

5. Banking sector performance

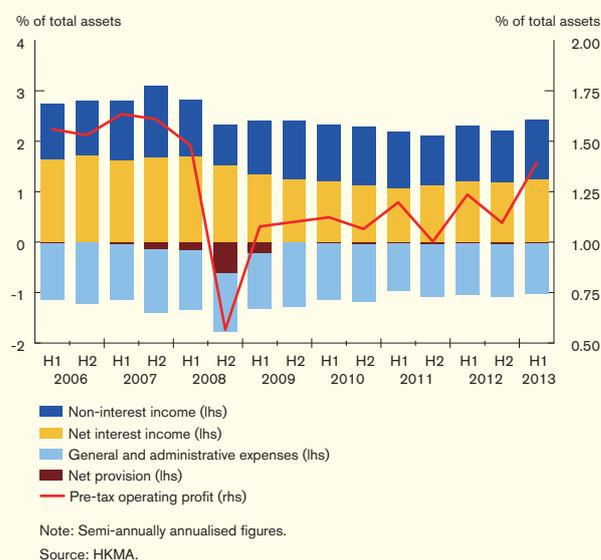
Notwithstanding an uncertain external environment and the slowdown of the Mainland China economy, the Hong Kong banking sector continued to post vibrant earnings performance. While bank lending grew more rapidly in the first half of 2013, domestic liquidity conditions remained healthy. However, the banking sector will face rising risks in the year to come. Domestically, the risk of interest rate volatility is expected to escalate. In the process of the eventual normalisation of US monetary policy, the impact of any shift of the yield curve or significant rise in interest rates on banks' balance sheets and asset quality may not be small. In particular, corporations' debt servicing ability would be under test given rising corporate leverage, and property prices could be under significant pressures. Externally, the rising share of banks' Mainland exposure continues to be a significant risk factor. The need for continued stringent prudential management of such exposure cannot be over-emphasised.

5.1 Profitability and capitalisation

Profitability

The banking sector continued to post vibrant performance, with the aggregate pre-tax operating profits of retail banks³¹ growing by 30.9% in the first half of 2013 from the second half of 2012. Their return on assets³² also rose to 1.39%, compared with a return of 1.1% in the previous six months (Chart 5.1). Improved net interest and non-interest incomes, which grew by 7.8% and 19.6% respectively, plus better control of operating expenses and lower net provision, were the main drivers of profitability growth.

Chart 5.1
Profitability of retail banks



³¹ Throughout this chapter, figures for the banking sector relate to Hong Kong offices only, except where otherwise stated.

³² Return on assets is calculated based on aggregate pre-tax operating profits.

Banking sector performance

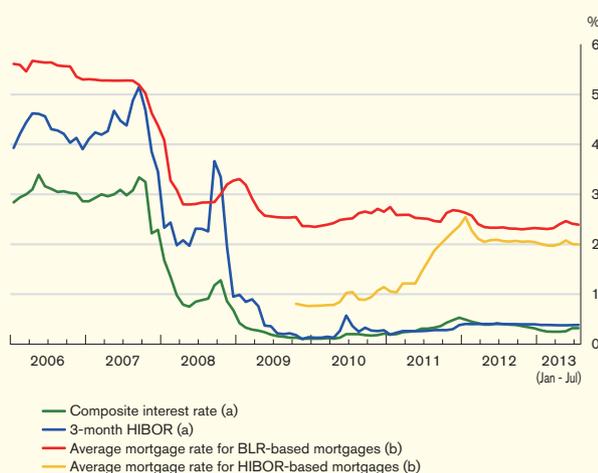
The net interest margin of retail banks improved further in the first half of 2013 to 1.41%, from 1.37% in the second half of 2012 (Chart 5.2), partly due to an easing of banks' funding pressure. The composite interest rate, a measure of the average cost of Hong Kong dollar funds of retail banks, averaged 0.27% in the first half, down from 0.37% in the second half of 2012 (Chart 5.3).

Chart 5.2
Net interest margin of retail banks



Note: Quarterly annualised figures.
Source: HKMA.

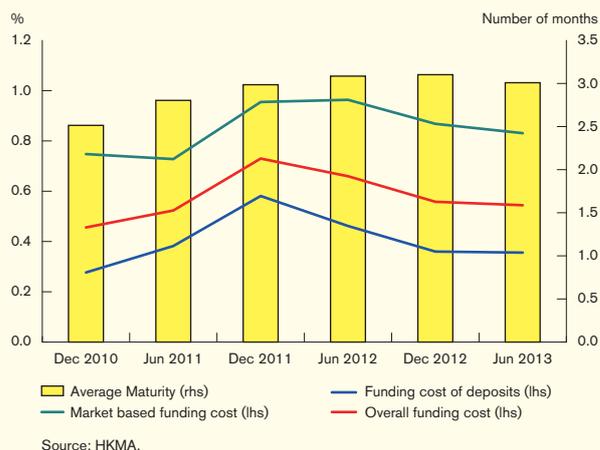
Chart 5.3
Interest rates



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

An analysis of licensed banks' data shows that their overall interest costs have fallen, with the market-based funding cost down by 4 basis points and the deposit funding cost remaining largely stable (Chart 5.4).³³

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



Source: HKMA.

Mortgage rates on average remained low in the first quarter of the year, with the best lending rate-based (BLR-based) rate edging higher but the HIBOR-based rate softening marginally. Partly in response to the rise in BLR-based rate, the share of BLR-based mortgages amongst newly approved mortgage loans decreased to 82.4% in the first half of 2013, from 92.8% in the second half of 2012.

³³ 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 edged up to 15.9% at the end of June, from 15.7% at the end of 2012 (Chart 5.5), with the tier-one capital adequacy ratio (the ratio of tier-one capital to total risk-weighted assets) edging lower to 13.2%, from 13.3%.

Chart 5.5
Capitalisation of locally incorporated AIs



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

5.2 Liquidity and funding

Domestic liquidity conditions remained healthy. Although the average liquidity ratio of all AIs fell moderately in the first half of 2013, it remained well above the regulatory minimum of 25%. For retail banks, the ratio decreased to 38.9% at the end of June, from 42.6% at the end of 2012 (Chart 5.6). The fall partly reflected banks' recent moves of reallocating assets from more liquid instruments (such as interbank claims) into less liquid assets (such as customer loans and advances).

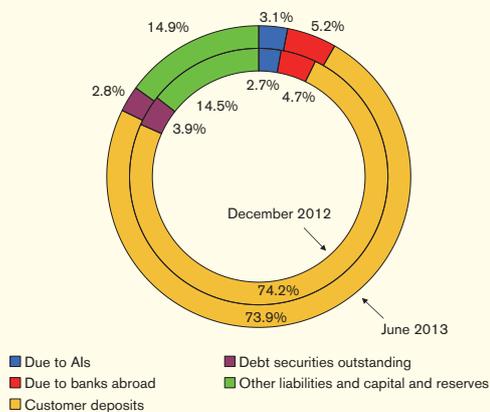
Chart 5.6
Liquidity ratio of retail banks



Note: Quarterly average figures.
 Source: HKMA.

Customer deposits continued to be the primary funding source for retail banks, although their share to banks' total liabilities decreased marginally to 73.9% at the end of June, from 74.2% at the end of 2012 (Chart 5.7).

Chart 5.7
Liabilities structure of retail banks

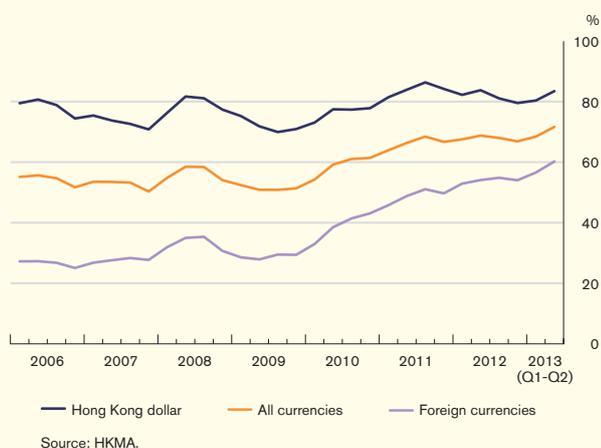


Notes:
 1. Figures may not add up to total due to rounding.
 2. Figures refer to the percentage of total liabilities (including capital and reserves).
 3. Debt securities comprise negotiable certificates of deposit and all other negotiable debt instruments.
 Source: HKMA.

