5. Banking sector performance

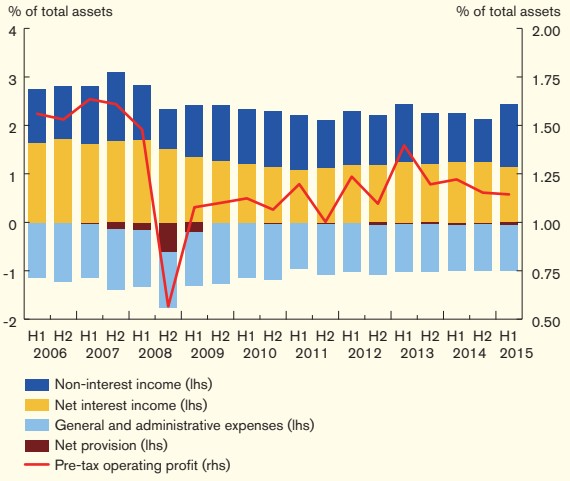
The local banking sector continued to post healthy performance, characterised by stable earnings growth, strong capital positions and sound asset quality. The liquidity conditions of the banking sector remained favourable, with the average liquidity ratios under Basel III staying well above the regulatory minimum. However, the financial market turmoil coupled with possible deterioration in business environment may weaken corporates' fundamentals. This together with the expected interest rate rises in the US could exert upward pressure on corporates' financing costs, posing challenges for banks' credit risk management in view of the rising leverage and debt-servicing burden of the corporate sector in recent years. The increasing share of Mainland-related lending coupled with slower economic growth in Mainland China remains a key risk factor to watch for.

5.1 Profitability and capitalisation

Profitability

Retail banks[38] registered stable earnings growth in the first half of 2015, with pre-tax operating profits bouncing back by 5.4% from the second half of 2014 (see the bars in Chart 5.1). The improvement in earnings was mainly due to substantial growth in non-interest income, which more than offset lower net interest income. However, reflecting relatively faster growth in assets than earnings, the return on assets of retail banks receded slightly to 1.14% in the first half of 2015 from 1.15% in the second half of 2014 (i.e. the red line in Chart 5.1).

Chart 5.1
Profitability of retail banks



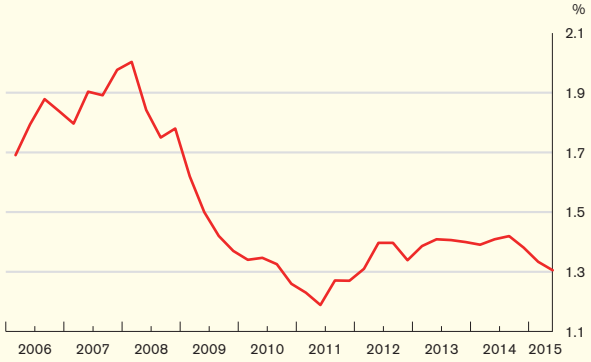
Note: Semi-annually annualised figures.
Source: HKMA.

The net interest margin (NIM) of retail banks declined to an average of 1.32% in the first half of 2015 (Chart 5.2). The fall in NIM was in line with anecdotal evidence of a declining average yield of corporate loans that emerged from the syndicated loan market in Hong Kong (Chart 5.3). Nevertheless, funding costs of banks were also reduced. For licensed banks as a whole, their overall interest costs registered a mild decrease of 7 basis points in the first half of 2015, contributed by a fall in both deposit and market-

[38] Throughout this chapter, figures for the banking sector relate to Hong Kong offices only, except where otherwise stated.

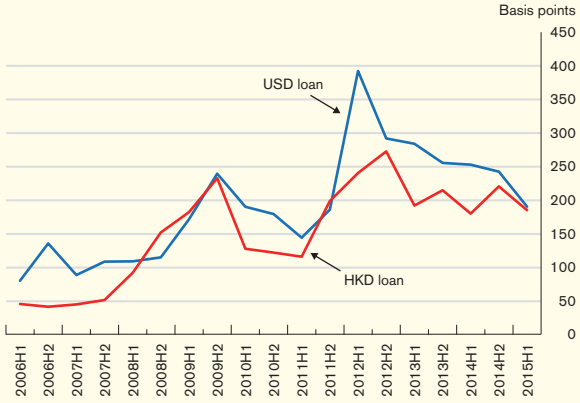
based funding costs (Chart 5.4).[39] The composite interest rate, a measure of the average cost of Hong Kong dollar funds for retail banks, decreased by 10 basis points during the first half of 2015 to 0.29% at the end of June, and further declined to a recent low of 0.26% at the end of July (Chart 5.5).

Chart 5.2
Net interest margin of retail banks



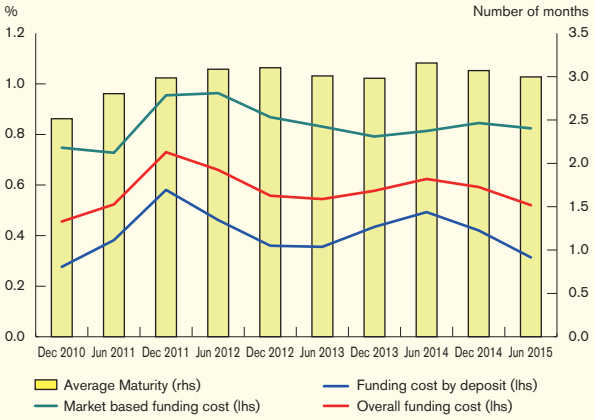
Note: Quarterly annualised figures.
Source: HKMA.

Chart 5.3
Average pricing of syndicated loans



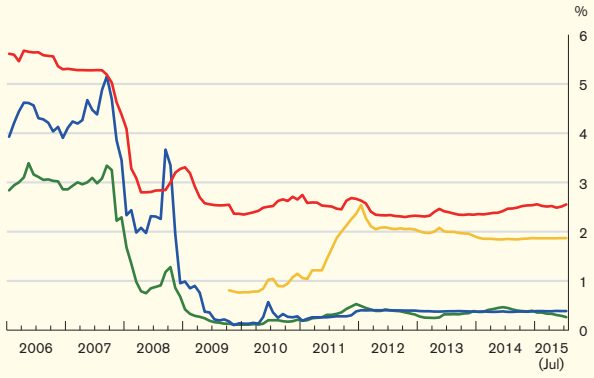
Note: The average pricing of syndicated loans is weighted by the loan amounts and the pricing of loans refers to sum of spread and the corresponding reference rate.
Source: HKMA staff estimates based on data from LoanConnector.

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



Source: HKMA.

