

## 5. Banking sector performance

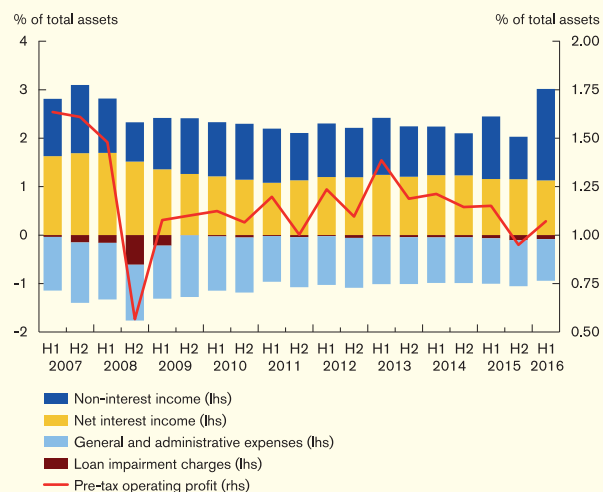
The profitability of retail banks improved in the first half of 2016 as compared to the second half of 2015. This was mainly due to lower operating costs. Capital and liquidity conditions were structurally robust. Asset quality remained sound by historical standards despite marginal deterioration during the review period. Looking ahead, the subdued demand for credit, depressed yields of safe assets and keen competition in the mortgage market could pose challenges for banks in managing their surplus funding, creating headwinds for their profitability. Meanwhile, in view of rising leverage of non-local corporates, the credit risk in relation to banks' corporate exposure would be expected to increase further as the US interest rate hike resumes. The Hong Kong banking system has not been much affected by the Brexit vote. However, given the unmatched role of the United Kingdom banking system in distributing international banking flows and the significant interbank linkage between Hong Kong and the United Kingdom, continued monitoring of potential international spillover risks is required.

### 5.1 Profitability and capitalisation

#### Profitability

The profitability of retail banks<sup>29</sup> improved with increased pre-tax operating profits of 14.9% in the first half of 2016 as compared with the second half of 2015. The improvement was largely due to lower operating costs. As a result, the return on assets<sup>30</sup> of retail banks rebounded from 0.95% in the second half of 2015 to 1.07% in the first half of 2016 (i.e. the red line in Chart 5.1).

**Chart 5.1**  
Profitability of retail banks



Note: Semi-annually annualised figures.

\* The sharp rise in non-interest income in 2016H1 was largely due to a one-off increase in non-trading investment income.

Source: HKMA.

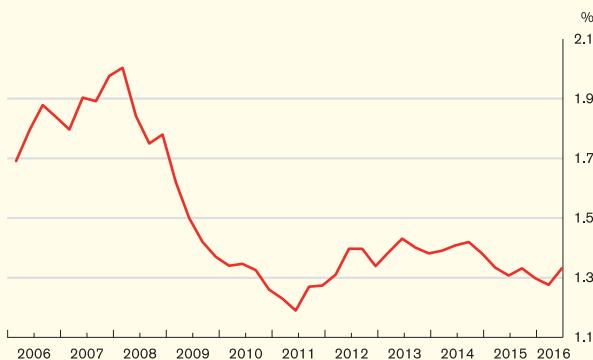
<sup>29</sup> Throughout this chapter, figures for the banking sector relate to Hong Kong offices only, except where otherwise stated.

<sup>30</sup> Return on assets is calculated based on aggregate pre-tax operating profits.

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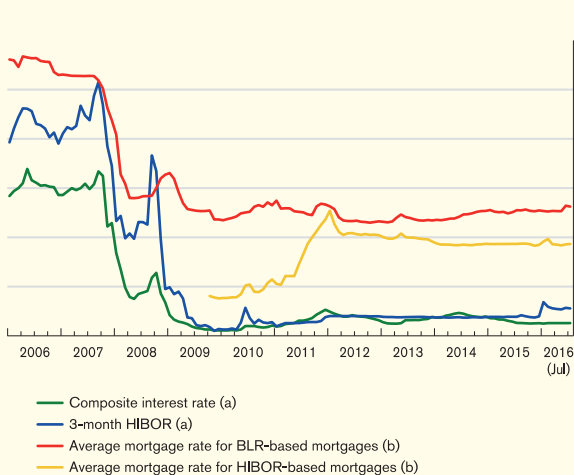
The net interest margin (NIM) of retail banks edged up to 1.33% in the second quarter of 2016 from 1.30% in the fourth quarter of 2015 (Chart 5.2), which was partly supported by a slight rise in mortgage rates. The best lending rate-based mortgage rate rose by 9 basis points during the first half of 2016, while the HIBOR-based mortgage rate stayed broadly stable (Chart 5.3).

**Chart 5.2**  
Net interest margin of retail banks



Note: Quarterly annualised figures.  
Source: HKMA.

**Chart 5.3**  
Interest rates

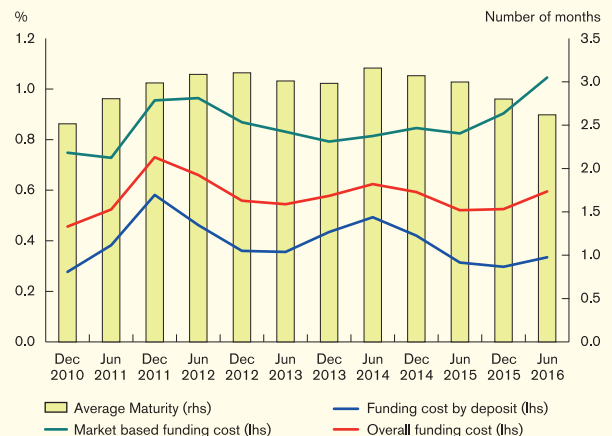


Notes:  
(a) End of period figures.  
(b) Period-average figures for newly approved loans.  
Sources: HKMA and staff estimates.

The US interest rate hike in December 2015 has so far had only a limited impact on banks' overall funding costs. The composite interest rate, a measure of the average cost of Hong Kong dollar funds for retail banks, stayed low at 0.26% during the first half of 2016.

Nevertheless, the wholesale funding market may have begun to reflect the impact partially. For instance, there was short-lived volatility in Hong Kong interbank interest rates (HIBORs) in the first two months of 2016 (i.e. the blue line in Chart 5.3). Market-based Hong Kong and US dollar funding cost<sup>31</sup> for licensed banks as a whole also increased, leading to an increase in their overall funding costs by 6 basis points during the first half of 2016 (Chart 5.4).

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



Source: HKMA.

