policy especially in view of accelerated M1 growth along with a slowdown in M2 expansion. Box 2 (see Page 28) addresses the question of whether the Mainland economy is in a liquidity trap, while Box 3 (see Page 31) explores the potential drivers for the divergence between M1 and M2 growth. The findings suggest that there is no evidence of Mainland China having entered into a liquidity trap, and the much faster growth of M1 than M2 was mainly contributed by recent monetary easing that reduced the opportunity costs of holding the liquid form of money, as well as increased economic uncertainty which might have driven up precautionary demand for money.

The domestic economy

The Hong Kong economy showed a modest pick up in growth during the second half of 2016. The quarter-on-quarter real Gross Domestic Product (GDP) growth increased to 1.2% in the fourth quarter from 0.8% in the third quarter. On the domestic front, private consumption growth continued to strengthen, while

investment growth was boosted by strong infrastructure activity in the fourth quarter. On the external front, growth in exports of goods strengthened amid improved regional trade flows, while exports of services grew steadily along with the recovery in trade-related and transportation services. Due to faster growth in imports of goods and services, net exports remained a drag on real GDP growth during the second half. Along with the pick up in economic growth, the headline unemployment rate dropped slightly to 3.3% in December.

Economic growth for 2017 is expected to remain moderate. The Government and the market consensus forecast of real GDP growth for 2017 are 2–3% and 2.0% respectively. However, Hong Kong's growth outlook remains subject to strong external headwinds. The protectionist rhetoric of the new US Administration has heightened the downside risks to global trade flows and hence Hong Kong's external demand. Amid upward pressure on the US dollar and the expected faster pace of US rate hikes, global financial environment is expected to turn less favourable and could trigger a tightening of domestic financial conditions, particularly if tail risks are realised. Box 4 (see page 47) discusses the compilation of the Financial Conditions Indexes for Hong Kong which can help monitor domestic financial conditions.

Local inflationary pressures have remained moderate since the second half of 2016, while the sequential momentum picked up in the fourth quarter of 2016, mainly due to volatile food prices and the rise in housing rentals. Inflationary pressures are expected to stay contained amid the backdrop of benign import prices and modest local cost pressures.

Monetary conditions and capital flows

The Hong Kong dollar exchange rate remained broadly stable despite market volatilities, though it eased occasionally since the US interest rate hike in December. The Convertibility Undertaking was not triggered. Along with the strengthening of the US dollar, the Hong Kong dollar effective exchange rate appreciated further.

With a sizable monetary base, the Hong Kong Interbank Offered Rate (HIBOR) remained relatively low, but it picked up somewhat from October amid year-end funding demands, as well as a catch-up with the increases in their US dollar counterparts. As such, the average mortgage rate also increased slightly to 2.07% in January 2017, after dropping to a recent low of 1.71% in October amid intense competition for mortgage lending business.

Growth in total loans accelerated to 4.2% in the second half of 2016, after increasing by 2.2% in the first half. Growth was underpinned by strengthened domestic economic activities and increased funding demand by multinational corporations towards year-end. Domestic loan growth quickened slightly while loans for use outside Hong Kong rebounded after recording a slight decline in the first half. Analysed by currency, Hong Kong dollar loans expanded strongly by 5.0% during the second half, while foreign currency loans grew by 3.2% amid the tapering of foreign currency loan repayments by Mainland borrowers.

Banks' funding conditions remained largely stable. Reflecting faster increases in deposits relative to loans, the Hong Kong dollar loan-to-deposit (LTD) ratio edged down to 77.1% at the end of 2016. The overall foreign currency LTD ratio declined to 59.9% at the end of the year, with the US dollar LTD ratio dropping significantly to 63.8% due to strong increase in US dollar deposits.

With a strong US dollar, both the onshore (CNY) and offshore (CNH) renminbi exchange rates weakened. Against this backdrop, Hong Kong's offshore renminbi liquidity pool (including outstanding customer deposits and certificates of deposits) consolidated further along with that of other offshore renminbi markets. The volatility of the CNH HIBORs also increased notably. That said, banks' renminbi liquidity management remained robust with the average daily turnover of the renminbi real time gross settlement system remaining at high levels. Hong Kong's offshore renminbi business will likely continue to face headwinds driven by uncertainty surrounding the renminbi exchange rate movements.

Asset markets

The Hong Kong equity market ended sharply higher in the review period amid improved global market conditions. The US presidential election result surprised most investors, but the shock was brief because hopes of a fiscal stimulus under the Trump administration added impetus to global equity markets. While benefiting from the rally on global markets, optimism in the local market was more guarded possibly due to concerns of a faster pace of rate rises, uncertain outlook for the Mainland economy and policy uncertainties about the renminbi and capital flow restrictions. Looking ahead, the local market is likely to be susceptible to external economic conditions, though its attractive valuation could provide some downside support.

The Hong Kong dollar debt market expanded steadily last year, notwithstanding the sharp increase in yields and a widening of spreads over US Treasuries towards the end of the year. The offshore renminbi debt market in Hong Kong recovered in the second half of 2016 after contracting in the first half, although there was a decline in new issuance for the year as a whole. If the earlier global search-for-yield phenomenon is reversed, both Hong Kong dollar and offshore renminbi debts may come under pressure. With

the renminbi exchange rate likely to remain volatile amid unpredictable US trade policies, the outlook for both debt markets will be clouded by significant uncertainties in the period ahead.

The residential property market showed signs of consolidation immediately after the introduction of the Government's new stamp duty measure before picking up more recently. In view of the renewed market buoyancy, the Government raised the stamp duty to a flat rate of 15% in November. In response, both primary and secondary market transactions declined in the subsequent two months. Nevertheless, transactions picked up more recently partly reflecting the increase in new launches by property developers in the primary market. Meanwhile, housing prices continued to increase to a new high after the new measure, but at a more moderate pace.

Banking sector performance

The profitability of retail banks improved, with the return on assets increasing to 1.12% in the second half of 2016 compared to 0.95% in the second half of 2015. The improvement was attributable to an increase in net interest income and non-interest income as well as a reduction in loan impairment charges.

The banks maintained their strong capital positions, with the consolidated capital adequacy ratio of locally incorporated authorized institutions staying high at 19.2% at the end of December 2016. To reinforce banks' resilience to systemic risks, the countercyclical capital buffer ratio for Hong Kong will rise to 1.875% with effect from 1 January 2018 from the current 1.25%.

Liquidity conditions remained favourable despite significant rises in Hong Kong dollar interbank rates after the resumption of US interest rate hikes in December. Underpinned by a large retail deposit base, retail banks' funding costs remained

low and stable. As measured by Basel III standards, both the average Liquidity Coverage Ratio for category 1 institutions and the average Liquidity Maintenance Ratio for category 2 institutions remained high at 156.3% and 51.0% in the fourth quarter of 2016. All these ratios were well above their regulatory minimums.

While asset quality remained sound by historical standards, banks should stay attentive to the external environment, as the assessment in Box 5 (page 70) shows that the banking sector has registered a rapid growth in loans for use outside Hong Kong following the global financial crisis, implying that their asset quality is more sensitive to the external environment. However, such risk may be counterbalanced by the banks' higher share of holdings of safe assets and a more stable funding structure.

Looking ahead, the possibility of quicker and larger increases in US interest rates under the Trump administration could pose challenges for banks in Hong Kong on various fronts:

(i) Faster-than-expected interest rate hikes could put pressure on banks' credit risk management, particularly for their loans to non-local corporates; (ii) Banks' investment portfolios may face higher risks of mark-to-market losses given the increased holding of debt securities after the global financial crisis, even though more investments were allocated to safe-assets; and (iii) Banks are more likely to see a steeper rise in funding costs when they start competing for retail deposits.

On the back of ample domestic liquidity and a strong capital position, the Hong Kong banking sector has remained sound after the US presidential election. Notwithstanding this, banks should carefully assess the implications of possible faster-than-expected US rate hikes and more broadly-based policy uncertainties in the US, particularly the risk of drastic capital outflows and their potential impact on local interest rates.

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

2. Global setting and outlook

Heightened US policy uncertainties have followed in the wake of the surprise election victory of Donald Trump. While markets have focused on the near-term benefits of potential large-scale fiscal and pro-business policies, fiscal stimulus may provide only a small cyclical boost to US growth while adding further upside risks to inflation with the US economy already operating close to potential. More importantly, emerging market economies are facing increased risks from a faster rise in US interest rates and a strengthening US dollar, which could put pressure on capital outflows, while possible US protectionist measures will threaten global trade flows.

In East Asia, real economic activities improved somewhat in the second half of 2016, with exports picking up recently. However, financial market volatility is likely to remain and downside risks to growth have intensified in the face of higher US interest rates and stronger US dollar as well as possible protectionist trade policies from the US.

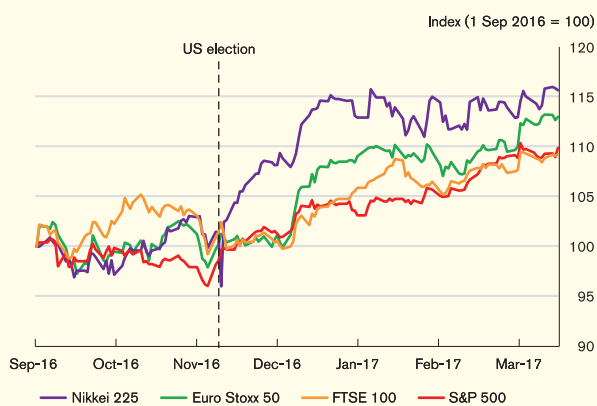
In Mainland China, economic growth crept up in the second half of 2016 amid robust infrastructure investment and improved private sector business spending. While the economy continued to rebalance with robust expansion in the tertiary industry, the ongoing economic restructuring and the dynamics in the Sino-US trade relations may add uncertainty to the near-term economic outlook. The real estate sector would likely extend less support to growth this year if property markets continue to cool down along with the authorities' determination to rein in the housing price rally. On the external front, capital outflow pressures increased towards the end of 2016 amid the strengthening of the US dollar and an interest rate hike in the US before appearing to have eased somewhat in early 2017, despite the stability of the renminbi against the currencies in the China Foreign Exchange Trade System basket during the review period.

2.1 External environment

Global financial markets reacted strongly to the surprised election victory of Donald Trump, particularly major equity markets which rallied on the hopes that Donald Trump would engage in tax reform, large-scale infrastructure spending

and deregulation that would drive stronger US growth and higher US inflation (Chart 2.1). As a result, market expectations for US inflation and US interest rates jumped, leading to a sharp rise in US Treasury yields and a strengthening of the US dollar.

Chart 2.1
Equity market indices in selected advanced economies (AEs)



Source: Datastream.

However, the much-anticipated Trump tax cuts may not have such a positive impact on US growth as markets may have expected. Although a policy shift towards fiscal loosening would alleviate the heavy burden placed on monetary easing, its timing remains questionable at this stage in the US business cycle. Despite growth moderating in recent quarters, the US economy is already operating close to full potential, with the output gap narrowing and the unemployment rate matching the Federal Reserve's (Fed) estimated natural rate of 4.7% in February. With the US economy already on an expansionary cycle, the fiscal multiplier would be smaller compared to recession periods (e.g. see Auerbach and Gorodnichenko (2012))¹. In fact, recent estimates of the US Laffer curve suggest that a cut in taxes on either labour or capital is likely to result in tax revenue losses (e.g. see Trabandt and Uhlig (2012)).²

Nevertheless, any further stimulative effect on growth, albeit possibly small, could lead to higher inflation amid dwindling spare capacity. Other factors including surging oil and commodity prices and potential trade protectionist measures, such as the border adjustment tax currently being considered, would also likely exacerbate upside risks to US inflation.

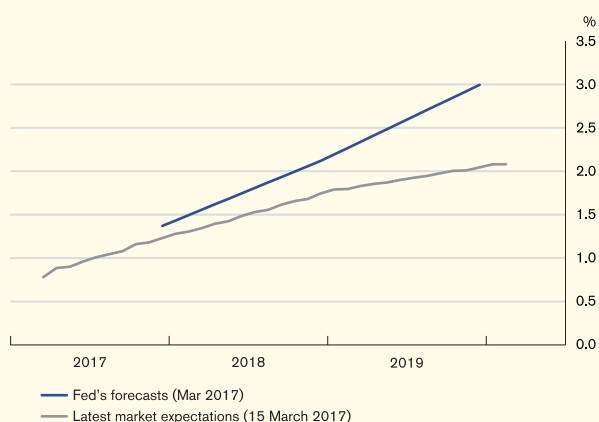
Despite these increasing risks, the Fed has continued to remain cautious on tightening US monetary policy and leans towards keeping its ultra-accommodative monetary stance. Nevertheless, long-term bond yields have already risen, partly reflecting the rising US inflation risk. While market expectations of future Fed funds rate have moved closer to the Fed's median projections over 2017 and early-2018 since the election, they remain considerably below those of the Fed's over the longer term (Chart 2.2). Therefore, a faster rise in US interest rates could pose the risk of inducing significant market volatility.

While financial markets have focused on the near-term benefits of potential expansionary fiscal and pro-business policies driving stronger US growth, longer-term risks such as harmful protectionist trade policies and a possible rise in US public debt remain. Indeed, there are risks that the Trump administration could follow through on its election pledges and adopt trade-protectionist measures. More barriers to trade would create welfare-reducing distortions, hamper global trade flows, weaken global supply chain efficiency and pose downside risks to the global economic outlook.

¹ Auerbach, A. J., & Gorodnichenko, Y. (2012). *Measuring the output responses to fiscal policy*. American Economic Journal: Economic Policy, 4(2), 1-27.

² Trabandt, M., & Uhlig, H. (2012). *How do Laffer curves differ across countries?* (No. w17862). National Bureau of Economic Research.

Chart 2.2
Future Fed funds rate projections: Fed versus the market

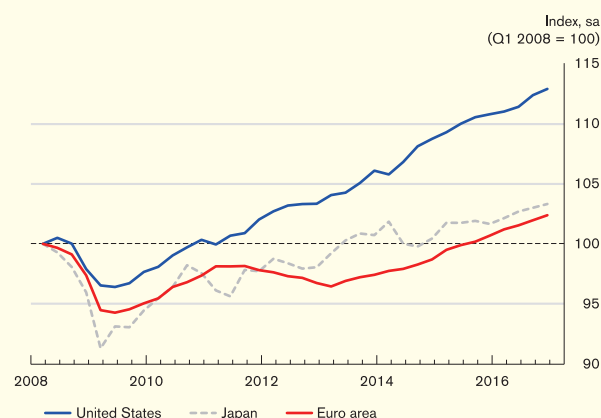


Note: Market expectations of future Fed funds rate are based on prices of Fed funds futures contracts.

Sources: Datastream and Fed.

Across the Atlantic, political instability remains a major risk and headwind to the recovery in Europe. While economic conditions have gradually improved with real Gross Domestic Product (GDP) of the euro area economy growing moderately at 1.7% year-on-year in the fourth quarter, only a touch slower than the 1.8% recorded in the third quarter, economic activities are still barely above the levels before the global financial crisis (GFC) (Chart 2.3) as opposed to the stronger recovery in the US. Following the Brexit decision last summer, there remain lingering concerns of an ultimate breakup of the euro area. Although the economic and political situation appears to have stabilised in Italy following the formation of a new government and the banking sector bailout, the upcoming elections in Germany, France and possibly Italy would likely become political flash points amid the Brexit negotiations and the build-up of anti-establishment sentiment. Partly as a result of deepening political uncertainties, sovereign bond yields have been rising across Europe with the corporate bond spread also widening, particularly in peripheral countries. This poses the risk of inducing a negative feedback loop to the real economy and may weigh on real investment in the euro area.

Chart 2.3
Real GDP of major AEs



Source: CEIC.

In Japan, the recovery has been stronger than previously expected after real GDP growth was revised upwards for recent quarters with the annual growth rate picking up to 1.6% year-on-year in the fourth quarter of 2016, the fastest pace since the third quarter of 2015. Nevertheless, consumption growth remained sluggish amid subdued wage growth, partly reflecting the structural problem of the dual labour market. The recent sharp depreciation of the yen also means the downward pressure from the earlier yen appreciation on the “new core” goods inflation may soon begin to dissipate. This, together with the stronger-than-expected recovery, suggests the near-term inflation outlook has improved with the recent fall of the “new core” inflation (excluding fresh food and energy) to 0.1% in December likely to bottom out. However, the risks of inflation undershooting the Bank of Japan’s 2% target over the medium term remain as growth is likely to stay moderate amid secular and structural headwinds while inflation expectations also remain subdued at around 0.5% – 0.6%, below levels prior to the launch of Abenomics in early 2014.

For the rest of the world, especially for emerging market economies (EMEs), the benefits of faster US growth may yet be smaller through the trade channel given weakened US import intensity after the GFC and potential protectionist policy

in the US. At the same time, downside risks stemming from tightening financial conditions have intensified, including a faster rise in US interest rates and further strengthening of the US dollar. This could dampen economic growth and heighten the risks of sharp capital outflows.

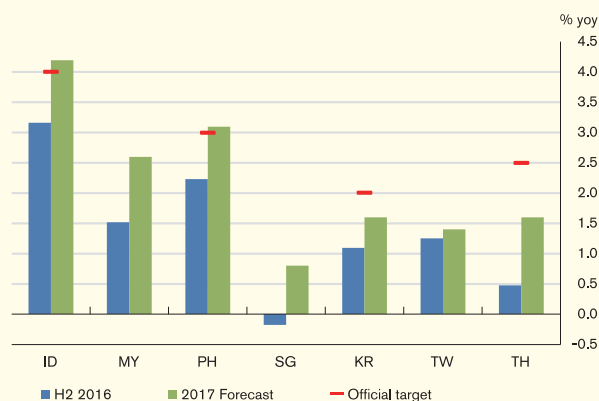
Indeed, the repricing of inflationary risk amid expectations of large-scale fiscal expansion under the Trump administration and concerns over surging energy inflation have led to widespread and notable increases in long-term yields, not only in AEs but in many EMEs as well. Box 1 assesses the potential spillover impact of higher interest rate expectations in the US on the sovereign bond markets in 26 selected economies.

In East Asia³, real economic activities gained some momentum recently, with marginal improvement in GDP growth and inflation picking up.

- **Real GDP growth** – Economic growth was generally steady in the second half of 2016, as private consumption held up in a number of regional economies. Exports generally rose moderately from a low base in 2015. The improved performance of developed market economies such as the US and Europe helped, as has the stabilisation of growth in Mainland China. For net exporters of commodities like Malaysia and Indonesia, the rebound in commodity prices has been an additional boost. Other major exporters such as South Korea, Taiwan and Singapore have also regained momentum due to stronger electronic and semiconductor exports.

- **Inflation** – With the reflation in commodity prices, and oil in particular, producer price inflation has generally been on an upward trend. While this will push up costs for industries and potentially for consumers, the reduced risk of prolonged deflation may actually help consumption and investment growth. Faster producer price inflation may pose upward pressure on consumer price inflation, but the actual impact will depend on the extent of pass through from producer prices to consumer prices, which varies across economies. Consensus forecasts of consumer price index (CPI) suggest inflation will move closer to, but still remain below, a number of regional central banks' targets in 2017 (Chart 2.4). Central banks in East Asia have generally kept the monetary policy stance unchanged at an accommodative level of interest rates, except for Indonesia which cut interest rates twice in September and October to support growth.

Chart 2.4
East Asia headline CPI inflation, forecasts and central bank targets



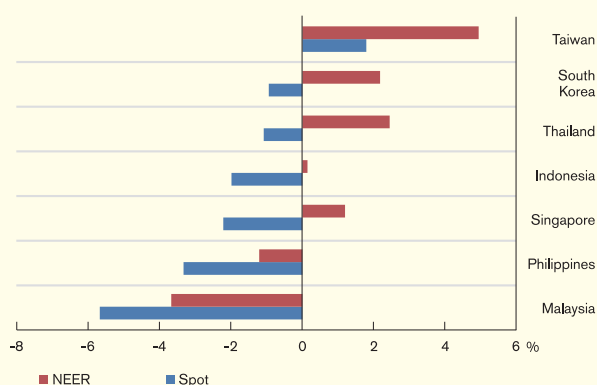
Sources: CEIC, Consensus Forecasts.

Despite improvement in the real economy, the surprise outcome of the US presidential election in November generated greater short-term volatility in financial markets.

³ East Asian economies refer to Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand.

- **Foreign exchange market** – Most regional currencies depreciated against the US dollar following the US presidential election amid reflationary expectations in the US. Nevertheless, in trade-weighted terms some regional currencies have fallen by less or even appreciated slightly since the election (Chart 2.5).

Chart 2.5
Spot foreign exchange depreciation against US dollar vs change in nominal effective exchange rate since the US presidential election



Note: Data from 8 November 2016 to 8 March 2017.
Sources: BIS, Bloomberg.

- **Bond and equity markets** – Asset prices initially fell sharply after the US presidential election, but stabilised relatively quickly. Sovereign bond spreads of East Asian economies increased against US Treasury yields. However, yields in some regional economies have since fallen as the market stabilised, although they have yet to return to the pre-election rates (Chart 2.6). Nevertheless, the spread has narrowed compared with the period before the election.

Chart 2.6
10-year sovereign bond yield spread over US Treasuries



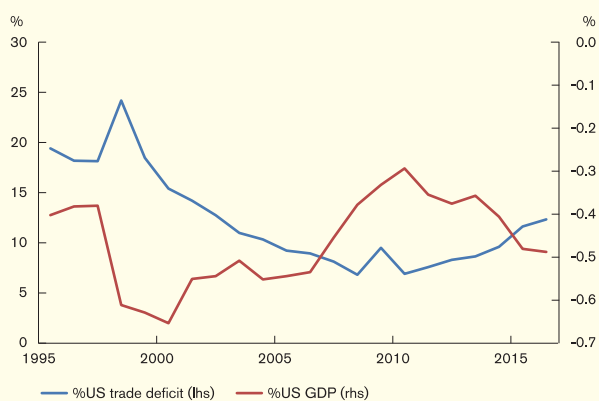
Note: Data from 8 November 2016 to 8 March 2017.
Source: Bloomberg.

- **Portfolio flows** – East Asia saw portfolio outflows in the final quarter of 2016, but the rate was less than that during the “taper tantrum” in mid-2013. Fund inflows were seen again in the first few weeks of 2017, helping to support asset valuations and financial conditions.

Looking ahead, growth in the region is likely to be stable, but still at a pace below their historical average. Financial market volatility is likely to remain elevated amid heightened policy uncertainty in the US and the associated policy response from the Fed. There is a risk that a sharp rise in the US dollar and yields could induce capital outflows from the region to the US, posing risks of an unwinding in asset markets, particularly those that are already stretched. The resultant tightening of financial conditions could also pose pressure on the debt repayment capacity of companies with significant dollar-denominated liabilities. On a macro level, higher global interest rates may also reduce fixed capital investment in the region, with long-term potential growth implications while being a near-term drag on aggregate demand.

Finally, exporters face the potential threat of protectionist trade policies from the new US administration. The US trade deficit with East Asian economies has been widening in recent years (Chart 2.7), especially in major export sectors from the region, such as electronics, electrical appliances, cars, apparel and textiles. The US has also seen a rise in imports and job losses in these sectors over the past couple of decades. Protectionist policies aimed at reducing the trade deficit and reshoring production to the US could be a major risk to exporters in the region.

Chart 2.7
US trade balance with East Asian economies as
% of US trade deficit and GDP



Sources: US Census Bureau, Bureau of Economic Analysis.

Box 1

Term premium spillovers from the US to international markets

Introduction

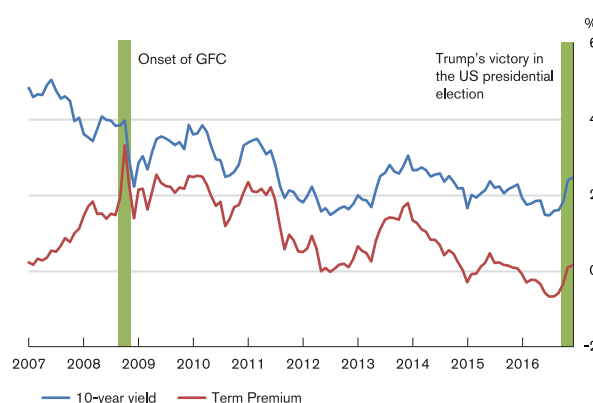
The ultra-accommodative monetary policy adopted by the US since the 2008 GFC has compressed the long-term yields to an unprecedented low level in the US. However, risk to US inflation has tilted to the upside recently amid concerns over surging energy inflation and expectations of a large-scale fiscal expansion under the Trump administration at a time when economic slack in the US is already diminishing. Such a repricing of inflationary risk quickly reverberated globally, leading to widespread and notable increases in long-term yields not only in advanced economies (AEs), but also in many EMEs (Charts B1.1 and B1.2). Against this background, this box assesses the potential spillover impact of higher interest rate expectations in the US on the sovereign bond markets in 26 selected economies (Table B1.A).

Theory and empirical settings

In theory, long-term interest rates can be decomposed into two key components according to the expectations hypothesis: (1) an expectation of future short-term rates; and (2) term premium. While the former is an expected return from investing in long-term bonds, the latter is the additional return that compensates investors for holding a long-term bond as opposed to rolling over a sequence of short-term bonds over the same period. Given that inflation erodes the nominal value of long-term bonds more than the short-term counterpart, a positive term premium can be interpreted as a compensation for the inflation risk. Thus, instead of assessing the sovereign bond yields directly, we examine the issue through assessing the term premium component that captures transmission of uncertainty about inflation in this analysis. Over the past 30 years, the US term premium estimated by the Federal

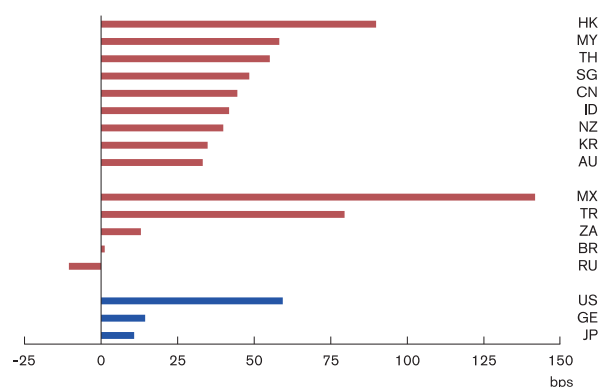
Reserve Bank of New York tracks closely with the 10-year Treasury yields (Chart B1.3).

Chart B1.1
10-year US Treasury yield and term premium from 2007 to present



Source: Federal Reserve Bank of New York.

Chart B1.2
Change in 10-year sovereign bond yields since the US presidential election

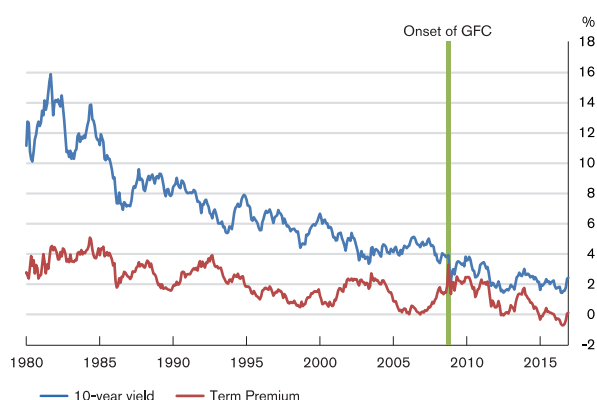


Notes:
1. 7 Nov 2016 – 6 Jan 2017
2. 7 Nov 2016 – 30 Dec 2016 for HK and RU
Source: Bloomberg.

Table B1.A
Eight AEs and 18 EMEs

Group		Economy
AEs		US, Japan, UK, Italy, France, Germany, Canada, Spain
EMEs	Emerging Europe and Africa	Czech, Hungary, Poland, Turkey, South Africa
	Latin America	Brazil, Chile, Colombia, Mexico, Peru
	Emerging Asia	Mainland China, Hong Kong, India, Indonesia, the Philippines, Singapore, South Korea, Thailand

Chart B1.3
10-year US Treasury yield and term premium
since 1980



Source: Federal Reserve Bank of New York.