Chart 5.5
Interest rates



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

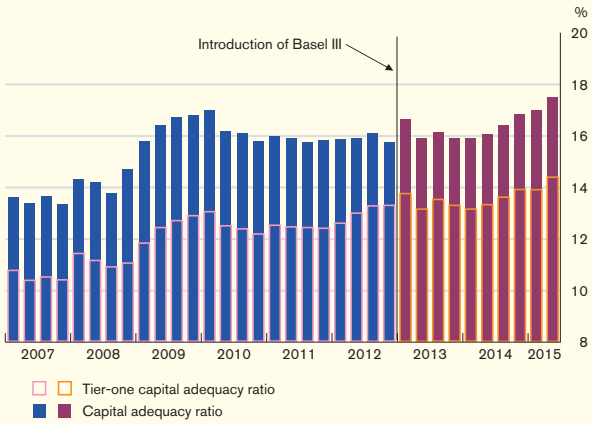
During the first half of 2015, both the HIBOR-based and the best lending rate-based (BLR-based) mortgage rates remained broadly stable. Partly reflecting the persistent lower price of HIBOR-based mortgages, the share of HIBOR-based mortgages amongst newly approved mortgage loans stayed steady at 85.8% at the end of June.

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

Capitalisation

Capitalisation of the banking sector remained well above the minimum international standards. The consolidated capital adequacy ratio of locally incorporated AIs climbed to 17.5% at the end of June from 16.8% at the end of 2014 (Chart 5.6), with the tier-one capital adequacy ratio[40] also increasing to 14.4% from 13.9%.

Chart 5.6
Capitalisation of locally incorporated AIs



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

Source: HKMA.

5.2 *Liquidity, interest rate and credit risks*

Liquidity and funding

The Basel III Liquidity Coverage Ratio (LCR)[41] requirement became effective from 1 January 2015. The liquidity position of the banking sector continued to be favourable during the review period. In particular, the average LCR of category 1 institutions was 131.7% in the second quarter of 2015, while the average Liquidity Maintenance Ratio (LMR) of category 2 institutions was 53.4% (Table 5.A). Both ratios were well above the regulatory minimum[42], suggesting that AIs in Hong Kong are generally not expected to encounter major difficulties in complying with the new liquidity standard over the transition period.

Table 5.A
Liquidity ratios

Quarterly average ratios (%)	2014 Q3	2014 Q4	2015 Q1	2015 Q2
Liquidity Coverage Ratio (Consolidated) — Category 1 institutions	n.a.	n.a.	129.9	131.7
Liquidity Maintenance Ratio (Consolidated) — Category 2 institutions	n.a.	n.a.	50.8	53.4
Liquidity ratio (Hong Kong Offices) — Retail banks	41.2	41.1	n.a.	n.a.

Note: n.a.: Not applicable
Source: HKMA.

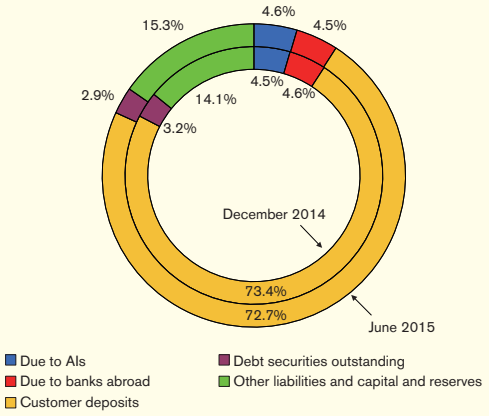
[40] The ratio of tier-one capital to total risk-weighted assets.

[41] 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, the requirement is implemented in two tiers: category 1 institutions adopt the LCR; category 2 institutions adopt the LMR, which is modified from the original liquidity ratio requirement.

[42] 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 a LMR of not less than 25% on average in each calendar month.

Meanwhile, customer deposits continued to be the primary funding source for retail banks, underpinning a stable funding structure. During the review period, the share of customer deposits to banks' total liabilities declined slightly to 72.7% at the end of June (Chart 5.7), but remained at a high level.

Chart 5.7
Liabilities structure of retail banks



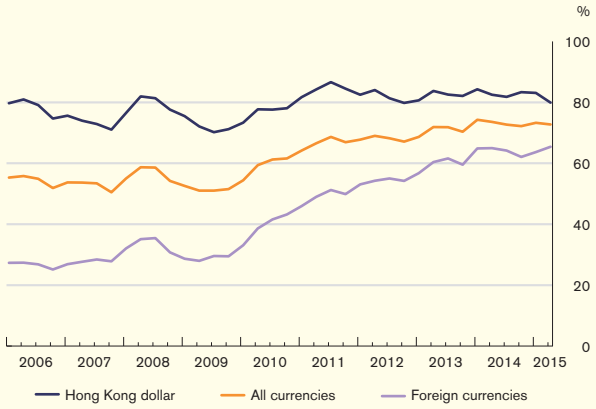
Notes:
1. Figures may not add up to total due to rounding.
2. Figures refer to the percentage of total liabilities (including capital and reserves).
3. Debt securities comprise negotiable certificates of deposit and all other negotiable debt instruments.

Source: HKMA.

On a half-year basis, the Hong Kong dollar loan-to-deposit (LTD) ratio for all AIs decreased by 3.4 percentage points to 79.9% at the end of June (Chart 5.8), due to a relatively stronger rise in Hong Kong dollar deposits which outpaced the moderate growth in Hong Kong dollar loans. In contrast, the foreign currency LTD ratio of all AIs increased notably to 65.4% at the end of June 2015, compared with 62.1% at the end of 2014. On the whole, the all-currency LTD ratio for all AIs increased slightly by 0.5 percentage point to 72.7% at the end of June.

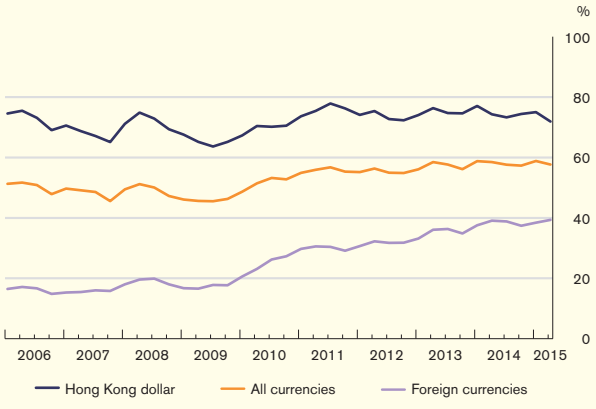
Retail banks' LTD ratios also exhibited similar development (Chart 5.9). The Hong Kong dollar LTD ratio declined tangibly by 2.5 percentage points to 71.9% at the end of June, while the foreign currency LTD ratio rose slightly by 1.9 percentage points to 39.3%. On the whole, the all-currency LTD ratio for retail banks stayed steady at 57.6%.

Chart 5.8
Average loan-to-deposit ratios of all AIs



Source: HKMA.