Looking ahead, the less-favourable external environment could create headwinds for Hong Kong banks' profitability, particularly for their investment portfolios. Specifically, the negative interest rate environment in some advanced economies, together with possible flight-to-safety in response to the Brexit vote, may fuel further

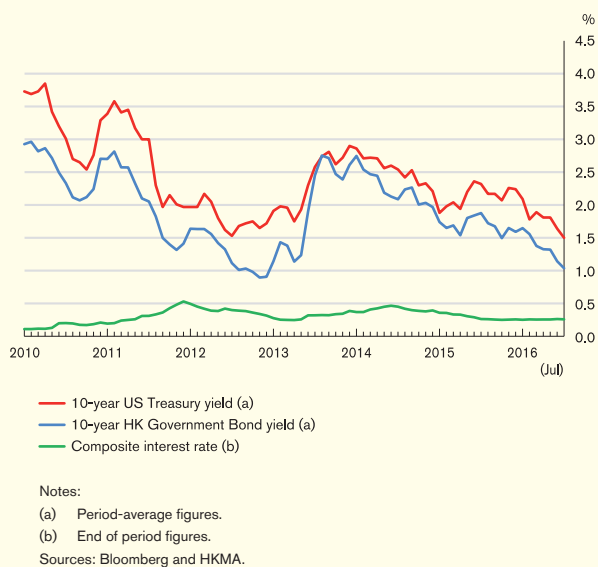
<sup>31</sup> Market-based funding cost is measured by the interest costs of banks' non-deposit interest-bearing liabilities.

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demand for safe assets that banks generally hold (Chart 5.5), implying that surplus funds deployed in these safe assets would earn much thinner returns than before.

Indeed, anecdotal evidence suggests that depressed yields of safe assets may have a broader implication. In particular, the thinner investment returns from safe assets may be one contributing factor to the fiercer competition in the mortgage market, which could put further pressure on Hong Kong banks' profitability.

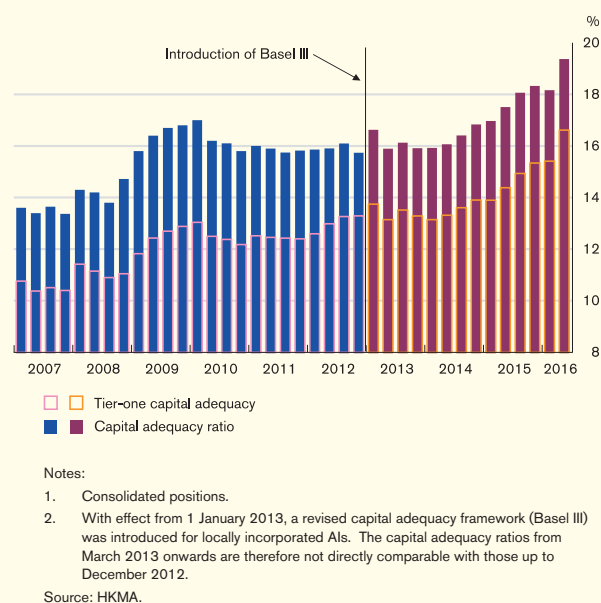
**Chart 5.5**  
Interest margin of safe assets



### Capitalisation

Capitalisation of the banking sector continued to be strong and well above the minimum international standards. The consolidated capital adequacy ratio of locally incorporated AIs increased to 19.4% at the end of June 2016 (Chart 5.6), while the tier-one capital adequacy ratio<sup>32</sup> also rose to 16.6%.

**Chart 5.6**  
Capitalisation of locally incorporated AIs



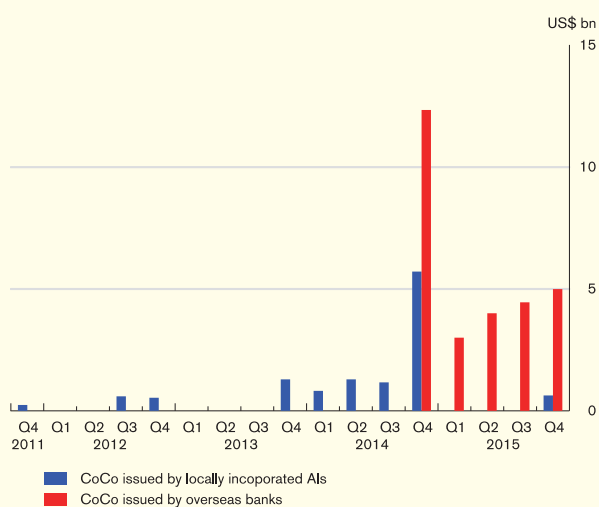
Issuing contingent convertible bonds (CoCos)<sup>33</sup> has become more popular among banks to strengthen their Additional Tier 1 and Tier 2 capital levels under the Basel III framework. In Hong Kong, the CoCo market was quiet until it registered a notable surge in 2014. From the fourth quarter of 2011 to the end of 2015, the cumulative issuance of CoCos by locally incorporated AIs was US\$12.3 billion (i.e. the sum of blue bars in Chart 5.7). The rapid increase in the issuance of CoCos was primarily driven by banks' need to replace certain capital instruments that will be phased out under the Basel III framework. The growth of issuance, however, slowed in 2015 for locally incorporated AIs, probably reflecting that many of them have broadly completed their replacement processes.

<sup>32</sup> The ratio of tier-one capital to total risk-weighted assets.

<sup>33</sup> CoCos are loss-absorbing debt instruments that can be converted into equity or written off upon a pre-specified trigger event. The intended role of CoCos is to provide a source of private capital when issuing banks are unlikely to be able to raise capital in times of market distress.

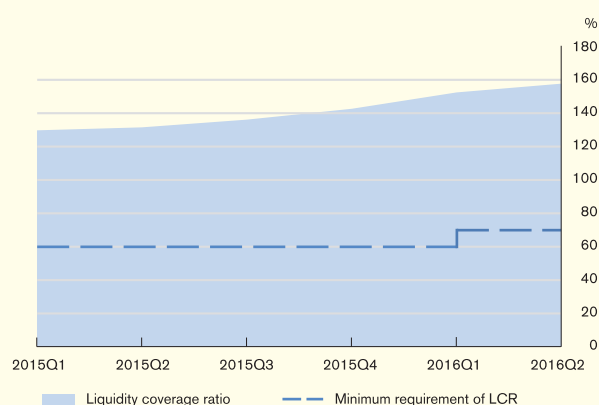
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**Chart 5.7**  
CoCos issuance in Hong Kong



Sources: Banks' websites and Dealogic.

**Chart 5.8**  
Liquidity coverage ratio



Source: HKMA.

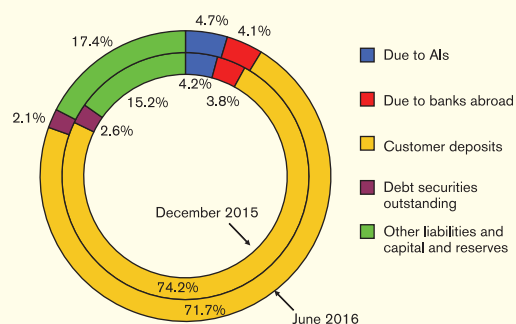
Customer deposits continued to be the primary funding source for retail banks, although the share of customer deposits to banks' total liabilities declined marginally to 71.7% at the end of June 2016, from 74.2% at the end of December 2015 (Chart 5.9).

## 5.2 Liquidity and interest rate risks

### Liquidity and funding

The liquidity position of the banking sector, as measured by the Basel III Liquidity Coverage Ratio (LCR)<sup>34</sup> requirement, remained favourable and strengthened further during the review period. The average LCR of category 1 institutions rose to 158.0% in the second quarter of 2016 from 142.9% in the last quarter of 2015 (Chart 5.8). Meanwhile, the average Liquidity Maintenance Ratio (LMR) of category 2 institutions remained steady at 53.8%. Both ratios remained well above their respective regulatory minimums,<sup>35</sup> suggesting that the Hong Kong banking sector is able to withstand potential liquidity shocks arising from possible capital outflows from Hong Kong.