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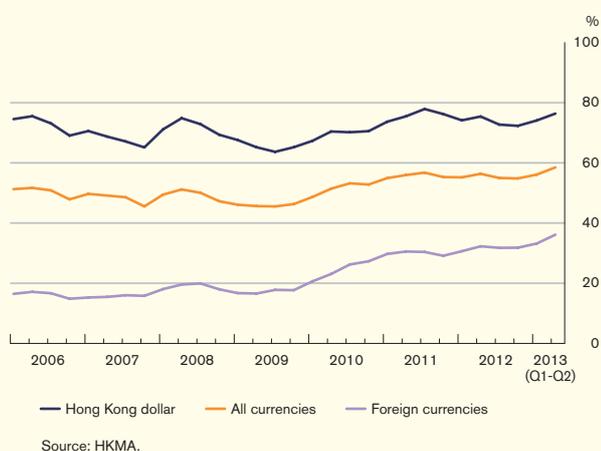
Due to a much stronger credit demand in the first half of 2013, which outpaced the moderate growth of deposits, the all currency loan-to-deposit (LTD) ratio of all AIs rose to 71.9% at the end of June, from 67.1% six months earlier (Chart 5.8). In particular, the foreign currency LTD ratio rose sharply by 6.2 percentage points to 60.4%, which was mostly driven by a significant increase in foreign currency loans and trade financing.³⁴

Chart 5.8
Loan-to-deposit ratios of all AIs



For retail banks, the all currency LTD ratio rose to 58.5% from 54.8%, with both the Hong Kong dollar and foreign currency LTD ratios increasing notably (Chart 5.9).

Chart 5.9
Loan-to-deposit ratios of retail banks



Foreign currency position

The banking sector's capability to repay liabilities denominated in foreign currencies can be assessed by reference to the aggregate net open position of AIs for all foreign currencies. This position amounted to HK\$69 billion at the end of June 2013, which was equivalent to 0.4% of total assets of AIs, indicating that the overall exposure of AIs to foreign exchange risks may not be of significant concern.

5.3 Interest rate risk

The spreads between the long- and short-term interest rates for the US dollar and Hong Kong dollar continued their upward trends, widening further to over 200 basis points in August 2013 (Chart 5.10). This suggests that the incentive for banks to search for yield by borrowing short-term funds to purchase long-term interest-bearing assets may have increased. This could potentially lead to greater maturity mismatches and increased interest rate risk.

Chart 5.10
Term spreads of Hong Kong and US dollars



³⁴ For details, please refer to Section 4.2 of the report.

Such interest rate risk should not be underrated, as the possible impact of any significant shift in the yield curve or rise in interest rates on banks' balance sheets in the process of the eventual normalisation of US monetary policy could be severe. 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 1.4% of their total capital base as of June 2013 (Chart 5.11). While the impact appears to be manageable³⁵, a significantly larger interest rate hike or an unfavourable change in the shape of the yield curve could result in a much bigger impact.

Chart 5.11
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 book³⁶, expressed as a percentage of the total capital base of banks.
 Source: HKMA staff estimates.

³⁵ The HKMA will be particularly attentive to the capital sufficiency of "outlier AIs" – those whose interest rate risk leads to an economic value decline of more than 20% of their capital base as a result of applying the standardised interest rate shock to the banking book. For details, see HKMA Supervisory Policy Manual's module "Interest Rate Risk Management" issued in December 2002.

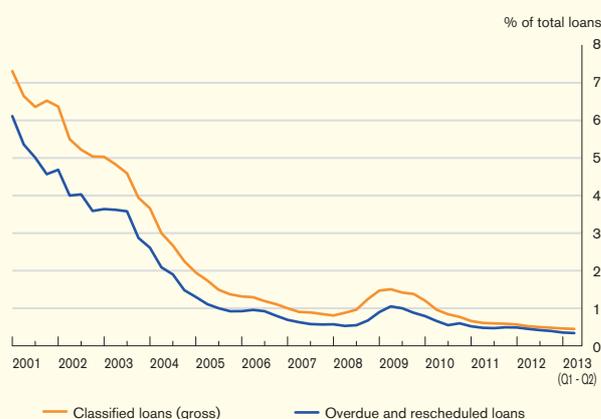
³⁶ Locally incorporated AIs subject to the market risk capital adequacy regime are required to report positions in the banking book only. Other locally incorporated AIs exempted from the market risk capital adequacy regime and overseas incorporated institutions are required to report aggregate positions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

³⁷ Defined as loans for use in Hong Kong plus trade-financing loans. If other loans for use outside Hong Kong are included, the growth in bank lending in the six months ended June 2013 is 9.5%, compared with 4.7% in the preceding six months.

5.4 Credit risk

The asset quality of retail banks' loan portfolios continued to improve in the first half of the year, with the classified loan ratio falling further to 0.45% at the end of June, from 0.48% six months earlier. The ratio of overdue and rescheduled loans also edged down to 0.34% from 0.39% (Chart 5.12) during the period.

Chart 5.12
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.

Loan growth in the banking sector accelerated in the first half of 2013. Total domestic lending³⁷ of AIs increased by 10.2% in the first half, following an increase of 4.1% in the preceding six months. The rapid credit expansion was mainly contributed by trade finance and loans to corporations, whereas property-related loans registered a more moderate increase of 3.2%, after rising by 4.3% in the second half of 2012.

Looking ahead, the rapid growth in lending may moderate. As suggested by results of the HKMA Opinion Survey on Credit Condition Outlook of June 2013, while more than two-thirds of the respondents expected loan demand to remain at the current level, the share of surveyed AIs expecting lower loan demand in the next three months had exceeded those expecting higher loan demand (Table 5.A).

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

(% of total respondents)	Sep 2012	Dec 2012	Mar 2013	Jun 2013
Considerably higher	0	0	0	0
Somewhat higher	10	14	10	10
Same	71	76	67	71
Somewhat lower	19	10	24	19
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 loans³⁸ showed signs of moderation, with the half-yearly growth rate slowing down to 3.8%, from 6.5% in the second half of 2012.

Mortgage lending, which is the major component of household loans, grew at a slightly slower pace of 3.1%, after expanding by 5% in the second half of 2012, partly reflecting softened property prices and reduced transaction volumes. As a result, the share of mortgage lending to total domestic loans edged down to 21.5% (Table 5.B).

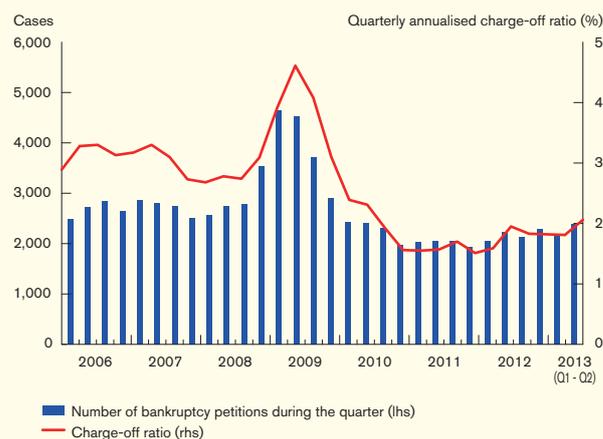
Table 5.B
Half-yearly growth of loans to households of all AIs

(%)	2010		2011		2012		2013
	H1	H2	H1	H2	H1	H2	H1
Mortgages	5.1	8.6	5.5	1.2	2.5	5.0	3.1
Credit cards	-0.9	17.9	-1.4	15.9	-1.6	15.3	-4.0
Other loans for private purposes	7.9	6.6	9.4	3.8	5.0	9.3	10.9
Total loans to households	5.1	8.9	5.6	2.7	2.6	6.5	3.8

Source: HKMA.

The credit risk of unsecured household exposure remained contained, with the annualised credit card charge-off ratio and the number of bankruptcy petitions staying low, albeit edging up slightly (Chart 5.13).

Chart 5.13
Charge-off ratio for credit card lending and bankruptcy petitions

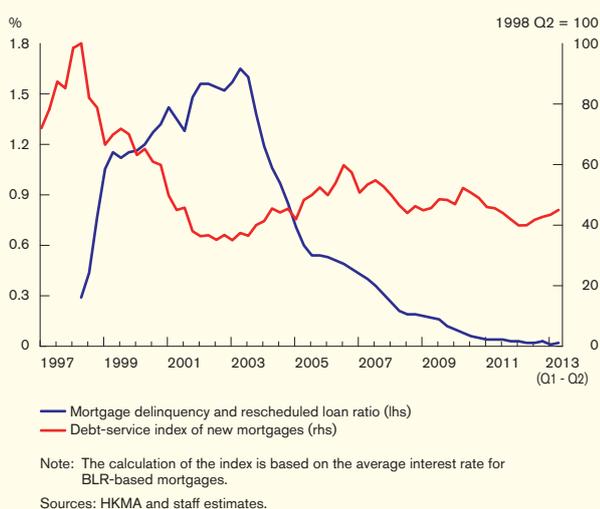


Sources: Official Receiver's Office and the HKMA.