The decomposition is done by estimating an affine term-structure model which takes into account both cross section and time series dimensions of the yield curve data.⁴ Based on a vector autoregressive (VAR) model using these estimated term premia as the endogenous variables, we conduct an impulse response analysis to evaluate how term premia in other economies would respond to an interest rate shock of a 200-basis-point increase in the US term premium. This interest rate shock mimics a rise in the US term premium from the current level of 0.14% at December to its long run pre-crisis mean level of 2.2% between 1980 and 2008. To control for the effect of global factors that could affect the global financial markets, we include the Chicago Board Options Exchange Market Volatility Index and the US dollar index as exogenous variables in the regression.

We collect weekly zero-coupon bond data of each economy with various tenors starting from 1989 for the term premium decomposition.^{5, 6} As the global sovereign bond markets have become more synchronised following the “taper tantrum” in May 2013, we focus on two sample periods in our impulse response analysis, covering the periods from January 2011 to May 2013 and from June 2013 to December 2016.⁷ For ease of discussion, we classify the economies into four groups: (i) AEs excluding the US (AExUS), (ii) Emerging Europe and Africa (EMEA), (iii) Latin America (LatAm), and (iv) Emerging Asia (EmAsia).

Empirical findings

Table B1.B summarises the contribution of the term premium component to the 10-year sovereign bond yields. As can be seen, term premium explains a significant amount of the fluctuations in the sovereign bond yields for the US and other economies, with an explanatory power of 82% on average during the sample periods. While previous studies only focus on AEs, we find that the significant contribution of term premium in driving the long-term bond yields is also applicable to EMEs.

⁴ The affine term-structure model is a commonly used method in the literature. It assumes that the driving forces of the yield curve are the first three principal components of the yield curve. The model imposes no-arbitrage conditions in deriving the expectations components and term premium. For details, see Joslin et al. (2011) “A New Perspective on Gaussian Dynamic Term Structure Models”, *Review of Financial Studies*, Vol. 24, pages 926-970.

⁵ Zero-coupon bond data include bond data with tenors of 3-month, 6-month, 1-year, 2-year, 3-year, 5-year, 7-year and 10-year.

⁶ It is worth noting that only some economies in the sample have yield curve data from 1989. For each economy, we take the longest possible data from Bloomberg as a sufficiently long data is less prone to identification problems inherited in the estimation of affine term structure model. For details, see Bauer et al. (2013), “Correcting Estimation Bias in Dynamic Term Structure Models”, *Journal of Business and Economic Statistics*, Vol. 30, pages 454-467.

⁷ For details, see Fong et al. (2016), “Measuring Spillovers between the US and Emerging Markets”, *HKIMR Working Paper No.8/2016*.

Table B1.B
Share of 10-year yield variation due to term premium from 2011 to 2016

Economy group	Share
US	83%
AExUS	80%
LatAm	86%
EmAsia	83%
EMEA	79%
All economies' average	82%

Note: Denote Y , RN and TP as the 10-year yield, the expectation component and term premium respectively, then $Y = RN + TP$. Given that RN and TP may not be always positive, the share in Table B1.B is approximated by $\frac{\Delta TP^2}{\Delta TP^2 + \Delta RN^2}$ where Δ is the difference operator.

Source: HKMA staff estimates.

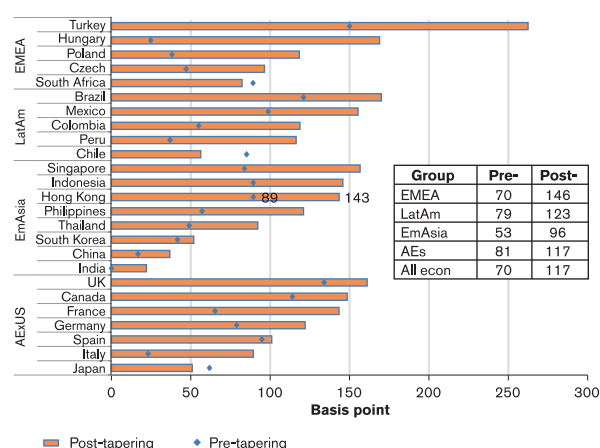
Chart B1.4 shows the cumulative impulse responses in term premium to the US shock during the two sample periods, with the economies in each economy group ranked according to their response's magnitude in the post-tapering period. Taking Hong Kong as an example, the estimated increase is 89 basis points in the pre-tapering period, compared with the increase of 143 basis points in the post-tapering period.

Firstly, the estimated responses of all economies in the post-tapering period are mostly stronger than those in the pre-tapering period, except for South Africa, Chile, and Japan. On average, the estimated increase in term premium for all economies is 70 basis points in the pre-tapering period and 117 basis points in the post-tapering period. This result suggests that the differentiation between the valuation of the US and other economies' long-term sovereign bonds has narrowed since the taper tantrum.

Secondly, by comparing the estimated increases of EMEs in the post-tapering period, economies in EMEA are the most responsive to the US shock on average (146 basis points), followed by those in LatAm (123 basis points) and EmAsia (96 basis points). This probably reflects the fact that geo-political instability remains a key risk confronting emerging economies in EMEA, while the relatively stronger economic fundamentals eases part of the risk in Asian economies in the post-tapering period.⁸

Finally, the spillover impact on AEs is comparable with that on EMEs. On average, the estimated increase in term premium in AEs is 117 basis points in the post-tapering period. The commensurate response may partially stem from heightened economic and political uncertainties in some core European economies with closer trade and financial linkages with the US.

Chart B1.4
The 10-week cumulative responses to a 200-basis-point increase in the US term premium



Note: Pre-tapering period denotes Jan 2011 to May 2013. Post-tapering period denotes Jun 2013 to Dec 2016.

Source: HKMA staff estimates.

⁸ As a reference, the average real GDP growth from June 2013 to December 2016 in EmAsia is 4.6%. The corresponding figures for AEs, LatAm and EMEA are 1.4%, 2.2% and 3.1% respectively.

Conclusion

In summary, our empirical results show that the influence of the US Treasury bond market on other sovereign bond markets has increased since the taper tantrum in 2013, and that higher interest rates and tighter financial conditions in the US will significantly affect many AEs and EMEs. If a repricing of inflation risk leads to a rapid surge in the long end of the US yield curve, the impact on other economies may potentially be outsized.⁹ In particular, increases in sovereign bond yields may lead to higher borrowing costs in the private sector that would have a material impact on EMEs with weaker underlying growth and a heavier sovereign debt financing burden. Presently, how the expansionary fiscal policies proposed by the new US administration may impact the US economy and affect the trajectory of future US long-term interest rates should come under close scrutiny.¹⁰

⁹ It is worth noting that an increase in short-term interest rates due to the Fed tightening may not always lead to an increase in the long-term interest rates. One recent example is the Greenspan conundrum in 2005, during which the US long-term interest rates remained flat when the Fed started the tightening cycle as term premium actually fell (see Chart B1.3). For details on the Greenspan conundrum and its association with term premium, see Backus and Wright (2007), "Cracking the Conundrum", *Brookings Papers on Economic Activity, Economic Studies Program, The Brookings Institution*, vol. 38(2007-1), pages 293-329.

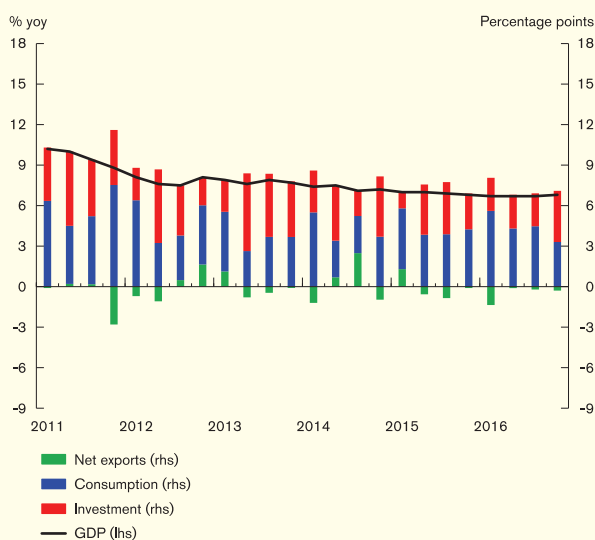
¹⁰ If the expansionary fiscal policy can lift the US economy significantly, which leads to substantial inflationary pressure, the Fed would respond by raising its policy rate thus leading to a possible increase in the US long-term interest rates.

2.2 Mainland China

Real sector

In Mainland China, economic growth crept up in the second half of 2016 amid robust infrastructure investment and improved private sector business spending. In particular, real GDP rose by 6.8% year on year in the last quarter, compared with an average of 6.7% in the first three quarters (Chart 2.8).

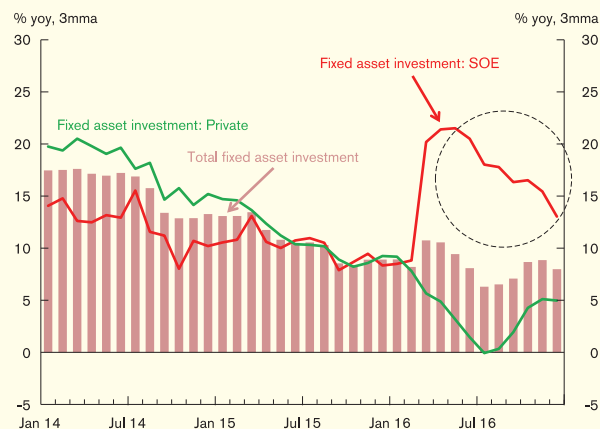
Chart 2.8
Mainland China: contribution to GDP growth by demand component



Sources: CEIC, NBS and HKMA staff estimates.

Among major GDP components, consumption growth remained solid, supported by robust growth in household income amid firm labour market conditions. On the investment front, the contribution of gross capital formation to real GDP growth increased in the second half of 2016, underpinned by robust infrastructure investment through state-owned enterprises (SOEs) and a rebound in non-state-owned business spending since July last year (Chart 2.9). The contribution of net exports to real GDP growth, however, continued to stay negative in the second half of the year, as imports expanded at a faster pace than exports amid improved domestic demand. For 2016 as a whole, real GDP expanded by 6.7%, in line with the government growth target of 6.5%-7.0% for the year.

Chart 2.9
Mainland China: Fixed asset investment growth by type of enterprise



Sources: CEIC and HKMA staff estimates.

In value added terms, tertiary industry recorded faster growth in the second half of 2016 and remained the major driver of growth. In particular, despite the moderation in growth of the financial and real estate sectors, there was acceleration in growth of other service sectors such as transportation and storage as well as wholesale and retail trade. Meanwhile, growth of secondary industry remained largely stable during the period, as the slowdown in the construction sector was offset by expansion in the manufacturing sector. With the growth rate of tertiary industry outpacing other industries, the share of tertiary industry in GDP rose further to 51.6% in 2016 from 50.2% in 2015.

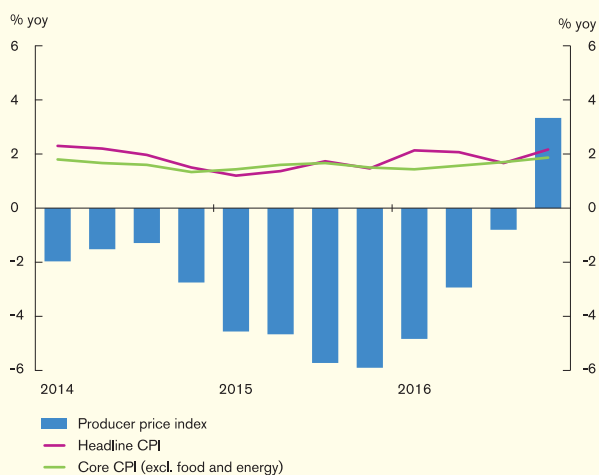
While there have been increased signs of stabilisation in Mainland China, the growth outlook continues to be full of uncertainties in the near term. On the domestic front, the support from the real estate sector may decline if property markets continue to cool down. As such, it remains uncertain whether the improvement in private sector activities, especially business expansion in property-related industries, can be sustained. In addition, the ongoing structural reforms, such as deleveraging and de-capacity of inefficient manufacturers, could also weigh on economic growth in the short term. On the external side, dynamics in the Sino-US trade relations may also add uncertainty to the

economic outlook. Latest consensus forecasts by market analysts expect real GDP growth will ease to 6.5% for 2017, after the official economic growth target was adjusted from 6.5%-7.0% for 2016 to the level of around 6.5% this year.

Along with the recovery in economic activities, upward price pressures emerged in the face of the sharp rebound in upstream prices. Specifically, producer price inflation bounced up to 3.3% year on year in the fourth quarter amid the rally in commodity prices. This was due in part to continued de-capacity on the supply side and stronger demand on the recent property market boom (Chart 2.10). Following the trend in producer prices, consumer price inflation crept up slowly from an averaged 2.2% year on year in the first half of 2016 to 2.3% in the fourth quarter, as moderation in food price inflation was outstripped by price increases in some non-food components such as housing-related and medical items.

Going forward, near-term inflationary pressures in upstream prices would likely remain if the supply-side reforms such as de-capacity and the improvement in economic activities continue. As rising upstream inflation may have a trickle-down effect, the slowly rising trend in consumer prices would also likely continue in the near term.

Chart 2.10
Mainland China: Consumer price and producer price inflation

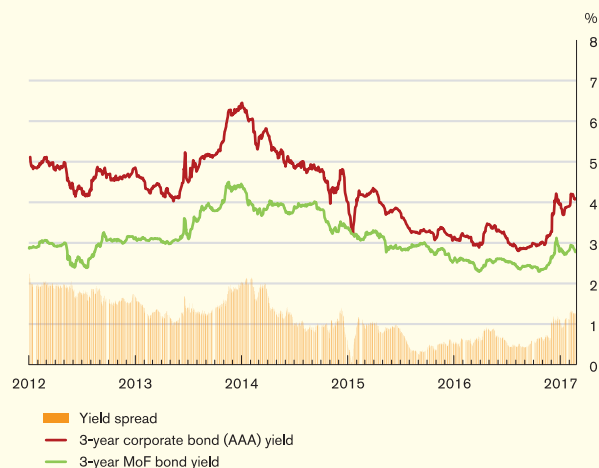


Asset Markets

During the review period, equity market sentiment remained benign, with stock prices rising moderately in the second half of 2016. In tandem, leveraged trading stayed subdued, with the outstanding size of margin financing stabilising at low levels for the whole year of 2016.

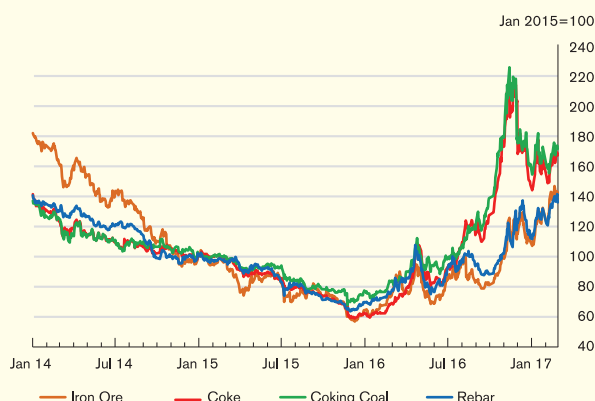
In the bond market, yields picked up in late 2016 along with increased inflation expectations and tightened interbank liquidity (Chart 2.11). Higher bond yields pushed up financing costs of enterprises. This may possibly increase the re-financing risk for firms which rely heavily on bond financing, such as real estate developers. In view of the heightened risks associated with the surge in bond yields, authorities tightened leveraged trading activities of exchange traded bonds.

Chart 2.11
Mainland China: government and corporate bond yields



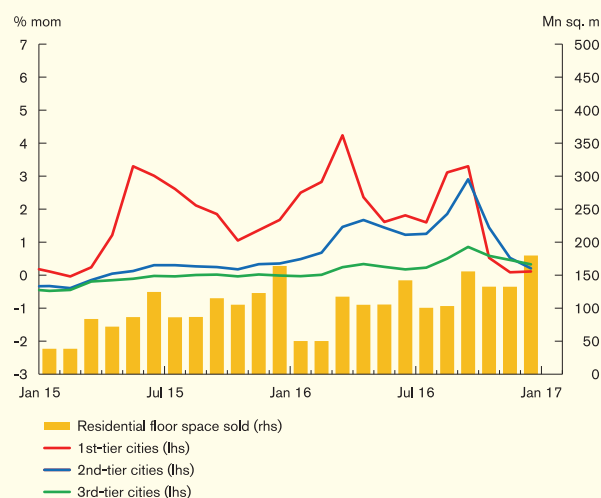
In the second half of 2016, Mainland commodity markets experienced a roller-coaster ride. The third quarter witnessed a continued investment binge and a sharp rise in commodity prices (Chart 2.12). While the rally in commodity prices was partly driven by continued de-capacity on the supply side and stronger demand on the recent property market boom, the exceptional market exuberance seemed to have also involved some speculative elements. In view of this, Shanghai, Dalian and Zhengzhou Commodity Exchanges introduced measures in mid-November to cool down the markets, including stricter margin requirements and higher transaction levies. In response, commodity prices dropped noticeably from the peak, but remained volatile towards the end of the year.

Chart 2.12
Mainland China: major commodity prices



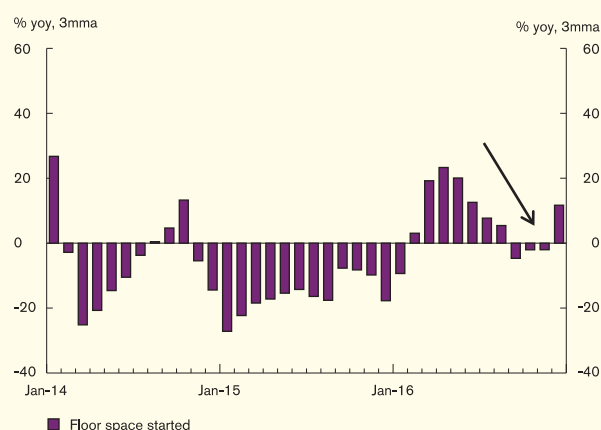
Mainland property markets showed tentative signs of tightening measures towards the end of 2016, following a housing price rally in the third quarter. Specifically, property price growth decelerated markedly in the last few months of the year after further introduction of tightening measures by local authorities in early-October (Chart 2.13). The sequential house price growth in first-tier cities almost stalled in November and fell below that in lower-tier cities for the first time since September 2014.

Chart 2.13
Mainland China: residential property prices and floor space sold



With the deceleration in property price growth, expansion in total floor space started also moderated before showing some signs of a rebound towards the end of the year (Chart 2.14). However, the real estate sector would likely extend less support to economic growth if real estate investment is to subside and the overheating property markets are brought back to normality given that curbing speculative activities and promoting stable and healthy development of property markets are among the top priorities for the Mainland authorities this year.

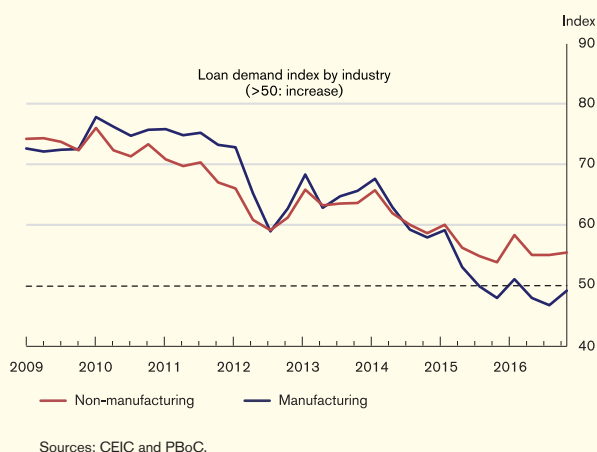
Chart 2.14
Mainland China: commercial and residential floor space started



Bank lending and asset quality

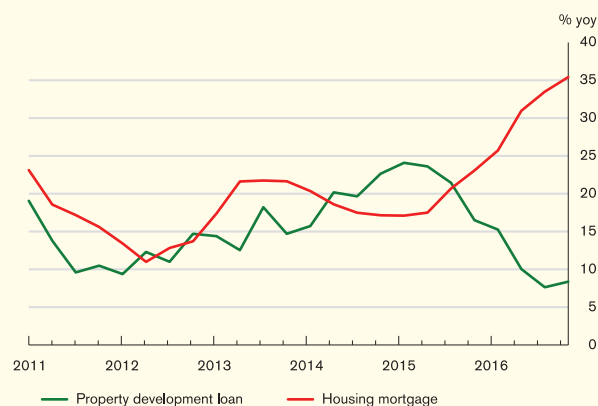
Despite the improvement in economic activities, bank loan growth continued to moderate amid weak loan demand during the review period. According to the quarterly bankers survey by the People's Bank of China (PBoC), loan demand from manufacturers continued to decline in 2016, while the increase in loan demand from non-manufacturing firms also hovered near historical lows (Chart 2.15).

Chart 2.15
Mainland China: Loan demand index by industry



On the supply side, in view of the potential risks associated with the overheated property markets, Mainland banks tightened their loan underwriting standards to developers, especially smaller ones which were more vulnerable to the real estate boom-bust cycle. As a result, the growth of developer loans decelerated notably to 8.4% at the end of 2016 from 16.5% a year ago (Chart 2.16).

Chart 2.16
Mainland China: Loan growth for property development and housing mortgage



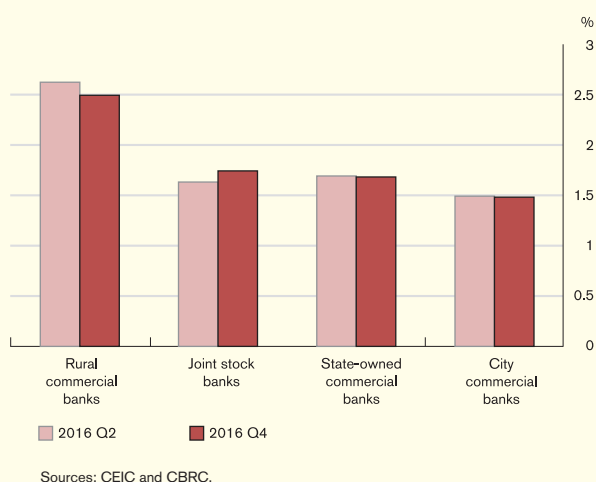
By contrast, bank lending to home buyers remained active and picked up quickly. That said, the risk associated with the fast growth in mortgage loans seemed to be limited. Firstly, the level of household leverage remained low. At the end of 2016, the outstanding size of mortgage loans was only equivalent to around one-third of the total household deposits. Secondly, the loan-to-value ratios also remained relatively low in overheated markets such as first-tier cities, thanks to the tightening measures introduced by the authorities which raised down-payment ratios. Thirdly, as the authorities had already rolled out measures to crack down on down-payment loans, especially those borrowed through the peer-to-peer platforms, the risk of involvement of shadow banking in mortgage lending had been contained as well.

While the direct impact of a boom-bust cycle in property markets on the repayment abilities of households and property developers is not likely to be large for the reasons mentioned above, the indirect effect of a boom-bust cycle in property markets on bank loan quality through collateral value should not be ignored. In particular, some studies pointed out that 30 – 45% of loans in the

five largest banks were backed by collateral, the majority of which was real estate.¹¹ As such, sharp corrections in housing prices would still increase the risk associated with bank loans especially those secured by properties and land.

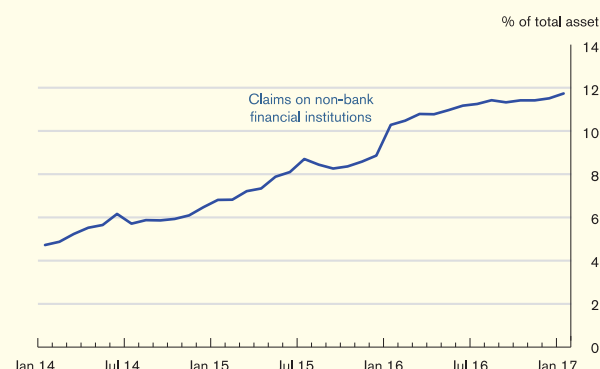
Even with buoyant property market conditions, weak earnings continued to plague most sectors and in turn weighed on the asset quality of Mainland banks during the review period. As a result, the non-performing loan (NPL) ratio edged up to 1.74% at the end of 2016 from 1.67% a year earlier. Among different types of banks, rural commercial banks were found to have the highest NPL ratio, though the ratio came down slightly from six months earlier (Chart 2.17).

Chart 2.17
Mainland China: NPL ratio by type of banks at the end of 2016



In the face of the pressure in corporate lending amid deterioration in loan quality, Mainland banks especially smaller ones continued to increase their exposure to non-bank financial institutions. As a result, banks' claims on non-bank financial institutions over total banking assets picked up notably to 11.5% at the end of 2016, from 6.5% and 8.9% at the end of 2014 and 2015 (Chart 2.18).

Chart 2.18
Mainland China: Banks' claim on non-bank financial institutions



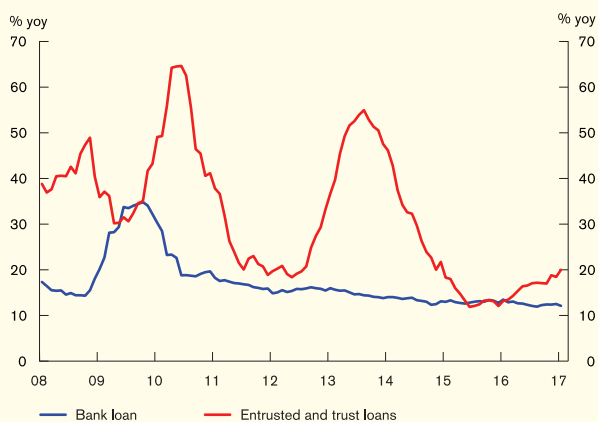
Sources: Wind, PBoC and HKMA staff estimates.

While financial disclosure of such claims is often less transparent than bank loans, information from listed bank financial statements suggests that increased non-bank exposure of banks might have involved scaled-up investment in receivables. Further breakdown of these receivables shows that smaller banks usually tended to hold a relatively larger portion of shadow bank-related products on their balance sheets, such as equities in trust projects or positions in entrusted funds managed by securities companies.

Echoing the fast increase in banks' investment in shadow bank-related receivables, the growth of shadow bank loans, including entrusted and trust loans, picked up from the beginning of 2016 (Chart 2.19). The divergence in bank and shadow bank loan growth may highlight the lengthening of the financial intermediation chain, and also the risk of resurgence in shadow banking activities amid tightened bank lending standards, which therefore warrants close monitoring.

¹¹ See for instance "People's Republic of China: Financial System Stability Assessment", the IMF, 2011, page 17.

Chart 2.19
Mainland China: Bank loan and shadow bank loan growth

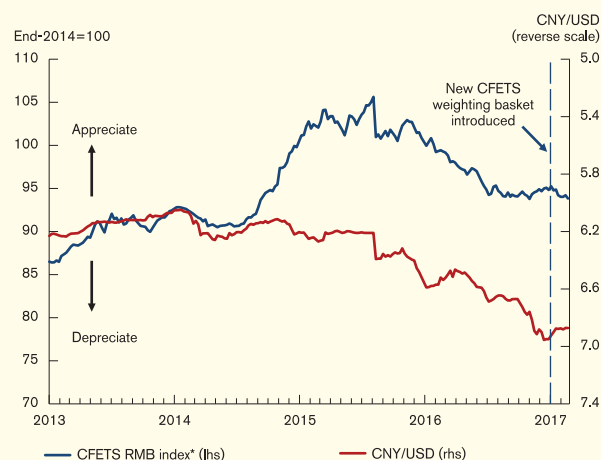


Sources: CEIC and HKMA staff estimates.

Exchange rate and money market

Following the strengthening of the US dollar since the middle of 2016, the renminbi weakened against the US dollar, but remained largely stable against a basket of currencies (Chart 2.20). Specifically, after weakening by 1.9% during the period of July – October, the renminbi depreciated further against the US dollar by 2.4% after the US presidential election till the end of 2016. The renminbi however showed some signs of stabilisation against the US dollar in the first two months of 2017, likely reflecting improved market sentiment. By contrast, the CFETS RMB index, a trade-weighted index capturing the movement of the renminbi against a basket of currencies, edged down by 0.2% during the review period.

