4. Monetary and financial conditions

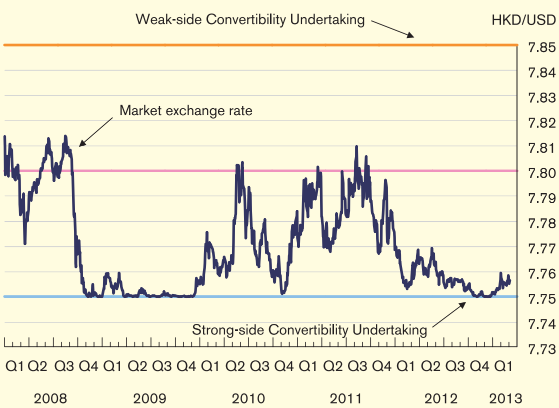
Exchange rate, interest rates and monetary developments

The Hong Kong dollar exchange rate strengthened and stayed close to 7.75 during the second half of 2012. The strong-side Convertibility Undertaking (CU) was triggered repeatedly in the fourth quarter amid strong inflows of funds. Local monetary conditions remained accommodative, with interest rates staying at low levels. Loan growth has moderated, though with some signs of pick-up in domestic credit towards the end of the year.

4.1 Exchange rate and interest rates

The Hong Kong dollar exchange rate strengthened and stayed close to 7.75 during the second half of 2012 (Chart 4.1). The strong-side CU was triggered repeatedly in the fourth quarter due to inflows of funds, which partly reflected increased allocation to Hong Kong dollar assets by overseas investors, as well as the proceeds from issuance of foreign currency bonds by Hong Kong firms in exchange for Hong Kong dollars. The stronger equity IPO activities in late November and December also to some extent supported the inflows. The Hong Kong dollar exchange rate then softened slightly in early 2013 amid increased allocation to US dollar assets, to 7.7562 on 28 February.

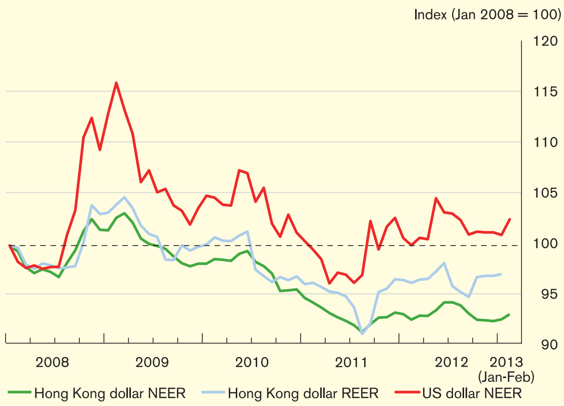
Chart 4.1
Hong Kong dollar exchange rate



Source: HKMA.

Mainly reflecting the movements of the US dollar against most of the major currencies, the trade-weighted Hong Kong dollar nominal effective exchange rate index (NEER) weakened in the third quarter and then stabilised in the fourth quarter. For the whole six-month period, the NEER declined by 2.0% (Chart 4.2). The Hong Kong dollar real effective exchange rate index (REER) also weakened, but at a milder pace due to slightly higher inflation in Hong Kong relative to its trading partners.

Chart 4.2
Nominal and real effective exchange rates



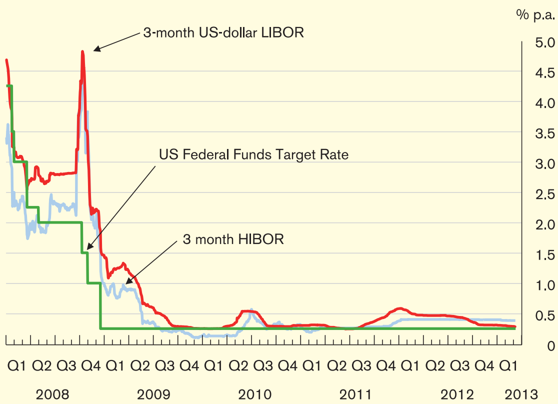
Note: Real effective exchange rate index is seasonally adjusted.

Sources: C&SD, CEIC and HKMA staff estimates.

The low interest rate environment in Hong Kong continued amid the ongoing expansionary monetary policy in the US. With the Federal Funds Target Rate staying at 0 – 0.25%, the Base Rate under the Discount Window operated by the HKMA was held unchanged at 0.5% (Chart 4.3). In the Hong Kong dollar money market, the interbank rates also stayed low, with the overnight and three-month HIBOR fixings hovering around 0.10% and 0.40% respectively. For maturities beyond three months, the interbank rates edged down slightly along with the LIBOR counterparts. Overall during the second half, there were only small fluctuations in the Hong Kong dollar interbank rates and the HIBOR-LIBOR spreads remained broadly stable.

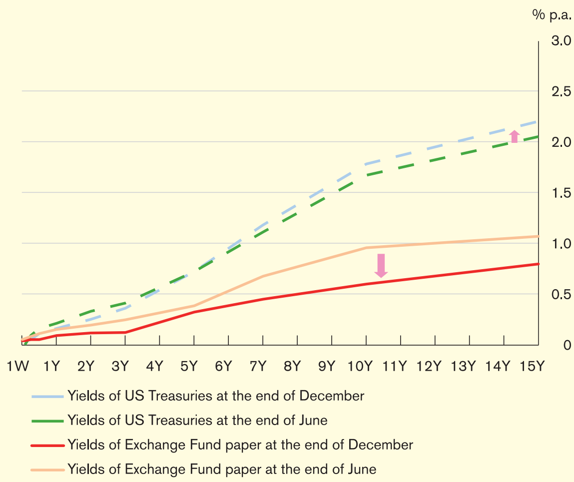
The nominal yield curve of Exchange Fund papers shifted down during the second half of 2012, partly reflecting increases in banks' demand for high quality Hong Kong dollar assets (Chart 4.4). On the other hand, the US Treasuries yield curve shifted up for long tenors but edged down for short tenors. As a result, the negative yield spread between long-dated Exchange Funds papers and US Treasuries widened during the second half. Moving into early 2013, despite additional issuance of Exchange Fund Bills, the yield curve of Exchange Fund papers has steepened, mainly reflecting larger increases of long-dated yields during this period. The yield spread against US Treasuries has narrowed somewhat as a result.

Chart 4.3
Interest rates of the Hong Kong dollar and US dollar



Source: CEIC.

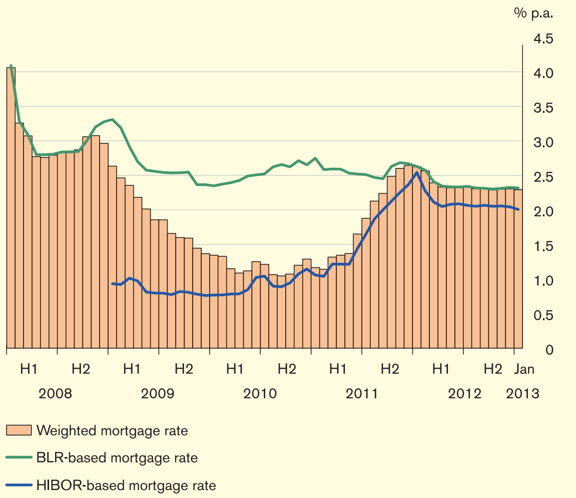
Chart 4.4
Yield curve movements in the second half of 2012



Source: HKMA.

Interest rates on the retail front remained steadily low. The Best Lending Rates (BLR) continued to be stable at 5.00% or 5.25% throughout the second half of 2012. Meanwhile, the average mortgage interest rate edged down by two basis points from June to 2.30% in December (Chart 4.5). Mainly due to a mild decrease in the weighted deposit rate, the composite interest rate decreased by 10 basis points to 0.32% at the end of December (Chart 4.6). This suggested an easing in retail banks' average cost of funds during this period.

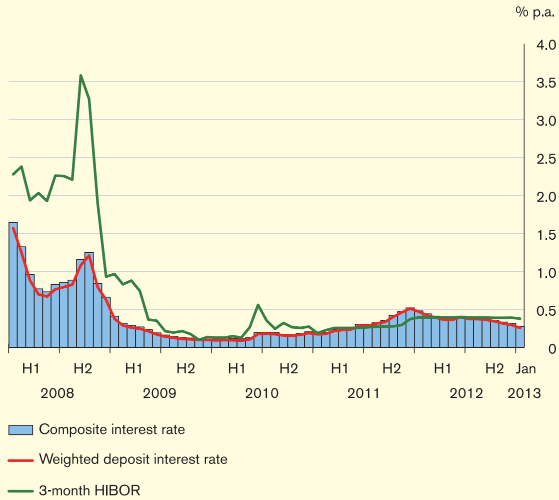
Chart 4.5
Mortgage interest rates for newly approved loans



Note: The share of HIBOR-based mortgage plans was small in 2008. All mortgage rates are estimates only.

Source: HKMA staff estimates.

Chart 4.6
Deposit interest rates and the average cost of funds



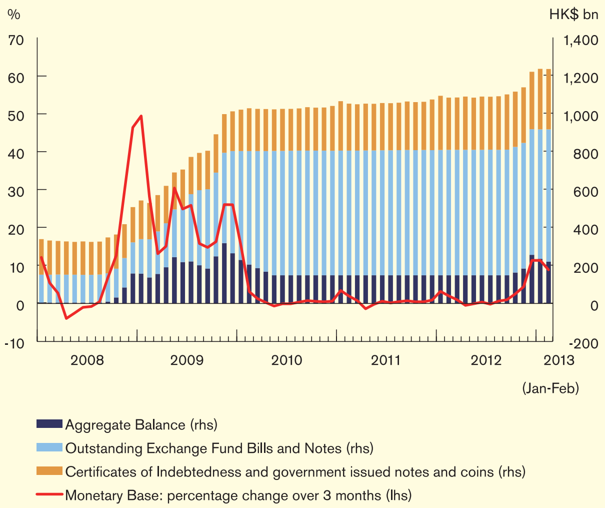
Sources: HKMA and CEIC.

The Hong Kong dollar interest rate environment just described remained roughly stable moving into 2013, with the interbank rates and the composite rate staying at low levels. As implied by the term structure, the HIBORs and swap rates are still expected to be low in the next two years. The latest consensus estimates for the three-month HIBOR also remain steady at 0.40 – 0.50% over the next 12 months. Broadly tracking the movements of interbank rates, lending and deposit rates would likely remain relatively low, yet subject to changes in the demand and supply conditions for loans and deposits in the banking system. In mid-March 2013, a few leading banks raised the interest rates for new mortgages by 25 basis points, reportedly in response to higher funding costs.

4.2 Money and credit

Monetary aggregates and bank lending increased steadily in the third quarter of 2012 but showed stronger growth thereafter. Due to repeated triggering of the strong-side CU in the fourth quarter, the Aggregate Balance and hence the Monetary Base increased appreciably (Chart 4.7). In early 2013, additional Exchange Fund papers were issued to meet the strong demand by banks for liquidity management. As a whole, the Aggregate Balance and the outstanding Exchange Fund papers rose by HK$107.1 billion during this period. The outstanding Certificate of Indebtedness (CIs) increased steadily, while currency notes and coins in circulation were little changed.