³⁸ 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 2013, the share of household lending in domestic lending was 29%.

Meanwhile, the delinquency ratio of banks' mortgage portfolios remained healthy (Chart 5.14). However, it is worth noting that the debt-service index of new mortgages further deteriorated to 45 in June 2013, from 43 at the end of 2012. The increase in debt-servicing burden mainly reflected the rise in both the average size of new mortgage loans and the effective mortgage rate. Banks should be vigilant about the impact of a rise in interest rates on their mortgage portfolios, both in terms of households' debt repaying ability and the risk of a possible property price correction.

Chart 5.14
Delinquency ratio of banks' mortgage portfolios and household debt-servicing burden in respect of new mortgages



Corporate exposure³⁹

The growth of domestic loans to corporations⁴⁰ accelerated to 13.2% in the first half of 2013, from 3.0% in the second half of 2012. At the end of June 2013, corporate loans accounted for 70.5% of domestic lending.

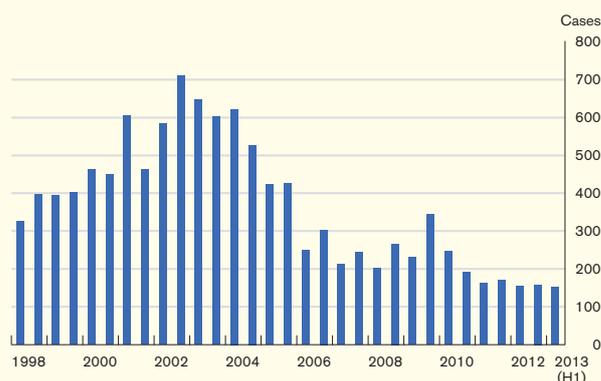
³⁹ Excluding interbank exposure.

⁴⁰ Loans to corporations comprise domestic lending except lending to professional and private individuals.

⁴¹ Altman's Z-score is a credit risk measure based on accounting data. It is a typical credit risk measure to assess the health of the corporate sector based on an array of financial ratios reported in companies' financial statements. The accounting ratios used to derive the Z-score are working capital/total assets, retained earnings/total assets, earnings before interest and taxes/total assets, market value of equity/book value of total liabilities, and sales/total assets.

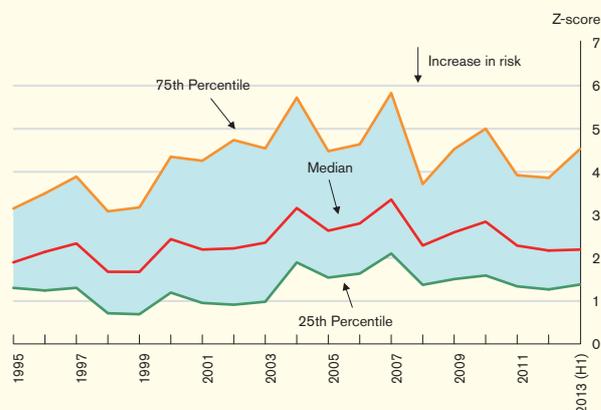
There are some initial signs that the credit risk of banks' corporate exposures may be building up. While the number of compulsory winding-up orders of companies (Chart 5.15) and the Altman's Z-score⁴¹ remained steady (Chart 5.16), the debt leverage of the corporate sector has increased in recent years, with the ratio of assets to shareholders' fund reaching 1.76 times at the end of 2012 (Chart 5.17). Meanwhile, the interest coverage ratio of local corporations, which gauges their abilities to cover interest expenses by earnings, showed a marked deterioration. These indicators suggest that the debt-servicing ability of the corporate sector could be under test when interest rates rise.

Chart 5.15
Number of winding-up orders of companies



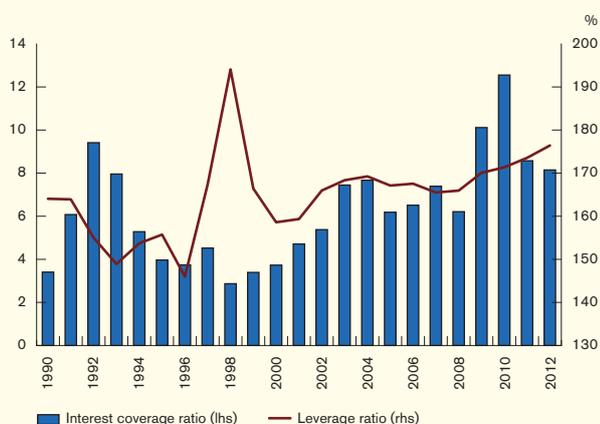
Source: Official Receiver's Office.

Chart 5.16
Altman's Z-score: A bankruptcy risk indicator of listed non-financial companies



Note: A lower Z-score indicates a higher likelihood of a company default.
Source: HKMA staff estimates based on data from Bloomberg.

Chart 5.17
Leverage ratio and interest coverage ratio of listed non-financial companies in Hong Kong



Notes:
1. The leverage ratio is defined as the ratio of total assets to shareholders' funds. A higher value indicates higher leverage.
2. Interest coverage ratio is defined as the ratio of earnings before interest and taxes to interest expense.
Source: HKMA staff estimates based on data from Bloomberg.

To the extent that a large outflow of funds from Hong Kong may take place as a result of Fed tapering, as some market participants anticipate, the situation would be aggravated. Box 4 examines the factors behind the rising loan spreads of syndicated loans after the global financial crisis. The findings suggest that even if the near-zero interest rate environment remains unchanged in the near term, a significant tightening of domestic liquidity conditions due to external factors could drive up the loan pricing in Hong Kong noticeably.

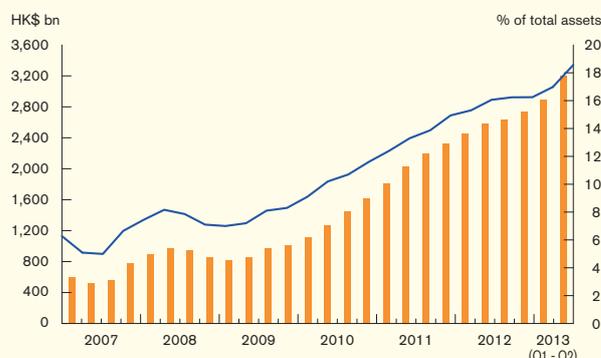
Mainland exposure

The credit exposure of the domestic banking sector to Mainland-related business continued to expand further. The total non-bank Mainland exposure of all AIs increased to HK\$3,198 billion (18.6% of total assets) at the end of June 2013, from HK\$2,739 billion (16.2% of total assets) six months earlier. Of this, retail banks' total non-bank Mainland exposure⁴² rose to HK\$2,003

⁴² Including exposure booked in retail banks' banking subsidiaries in Mainland China.

billion (18.2% of total assets) from HK\$1,779 billion (16.5% of total assets).

Chart 5.18
Non-bank Mainland exposures of all AIs



Note: Figures include exposures booked in AIs' banking subsidiaries in Mainland China.
Source: HKMA.

The rising share of banks' Mainland exposure continues to be a significant risk factor amid growing market concerns about Mainland China's growth outlook, corporate leverage and funding conditions.

While banks' lending to Mainland-related customers is largely backed by guarantees or collateralised, in view of the Mainland's high level of credit-to-GDP ratio (Chart 5.19), the recent deterioration of the aggregate distance-to-

Chart 5.19
Credit-to-GDP ratio in Mainland China



Note: Credit-to-GDP ratio is defined as the ratio of claims on private sector to the sum of quarterly nominal GDP for the latest four quarters.
Sources: IMF International Financial Statistics and CEIC.