Chart 2.20
Mainland China: The CFETS RMB index and 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.

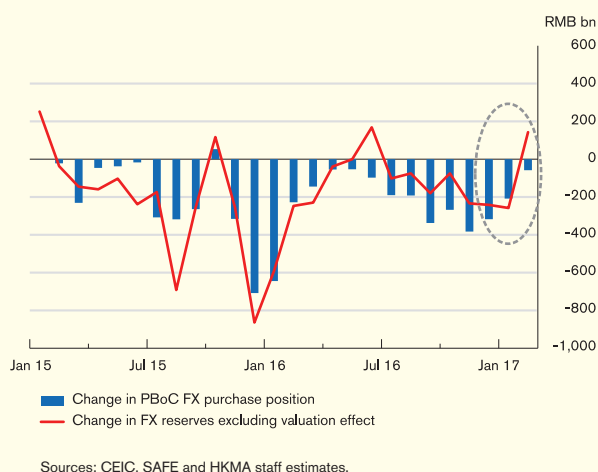
To further improve the representativeness of the CFETS RMB index, the CFETS revised the calculation of the index by adding 11 currencies, which were newly traded on the CFETS platform, into the existing basket in January 2017. As a result, the weights of major currencies such as the US dollar, the Euro and the Japanese Yen were adjusted lower and the renminbi was expected to link more to regional currencies such as the Korean Won.¹²

Amid the stabilisation of renminbi exchange rate against the US dollar, capital outflow pressures in Mainland China appeared to have eased somewhat in early 2017 after having intensified in the second half of 2016. Excluding valuation effects, Mainland China's foreign reserves was estimated to have declined by a monthly average of around US\$29 billion during September 2016 – January 2017 amid the strengthening of the US dollar,

¹² For the major currencies, the weights of the US dollar, the Euro and the Japanese Yen declined by 4%, 5.05% and 3.15% to 22.4%, 16.34% and 11.53% respectively, while the newly added the Korean Won alone was assigned a weight of 10.77%.

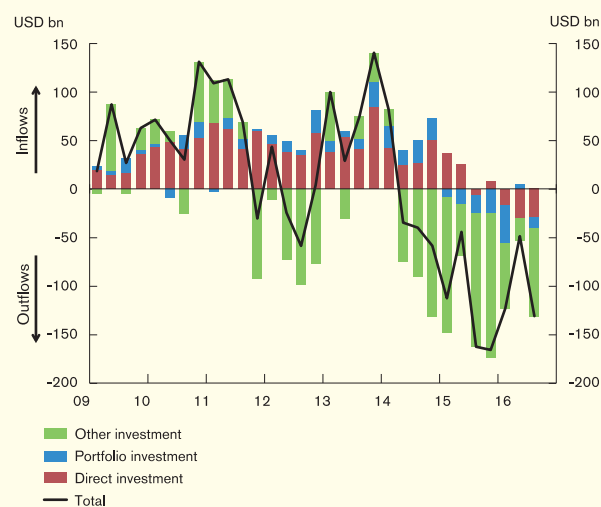
but rebounded by US\$21 billion in February (Chart 2.21). During the review period, the size of foreign reserves in Mainland China decreased by US\$180 billion to stand at US\$3,005 billion in February 2017.

Chart 2.21
Mainland China: Changes in PBoC's foreign exchange purchase position and foreign reserves



Breakdown of net cross-border capital flows data under the balance of payments statistics suggests that flows through other investment remained the most important contributor to capital outflows (Chart 2.22). However, further examination points to the fact that reduction in external borrowing seemed to be no longer a driving force since the second quarter of 2016. In particular, the notable increase in capital outflows through other investment in the third quarter was found to be mainly driven by Mainland banks' lending to non-residents rather than further reduction in external borrowing by Mainland residents. That said, since cross-border bank flows tend to be volatile, more time is needed to discern the new trend in other investment.

Chart 2.22
Mainland China: Net cross-border capital flows by type of flow

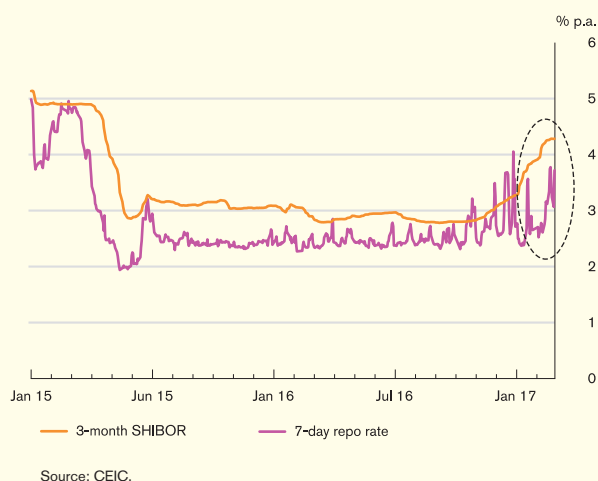


Meanwhile, capital outflows through direct investment and portfolio investment appeared to have become an increasingly important driver of capital outflows in 2016. In particular, direct investment related cross-border capital flows turned from a small net positive inflow in the fourth quarter of 2015 to a net outflow of US\$29 billion in the third quarter of 2016, likely reflecting an increased allocation of assets overseas by Mainland residents.

Looking ahead, while the current account surplus and robust economic and productivity growth would continue to provide support to the renminbi exchange rates over the longer term, the short-term outlook for capital flows remains uncertain, hinging on future movements of the US dollar, the pace of portfolio re-balancing by Mainland residents, as well as global market sentiment.

Amid intensified capital outflows, liquidity conditions in the money market became tighter towards the end of 2016. The 7-day repo rate was on the rise in recent months and became increasingly volatile (Chart 2.23). Longer-end interbank funding costs also seemed to be affected, with the 3-month Shanghai Interbank Offered Rate (SHIBOR) picking up to 4.3% in February 2017 from 2.7% at the end of August 2016.

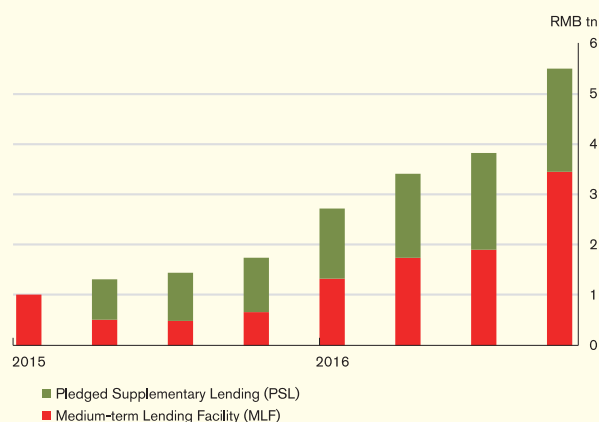
Chart 2.23
Mainland China: 7-day repo rate and 3-month SHIBOR



Fiscal and monetary policy

In view of intensified capital outflows, the PBoC continued to rely more on targeted measures to provide liquidity support to the banking system during the review period, while keeping the required reserve ratio unchanged. In particular, the outstanding size of the Medium-term Lending Facility (MLF) increased notably to around RMB3.5 trillion at the end of 2016 from about RMB1.7 trillion in June (Chart 2.24).

Chart 2.24
Mainland China: Outstanding sizes of targeted easing tools by the PBoC



In the second half of 2016, the overall monetary conditions continued to ease on a weaker real effective exchange rate of the renminbi and lower real effective lending rates amid rising inflation. Despite the fact that easing monetary conditions helped stabilise economic activities in the private sector, there were still concerns about the deterioration in the effectiveness of monetary policy especially in view of accelerated M1 growth along with a slowdown in M2 expansion. According to some market commentators, the divergence between M1 and M2 growth might have been driven by a quick accumulation of idle funds due to a lack of investment opportunities amid economic slowdown, thus highlighting the possibility that the Mainland economy was entering a liquidity trap.

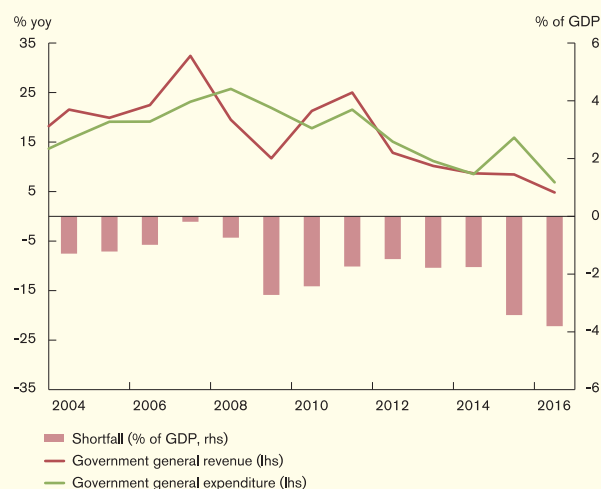
Our analysis in Box 2 finds little support for the view that the Mainland economy was facing a liquidity trap, as there was no quick surge in the interest elasticity of money demand, contrary to the liquidity trap hypothesis. So the question is then what drives the divergence of M1 and M2 growth. In Box 3, we explore the potential drivers for M1 and M2 growth and find that

while recent monetary easing in part accounted for the much faster growth of M1 than M2, increased economic uncertainty, rather than economic slowdown, appeared to have also played an important role through driving up precautionary demand for money and holding off investment.

According to the Central Economic Work Conference and the government work report, monetary policy stance will be prudent and neutral in 2017. On top of that, the authorities will focus more on preventing financial risks in view of the potential systemic impact of overheated asset markets such as property markets. For instance, the PBoC raised both the 6-month and 12-month MLF rates by 10 basis points on 24 January 2017 while providing liquidity support to the banking system. For the whole year of 2017, M2 and aggregate financing growth are both envisaged at a slower pace of around 12%, compared with the government expectation of 13% in 2016.

On the fiscal front, the shortfall between government general revenue and expenditure widened from 3.4% of GDP in 2015 to 3.8% in 2016 (Chart 2.25). While growth in government expenditure slowed in 2016, government revenue seemed to decline at a faster pace. For instance, government revenue from business and value-added taxes reversed from an increase of 36.6% year on year in the first five months of 2016 to a decline of 16.9% in June – December after the value-added tax reform. Meanwhile, growth of government non-tax revenues also slowed notably from 29.0% in 2015 to 6.8% in 2016 along with the government's effort to reduce and exempt business fees. While the decline in government revenue may in part reflect the slowdown in economic activities, it could also reflect the fact that authorities had put more weight on measures such as corporate tax cuts and fee exemptions to promote private sector spending in addition to infrastructure investment.

Chart 2.25
Mainland China: Government general revenue and expenditure



Sources: CEIC and HKMA staff estimates.

To stabilise the economy and continue to support supply-side reforms, the authorities pledged a more proactive fiscal policy stance this year. The government raised the budget deficit from RMB2.18 trillion in 2016 to RMB2.38 trillion in 2017, while keeping the ratio of budget deficit to GDP unchanged from last year's 3.0%. In particular, Mainland authorities planned to further reduce the tax burden and business fees of the corporate sector by around RMB350 billion and RMB200 billion respectively this year. On the expenditure front, the government planned to invest RMB800 billion in railway construction and RMB1.8 trillion in highway and waterway projects in 2017.

Notwithstanding the government's adoption of a more proactive fiscal policy stance, the increase in overall government debt remained moderate at 2.5% in 2016. As a result, the overall indebtedness of the government lowered somewhat in 2016, with public debt to GDP ratio easing slightly from 38.7% in 2015 to 36.7%. At the local level, the ongoing loan-for-bond swap and improved land sales helped alleviate concerns on the refinancing risks of local government debt during the review period. That said, some provinces such as Qinghai, Shanxi and Shaanxi experienced deterioration in their fiscal positions as government revenue declined in 2016.

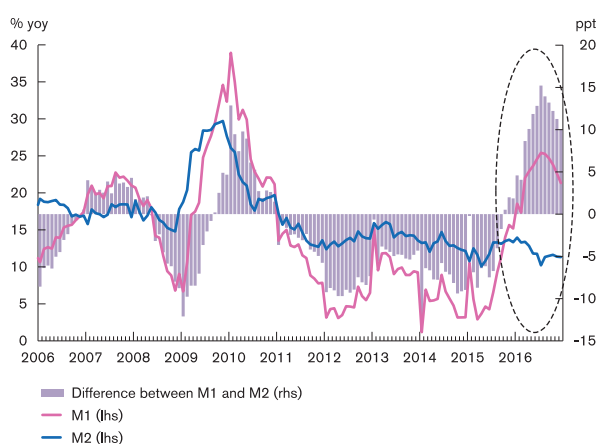
Box 2

Is the Mainland economy entering a liquidity trap?

Introduction

Historically, M1 (narrow money) and M2 (broad money) usually moved in the same direction in Mainland China, despite the more volatile growth rate of M1. However, 2016 saw the acceleration of M1 growth from around 15% year on year to as high as 25.4% in July, while M2 growth, in contrast, declined from 13.3% to 11.3% during the same period (Chart B2.1). The fact that the rapid expansion in M1 was not accompanied by fast growth of M2 has raised some concerns over the effectiveness of monetary policy. Some commentators even suggested that the Mainland economy was likely entering a liquidity trap, as such divergence in M1 and M2 growth might have been driven by a quick accumulation of idle funds due to a lack of investment opportunities amid the economic slowdown.

Chart B2.1
Growth of M1 and M2 in Mainland China



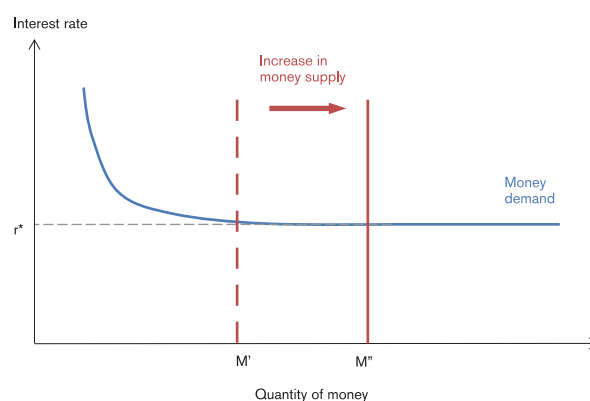
Understanding whether the Mainland economy is entering a liquidity trap is important. If the answer is yes, then monetary policy would be ineffective and the Mainland authorities might need to rely more on other measures, such as fiscal stimulus to support the economy. This analysis formally tests the liquidity trap hypothesis, given that the much faster growth of

M1 than M2 itself may not be a straightforward indicator for whether a liquidity trap exists. In particular, we explore the time profile of the interest elasticity of money demand and examine directly whether the demand for money actually becomes more elastic in tandem with the fall in interest rates.

Liquidity trap: definition and debate on the Mainland case

Although there is no clear-cut definition of a liquidity trap, related discussion typically focuses on the situation where monetary policy is no longer able to further lower real or nominal interest rates and thus loses grip on the economy.¹³ Under such circumstances, interest rates are at low levels or close to zero and money demand becomes very elastic. Therefore, any further increase in money supply will be hoarded so that the interest rate cannot be further lowered to stimulate the economy (Chart B2.2).

Chart B2.2
An illustration of money demand and supply in a liquidity trap



¹³ Keynes (1936) in his *General Theory* noted the possibility that after the rate of interest has fallen to a certain level, liquidity-preference may become virtually absolute, and the monetary authority would have lost effective control over the rate of interest. More recent theorists such as Krugman (1998) defined liquidity trap as a situation in which conventional monetary policies have become impotent, because nominal interest rates are at or near zero.

The debate on whether the Mainland economy is entering a liquidity trap is often polarised between two points of view. Focusing on the effectiveness of monetary policy, one strand of thought argues that the Mainland economy is likely mired in a liquidity trap as monetary easing in Mainland China seems to have less apparent impact on real activities, especially in view of a quick surge in M1 growth together with the slowdown in M2 growth, which is a sign of a quick accumulation of idle funds. The other however holds the opposite view, judging from the level of interest rates in Mainland China. Currently, the effective lending rate remains high at above 5%, though has been coming down from higher levels since early 2015.

An empirical framework for testing the liquidity trap hypothesis

One way to evaluate the relevance of the liquidity trap hypothesis is to examine directly whether the demand for money actually becomes more elastic in tandem with the fall in interest rates. Following Hondroyiannis et al (2000), in this analysis we estimate the interest elasticity of money demand in Mainland China using the following equation,

$$\ln(MD_t) = \beta_0 + \beta_1 \ln(r_t) + \beta_2 \ln(Y_t) + u_t,$$

where MD_t is the money demand and r_t is prevailing market interest rates. β_1 , the coefficient of interest rates therefore captures the interest elasticity of money demand. If the Mainland economy is indeed in a liquidity trap, we should observe a quick surge in the interest elasticity of money demand in tandem with the fall in interest rates.

Apart from interest rates, income levels may also affect money demand. Specifically, other things being equal, higher levels of income may lead to greater demand for money. Therefore, Y_t , the level of GDP, a proxy for income, is also included in the specification.

Testing the liquidity trap hypothesis using Mainland data

Using monthly data during the period of January 2005 to September 2016, our estimation results suggest that money demand, proxied by M2 or aggregate financing¹⁴, in general increases when interest rates decline, as shown by the negative coefficients of varied interest rates (Table B2.A).¹⁵ The income elasticity of money demand is found to be positive and slightly above unity, as suggested by the coefficients of GDP.

Table B2.A
Income and interest elasticities of money demand in Mainland China: 2005/01-2016/09

Dependent variable:	(a) M2	(b) Agg. Fin	(c) M2	(d) Agg. Fin	(e) M2	(f) Agg. Fin
Explanatory variables:						
GDP	1.176 (.000)	1.381 (.000)	1.163 (.000)	1.363 (.000)	1.224 (.000)	1.425 (.000)
Interest rates						
Estimated 1-year effective lending rate	-0.271 (.000)	-0.286 (.000)				
1-year benchmark lending rate			-0.306 (.000)	-0.358 (.000)		
7-day repo rate					-0.059 (.009)	-0.051 (.149)
Constant	-0.796 (.000)	-3.054 (.000)	-0.633 (.000)	-2.784 (.000)	-1.759 (.000)	-4.017 (.000)
R-squared	.996	.992	.997	.994	.994	.990
No. of observations	141	141	141	141	141	141

Note: Monthly estimates of GDP are based on quarterly GDP, GDP shares of investment, consumption and net exports, as well as monthly data on fixed asset investment, retail sales and trade balance. The estimated 1-year effective lending rate is calculated based on the 1-year benchmark lending rate and the shares of loans extended at the rate below or above the benchmark lending rate during the month. The Newey-West standard errors are calculated and P-values are reported in parenthesis.

Further study on the time profile of the interest elasticity of money demand, using a rolling window analysis, suggests that there is little evidence for the view that the Mainland economy is entering a liquidity trap. More specifically, contrary to the liquidity trap hypothesis, our results find no quick surge in the interest elasticity of money demand despite the

¹⁴ M2 is a commonly used proxy for money demand in literature. In the case of the Mainland economy, we also use aggregate financing as a proxy.

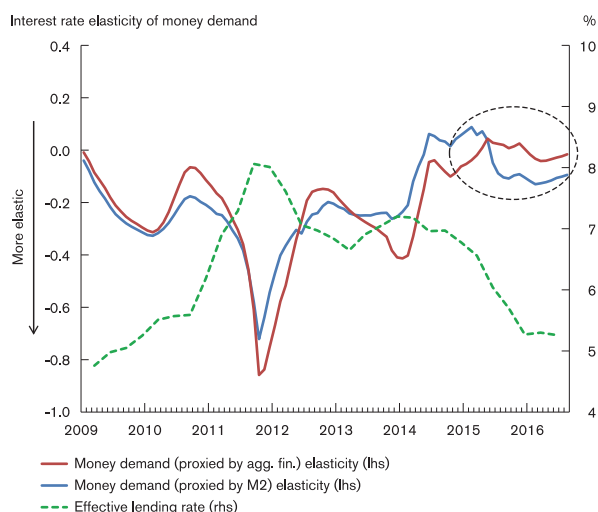
¹⁵ The only exception is that aggregate financing shows to be not very responsive to short-term interbank rates such as the 7-day repo rate (column (f) in Table B2.A).

effective lending rate having declined notably after 2015 (Chart B2.3). Following the interest rate decline, money demand indeed became slightly more elastic, but remained much less elastic than in previous episodes.

Our findings of no quick surge in the interest elasticity of money demand during recent periods remain robust irrespective of the choices of interest rates and different rolling windows¹⁶, or after including further controlling variables such as the required reserve ratio.

Chart B2.3

The dynamics of interest elasticity of money demand based on a rolling window analysis



Note: Interest elasticity of money demand is estimated by a 36-month rolling window during the period of 2005/01 – 2016/09.

Conclusion

The results presented in this analysis find little support for the view that the Mainland economy might have been entering a liquidity trap. Specifically, the results suggest that there is no quick surge in the interest elasticity of money demand despite the sharp fall in lending rates after 2015, contrary to the liquidity trap hypothesis. In this sense, sustained monetary expansion, if needed, would still be effective in shoring up economic activities in Mainland China.

References

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Keynes, J.M. (1936), "The General Theory of Employment, Interest and Money", *London: Macmillan*.

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¹⁶ Our results are robust for the rolling windows of 24 months and 48 months.

Box 3

Divergence between M1 and M2 growth in Mainland China

Introduction

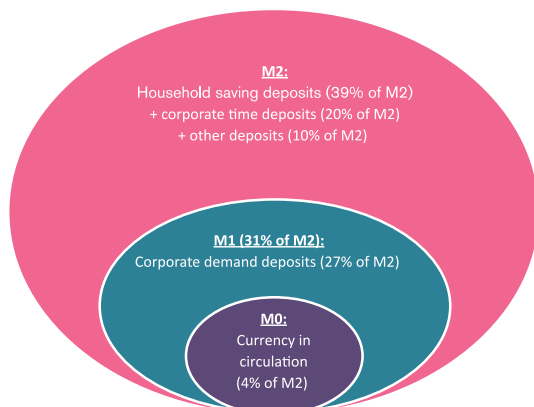
In Box 2 we have shown that there is no evidence for the view that the Mainland economy is entering a liquidity trap. The rising divergence between M1 and M2 growth is however left unexplained. Therefore, this analysis empirically investigates what could be the potential factors driving the much faster growth of M1 than M2, and discusses whether such divergence should be a concern.

Definition of M1 and M2 in Mainland China

According to the official definition by the PBoC, M1 in Mainland China consists mainly of currency in circulation (also known as M0) and corporate demand deposits (Chart B3.1), which are usually perceived as money held for transactions and precautionary purposes. M2 is a broader measure of money, which includes a wider set of deposits, such as corporate time deposits, household saving deposits, as well as deposits of non-depository financial institutions, in addition to M1. Time deposits are usually held for investment/speculation purposes and receive higher interest rates than demand deposits.

Chart B3.1

Definition of money supply in Mainland China

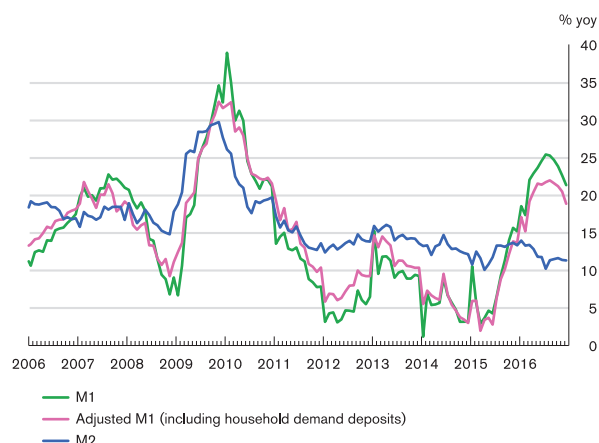


Sources: CEIC and HKMA staff estimates.

Unlike conventionally defined narrow money, M1 in Mainland China does not include demand deposits from households. Instead, household demand deposits are included in household saving deposits as part of M2. That said, adding back household demand deposits into M1 does not appear to change too much the growth pattern of narrow money, though making it slightly less volatile (Chart B3.2). This may reflect the fact that the demand of household and corporate for the liquid form of money such as demand deposits tends to be affected by similar macro-economic and structural factors.

Chart B3.2

M1 and M2 growth in Mainland China



Sources: CEIC and HKMA staff estimates.

Potential factors affecting M1 and M2 growth: what does economic theory tell us?

Various factors may affect the demand for money and thus the growth rates of M1 and M2. Firstly, demand for money, especially M1, tends to increase with a higher level of output. As money is used as a medium of exchange, or as a means of payment, higher income or levels of economic activities may lead to greater need for people to hold the most liquid form of money, for instance, cash or money in the checking account, to facilitate transactions or payment. Because of

the strong correlation between money demand and economic growth, rising M1 growth is sometimes perceived as an early sign of improvement in economic activities.

Secondly, demand for money can also be affected by interest rates. When interest rates become lower, time deposits will receive less return and the opportunity cost of holding the liquid form of money will decrease. Therefore, people may have incentives to hold more money in their checking accounts. In this sense, declines in interest rate usually lead to higher M1 growth.

On the other hand, lower interest rates could result in lower demand for time deposits, which is another important component of M2, than demand deposits. Specifically, since changes in interest rates may also affect investment returns, people may be willing to move money out of their savings account into bonds or other interest-sensitive assets whose value will increase amid declines in interest rates. Therefore, declines in interest rates tend to have positive but relatively smaller overall impact on M2 growth than M1 growth.

Thirdly, the precautionary motive for holding money will become stronger amid greater uncertainties, resulting in faster growth of M1. Typically, people tend to increase their holding of precautionary liquidity for emergency expenses if the economic outlook becomes unpredictable. For companies, rising levels of economic uncertainty may discourage investment and, in turn, result in the piling up of idle funds on their balance sheets.

Apart from the above mentioned macro-economic factors, structural changes in the financial system may also affect M1 and M2 growth. For instance, the fast development of shadow banking activities in Mainland China may lengthen the financial intermediation chain and thus slow down money creation. In addition, the introduction of new technologies

improving conversion between checking and savings accounts or providing liquidity, such as credit cards may also reduce the transaction demand for money.

Estimating the determinants of M1 and M2 growth in Mainland China

While in theory M1 and M2 growth can be affected differently by various factors as discussed, which factors actually played the role in driving the M1 and M2 growth divergence in recent periods in Mainland China is an empirical question. To this end, we estimate the demand equation for real M1 and M2 growth separately using the same set of explanatory variables. Following the conventional definition of M1, in addition we also estimated the demand equation of adjusted real M1 growth, which takes into account household demand deposits in addition to currency in circulation and corporate demand deposits. In this analysis, we estimate the money demand equations using quarterly data over the period of the first quarter of 2006 to the third quarter of 2016.

The explanatory variables include real GDP growth and changes in the benchmark 1-year lending rate. To take into account the impact of economic uncertainty, we also include a news-based economic uncertainty index for Mainland China into the specification.¹⁷ In addition, the impact of shadow banking activities is also considered, with the ratio of the outstanding size of shadow banking activities to the outstanding size of bank loans being added to the specification.¹⁸

¹⁷ To proxy for economic uncertainty, we use the economic policy uncertainty (EPU) index for Mainland China developed by Baker, S.R., Bloom, N., and Davis, S.J., which captures the percentage of economic news reports related to Mainland China in a major newspaper through a text keyword filter (source: http://www.policyuncertainty.com/china_monthly.html). Similar news-based EPU indices on other economies developed by the team appeared in many recent studies including those by the European Central Bank and the IMF.

¹⁸ Shadow banking activities include entrusted loans, trust loans and entrusted funds managed by securities firms.