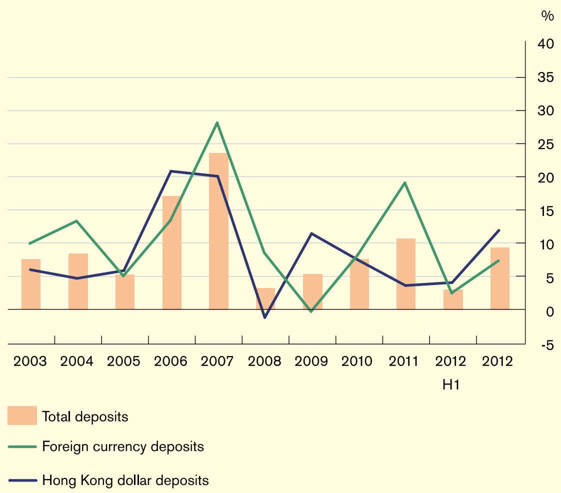
Chart 4.7
Monetary Base components



Source: HKMA.

The Hong Kong dollar monetary aggregates showed much faster increase during the second half of the year partly reflecting inflows of funds. For the whole year, the seasonally adjusted Hong Kong dollar narrow money supply (HK$M1) increased by 15.8% and the broad money supply (HK$M3) by 12.1%. Hong Kong dollar deposits increased by 11.7% in 2012 as a whole, compared with a modest annualised 3.8% increase in the first half (Chart 4.8). Demand and savings deposits recorded double-digit growth, while time deposits were little changed. Growth in foreign currency deposits picked up to 7.0% for the whole year, compared with an annualised 2.2% in the first half. This largely reflected brisk growth in US dollar deposits. Renminbi deposits bounced up in the second half. Their recent developments will be discussed in greater detail later in this section.

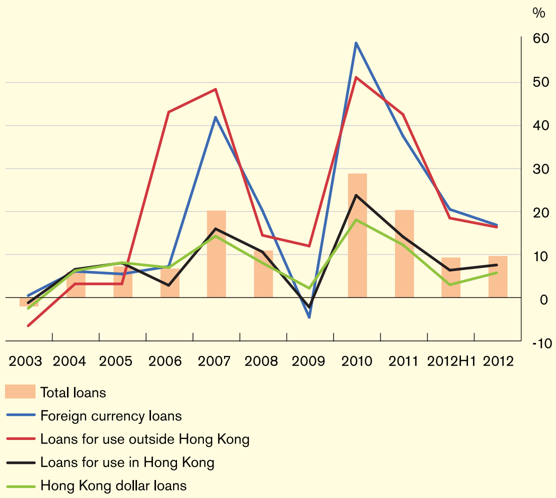
Chart 4.8
Deposit growth



Note: Growth rates in 2012 H1 are annualised.
Source: HKMA.

On the credit side, total loan growth slowed visibly to 9.6% in 2012 from 20.2% in 2011 along with the slowdown in the domestic economy and in part reflecting the impact of prudential measures by the HKMA (Chart 4.9). But compared with the first half, there was a slight acceleration in loan growth later in the year led by Hong Kong dollar loans and loans for domestic use, although growth remained modest at 5.5% and 7.3% respectively for the whole year. Foreign currency loans and loans for non-domestic use saw growth decelerating throughout the year to around 16%.

Chart 4.9
Loan growth

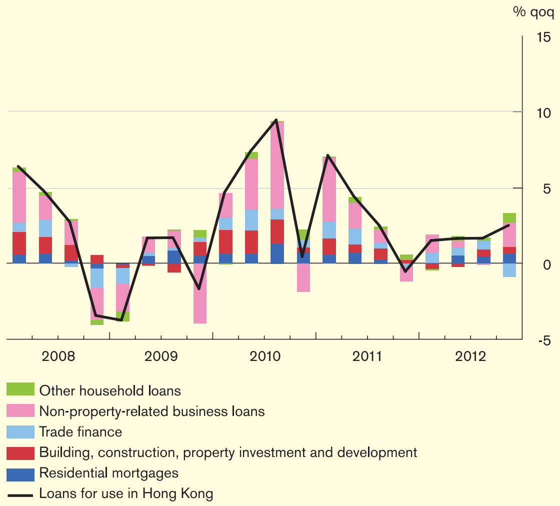


Note: Growth rates in 2012 H1 are annualised.

Source: HKMA.

Analysed by economic use, most types of loans for domestic use except trade financing showed faster growth in the second half (Chart 4.10). Property-related loans increased steadily amid pick-ups in property trading and construction activities. Non-property-related business loans grew even faster. In particular, loans to financial concerns and stockbrokers expanded vibrantly alongside revivals in stock market and fund raising activities. Loans to wholesale and retail trade continued to rise at a robust pace. Household loans (including residential mortgages, credit card advances and personal loans) also increased notably. As a result, the household debt-to-GDP ratio rose to a high of 61%, suggesting households could have a more stretched balance sheet.

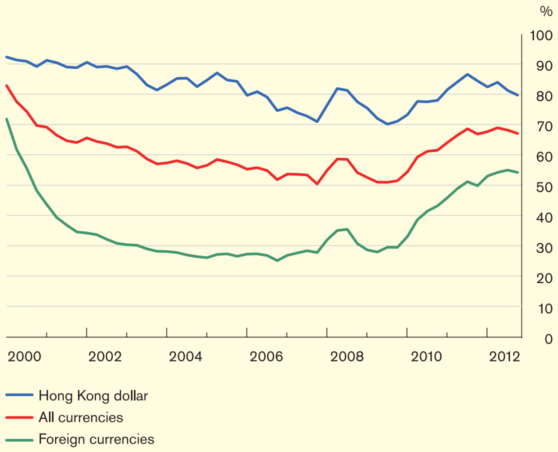
Chart 4.10
Loans for use in Hong Kong by sector



Source: HKMA.

Due to relatively stronger increase in deposits, the Hong Kong dollar loan-to-deposit ratio declined to 79.8% in December 2012 from 84.0% in June (Chart 4.11). This reflected some easing in the Hong Kong dollar liquidity conditions. The foreign currency loan-to-deposit ratio was little changed from June, staying at 54.3% in December.

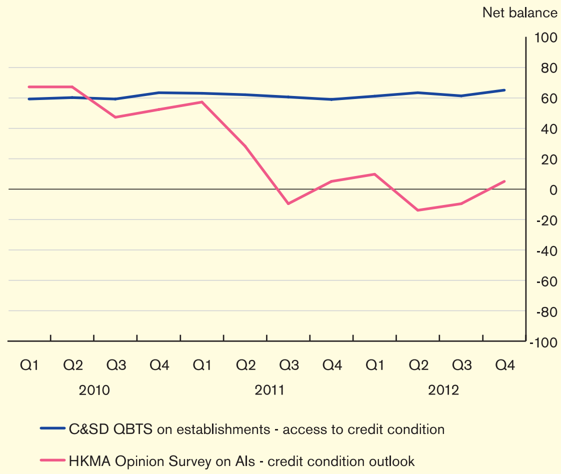
Chart 4.11
Loan-to-deposit ratios



Source: HKMA.

It is likely that credit demand will increase in the near term amid signs of improvement in the domestic economy. The latest HKMA Opinion Survey on Credit Condition Outlook points to stronger credit demand in the period ahead, with the net balance (the difference between the proportion of surveyed AIs expecting an increase and those expecting a decrease) turning positive again (Chart 4.12). Meanwhile, credit supply is expected to remain accommodative with the continuation of the low interest rate environment. The latest QBTS also indicates no signs of deterioration in firms' credit access.

Chart 4.12
Surveys on credit demand and credit access

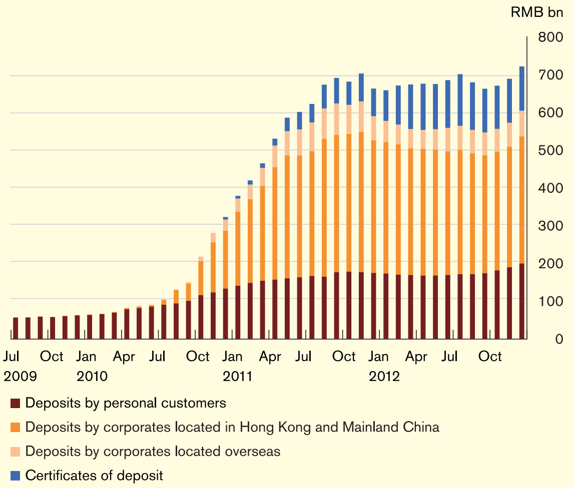


Sources: HKMA and C&SD.

The funding structure of banks' renminbi business in Hong Kong continues to evolve. Banks were increasingly issuing renminbi certificates of deposits (CDs) as a means to tap renminbi funds in the first half of 2012, although such tendency moderated somewhat in the second half of the year. Starting from 1 August 2012, banks are offering renminbi services to personal customers who are non-Hong Kong residents, and this has provided an additional source of renminbi funding.

For the year as a whole, renminbi customer deposits increased by 2.5% to RMB603.0 billion (Chart 4.13). In Hong Kong dollar terms, this represented 9.1% of total deposits in the banking system, compared with a 9.6% share a year ago. Meanwhile, outstanding CDs surged by 60.5% to RMB117.3 billion. Taken together, the total outstanding amount of renminbi customer deposits and CDs grew modestly by 8.9% to RMB720.2 billion.

Chart 4.13
Renminbi deposits and outstanding certificates of deposit in Hong Kong



Source: HKMA.

In view of the quick evolution of the offshore renminbi market, Box 4 article provides a preliminary analysis of the determinants to the growth in outstanding renminbi deposits. This helps draw further insights on the development of offshore renminbi liquidity.

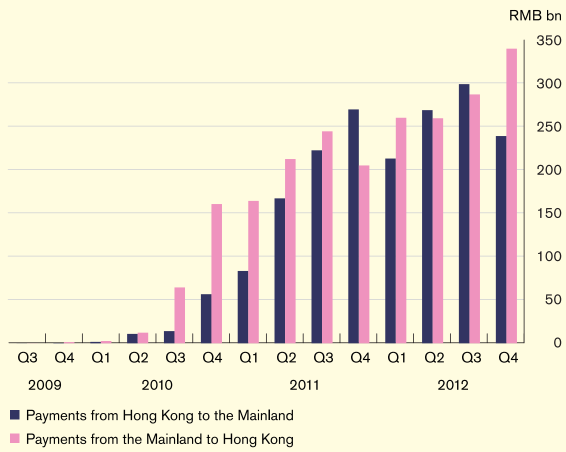
During the second half of 2012, the offshore renminbi exchange rate in Hong Kong (CNH) moved largely in tandem with the onshore exchange rate (CNY) (Chart 4.14). Both the CNH and CNY strengthened amid Mainland's improving economic outlook. The CNH traded at a premium to CNY since November along with the risk-on sentiment in the global financial market.

Chart 4.14
Onshore and offshore renminbi exchange rates

Source: Bloomberg.

Renminbi trade settlement conducted through Hong Kong banks increased by a robust 37.5% to RMB2,632.5 billion during 2012. Among the total, inward remittances from the Mainland and outward remittances from Hong Kong grew at similar pace of 38.8% and 37.3% respectively (Chart 4.15). Renminbi loans extended by banks in Hong Kong surged by 156.6% to RMB79.0 billion, or 1.8% of banks' total loans. The number of participating banks in Hong Kong's renminbi clearing platform increased further to 204 at the end of 2012 from 187 at the end of 2011. The amount due to, and due from, such overseas banks amounted to RMB99.1 billion and RMB117.1 billion respectively.

Chart 4.15
Flows of renminbi trade settlement payments



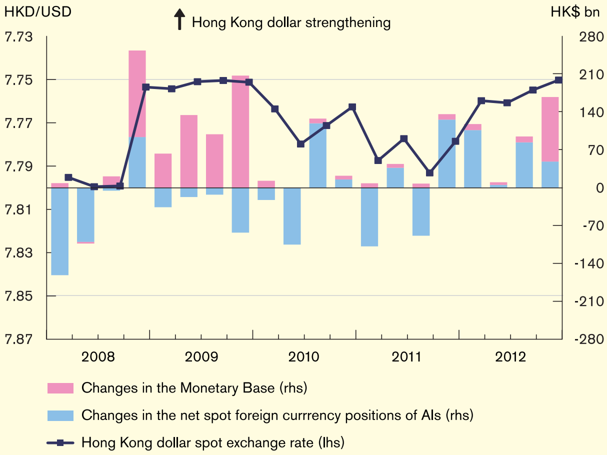
Source: HKMA.