Chart 5.9
Average loan-to-deposit ratios of retail banks

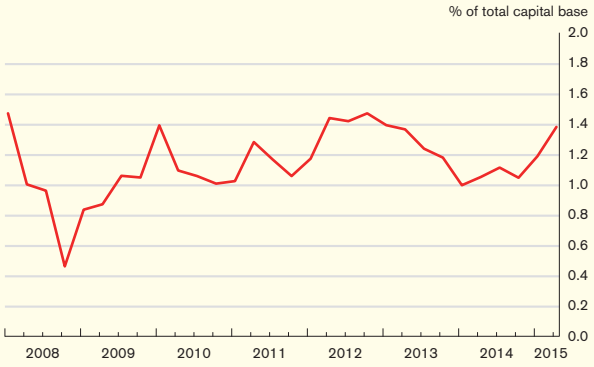


Source: HKMA.

Interest rate risk

Interest rate risk exposure of retail banks remained manageable during the review period. It is estimated that under a hypothetical shock of an across-the-board 200-basis-point increase in interest rates, the economic value of retail banks' interest rate positions could be subject to a decline equivalent to 1.38% of their total capital base as of June 2015 (Chart 5.10). Banks should remain alert to risks associated with the uncertainty of both the pace and timing of the US interest rate hikes.

Chart 5.10
Impact of interest rate shock on retail banks



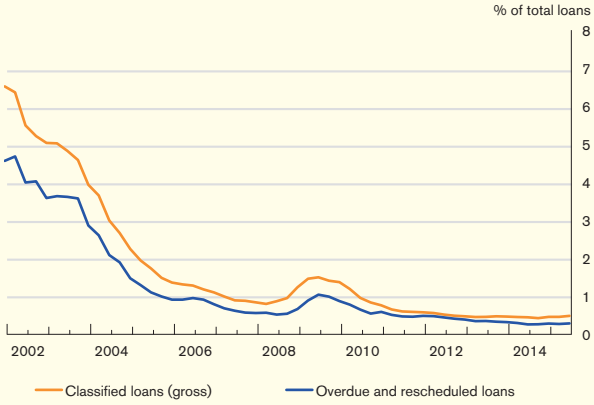
Notes:
1. Interest rate shock refers to a standardised 200-basis-point parallel rate shock to institutions' interest rate risk exposures.
2. The impact of the interest rate shock refers to its impact on the economic value of banking and trading book[43], expressed as a percentage of the total capital base of banks.

Source: HKMA staff estimates.

Credit risk

There were tentative signs of deterioration in asset quality of retail banks, with the classified loan ratio increasing slightly to 0.49% at the end of June, from 0.47% at the end of 2014, while the ratio of overdue and rescheduled loans stayed at 0.29% during the period (Chart 5.11). Nevertheless, both ratios remained low by historical standard, suggesting that the asset quality of retail banks' loan portfolios remained healthy.

Chart 5.11
Asset quality of retail banks



Notes:
1. Classified loans are those loans graded as "sub-standard", "doubtful" or "loss".
2. Figures related to retail banks' Hong Kong office(s) and overseas branches.

Source: HKMA.

Credit growth continued to be moderate in the first half of 2015, although there was a surge in growth at the end of March driven by a temporary increase in IPO loans. On a half-year basis, domestic lending[44] of AIs grew by 5.0% in the first half of 2015, compared to 0.4% in the second half of 2014.[45]

According to the results of the HKMA Opinion Survey on Credit Condition Outlook of June 2015, the share of surveyed AIs expecting loan demand to remain the same in the next three months had increased to 95%, whereas there were some surveyed AIs expecting a lower loan demand (Table 5.B). Credit condition outlook had turned to be more neutral, compared to the optimism in the second half of 2014.

[43] 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 and overseas incorporated institutions are required to report aggregate positions in the banking book and trading book.

[44] Defined as loans for use in Hong Kong plus trade-financing loans.

[45] The growth rate is different from that in the previous report due to revised figures of domestic lending in December 2014.

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

% of total respondents	Sep-14	Dec-14	Mar-15	Jun-15
Considerably higher	0	0	0	0
Somewhat higher	19	10	10	0
Same	81	90	86	95
Somewhat lower	0	0	5	5
Considerably lower	0	0	0	0
Total	100	100	100	100

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

Household exposure

Household loan[46] growth moderated to 5.0% in the first half of 2015 from 5.9% in the second half of 2014, which was in line with a lower mortgage loan growth of 4.5% from 5.2% (Table 5.C).

Growth in other loans for private purposes (i.e. personal loans) accelerated to 10.5% in the first half of 2015, compared to 6.9% in the second half of 2014. Banks are reminded to stay prudent on personal lending business.

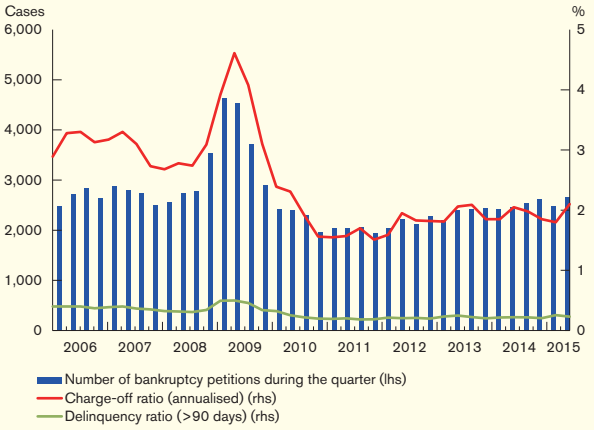
Table 5.C
Half-yearly growth of loans to households of all AIs

	2012		2013		2014		2015
(%)	H1	H2	H1	H2	H1	H2	H1
Mortgages	2.5	5.0	3.1	0.8	3.1	5.2	4.5
Credit cards	-1.6	15.3	-4.0	10.2	-4.1	10.4	-5.5
Other loans for private purposes	5.0	9.3	10.6	10.5	13.9	6.9	10.5
Total loans to households	2.6	6.5	3.8	3.3	4.6	5.9	5.0

Source: HKMA.

The credit risk of unsecured household exposure remained contained in the first half of 2015, with the annualised credit card charge-off ratio and the number of bankruptcy petitions staying relatively low (Chart 5.12). The delinquency ratio of credit card lending first increased by 6 basis points in the first quarter of 2015, before edging down by 3 basis points to 0.23% in the second quarter. Although the ratio increased in the first half of 2015, the level remained low by historical standard.

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



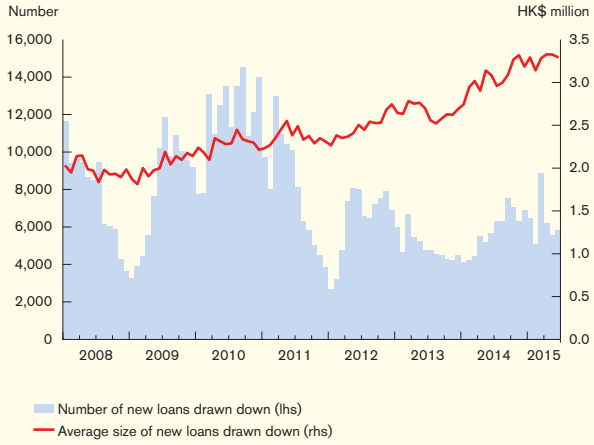
Sources: Official Receiver's Office and the HKMA.