Banking sector performance

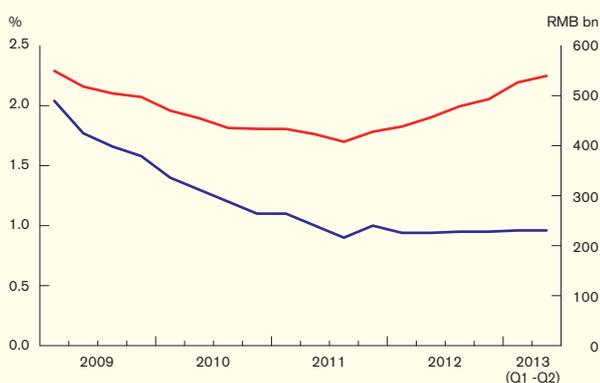
default index⁴³ of Mainland's corporate sector (Chart 5.20) and the rise in the amount of non-performing loans in its banking system (Chart 5.21), the need for Hong Kong banks to maintain their stringent prudential management of their Mainland exposure cannot be over-emphasised.

Chart 5.20
Distance-to-default index for the Mainland corporate sector



Note: Distance-to-default index is defined as the simple average of the distance-to-default values of 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 5.21
Non-performing loans in Mainland China



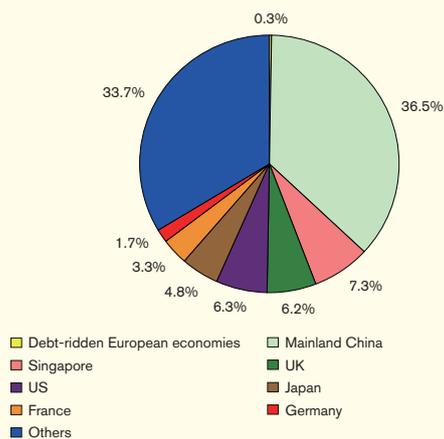
— Non-performing loans ratio (lhs)
— Amount of non-performing loans (rhs)

Source: China Banking Regulatory Commission.

Impact of the European sovereign debt crisis

While recent policies have reduced the tail risk of the European sovereign debt crisis, downside risks to economic growth remain. Thus, the performance of local banks will continue to be affected by the evolution of the European sovereign debt crisis and fiscal issues. Given that the exposure of the Hong Kong banking sector to banks in the UK, France and Germany is not immaterial (Chart 5.22), and these banks in turn have significant exposures to the more debt-ridden European economies, the possible contagion risk and its implications for banks in Hong Kong merit close attention.

Chart 5.22
External claims of the Hong Kong banking sector on major economies (all sectors) at the end of June 2013



Notes:
1. Figures may not add up to 100% due to rounding.
2. Debt-ridden European economies refer to Greece, Ireland, Italy, Portugal and Spain.

Source: HKMA.

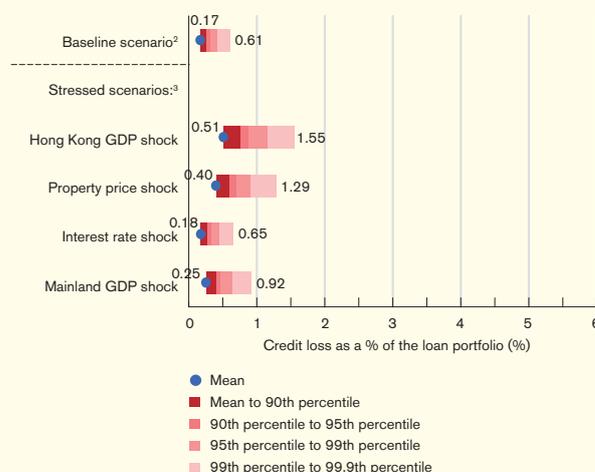
⁴³ The distance-to-default is a market-based default risk indicator based on the framework by R. Merton (1974), "On the pricing of corporate debt: the risk structure of interest rates", *Journal of Finance*, Vol. 29, pages 449 - 470, in which equity prices, equity volatility, and companies' financial 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.

Macro stress testing of credit risk^{44 & 45}

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 5.23 presents the simulated future credit loss rate of retail banks in the second quarter of 2015 under four specific macroeconomic shocks⁴⁶ using information up to the second quarter of 2013. The expected credit losses for retail banks' aggregate loan portfolios two years after the different hypothetical macroeconomic shocks are estimated to be moderate, ranging from 0.18% (interest rate shock) to 0.51% (Hong Kong GDP shock).

Chart 5.23
The mean and value-at-risk statistics of simulated credit loss distributions¹



Notes:

1. The assessments assume the economic conditions in 2013 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 2013 Q3 to 2014 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 2013 Q3 to 2014 Q2.

Interest rate shock: A rise in real interest rates (HIBORs) by 300 basis points in the first quarter (i.e. 2013 Q3), followed by no change in the second and third quarters and another rise of 300 basis points in the fourth quarter (i.e. 2014 Q2).

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

Source: HKMA staff estimates.

Taking account of tail risk, banks' maximum credit losses (at the confidence level of 99.9%) under the stress scenarios range from 0.65% (interest rate shock) to 1.55% (Hong Kong GDP shock), which are significant, but smaller than the loan loss of 4.39% following the Asian financial crisis.

⁴⁴ Macro stress testing refers to a range of techniques used to assess the vulnerability of a financial system to "exceptional but plausible" macroeconomic shocks. Details of the model adopted in this exercise can be found in J. Wong et al. (2006), "A framework for stress testing banks' credit risk", *Journal of Risk Model Validation*, Vol. 2(1), pages 3 - 23. An updated framework is used for the current estimations.

⁴⁵ All estimates of credit loss for the overall loan portfolio of Hong Kong banks presented in this report are based on a revised stress testing framework. They are not strictly comparable to those estimates from the past framework that appeared in previous reports due mainly to different definitions of credit losses in these two frameworks. Specifically, credit losses in two years after any shock under the revised framework are measured by the estimated specific provision ratio at the end of the second year plus 50% of the estimated specific provision ratio at the end of the first year after the shock, while credit loss estimates from the past framework are derived based on an estimated delinquency ratio at the end of the second year multiplied by a loss-given-default estimate, which is determined by the simulated property price change over the two-year horizon.

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

5.5 Systemic risk to the banking system

While the credit default swap spreads for European banks remained well above the levels prevailing prior to the onset of the European sovereign debt crisis, the corresponding spreads for Asian banks continued to stay low (Chart 5.24), suggesting the systemic risk of banking sector in Asia has not been severely affected by the sovereign debt crisis in Europe.

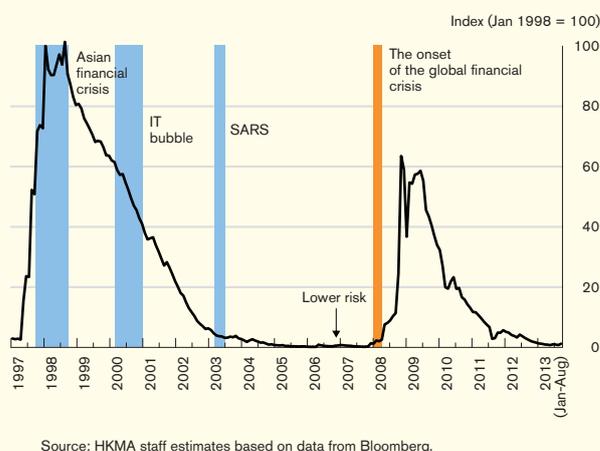
Chart 5.24
Credit default swap spreads of banks in Europe and Asia



In Hong Kong, the banking distress index, a market-based systemic risk indicator for the local banking sector, increased slightly to 1.2 in August from 1 in February 2013 (Chart 5.25).

However, the risk of contagion in the banking system remained insignificant and the probability of an occurrence of multiple bank defaults is small. This optimistic market view was broadly consistent with the latest assessment result of the composite early warning system⁴⁷, which estimated that the banking distress probability remained within the range of the low fragility category, suggesting that the banking sector continued to be stable and resilient.⁴⁸

Chart 5.25
The banking distress index



The proposed reform of the OTC derivatives market being put forward by the Financial Stability Board (FSB) is expected to play a significant role in reducing the probability of a reoccurrence of financial crises. The Macroeconomic Assessment Group on Derivatives (MAGD) of the FSB conducted an assessment of the costs and benefits of the OTC derivatives reform. Box 5 presents the key findings. The reform could reduce counterparty risks through central clearing and more comprehensive collateralisation. Such benefits are balanced against the costs of holding more capital and collateral by derivatives users. MAGD quantitatively estimates that the reform can generate median net benefits equivalent to 0.12% of GDP across 16 jurisdictions. For Hong Kong, it is estimated that the net benefits are around 0.13% of GDP.