4.3 Capital flows

Demand for Hong Kong dollar assets

Demand for the Hong Kong dollar picked up in the third quarter of 2012 after dwindling somewhat in the second quarter, according to both the price and quantity indicators (Chart 4.16). In particular, the Hong Kong dollar spot exchange rate strengthened slightly to an average of 7.7553 in the third quarter from 7.7614 in the second quarter. The net spot foreign currency positions of the AIs also expanded successively during the third quarter, pointing to some inflows of funds in the non-bank private sector. [19] For the whole quarter, Hong Kong dollar deposits increased by HK$173.4 billion, much larger than the HK$38.1 billion rise in Hong Kong dollar loans.

Chart 4.16
Fund flow indicators (quarterly)



Note: A positive change in the Monetary Base or the net spot foreign currency positions of AIs signals inflows.

Source: HKMA.

Market information suggests that the pick-up in the Hong Kong dollar demand was partly driven by equity investments and liquidity needs of banks towards the quarter-end. The announcement of the ECB to undertake OMTs and of the Fed to purchase additional agency mortgage-backed securities in September might also have lifted investor sentiment, leading to additional demand for the Hong Kong dollar. Given that the Hong Kong dollar spot exchange rate was very near 7.75 at that time, market participants had expected that the strong-side CU could be triggered soon.

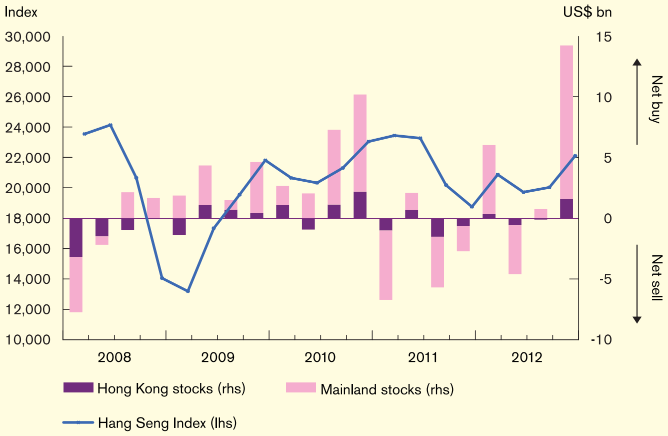
Moving into Q4, the buying pressure on the Hong Kong dollar strengthened, and the strong-side CU was repeatedly triggered between 19 October and 21 December. Consequently, the HKMA purchased a total of US$13.8 billion of US dollars from banks and the Aggregate Balance increased by HK$107.2 billion to close at HK$255.8 billion at the end of 2012. During the quarter, the Hong Kong dollar spot exchange rate stayed near 7.75. The net spot foreign currency positions of the AIs also rose in tandem with the Aggregate Balance, signalling that the Hong Kong dollar demand came mainly from the non-bank private sector (Chart 4.16). As such, Hong Kong dollar deposits recorded another quarter of solid expansion, by HK$190.7 billion, as against a HK$91.0 billion increase in Hong Kong dollar loans.

This fresh round of Hong Kong dollar inflows in the fourth quarter reflected a number of factors in play. First, there was increased allocation to Hong Kong dollar assets by overseas investors. Market information suggests that global mutual funds purchased more equities listed in Hong Kong, reversing the broad pattern of net selling

[19] It should be noted that changes in the net spot foreign currency positions of the AIs, or the equivalent of their net spot Hong Kong dollar positions, include the effects of valuation changes like price and exchange-rate changes, and, therefore, are only a proxy for net Hong Kong dollar fund flows.

in the second quarter (Chart 4.17). In particular, improving market sentiment – owing to further monetary easing in the US and the euro area as well as signs of a growth pick-up in the Mainland economy – drove global funds to search for investment opportunities and helped support the equity-related demand for the Hong Kong dollar.

Chart 4.17
Market survey of equity-related flows

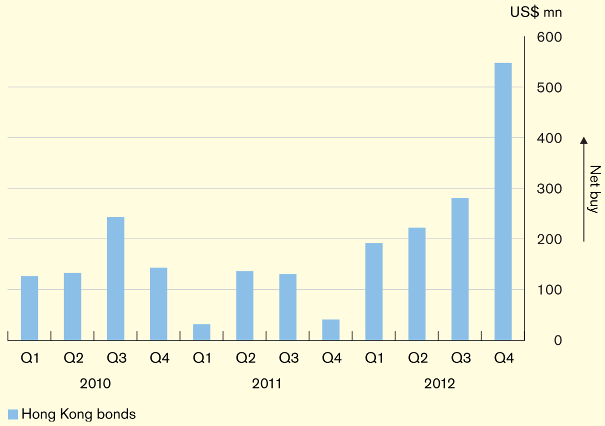


Note: "Mainland stocks" include H-shares, red-chips listed on the Hong Kong Stock Exchange and those shares listed on the Mainland stock markets.

Sources: CEIC and EPFR Global.

Secondly, there was more issuance of US dollar bonds by Hong Kong corporations and part of the foreign currency proceeds from these bond issuance activities were exchanged into Hong Kong dollars in the spot market, thereby increasing the buying pressure on the Hong Kong dollar. More Hong Kong firms turned to the bond market for longer-term funds partly because local syndicated loan market became less active following the European sovereign debt crisis. According to market statistics, the total amount of foreign currency bonds issued by local firms reached US$23.3 billion (around HK$180 billion) in 2012, tripling the size in 2011. On the flip side, net foreign buying of Hong Kong bonds successively increased throughout 2012, as indicated by a survey of fund managers (Chart 4.18). In fact, many Asian economies saw a resurgence of flows into bond funds in 2012.

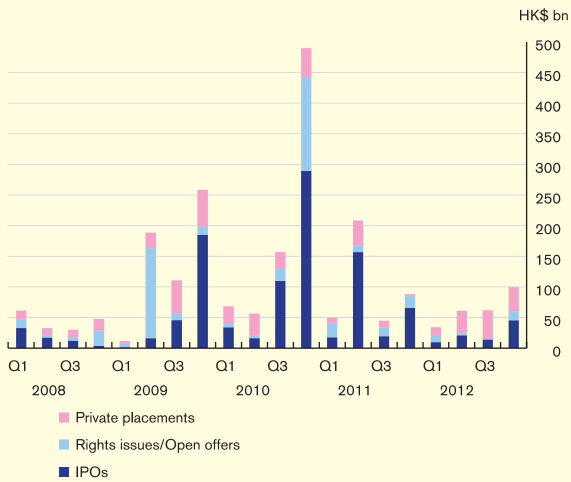
Chart 4.18
Market survey of bond-related flows



Source: EPFR Global.

Thirdly, towards the end of December, fund-raising activity in the stock market bounced back from its earlier doldrums, to some extent giving extra impetus to the Hong Kong dollar demand (Chart 4.19). Specifically, after recording the worst January-September performance in terms of proceeds raised since the 2008-09 global financial crisis, IPO activity picked up in late November and December alongside soaring local stock prices. This was partly attributable to improving liquidity and market sentiment amid more aggressive monetary easing in the US and diminished tail risk in the euro area.

Chart 4.19
Equity funds raised in Hong Kong



Note: Figures exclude warrants exercised, consideration issues and share option schemes.

Source: Hong Kong Exchanges and Clearing Limited.

As such, these Hong Kong dollar inflows might not necessarily be "hot money" as often characterised by some observers. The increase in asset allocation to Hong Kong dollar assets by institutional investors and the exchange for Hong Kong dollars with foreign currencies to meet operational needs of firms were largely normal economic and financial activities. Despite strong inflows into the Hong Kong dollar, there have been no signs of exchange-rate speculation against the Linked Exchange Rate system. (Box 3 analyses recent performance of the Hong Kong dollar exchange market.)

Balance of Payments and cross-border capital flows [20]

The Balance of Payments (BoP) statistics indicated that reserve assets expanded slightly by HK$37.9 billion (7.2% of GDP) in the third quarter of 2012, partly due to incomes from foreign currency assets and increases in CIs, which were more related to the normal operation of the Currency Board instead of autonomous inflow pressures (Table 4.A). Recent HKMA data show that the foreign currency reserve assets of the Exchange Fund increased solidly in the fourth quarter.

Table 4.A
Balance of Payments account by standard component

% of GDP	2010	2011	2012 Q1	2012 Q2	2012 Q3
Current Account	6.6	4.8	0.2	-2.4	4.5
Capital and Financial Account	-5.0	-5.8	2.9	6.6	-9.8
Financial non-reserve assets (net change)	-1.4	-1.3	16.1	5.3	-2.5
Direct investment	-6.9	0.1	-1.8	2.0	-3.7
Portfolio Investment	-24.9	-0.6	40.2	3.7	-10.2
Financial derivatives	1.1	1.1	0.4	0.1	0.2
Other investment	29.3	-1.9	-22.6	-0.5	11.2
Reserve assets (net change)	-3.3	-4.5	-13.2	1.5	-7.2
Net errors and omissions	-1.6	1.0	-3.1	-4.2	5.2

Source: C&SD.

Despite a slight deterioration in the terms of trade, the current account balance returned to a surplus of HK$23.8 billion (4.5% of GDP) in the third quarter, compared with a deficit in the second quarter. While the fourth quarter current account figure is not yet released at the time of writing, the national income data showed some narrowing in the overall trade balance during that quarter. This suggests that the current account balance may have weakened in the fourth quarter, given that factor income is small relative to the trade balance.

There was an overall net private capital outflow of HK$13.2 billion (2.5% of GDP) in the third quarter, with net direct investment outflows and net portfolio investment outflows exceeding net other investment inflows relating to loans and deposits (Table 4.A). A closer look at the

[20] For more discussion about the concept of Hong Kong dollar fund flows and its relationship with cross-border capital flows under the BoP account, see "How do we monitor Hong Kong dollar fund flows?", *HKMA Quarterly Bulletin*, December 2012.

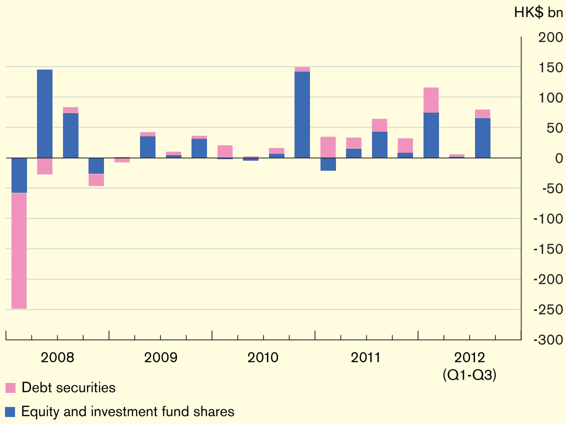
portfolio investment statistics suggested strong flows in both directions, despite the fact that there were more outflows than inflows (Table 4.B). Local residents continued to increase their holdings of non-resident equities. Their holdings of non-resident bonds also rebounded strongly. Non-residents also purchased more Hong Kong equities and debt securities (Chart 4.20), the latter in part related to local enterprises turning more to overseas bond markets to satisfy longer-term funding needs.