**Chart 5.9**  
The liability structure of retail banks



Notes:

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

Source: HKMA.

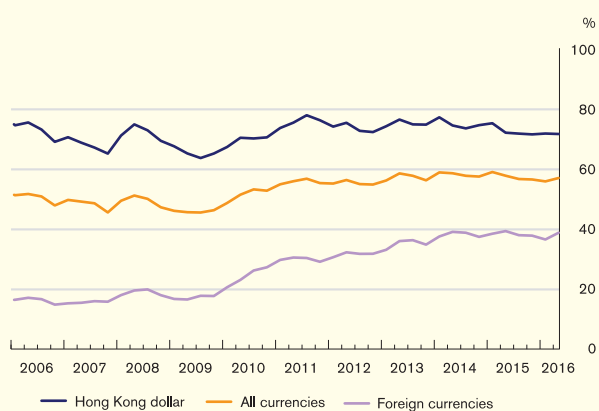
<sup>34</sup> The Basel III LCR requirement, phased-in from 1 January 2015, is designed to ensure that banks have sufficient high-quality liquid assets to survive a significant stress scenario lasting 30 calendar days. In Hong Kong, AIs designated as category 1 institutions adopt the LCR; while category 2 institutions adopt the LMR, which is a modified form of the original statutory liquidity ratio requirement.

<sup>35</sup> 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.

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Due to a relatively faster growth of loans than deposits for the retail banks during the review period, the Hong Kong dollar loan-to-deposit (LTD) ratio of retail banks edged up by 0.2 percentage points to 71.7% at the end of June (Chart 5.10), while the foreign currency LTD ratio also increased by 1 percentage point to 38.8%. As a whole, the all-currency LTD ratio increased moderately to 57.0% at the end of June from 56.5% six months earlier.

**Chart 5.10**  
Average loan-to-deposit ratios of retail banks



Source: HKMA

## Interest rate risk

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<sup>36</sup> could be subject to a decline equivalent to 3.62%<sup>37</sup> of their total capital base as of June. Nevertheless, as the uncertainty about the pace and timing of US interest rate rises remains, banks should pay close attention to their interest rate risk management.

<sup>36</sup> Locally incorporated AIs subject to the market risk capital adequacy regime are required to report positions in the banking book only. Other locally incorporated AIs exempted from the market risk capital adequacy regime are required to report aggregate positions in the banking book and trading book.

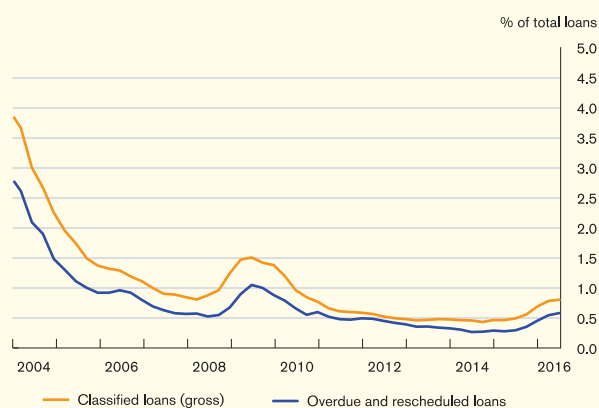
<sup>37</sup> The estimated level of impact reported here is not strictly comparable to that published in previous issues of this report due to different coverage of banks.

## 5.3 Credit risk

### Overview

The asset quality of retail banks remained healthy by historical standards despite marginal deterioration during the review period. The classified loan ratio increased to 0.80% at the end of June from 0.69% at the end of 2015, and the ratio of overdue and rescheduled loans rose to 0.58% from 0.45% (Chart 5.11).

**Chart 5.11**  
Asset quality of retail banks



Notes:

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

Source: HKMA.

Credit growth is expected to be sluggish as results of the HKMA Opinion Survey on Credit Condition Outlook of June 2016 show that the share of surveyed AIs expecting a lower loan demand in the next three months increased notably to 38% (Table 5.A).

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

% of total respondents	Sep-15	Dec-15	Mar-16	Jun-16
Considerably higher	0	0	0	0
Somewhat higher	0	0	0	0
Same	86	86	71	62
Somewhat lower	14	14	29	38
Considerably lower	0	0	0	0
Total	100	100	100	100

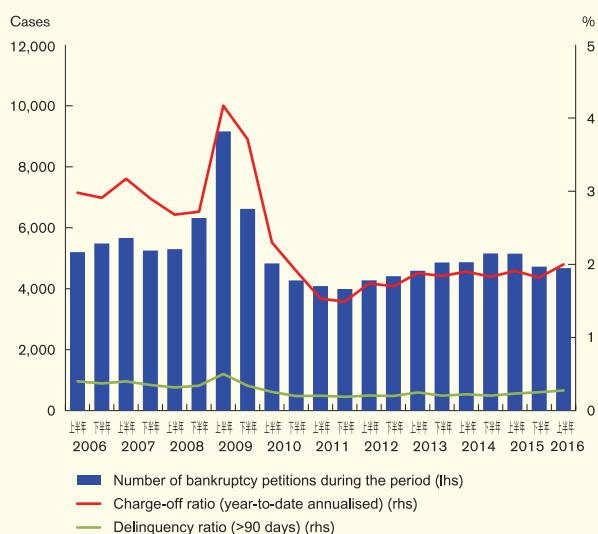
Source: HKMA.

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### Household exposure<sup>38</sup>

The credit risk of unsecured household exposure deteriorated moderately, with both the annualised credit card charge-off ratio and the delinquency ratio rising to 2.00% and 0.27% respectively in the first half of 2016 (Chart 5.12). Nevertheless, both ratios remained low by historical standards, suggesting the credit risk of unsecured household loans remained contained.

**Chart 5.12**  
Charge-off ratio and delinquency ratio for credit card lending and bankruptcy petitions



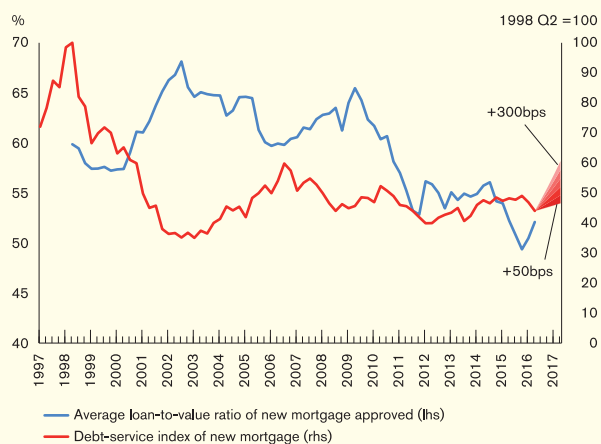
Sources: Official Receiver's Office and the HKMA.

Banks' mortgage portfolios remained healthy with the delinquency ratio staying low at 0.04% at the end of June. Reflecting the policy effect of macro-prudential measures by the HKMA since 2009, the average loan-to-value ratio of new mortgage loans approved has stayed low at 52.1% in the second quarter compared to 64% immediately before the implementation of tightening measures in September 2009.