The estimated cumulative effects of these explanatory variables are summarised in Table B3.A. Our findings suggest that while the cumulative effects of GDP growth on M1, adjusted M1 and M2 growth are all statistically positive, the effects on M1 and adjusted M1 growth are much larger. These findings are in line with theoretical expectations, as the transaction demand for money is much more relevant for the most liquid form of money, and the impact of economic growth on time deposits is less pronounced. Similarly, interest rate changes are found to have a significant and negative effect on M1, adjusted M1 and M2 growth, with M1 and adjusted M1 growth appearing to be more sensitive to interest rate changes, in line with what we discussed in the previous section.

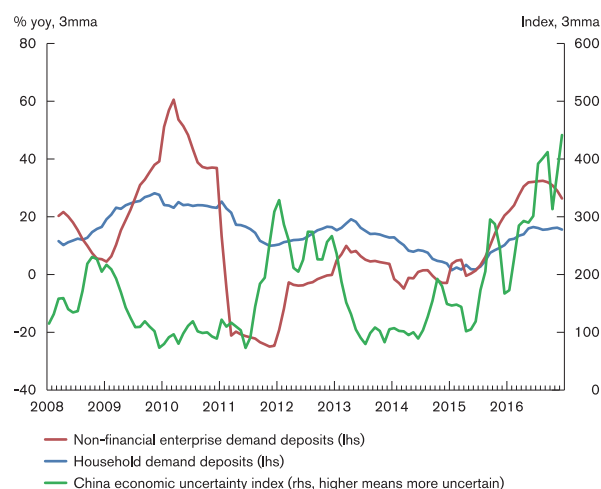
Table B3.A
Cumulative effects of a one unit change of explanatory variables on real M1 and M2 growth¹⁹

Explanatory variable	Real M1 (%yoy)	Adjusted real M1 (%yoy)	Real M2 (%yoy)
Real GDP (%yoy)	2.026**	1.535**	0.937**
Interest rate (%)	-12.153***	-11.674***	-5.529***
Economic uncertainty (normalised, per standard deviation)	2.973**	2.614***	-0.181
Share of shadow banking (%)	-0.266*	-0.412***	-0.257**
R-squared	0.941	0.944	0.931

Note: ***, ** and * denote the original estimated coefficients are significant at 1%, 5% and 10% levels respectively.

Economic uncertainty appears to have positive and statistically significant impacts on both M1 and adjusted M1 growth but not for M2 growth, suggesting that higher economic uncertainty tends to be associated with higher precautionary demand for money or a fast accumulation of the idle funds on corporate balance sheets. Indeed, the growth of household and enterprise demand deposits seemed to have strong correlation with the economic uncertainty index, especially after 2011 (Chart B3.3).

Chart B3.3
Growth of household and enterprise demand deposits and economic uncertainty



Sources: CEIC, China Economic Policy Uncertainty Index (source: http://www.policyuncertainty.com/china_monthly.html) and HKMA staff estimates.

In comparison, growth rates of M1 and M2 are found to have similar negative correlations with the relative size of shadow banking activities to bank lending. This suggests that while shadow banking activities may have slowed down money growth in Mainland China, they may not necessarily be a key reason for the recent M1-M2 growth divergence.

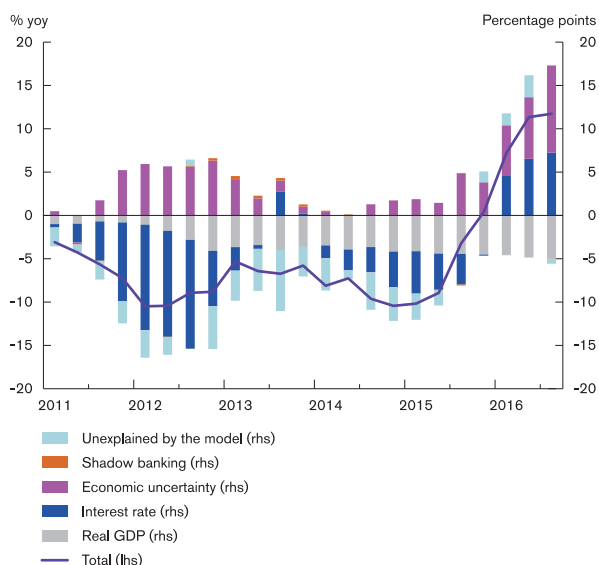
It is worth noting that shadow banking activities appeared to have a larger negative impact on adjusted M1 growth than on M1 growth. This may be because the substitution effect is much stronger between shadow banking products such as wealth management products and household demand deposits than between these shadow banking products and corporate demand deposits.²⁰

¹⁹ We include lagged dependent variable and the autoregressive term in the regressions to control for the serial correlation problem. This table reports the cumulative effects, or the long-run propensity, of a one unit change in explanatory variables up to five quarters.

²⁰ For instance, latest official data suggests that above 50% of newly issued wealth management products were with maturity equal or below 3 months. Source: www.chinawealth.com.cn

Based on our estimation results, we disentangle the contributions of different factors to the growth divergence between M1 and M2.²¹ Not surprisingly, interest rate declines have been one of the main reasons for the much faster growth of M1 than M2 since 2016 (Chart B3.4).

Chart B3.4
Contribution to the differences in M1-M2 growth



Sources: CEIC, China Economic Policy Uncertainty Index (source: http://www.policyuncertainty.com/china_monthly.html) and HKMA staff estimates.

Unlike some market claims that the divergence between M1 and M2 growth is due to lack of investment opportunities amid economic slowdown, our findings do not lend support to this view. Instead, recent economic slowdown resulted in much slower growth of M1 due to lower transaction demand for money. In fact, it is economic uncertainty, rather than the economic slowdown itself, that is found to be the other important factor driving the divergence of M1-M2 growth. In particular, our findings indicate that the contribution of economic uncertainty on the M1-M2 growth differential in recent periods was almost comparable to that of interest rate declines.

Conclusion

Our analysis documents the important role of economic uncertainty played in shaping money demand in Mainland China in recent periods. While recent monetary easing in part accounted for the much faster growth of M1 than M2, increased economic uncertainty appeared to have also played an important role through driving up precautionary demand for money and holding off investment. By contrast, recent economic slowdown and expansion in shadow banking activities appeared to negatively affect money growth especially through lowering the demand for M1, the most liquid form of money.

²¹ We take end-2010, when growth of M1 and M2 were largely similar, as a base period, and estimate the effects of each explanatory factor on the difference between M1 and M2 growth relative to the base period.

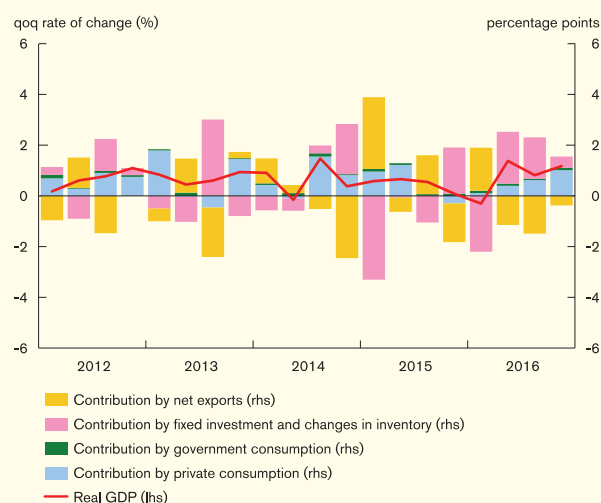
3. Domestic economy

The Hong Kong economy showed a modest pick-up in growth during the second half of 2016, reflecting faster private consumption growth and strong public sector building and construction activities. Economic growth for 2017 is expected to be moderate amid heightened uncertainties in the external environment. Local inflationary pressures are likely to remain contained with benign import prices and moderate domestic growth momentum in the near term.

3.1 Real activities

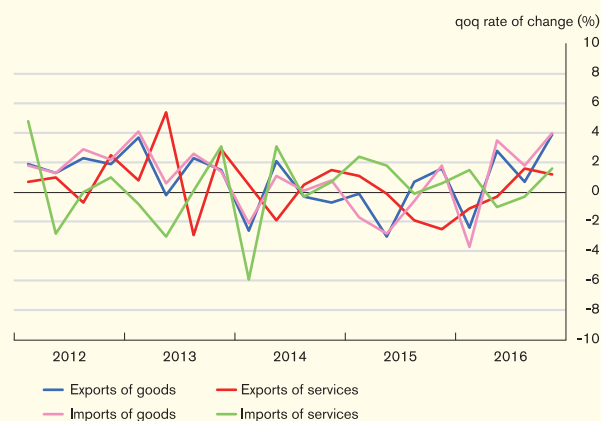
The Hong Kong economy recorded a modest pick-up in growth during the second half of 2016. On a seasonally adjusted quarter-on-quarter basis, real Gross Domestic Product (GDP) rose by 1.2% in the fourth quarter, slightly faster than the 0.8% growth in the third quarter (Chart 3.1). Private consumption increased at a faster pace and was the main driver behind GDP growth, partly reflecting improved consumer confidence and robust labour market conditions. Building and construction activities also quickened, underpinned by infrastructure projects such as the Hong Kong Airport's third runway. However, the positive contribution of overall investment spending to GDP growth narrowed because of softer business capital expenditure. On the external front, along with rising regional trade flows, both exports and imports of goods grew faster (Chart 3.2).²² Exports of services increased further driven by trade-related and transportation services, and imports of services rebounded due in part to strong travel interest among residents. On a net basis, overall trade balance continued to detract from the 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

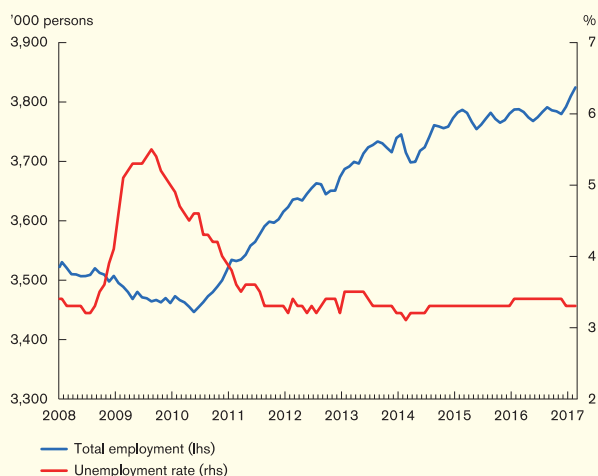


Source: C&SD.

²² The change of ownership principle was adopted in recording trade in goods and services. More details can be found in *Gross Domestic Product (Quarterly), Fourth Quarter 2016* published by the Census and Statistics Department (C&SD).

The labour market remained tight. After staying at 3.4% in the first three quarters, the seasonally adjusted unemployment rate edged down to 3.3% in the final quarter (Chart 3.3). In fact, many major sectors saw a lower unemployment rate during this period, including the retail, accommodation and food services sector due in part to the stabilisation of the retail downturn. Total employment climbed to a record high of 3.824 million in February 2017, while the labour force participation rate was roughly stable at about 61%.

Chart 3.3
Unemployment rate and total employment



Source: C&SD.

Real economic growth for 2017 is anticipated to remain moderate. Externally, global economic and trade growth may remain moderate amid increased uncertainty in the global macro-financial environment. This, coupled with the appreciation of the Hong Kong dollar real exchange rate due to the strength of the US dollar, will restrain Hong Kong's export performance. Domestically, private consumption is expected to grow moderately, supported by stable employment and earnings conditions, while dragged down by rising interest rates. Building and construction activities should progress steadily on the back of rising housing supply and infrastructure projects in the pipeline, but weak business sentiment and a pick-up in

interest rates will weigh on business capital spending. The Government now forecasts 2017 real GDP growth in the range of 2-3%, while private-sector analysts project the economy to expand at an average rate of 2.0% in 2017.

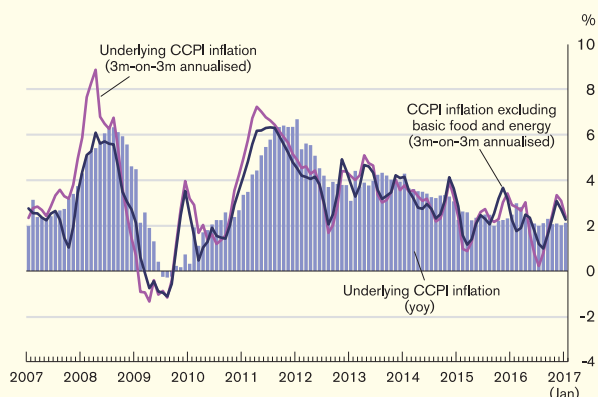
This growth outlook is subject to heightened uncertainties, particularly from the external environment. Policy uncertainties surrounding the new US administration will cloud the global economic outlook, with potential protectionist policies posing headwinds to global trade flows. The Brexit process and national elections in several major European countries may also result in asset market volatilities and affect the directions of Hong Kong dollar fund flows. In addition, the US interest rate normalisation will tighten domestic monetary conditions and pose downward pressure on both the real economy and asset prices.

3.2 Consumer prices

Local inflationary pressures have remained moderate since the second half of 2016, while the sequential momentum has picked up in recent months. On a year-on-year comparison, the underlying composite consumer price index (CCPI) held steady at 2.1% in the second half of 2016 and January 2017 (Chart 3.4). Inflation momentum, as measured by the annualised three-month-on-three-month underlying inflation rate, accelerated from 0.9% in the third quarter to 3.0% in the fourth quarter, before moderating slightly to 2.4% in January. The faster pace of price increases was mainly due to the higher costs of tradables and housing rentals (Chart 3.5). In particular, tradables' price inflation turned positive to 3.0% in the fourth quarter, from its negative territory in the third quarter, mainly driven by the basic food and the clothing and footwear components. Amid the narrowed decline in private residential rentals and the upward adjustment in public housing rentals in September 2016, the housing rental component of CCPI picked up in the third

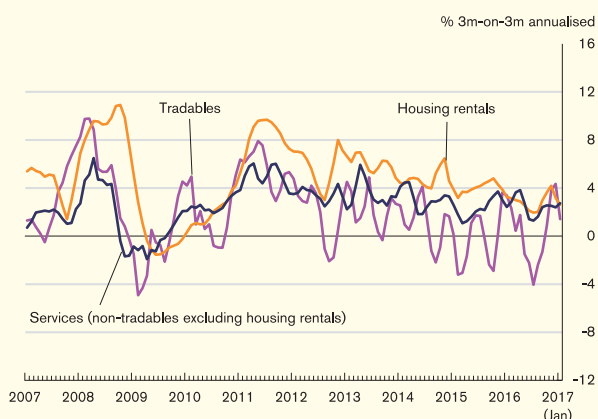
quarter, followed by a slight moderation in January (Chart 3.6).

Chart 3.4
Different measures of consumer price inflation



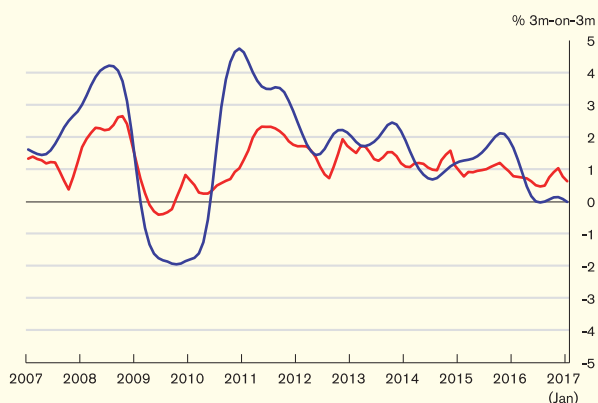
Sources: C&SD and HKMA staff estimates.

Chart 3.5
Consumer price inflation by broad component



Sources: C&SD and HKMA staff estimates.

Chart 3.6
CCPI rental component and market rental

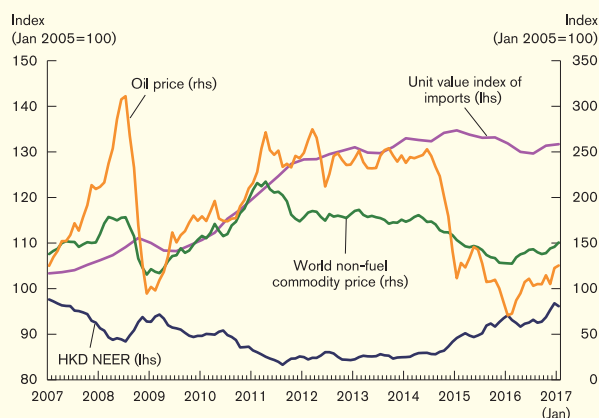


— Underlying CCPI rental component
— Residential rental (18-month moving average)

Sources: C&SD and R&VD.

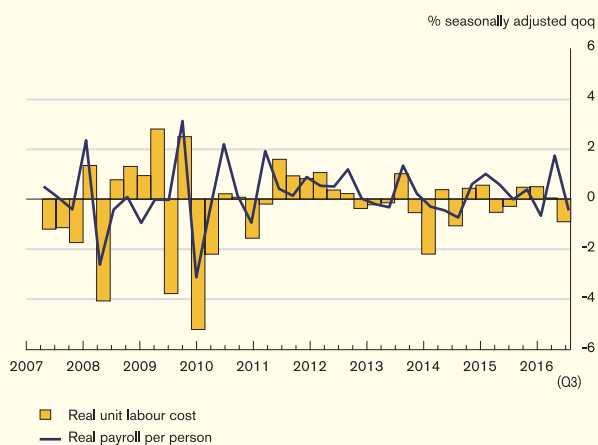
In the near term, inflationary pressures are expected to remain contained amid the soft import prices and modest local cost pressures. Imported inflation should remain muted on the back of the strong Hong Kong dollar, which could offset to some extent the effect of the recovery in global commodity prices (Chart 3.7). Domestically, the output gap is estimated to be close to zero in the fourth quarter of 2016, which should help to restrain business costs and hence the services inflation component. Despite a tight labour market, wage increases have been mild in recent quarters with the real payroll per person falling by 0.4% in the third quarter of 2016 after growing by 1.1% in the first half (Chart 3.8). Growth in the cost of labour is likely to keep steady in the face of cautious business sentiment amid lingering external uncertainties. The growth in retail property rental is anticipated to be moderate with the lacklustre performance of retail sales in recent months. The continued feed-through of the earlier softening in private residential rentals should also help keep inflation pressures in check. On the whole, the annual year-on-year inflation rate in 2017 is expected to ease, with the Government forecasting an annual underlying inflation rate of 2.0%, down from 2.3% in 2016.

Chart 3.7
Commodity and import prices



Sources: C&SD and IMF.

Chart 3.8
Unit labour cost and payroll per person



Sources: C&SD and HKMA staff estimates.

The inflation outlook is subject to risks on both sides. On the downside, a faster-than-expected pace of the US interest rate hikes in response to a higher inflation under the Trump administration, could push up local mortgage rates and add to downward pressure on property prices and housing rentals. At the same time, the strengthening of Hong Kong dollar could further keep import prices soft while dampening inbound tourism. On the upside, a stronger-than-expected expansion in the global economy could support growth in Hong Kong and increase the demand-pull inflation of global commodities, thus exerting upward pressures on local inflation. The increase in Statutory Minimum Wage, effective from 1 May 2017, might drive up inflation further, although the actual impact of this cost-push inflation is likely to depend on the extent of the pass-through from wage cost to consumer prices.

4. Monetary and financial conditions

Exchange rate, capital flows and monetary developments

The Hong Kong dollar exchange rate was broadly stable despite financial market volatilities, while the Hong Kong dollar interbank interest rates picked up alongside the movements in their US dollar counterparts. Total loans continued to expand moderately in part underpinned by the improved domestic economic environment. Looking ahead, Hong Kong dollar fund flows could face more volatility amid a faster pace of US interest rate normalisation, policy uncertainties surrounding the new US administration and political risks in Europe.

4.1 Exchange rate and capital flows

The Hong Kong dollar spot exchange rate was broadly stable despite financial market volatilities (Chart 4.1). While Asian currencies generally weakened amid volatilities stemming from the US presidential election in November, the Hong Kong dollar spot exchange rate remained calm. However, the interest rate forecasts released by the US Federal Open Market Committee (FOMC) at the meeting on 13-14 December 2016 had boosted expectations of faster US interest rate hikes, and the Hong Kong dollar softened briefly after the FOMC meeting. After regaining strength along with other Asian currencies in early 2017, the Hong Kong dollar exchange rate saw some easing pressures again since mid-February in the running up to the US interest rate hike in March. During the review period, the Convertibility Undertaking (CU) was not triggered (Chart 4.2).

Chart 4.1
Exchange rate and fund flow indicators

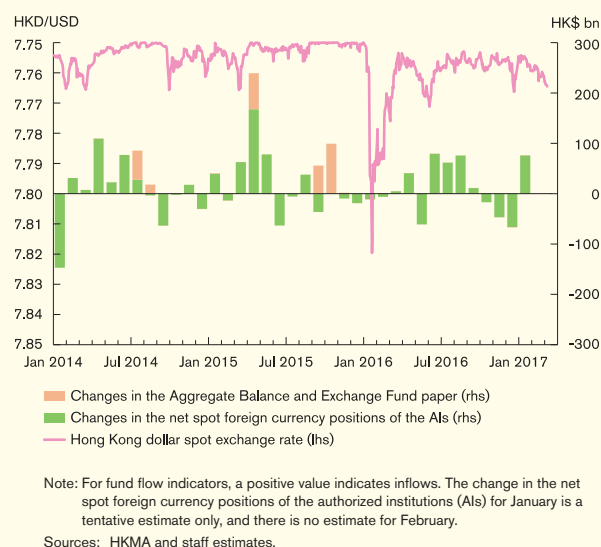
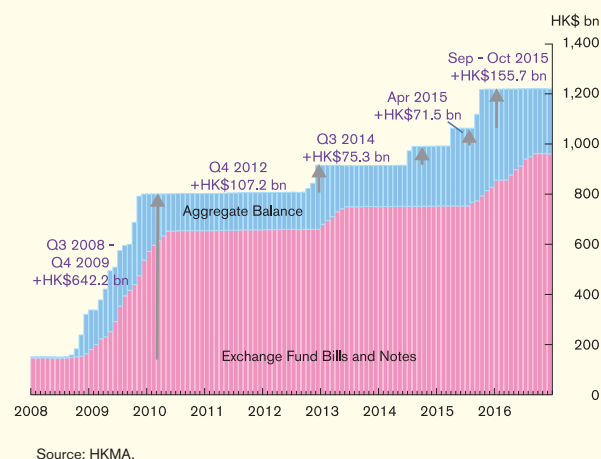
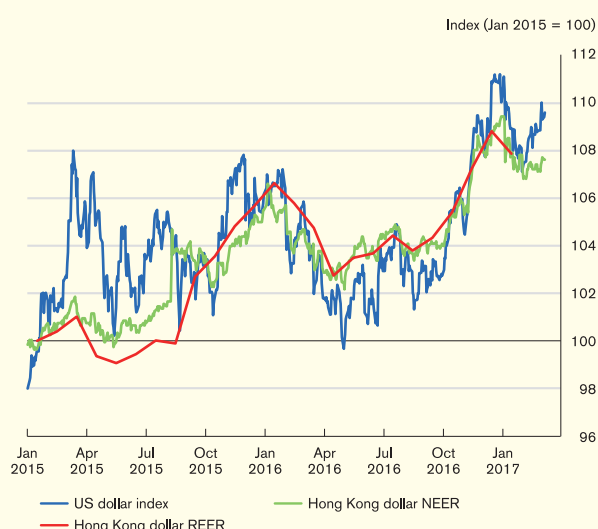


Chart 4.2
Fund flow indicators



Due to the strength of the US dollar, the Hong Kong dollar nominal effective exchange rate index (NEER) increased by 4.9% between August and December before stabilising more recently (Chart 4.3). The Hong Kong dollar real effective exchange rate index (REER) moved closely with the NEER as the narrowing inflation differential between Hong Kong and its trading partners posed only small influences on the movement of the REER.

Chart 4.3
Nominal and real effective exchange rates



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

Portfolio investment saw outflows in the second half of 2016. According to the latest Balance of Payments (BoP) statistics, there were net equity and debt portfolio investment inflows by non-residents in the third quarter amid improved global market sentiment and large Initial Public Offering (IPO) activities (Table 4.A).²³ Nevertheless, such inflows were dwarfed by the sizeable outflows of debt investment by residents, which were partly driven by an increase in US bond holdings by Hong Kong banks. As a result, cross-border portfolio investment registered net outflows in the third quarter. Data based on a

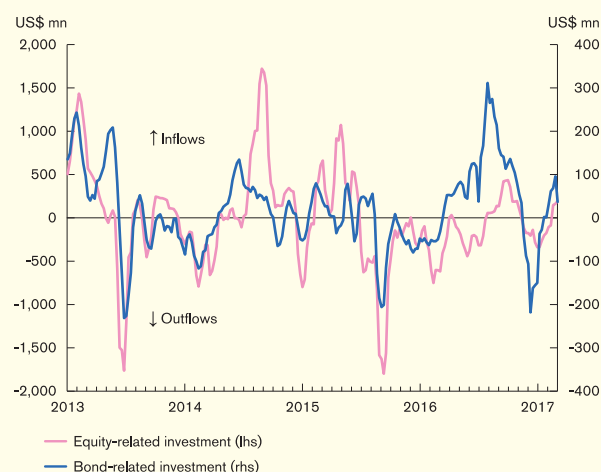
global mutual funds survey points to portfolio outflows in the last quarter of 2016, as the local financial market came under pressure along with other Asian markets amid the surprise outcome of the US presidential election and the expectation of a faster pace of US rate hikes (Chart 4.4). More recent data suggests that there were inflow pressures in the first quarter of 2017 amid a better performance across global financial markets that were boosted by the optimism of an expansionary fiscal policy in the US.

Table 4.A
Cross-border portfolio investment flows

(HK\$ bn)	2014	2015	2016		
			Q1	Q2	Q3
By Hong Kong residents					
Equity and investment fund shares	-318.2	-420.2	22.5	-45.6	-9.4
Debt securities	42.1	-241.0	111.6	-19.9	-262.1
By non-residents					
Equity and investment fund shares	136.7	-329.7	-48.5	41.4	37.2
Debt securities	75.0	20.0	-0.9	5.2	20.6

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.

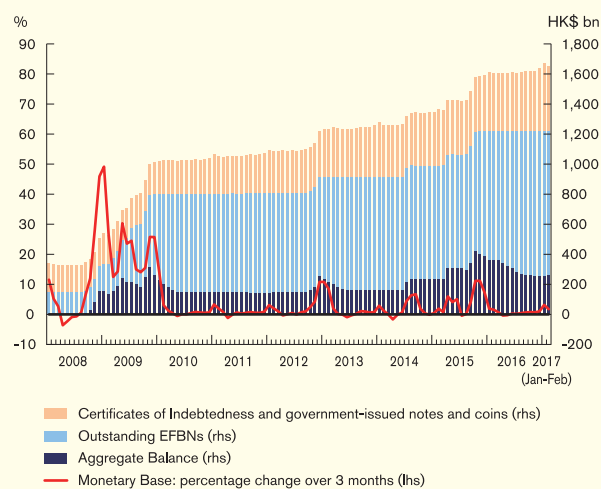
²³ At the time of writing, the fourth-quarter BoP statistics were not available yet.

Looking ahead, Hong Kong dollar fund flows may face more volatility. The possibility of faster pace of US interest rate normalisation could increase the risk of a reversal of the Hong Kong dollar fund flows. At the same time, fund flow volatility could increase amid the uncertainties surrounding the new US administration, the Brexit process and national elections in European Union member countries. Meanwhile, an increase in investment demand for Hong Kong dollar assets from Mainland investors could induce some inflow pressures on the Hong Kong dollar. In particular, while the launch of the Shenzhen-Hong Kong Stock Connect in December saw a larger north-bound trade than south-bound trade at the initial stage, two-way equity portfolio flows between Mainland China and Hong Kong through this programme is expected to increase gradually.