Table 4.B
Cross-border portfolio investment flows

(HK$ bn)	2010	2011	2012 Q1	2012 Q2	2012 Q3
By Hong Kong residents					
Equity and investment fund shares	-365.1	-237.3	83.4	-27.5	-84.3
Debt securities	-261.5	81.5	-4.4	38.9	-49.0
By non-residents					
Equity and investment fund shares	143.5	47.1	74.5	2.4	65.7
Debt securities	40.7	97.7	41.4	3.8	13.9

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

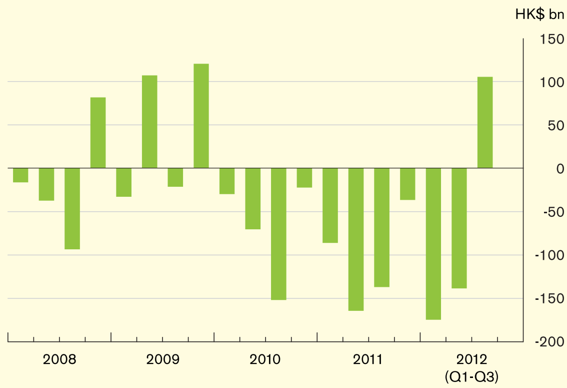
Chart 4.20
Portfolio investments by non-residents



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

The other investment account recorded some net inflows in the third quarter, in part driven by loan and deposit inflows by local residents. Some local corporations, which had raised funds in the overseas bond market, repatriated the proceeds back to Hong Kong, thereby raising the capital inflows relating to deposits. In addition, after considerable capital outflows relating to external loans between the first quarter of 2010 and the second quarter of 2012, there were some inflows relating to loans in the third quarter. Specifically, local banks contracted their loan assets vis-à-vis non-residents (Chart 4.21), possibly due to loan repayment. This was also consistent with the moderating growth trend in external loans in the local banking system.

Chart 4.21
Loans extended by local banks to non-residents



Note: A negative value indicates outflows.
Source: C&SD.

Outlook for capital flows

The direction and size of fund flows are relatively uncertain in 2013, reflecting the interplay of various pull and push factors. On the one hand, against the backdrop of more aggressive monetary easing in advanced economies, the consequential abundant global liquidity appears to have increased market's risk appetite and incentive for a search for yield around the world and particularly in Asia and other emerging markets. With the economic outlook for Hong Kong and the Mainland China gradually improving, there could be more equity-related demand for Hong Kong dollars. A possible revival in stock market fund-raising activities and the furthering of overseas bond issuance by local corporations (followed by proceeds repatriation) will also likely bolster Hong Kong dollar demands and capital inflows. On the other hand, a faster-than-expected recovery in the advanced economies could induce capital outflows from Hong Kong and the region. Moreover, given that tail risks in the global economy and the financial markets have not vanished, it is possible that the sanguine market sentiment and risk appetite could make a sharp turn and capital flows would be subject to much volatility.

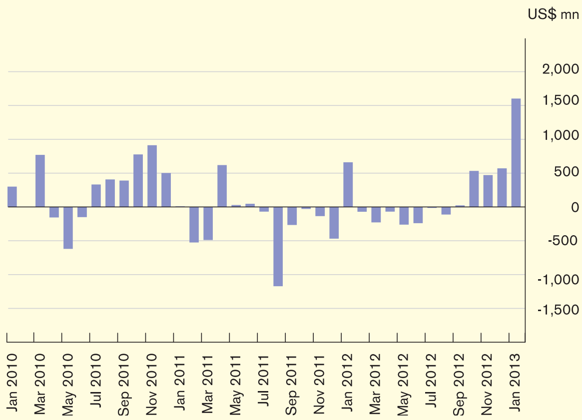
Asset markets

Local equities have rebounded strongly in view of an improved global economic outlook, with implied volatility falling to the lowest level since the subprime crisis. The domestic debt market, especially foreign currency debt issued by local corporations, grew markedly, while the offshore renminbi debt market became increasingly mature. Property prices rose sharply in the second half of 2012, while the volume of transactions was volatile. With only tepid income growth, however, housing affordability has deteriorated much further.

4.4 Equity market

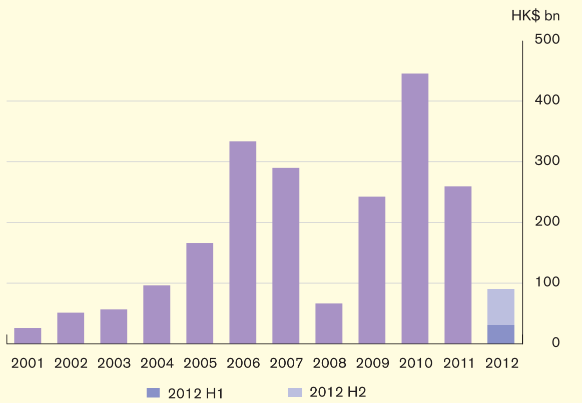
The equity market in Hong Kong gained momentum after the summer break in the wake of sizeable equity fund inflows, improved global financial conditions and growing optimism over the outlook for the Mainland economy. In the first fourth months following the introduction of further monetary easing measures by the Fed and the ECB, Hong Kong attracted strong equity fund inflows amid increased expectations that the Mainland economy was bottoming out in the third quarter (Chart 4.22). Investors subsequently turned cautious towards the end of December as the US "fiscal cliff" deadline approached, but returned from the sideline as soon as the White House and Senate leaders struck a last-minute deal. While the fundamental fiscal problems of the US are still far from being resolved, the deal has nevertheless averted a possible crisis. This, coupled with the release of a higher-than-expected fourth quarter GDP growth for China, substantially improved investor appetite, prompting a rebound in the average daily turnover of local equities to HK$78 billion in January. Meanwhile, activities in the primary market also picked up their pace, with funds raised though IPO in the second half of 2012 growing by over 90% as compared with the amount recorded in the previous six months (Chart 4.23).

Chart 4.22
Equity fund flows into Hong Kong



Source: EPFR Global.

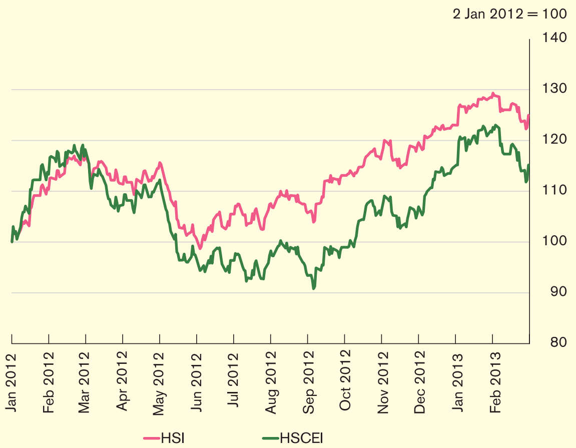
Chart 4.23
The IPO market in Hong Kong



Source: CEIC.

Overall, the Hang Seng Index (HSI) and Hang Seng China Enterprises Index (HSCEI) (also known as the H-share index) rallied strongly by 18.2% and 23.2% respectively from September 2012 to February 2013 (Chart 4.24). Among the sub-indices, the property sector index soared by 29.6% during the same period, despite further governments measures to cool the housing market were introduced. Reflecting improved sentiment in the equity market, the implied volatility of the HSI once fell to 12.3%, the lowest level since August 2005.

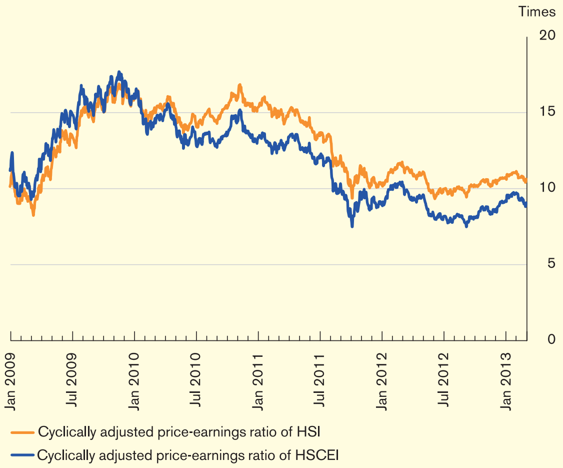
Chart 4.24
The Hang Seng Index and Hang Seng China Enterprises Index



Source: Bloomberg.

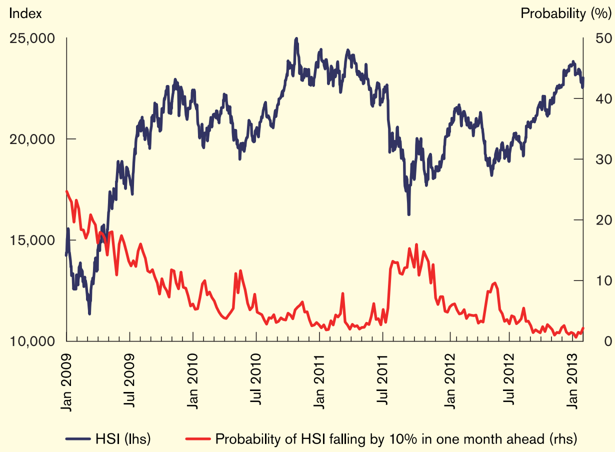
With the valuation of local equities staying well below the historical average, the downside risk of the market, as measured in terms of the probability of a 10% fall in the HSI in one month ahead, appears limited in the near term (Charts 4.25 and 4.26). That said, the recent rally has to a large extent been propelled by optimism that economic activity will gather pace in the US, the European sovereign debt crisis will ease further and the Mainland economy has bottomed out. However, the reality is that the most fundamental fiscal issues in the US and Europe remain unresolved while the strength of the nascent pick-up in economic activity in the Mainland remains in doubt. The impact from the wrestling between political parties in the US and Europe and the speed of them being able to come to terms with solutions to sensitive policy issues will shake confidence sporadically and cause volatility. At the same time, geopolitical tensions stemming from a possible nuclear test in North Korea and the sovereign issue of the Diaoyu islands could also impact the market at some stage. All these factors suggest that the local equity market is unlikely to have a smooth ride in the period ahead.

Chart 4.25
Cyclically adjusted price-earnings ratios of the Hang Seng Index and Hang Seng China Enterprises Index



Sources: Bloomberg and HKMA staff estimates.

Chart 4.26
Hang Seng Index and its option-implied probability of falling by 10% in one month ahead

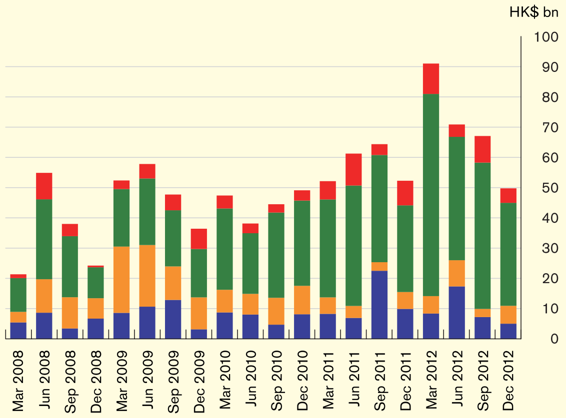


Sources: Bloomberg and HKMA staff estimates.