<sup>38</sup> Loans to households constitute lending to professional and private individuals, excluding lending for other business purposes. Mortgage lending accounts for a major proportion of household loans while the remainder comprises mainly unsecured lending through credit card lending and other personal loans for private purposes. At the end of June 2016, the share of household lending in domestic lending was 29.6%.

Meanwhile, the debt-service index of new mortgages<sup>39</sup> improved to 44.0 in the second quarter from 49.0 in the fourth quarter of 2015 (i.e. the red line in Chart 5.13), mainly reflecting a lower average size of new mortgage loans (Chart 5.14). However, the household debt-servicing burden could increase drastically if US interest rate normalisation resumes, as a sensitivity test suggests that the index could rise significantly to 60.6 in a four-quarter period if interest rates were to increase by 300 basis points<sup>40</sup> other things being constant. Banks should stay alert to the risks associated with a rising household debt-servicing burden.

**Chart 5.13**  
Average loan-to-value ratio and household debt-servicing burden in respect of new mortgages



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

Sources: HKMA and staff estimates.

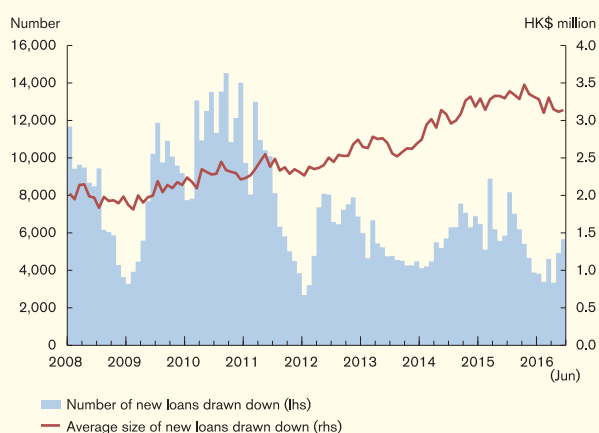
<sup>39</sup> A higher value of the debt-service index indicates that there is either a drop in household income, or an increase in interest rates, or an increase in the average mortgage loan amount drawn by households. Historical movements in the index suggest that a sharp rise in the index may lead to deterioration in the asset quality of household debt.

<sup>40</sup> The assumption of a 300-basis-point rise in interest rates is consistent with the prudential measure that requires AIs to have a 3-percentage-point mortgage rate upward adjustment for stress testing property mortgage loan applicants' debt servicing ability.



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**Chart 5.14**  
New mortgage loans of surveyed AIs



Source: HKMA Residential Mortgage Survey.

### Corporate exposure<sup>41</sup>

Box 4 provides a comprehensive assessment on corporate leverage in Hong Kong based on different indicators from various data sources. Overall, the assessment supports the view that non-local corporates have played a bigger role in driving up the aggregate corporate leverage in Hong Kong after the global financial crisis and that some of these non-local corporates in Hong Kong may face significant debt-servicing problems when the US interest rate rises resume.

Looking forward, if the business environment deteriorates further, some non-local corporates' earnings could be hit harder and quicker, putting their debt-servicing ability under significant pressure. Meanwhile, local corporates may be indirectly affected by this unfavourable economic environment. Therefore, banks should assess how the possible deterioration of the external economic environment could have an impact on the asset quality of their corporate exposure.

Corporates' currency mismatches are another key factor that warrants close monitoring. The prolonged low interest rate environment may have encouraged corporates to take on excessive foreign exchange exposure without regard to the possible impact on the currency mismatch between their assets and liabilities.<sup>42</sup> Such currency mismatch could translate into significant losses and thus increase their default risk if exchange rates move unfavourably. Banks should remain cautious to corporates' currency mismatch risk.

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

The banking sector's Mainland-related lending resumed positive growth during the review period. Total Mainland-related lending rose by 3.4% to HK\$3,443 billion (15.6% of total assets) at the end of June 2016 from HK\$3,331 billion (15.5% of total assets) at the end of 2015 (Table 5.B).

Other non-bank exposures also increased by 7.5% to HK\$1,110 billion (Table 5.C).

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

HK\$ bn	Sep 2015	Dec 2015	Mar 2016	Jun 2016
Mainland-related loans	3,377	3,331	3,342	3,443
Mainland-related loans excluding trade finance	3,061	3,055	3,042	3,138
Trade finance	316	276	300	305
By type of AIs:				
Overseas-incorporated AIs	1,448	1,437	1,439	1,492
Locally-incorporated AIs*	1,380	1,358	1,363	1,413
Mainland banking subsidiaries of locally-incorporated AIs	549	536	540	538
By type of borrowers:				
Mainland state-owned entities	1,419	1,398	1,400	1,422
Mainland private entities	674	658	685	718
Non-Mainland entities	1,284	1,275	1,257	1,304

Notes:

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

Source: HKMA.

<sup>42</sup> 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 risks as a result.

<sup>41</sup> Excluding interbank exposure. At the end of June, the share of corporate loans in domestic lending was 70.2%.

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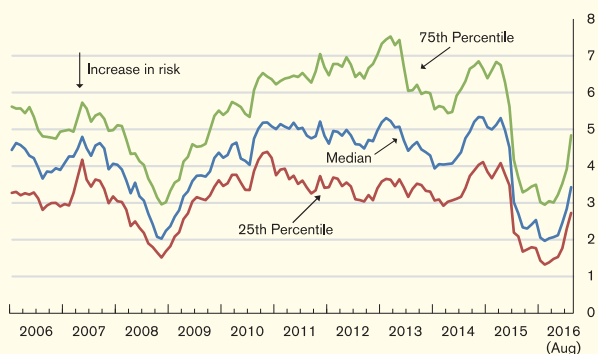
**Table 5.C**  
**Other non-bank exposures**

HK\$ bn	Sep 2015	Dec 2015	Mar 2016	Jun 2016
Negotiable debt instruments and other on-balance sheet exposures	668	647	647	685
Off-balance sheet exposures	406	386	413	425
<b>Total</b>	<b>1,073</b>	<b>1,033</b>	<b>1,060</b>	<b>1,110</b>

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

The distance-to-default index,<sup>43</sup> a market-based default risk indicator, points to a broad-based improvement in the default risk of the Mainland corporate sector since February (Chart 5.15). The decrease in default risk for the Mainland corporate sector is consistent with the improvement in the leverage ratio of the Mainland corporate sector (Chart 5.16).

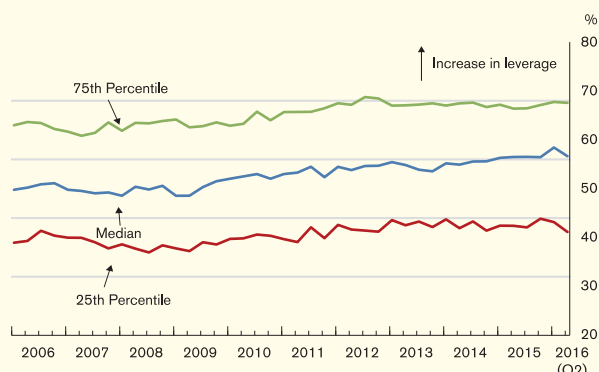
**Chart 5.15**  
**Distance-to-default index for the Mainland corporate sector**



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.