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

⁴⁷ The composite early warning system is designed to estimate banking distress probability based on 10 leading indicators. These include macroeconomic fundamentals, currency crisis vulnerability, default risk of banks and non-financial companies, asset price misalignments, credit growth, and the occurrence of banking distress in other Asia-Pacific economies. For details, see J. Wong et al. (2010), "Predicting banking distress in the EMEAP economies", *Journal of Financial Stability*, Vol. 6(3), pages 169 - 179.

⁴⁸ The composite early warning system is a four-level risk rating system. A. Demircü-Kunt and E. Detragiache (2000), "Monitoring Banking Sector Fragility: A Multivariate Logit Approach", *World Bank Economic Review*, Vol. 14(2), pages 287 - 307, has been followed in the selection of the upper bounds of each of the four fragility classes so that type I error associated with the bounds are 10%, 30%, 50% and 100% respectively.

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

	Jun 2012	Mar 2013	Jun 2013
Interest rate			
1-month HIBOR fixing ² (quarterly average)	0.30	0.23	0.21
3-month HIBOR fixing (quarterly average)	0.40	0.39	0.38
BLR ³ and 1-month HIBOR fixing spread (quarterly average)	4.70	4.77	4.79
BLR and 3-month HIBOR fixing spread (quarterly average)	4.60	4.61	4.62
Composite interest rate ⁴	0.42	0.25	0.32
Retail banks			
Balance sheet developments⁵			
Total deposits	1.3	-0.3	1.4
Hong Kong dollar	0.2	-1.6	0.5
Foreign currency	2.7	1.5	2.5
Total loans	3.4	2.2	5.6
Domestic Lending ⁶	2.9	2.5	5.3
Loans for use outside Hong Kong ⁷	6.1	0.9	7.1
Negotiable instruments			
Negotiable certificates of deposit (NCD) issued	6.4	2.8	15.1
Negotiable debt instruments held (excluding NCD)	-2.8	4.5	-0.3
Asset quality⁸			
As a percentage of total loans			
Pass loans	98.19	98.32	98.44
Special mention loans	1.28	1.22	1.11
Classified loans ⁹ (gross)	0.52	0.46	0.45
Classified loans (net) ¹⁰	0.30	0.32	0.31
Overdue > 3 months and rescheduled loans	0.45	0.35	0.34
Profitability			
Bad debt charge as percentage of average total assets ¹¹	0.01	0.02	0.03
Net interest margin ¹¹	1.35	1.39	1.41
Cost-to-income ratio ¹²	44.5 ^r	41.7	40.9
Liquidity ratio (quarterly average)	39.7	40.2	38.9
Surveyed institutions			
Asset quality			
Delinquency ratio of residential mortgage loans	0.01	0.01	0.02
Credit card lending			
Delinquency ratio	0.21	0.23	0.25
Charge-off ratio — quarterly annualised	1.95 ^r	1.81	2.06
— year-to-date annualised	1.74 ^r	1.81	1.88
All locally incorporated AIs			
Capital adequacy ratio (consolidated)¹³	15.9	16.6	15.9

Notes:

- Figures are related to Hong Kong office(s) only except where otherwise stated.
- The Hong Kong dollar Interest Settlement Rates are released by the Hong Kong Association of Banks.
- With reference to the rate quoted by The Hongkong and Shanghai Banking Corporation Limited.
- The composite interest rate is a weighted average interest rate of all Hong Kong dollar interest-bearing liabilities, which include deposits from customers, amounts due to banks, negotiable certificates of deposit and other debt instruments, and Hong Kong dollar non-interest-bearing demand deposits on the books of banks. Further details can be found in the HKMA website.
- Quarterly change.
- Loans for use in Hong Kong plus trade finance.
- Including "others" (i.e. unallocated).
- Figures are related to retail banks' Hong Kong office(s) and overseas branches.
- Classified loans are those loans graded as "substandard", "doubtful" or "loss".
- Net of specific provisions/individual impairment allowances.
- Year-to-date annualised.
- Year-to-date figures.
- For the implementation of the Basel III framework, all locally incorporated AIs are required to report their capital adequacy positions under the Banking (Capital) Rules starting from 1 January 2013.

^r Revised figure.

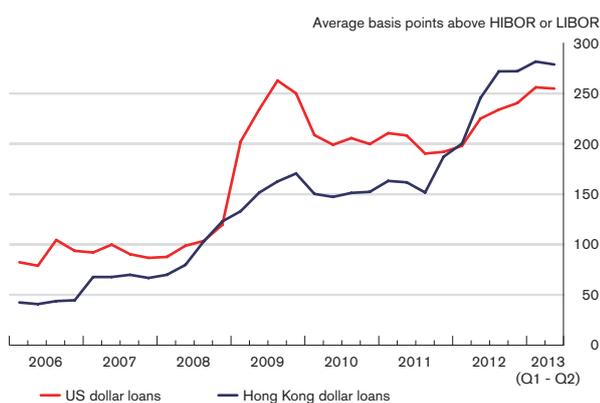
Box 4

Explaining rising loan spreads on syndicated loans in Hong Kong after the global financial crisis

Introduction

Spreads on syndicated loans in Hong Kong rose significantly after the global financial crisis from an average of below 100 basis points over HIBOR or LIBOR to around 250 basis points (Chart B4.1)⁴⁹. This box empirically identifies factors contributing to the rising loan spread and assesses the implications.

Chart B4.1
Average spreads on syndicated loans in Hong Kong



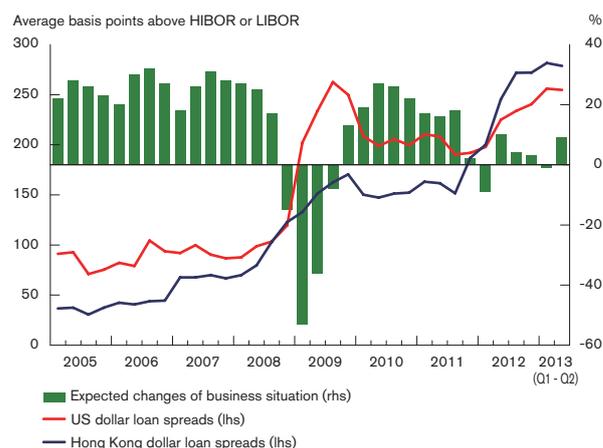
Note: Loan spreads are expressed as the four-quarter moving average.
Sources: Bloomberg and HKMA staff estimates.

Possible explanations for the rising spread

There are some factors that could account for the rising loan spread on syndicated loans in Hong Kong after the global financial crisis. First, the higher loan spread may reflect a riskier composition of borrowers tapping syndicated loans in Hong Kong. This may be associated with the rapid growth of syndicated loans to Mainland-related firms. Besides, borrowers with unrated or speculative-grade ratings are observed to be more prevalent.

Second, the rising loan spread may be partly a result of higher default risk premiums demanded by banks to compensate for the potential adverse impact of weak business conditions after the global financial crisis on firms' financial health. In fact, the spike in the loan spread that occurred from the fourth quarter of 2008 to the third quarter of 2009 is associated with a pessimistic business outlook (Chart B4.2).

Chart B4.2
Expected changes of Hong Kong business situation¹ and spreads on syndicated loans



Notes:

1. An increase in the expected change of business situation indicates that business situation is likely to improve, while a decrease may signal deterioration in business situation in the near term.
 2. Loan spreads are expressed as the four-quarter moving average.
- Sources: Bloomberg, C&SD and HKMA staff estimates.

The third factor is that banks may charge higher liquidity premiums for syndicated loans after the global financial crisis. This hypothesis is supported by the fact that the foreign-currency loan-to-deposit (LTD) ratio of the Hong Kong banking sector has shown a clear upward trend since 2009 (see Chart 5.8 in Chapter 5), which may signal significant pressure on banks' funding, particularly for their US dollar lending.

⁴⁹ See He, D. and R. N. McCauley (2013), "Transmitting Global Liquidity to East Asia: Policy rates, Bond Yields, Currencies and Dollar Credit", paper prepared for presentation at the Hong Kong Monetary Authority 20th Anniversary Research Workshop, 7 June 2013, Hong Kong.

Finally, short-term interest rates may be one factor affecting loan spreads, although the direction of the impact may be inconclusive. On one hand, a negative relationship is consistent with Merton's (1974) theory of corporate default.⁵⁰ On the other hand, it may be argued that firms may take advantage of lower short-term interest rates to refinance debt, thus reducing their debt-servicing burdens and default risk. This counter argument implies a positive relationship between short-term interest rates and loan spreads.