Banks' mortgage portfolios remained healthy with the delinquency ratio hovering at 0.03%. However, the credit risk of mortgage lending business could increase drastically should the property market cycle turn or interest rates increase. To strengthen banks' risk management in relation to their mortgage lending business, the HKMA implemented another round of macro-prudential measures on banks' mortgage lending[47].

[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 June 2015, the share of household lending in domestic lending was 29.0%.

[47] On 27 February 2015, the HKMA introduced a new round of prudential supervisory measures on property mortgage business, which included lowering the maximum loan-to-value ratio and debt-servicing ratio, to strengthen banks' risk management and resilience. Meanwhile, the HKMA also required AIs using the internal ratings-based approach to extend, by end-June 2016, the risk-weight floor of 15% to residential mortgage loans approved before February 2013. For details, see HKMA press release "Prudential Supervisory Measures for Mortgage Lending" issued on the same date.

Chart 5.13
New mortgage loans of surveyed AIs

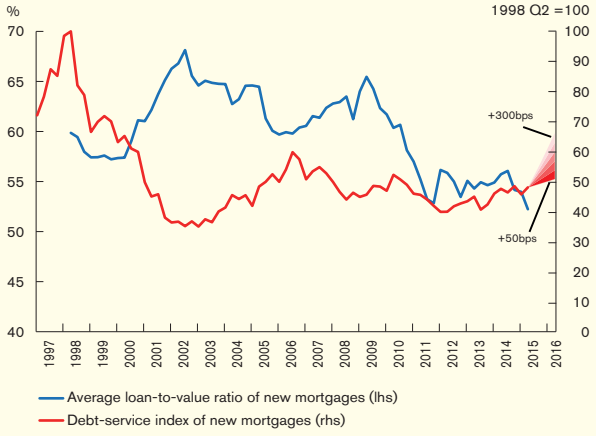


Source: HKMA Residential Mortgage Survey.

Largely reflecting the effect of the latest round of macro-prudential measures introduced in late-February, both the amount and the number of new mortgage loans drawn down shrank in the second quarter of 2015 (Chart 5.13).

The average loan-to-value ratio of new mortgage loans approved also declined to 52.2% in the second quarter of 2015 from 54.2% in the fourth quarter of 2014, suggesting that banks' resilience to property price shocks continued to be strong (Chart 5.14). The debt-service index of new mortgages[48] was largely unchanged at 48.1 in the second quarter of 2015, compared to 48.5 in the fourth quarter of 2014, suggesting that household repayment ability remained stable. Nevertheless, a sensitivity test still suggests that the debt-service index would rise significantly to 66.2 if interest rates were to increase by 300 basis points[49] and other things being constant. Given that households' debt servicing ability could come under significant pressures should the US interest rates rise, banks should continue to be attentive to risks associated with household debt-servicing burden.

Chart 5.14
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.

While macro-prudential policies (MPPs) have been increasingly adopted by policymakers globally to contain systemic risks after the global financial crisis, their implementations may come with unintended international spillover effects. Findings from Box 4 show that the Hong Kong banking sector is not immune to the spillover effect from home countries of foreign banks in Hong Kong. Our study further shows that both the pattern and the extent of the spillover effect of MPPs are crucially dependent on banks' balance sheet characteristics and types of MPP instruments being adopted. These findings suggest that policymakers may face significant challenges in achieving a coordinated implementation of MPPs across different jurisdictions.

[48] 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.

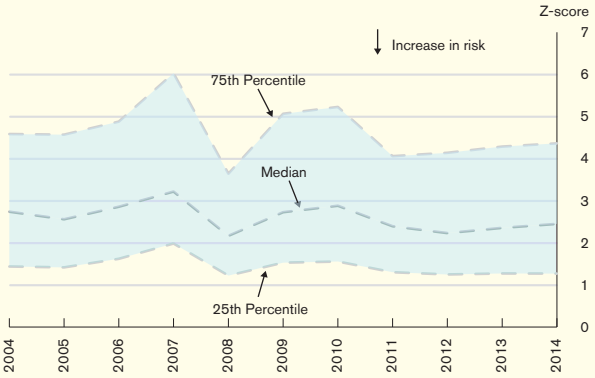
[49] The assumption of a 300-basis-point rise in interest rates is consistent with the prudential measure that requires AIs to have a 3-percentage-point mortgage rate upward adjustment for stress testing property mortgage loan applicants' debt servicing ability.

Corporate exposure[50]

Domestic loans to corporations grew by 5.0% in the first half of 2015, after declining by 1.7% in the second half of 2014. Loans to manufacturing and the wholesale and retail sectors saw noticeable moderation in growth, partly due to weakening domestic economic activities. At the end of June, corporate loans accounted for 70.8% of domestic lending.

The Altman's Z-score (Chart 5.15), a typical credit risk measure based on accounting data, stayed largely unchanged at healthy levels up to the end of 2014. Owing to the time lag of availability of accounting data, how the recent financial market turmoil would affect the corporate sector's fundamentals and default risk cannot be fully assessed. However, past episodes may shed light on this question. In particular, the Z-score dropped significantly right after the onset of the global financial crisis in 2007–08 and that of the euro-zone crisis in 2010–11 due mainly to deterioration in corporates' earnings and net worth. Drawing on this evidence, the corporate sector's default risk and thus financing cost could be adversely affected should the financial market turmoil persist or intensify.

Chart 5.15
Altman's Z-score: A bankruptcy risk indicator of listed non-financial companies



Notes:
1. A lower Z-score indicates a higher likelihood of a company default.
2. Figures are calculated based on information up to end-August 2015.

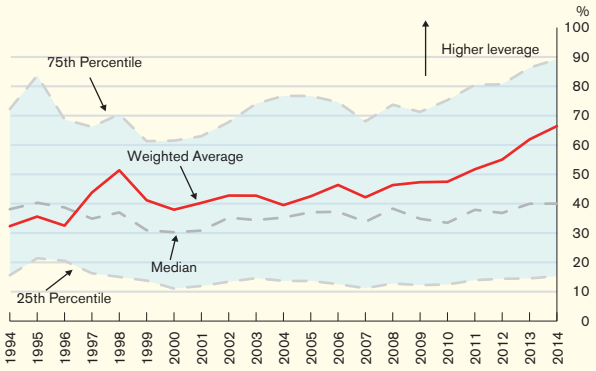
Source: HKMA staff estimates based on data from Bloomberg.

The possible rise in corporates' financing cost amid financial market instability together with the expected normalisation of the US interest rates would put the credit quality of corporate loans to the test in view of the rising trend of the corporate sector's leverage and debt-servicing burden after the global financial crisis. The leverage of the corporate sector as measured by weighted average debt-to-equity ratio has trended upward in recent years, with the ratio rising to 66.4% in 2014 (Chart 5.16). The rise in debt-service ratio, as measured by total interest expenses divided by earnings before interest and taxes (EBIT), suggests a general deterioration of local corporations' debt-servicing ability (Chart 5.17).