<sup>43</sup> The distance-to-default is a market-based default risk indicator based on the framework by R. Merton (1974), "On the pricing of corporate debt: the risk structure of interest rates", *Journal of Finance*, Vol. 29, pages 449-470, in which equity prices, equity volatility, and companies' financial liabilities are the determinants of default risk. In essence, it measures the difference between the asset value of a firm and a default threshold in terms of the firm's asset volatility.

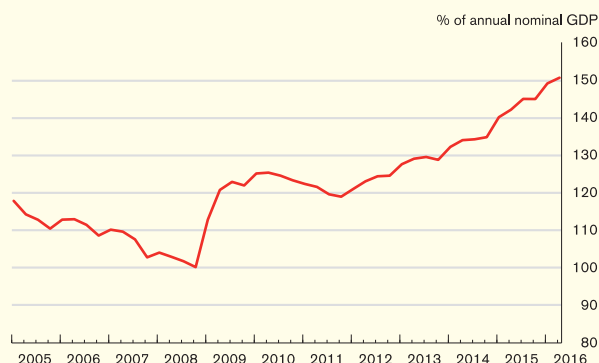
**Chart 5.16**  
**Leverage ratio for the Mainland corporate sector**



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.

However, the classified loan ratio of Mainland-related lending of retail banks<sup>44</sup> increased to 0.92% at the end of June 2016 from 0.78% at the end of December 2015. In view of possible further slowdown of the Mainland economy and the risk of excessive credit, as revealed from the rising trend of the credit-to-GDP ratio (Chart 5.17), banks should remain attentive to the credit risk management of their Mainland-related lending.

**Chart 5.17**  
**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.

<sup>44</sup> Figures covered retail banks' Hong Kong offices, Mainland branches and subsidiaries.



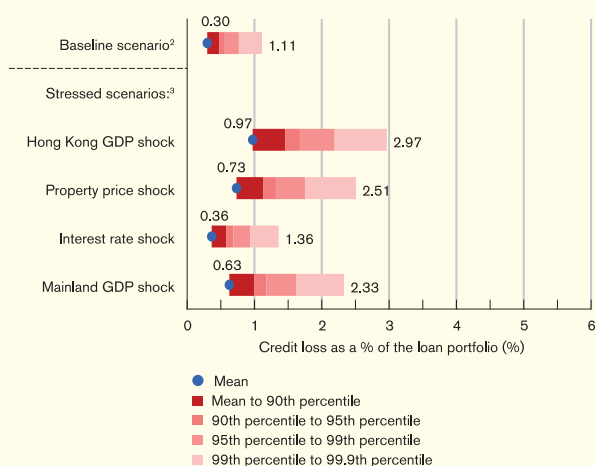
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*Macro stress testing of credit risk<sup>45</sup>*

Results of the latest macro stress testing on retail banks' credit exposure suggest that the Hong Kong banking sector remains resilient and should be able to withstand rather severe macroeconomic shocks, similar to those experienced during the Asian financial crisis. Chart 5.18 presents the simulated future credit loss rate of retail banks in the second quarter of 2018 under four specific macroeconomic shocks<sup>46</sup> using information up to the second quarter of 2016.

Taking account of tail risk, banks' credit losses (at the confidence level of 99.9%) under the stress scenarios range from 1.36% (Interest rate shock) to 2.97% (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 distributions<sup>1</sup>



## Notes:

- The assessments assume the economic conditions in 2016 Q2 as the current environment. The Monte Carlo simulation method is adopted to generate the credit loss distribution for each scenario.
- Baseline scenario: no shock throughout the two-year period.
- 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 2016 Q3 to 2017 Q2.
  - 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 2016 Q3 to 2017 Q2.
  - Interest rate shock:** A rise in real interest rates (HIBORs) by 300 basis points in the first quarter (i.e. 2016 Q3), followed by no change in the second and third quarters and another rise of 300 basis points in the fourth quarter (i.e. 2017 Q2).
  - Mainland GDP shock:** Slowdown in the year-on-year annual real GDP growth rate to 4% in one year.

Source: HKMA staff estimates.

**5.4 Systemic risk***The potential impact from Brexit*

Although the outcome of the Brexit referendum led to a significant instant impact on the global stock and foreign exchange markets, the global banking system has remained broadly intact so far.

In particular, while some individual European banks saw a significant drop in their stock prices right after the referendum, this negative stock market response has not translated into a notable increase in counterparty and liquidity risks that could systemically undermine the functioning of the global banking system. For instance, in the short-term US dollar funding market, the spread between the three-month US dollar London Interbank Offered Rate (LIBOR) and its corresponding overnight index swap (OIS) rate<sup>47</sup>, which is a common indicator of systemic liquidity risks, only widened slightly to around 40 basis points after the referendum (Chart 5.19).<sup>48</sup>

<sup>45</sup> Macro stress testing refers to a range of techniques used to assess the vulnerability of a financial system to "exceptional but plausible" macroeconomic shocks. The credit loss estimates presented in this report are obtained based on a revised framework from J. Wong et al. (2006), "A framework for stress testing banks' credit risk", *Journal of Risk Model Validation*, Vol. 2(1), pages 3-23. All estimates in the current report are not strictly comparable to those estimates from previous reports.

<sup>46</sup> These shocks are calibrated to be similar to those that occurred during the Asian financial crisis, except the Mainland GDP shock.

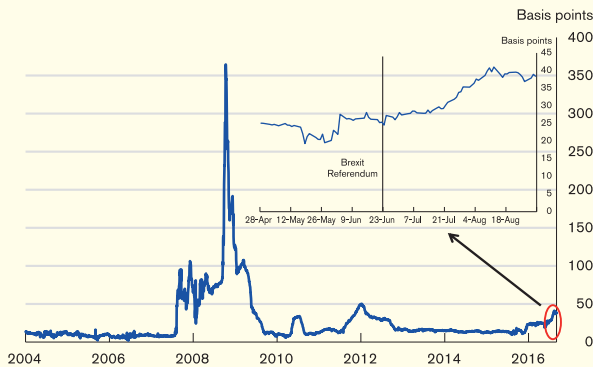
<sup>47</sup> An OIS is an interest rate swap in which the floating leg is linked to an index of daily overnight rates. The two parties agree to exchange at maturity, on an agreed notional amount, the difference between interest accrued at the agreed fixed rate and interest accrued at the floating index rate over the life of the swap. The fixed rate is a proxy for expected future overnight interest rates. As overnight lending generally bears lower credit and liquidity risks, the credit risk and liquidity risk premiums contained in the OIS rates should be small. Therefore, the LIBOR-OIS spread generally reflects the credit and liquidity risks in the interbank market.

<sup>48</sup> Anecdotal evidence suggests that the widened LIBOR-OIS spread is partially attributable to the upward pressure on LIBORs associated with the build-up of liquidity buffers by some US prime money market funds to pre-empt possible effects of the impending US money market reform in October 2016 on outflows of funds.