An empirical model of loan spreads

To what extent these four factors account for the rising loan spread can be studied empirically. Here, a two-stage approach is adopted to decompose the relative contribution of each factor. In the first-stage analysis, we investigate how risk characteristics of individual borrowers help explain the loan spread. Specifically, using a database of 737 loan observations from the first quarter of 2005 to the second quarter of 2013, we regress the loan spread by a set of conventional loan-level default risk indicators.

The estimation result (Table B4.A) suggests that syndicated loans with smaller loan sizes, longer maturities and speculative grade ratings tend to be associated with higher loan spreads.⁵¹ Mainland-related loans are estimated with a higher loan spread, probably reflecting the strong demand for foreign-currency loans by Mainland firms such that they are more willing to pay a premium for syndicated loans in Hong Kong. In addition, banks are estimated to charge a lower loan spread for Hong Kong dollar loans than US dollar loans. Largely in line with findings in the literature⁵², loans backed by collateral are found to be associated with higher loan spreads, which could be explained partly by the banks being more likely to demand collateral for loans that are perceived to entail high default risk. As revealed from the R^2 , a conventional goodness-of-fit statistic, risk characteristics of individual borrowers only account for around 17% of the variation of loan spreads, suggesting that macro factors (i.e. the remaining three factors) may play more significant roles in determining loan spreads on syndicated loans in Hong Kong.

Table B4.A
Estimation result for the first-stage regression

Explanatory variables	Dependent variable: Spreads on syndicated loans (Sample period: 2005Q1 - 2013Q2)
Log(Size of loan facility)	-5.22 *
Time to maturity ¹	1.35 ***
A dummy variable for loans with speculative grade ratings ²	84.79 ***
A dummy variable for Mainland-related loans	36.27 ***
A dummy variable for Hong Kong dollar loans	-37.22 ***
A dummy variable for loans with collateral	32.96 ***
Constant	232.78 ***
R^2	0.171
Number of observations	737

Notes:

1. In number of months, for loans with maturity shorter than 60 months.
2. Loans with ratings below BBB.
3. *** and * denote significance at 1% and 10% levels respectively.
4. The estimation sample includes Hong Kong dollar loans and US dollar loans.

⁵⁰ See Merton, R. (1974), "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates", *Journal of Finance*, 29, pages 449 – 470. Specifically, an important part of the theory is that a firm's expected growth rate of asset is determined by risk-free interest rates. Assuming a constant amount of debt, a decline in interest rates leads to a reduction in the firm's net worth, implying higher default risk and thus a higher loan spread. While empirical evidence remains mixed, Lo and Hui (2013) recently find a significant negative relationship between credit spreads and risk-free interest rates in the US during January 2008 to June 2013. For details, see Lo and Hui (2013), "Pricing Corporate Bonds in an Ultra-low Interest Rate Environment", available at the Social Science Research Network (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2185861).

⁵¹ A preliminary analysis finds that a dummy variable for guarantee and that for loans with investment grade ratings are statistically insignificant. These two variables are therefore dropped from the regression equation.

⁵² See Jiménez, G., and J. Saurina (2004), "Collateral, Type of Lender and Relationship Banking as Determinants of Credit Risk", *Journal of Banking and Finance*, 28(9), pages 2191 – 2212.

The second-stage analysis focuses on the three macro factors. Specifically, we first compute the residuals from the first-stage regression equation (denoted by e), which by construction contain information other than risk characteristics of individual borrowers. We then regress e by an indicator of expected changes in business situation (EXP)⁵³, LTD ratios, an interacting term between a dummy variable⁵⁴ and LTD ratios ($LTD09$), and short-term interest rates (SR). $LTD09$ is included to capture a possible increase in the sensitivity of the loan spread to LTD ratios when LTD ratios are on their rising trends. Since these macro factors may have different impacts on Hong Kong dollar loans and US dollar loans, we estimate the equation separately for these two groups of samples.

In line with our discussion in the previous section, we hypothesise that the loan spread is correlated negatively with EXP and positively with the LTD ratio. For $LTD09$, we expect a positive estimated coefficient for two reasons. First, there is a clear rising trend of the foreign-currency LTD ratio since 2009, which may signal significant funding pressure on banks. Second, since late 2009, the stance of macroprudential policy in Hong Kong has been tightened generally, partly reflecting regulatory concerns

about the sustainability of credit growth and rising LTD ratios.⁵⁵ Banks may since then become more prudent in pricing their lending, including syndicated loans, by factoring in the potential liquidity risk amid the unprecedented low interest rate environment.

The estimation result (Table B4.B) is generally in line with our expectation, except for short-term interest rates, which is found to be statistically insignificant.⁵⁶ Nevertheless, the macro factors together account for around 32% and 18% of the variation of loan spreads for Hong Kong dollar loans and US dollar loans respectively⁵⁷, suggesting that macroeconomic environments significantly affect the pricing for syndicated loans in Hong Kong.

Table B4.B
Estimation result for the second-stage regression

Explanatory variables	Dependent variable: e (Sample period: 2005Q1 - 2013Q2)	
	HKD loans	USD loans
SR	-4.02	-4.94
EXP	-1.90 ***	-1.32 ***
LTD ratio	1.79 **	0.34
$LTD09$	1.13 ***	1.17 **
Constant	-148.23 **	-20.83
R^2	0.385	0.218
Number of observations	353	384

Note: *** and ** denote significance at 1% and 5% levels respectively.

⁵³ An increase in EXP indicates that business situation is likely to improve while a decrease may signal deterioration in business situation in the near term.

⁵⁴ The dummy variable is defined as one after November 2009 for Hong Kong dollar loans and after July 2009 for US dollar loans.

⁵⁵ Apart from a series of macroprudential measures since late 2009 to help banks to manage specifically their risks in mortgage lending, the HKMA issued circular "Credit growth" on 11 April 2011 to all AIs, requiring them to reassess their loan business and funding plans.

⁵⁶ Short-term interest rates are found to have a significant negative relationship with the loan spread in univariate regression analysis. However, the significance does not carry over after controlling for the effect of LTD ratios.

⁵⁷ This is calculated as $(1 - R_{(1)}^2)R_{(2)}^2$, where $R_{(1)}^2$ and $R_{(2)}^2$ are the R -squared statistics from the first- and second-stage estimations respectively.

Decomposition analysis of loan spreads

Based on the estimation result, we decompose the relative contribution of each factor to changes in the loan spreads. Charts B4.3 and B4.4 show the cumulative change in the loan spreads since the third quarter of 2007 for Hong Kong dollar loans and US dollar loans respectively together with the estimated contribution by each factor. There are some interesting patterns from the charts. First, risk characteristics of individual borrowers are found to contribute mainly to the volatility of the loan spread rather than the upward trend (see the red bars). Second, among the macro factors, liquidity, which is proxied by LTD ratios, contributes the most significant part of the rising loan spread (i.e. the orange bars), followed by changes in expectation of business situation (i.e. the blue bars). Changes in short-term interest rates, even assuming it as one significant contributor, are found to have a limited contribution to the rising loan spread.

Chart B4.3
Factors contributing to the rising loan spread on Hong Kong dollar syndicated loans since 2007Q3

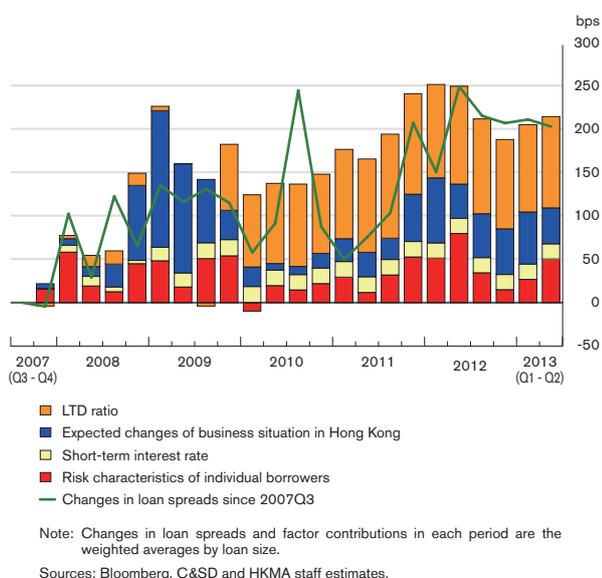
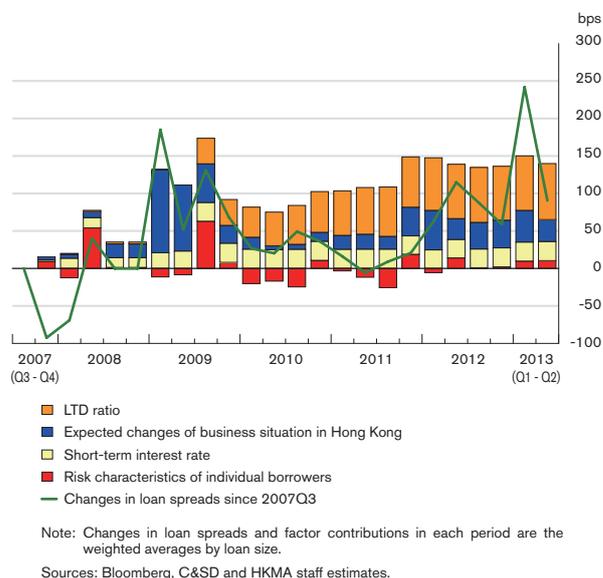