Meanwhile, given the prolonged period of low interest rate environment in major advanced economies, corporations may be encouraged to take on excessive foreign exchange exposure due to attractive borrowing rates without regard to the possible impact on the currency mismatch between their funding and earnings. Such currency mismatch could translate into significant losses and thus increase their default risk if exchange rates move unfavourably. Banks should remain vigilant to corporate currency mismatch risk.

[50] Excluding interbank exposure.

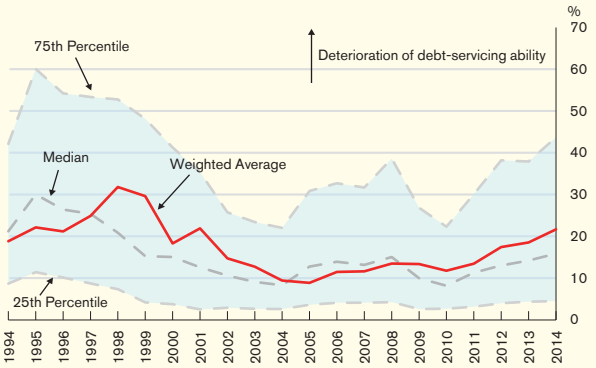
Chart 5.16
Leverage ratio of listed non-financial companies in Hong Kong



Notes:
1. The leverage ratio is defined as the ratio of debt to equity. A higher value indicates higher leverage.
2. All non-financial corporations listed on the Hong Kong Stock Exchange are selected.
3. Figures are calculated based on information up to end-August 2015.

Source: HKMA staff estimates based on data from Bloomberg.

Chart 5.17
Debt-service ratio of listed non-financial companies in Hong Kong



Notes:
1. Debt-service ratio is calculated by the total interest expenses divided by the earnings before interest and tax (EBIT). Companies with negative EBIT are excluded from the calculation.
2. All non-financial corporations listed on the Hong Kong Stock Exchange are selected.
3. Figures are calculated based on information up to end-August 2015.

Source: HKMA staff estimates based on data from Bloomberg.

Mainland-related lending and non-bank exposures

The banking sector continued to expand its business in Mainland China during the review period. Total Mainland-related lending increased by 8.1% to HK$3,486 billion (15.9% of total assets) at the end of the second quarter of 2015 from HK$3,224 billion (15.4% of total assets) at the end of 2014 (Table 5.D). During the review period, other non-bank exposures increased by 4.9% to HK$1,083 billion (Table 5.E).

Table 5.D
Mainland-related lending

HK$ bn	Sep 2014	Dec 2014	Mar 2015	Jun 2015
Mainland-related loans	3,062	3,224	3,439	3,486
Mainland-related loans excluding trade finance	2,641	2,869	3,053	3,114
Trade finance	421	355	386	373
By type of AIs:				
Overseas-incorporated AIs	1,315	1,388	1,468	1,476
Locally-incorporated AIs*	1,206	1,294	1,420	1,453
Mainland banking subsidiaries of locally-incorporated AIs	541	542	551	557
By type of borrowers:				
Mainland state-owned entities	1,430	1,480	1,576	1,548
Mainland private entities	563	585	653	653
Non-Mainland entities	1,068	1,160	1,209	1,285

Notes:
1. * Including loans booked in the Mainland branches of locally-incorporated AIs.
2. Figures may not add up to total due to rounding.

Source: HKMA.

Table 5.E
Other non-bank exposures

HK$ bn	Sep 2014	Dec 2014	Mar 2015	Jun 2015
Negotiable debt instruments and other on-balance sheet exposures	598	637	621	670
Off-balance sheet exposures	436	396	369	413
Total	**1,035**	**1,032**	**990**	**1,083**

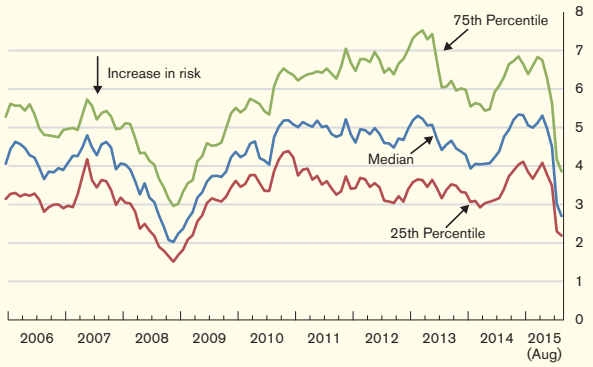
Note: Figures may not add up to total due to rounding.

Source: HKMA.

The rising share of banks' Mainland-related lending continues to be a key risk factor to watch for. In particular, the recent sharp fall of prices in the Mainland stock markets may spark concerns over the credit risk of Mainland-related exposure. A market-based default risk indicator (i.e. distance-to-default index)[51] points to a broad-based increase in credit risk of the Mainland corporate sector since June 2015 (Chart 5.18). The deterioration in default risk for the Mainland corporate sector was largely driven by heightened market volatility along with an increasing trend of corporate leverage (Chart 5.19). However, the level of credit risk remained lower than that during the global financial crisis, suggesting that the likelihood of a large-scale default in the Mainland corporate sector should not be significant in near term.

Nevertheless, in view of concerns over a possible further slowdown of the Mainland economy and its relatively high level of credit-to-GDP ratio (Chart 5.20), banks should be attentive to the credit risk management of their Mainland-related exposure.

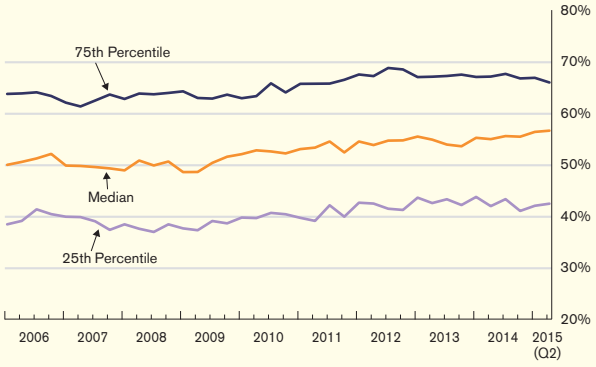
Chart 5.18
Distance-to-default index for the Mainland corporate sector



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

Source: HKMA staff estimates.

Chart 5.19
Leverage ratio for the Mainland corporate sector



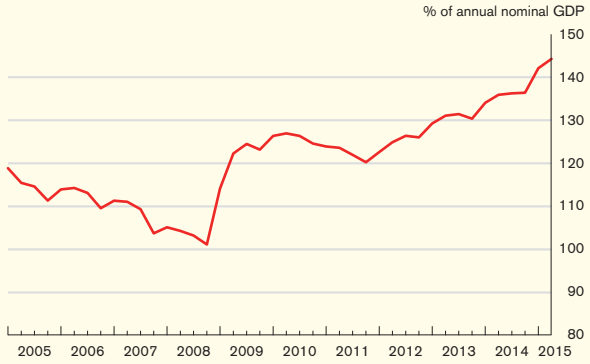
Notes:

1. The leverage ratio is defined as the ratio of total liabilities to total assets.
2. It is calculated based on 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.