4.5 Debt market

The Hong Kong dollar debt market maintained strong growth in 2012. Total new issuance grew 2.8% to HK$2,130.4 billion, with the private sector issuing HK$57.6 billion or 31.6% more debt than the year before. Notwithstanding this, the Exchange Fund remained the largest issuer, followed by AIs and then local corporations (Chart 4.27). [21]

Chart 4.27
New issuance of non-Exchange Fund Bills and Notes Hong Kong dollar debt

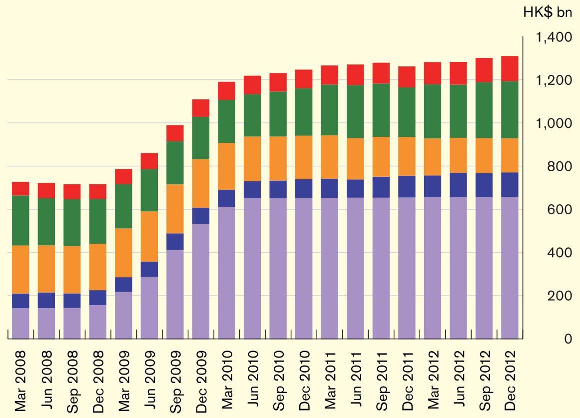


■ Government, statutory bodies and government-owned corporations
■ Overseas borrowers (including multilateral development banks)
■ AIs
■ Local corporations

Source: HKMA.

At the end of 2012, the total amount of Hong Kong dollar debt outstanding stood at HK$1,308.8 billion, a 3.8% increase from a year ago. The local private sector, which is composed of AIs and local corporations, issued significantly more debt than matured. [22] In contrast, a significant portion of matured private overseas debt was not rolled over. Despite issuing 25.0% more debt in 2012, overseas borrowers excluding multilateral development banks (MDBs) saw their debt outstanding contract by 9.8% (Chart 4.28).

Chart 4.28
Outstanding Hong Kong dollar debt



■ Exchange Fund
■ Government, statutory bodies and government-owned corporations
■ Overseas borrowers (including MDBs)
■ AIs
■ Local corporations

Source: HKMA.

It appears that the corporate sector has been more able to tap the debt market, especially at the longer end of the yield curve. Reflecting this, the proportion of newly issued private sector debt (excluding CDs) maturing in five years or more increased to 50.3% of new issuances last year compared to 32.3% in 2011. The average maturity of these debt securities also lengthened

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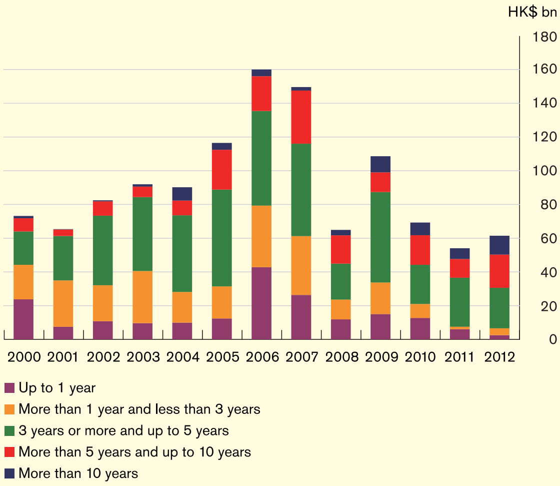
21 The Exchange Fund accounted for 86.9% of new Hong Kong dollar debt issuances. Debt issued by AIs jumped by 39.4% to HK$190.1 billion. New debt issued by local corporations declined by 2.1% to HK$27.7 billion.

22 Although local corporations issued 2.1% less debt in 2012 than 2011, their amount of debt outstanding surged 19.4% year on year with a net issuance of HK$18.9 billion. The amount of AI debt outstanding also increased by 15.0% year on year with a net issuance totalling HK$34.4 billion.

to 7.4 years in 2012 from 5.7 years in 2011 (Chart 4.29). [23]

Chart 4.29
New issuance of Hong Kong dollar private sector debt (excluding CDs) by tenor

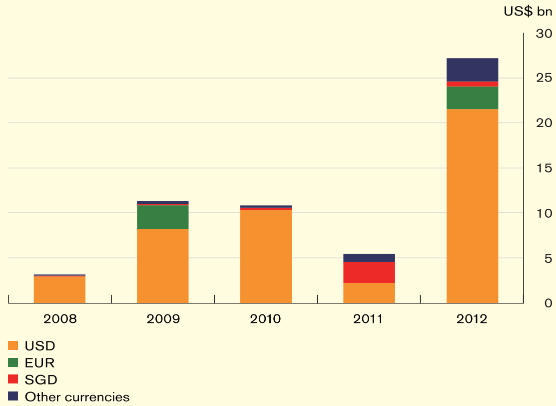


Note: The "private sector" consists of AIs, local corporations and non-MDB overseas borrowers.

Source: HKMA.

The non-bank corporate sector tapped the foreign currency debt market even more aggressively. [24&25] In 2012, total foreign currency debt issued by local non-bank corporations amounted to US$27.1 billion, almost five times the previous year (Chart 4.30). Most notably, US dollar debt securities issued by local non-bank corporations rose by more than eight times to US$21.4 billion.

Chart 4.30
New issuance of foreign currency debt securities by local non-bank corporations



Note: Money market debt securities and CDs are excluded from calculations.

Source: Dealogic.

The phenomenal growth of the foreign currency debt market was driven by a mix of cyclical and structural factors. The most important cyclical factor is probably the current low interest rate environment which has fuelled the search for yield globally, thus allowing corporations to raise funds at relatively lower costs. On the structural side, the reluctance of banks in extending long-term loans amid regulatory changes has to a certain extent forced corporations to turn to the bond market for meeting their long-term financing needs. [26]

The Hong Kong offshore renminbi debt securities market has gradually become more mature. It grew steadily in 2012. In total, RMB 271.3 billion worth of debt securities were issued in 2012, almost 1.5 times the RMB188.2 billion recorded in 2011. [27] At the end of December 2012, the value of debt securities outstanding stood at a

[23] Perpetual debt securities are excluded from the calculations of average maturity.

[24] The "non-bank corporate sector" includes statutory bodies, government-owned corporations and domestically domiciled corporations.

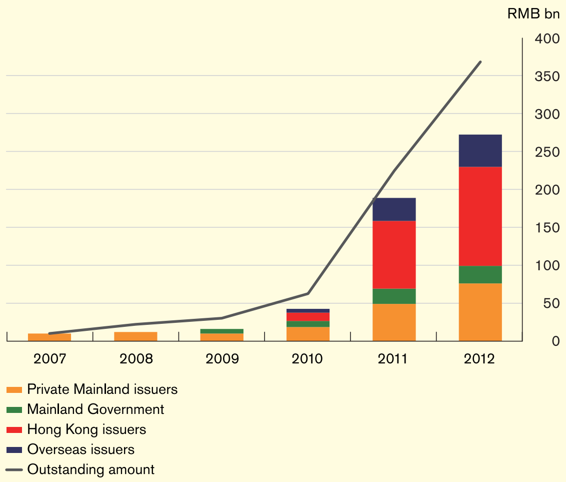
[25] The foreign currency debt market here does not include debt securities denominated in renminbi.

[26] For example, banks are likely to find it less attractive to extend long-term loans in light of the new liquidity requirements under Basel III.

[27] Debt securities include both medium and long-term notes, CDs and commercial papers.

record high of RMB366.8 billion (Chart 4.31). Last year saw the issuance of CDs soar by 86.3% to RMB143.6 billion.

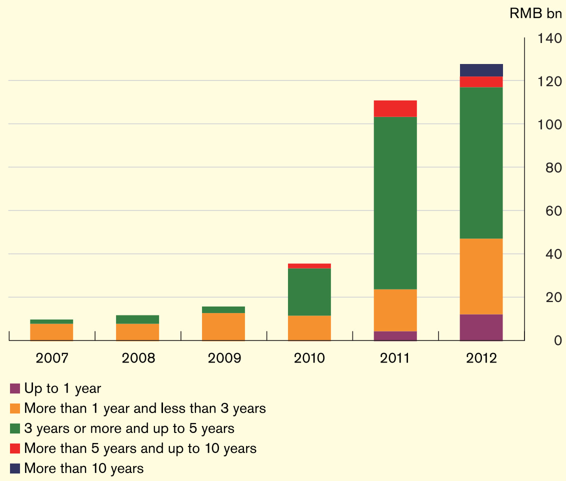
Chart 4.31
New issuance and outstanding amounts of offshore renminbi debt securities



Sources: Newswires and HKMA staff estimates.

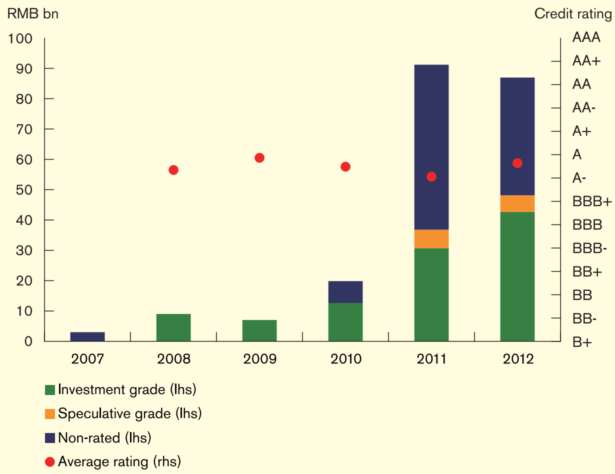
Apart from market size, many other positive developments in 2011 continued to be evident in 2012. First of all, there was a more diversified issuer mix in the market, with a number of new overseas companies tapping the market for the first time. [28] A total of RMB42.5 billion debt securities were issued by companies whose headquarters are located outside Hong Kong and the Mainland in 2012, up remarkably by 40.0% from a year ago. Second, the length of maturity of new issuance increased, albeit only marginally, with the average maturity of newly issued debt (excluding CDs) rising to 3.5 years in 2012 from 3.4 years in 2011 (Chart 4.32). The yield curve was also extended with a few bond issues maturing in more than 10 years. [29] Finally, the credit quality of debt securities has improved. Of the total issuance (excluding the Ministry of Finance and Mainland policy banks), the proportion of rated new issues increased considerably to 55.3% in 2012 from 40.4% in 2011 (Chart 4.33). Within rated new issues, the proportion of investment grade debt securities increased to 88.7% from 83.4%, which raised the average rating of the rated new issues almost to single-A rating.

Chart 4.32
New issuance of non-CD renminbi debt securities by tenor



Sources: Newswires and HKMA staff estimates.

Chart 4.33
Average credit rating of new issuances (excluding CDs)



Note: Excluding debt securities issued by the Ministry of Finance and Mainland policy banks.

Sources: Newswires and HKMA staff estimates.

[28] For example, Volvo and Renault SA issued their first offshore renminbi bond in the final quarter of 2012.

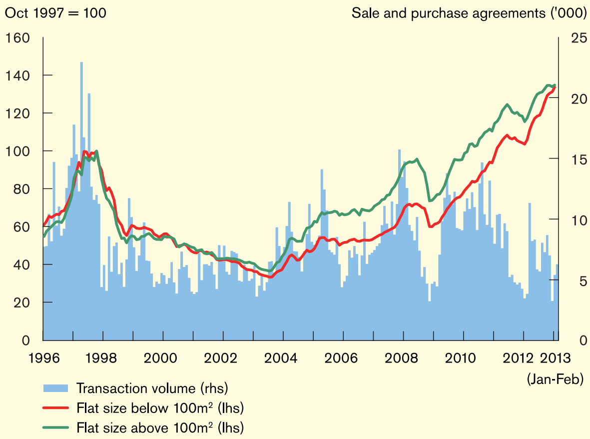
[29] The China Development Bank issued a 15-year note and a 20-year note in January and August 2012 respectively. The Ministry of Finance and Export-Import Bank of China issued a 15-year note in June 2012.