Chart B4.4
Factors contributing to the rising loan spread on US dollar syndicated loans in Hong Kong since 2007Q3



Conclusion

This analysis empirically reveals that less abundant domestic liquidity conditions, as reflected by rising LTD ratios since 2009, are one major contributor to the rising loan spread of syndicated loans in Hong Kong. One implication is that even if the near-zero interest rate environment remains unchanged in the near term, a significant change in domestic liquidity conditions due to external factors could drive the loan pricing in Hong Kong noticeably. There is market speculation that the US tapering could result in significant outflows of funds from Asia, including Hong Kong. If such a scenario occurs, domestic liquidity conditions could be tightened due to withdrawals of deposits, and loan prices could rise significantly ahead of any interest rate hike. The potential impact of a sudden change in local liquidity conditions on loan prices and its possible consequences merit close attention.

Box 5

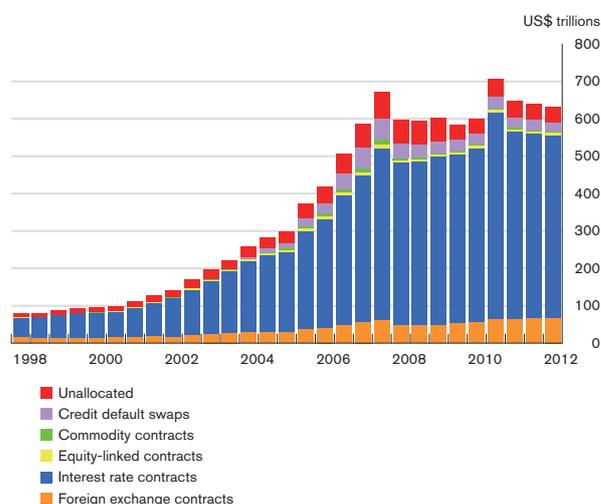
Macroeconomic impact assessment of the OTC derivatives reform

Background

The over-the-counter (OTC) derivatives market expanded rapidly in the past decade, with the outstanding amount of derivative contracts rising from US\$80 trillion at the end of 1998, to US\$633 trillion at the end of 2012 (Chart B5.1). It is generally believed that the opacity, highly unregulated and insufficiently collateralised nature of OTC derivatives market, given its sheer size, helped propagate and amplify the global financial crisis. In response, the G20 leaders declared in the 2009 Pittsburgh Summit that more regulations on OTC derivatives were required. At the initiative of the Financial Stability Board (FSB), a working group was formed in April 2010 to make recommendations on the implementation of the G20 decisions.⁵⁸ Specifically, the proposed OTC derivatives reform consists of four elements: (1) all standardised OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared

through central counterparties (CCPs); (2) OTC derivative contracts should be reported to trade repositories; (3) non-centrally cleared contracts should be subject to higher capital requirements; and (4) non-centrally cleared contracts should be subject to more stringent margin requirements⁵⁹.

Chart B5.1
Outstanding amount of global OTC derivatives contracts



Note: Figures are based on Semi-annual Over-the-counter (OTC) Derivatives Markets Statistics published by the BIS.

Source: BIS.

⁵⁸ For a progress report of the reform across member institutions of the FSB, see Sixth Progress Report on Implementation of OTC Derivatives Market Reforms, published by the FSB in September 2013. In Hong Kong, to provide for the regulatory framework for the OTC derivatives market, the relevant Bill was gazetted in June 2013 and was tabled before the Legislative Council in July 2013. Detailed rules for implementing the new framework, in the form of subsidiary legislation, are being prepared and will be issued for public consultation in late 2013.

⁵⁹ Initial margins and variation margins are deployed in OTC derivatives transactions to mitigate counterparty risks. Initial margins are posted by each counterparty at the beginning of the trade to cover potential losses in the event of default. Variation margins are adjusted between counterparties daily to reflect mark-to-market profit and loss in their derivative positions.

⁶⁰ MAGD is composed of 29 member institutions of the FSB, with the help of the BIS and International Monetary Fund. The full MAGD report, "Macroeconomic impact assessment of OTC derivative regulatory reforms", published on 26 August 2013 is available in the BIS website.

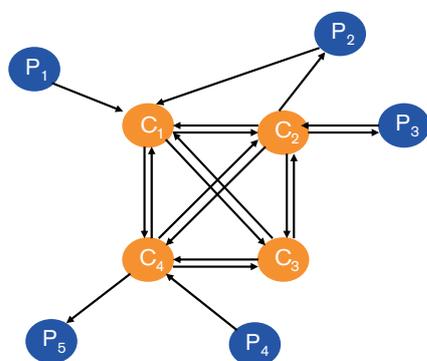
As the reform is still under consultation, the Over-the-Counter Derivatives Coordination Group commissioned the Macroeconomic Assessment Group on Derivatives (MAGD) to conduct a quantitative benefits and costs assessment of the macroeconomic implications of the reform. At the invitation of the Bank for International Settlements (BIS), the HKMA has joined the MAGD.⁶⁰ This box presents key findings of the assessment.

Macroeconomic assessment

(A) Benefits of the reform

Benefits of the reform are gauged by network modelling. Based on data from the 16 largest derivatives dealers (G16 dealers) and 25 less active banks at the end of 2012, a network of bilateral exposures between them is estimated.⁶¹ The estimated network attempts to mimic the structure of the OTC derivatives market, which is characterised by a highly interconnected core and less interconnected periphery (Chart B5.2).⁶²

Chart B5.2
Stylised core-periphery network



Notes:

1. Orange nodes with a letter "C" refer to 'core' set of players in the network, and blue nodes with a letter "P" refer to 'periphery' set of players. The arrows represent the direction of bilateral gross exposure. For example, the arrow originates from P₁ to C₁, denotes a claim of P₁ on C₁.
2. Banks from the periphery set do not have linkages among themselves. However, they are indirectly linked to each others through the core banks.

⁶¹ As data for banks' bilateral exposures are not available due to confidentiality issues, the network of bilateral exposures is estimated using an improved maximum entropy method. For details, see G. Halaj and C. Kok (2013), "Assessing Interbank Contagion Using Simulated Networks", ECB Working Paper No. 1506.

⁶² To ensure the estimated network is a reasonable description of the reality, summary statistics generated from the estimated network have been validated against confidential data sources.

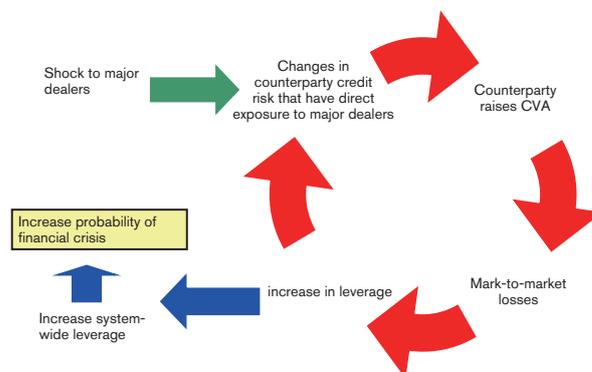
⁶³ CVA is an adjustment made by the institution to the valuation of a netting set with the counterparty to reflect the market value of the credit risk of that counterparty. CVA capital charge represents the amount of capital that a bank is required to hold for the CVA risk of the counterparty and is a new element under the Basel III regulatory framework.

⁶⁴ Netting is the process of offsetting different counterparties' transactions into one single net obligation.