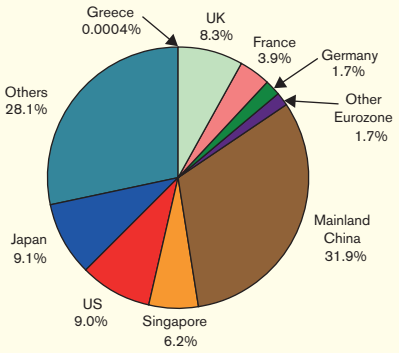
[51] The distance-to-default is a market-based default risk indicator based on the framework by R. Merton (1974), "On the pricing of corporate debt: the risk structure of interest rates", *Journal of Finance*, Vol. 29, pages 449–470, in which equity prices, equity volatility, and companies' financial 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 5.20
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 5.21
External claims of the Hong Kong banking sector on selected economies (all sectors) at the end of June 2015



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

The impact of possible contagion from Greece

The "Grexit" issue has threatened the financial stability in the euro area and sparked concerns about the potential spillover effect to the global banking sector. Such risk to the Hong Kong banking sector should be small given the small direct exposure to Greece (Chart 5.21). However, given that the exposure of the Hong Kong banking sector to some European banking sectors (e.g. UK, France and Germany) is significant, and the interconnectedness of these European banking sectors to Greece, banks in Hong Kong should continue to be pay close attention to the possible indirect contagion risk.

Macro stress testing of credit risk[52]

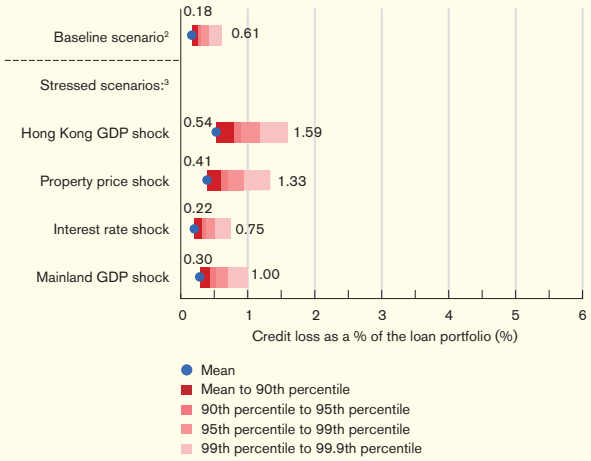
Results of the latest macro stress testing on retail banks' credit exposure suggest that the Hong Kong banking sector remains resilient and should be able to withstand rather severe macroeconomic shocks, similar to those experienced during the Asian financial crisis. Chart 5.22 presents the simulated future credit loss rate of retail banks in the second quarter of 2017 under four specific macroeconomic shocks[53] using information up to the second quarter of 2015.

Taking account of tail risk, banks' credit losses (at the confidence level of 99.9%) under the stress scenarios range from 0.75% (Interest rate shock) to 1.59% (Hong Kong GDP shock), which are significant, but smaller than the estimated loan loss of 4.39% following the Asian financial crisis.

[52] 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.

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

Chart 5.22
The mean and value-at-risk statistics of simulated credit loss distributions[1]



Notes:

1. The assessments assume the economic conditions in 2015 Q2 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 2015 Q3 to 2016 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 2015 Q3 to 2016 Q2.

   Interest rate shock: A rise in real interest rates (HIBORs) by 300 basis points in the first quarter (i.e. 2015 Q3), followed by no change in the second and third quarters and another rise of 300 basis points in the fourth quarter (i.e. 2016 Q2).

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

Source: HKMA staff estimates.

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 2015 that the CCyB for Hong Kong will be 0.625% with effect from 1 January 2016.[54] Under the phase-in arrangement for the CCyB, the maximum CCyB under Basel III will begin at 0.625% of banks' risk-weighted assets on 1 January 2016.[55]

In setting the CCyB rate, the Monetary Authority considered a series of indicators (Table 5.F), 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[56]). Based on the latest information up to the decision date at the end of second quarter, the credit-to-GDP gap narrowed to 20.8% from 32.8% in January 2015 while the property price-to-rent gap widened slightly to 16.0% from 14.2%. Both gaps remained at elevated levels and a simple mapping from the indicative buffer guide would signal a CCyB of 2.5%, remaining unchanged at the upper end of the Basel III range.

In addition, the information drawn from other reference indicators[57] was, in the view of the Monetary Authority, consistent with the signal from the indicative buffer guide.

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

	27-Jan-15	Q1-2015	Q2-2015
Announced CCyB rate	0.625%		
Date effective	01/01/2016		
Indicative buffer guide	2.5%	2.5%	2.5%
Basel Common Reference Guide	2.5%	2.5%	2.5%
Property Buffer Guide	2.5%	2.5%	2.5%
Composite CCyB Guide	2.5%	2.5%	2.5%
Indicative CCyB Ceiling	None	None	None
Primary gap indicators			
Credit/GDP gap	32.8%	26.1%	20.8%*
Property price/rent gap	14.2%	14.8%	16.0%
Primary stress indicators			
3-month HIBOR spread (percentage points)	0.17%	0.18%	0.18%
Quarterly change in classified loan ratio (percentage points)	-0.01%	0.02%	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 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.
2. *This gap was calculated based on end-Q1 credit data excluding from the credit measure IPO loans of HK$201 billion at end-March 2015. If such loans are included, the Credit/GDP gap increases to 28.9%. See press release at: http://www.hkma.gov.hk/eng/key-information/press-releases/2015/20150430-5.shtml

Source: HKMA.

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

54 Further details of the decision may be found in the "Announcement of the CCyB to authorized institutions" released on 27 January 2015 which is available on the HKMA website.

55 Under the phase-in arrangement, the maximum CCyB rate would be capped at 0.625% on January 2016, with the cap rising by 0.625 percentage points each subsequent year until it reaches 2.5% on 1 January 2019.