4.2 Money and credit

Despite the rise in US dollar interest rates and financial market volatilities, Hong Kong's monetary environment remained accommodative in the second half of 2016 and in recent months. The Hong Kong dollar Monetary Base remained sizeable, picking up further by 1.7% in the second half due to increases in Certificates of Indebtedness and Government-issued notes and coins in circulation (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 a high level of around HK\$1,222.7 billion. Within the total, the Aggregate Balance contracted and the outstanding EFBNs increased correspondingly as a result of the additional issuance of Exchange Fund Bills (which amounted to HK\$49 billion) to meet banks' strong demand for liquidity management.²⁴

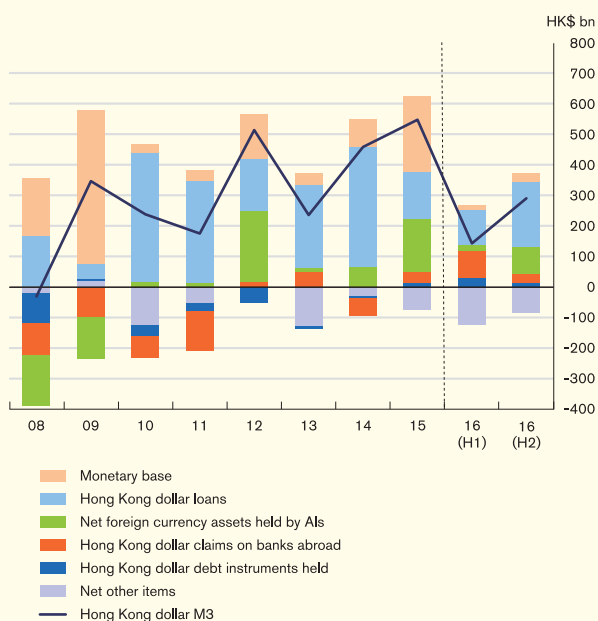
Chart 4.5
Monetary Base components



The Hong Kong dollar monetary aggregate expanded at a faster pace as the domestic economy gathered strength. Growth in the Hong Kong dollar broad money supply (HK\$M3) accelerated from 2.3% in the first half to 6.5% in the second half. As the major component of HK\$M3, Hong Kong dollar deposits witnessed a faster 6.6% expansion in the second half (Chart 4.7), mainly underpinned by increased transaction demand amid strengthened domestic economic activities and a pick-up in IPOs. Analysed by the asset-side counterparts, the expansion of HK\$M3 mainly reflected growth in Hong Kong dollar loans and banks' net foreign currency assets (Chart 4.6), which respectively reflect money creation through credit expansion and net Hong Kong dollar inflows into the non-bank private sector.

²⁴ This is consistent with Currency Board principles, as the additional issuance of Exchange Fund Bills represents a change in the composition of the Monetary Base with a shift from the Aggregate Balance to the outstanding EFBNs. The Monetary Base remains fully backed by foreign exchange reserves.

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

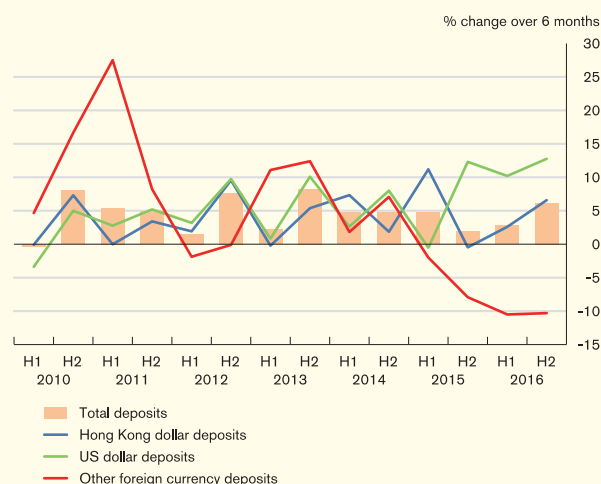


Note: The HK\$M3 in the monetary survey has been adjusted to include foreign currency swap deposits and to exclude government deposits and Exchange Fund deposits with licensed banks.

Source: HKMA staff estimates.

On the other hand, growth in foreign currency deposits continued to show mixed performance. After picking up by 10.2% in the first half, US dollar deposits recorded an even stronger increase of 12.8% in the second half amid the broad strength of the US dollar (Chart 4.7). In contrast, other foreign currency deposits contracted further by 10.3%, mainly led by the decline in renminbi deposits. Overall, total deposits with the AIs expanded faster by 6.2% in the second half of 2016, and 9.1% for the whole year.

Chart 4.7
Deposit growth



Source: HKMA.

Amid the expected US interest rate normalisation, banks' wholesale funding costs increased somewhat during the fourth quarter of 2016. While still relatively low by historical standards, the Hong Kong dollar interbank rates picked up in part underpinned by the year-end funding demand as well as catching up with increases in the US interbank rates. During the second half, the overnight and the three-month Hong Kong Interbank Offered Rate (HIBOR) fixings moved up by 54 and 46 basis points to 0.66% and 1.02% respectively (Chart 4.8). Likewise, the Hong Kong dollar yield curve shifted upwards along with the US dollar yield curve, with the yield of the 10-year Hong Kong Government Bond rising by about 90 basis points to 1.93% at the end of December. Moving into early 2017, Hong Kong dollar interbank rates generally decreased amid a decline in funding demand while the yield of the long-dated Hong Kong Government Bond also edged down alongside the movement in the US counterpart.

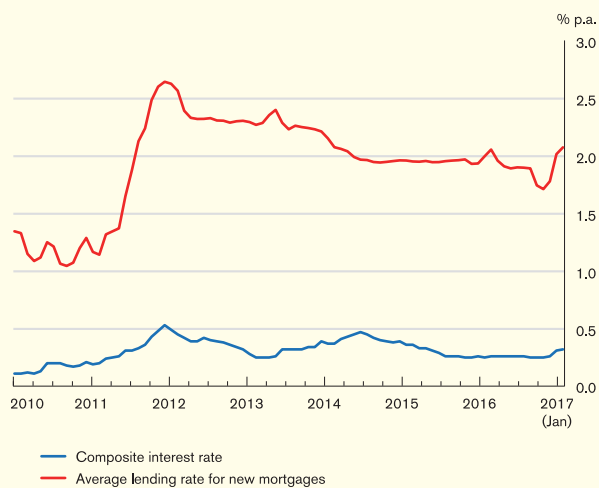
Chart 4.8
Hong Kong dollar interbank interest rates and
yield of the 10-year Government Bond



Source: HKMA.

With a large deposit base in the banking system, increases in retail-level interest rates were relatively small. Banks' average funding costs (as indicated by the composite interest rate) continued to stay low, only edging up by six basis points from seven months ago to 0.32% in January 2017 (Chart 4.9). With relatively stable funding costs and keener competition in the mortgage business, banks' average lending rate for new mortgages declined to a recent low of 1.71% in October 2016, before rebounding to 2.07% in January 2017 along with the rise in HIBORs.

Chart 4.9
The composite interest rate and the average
lending rate for new mortgages

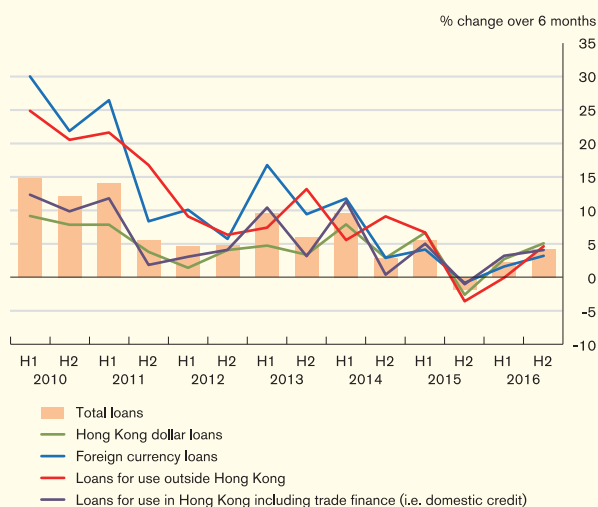


Sources: HKMA and staff estimates.

Looking ahead, the pace of the increase in domestic interest rates will depend on the speed of the US interest rate normalisation process, the size of fund outflows, and global macro-financial development. The upward pressures on domestic interest rates, together with the appreciation of the Hong Kong dollar REER alongside its US dollar counterpart, could make domestic financial conditions less favourable. Box 4 discusses the compilation of the financial conditions indexes for Hong Kong which can be used to monitor domestic financial conditions.

Amid strengthened domestic economic activities and increased cross-border funding demand, total loans picked up further by 4.2% in the second half after increasing by 2.2% in the preceding half-year period (Chart 4.10). With the economic growth momentum holding up, growth in domestic loans quickened slightly from 3.2% in the first half to 4.0% in the second half. Loans for use outside Hong Kong rebounded by 4.6% after recording a slight decline in the first half, partly reflecting a rise in funding demand by multinational corporations towards the end of the year. Analysed by currency, Hong Kong dollar loans expanded strongly by 5.0% during the second half, and foreign currency loans also grew moderately by 3.2% amid the tapering of foreign currency loan repayments by Mainland borrowers. For the whole of 2016, total loans expanded moderately by 6.5% compared with 3.5% in 2015.

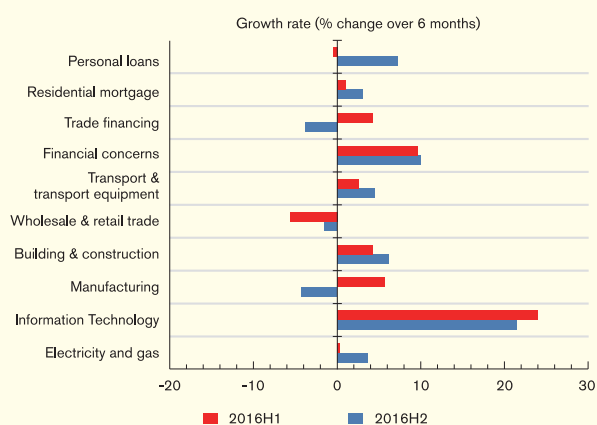
Chart 4.10
Loan growth



Source: HKMA.

Domestic lending by sector showed rather mixed performance in the second half (Chart 4.11). Loans to financial concerns and information technology posted double-digit growth in the second half, to some extent reflecting strong funding needs amid better growth prospects for these sectors. Loans to building, construction and property development also witnessed faster expansion along with increased private construction activities. On the other hand, trade finance and loans to manufacturing, wholesale and retail trade declined despite signs of improvement in merchandise trade and retail sales.

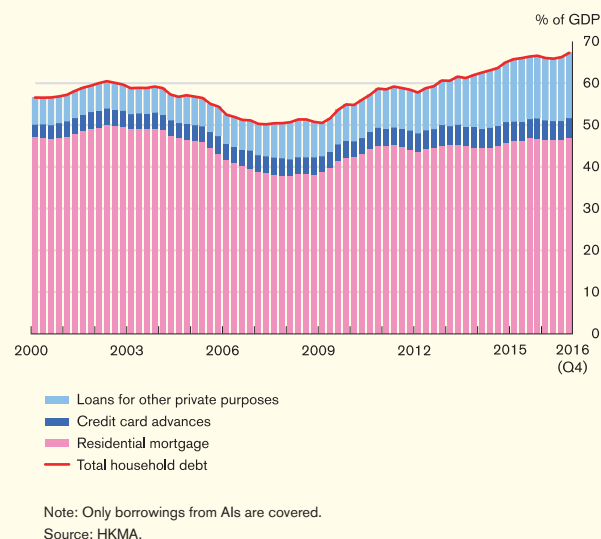
Chart 4.11
Growth in domestic loans by selected sectors



Source: HKMA.

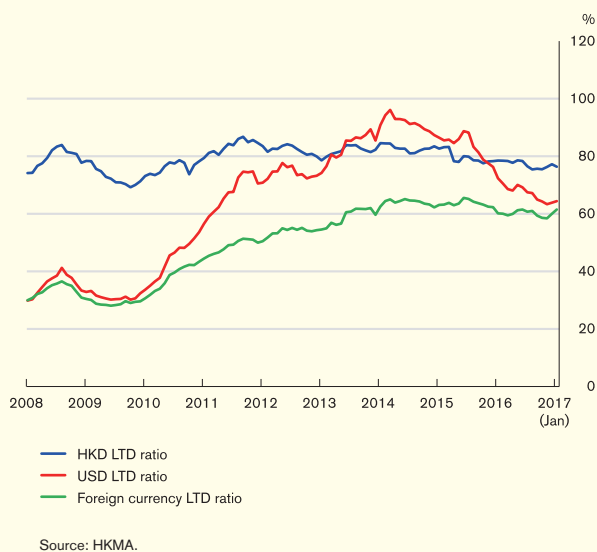
Household debt grew faster by 4.3% in the second half, compared with 0.5% in the first half. Within household debt, personal loans (which comprise credit card advances and loans for other private purposes) bounced up by 7.2% on the back of the improved economic environment (Chart 4.11), and residential mortgage loans grew faster by 3.1% mainly reflecting buoyant housing transactions between July and October. As a result, the household debt-to-GDP ratio picked up to 67.2% in the fourth quarter of 2016 from 65.8% in the second quarter (Chart 4.12).

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



Banks' funding conditions remained largely stable. Reflecting faster increases in deposits relative to loans, the Hong Kong dollar loan-to-deposit (LTD) ratio edged down from 78.2% at the end of June to 77.1% at the end of 2016 (Chart 4.13). Meanwhile, the overall foreign currency LTD ratio declined from 61.4% to 59.9% at the end of the year, with the US dollar LTD ratio dropping significantly to 63.8% due to the strong increase in US dollar deposits.

Chart 4.13
LTD ratios



In the coming period, credit growth is subject to uncertainties stemming from the expectation of interest rate hikes and rapidly changing macro-financial environments. According to the HKMA Opinion Survey on Credit Condition Outlook, credit demand is expected to remain soft in the near term.

Offshore renminbi banking business

The offshore (CNH) and the onshore (CNY) renminbi exchange rate weakened amid the US dollar appreciation (Chart 4.14). The CNH exchange rate mostly traded at a discount against its onshore counterpart in the latter part of 2016, and closed at the year-low of 6.98 against the US dollar at the end of 2016. Tightening liquidity pressure in the CNH interbank market re-emerged in December in part reflecting worsened financial market conditions and banks' precautionary funding demand ahead of the year end (Chart 4.15). With banks hoarding more liquidity buffer amid weak market sentiment, the overnight CNH HIBOR fixing once climbed to 61.3% on 6 January 2017. With the higher CNH funding costs subsequently causing the unwinding of short CNH positions, the CNH exchange rate rebounded in early January 2017 with the CNH-CNY spread turning to a premium. Since mid-January, the CNH and CNY exchange

rate stabilised somewhat and the liquidity conditions gradually improved, with the overnight and the three-month CNH HIBOR fixings dropping to 2.00% and 4.61% respectively at the end of February 2017.

Chart 4.14
Onshore and offshore renminbi exchange rates

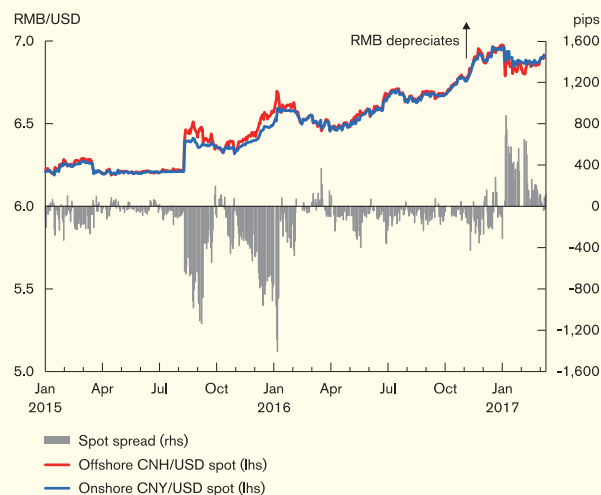
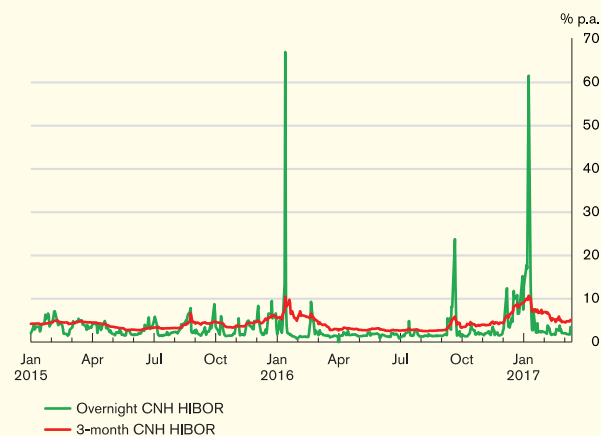


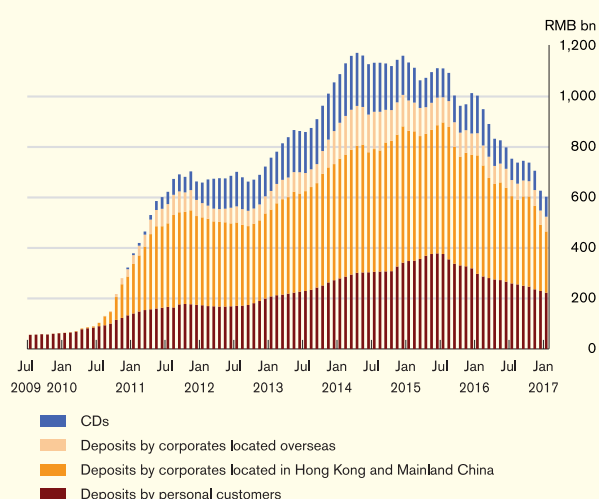
Chart 4.15
The overnight and the three-month CNH HIBOR fixings



Amid uncertainty in the renminbi exchange rate outlook, the total outstanding amount of renminbi customer deposits and certificates of deposit (CDs) fell further by 21.5% from six months earlier to RMB625.1 billion at the end of 2016 (Chart 4.16 and Table 4.B). Among the total, renminbi customer deposits registered a 23.2% decrease, with corporate customer deposits

declining at a faster pace than personal customer deposits. On the other hand, the pace of decline in the outstanding CDs narrowed from 46.8% in the first half to 7.5% in the second half. With tightened interbank liquidity, some retail banks have raised their preferential renminbi deposit rates to attract deposit funding.

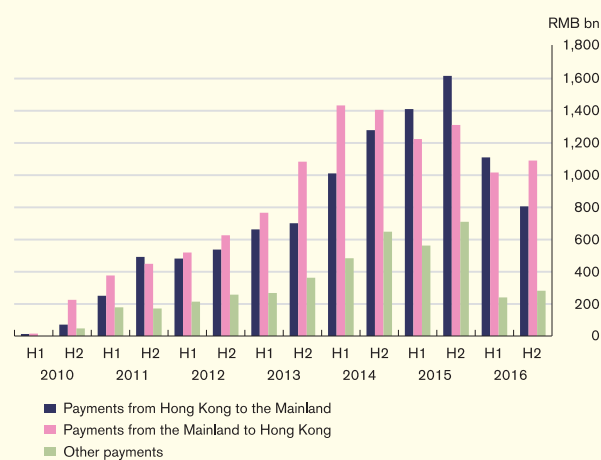
Chart 4.16
Renminbi deposits and CDs in Hong Kong



Source: HKMA.

Despite the contraction of the renminbi liquidity pool, banks' renminbi liquidity management remained robust, and the size of the pool is adequate to support a large amount of renminbi payments and financial transactions. As such, the average daily turnover of the renminbi real time gross settlement (RTGS) system stayed high at RMB863.6 billion in 2016. During the second half, the outstanding amount of renminbi bank loans resumed an expansion of 2.6% after consolidating in the first half. On the other hand, renminbi trade settlement transactions handled by banks in Hong Kong totaled RMB2,176.9 billion in the second half, down 8.0% from the first half. Although outward trade remittances to Mainland China continued to decline, other trade remittance (including inward trade remittance from Mainland China to Hong Kong and remittance among offshore markets passing through Hong Kong) resumed moderate growth (Chart 4.17).

Chart 4.17
Flows of renminbi trade settlement payments



Source: HKMA.

The renminbi liquidity pool in Hong Kong is expected to remain overshadowed by the uncertainty in the renminbi exchange rate movements. Nevertheless, Hong Kong's offshore renminbi business will continue to be supported by the demand for renminbi-denominated assets following the inclusion of the renminbi into the International Monetary Fund's Special Drawing Rights basket. Through increasing the international use of the renminbi in infrastructure investment and financing, the Belt and Road Strategy can also bring new opportunities to Hong Kong.²⁵

Table 4.B
Offshore renminbi banking statistics

	Dec 2015	Dec 2016
Renminbi deposits & certificates of deposit (CDs) (RMB bn)	1,010.4	625.1
Of which:		
Renminbi deposits (RMB bn)	851.1	546.7
Share of renminbi deposits in total deposits (%)	9.3	5.2
Renminbi certificates of deposit (CDs) (RMB bn)	159.3	78.3
Renminbi outstanding loans (RMB bn)	297.4	294.8
Number of participating banks in Hong Kong's renminbi clearing platform	217	210
Amount due to overseas banks (RMB bn)	105.7	69.0
Amount due from overseas banks (RMB bn)	132.1	91.6
	2015	2016
Renminbi trade settlement in Hong Kong (RMB bn)	6,833.1	4,542.1
Of which:		
Inward remittances to Hong Kong (RMB bn)	2,535.1	2,106.1
Outward remittances to Mainland China (RMB bn)	3,026.3	1,915.2
Turnover in Hong Kong's RMB RTGS system (Daily average during the period; RMB bn)	947.0	863.6

Source: HKMA.

²⁵ The HKMA has established the Infrastructure Financing Facilitation Office to facilitate infrastructure investments and their financing by working with a cluster of key stakeholders.

Box 4

Financial conditions indexes for Hong Kong

Hong Kong's financial conditions could tighten in view of challenges from the external environment over multiple fronts. Hong Kong dollar interest rates may rise again given the expected US rate hikes this year. Further strengthening of the US dollar may also buoy the Hong Kong dollar real effective exchange rate alongside, while market sentiment could deteriorate in response to adverse economic or geopolitical events. This box introduces the financial conditions indexes (FCIs) for Hong Kong to help provide an overall assessment of domestic financial conditions.

Compilation of the financial conditions indexes

To construct FCIs, most studies use the weighted-sum (WS) approach and/or the principal component (PC) approach.²⁶ The former approach weighs the financial variables by its estimated impact on real activity in a vector autoregressive (VAR) model. This approach could take into account the interactions among variables, but there are limitations on the number of component variables. The latter approach weighs through finding the PC of a large, selected set of financial variables. The set of variables could be unlimited, but the method does not account for the interactions among the input variables. We use both techniques to cross check the robustness of the estimated FCIs.

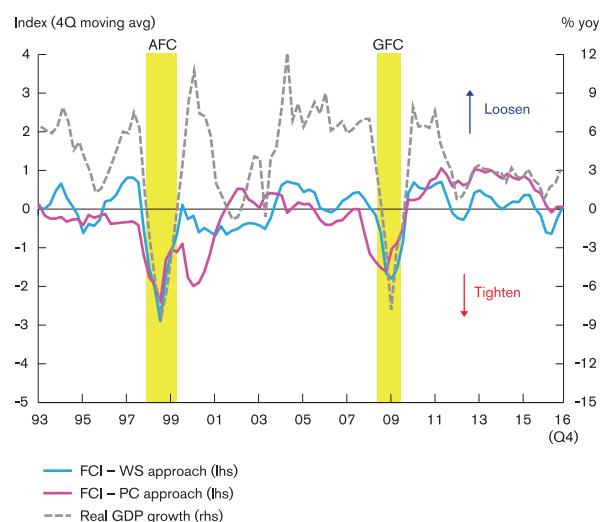
Under the WS approach, the component financial variables include the 3-month Hong Kong Interbank Offered Rate (HIBOR), residential property prices, the Hang Seng Index (HSI), the volatility of the HSI, Hong Kong Dollar real effective exchange rate, Hong Kong Dollar domestic loans, and the spread of the 3-month HIBOR over the yield of the 3-month Exchange

Fund Bill. On the PC approach, in light of its ability in extracting information from a large set of variables, we expand the list of the component financial variables to also include indicators such as term spreads and credit spreads, which are predictive of future economic activity and can measure counterparty and credit risks.²⁷

Broad features of the financial conditions indexes

Chart B4.1 shows the constructed FCIs under the two approaches, with a higher value of the FCI representing a loosening of financial conditions, and vice versa. To facilitate comparison, the FCIs are normalised with its standard deviation being equal to one. Hong Kong's real GDP growth is also shown in the chart for reference.

Chart B4.1
FCIs and real GDP growth



Sources: C&SD and HKMA staff estimates.

²⁶ See IMF (2015), Regional Economic Outlook: Asia and Pacific, April 2015 and Osorio et al. (2011), "A Quantitative Assessment of Financial Conditions in Asia", IMF Working Paper 11/170, 2011.

²⁷ For more details on the variables selection and the methodology, see Chan et al. (2016), "Financial Conditions Indexes for Hong Kong", HKMA Research Memorandum 09/2016.

Despite some occasional divergences, the FCIs constructed under the two different methodologies broadly share similar patterns. In particular, both indexes indicate a material tightening of financial conditions during the Asian Financial Crisis and the Global Financial Crisis, with the magnitude of the tightening being broadly similar. Both FCIs also show that financial conditions loosened after the implementation of quantitative easing in the US, before tightening momentarily in late 2011 amid a deepening of the European sovereign debt crisis.

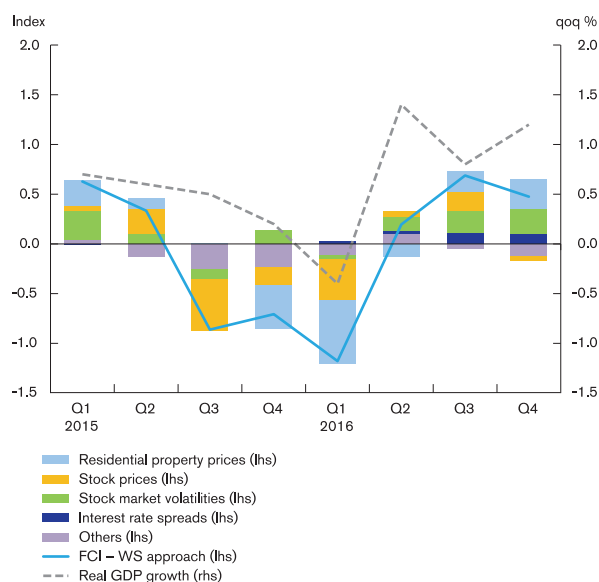
Decomposition analysis shows that the sharp plunges in the FCIs during crisis periods were mainly driven by movements in asset prices and volatilities, reflecting the ability of the asset markets to signal sharp changes in future economic activity. During tranquil periods, property prices contributed strongly to the dynamics of the FCIs, reflecting the strong influence of the property market on the real economy.²⁸ Interest rate spreads could also be important drivers of financial conditions during both crisis and tranquil periods.

In assessing their forecasting power for real GDP growth against standard statistical models, we find that the FCIs have stronger forecasting power up to two quarters ahead.²⁹ Hence, they could aid our macro-financial surveillance of the Hong Kong economy by providing a quick assessment of the impact of major financial disturbances on the real economy.

Recent developments in the financial conditions indexes and their implications for the economic outlook

Amid concerns over US rate hikes and the change to the renminbi fixing mechanism, financial conditions tightened in the third quarter of 2015 along with gyrations in domestic asset markets (Charts B4.2 and B4.3). Financial conditions began to improve in the second quarter of 2016 amid stabilisation of global financial markets. In particular, following the UK's referendum on Brexit, stock market volatilities were generally subdued in the third quarter as market sentiment improved, while asset prices were supported by the expectation of still-abundant global liquidity. Despite rises in Hong Kong dollar interbank rates, financial conditions remained steady in the last quarter of 2016, mainly due to subdued stock market volatilities and the pick-up in property prices.