4.6 Property markets

Residential property market

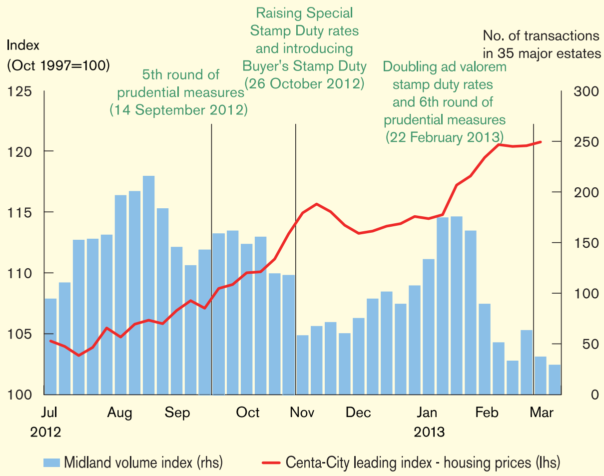
Risks in the residential property market continue to be a major concern for macroeconomic and financial stability in Hong Kong, with increasing disconnect between flat prices and economic fundamentals. In contrast to tepid income growth, flat prices increased notably by 25.2% in 2012 and more than doubled from the end of 2008, against the backdrop of a low interest rate environment, rising income and tight supply conditions (Chart 4.34). Expectations for further price rises also apparently had fuelled the sharp increase. The run-up in flat prices moderated in the fourth quarter of 2012 with the introduction of prudential measures and fiscal measures in September and October the same year, though with signs of a faster pick-up in early 2013. (Chart 4.35).

Chart 4.34
Residential property prices and transaction volumes



Sources: R&VD and Land Registry.

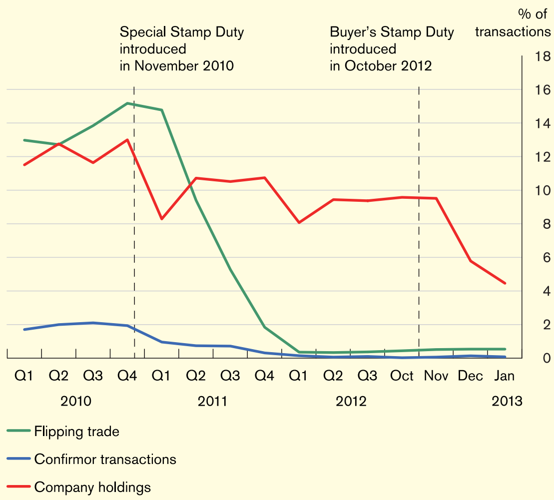
Chart 4.35
Residential property prices and transaction volumes estimated by realties



Sources: Midland Realty and Centaline Property Agency Limited.

The volume of housing transactions has been volatile. Housing transactions strengthened somewhat in the third quarter of 2012, but fell quite markedly in the fourth quarter. Moving into 2013, housing transactions picked up in January but moderated again in February due partly to the holiday effect of the Chinese New Year. Speculative activities, as indicated by confirmor transactions and flipping trade (selling within 12 months of holding), remained largely contained (Chart 4.36). Company holdings have dropped after the introduction of the Buyer's Stamp Duty (BSD).

Chart 4.36
Confirmor transactions, flipping trade and company holdings



Source: Centaline Property Agency Limited.

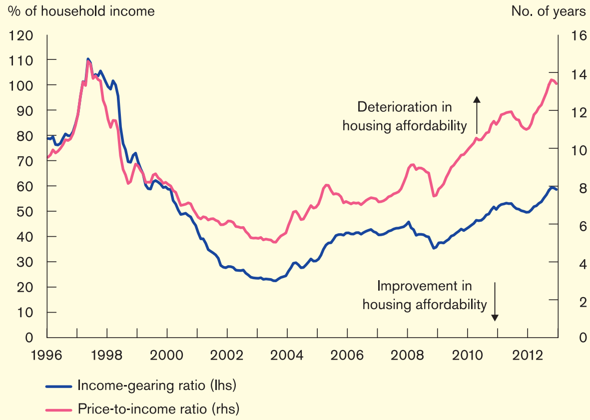
Housing rentals for fresh leases leaped by 11.2% in 2012, compared with a milder 6.6% increase in 2011. With housing rentals rising at a much slower pace than prices, flat rental yield dropped to a historical low of 2 – 3% (Chart 4.37). From an asset-pricing perspective, the currently low rental yield also signals risk of housing prices running ahead of the fundamentals. User-cost models further indicate that strong expectations for further price rises could have contributed to the sharp rise in the cost of owning a flat compared with renting one.

Chart 4.37
Housing rental yield for fresh leases

Source: R&VD.

Another sign of vulnerability is the continued deterioration in housing affordability. Compared with flat prices, growth in private household income has been a lot more gradual at 1.7% in 2012 and a cumulative 20.0% over the past four years. To illustrate, the HKMA's estimated price-to-income ratio, at 13.4 at the end of 2012, has come quite close to the peak of 14.6 reached in 1997 (Chart 4.38). [30] The income-gearing ratio also rose to a 12-year high of around 60%. Moreover, if the mortgage interest rate were much higher, say three percentage points above the current level, the income-gearing ratio would have reached an even more acute level of almost 80%. [31]

Chart 4.38
Indicators of housing affordability



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

Current and prospective borrowers should be mindful about the risk of interest rate hikes in the period ahead. When interest rates return to more normal levels, mortgage burden could rise substantially. In a stressed scenario of a three-percentage-point rise in the interest rates, borrowers' monthly mortgage payment could increase by 30% under a 20-year mortgage and by about 45% under a 30-year mortgage. It is also worth noting that interest rate hikes could pose downward pressures on flat prices. A significant fall in housing prices, if realised, could translate into a negative feedback loop of macro-financial vulnerability through private-sector deleveraging and plunge the economy into recession.

In order to strengthen banks' risk management in property lending business, the HKMA introduced a further round of prudential measures in September last year. As a result, the average loan-to-value (LTV) ratio dropped from 64% before policy measures to 56% recently and the average debt-servicing ratio from 42% to 36%. In October, the Government raised the

30 The mortgage payment-to-income ratio compares the amount of mortgage payment for a typical 50 m^2 flat (under a 20-year mortgage scheme with a 70% LTV ratio) with the median income of households living in private housing. Alternately, the price-to-income ratio measures the average price of a typical 50 m^2 flat relative to the median income of households living in private housing.

31 This income-gearing ratio is not the same as a borrower's actual debt-servicing ratio, which is subject to a maximum cap by the HKMA prudential measures.

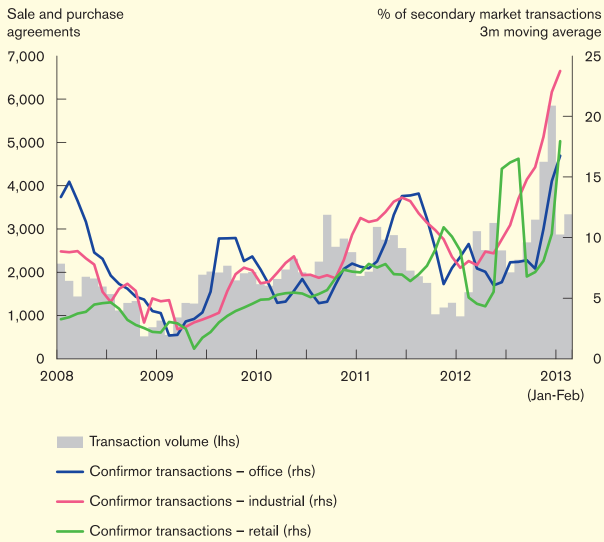
Special Stamp Duty (SSD) rates from 5 – 15% to 10 – 20%, and extended the restriction period from two years to three. The Government also implemented a BSD of 15% on residential properties acquired by companies and non-locals. As discussed earlier, there are signs of moderation in company holdings since then. Anecdotal observation also suggests non-local purchases have declined. In February 2013, the Government introduced further measures by generally doubling the rates of existing ad valorem stamp duties. The HKMA imposed stricter stress testing requirements for mortgage lending, and introduced a risk weight floor of 15% for new residential mortgage lending by banks using the internal ratings-based approach. Also, a few leading banks raised the mortgage interest rates by 25 basis points in mid-March, reportedly in response to higher funding costs.

As regards the outlook, the disconnect between flat prices and economic fundamentals could still aggravate further. Upward pressures on flat prices could persist with the current tight supply condition, low interest rates and more entrenched expectations for further price increase. Improved market sentiment amid better growth outlook and abundant liquidity following more aggressive monetary easing in advanced economies could also exert upward pressures on flat prices. On the downside, interest rates could rise earlier than expected. Tail risks in the global economy and the financial markets also have not vanished, and if realised, could drag down flat prices. The HKMA will continue to monitor the market situation closely and introduce appropriate measures in response to changes in the property market cycle to safeguard macroeconomic and financial stability in Hong Kong. Home purchasers should stay vigilant on property market and interest rate developments and avoid stretching themselves with excessive borrowing.

Commercial and industrial property markets

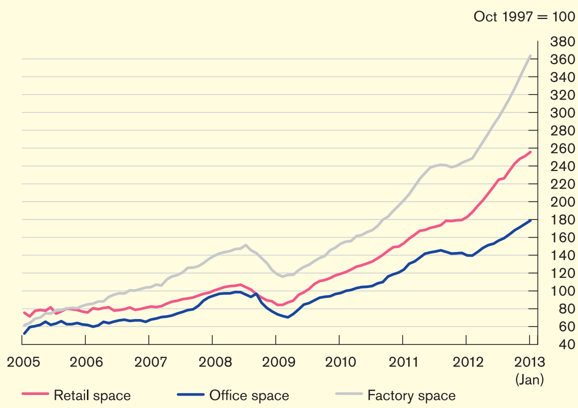
The overall conditions of the commercial and industrial property markets were even more buoyant than the residential market, with both trading activities and prices rising sharply. Total transactions increased by 51% in the second half of 2012 from the preceding half year period, with sharp spikes in November and December partly due to strong sales in parking spaces. Speculative activities, as indicated by confirmor transactions, continued to be vibrant (Chart 4.39). The run-up in prices for commercial and industrial properties accelerated in the second half. For the whole year, prices of office space increased by 22.7%, while prices of retail premises and flatted factories soared by around 40% (Chart 4.40). As rentals increased more moderately, overall rental yields of commercial and industrial properties sank further to a record low of 2.3 – 2.9%.

Chart 4.39
Transactions in commercial and industrial properties



Sources: CEIC, Land Registry, Centaline Property Agency Limited and HKMA staff estimates.

Chart 4.40
Commercial and industrial property price indices



Source: R&VD.

The strong momentum of the commercial and industrial property markets in part reflected the still-favourable demand conditions, and the limited and inelastic supply. Property values might also have been boosted by urban renewals and re-development opportunities. However, the much steeper surge in sales prices relative to rentals may not be fully explained by fundamental factors, suggesting their growing disconnect and risk of overheating. There is therefore a continuing need for banks to enhance risk management for lending business related to commercial and industrial properties.

In view of the exuberant development in the non-residential property markets, the HKMA announced a new round of prudential measures in February 2013 by lowering the LTV ratio for commercial and industrial properties by 10 percentage points, while a maximum LTV ratio of 40% and loan tenor not exceeding 15 years are also applied to the mortgage lending of parking spaces. To cool the vibrant speculation in the non-residential property markets, the Government has doubled the ad valorem stamp duty rates and advanced the charging of the stamp duty from the conveyance on sale to the agreement for sale.

Box 3
Recent performance of the Hong Kong dollar exchange market

This article reviews recent developments of the Hong Kong dollar exchange market and exchange rate dynamics since May 2005, when a symmetric convertibility zone was introduced with a strong-side Convertibility Undertaking (CU) at 7.75 HKD/USD and a weak-side CU at 7.85.