⁶⁵ Under the Basel III capital requirement, a better collateralised exposure is subjected to a lower CVA charge.

To understand the propagation mechanism of the estimated network, an exogenous shock is considered to the G16 dealers that increases their default probability (Chart B5.3). Counterparties which have direct exposures to G16 dealers will respond to the shock by increasing the credit valuation adjustments (CVA) for the uncollateralised derivatives exposures.⁶³ Although actual default is yet to occur, this results in mark-to-market losses equal to changes in CVAs and drives up counterparties' leverage. Due to a higher leverage, the riskiness of the network increases and the losses reverberate further to other banks that may not have direct exposures to the G16 dealers initially. Overall, the shock to the G16 dealers would lead to an increase in the system-wide leverage. If the increase in leverage is severe enough, the elevated systemic risk can result in the occurrence of a financial crisis.

Chart B5.3
Stylised model architecture



There are two major benefits of the reform that help banks to withstand shocks. First, as central clearing through CCPs enables multilateral netting, the cascade of losses will be transmitted in a less complex network, thus the systemic risk arising from inter-linkage between banks will be significantly reduced.⁶⁴ Secondly, better collateralisation against OTC derivatives exposures can lower the impact of the initial shocks when it reverberates through the network.⁶⁵ The MAGD estimates that the reform can lower the probability of occurrence of a financial crisis in any given year by 0.26 percentage points. Based on the finding that the

median cost of a financial crisis is 60% of the pre-crisis GDP, it is estimated that expected annual GDP losses of about 0.16% could be avoided by the reform.⁶⁶ It is noteworthy that the estimated benefits are based on data from the derivatives exposure of banks which have significant operations in the global OTC derivatives market, thus the estimated benefits are equally applicable to every jurisdiction.

(B) Costs of the reform

There are three ways in which the reform may lead to higher cost to banks. First, the higher CVA capital charges require banks to hold more capital, which creates downward pressure on their profitability as cost of equity is typically greater than debt.⁶⁷ Second, the more stringent margins requirements for both centrally and non-centrally cleared OTC derivatives require banks to hold more collateral-eligible assets, which results in additional expenses.⁶⁸ Third, the fee required by

CCPs and the default fund contributions are direct expenses incurred by banks when more trades are shifted to central clearing.⁶⁹

To assess the impact, based on the differences in the assumed effectiveness of the multilateral netting achieved by CCPs, three scenarios (high-netting, low-netting and central) are considered.⁷⁰ The MAGD estimates that the cost under the central scenario is €20 billion, while the costs under the high and low netting scenarios are €32 billion and €15 billion respectively. It is assumed that banks will transfer the costs to customers by widening the lending spreads. Using an estimate of €24 trillion that represents the size of the global banking loan book, the lending spreads are estimated to increase by 6, 8 and 13 basis points in the high netting, central and low netting scenarios respectively.

Using a suite of macroeconomic models provided by the MAGD members, it is estimated that the increase in lending spreads would reduce GDP by 0.03% (high-netting) to 0.07% (low-netting) under the three scenarios (Table B5.A). For Hong Kong, an error correction model is developed by linking Hong Kong's GDP with its interest rates and lending spreads.⁷¹ Under the three scenarios, it is estimated that the reform would lead to a drop of GDP ranging from 0.02% (high-netting) to 0.05% (low-netting).

Table B5.A
Macroeconomic benefits and costs of OTC derivatives regulatory reforms

Impact on long-run GDP in per cent	High-netting scenario	Central scenario	Low-netting scenario
Global average			
Benefits ¹	0.16	0.16	0.16
Costs ²	-0.03	-0.04	-0.07
Net benefits	0.13	0.12	0.09
Hong Kong			
Benefits ¹	0.16	0.16	0.16
Costs ³	-0.02	-0.03	-0.05
Net benefits	0.14	0.13	0.11

Notes:

1. Calculated as the impact on GDP due to a financial crisis times the reduction of probability of a crisis. The assumed decline in output is 60% of pre-crisis GDP. As exposures were found to be sufficiently collateralised post reform, the reductions of probability of a crisis and hence the benefits are estimated to be the same under the three scenarios. The estimated benefits are equally applicable to every jurisdiction.
2. Impact on GDP due to higher lending spreads. The increases in lending spreads under the high-netting, central and low-netting scenarios are 6, 8 and 13 basis points respectively. The figures are based on the median of the results from 16 jurisdictions using different macroeconomic models.
3. Estimates are for Hong Kong only.

⁶⁶ The benefits of the reform are computed as the reduction in the probability of the crisis times its output cost. The output cost is estimated from a previous macroeconomic assessment by the Macroeconomic Assessment Group. For details, see Basel Committee on Banking Supervision (2010), "An assessment of the long-term economic impact of stronger capital and liquidity requirements".

⁶⁷ It is noteworthy that the increase in funding cost is an upper-bound estimate since it ignores the contribution of a lower risk arising from a better capitalised banking system.

⁶⁸ The cost increase in OTC derivatives due to additional collateral requirements is also an upper-bound estimate since it ignores the possible situation of a more favourable pricing arising from lower counterparty risk when counterparties post more collateral.

⁶⁹ Default funds are made up of contributions from both clearing participants and CCPs. It has a risk-sharing feature that non-defaulting clearing participants may be required to share any losses due to a default of another clearing participant.

⁷⁰ It is assumed that multilateral netting associated with central clearing is about four times more effective than bilateral netting. In designing various netting scenarios, the percentage of OTC derivatives that will be centrally traded is assumed to change from the current 35% to 60% post reform in the central scenario. In the high-netting scenario, the ratio is increased further to 75% post reform. In the low-netting case, while 75% of trades are assumed to clear through CCPs, there are no netting benefits.

⁷¹ Hong Kong's interest rates and lending spreads are proxied by HIBOR and the net interest margins of the Hong Kong banking sector. For details, see Wong et al., "An Assessment of The Long-term Economic Impact of the New Regulatory reform on Hong Kong" *HKMA Research Note 05/2010*.

(C) Net Result

In sum, the MAGD concludes that the net benefits of the reform are positive in all scenarios, with a central estimate of 0.12% of GDP a year. For Hong Kong, the net benefits of the reform are about 0.13% of GDP a year.

Limitations of the quantitative assessment

Although the analytical approach suggests that the reform can generate net benefits, there are a number of factors that may affect the impact of the reform, but their effects have not been covered by the assessment. These include the following:

1. *Interconnection risks arising from multilateral netting across CCPs*

Central clearing allows CCPs to perform multilateral netting of exposures, thereby facilitating the reduction of counterparty risk. Given the proliferation of CCPs, this benefit can only be realised if there are linkages among them. While such linkages among CCPs could increase the scope for multilateral netting and reduce collateral demand, it may also introduce interconnection risks and transmit participants' failure among themselves. The potential impact of the establishment of linkages among CCPs needs to be further assessed.

2. *Pressures on prices of collateralised assets*

It is foreseeable that collateral demand will increase significantly post reform. Any shortage of collateral during times of stress may pose excessive pressures on prices of high quality assets, and hence increase the costs of using derivatives.

3. *Increased cost of indirect clearing*

Indirect clearing through other CCPs clearing members offers a way through which smaller market participants could have access to CCPs. However, they may face higher margin requirements required by the direct clearing members than that imposed by CCPs on direct clearers themselves. The more stringent margin requirements, which aim at protecting direct clearing members from the increased risk associated with indirect clearing, will raise the cost of risk transfer. Should this deter risk hedging by smaller market participants, it may not be conducive to economic and financial stability.⁷²

4. *Cross-border issues and its impact*

As jurisdictions around the world gradually put their own regulatory regimes in place, there are indications of potential differences in the scope and application of the new regulations across jurisdictions.⁷³ Should any conflicts in the regulatory frameworks not be properly addressed, there is a risk that they could create potential for regulatory arbitrage. Given the significant presence of global dealers in the regional OTC derivatives markets, any withdrawal of them in taking advantage of the regulatory differences may result in market fragmentation, and may have a significant impact on the pricing and liquidity of the products traded in the region.

⁷² For large institutions, it seems unlikely that they will be discouraged from using derivatives in hedging at all just because of the higher costs. Nonetheless, during a meeting organised by MAGD with OTC derivatives market participants, it was suggested that some smaller pension funds and non-financial companies may choose to hedge much less or not at all.

⁷³ One example is the difference in the recognition of CCPs. For instance, European and US banks may be prevented from clearing their trades through CCPs that are not recognised by or registered in their home jurisdictions.