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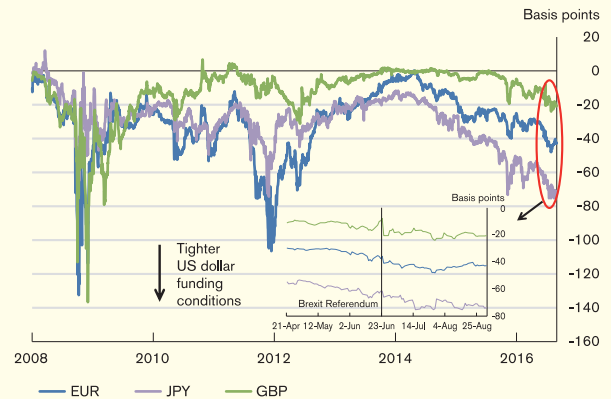
Nevertheless, the cost for longer-term US dollar funding increased somewhat after the Brexit vote, as indicated by a widened negative spread of 1-year cross-currency basis swap for major currencies against the US dollar (Chart 5.20).<sup>49</sup> The stronger market response in the longer-term funding market, as compared to the short-term market, may reflect that market participants remained cautious about the long-term effect of Brexit, and other political and economic risks in coming months.

**Chart 5.19**  
3-month US dollar LIBOR-OIS spreads



Source: Bloomberg.

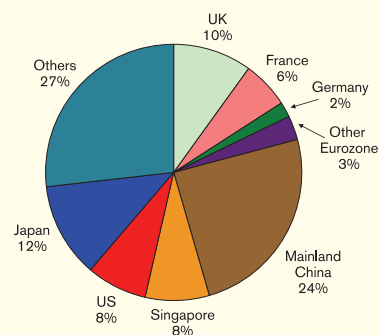
**Chart 5.20**  
1-year cross-currency basis swap spreads of major currencies against US dollar



Source: Bloomberg.

In the longer-term, Brexit may structurally alter the interconnectedness between the UK and euro-area economies, which, in theory, could lead to significant shifts in cross-border banking flows. This could have an important implication for global financial stability in view of the unmatched role of the UK banking system in distributing international banking flows, particularly for US dollar interbank funding. Any abrupt shift in banking flows from the UK banking system could have a spillover effect to Hong Kong as the direct exposure of the Hong Kong banking sector to banks in the UK and the broader euro area is not immaterial (Chart 5.21).

**Chart 5.21**  
External claims of the Hong Kong banking sector on banks in selected economies at the end of June 2016



Note: Figures may not add up to 100% due to rounding.  
Sources: HKMA.

<sup>49</sup> For illustration, in a cross currency basis swap for a EUR/USD, a party borrowing US dollars (which lends EUR at the same time to the counterparty) will pay US dollar LIBOR and receive EUR LIBOR plus a spread (i.e. shown in Chart 5.20) during the contract. When the contract expires, these two parties exchange the principal. A negative spread means that the US dollar borrower accepts a lower EUR interest rate paid by the counterparty than EUR LIBOR. Therefore, a negative spread indicates a tighter US dollar funding condition, which could reflect differences in demand and supply of the two currencies involved, monetary policies and counterparty risks.

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*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 14 January 2016 that the CCyB for Hong Kong will increase to 1.25% with effect from 1 January 2017, from the current 0.625%.<sup>50</sup> This is reflective of the fact that, under the Basel III phase-in arrangements, the maximum CCyB under Basel III will increase to 1.25% of banks' risk-weighted assets on 1 January 2017 from 0.625% effective from 1 January 2016.<sup>51</sup>

In setting the CCyB rate, the Monetary Authority considered a series of indicators (Table 5.D), including an "indicative buffer guide" (which is a metric providing a guide for CCyB rates based on credit-to-GDP and property price-to-rent gaps<sup>52</sup>). Based on the latest information up to the decision date at the end of the second quarter, both the credit-to-GDP gap and the property price-to-rent gap narrowed to 10.4% and 6.0% respectively, compared to 15.3% and 13.1% on the last announcement date, suggesting a slower pace of credit growth and signs of easing in the property market. However, 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 would signal a CCyB of 1.9%, remaining higher than the 1.25% that will be in effect from 1 January 2017.

<sup>50</sup> Further details of the decision may be found in the press release "Monetary Authority Announces Countercyclical Capital Buffer for Hong Kong" issued on 14 January 2016 which is available on the HKMA website.

<sup>51</sup> Under the Basel III phase-in arrangements, the maximum CCyB rate was capped at 0.625% on 1 January 2016, with the cap rising by 0.625 percentage points each subsequent year until it reaches 2.5% on 1 January 2019.

<sup>52</sup> 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.

In addition, the information drawn from other reference indicators<sup>53</sup> was, in the view of the Monetary Authority, consistent with the signal from the indicative buffer guide.

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

	27-Jan-15	14-Jan-16	Q2-2016
Announced CCyB rate	0.625%	1.25%	
Date effective	01/01/2016	01/01/2017	
Indicative buffer guide	2.5%	2.5%	1.9%
Basel Common Reference Guide	2.5%	2.5%	2.5%
Property Buffer Guide	2.5%	2.5%	1.2%
Composite CCyB Guide	2.5%	2.5%	1.9%
Indicative CCyB Ceiling	None	None	None
<i>Primary gap indicators</i>			
Credit/GDP gap	32.8%	15.3%	10.4%
Property price/rent gap	14.2%	13.1%	6.0%
<i>Primary stress indicators</i>			
3-month HIBOR spread (percentage points)	0.17%	0.30%	0.44%
Quarterly change in classified loan ratio (percentage points)	-0.01%	0.07%	0.08%

Note: The values of all CCyB guides, the Indicative CCyB Ceiling and their respective input variables are based on public data available prior to the corresponding decision, 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.

Source: HKMA.

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

<sup>53</sup> These included measures of bank, corporate and household leverage; debt servicing capacity; profitability and funding conditions within the banking sector and macroeconomic imbalances.

## Banking sector performance

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

	Jun 2015	Mar 2016	Jun 2016
<b>Interest rates</b>			
1-month HIBOR fixing <sup>2</sup> (quarterly average)	0.24	0.29	0.22
3-month HIBOR fixing (quarterly average)	0.39	0.58	0.54
BLR <sup>3</sup> and 1-month HIBOR fixing spread (quarterly average)	4.76	4.71	4.78
BLR and 3-month HIBOR fixing spread (quarterly average)	4.61	4.42	4.46
Composite interest rate <sup>4</sup>	0.29	0.26	0.26
<b>Retail banks</b>			
<b>Balance sheet developments<sup>5</sup></b>			
Total deposits	1.7	1.6	0.8
Hong Kong dollar	2.5	0.3	1.9
Foreign currency	0.6	3.2	-0.5
Total loans	-0.5	0.4	2.8
Domestic lending <sup>6</sup>	-1.8	0.3	3.6
Loans for use outside Hong Kong <sup>7</sup>	5.5	0.8	-0.5
Negotiable instruments			
Negotiable certificates of deposit (NCDs) issued	-15.0	-19.6	-1.1
Negotiable debt instruments held (excluding NCDs)	6.2	3.8	1.4
<b>Asset quality</b>			
As a percentage of total loans <sup>8</sup>			
Pass loans	98.23	97.77	97.80
Special mention loans	1.28	1.45	1.40
Classified loans <sup>9</sup> (gross)	0.49	0.78	0.80
Classified loans (net) <sup>10</sup>	0.35	0.56	0.56
Overdue > 3 months and rescheduled loans	0.29	0.54	0.58
Classified loan ratio (gross) of Mainland related lending <sup>11</sup>	0.73	0.94	0.92
<b>Profitability</b>			
Loan impairment charges as a percentage of average total assets <sup>12</sup>	0.07	0.07	0.07
Net interest margin <sup>12</sup>	1.32	1.28	1.30
Cost-to-income ratio <sup>13</sup>	43.5	43.8	42.7
<b>All AIs</b>			
<b>Liquidity ratios (quarterly average, consolidated)</b>			
Liquidity Coverage Ratio — category 1 institutions	131.7	152.7	158.0
Liquidity Maintenance Ratio — category 2 institutions	53.4	53.2	53.8
<b>Surveyed institutions</b>			
<b>Asset quality</b>			
Delinquency ratio of residential mortgage loans	0.03	0.04	0.04
Credit card lending			
Delinquency ratio	0.23	0.27	0.27
Charge-off ratio — quarterly annualised	2.10	1.91	2.17
— year-to-date annualised	1.91	1.91	2.00
<b>All locally incorporated AIs</b>			
<b>Capital adequacy (consolidated)</b>			
Common Equity Tier 1 capital ratio	13.7	14.6	15.8
Tier 1 capital ratio	14.4	15.4	16.6
Total capital ratio	17.5	18.2	19.4