An overview of the Hong Kong dollar market and its recent developments

Market depth

The market depth of the Hong Kong dollar has increased substantially in recent years. As a result, the Hong Kong monetary system is in a strong position to accommodate substantial amounts of fund flows with minimal market disruptions. According to latest available Bank for International Settlements (BIS) data, the average daily foreign exchange market turnover of Hong Kong dollar amounted to US$94 billion in 2010, more than 6 times the level in 1998 (Table B3.A). Of the total turnover, spot transactions amounted to US$18.7 billion, which are comparable to other major ex-Japan Asian currencies, while foreign exchange swaps amounted to US$69.5 billion and compare favourably with other major regional currencies, other than the yen.

Market liquidity

The Hong Kong dollar market is highly liquid, as shown by its narrow bid-ask spread that averaged 0.01% during the study period from January 1997 to November 2012 (Table B3.B). [32]

[32] In this article, bid-ask spread is expressed as a percentage of the closing price.

Table B3.A
Average daily foreign exchange market turnover

Currency	2010 US$ bn	2010 Share (%)	1998 US$ bn	1998 Share (%)
HKD	94	1.2	14	0.5
Major currencies				
USD	3,378	42.4	1,251	43.4
EUR	1,555	19.5	442 *	18.8 *
JPY	755	9.5	313	10.9
GBP	513	6.4	159	5.5
AUD	302	3.8	44	1.5
Major Asian currencies				
KRW	60	0.8	2	0.1
SGD	56	0.7	16	0.6
CNY	34	0.4	0.2	0.0
MYR	11	0.1	0.5	0.0
THB	8	0.1	2	0.1
IDR	6	0.1	1	0.0

Notes:
1. The reference month is April of the respective year.
2. In BIS data, foreign exchange trading covers spot transactions, outright forward, foreign exchange swaps, currency swaps, options and other products. For the Hong Kong dollar market, the average daily turnovers of the first five types of contracts in April 2010 were US$18.7 billion, US$3.7 billion, US$69.5 billion, US$0.3 billion, and US$1.7 billion respectively.
3. Figures in asterisk refer to turnovers obtained by the 2001 survey, the first triennial survey after the introduction of the euro.

Source: BIS.

Table B3.B
Average foreign exchange bid-ask spread of the Hong Kong dollar, major and other Asian currencies

Episode (%)	Full sample period (1/1997-11/2012)	Before 2-sided CU (1/1997-5/2005)	After 2-sided CU (5/2005-11/2012)	Weak HKD episode (1/2007-9/2007)	Strong HKD episode (10/2008-12/2009)	Strong HKD episode (9/2012-11/2012)
HKD	0.01	0.009	0.01	0.013	0.011	0.004
Major currencies						
EUR	0.024	0.044	0.008	0.008	0.009	0.007
JPY	0.03	0.045	0.013	0.011	0.014	0.011
Major Asian currencies						
CNH[2, 3]	0.077	n.a.	0.077	n.a.	n.a.	0.047
CNY	0.023	0.024	0.021	0.026	0.026	0.08
SGD	0.059	0.057	0.061	0.051	0.113	0.035
THB	0.203	0.235	0.168	0.062	0.241	0.066
IDR	0.465	0.656	0.253	0.141	0.648	0.298
MYR	0.118	0.141	0.091	0.097	0.163	0.095
KRW	0.119	0.112	0.126	0.068	0.219	0.18

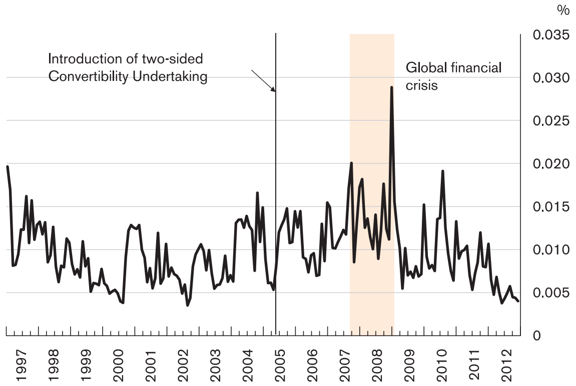
Notes:
1. Period average of daily closing.
2. Periods cover from August 2010 as CNH market only then started.
3. n.a.: not applicable as CNH market only started in August 2010.

Source: HKMA staff estimates based on data from Bloomberg.

The spread also compares favourably with most other currencies. Even during crisis periods such as the Asian financial crisis and the recent global financial crisis, the spread did not widen drastically, and it narrowed back to its normal level soon in subsequent months (Chart B3.1).

In addition, it is noteworthy that market liquidity conditions remained relatively stable during episodes of large capital flows, as the bid-ask spread showed only mild changes when the Hong Kong dollar moved near the strong-side or weak-side limits.

Chart B3.1
Bid-ask spread of USD/HKD exchange rate



Note: Period average figures of respective months.
Source: HKMA staff estimates based on data from Bloomberg.

Market Volatility

The HKD/USD exchange rate has been relatively more stable compared with major and other Asian currencies (Table B3.C), partly reflecting its link to the US dollar. The volatility, as measured by the annualised standard deviations of changes for 30 days, averaged 0.5% since the introduction of the two-sided CU, significantly lower than other currencies [33]. While the Hong Kong dollar volatility increased during the renminbi revaluation speculation in 2003 and the global financial crisis in 2007-08, it subsided rapidly as the situations stabilised, suggesting that the CU is credible in anchoring market expectations about future movements of the Hong Kong dollar. Similar trends were also observed for the three-month HKD/USD option-implied volatility (Chart B3.2). In addition, volatility did not show substantial increases when the Hong Kong dollar was near the strong-side or weak-side limits, and remained significantly lower than major and other Asian currencies during respective periods.

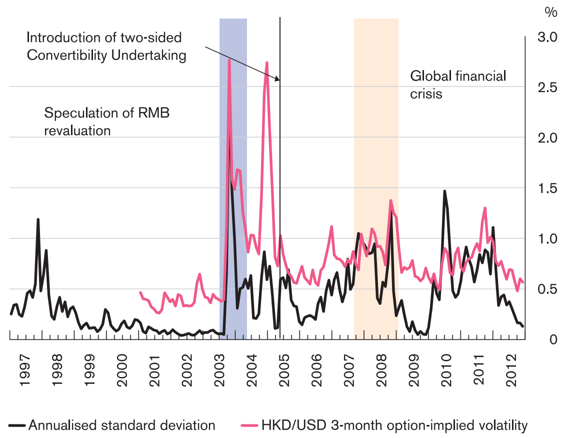
Table B3.C
Average foreign exchange volatility of the Hong Kong dollar, major and other Asian currencies

Episode (%)	Full sample period (1/1997-11/2012)	Before 2-sided CU (1/1997-5/2005)	After 2-sided CU (5/2005-11/2012)	Weak HKD episode (1/2007-9/2007)	Strong HKD episode (10/2008-12/2009)	Strong HKD episode (9/2012-11/2012)
HKD	0.38	0.28	0.49	0.55	0.24	0.15
Major currencies						
EUR	10.15	10.38	9.96	5.48	13.94	7.37
JPY	10.53	10.96	10.04	8.02	15.3	6.37
Major Asian currencies						
CNH[2, 3]	2.4	n.a.	2.4	n.a.	n.a.	1.36
CNY	0.76	0.05	1.54	1.55	1.03	3.19
SGD	5.45	5.45	5.45	3.04	7.25	3.58
THB	6.87	9.07	4.43	5.05	3.94	3.06
IDR	16.14	22.57	8.99	7.86	19.19	2.92
MYR	4.97	4.18	5.84	3.86	7.94	6.43
KRW	10.8	10.61	11	4.14	25.37	3.61

Notes:
1. Period average of daily closing.
2. Periods cover from August 2010 as CNH market only then started.
3. n.a.: not applicable as CNH market only started in August 2010.
4. Volatility is measured by the annualised standard deviations of the daily change of foreign exchange rate for the 30 most recent trading days.

Source: HKMA staff estimates based on data from Bloomberg.

Chart B3.2
Volatility of USD/HKD exchange rate



Sources: HKMA staff estimates based on data from Bloomberg and JP Morgan.

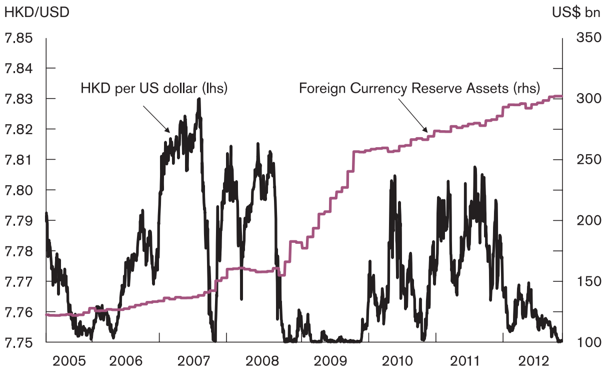
The above development shows that the Hong Kong dollar market has grown further in recent years, characterised by rising transaction volume, relatively narrow spreads and subdued volatility. The existence of a deep and highly liquid Hong Kong dollar market has been conducive to the smooth operation of the Linked Exchange Rate system (LERS).

33 Volatility is measured by the annualised standard deviations of daily changes of foreign exchange rate for the 30 most recent trading days.

Hong Kong dollar in a target zone

The LERS was refined into a target zone system in May 2005 when a symmetric convertibility zone was introduced with a strong-side CU at 7.75 HKD/USD and a weak-side CU at 7.85. In the policy literature, it is typically argued that, if a currency follows a mean-reverting process around the central parity [34], which may be driven either by within-zone central bank intervention or "stability speculation" by market participants, then the target zone is perceived to be credible. [35] However, the Hong Kong dollar exchange rate did not seem to have exhibited a mean-reverting movement around the central parity, as shown in Chart B3.3.

Chart B3.3
Foreign reserves and USD/HKD exchange rate in the convertibility zone



Source: HKMA.

To understand the performance of the LERS, we propose an analytically tractable model of exchange rate dynamics in a fully credible target zone, and apply the proposed model to the Hong Kong dollar. In essence, we hypothesise that the exchange rate follows a random walk most of the time. When the exchange rate is "well within" the band, market participants do not feel particularly compelled or encouraged to pull the exchange rate towards its central parity.

However, when the exchange rate moves closer to the boundaries, the market may anticipate an intervention and would therefore act to stabilise the exchange rate or even push it away from the boundaries. Hence, we have a bounded process with a stopping/restoring effect that only occurs close to the boundaries of the zone but not necessarily around the central parity. The intervention policy of the central bank and the behaviour of market participants are described implicitly by specifying the restoring force and fluctuating force (volatility) of the exchange rate dynamics.

As shown in Chart B3.3, after trading within a relatively wide range between May 2005 and August 2008, the Hong Kong dollar exchange rate strengthened towards the strong-side CU of 7.75 after September 2008 due to capital inflows, with the strong-side CU triggered repeatedly until early December 2009, prompting the HKMA to passively inject liquidity into the banking system. [36] The Monetary Base of the Hong Kong dollar expanded notably by more than two times, and the foreign reserves correspondingly increased. [37] Subsequently, as capital inflows halted, the Hong Kong dollar exchange rate weakened but it continued to stay within the strong-side CU zone for most of the time before appreciating again towards the strong-side limit in the fourth quarter of 2012, due to a renewed round of capital inflows.

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[34] P. Krugman (1991), "Target Zones and Exchange Rate Dynamics", *Quarterly Journal of Economics*, 106, 669-82.

[35] The exchange rate may not exhibit such a property if intervention occurs only at the limits of the target zone.