56 The gap 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.

57 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.G
Key performance indicators of the banking sector[1] (%)

	Jun 2014	Mar 2015	Jun 2015
Interest rate			
1-month HIBOR fixing[2] (quarterly average)	0.21	0.24	0.24
3-month HIBOR fixing (quarterly average)	0.37	0.39	0.39
BLR[3] and 1-month HIBOR fixing spread (quarterly average)	4.79	4.76	4.76
BLR and 3-month HIBOR fixing spread (quarterly average)	4.63	4.61	4.61
Composite interest rate[4]	0.47	0.33	0.29
		Retail banks	
Balance sheet developments[5]			
Total deposits	5.3	3.1	1.7
Hong Kong dollar	7.9	6.7	2.5
Foreign currency	2.4	-1.1	0.6
Total loans	4.8	5.9	-0.5
Domestic lending[6]	4.9	6.2	-1.8
Loans for use outside Hong Kong[7]	4.4	4.5	5.5
Negotiable instruments			
Negotiable certificates of deposit (NCD) issued	-3.3	9.6	-15.0
Negotiable debt instruments held (excluding NCD)	5.3	4.7	6.2
Asset quality[8]			
As a percentage of total loans			
Pass loans	98.50	98.39	98.25
Special mention loans	1.05	1.14	1.25
Classified loans[9] (gross)	0.46	0.46	0.49
Classified loans (net)[10]	0.33	0.32	0.35
Overdue > 3 months and rescheduled loans	0.27	0.28	0.29
Profitability			
Bad debt charge as percentage of average total assets[11]	0.05	0.06	0.07
Net interest margin[11]	1.40	1.33	1.32
Cost-to-income ratio[12]	42.7	43.7	43.6
		All AIs	
Liquidity ratios (quarterly average, consolidated)[13]			
Liquidity Coverage Ratio — Category 1 institutions	n.a.	129.9	131.7
Liquidity Maintenance Ratio — Category 2 institutions	n.a.	50.8	53.4
		Surveyed institutions	
Asset quality			
Delinquency ratio of residential mortgage loans	0.02	0.03	0.03
Credit card lending			
Delinquency ratio	0.22	0.26	0.23
Charge-off ratio — quarterly annualised	2.05	1.80	2.10
— year-to-date annualised	1.90	1.80	1.91
		All locally incorporated AIs	
Capital adequacy (consolidated)			
Common Equity Tier 1 capital ratio	13.2	13.3	13.7
Tier 1 capital ratio	13.3	13.9	14.4
Total capital ratio	16.1	17.0	17.5

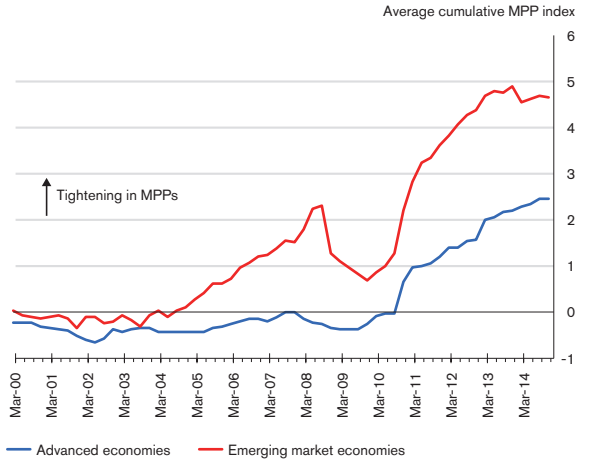
Notes:

1. Figures are related to Hong Kong office(s) only except where otherwise stated.
2. The Hong Kong Dollar Interest Settlement Rates are released by the Hong Kong Association of Banks.
3. With reference to the rate quoted by The Hongkong and Shanghai Banking Corporation Limited.
4. The composite interest rate is a weighted average interest rate of all Hong Kong dollar interest-bearing liabilities, which include deposits from customers, amounts due to banks, negotiable certificates of deposit and other debt instruments, and Hong Kong dollar non-interest-bearing demand deposits on the books of banks. Further details can be found in the HKMA website.
5. Quarterly change.
6. Loans for use in Hong Kong plus trade finance.
7. Including "others" (i.e. unallocated).
8. Figures are related to retail banks' Hong Kong office(s) and overseas branches.
9. Classified loans are those loans graded as "substandard", "doubtful" or "loss".
10. Net of specific provisions/individual impairment allowances.
11. Year-to-date annualised.
12. Year-to-date figures.
13. A new data series was introduced for liquidity ratios which are defined in accordance with the Basel III framework starting from January 2015. For a category 1 institution, the minimum requirement for Liquidity Coverage Ratio 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 a Liquidity Maintenance Ratio of not less than 25% on average in each calendar month.

Box 4
Inward spillover effect of macro-prudential policies – evidence from foreign banks in Hong Kong

Although macro-prudential policies (MPPs) have been increasingly adopted globally to address systemic risks (Chart B4.1) after the global financial crisis, there remains an ongoing debate on how this tool can be effectively implemented. One key issue is the international spillover effect of MPPs, which not only potentially undermines the effectiveness of MPPs implemented in one country, but could also adversely affect financial stability for other countries, particularly when their economic and financial cycles are not synchronised. To broaden our understanding of this policy issue, this box empirically examines the inward spillover effect of MPPs from home countries of foreign banks to the Hong Kong banking sector.

Chart B4.1
Average cumulative MPP index of advanced and emerging market economies



Note: The index reflects the average cumulative number of MPP actions by assigning a positive value for tightening and a negative value for loosening. Policy instruments include general capital requirement, sector-specific capital requirement, countercyclical capital buffer, limit on interbank exposure, concentration limit ratio, caps on loan-to-value ratios and reserves requirements.

Source: HKMA staff estimates based on data contributed by the International Banking Research Network.

Potential inward spillover effect of MPPs

The strong presence of foreign banks in Hong Kong provides a natural experiment setting to study the issue of inward spillover effect of MPPs from a host country's perspective.[58] Since these foreign banks are subject to MPPs imposed in their home countries, by studying how their cross-sectional differences in lending in Hong Kong are associated with changes in MPPs in their respective home countries, we can identify the inward spillover effect of MPPs empirically. The large number of foreign banks in Hong Kong is conducive to a reliable statistical result.

This study focuses on two hypotheses. First, we posit that there is a significant inward spillover of MPPs from foreign banks to a host country, but the pattern of inward spillover differs among MPP instruments. This hypothesis is consistent with the fact that the wide range of MPP instruments are implemented with very different scopes of application and policy objectives. So, even for the same MPP stance, banks may respond differently to MPP actions, depending on whether the instruments being adopted are applied at the consolidated level (e.g. the countercyclical capital buffer) or in a geographically confined area (e.g. loan-to-value caps) and whether the instruments target to a specific sector (e.g. capital charge for property-related loans).