Chart B4.2
Contribution to changes in FCI – WS approach

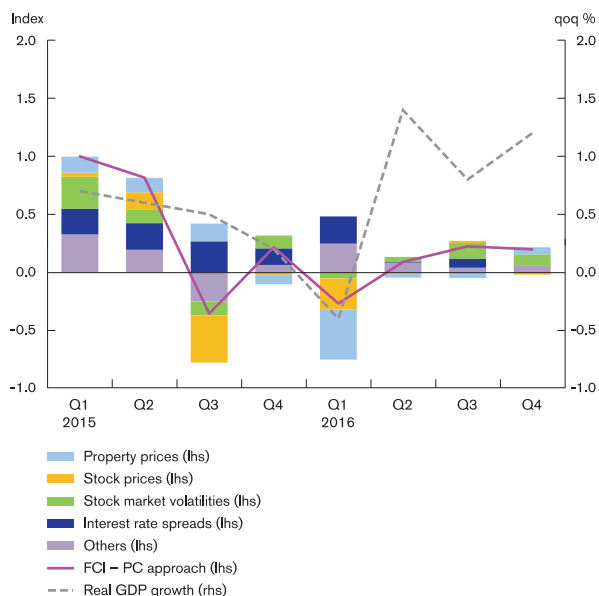


Source: HKMA staff estimates.

²⁸ See Cheung et al. (2016), "Inflation Mechanism and Monetary Policy Perspectives from Hong Kong", *BIS Papers No 89*.

²⁹ For more details about the forecasting power assessment, see Chan et al. (2016), "Financial Conditions Indexes for Hong Kong", *HKMA Research Memorandum 09/2016*.

Chart B4.3
Contribution to changes in FCI – PC approach



While the reading of the FCIs for the first quarter of 2017 is not yet available, high-frequency releases suggest that Hong Kong's financial conditions may remain stable during the quarter. On one hand, Hong Kong's housing prices have been growing at a moderated pace after the introduction of the new stamp duty measures, and that equity prices and volatilities have become more favourable. On the other hand there could be upward pressures on domestic interest rates due to the US rate hike in March (Charts B4.4 and B4.5).

Chart B4.4
Property prices, HSI and its realised volatility

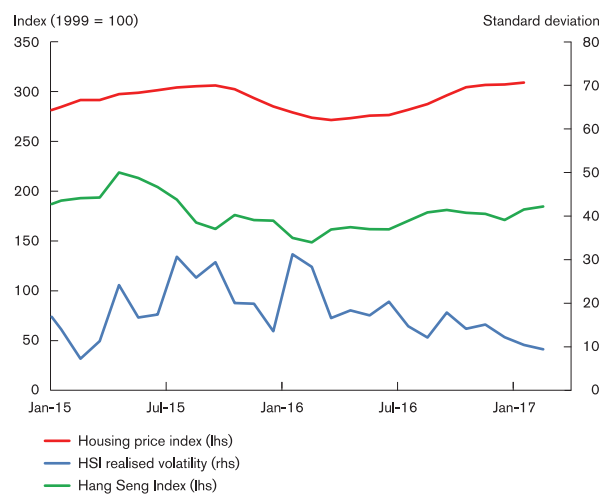
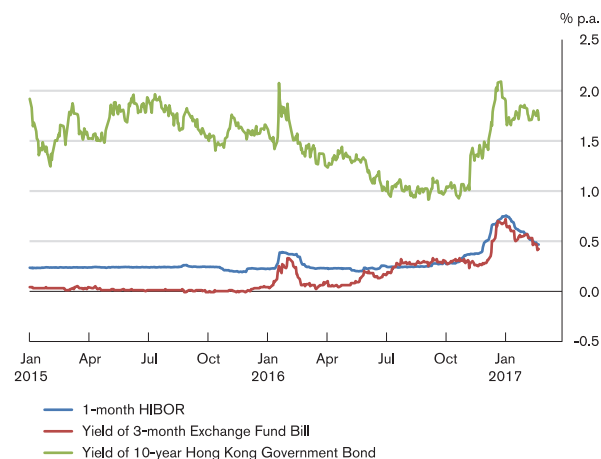


Chart B4.5
Hong Kong dollar interest rates and yields



Conclusion

Hong Kong's financial conditions are not expected to be a drag on real GDP growth in the first half of 2017, given there were no signs of a notable tightening in recent quarters. However, with the prospect of further US rate hikes and potential asset market volatilities, close monitoring is warranted.

Asset markets

Hong Kong equity prices rose sharply towards the end of the review period with more positive signs from the US economy and improved market sentiment globally. However, optimism in the local market was more guarded possibly due to increased expectations of faster rate hikes and a challenging outlook for the Mainland economy. The Hong Kong dollar debt market maintained steady growth, while the offshore renminbi debt market continued to contract in 2016. The residential property market showed signs of consolidation immediately after the introduction of the new stamp duty measure before picking up more recently.

4.3 Equity market

Riding on the back of a global equity rally, the local stock market ended sharply higher towards the end of the period under review. While the US presidential election result caught most investors off guard, confidence was quickly restored amid hopes of a fiscal stimulus under the Trump administration. The US Federal Reserve's (Fed) upward revision of economic projections reinforced a more positive outlook for 2017, adding impetus to the US and other major markets towards the end of the review period. Although the Hong Kong market underperformed most of the major markets, it rose with the tide, once breaking the upper bound of the recent trading range. The fact that optimism was more guarded in the local market may be due to concerns of a faster pace of rate hikes in the US and an increasingly challenging economic outlook for Mainland China. Policy uncertainties surrounding the renminbi and capital flow restrictions also reduced investor appetite for Mainland enterprises, which accounted for 63% of the local market capitalisation at the end of 2016.³⁰ The Shenzhen-Hong Kong Stock Connect launched in early December, a crucial milestone for the

long-term development of the market, also failed to boost market sentiment. Overall, the Hang Seng Index (HSI) and the Hang Seng China Enterprises Index (HSCEI), also known as the H-share index, increased by 3.3% and 7.9% respectively from September 2016 to February 2017, with the option implied volatility of the HSI (VHSI) staying at relatively low levels (Charts 4.18 & 4.19).

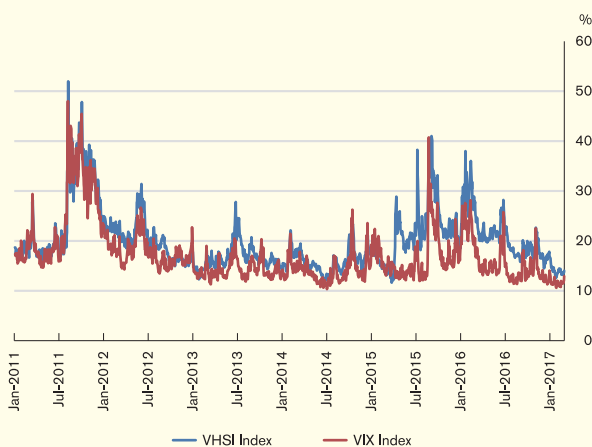
Chart 4.18
Equity prices in Hong Kong



Source: Bloomberg.

³⁰ Mainland enterprises refer to H-share companies, red chip companies and Mainland private enterprises.

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



The Hang Seng China AH Premium Index, which measures the price discrepancy between stocks listed in the Mainland and Hong Kong markets, remained tangible during the review period. The notable gap of equity valuation between the two markets could potentially be attributable to disparities in the equity valuation between Mainland and Hong Kong investors. And this could be related more to the latest uncertainties over the Mainland economy (Chart 4.20).³¹

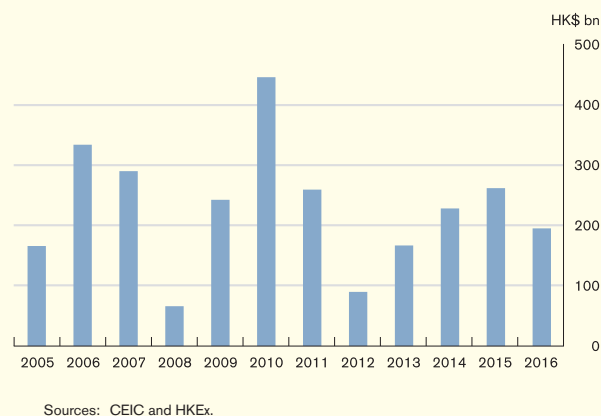
Chart 4.20
Hang Seng China AH Premium Index



³¹ See Chung, Hui and Li (2013) "Explaining share price disparity with parameter uncertainty: Evidence from Chinese A- and H-shares", *Journal of Banking and Finance*, 37 (2013) pp1073–1083.

In 2016, the Hong Kong Stock Exchange outperformed its major rivals and remained the world's largest listing market for the second consecutive year. Amid heightened economic and political uncertainties, global IPO markets saw a significant fall in activities during the year, with total proceeds decreasing by 31% to US\$131.1 billion.³² However, funds raised through IPOs in Hong Kong, while also registering a decline to HK\$194.8 billion, were only 26% lower than in the previous year (Chart 4.21).

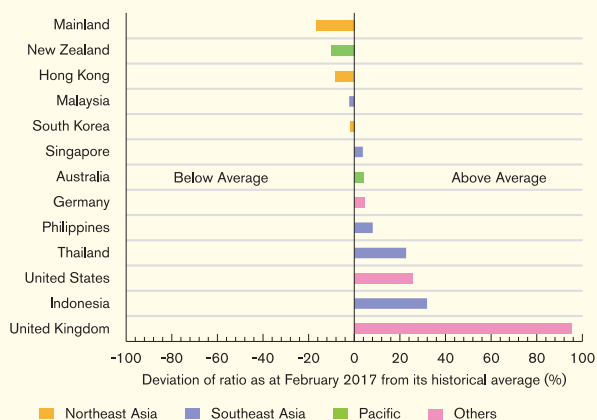
Chart 4.21
The IPO market in Hong Kong



The local equity market is expected to be highly susceptible to external market conditions in the period ahead. While its valuations remain attractive, the outlook is clouded by uncertainties over the Mainland economy as well as risks of heightening tensions between Mainland China and the US (Chart 4.22). Despite the recent positive signs of a recovery in the global economy, a tightening of monetary conditions as a result of an increased pace of interest rate normalisation could lead to a higher refinancing risk for the corporate sector, bringing more uncertainties to the market.

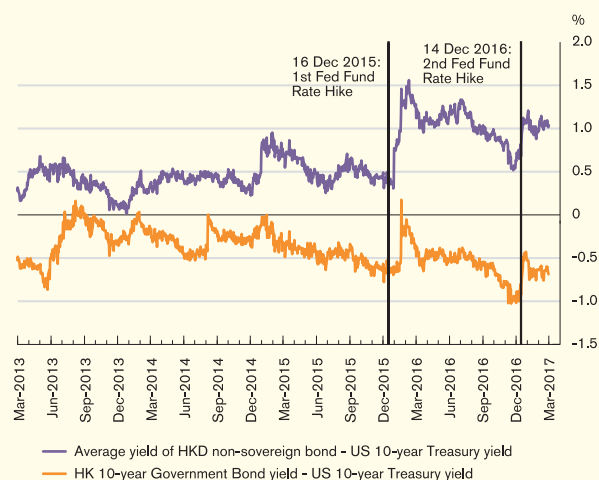
³² Thomson Reuters (2016) "Global Equity Capital Markets Review".

Chart 4.22
Price-earnings ratios of Asia Pacific (excluding Japan) and other major markets



Sources: Bloomberg and HKMA staff estimates.

Chart 4.23
HK dollar yield spreads with the US 10-year Treasury yield



Sources: HKMA, Bank of America Merrill Lynch and Bloomberg.

4.4 Debt market

The Hong Kong dollar debt market expanded steadily over the course of 2016, until yields increased sharply towards the end of the year, as the Fed increased interest rates for the second time in the current cycle. In the wake of an improved growth outlook and heightened inflation risk, markets generally expect that the pace of monetary normalisation will pick up in the US. Against this backdrop, selling pressure emerged in bond markets globally and Hong Kong was no exception. Indeed, the rise in domestic bond yields was much steeper, with the spreads of sovereign and non-sovereign debts over US Treasuries both shooting up at the turn of the year. This was reminiscent of the surge in yield spreads in early 2016 that were also similarly triggered by heightened expectations of US rate hikes (Chart 4.23).

However, apart from the year-end yield rebound, market development was smooth and steady in 2016. Total debt issuance increased by 22.4% to HK\$3,052.6 billion, with overseas borrowers including multilateral development banks (MDBs) issuing HK\$47.4 billion or 80.5% more than the year before (Chart 4.24). As a result of the growth in new issuance, the total amount of Hong Kong dollar debt outstanding rose by 14.1% to HK\$1,730.6 billion at the end of 2016 (Chart 4.25). The Exchange Fund remains the largest contributor to the growth, with outstanding debt rising by 16.3% to HK\$963.1 billion, followed by AIs and overseas borrowers including MDBs whose outstanding debt increased by 13.7% and 15.2% to HK\$273.1 billion and HK\$188.1 billion respectively.

Chart 4.24
New issuance of non-Exchange Fund Bills and Notes Hong Kong dollar debt

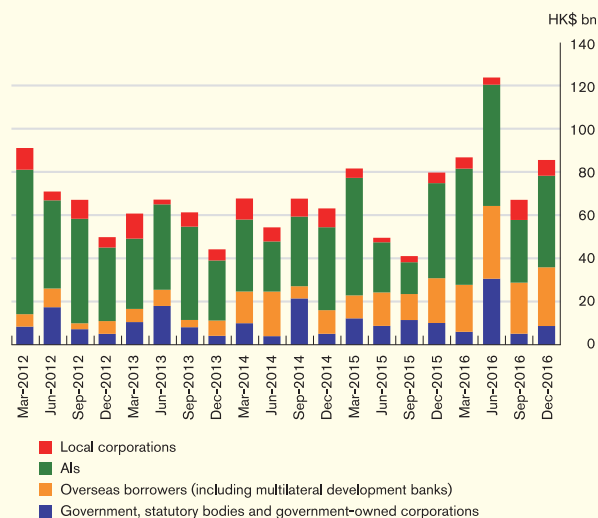
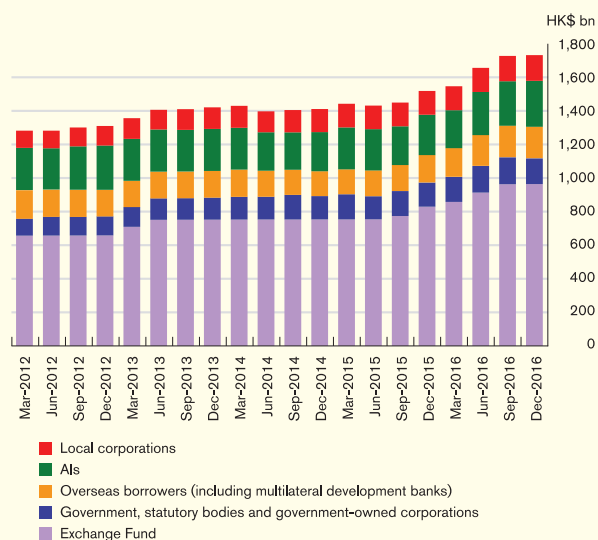


Chart 4.25
Outstanding Hong Kong dollar debt



The development of the offshore renminbi debt market in Hong Kong recovered in the second half of 2016 after the contraction in the first half, mainly driven by an increase in issuance by overseas issuers. Throughout 2016, offshore renminbi debt issuance amounted to RMB275.7 billion, declining by 21.4% year on year (Chart 4.26). In particular, private Mainland issuers saw their issuance of non-CD debt securities decrease by 56.6% to RMB9.0 billion in

2016, partly attributable to the relatively lower funding cost onshore (Chart 4.27). New non-CD debts of Hong Kong and overseas issuers also fell by 24.1% and 4.7% to RMB23.1 billion and RMB97.5 billion respectively.

Chart 4.26
New issuance of offshore renminbi debt securities

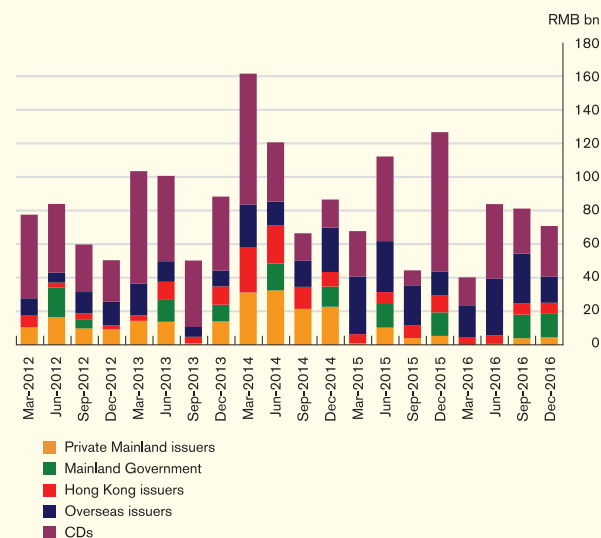
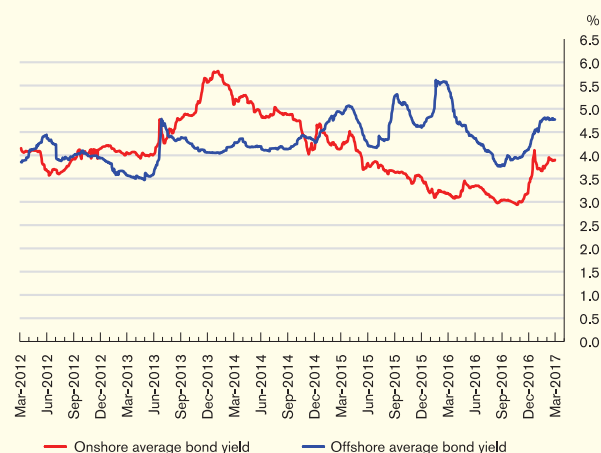
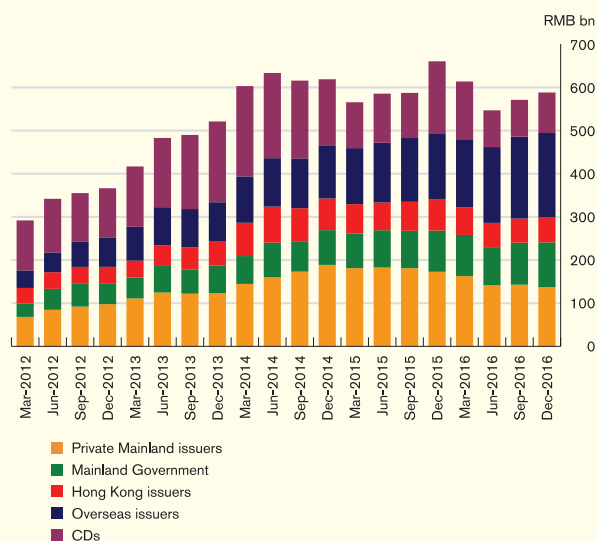


Chart 4.27
Average yields of onshore vs. offshore renminbi bond indices



With the decline in debt issuance, the outstanding amount of offshore renminbi debt securities in Hong Kong contracted by 11.0% year on year to RMB587.4 billion at the end of 2016, whereas the non-CD outstanding debt edged up by 0.1% to RMB493.7 billion (Chart 4.28). Overseas issuers saw their outstanding non-CD renminbi debts in Hong Kong continue the upward trend, growing by 28.3% from the end of 2015 to RMB195.5 billion. This, together with the 8.4% or RMB8.0 billion increase by the Mainland Government, more than offset the decrease in non-CD debt outstanding by private Mainland and Hong Kong issuers, which shrank by 20.5% and 21.1% to RMB137.3 billion and RMB57.4 billion respectively.

Chart 4.28
Outstanding amount of offshore renminbi debt securities



Sources: Newswires and HKMA staff estimates.

With increasing expectations of a faster pace of US rate hikes, emerging market assets, including the Hong Kong dollar and offshore renminbi debts may come under more pressure if the earlier global search-for-yield phenomenon is reversed. The renminbi exchange rate is also likely to remain volatile amid the uncertainties surrounding US trade policies under the Trump administration. Against this backdrop, there

may be more bumpy rides ahead for both the Hong Kong dollar and offshore renminbi debt markets.

4.5 Property markets

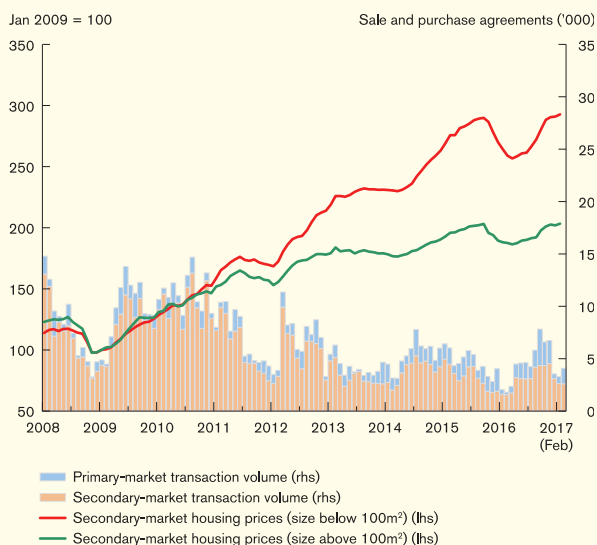
Residential property market

The residential property market showed renewed signs of exuberance in the second half of 2016, prompting the Government to introduce new stamp duty measure³³ in November. Average monthly housing transactions increased markedly from 3,320 units in the first half of the year to 6,123 units during July – October (Chart 4.29). This partly reflected improved market sentiment, declines in mortgage rates, and more new property launches in the primary market along with various promotional schemes to attract buyers. Housing prices in the secondary market also rose strongly, with prices of small and medium-sized flats (with a saleable area of less than 100m²) seeing a quicker pace of increase than large flats (with a saleable area of at least 100m²). In response to the renewed market buoyancy, the Government announced a new stamp duty measure on 4 November.

Immediately following its introduction, the housing market showed some signs of consolidation. Average monthly secondary market transactions decreased by around 30%, from 4,410 units during September – November to about 2,800 units in the subsequent two months, due in part to the cautious attitude of both buyers and sellers. Primary market transactions also declined visibly in December. Nevertheless, total market transactions picked up more recently partly reflecting the increase in new launches by property developers. Meanwhile, housing prices continued to increase to a new high after the new measure, but at a more moderate pace.

³³ More specifically, the Government raised stamp duty to a flat rate of 15%, effective from 5 November, for all residential property transactions (except for purchase by Hong Kong permanent resident first home buyers).

Chart 4.29
Residential property prices and transaction volume



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

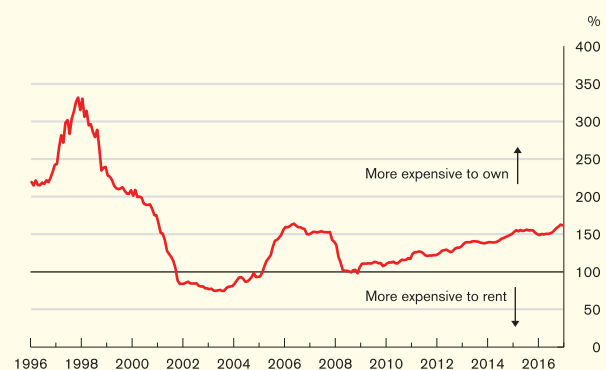
Housing affordability remained stretched, with the housing price-to-income ratio rising to 15.9 in the fourth quarter, higher than the 1997 peak of 14.6. The income-gearing ratio also climbed to 72.0%, much higher than the long-term average of about 50% (Chart 4.30).³⁴ While remaining at low levels, mortgage rates edged up towards the end of 2016 owing to the increase in Hong Kong dollar interbank interest rates. As housing prices trended up, but the residential rental yields stayed low at 2 – 3% in the second half of 2016, the buy-rent gap as a measure of relative user costs widened to a recent high of 161.6% (Chart 4.31).³⁵

Chart 4.30
Indicators of housing affordability



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

Chart 4.31
Buy-rent gap



Note: This indicator is calculated as the ratio of the cost of purchasing and maintaining a 50m² flat with that of renting it.

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

The countercyclical macro-prudential measures introduced by the HKMA since 2009 helped contain household leverage and safeguard banks' resilience. The average LTV ratio for new mortgages declined to 50.1% in January 2017 from 64% before the measures were first introduced, and the DSR also decreased by about 8 percentage points to 33.0%.

The outlook for the residential property market remains highly uncertain. In the near term, the still-low mortgage interest rates, stable job and income conditions and the release of pent-up demand amid increasing incentives offered by property developers such as discounts and cash

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

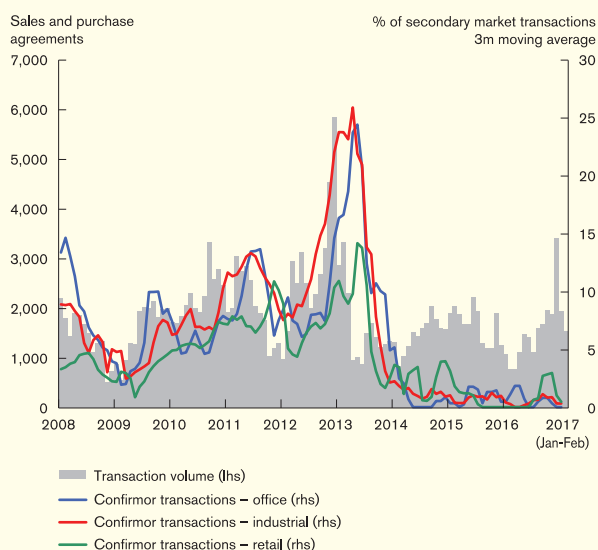
³⁵ The buy-rent gap estimates the cost of owner-occupied housing (under a 20-year mortgage scheme with a 70% LTV ratio) relative to rentals.

rebates could render support to housing demand. On the other hand, the new stamp duty measure, possible pick-up in the pace of US rate hikes and the steady catch-up in housing supply may continue to pose headwinds to the housing market. Nonetheless, with the macro-prudential measures and other supervisory measures in place, Hong Kong's banking sector has improved its resilience and is well prepared to cope with the potential risks associated with the property market.

Non-residential property market

Reflecting improved market sentiment, activities in the non-residential property market have shown signs of picking up since mid-2016. After falling to a recent low of 1,108 units in the first half of 2016, the average monthly transaction volume increased to 1,890 units in the subsequent eight months, with a sharp spike in December mainly due to the strong sales in parking spaces (Chart 4.32). That said, speculative activities, as indicated by confirmor transactions, remained inert.

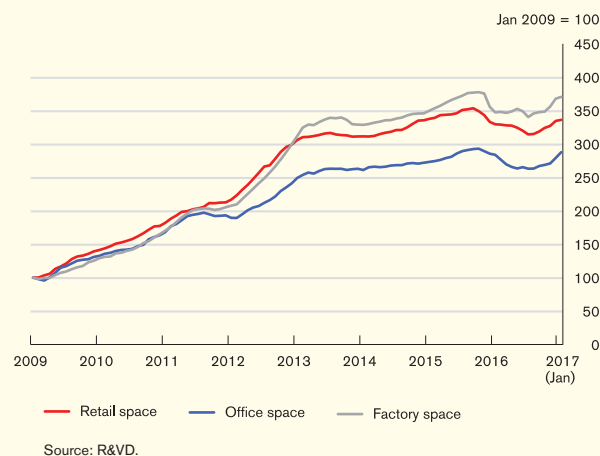
Chart 4.32
Transactions in non-residential properties



Sources: Land Registry and Centaline Property Agency Limited.

Alongside more transactions, prices of office space, retail premises and flatted factories increased by 8.4%, 5.0% and 6.1% respectively in the seven months to January 2017, following some consolidation in the preceding half year period (Chart 4.33). Rentals of office space and flatted factories also recorded modest increases from mid-2016, while rentals of retail space consolidated further. The overall rental yields across segments remained steadily low at around 2.5 – 3.4%.

Chart 4.33
Non-residential property price indices



Source: R&VD.

The non-residential property market faces uncertainties from the global macro-financial environment, domestic economic growth prospects and the pace of interest rate rises. Meanwhile, the performance of individual market segments is expected to be mixed. For example, rising office supply, especially in areas outside Central, will further restrain upside in the office segment. The normalisation of retail sales from the extraordinary growth in earlier years will continue to drag on prime-location retail rentals. In contrast, investment interests in parking spaces and industrial properties may remain strong following the new stamp duty measure on the residential property market.