## 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 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 retail banks' 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 4 Assessing corporate leverage in Hong Kong

### Introduction

The prolonged period of low interest rates in major advanced economies after the global financial crisis (GFC) raises questions about levels of corporate leverage. To shed light on this issue, this Box examines the leverage of non-financial corporates in Hong Kong.<sup>54</sup> We kick off the analysis by studying the ratio of corporate debt to GDP, a common aggregate indicator used for international comparison, and highlight its limitations in financial stability analysis for Hong Kong. To reveal a clearer picture of corporate leverage in Hong Kong, we complement the analysis by using firm-level accounting data of listed corporates in Hong Kong. Finally, a market-based indicator will be examined to provide a forward-looking assessment.

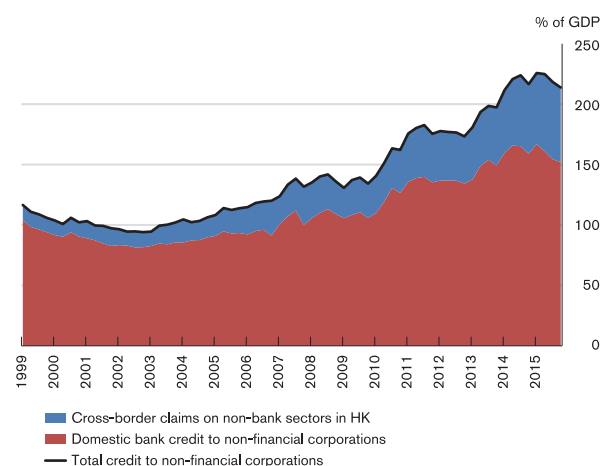
### The aggregate indicator of corporate leverage and its limitation

The corporate debt to GDP ratio is a common indicator of corporate leverage for an economy. Chart B4.1 presents the ratio for Hong Kong compiled by the BIS. Here, corporate debt includes credit from banks resident in and outside Hong Kong. This information enables us to assess how domestic and cross-border credits respectively contribute to changes in corporate leverage in Hong Kong.

As expected, there has been a rising trend in corporate leverage for Hong Kong amid the low interest rate environment. The aggregate indicator increased significantly after the GFC and reached its peak of 226% in the first quarter of 2015 before stabilising to 214% at the end of 2015.

Although banks in Hong Kong remained the major fund providers to corporates in Hong Kong (i.e. see the red area), cross-border credit registered a rapid expansion (i.e. the blue area) after the GFC. The latter reflects that corporates in Hong Kong would become more vulnerable to funding shocks arising from banking sectors overseas. It may also be suggestive of higher interconnectedness between the domestic and foreign banking sectors through their common exposure to corporates in Hong Kong. As shown, the aggregate indicator can provide important information to policymakers.

**Chart B4.1**  
Aggregate corporate leverage in Hong Kong



Source: BIS.

However, caution should be exercised when interpreting the level of this aggregate indicator, as it tends to overstate corporate leverage in Hong Kong. Specifically, the aggregate indicator, which is conceptually akin to a debt-to-income ratio, attempts to measure the ability of corporates in Hong Kong to service their debt by income. However, Hong Kong's GDP (i.e. the denominator) may not be a suitable proxy for income of corporate borrowers of banks in Hong Kong. This is mainly due to the fact that Hong Kong is an international financial centre and therefore many multinational and non-local

<sup>54</sup> Throughout the analysis, corporates refer to non-financial corporates which exclude banks, financial service firms, insurance companies and real estate investment trusts.

## Banking sector performance

corporates borrow their funds from Hong Kong to finance their overseas operations.<sup>55</sup> Their economic activities and thus income are not fully reflected in Hong Kong's GDP.

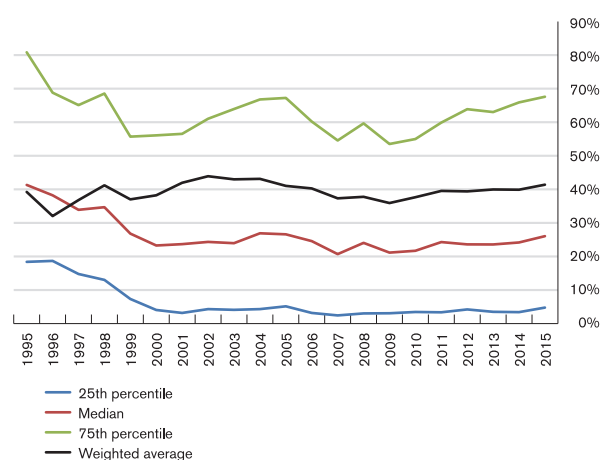
In addition, similar to other aggregate measures, the corporate debt to GDP ratio cannot reveal which types of corporates are the main drivers for the rising corporate debt in Hong Kong.

### Micro evidence from corporates listed in Hong Kong

Given the limitations of the aggregate indicator, we complement the analysis by using accounting data of corporates listed in Hong Kong. To reveal corporate leverage more accurately, we study their debt-to-equity ratios. Since local and non-local corporates listed in Hong Kong may experience different developments in respect of leverage, we split the whole sample into two sub-samples, i.e. corporates domiciled in Hong Kong and corporates domiciled outside Hong Kong (henceforth referred to as local and non-local corporates respectively).<sup>56</sup>

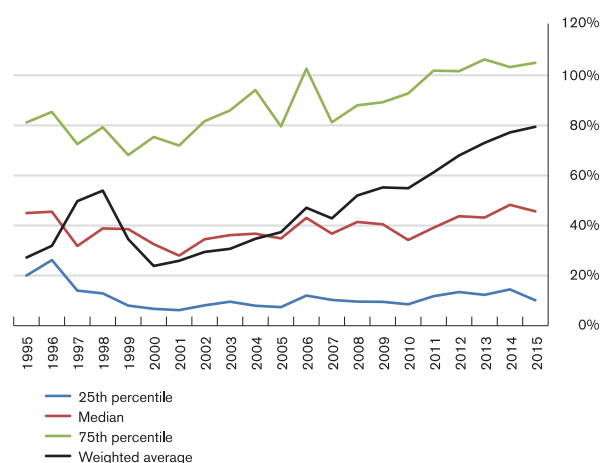
Charts B4.2 and B4.3 present the distribution of leverage for local and non-local corporates respectively. The two sub-samples demonstrate notable different developments in respect of leverage. For local corporates, the average leverage remained broadly steady at around 40%, while the leverage for highly leveraged local corporates (i.e. the 75th percentile, see the green line in Chart B4.2) increased after the GFC. Nevertheless, it remained lower than the peak right before the Asian financial crisis.