The second hypothesis is that banks' balance sheet characteristics matter for the extent of MPP spillover. We set up this hypothesis by drawing on recent findings from international banking research that balance sheet characteristics of global banks play a pivotal role in determining

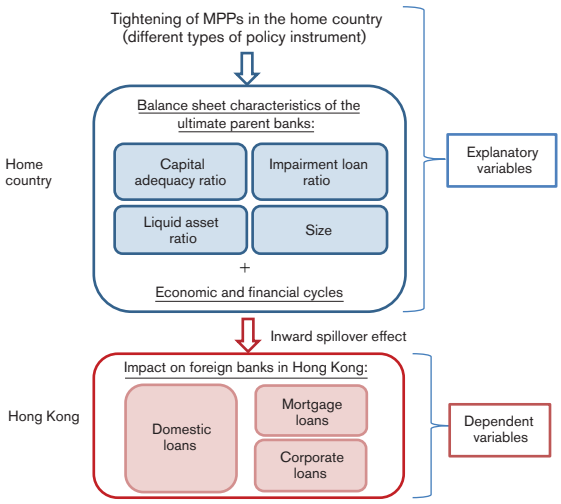
[58] At the end of 2014, there were 152 foreign banks operating in Hong Kong, including 45 of top 50 global banking organisations (by consolidated assets).

the international transmission of financial shocks.[59]

The empirical model and estimation results

To test these two hypotheses, we adopt the baseline regression model as proposed by Buch and Goldberg (2014).[60] In our context, the model is specified to explain changes in loans of foreign banks in Hong Kong by an MPP index that reflects MPP actions taken in their respective home countries. The model also includes a vector of explanatory variables that interact the MPP index with parent banks' balance sheet characteristics[61] and home country's economic and financial cycles to identify how these variables affect the spillover effect of MPPs (Chart B4.2 details the model specification).

Chart B4.2
Structure of the empirical model



Regarding the type of MPPs, three commonly adopted instruments are considered. We consider both overall and sector-specific capital requirements (denoted by *CapitalReq* and *SSCB* respectively), with the latter generally targeting property-related loans. These two measures are generally applied on a consolidated basis at the parent-bank level. Our analysis also includes loan-to-value ratio caps (*LTVcap*) for mortgage loans, which is conventionally applied in a geographically confined area, mostly in the home country.

The model is estimated using a quarterly panel dataset of 81 foreign banks in Hong Kong covering from 2000Q1 to 2013Q4.[62] The dependent variables (i.e. loans of foreign banks in Hong Kong) are constructed using regulatory data filed by the foreign banks to the HKMA, while parent-level variables are constructed using consolidated balance sheet data of their respective parents from *Bankscope*. Data of the economic and financial cycles are obtained from the BIS. The MPP indexes[63] are constructed by using a refined database from the result of the IMF's worldwide survey for macro-prudential instruments.[64]

59 Buch, C.M. and L.S. Goldberg (2014), "International banking and liquidity risk transmission: Lessons from across countries", National Bureau of Economic Research, Working Papers, N. 20286.

60 Buch, C.M. and L.S. Goldberg (2014), "Cross-border regulatory spillovers: How much? How important? Evidence from the International Banking Research Network", International Banking Research Network, Draft.

61 The balance sheet characteristics include: (1) the regulatory capital adequacy ratio, (2) ratio of impairment loans to gross loans, (3) ratio of liquid assets to total assets; and (4) log of real total assets.

62 Total assets of the estimation samples account for about 77% of the total assets of foreign banks in Hong Kong at the end of 2014.

63 All MPP indexes are defined in the following fashion: an index takes a value of 1 in quarter t if the home country tightens the measure in t; -1 if the home country loosens the measure; and 0 otherwise.

64 The MPP dataset primarily comes from the IMF Global Macroprudential Policy Instruments survey, with further verification of the data accuracy by members of the International Banking Research Network.

Table B4.A
Estimated impact of MPPs on lending of foreign banks in Hong Kong

	Overall capital requirement	Sector specific capital requirement	Loan-to-value ratio cap
Consolidated level?	Yes	Yes	No
Sector-specific?	No	Yes	Yes
Panel A	Estimated marginal effect of MPPs on lending of an average foreign bank in HK		
Loans in HK	↓	↑	↑*
Mortgage loans	↑**	↓**	↑***
Corporate loans	↓	↑	↑**
Panel B	Balance sheet characteristics that are estimated to affect the spillover effect of MPPs significantly		
Higher impairment loan ratio	Loans in HK↓↓	Mortgage loans↓↓	
Higer capital adequacy ratio			Loans in HK↑↑

Notes:
1. Panel A displays the estimated directional change in loans of an average foreign bank in HK by different type of instruments. ***, ** and * respectively indicate statistical significance at the 1%, 5% and 10% level.
2. Panel B displays the estimation result on which balance sheet characteristics are found to affect the extent of the spillover effect of MPPs statistically.

Source: HKMA staff estimates.

Our preliminary estimation result, which broadly supports our hypotheses, is summarised as follows (see also Table B4.A):

(1) Our empirical findings point to a significant inward spillover (Panel A of Table B4.A). However, the pattern of inward spillover is found to differ among the MPP instruments for a typical foreign bank in Hong Kong (henceforth referred to as "the average foreign bank").[65] Specifically,

(a) For *CapitalReq*, the average foreign bank is estimated to reduce its lending in Hong Kong in response to a more stringent capital requirement in the home country (though the estimation result is not statistically significant).

The estimated directional change in loans in Hong Kong suggests that the inward spillover effect tends to be consistent with the MPP stance in the home country. However, mortgage lending in Hong Kong is estimated to increase. This suggests that the affected banks may partially offset the impact of overall capital requirement by reallocating loan portfolio towards less capital-intensive or less risky exposure, such as mortgage loans in Hong Kong.

(b) For *SSCB*, the average foreign bank is estimated to reduce its mortgage loans in Hong Kong while at the same time increase its corporate loans. The net impact on lending in Hong Kong of the average foreign bank is therefore uncertain. The finding suggests that affected banks may have strong incentives to rebalance its loan portfolios by increasing those exposures that are not subject to the more stringent MPP measure.

(c) Regarding the impact of *LTVcap*, it is estimated that the average foreign bank would react to the tightening measure by increasing its lending in Hong Kong generally, particularly for mortgages. This finding suggests that affected banks would maintain their portfolio mix by increasing mortgage loans in overseas markets when a more stringent MPP requirement is imposed on mortgage loans in the home market.

65 For each MPP instrument considered, an average foreign bank is constructed by taking the mean value for banks' balance sheet characteristics and economic and financial cycles for those samples that their home countries have triggered the particular MPP instrument during the estimation period.

(2) The estimation result also supports the second hypothesis (Panel B of Table B4.A). Specifically, banks with higher impairment loan ratios are found to reduce their lending in Hong Kong and mortgage loans more than the average foreign bank in response to the tightening of *CapitalReq* and *SSCB* respectively, probably reflecting that banks with an impaired balance sheet may be more subject to capital constraints, and therefore, more sensitive to the MPP tightening. Meanwhile, banks with higher capital adequacy ratios are found to increase their lending in Hong Kong by a larger extent in response to the tightening of *LTVcap*, which may probably reflect that better capitalised banks are relatively more capable of expanding other loan portfolios.

Conclusion

Our empirical findings show that both the pattern and the extent of the international spillover effect of MPPs are crucially dependent on various factors, including banks' balance sheet characteristics and types of MPP instruments being adopted. These findings have important implications for the issue of international coordination of MPPs. Specifically, the different patterns of inward spillover effects among MPP instruments and the potential heterogeneous banks' responses to MPPs due to different balance sheet characteristics may pose significant challenges for policymakers in achieving a coordinated implementation of MPPs globally.