5. Banking sector performance

The profitability of retail banks improved in the second half of 2016 as compared to the same period of 2015 due to higher net interest income and non-interest income, coupled with lower loan impairment charges. Banks maintained their strong capital positions and sound asset quality. Despite significant rises in Hong Kong dollar interbank rates following the US interest rate hike in December, liquidity conditions remained favourable. Underpinned by a large retail deposit base, retail banks' funding costs stayed low and stable. However, banks should assess the implications of possible faster-than-expected US rate hikes, particularly the risk of significant capital outflows and subsequent impacts on local interest rates. A sharp increase in interest rates could also translate into a significant deterioration in banks' asset quality given the rising levels of leverage among non-local corporates. To strengthen banks' resilience against systemic risks, the countercyclical capital buffer ratio for Hong Kong will rise to 1.875% with effect from 1 January 2018.

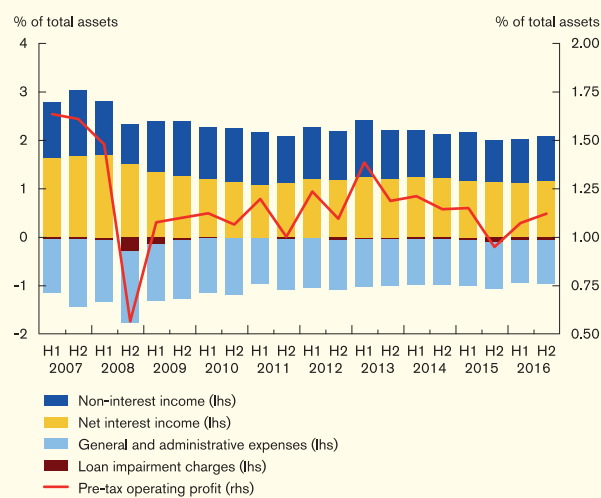
5.1 Profitability and capitalisation

Profitability

The profitability of retail banks³⁶ improved with the return on assets³⁷ increasing to 1.12% in the second half of 2016, compared to 0.95% in the second half of 2015 (the red line in Chart 5.1). The improvement was due to an increase in both net interest income and non-interest income as well as a reduction in loan impairment charges.

For 2016 as a whole, the aggregate pre-tax operating profits of retail banks recorded an increase of 8.7% with the return on assets rising to 1.10% from 1.05% in 2015.

Chart 5.1
Profitability of retail banks



Notes:

1. Semi-annually annualised figures.
2. Starting from this issue, non-operating components are excluded from non-interest income. Therefore, figures for non-interest income in Chart 5.1 are not strictly comparable with those in previous issues.

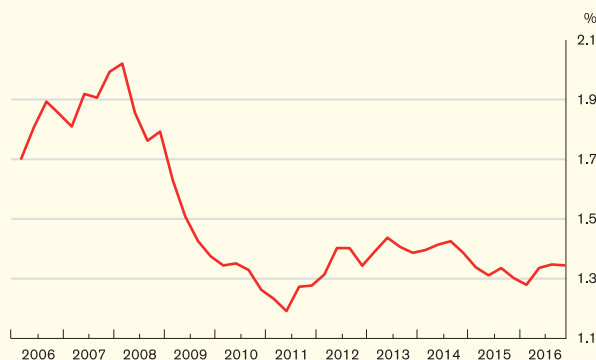
Source: HKMA.

³⁶ Throughout this chapter, figures for the banking sector relate to Hong Kong offices only unless otherwise stated.

³⁷ Return on assets is calculated based on aggregate pre-tax operating profits.

The net interest margin (NIM) of retail banks continued to improve and reached 1.34% in the fourth quarter of 2016 (Chart 5.2).

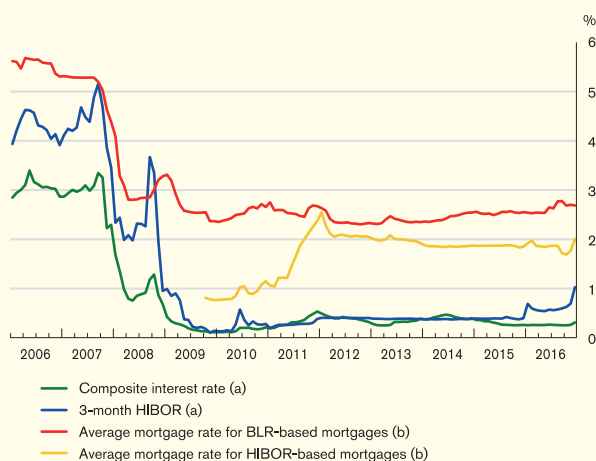
Chart 5.2
NIM of retail banks



Note: Quarterly annualised figures.
Source: HKMA.

Wholesale funding costs in Hong Kong increased significantly after the resumption of US interest rate hikes in December. In particular, the three-month HIBOR increased markedly by 33 basis points in December, although the current level remained low by historical standards (the blue line in Chart 5.3).

Chart 5.3
Interest rates

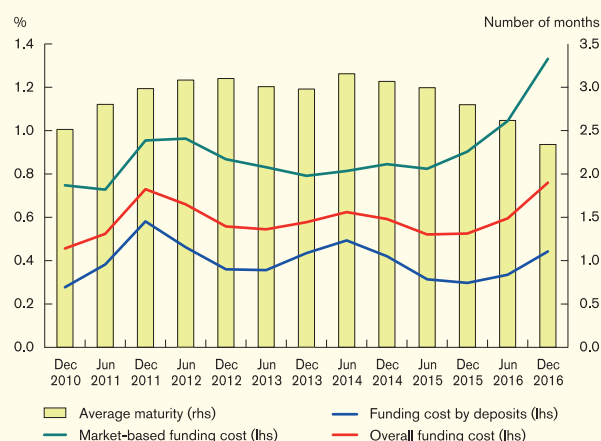


Notes:
(a) End of period figures.
(b) Period-average figures for newly approved loans.
Sources: HKMA and staff estimates.

However, the overall impact of US interest rate hikes on the Hong Kong dollar funding cost of retail banks remained small. This is due to the fact that retail deposits are their major funding source, and that retail deposit rates have remained low and stable despite the rate rises. Reflecting this, the composite interest rate, a measure of the average cost of Hong Kong dollar funds for retail banks, only saw a mild increase of 5 basis points in December to 0.31% after staying low at around 0.26% for more than a year.

More broadly, the aggregate Hong Kong and US dollar funding cost of licensed banks in Hong Kong showed a similar picture. The banks' average market-based Hong Kong and US dollar funding cost³⁸ increased by 28 basis points during the second half of 2016, but in the retail market, their average deposit funding cost saw a smaller increase of 11 basis points. On the whole, their average overall Hong Kong and US dollar funding cost increased by 17 basis points (the red line in Chart 5.4).

Chart 5.4
Hong Kong and US dollar funding cost and maturity of licensed banks



Source: HKMA.

³⁸ Market-based funding cost is measured by the interest costs of banks' non-deposit interest-bearing liabilities.

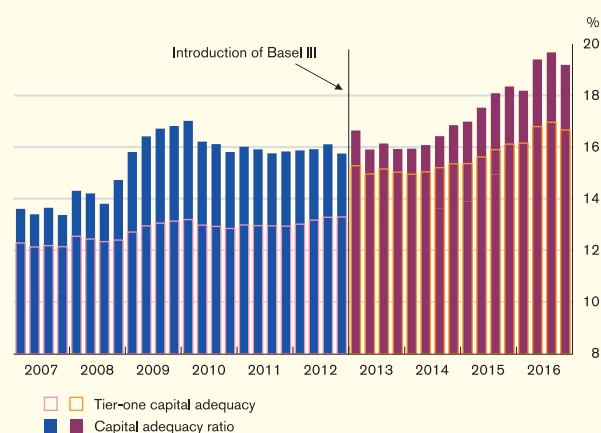
With HIBORs seeing a larger and faster increase than the funding cost of banks in Hong Kong, this may represent a positive development for some retail banks, as their HIBOR-based mortgage lending, which has been promoted actively in the past few years, may help widen their overall NIMs.³⁹

However, the improvement in NIMs may be partially offset by keen competition in the mortgage market. Indeed, there are signs that some banks reduced their mortgage rate spreads and/or provided more attractive mortgage terms in order to attract customers. In the longer term, given that further US interest rate rises are in the pipeline, banks may soon face upward pressure on retail deposit rates, which will affect their funding costs and thus NIMs more significantly.

Capitalisation

Capitalisation of the banking sector continued to be strong and well above the minimum international standards. The consolidated capital adequacy ratio (CAR) of locally incorporated AIs stayed high at 19.2% at the end of December (Chart 5.5). The tier-one CAR⁴⁰ was 16.4%, of which 15.4% was contributed by common equity tier-one (CET1) capital.⁴¹

Chart 5.5
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.

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)⁴² requirement, remained favourable during the review period. The average LCR of category 1 institutions edged down to 156.3% in the fourth quarter of 2016 from 158.0% in the second quarter but remained at a high level (Chart 5.6). The average Liquidity Maintenance Ratio (LMR) of category 2 institutions also remained steady at 51.0%. Both ratios remained well above their respective regulatory minimums⁴³, suggesting that the Hong Kong banking sector is able to withstand liquidity shocks arising from possible capital outflows from Hong Kong.

³⁹ For instance, the effective average HIBOR-based mortgage rate increased by 24 basis points in December 2016 along with the rise in HIBORs (the yellow line in Chart 5.3), while the composite interest rate (i.e. Hong Kong dollar funding cost) increased by only 5 basis points.

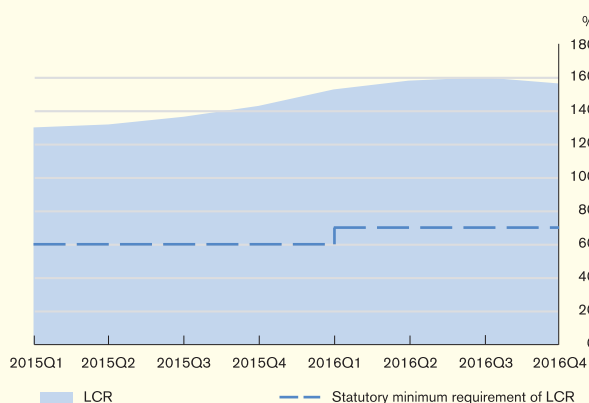
⁴⁰ The ratio of tier-one capital to total risk-weighted assets.

⁴¹ CET1 capital comprises the core capital of an AI including ordinary shares and retained earnings. For details of the definition, see the circular "Basel III Implementation – Standard Templates for Disclosures in Relation to Regulatory Capital" published on the HKMA website on 19 August 2013.

⁴² 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, which is a modified form of the original statutory liquidity ratio requirement.

⁴³ For a category 1 institution, the minimum requirement for LCR began at 60% on 1 January 2015, rising in equal annual steps of 10 percentage points to reach 100% on 1 January 2019. A category 2 institution must maintain an LMR of not less than 25% on average in each calendar month.

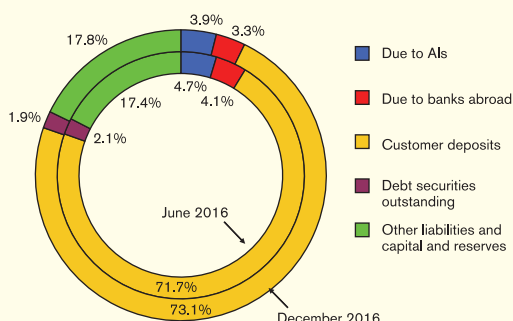
Chart 5.6
LCR



Source: HKMA.

Customer deposits continued to be the primary funding source for retail banks. The share of customer deposits to banks' total liabilities increased to 73.1% at the end of December 2016 from 71.7% at the end of June (Chart 5.7).

Chart 5.7
The liability structure of retail banks



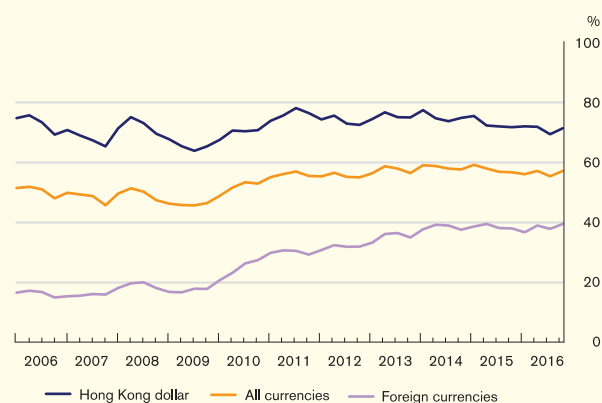
Notes:

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

Source: HKMA.

As the total loans and advances and the total deposits of retail banks grew at a similar pace during the review period, the all-currency loan-to-deposit (LTD) ratio of retail banks remained steady at 57.0% in December 2016 (Chart 5.8). The Hong Kong dollar and foreign-currency LTD ratios also remained largely unchanged during the same period.

Chart 5.8
Average LTD ratios of retail banks



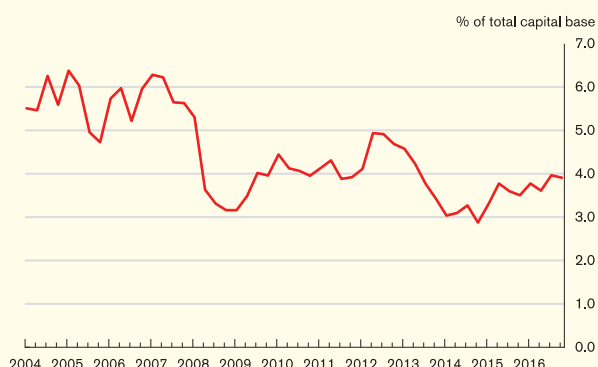
Source: HKMA.

Interest rate risk

Although increasing slightly, 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 3.92% of their total capital base as of December 2016 (Chart 5.9).⁴⁴ Nevertheless, as the pace of US interest rate normalisation may be faster than expected after the US presidential election, banks should assess the implications for their interest rate risk management.

⁴⁴ The estimate does not account for the effect from any mitigating actions of banks in response to the shock. The impact would be smaller if mitigating actions are taken by banks in response to the shock.

Chart 5.9
Estimated impact of an interest rate shock on locally incorporated licensed banks

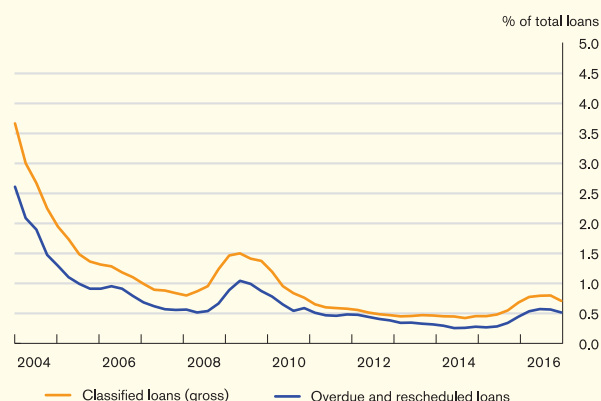


Notes:

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 book⁴⁵, expressed as a percentage of the total capital base of banks.

Source: HKMA.

Chart 5.10
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.

5.3 Credit risk

Overview

The asset quality of retail banks' loan portfolios remained sound during the review period, with the gross classified loan ratio and the ratio of overdue and rescheduled loans staying low at 0.72% and 0.53% respectively at the end of December 2016. Both ratios remained low by historical standards (Chart 5.10).

While the current asset quality is sound by historical standards, banks in Hong Kong should stay alert to the external environment, as the assessment in Box 5 shows that after the global financial crisis (GFC) the banking sector has registered rapid growth in loans for use outside Hong Kong, implying that their asset quality will be more sensitive to the external environment.

Expectations on credit growth in the near term have been mixed. The results of the HKMA Opinion Survey on Credit Condition Outlook in December 2016 showed that, although the majority of surveyed AIs expected no change in the loan demand in the next three months, the surveyed AIs expecting higher loan demand in the next three months increased slightly to 14% (Table 5.A).

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

% of total respondents	Mar-16	Jun-16	Sep-16	Dec-16
Considerably higher	0	0	0	0
Somewhat higher	0	0	5	14
Same	71	62	71	62
Somewhat lower	29	38	24	24
Considerably lower	0	0	0	0
Total	100	100	100	100

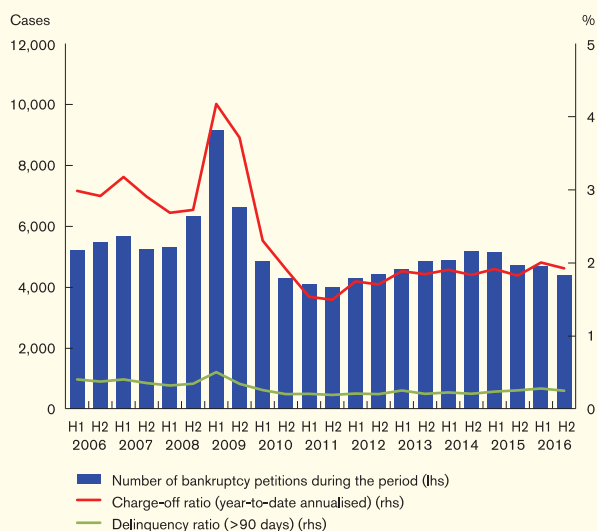
Source: HKMA.

⁴⁵ 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.

Household exposure⁴⁶

The credit risk of unsecured household exposure remained contained in the second half of 2016, with the annualised credit card charge-off ratio and the delinquency ratio edging down to 1.92% and 0.24% respectively (Chart 5.11) at the end of December.

Chart 5.11
Charge-off ratio and delinquency ratio for credit card lending and bankruptcy petitions

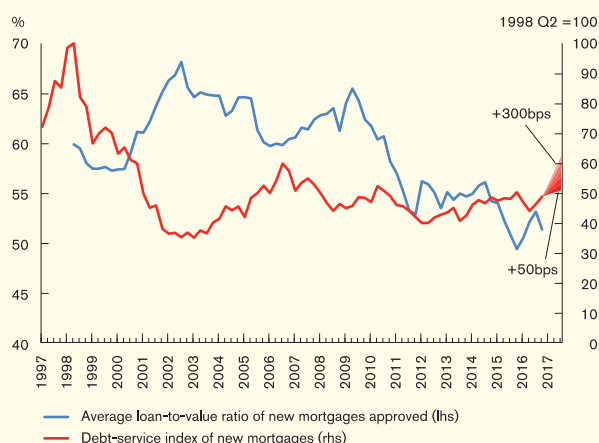


Sources: Official Receiver's Office and HKMA.

Banks' mortgage portfolios stayed healthy with the delinquency ratio hovering at 0.03% at the end of December. The average loan-to-value (LTV) ratio of new mortgage loans approved was 51.3% in the last quarter of 2016 (Chart 5.12). The ratio remained well below the 64% in September 2009, just before the commencement of the implementation of the seven rounds of countercyclical macro-prudential measures by the HKMA.

However, the debt-service index of new mortgages⁴⁷ increased to 48.8 in the fourth quarter from 44.0 in the second quarter of 2016 (the red line in Chart 5.12), mainly reflecting an increase in the average size of new mortgage loans (Chart 5.13). The ongoing US interest rate normalisation could further weigh on the household debt-servicing burden, as a sensitivity test suggests that the index could rise significantly to 67.3 in a four-quarter period if interest rates were to increase by 300 basis points, other things being constant.⁴⁸ Therefore, banks should stay alert to the risks associated with a rising household debt-servicing burden.

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.

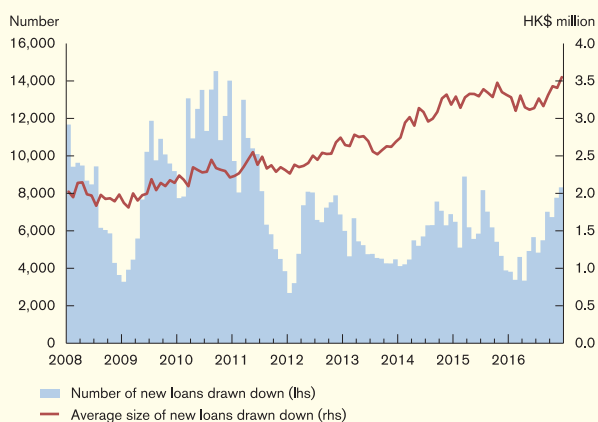
Sources: HKMA and staff estimates.

⁴⁶ 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 29.6%.

⁴⁷ A higher value of the debt-service index indicates that 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 deterioration in the asset quality of household debt.

⁴⁸ 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 5.13
New mortgage loans of surveyed AIs



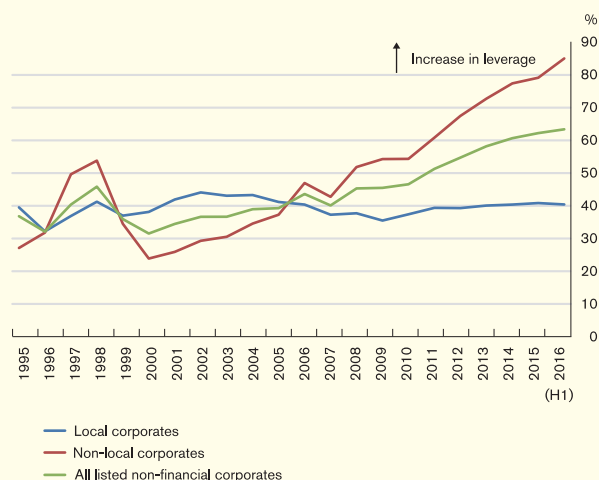
Source: HKMA Residential Mortgage Survey.

Corporate exposure⁴⁹

The potential pace of US interest rate hikes continued to be one key factor affecting the credit risk of corporate exposures. Nevertheless, how a given bank's asset quality actually fares depends on the characteristics of its corporate loan portfolio. In particular, our assessment, which is based on accounting data of non-financial firms listed in Hong Kong, finds that the leverage of local and non-local corporates exhibited very different developments after the GFC, with non-local corporates being more subject to debt-servicing problems.⁵⁰ Banks should assess how interest rate rises will affect the credit risk in relation to their exposure to non-local corporates.

Specifically, the rise in corporate sector leverage after the GFC, as measured by the weighted average of the debt-to-equity ratio, was largely driven by non-local corporates. The leverage of non-local corporates increased to 85% in the first half of 2016 (the red line in Chart 5.14), while the leverage of local corporates remained largely stable.

Chart 5.14
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 2017.

Source: HKMA staff estimates based on data from Bloomberg.

Corporates' currency mismatch is another key risk factor.⁵¹ Specifically, US interest rate hikes and the concurrent US dollar appreciation are likely to worsen the financial health of those corporates not having significant US dollar revenue, but have accumulated large net US dollar denominated liabilities over past years. Such currency mismatch could translate into significant losses and thus increase their default risk if exchange rates move unfavourably. Banks should remain vigilant to corporates' currency mismatch risk.

⁴⁹ Excluding interbank exposure. At the end of December, the share of corporate loans in domestic lending was 70.1%.

⁵⁰ Local corporates refer to the Hong Kong-listed non-financial corporates that are domiciled in Hong Kong. Non-local corporates are those Hong Kong-listed non-financial corporates that are domiciled outside Hong Kong. For detailed assessment, see "Box 4: Assessing corporate leverage in Hong Kong", *Half-yearly Monetary and Financial Stability Report*, September 2016.

⁵¹ Under the Linked Exchange Rate System, Hong Kong dollars and US dollars are regarded as the same currency in the context of foreign exchange risk. For example, a company that earns mainly Hong Kong dollar-denominated revenues and is funded by US dollar-denominated debt is not regarded as having foreign exchange risk as a result. For details, see section 7 of the HKMA's Supervisory Policy Manual (SPM) TA-2, "Foreign exchange risk management".

Mainland-related lending and non-bank exposures

The banking sector's Mainland-related lending increased further during the review period. Total Mainland-related lending rose by 3.5% to HK\$3,564 billion (15.6% of total assets) at the end of December from HK\$3,443 billion (15.6% of total assets) at the end of June (Table 5.B).

Other non-bank exposures also increased by 11.4% to HK\$1,237 billion (Table 5.C).

Table 5.B
Mainland-related lending

HK\$ bn	Mar 2016	Jun 2016	Sep 2016	Dec 2016
Mainland-related loans	3,342	3,443	3,552	3,564
Mainland-related loans excluding trade finance	3,042	3,138	3,258	3,290
Trade finance	300	305	294	273
By type of Als:				
Overseas incorporated Als	1,439	1,492	1,550	1,531
Locally incorporated Als*	1,363	1,413	1,441	1,488
Mainland banking subsidiaries of locally incorporated Als	540	538	560	545
By type of borrowers:				
Mainland state-owned entities	1,400	1,422	1,481	1,435
Mainland private entities	685	718	771	834
Non-Mainland entities	1,257	1,304	1,300	1,294

Notes:

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

Source: HKMA.

Table 5.C
Other non-bank exposures

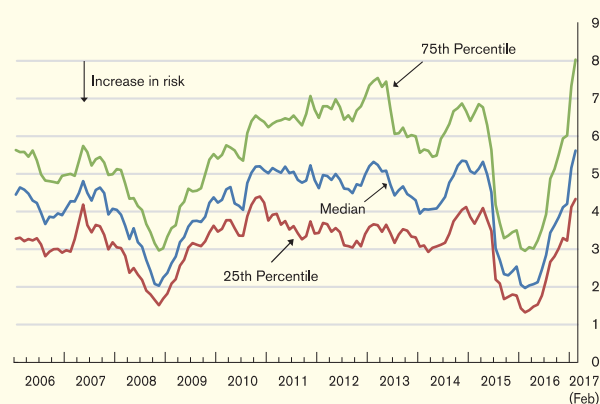
HK\$ bn	Mar 2016	Jun 2016	Sep 2016	Dec 2016
Negotiable debt instruments and other on-balance sheet exposures	647	685	709	720
Off-balance sheet exposures	413	425	453	517
Total	1,060	1,110	1,163	1,237

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

Source: HKMA.

The distance-to-default index,⁵² a market-based default risk indicator, shows further improvements in the default risk of the Mainland corporate sector during the second half of 2016 (Chart 5.15). The asset quality of retail banks' Mainland-related lending also improved, with the gross classified loan ratio decreasing to 0.82% at the end of December from 0.92% at the end of June.⁵³

Chart 5.15
Distance-to-default index for the Mainland corporate sector



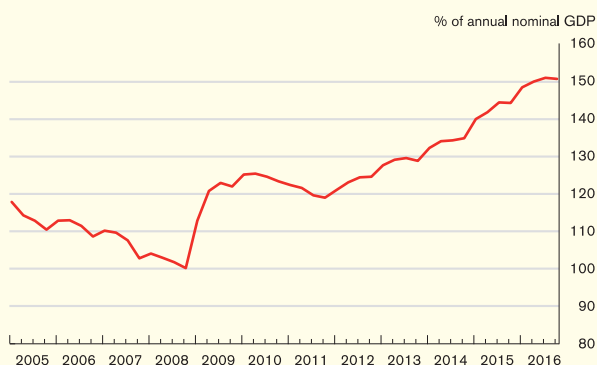
Note: Distance-to-default index is calculated based on the non-financial constituent companies (i.e. excluding investment companies and those engaged in banking, insurance and finance) of the Shanghai Stock Exchange 180 A-share index.
Source: HKMA staff estimates based on data from Bloomberg.

Despite signs of improvement in the default risk of Mainland corporates, banks should maintain prudent credit risk management for their Mainland-related lending in view of the rising trends in credit-to-GDP ratio and corporate sector leverage in the Mainland (Chart 5.16 and Chart 5.17).

⁵² 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.

⁵³ Figures cover retail banks' Hong Kong offices and Mainland branches and subsidiaries.