**Chart B4.2**  
Debt-to-equity ratios of local corporates



Source: HKMA staff estimates based on data from Bloomberg.

**Chart B4.3**  
Debt-to-equity ratios of non-local corporates



Source: HKMA staff estimates based on data from Bloomberg.

By contrast, there was a broad-based increase in leverage for non-local corporates from 2010 (Chart B4.3). The average leverage for non-local corporates increased markedly to 79% in 2015 from 55% in 2010. For highly leveraged non-local corporates (i.e. the 75th percentile), their debt-to-equity ratios exceeded 100% at the end of 2015, meaning that they fund their business primarily by debt.

<sup>55</sup> Based on annual reports of some large banks in Hong Kong, the average share of loans to customers located outside Hong Kong accounted for about 25% of their total loans at the end of 2015.

<sup>56</sup> There were 1,917 listed corporates in our sample spanning from 1995 to 2015, of which 1,267 are domiciled in Hong Kong while the rest are domiciled outside Hong Kong.

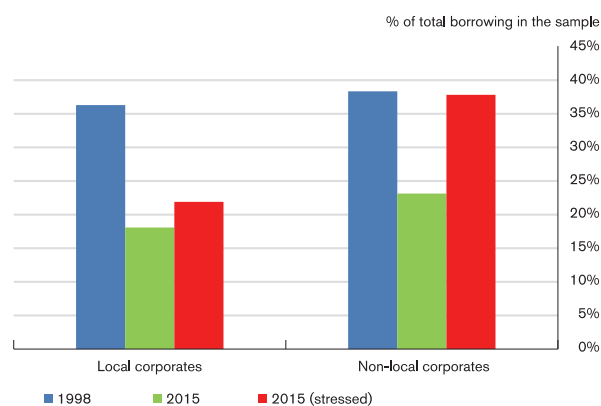


The rising leverage of non-local corporates poses a question on their debt-servicing ability. Debt-at-risk (DaR)<sup>57</sup>, which is defined as the amount of debt for those corporates with an interest coverage ratio (ICR) lower than one (i.e. corporates with insufficient earnings<sup>58</sup> in a year to cover interest expenses in that year), as a share of total corporate debt can help answer this question.

Chart B4.4 presents the DaR for the two sub-samples based on their accounting data in 2015 (i.e. the green bars). Their DaRs after the Asian financial crisis (i.e. the blue bars) and under a hypothetical stress scenario (i.e. the red bars) are also estimated for comparison. When estimating the stressed DaRs, we assume that corporate earnings and interest expenses in 2015 declined by 26% and increased by 14% respectively, which essentially resembles what happened during the Asian financial crisis.

Consistent with the findings shown in Charts B4.2 and B4.3, non-local corporates would be more exposed to debt-servicing problems should rising interest rates and/or deteriorations of earnings occur. This can be seen by noting that although currently the DaR for both local and non-local corporates stayed at a relatively low level, the stressed DaR for non-local corporates would increase drastically to a level similar to that which occurred during the Asian financial crisis.

**Chart B4.4**  
**Debt-at-risk of local and non-local corporates in Hong Kong**



Source: HKMA staff estimates based on data from Bloomberg.

#### *A market-based assessment*

Although firm-level accounting data can help assess corporate leverage, the backward-looking nature and the time lag in data availability would limit their usefulness, particularly during periods when financial and economic conditions are more volatile. Market-based default risk indicators, which extract information from high-frequency financial data e.g. stock prices, have been increasingly adopted in financial stability analysis. One common measure is the distance-to-default (DTD).<sup>59</sup> By construction, a lower DTD implies a higher default risk.

Focusing on corporates with lower debt-servicing ability, Chart B4.5 shows the median DTD for the two groups of corporates with an ICR lower than one. Before the second half of 2015, the market-based indicator reflected a lower default risk for non-local corporates than their local counterparts, which is contrary to the previous assessment based on Chart B4.4. However, the more positive assessment for non-local

<sup>57</sup> The calculation of debt-at-risk follows the same methodology used in the IMF *Global Financial Stability Report* issued in April 2016.

<sup>58</sup> Earnings before interest and taxes.

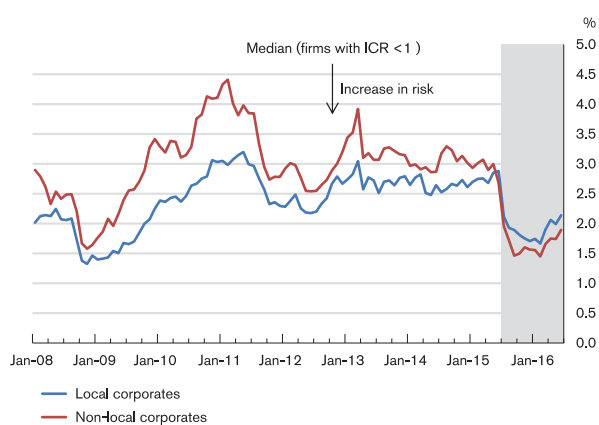
<sup>59</sup> The distance-to-default is a market based default risk indicator based on the framework by R. Merton (1974), "On the pricing of corporate debt: the risk structure of interest rates", *Journal of Finance*, Vol. 29, pages 449-470, in which equity prices, equity volatility, and companies' financial liabilities are the determinants of default risk. In essence, it measures the difference between the asset value of a firm and a default threshold in terms of the firm's asset volatility.

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corporates by the DTD is consistent with their higher stock price valuations which may reflect that financial market participants might expect better growth prospects for non-local corporates, particularly for Mainland corporates.

It was not until the second half of 2015 that the global financial market turmoil triggered by the Mainland stock market crash led to a reappraisal of corporate fundamentals by financial market participants. As a result, non-local corporates turned to show a higher average default risk than local corporates. Although tentative signs of improvement in default risk appeared for both groups of corporates in the second quarter of 2016, the sustainability of improvement remains a question given the fragile global business environment.

**Chart B4.5**  
**Median distance-to-default of corporates with an ICR lower than one**



Source: HKMA staff estimates based on data from Bloomberg.

## Conclusion

Assessing corporate leverage has long played an important part in financial stability analysis. This Box conducts an assessment of corporate leverage in Hong Kong based on different indicators from various data sources in order to reveal a clear picture. Overall, the assessment supports the view that non-local corporates in Hong Kong have played a bigger role in driving up the aggregate corporate leverage in Hong Kong after the GFC. Some of these non-local corporates in Hong Kong could face significant debt-servicing problems when the US interest rate rises resume.

Looking forward, if the already fragile global economic environment deteriorates further, non-local corporates' earnings could be hit harder and quicker, putting their debt-servicing ability to the test. Meanwhile, local corporates are far from immune to this unfavourable environment. Therefore, banks should assess how the possible deterioration of external environments could have an impact on the asset quality of their corporate exposure.