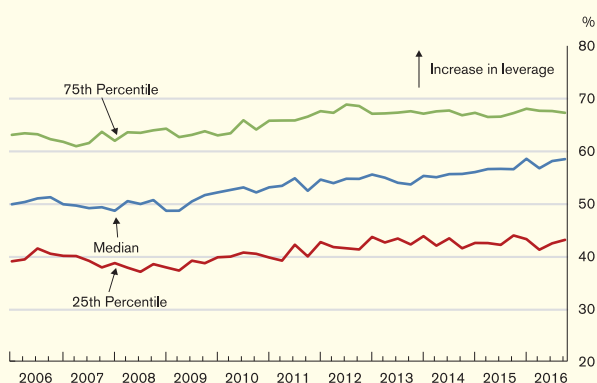
Chart 5.16
Credit-to-GDP ratio in Mainland China



Note: Credit-to-GDP ratio is defined as the ratio of total bank loans (all currencies) to the sum of quarterly nominal GDP for the latest four quarters.

Sources: CEIC and HKMA staff estimates.

Chart 5.17
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 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.

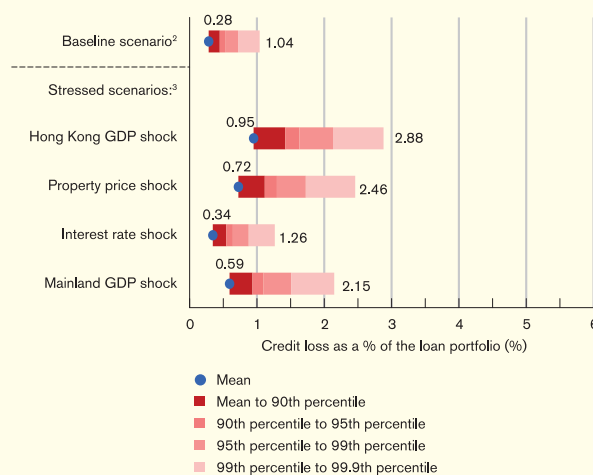
Macro stress testing of credit risk⁵⁴

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 5.18 presents the simulated future credit loss rate of retail banks in the fourth quarter of 2018 under four specific macroeconomic shocks⁵⁵ using information up to the fourth quarter of 2016.

Taking account of tail risk, banks' credit losses (at the confidence level of 99.9%) under the stress scenarios range from 1.26% (Interest rate shock) to 2.88% (Hong Kong GDP shock), which are significant, but smaller than the estimated loan loss of 4.39% following the Asian financial crisis.

Chart 5.18
The mean and value-at-risk statistics of simulated credit loss distributions¹



Notes:

1. The assessments assume the economic conditions in 2016 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 2017 Q1 to 2017 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 2017 Q1 to 2017 Q4.

Interest rate shock: A rise in real interest rates (HIBORs) by 300 basis points in the first quarter (i.e. 2017 Q1), followed by no change in the second and third quarters and another rise of 300 basis points in the fourth quarter (i.e. 2017 Q4).

Mainland GDP shock: Slowdown in the year-on-year annual real GDP growth rate to 4% in one year.

Source: HKMA staff estimates.

⁵⁴ 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.

⁵⁵ These shocks are calibrated to be similar to those that occurred during the Asian financial crisis, except the Mainland GDP shock.

5.4 Systemic risk

The policy uncertainty after the US presidential election is an important factor affecting the systemic risk of the Hong Kong banking sector. In particular, financial market indicators generally factored in quicker and larger increases in US interest rates in the coming few years. If this scenario occurs, it could pose challenges for banks in Hong Kong on various fronts.

Firstly, faster-than-expected interest rate hikes could put pressure on banks' credit risk management in view of the rising leverage of corporates, particularly non-local corporates. Secondly, banks' investment portfolios may face higher risks of mark-to-market losses given the increased holding of debt securities after the GFC, notwithstanding that they have allocated more investments to safe-assets. Thirdly, banks are more likely to see a steeper rise in funding costs, particularly when they start competing for retail deposits.

The systemic impact on the Hong Kong banking sector could be severe if any faster-than-expected hikes trigger significant capital outflows from the Hong Kong banking sector, which may result in the overshooting of interest rates in Hong Kong.

Importantly, Trump's other policies will probably lead to higher rather than lower risks of capital outflows from the region. For instance, to the extent that the new trade policy under the Trump administration hampers the export sector performances of the US trading partners thus weakening their growth outlook, disorderly capital outflows from its major trading partners, including Asian emerging economies could occur.

In addition, Trump's policy on financial regulation, which may relax or unwind some regulatory measures in the US that have been designed to help avoid another financial crisis, could also trigger banking flows from jurisdictions where more stringent regulatory measures are adopted.

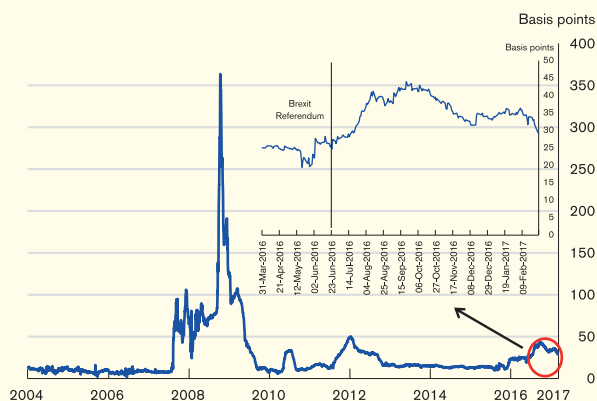
On the back of ample domestic liquidity and strong capital positions, the Hong Kong banking sector has remained sound and stable in the aftermath of the US presidential election. Banks, however, should carefully assess the longer-term impact.

Across the Atlantic, the Brexit process is another risk factor meriting close monitoring. As pointed out in the previous issue of the *Report*, the potential impact of spillover risks to the Hong Kong banking sector should not be underestimated, 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.

However, during the assessment period, there was no apparent deterioration in interbank funding conditions. In particular, the spread between the three-month US dollar LIBOR and its corresponding overnight index swap (OIS) rate⁵⁶, which is a common indicator of systemic liquidity risks in the short-term US dollar funding market, has been broadly stable (Chart 5.19).

⁵⁶ 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 5.19
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 27 January 2017 that the CCyB ratio for Hong Kong will increase to 1.875% with effect from 1 January 2018, from the current 1.25%.⁵⁷ This reflects the fact that, under the Basel III phase-in arrangements, the maximum CCyB under Basel III will increase to 1.875% of banks' risk-weighted assets on 1 January 2018 from 1.25% effective from 1 January 2017.⁵⁸

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 gaps⁵⁹). Based on the information considered for the last announcement date, both the credit-to-GDP gap and the property price-to-rent gap widened to 11.5% and 8.2% respectively, compared to 10.4% and 6.0% in the second quarter of 2016. Both gaps remained at elevated levels and the risks associated with credit and property market conditions have not abated. A simple mapping from the indicative buffer guide of 2.4% would signal a CCyB rate of 2.25%,⁶⁰ which is close to the upper end of the Basel III range.

In addition, the information drawn from other reference indicators⁶¹ was, in the view of the Monetary Authority, consistent with the signal from the indicative buffer guide.

⁵⁷ Further details of the decision may be found in the press release “Monetary Authority Announces Countercyclical Capital Buffer for Hong Kong” issued on 27 January 2017 which is available on the HKMA website.

⁵⁸ 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.

⁵⁹ The gaps between the ratio of credit to GDP and its long term trend, and between the ratio of residential property prices to rentals and its long-term trend.

⁶⁰ 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.

⁶¹ These included measures of bank, corporate and household leverage; debt servicing capacity; profitability and funding conditions within the banking sector and macroeconomic imbalances.

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

	14-Jan-16	Q2-2016	27-Jan-17
Announced CCyB rate	1.25%		1.875%
Date effective	01/01/2017		01/01/2018
Indicative buffer guide	2.5%	1.9%	2.4%
Basel Common Reference Guide	2.5%	2.5%	2.5%
Property Buffer Guide	2.5%	1.2%	2.0%
Composite CCyB Guide	2.5%	1.9%	2.4%
Indicative CCyB Ceiling	None	None	None
<i>Primary gap indicators</i>			
Credit/GDP gap	15.3%	10.4%	11.5%
Property price/rent gap	13.1%	6.0%	8.2%
<i>Primary stress indicators</i>			
3-month HIBOR spread (percentage points)	0.30%	0.44%	0.75%*
Quarterly change in classified loan ratio (percentage points)	0.07%	0.08%	0.01%

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. * The increase in the interbank market spread, measured as the difference between 3-month HIBOR and 3-month OIS rate, does not appear to be a reflection of market stress, after taking into account other market stress indicators. The HKMA will review the current measure of the interbank market spread.

Source: HKMA.

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

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

	Dec 2015	Sep 2016	Dec 2016
Interest rates			
1-month HIBOR fixing ² (quarterly average)	0.22	0.25	0.43
3-month HIBOR fixing (quarterly average)	0.39	0.57	0.71
BLR ³ and 1-month HIBOR fixing spread (quarterly average)	4.78	4.75	4.57
BLR and 3-month HIBOR fixing spread (quarterly average)	4.61	4.43	4.29
Composite interest rate ⁴	0.26	0.25	0.31
Retail banks			
Balance sheet developments⁵			
Total deposits	0.1	4.3	0.6
Hong Kong dollar	0.5	4.7	0.5
Foreign currency	-0.4	3.9	0.8
Total loans	-0.1	1.0	3.9
Domestic lending ⁶	0.2	1.2	3.3
Loans for use outside Hong Kong ⁷	-1.7	0.2	6.6
Negotiable instruments			
Negotiable certificates of deposit (NCDs) issued	3.9	-5.1	-2.8
Negotiable debt instruments held (excluding NCDs)	-0.9	6.3	-3.4
Asset quality			
As a percentage of total loans ⁸			
Pass loans	97.87	97.68	97.75
Special mention loans	1.44	1.51	1.53
Classified loans ⁹ (gross)	0.69	0.81	0.72
Classified loans (net) ¹⁰	0.49	0.55	0.48
Overdue > 3 months and rescheduled loans	0.45	0.57	0.53
Classified loan ratio (gross) of Mainland related lending ¹¹	0.78	0.89	0.82
Profitability			
Loan impairment charges as a percentage of average total assets ¹²	0.09	0.07	0.07
Net interest margin ¹²	1.32	1.32	1.32
Cost-to-income ratio ¹³	45.3	41.9	43.0
All AIs			
Liquidity ratios (quarterly average, consolidated)			
Liquidity Coverage Ratio — category 1 institutions	142.9	159.9	156.3
Liquidity Maintenance Ratio — category 2 institutions	53.9	53.2	51.0
Surveyed institutions			
Asset quality			
Delinquency ratio of residential mortgage loans	0.03	0.04	0.03
Credit card lending			
Delinquency ratio	0.25	0.25	0.24
Charge-off ratio — quarterly annualised	1.86	2.14	1.89
— year-to-date annualised	1.82	2.02	1.92
All locally incorporated AIs			
Capital adequacy (consolidated)			
Common Equity Tier 1 capital ratio	14.6	16.0	15.4
Tier 1 capital ratio	15.3	16.9	16.4
Total capital ratio	18.3	19.6	19.2

Notes:

- Figures are related to Hong Kong offices only except where otherwise stated.
- The Hong Kong Dollar Interbank Offered Rates are released by the Hong Kong Association of Banks.
- With reference to the rate quoted by The Hongkong and Shanghai Banking Corporation Limited.
- The composite interest rate is a weighted average interest rate of all Hong Kong-dollar interest-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 in the HKMA website.
- Quarterly change.
- Loans for use in Hong Kong plus trade finance.
- Including "others" (i.e. unallocated).
- Figures are related to retail banks' Hong Kong offices, overseas branches and major overseas subsidiaries.
- Classified loans are those loans graded as "substandard", "doubtful" or "loss".
- Net of specific provisions/individual impairment allowances.
- Figures are related to retail banks' Hong Kong offices, Mainland branches and subsidiaries.
- Year-to-date annualised.
- Year-to-date figures.

Box 5

Changes in the business models of banks in Hong Kong after the crisis and their implications

Introduction

The global banking environment has changed dramatically since the 2008–09 GFC. The combined impact of the crisis, the subsequent regulatory reforms and recent negative interest rate environments in some economies could drive banks to structurally adjust their business models. Against this background, this box investigates post-crisis developments on business models for banks in Hong Kong⁶² and the implications for banking stability.

Retail banks and foreign bank branches

This assessment focuses on licensed banks in Hong Kong. In general, they have heterogeneous business models, as they carry out different functions for their respective banking organisations. However, they can be divided into two groups, retail banks and foreign bank branches. The former comprises mainly locally incorporated licensed banks in Hong Kong, which generally fund their business by local retail deposits.⁶³ For the group of foreign bank branches, intragroup funding from overseas offices shares a significant part of their liabilities.⁶⁴ Given their different funding structures, we analyse these two groups of banks in Hong Kong separately.

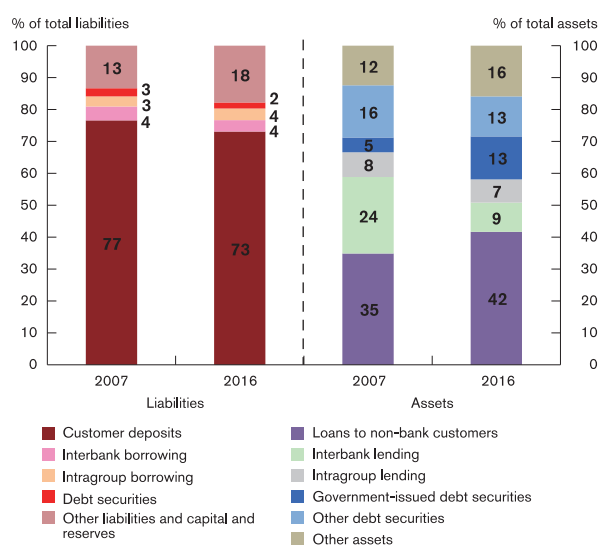
Post-crisis development for retail banks

While the liability structure of retail banks remained broadly unchanged after the crisis (see the left-hand side of Chart B5.1), retail banks witnessed notable changes in their asset compositions (see the right-hand side of Chart B5.1).

For lending, the aggregate share of interbank lending to total assets reduced by more than half from 24% at the end of 2007 (that is, before the crisis) to 9% at the end of 2016. The reduction in their interbank lending may be driven by various factors, including lower demand for interbank loans amid ample liquidity conditions, significant counterparty risks and wafer-thin profit margins.

By contrast, the share of loans to non-bank customers to total assets increased significantly from 35% before the crisis to 42% after the crisis (the purple bars in Chart B5.1).

Chart B5.1
The asset-liability structure of retail banks



Notes:

1. Year-end positions. Figures may not add up to total due to rounding.
2. Intragroup lending (borrowing) refers to lending to (borrowing from) connected banks in Hong Kong or overseas offices of the bank. Interbank lending (borrowing) refers to lending to (borrowing from) unconnected banks in Hong Kong and overseas.

Source: HKMA.

⁶² Throughout the box, figures for the banks in Hong Kong relate to their Hong Kong offices only, unless otherwise specified.

⁶³ Retail banks include a few overseas incorporated licensed banks (i.e. foreign bank branches) which operate similarly to a typical locally incorporated licensed bank in Hong Kong.

⁶⁴ Foreign bank branches here include all overseas incorporated licensed banks in Hong Kong, except those already included as retail banks.

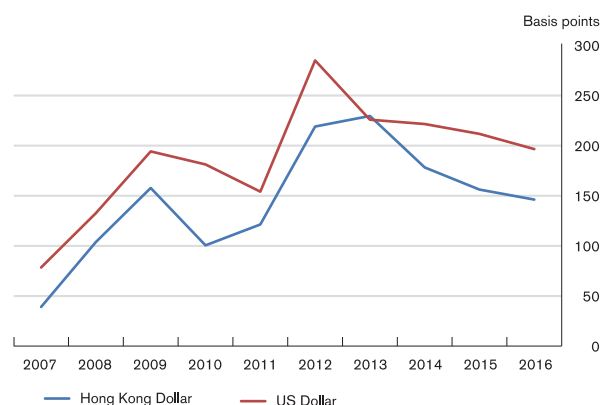
A breakdown of statistics for loans to non-bank customers suggests that the increased share of loans to non-bank customers is driven by an increase in loan demand from corporate borrowers after the crisis (Chart B5.2). In particular, retail banks registered a higher share of corporate loans to non-property sectors which went up by 3 percentage points. Loans for use outside Hong Kong (which are most likely borrowed by corporates to finance their overseas operations) recorded an even larger increase in its share of total assets by 5 percentage points.

Chart B5.2
Composition of loans to non-bank customers for retail banks



Anecdotal evidence from data of syndicated loans in Hong Kong suggests that the average spread of corporate loans intermediated by Hong Kong banks has increased significantly since 2008. The average spread of Hong Kong dollar syndicated loans in Hong Kong reached a peak of around 228 basis points in 2013 (the blue line in Chart B5.3). Although the spread has narrowed since then, it remains significantly higher than pre-crisis levels. The expansion of the corporate loan portfolios of retail banks, coupled with the rising spread, helped them to sustain stable profits after the crisis (Charts 5.1 and 5.2 for retail banks' return on assets and NIMs respectively).

Chart B5.3
Average spread of syndicated loans in Hong Kong



Notes:

1. Annual average figures.
 2. The spread for Hong Kong dollar syndicated loans refers to the average spread over HIBOR for HIBOR-based syndicated loans.
 3. The spread for US dollar syndicated loans refers to the average spread over US dollar LIBOR for US dollar LIBOR-based syndicated loans intermediated in Hong Kong.
- Source: HKMA staff estimates based on data from LoanConnector.

Although the expansion of corporate loan portfolios may incur higher credit risk, such risk may be counterbalanced somewhat by recent changes in retail banks' investment portfolios. In particular, their holdings of government-issued debt securities increased significantly, which accounted for around 13% of their total assets at the end of 2016 compared to 5% before the crisis (dark blue bars in Chart B5.1). While credit risk management may be one factor driving retail banks to hold more safe-assets, their internal liquidity management needs and the Basel III regulatory liquidity requirements may also be contributors.

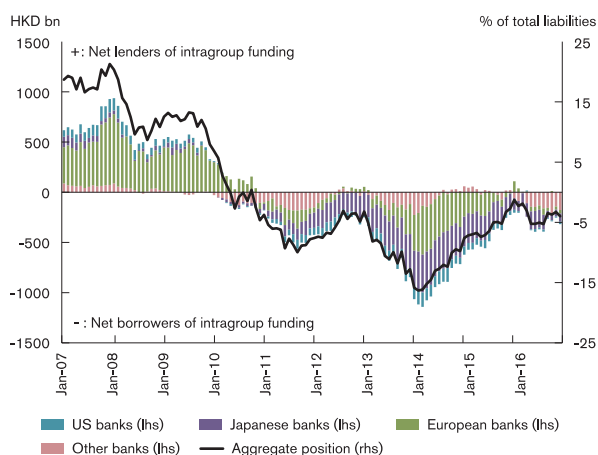
Post-crisis development for foreign bank branches

Our previous assessment based on data up to June 2012 found that some US and European bank branches had changed their business models after the crisis by shifting from intragroup funding centres to regional lending units.⁶⁵ Largely reflecting this development, foreign bank branches in Hong Kong on aggregate switched from a net lender of intragroup funding to become a net borrower.

⁶⁵ See "Box 6: Changing business models of Hong Kong branches of US and European global banks", *Half-yearly Monetary and Financial Stability Report*, March 2013.

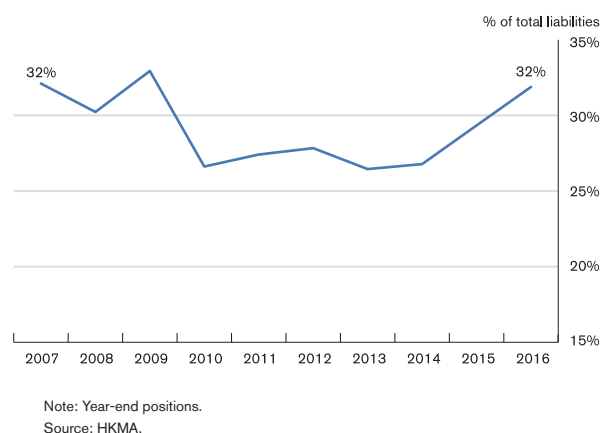
Latest statistics show that although foreign bank branches as a whole remained a net borrower of intragroup funding (Chart B5.4), the net borrowing position reduced significantly from the peak of around 16% of their liabilities in February 2014 to just 4% of their liabilities at the end of 2016.

Chart B5.4
Net intragroup position for foreign bank branches



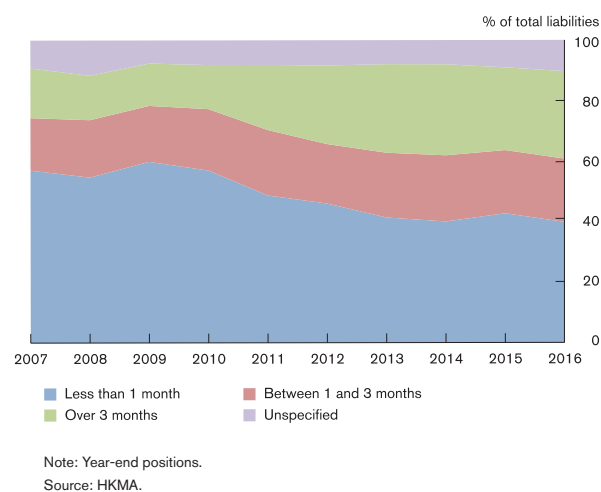
One contributing factor to their reduced reliance on intragroup funding since the last assessment is the fact that they raised more retail deposits to fund their business.⁶⁶ As a result, the aggregate share of retail deposits to total liabilities of foreign bank branches in Hong Kong has recovered gradually since 2013, reaching the pre-crisis level of 32% at the end of 2016 (Chart B5.5).

Chart B5.5
Share of funding by retail deposits for foreign bank branches



The maturity profile of liabilities for foreign bank branches also shows healthy development. In particular, the share of their liabilities with maturities longer than three months increased from 16% at the end of 2007 to 29% at the end of 2016 (green area in Chart B5.6). This partly reflects the policy effect of the Stable Funding Requirement introduced by the HKMA in 2013.⁶⁷ Taken together, foreign bank branches in Hong Kong have developed a more stable funding structure since the last assessment.

Chart B5.6
Maturity profile for foreign bank branches' liabilities



⁶⁶ This may be partially supported by significant lower default risks of international banks as the negative impact of the global financial crisis and the European sovereign debt crisis recede.

⁶⁷ See a reference note on the Stable Funding Requirement available at <http://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2014/20141128e2a5.pdf>

On the asset side, loan portfolios of foreign bank branches in Hong Kong exhibited a similar development to that of retail banks. Foreign bank branches' loans to non-bank customers accounted for around 34% of their total assets at the end of 2016 compared to less than 20% before the crisis (Chart B5.7). Loans for use outside Hong Kong are the main source of growth, while corporate loans used locally also registered a higher share.

Chart B5.7
Composition of loans to non-bank customers
by foreign bank branches in Hong Kong



Note: Year-end positions.
Source: HKMA.

Secondly, foreign bank branches in Hong Kong have developed a more stable funding structure, which should enhance their resilience against liquidity and funding shocks. In addition, their active participation in the loan market after the crisis could improve the availability of diversified sources of loan supply in the Hong Kong banking sector, thus reducing the risk of systemic loan curtailment in times of stress.

Nevertheless, the Hong Kong banking sector should stay particularly alert to the external environment, as both retail banks and foreign bank branches have registered rapid growth in loans for use outside Hong Kong since the crisis, implying that their asset quality will be more sensitive to the external environment.

Implications for banking stability

Recent developments relating to banks in Hong Kong have three implications for banking stability. Firstly, for retail banks, although the expansion of their corporate loan portfolios in general incurs higher credit risk, such risk may be counterbalanced by their higher share of holdings of safe assets. Importantly, the expansion of their corporate loan portfolios may generate higher returns, which help them to sustain stable profits when net interest margins have been generally compressed in low interest rate environments. With stable profit and strong capital positions, retail banks are well placed to meet the capital requirements under the Basel III framework.

Glossary of terms

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 (EFBN)

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.

Abbreviations

3m moving average	Three-month moving average
3m-on-3m	Three-month-on-three-month
AEs	Advanced economies
AFC	Asian Financial Crisis
ASEAN	Association of Southeast Asian Nations
Als	Authorized Institutions
BIS	Bank for International Settlements
bn	Billion
BLR	Best lending rate
BoJ	Bank of Japan
BoP	Balance of Payments
BSD	Buyer's stamp duty
CAR	Capital Adequacy Ratio
CBRC	China Banking Regulatory Commission
CCPI	Composite Consumer Price Index
CCyB	Countercyclical capital buffer
CDs	Certificates of deposits
CDS	Credit default swap
CET1	Common equity tier-one
CFETS	China Foreign Exchange Trade System
CIs	Certificates of Indebtedness
CNH	Offshore renminbi in Hong Kong
CNY	Onshore renminbi
C&SD	Census and Statistics Department
CPI	Consumer Price Index
CU	Convertibility Undertaking
DF	Deliverable forward
DI	Direct investment
DSD	Doubling of the ad valorem stamp duty rates
DSR	Debt servicing ratio
ECB	European Central Bank

EFBNs	Exchange Fund Bills and Notes
EMEs	Emerging Market Economies
EPIFs	External primary income flows
EPU	Economic policy uncertainty
ETFs	Exchange traded funds
EU	European Union
EUR	Euro
FCI	Financial Conditions Index
FDI	Foreign direct investment
Fed	Federal Reserve
FOMC	Federal Open Market Committee
FSB	Financial Stability Board
FX	Foreign exchange
GBs	Government Bonds
GDP	Gross Domestic Product
GFC	Global Financial Crisis
G-SIBs	Global systemically important banks
HIBOR	Hong Kong Interbank Offered Rate
HK	Hong Kong
HKD	Hong Kong dollar
HKEx	The Hong Kong Exchanges and Clearing Limited
HKMA	Hong Kong Monetary Authority
HK\$M3	Hong Kong dollar broad money supply
HSCEI	Hang Seng China Enterprises Index
HSI	Hang Seng Index
IFC	International Finance Corporation
IMF	International Monetary Fund
IPO	Initial Public Offering
IT	Information technology
LCR	Liquidity Coverage Ratio
LEI	Composite index of leading economic indicators
LIBOR	London Interbank Offered Rate
LMR	Liquidity Maintenance Ratio
lhs	Left-hand scale
IRB	Internal-Ratings Based Approach
LTD	Loan-to-deposit

LTV	Loan-to-value
mn	Million
MDBs	Multilateral Development Banks
MLF	Medium-term Lending Facility
MRF	Mutual Recognition of Funds
MTN	Medium-term Note
NBS	National Bureau of Statistics
NCD	Negotiable certificate of deposit
NEER	Nominal effective exchange rate
NIE	Newly industrialised economies
NIM	Net interest margin
NPL	Non-performing loan
OIS	Overnight indexed swap
OTC	Over-the-counter
p.a.	Per annum
P2P	Peer-to-peer
PBoC	People's Bank of China
PMI	Purchasing Managers' Index
PPI	Producer Price Index
PSL	Pledged Supplementary Lending
qoq	Quarter-on-quarter
QE	Quantitative Easing
QQE	Quantitative and Qualitative Easing
R&VD	Rating and Valuation Department
REER	Real effective exchange rate
Repo	Repurchase operation
rhs	Right-hand scale
RMB	Renminbi
RTGS	Real time gross settlement
SAFE	State Administration of Foreign Exchange
SDR	Special Drawing Rights
SHIBOR	Shanghai Interbank Offered Rate
SLO	Short-term Liquidity operation
SME	Small and medium-sized enterprise
SOEs	State-owned enterprises
SPM	Supervisory Policy Manual

SSD	Special stamp duty
SSE	Shanghai Stock Exchange
SWIFTs	Society for Worldwide Interbank Financial Telecommunication
S&P	Sale and Purchase Agreements of Building Units
S&P 500	Standard & Poor's 500 Index
TLTRO	Targeted Longer-Term Refinancing Operation
TWI	Trade Weighted Index
UK	United Kingdom
US	United States
USD	US dollar
VAR	Vector autoregressive
VHSI	HSI Volatility Index
VIX	Chicago Board Options Exchange Market Volatility Index
WMPs	Wealth management products
yoy	Year-on-year

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