[36] The capital inflows into the Hong Kong dollar after the global financial crisis intensified in September 2008 is discussed in the inSight article "Latest Analysis of Fund Inflows into the Hong Kong Dollar" by Norman T.L. Chan, issued in the HKMA website on 1 February 2010.

[37] In Hong Kong, the Monetary Base comprises Certificates of Indebtedness (for backing the banknotes issued by the note-issuing banks), government-issued currency in circulation, the balance of the clearing accounts of banks kept with the HKMA (the Aggregate Balance), and Exchange Fund Bills and Notes.

Hong Kong dollar exchange rate dynamics

To investigate whether the above tractable model with quasi-bounded process for exchange rate dynamics can describe movements in the Hong Kong dollar and if the LERS is perceived by the market as credible, we estimate the following three factors of the dynamics [38]:

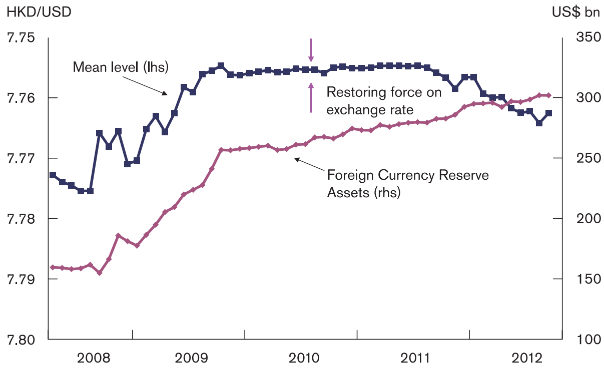
(i) the medium-term mean level for the exchange rate;

(ii) the restoring force towards the mean level; and

(iii) the fluctuating force (volatility).

Using the daily time series data from 18 May 2005 to 31 October 2012, we find that these three factors are all statistically significant.[39, 40] Chart B3.4 shows that the estimated mean level of the Hong Kong dollar exchange rate moved towards the strong-side limit when there were strong capital inflows during 2009. [41] Having stayed persistently near the strong-side limit, the mean level moved back to close to it previous level prior to the inflows, as capital flows halted.

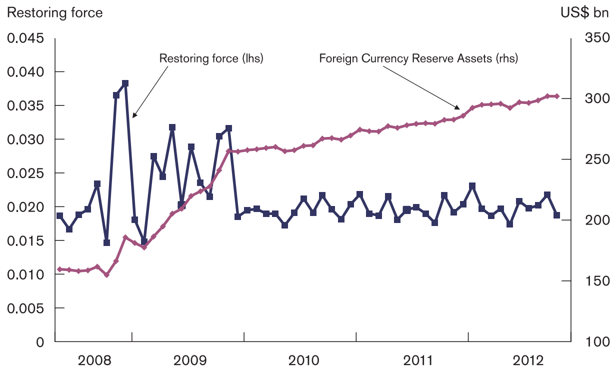
Chart B3.4
Estimated mean level of HKD exchange rate



Sources: HKMA and staff estimates.

The empirical analysis reveals a positive relationship between the restoring force and changes in foreign reserves, largely caused by capital flows, as indicated in Chart B3.5. [42] Thus, when the mean level of exchange rate moves towards its strong-side limit as a result of capital inflows, the tendency to mean reversion can act as a force reducing the stickiness of the exchange rate near the strong-side limit. In other words, when the strong-side CU is triggered, the restoring force that pushes the exchange rate away from the limit and towards its previous mean level would increase. Such dynamics suggest that any triggering of the strong-side CU is anticipated to be temporary by the currency market.

Chart B3.5
Estimated restoring force towards the mean level of HKD



Sources: HKMA and staff estimates.

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38 In finance literature, the second term refers to the speed of the mean reversion towards the mean level, while the third term refers to the standard deviation of the daily change in the Hong Kong dollar.

39 The detailed analysis is in C. F. Lo, C. H. Hui, S. W. Chu, T. Fong (2012), "A Quasi-Bounded Target Zone Model – Theory and Application to Hong Kong Dollar", *Hong Kong Institute for Monetary Research Working Paper*, No. 28/2012.

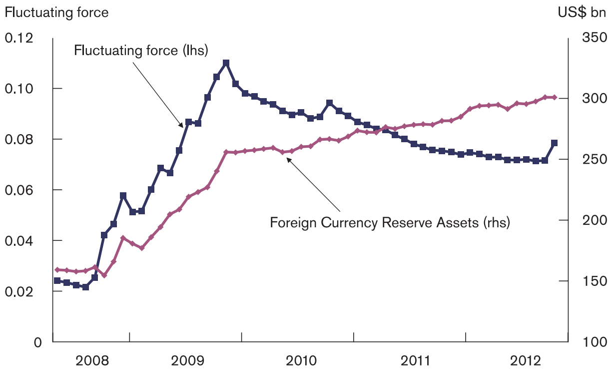
40 In this study, instead of using the Monetary Base of the Hong Kong dollar as a proxy as in the detailed analysis in Lo et al. (2012), the official foreign reserves in Hong Kong is employed. However, as the time series of official foreign reserves is only available in monthly frequency, to construct a daily time series of official foreign reserves, its daily changes are approximated by the daily changes in the Monetary Base of the Hong Kong dollar.

41 This mean level is an estimate of where the Hong Kong dollar usually fluctuates around during a specific period of time.

42 The restoring force has a positive slope with the changes in foreign reserves in the regression estimation.

Chart B3.6 shows the fluctuating force (volatility) of the exchange rate. The volatility increased along with the inflows of capital into the Hong Kong dollar (i.e. increases in foreign reserves) during the period between September 2008 and November 2009, which pushed the mean exchange rate towards the strong-side CU limit. During the period from November 2009 to September 2012 when there were no further capital inflows, the fluctuating force decreased and the exchange rate moved away from the strong-side boundary. In the fourth quarter of 2012, the fluctuating force is estimated to have increased again due to capital inflows, with the mean exchange rate moving close to the strong-side CU limit once again.

Chart B3.6
Estimated fluctuating force of HKD exchange rate



Sources: HKMA and staff estimates.

Conclusion

After the introduction of a target-zone system to the LERS in May 2005, the Hong Kong dollar showed no strong tendency to revert towards the centre of the convertibility zone. This is perhaps not surprising as there have been no active interventions in the foreign exchange market by the HKMA, other than acting passively when the strong-side CU was triggered. When the Hong Kong dollar exchange rate is "well within" the band, market participants do not feel compelled or encouraged to pull the exchange rate towards the central parity. However, when the exchange rate moves closer to the boundaries, a stopping/reversion effect occurs.

The restoring force in the exchange rate dynamics, which pushes the exchange rate towards the mean level, increases with the foreign reserves and reduces the stickiness of the exchange rate near the strong-side limit. Such property suggests that any triggering of the strong-side CU is anticipated to be temporary by the currency market.

Box 4
Determinants of the growth of renminbi deposits in Hong Kong

In Hong Kong, banks started to take renminbi deposits from personal customers in February 2004. With the launch of renminbi trade settlement in July 2009, renminbi deposits had since seen phenomenal growth. Having reached a plateau at the end of 2011, the deposits declined slowly through the middle of 2012. Growth resumed towards late 2012. In light of the recent development, this article studies the key factors determining the growth of renminbi deposits in Hong Kong.

In theory, portfolio allocation by Hong Kong and overseas personal and corporate customers into renminbi deposits is mainly influenced by two factors, namely, the level of economic activity – a major source of income and wealth accumulation – and the expected rate of return. In the case of corporate customers, the growing popularity of renminbi as a cross-border settlement currency also boosts corporate demand. The expected rate of return of holding renminbi deposits not only depends on the interest rate differential between renminbi and Hong Kong dollar deposits, but also the expectation of exchange rate changes, which holds key to what determines the opportunity cost of not holding renminbi deposits.

With the above factors in mind, we regress the monthly change in renminbi deposits (*DEP_RMB*) during May 2004 to December 2012 on five explanatory variables: (1) the risk-adjusted renminbi-Hong Kong dollar deposit rate differential (*ID_RMBHKD*) and (2) the discount rate of the one-year renminbi non-deliverable forwards (*DIS_NDF*) which proxies the expected appreciation of renminbi; (3) real GDP growth (*RGDPG*) which measures the level of economic activity in Hong Kong; (4) the amount of net renminbi remittances for trade settlement purpose (*TR_SET*) for capturing the effect of cross-border trade settlement in renminbi on the growth of renminbi deposits in Hong Kong; and (5) one-month lag term of renminbi deposits to take account of the growth momentum of renminbi deposits.

The regression results are summarised in Table B4.A. All explanatory variables are found to be significantly positive, suggesting that, other things being equal, the growth of renminbi deposits would rise when (1) the risk-adjusted return of renminbi deposits goes up (due to larger interest rate differential, higher expectations of renminbi appreciation or lower implied exchange rate volatility); (2) real GDP growth accelerates; or (3) the net inflow of renminbi remittances for trade settlement purpose increases.

Table B4.A
Estimation results of renminbi deposits growth

Dependent Variable: Δ(*DEP_RMB*)
Sample period: May 2004 – Dec 2012

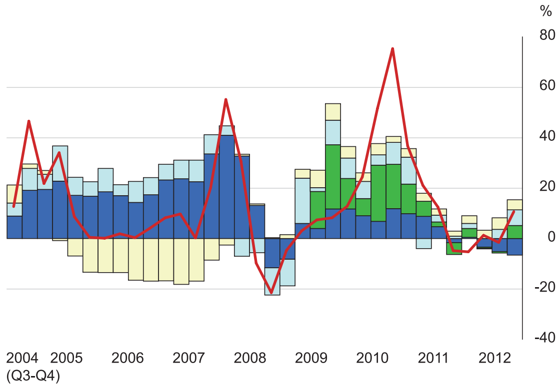
Independent Variable	Coeff	t-statistic	p-value
Intercept	-0.011	-1.477	0.143
ID_RMBHKD	0.027 **	2.238	0.028
DIS_NDF	0.761 ***	3.041	0.003
RGDPG	2.331 *	1.969	0.052
TR_SET	0.026 ***	2.983	0.004
lag of Δ(*DEP_RMB*)	0.478 ***	6.333	0.000
Sample size	116		
Adjusted R-squared	0.607		
Ljung Box test statistic for zero residual autocorrelations (p-value)	11.205 (0.511)		
Ljung Box test statistic for zero squared residual autocorrelations (p-value)	7.360 (0.833)		

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Based on these results, we carry out a simple attribution analysis of the factors driving the growth of renminbi deposits over the sample period. Chart B4.1 shows how much of the quarterly change in renminbi deposits (represented by the red line) is attributable to each of the factors in the long term.[43] Prior to the global financial crisis, expectations of renminbi appreciation accounted for most of the growth, followed by real GDP growth. Interest rate differential was mostly a drag on the growth in this period. During the crisis, renminbi deposits actually fell, due mainly to the slowing economy and reduced expectations of renminbi appreciation. After the crisis, the growth of renminbi deposits regained momentum again, with cross-border trade settlement emerging as the key driving force. Expectations of renminbi appreciation were also an important factor but much less so compared to the pre-crisis period. Finally, over the past year or so, as change in all these factors have been relatively moderate, the growth of renminbi deposits has also slowed accordingly.

Looking forward, the demand for renminbi deposits is likely to remain robust, as growth of the Hong Kong and the global economy recovers, and as the relative return to renminbi assets is expected to remain attractive. There will also be new driving forces coming in play, as new policy initiatives take effect and the currency becomes more internationalised and increasingly accepted for payment in the region. As capital flows into and out of Mainland China become more balanced and the renminbi exchange rate becomes more flexible, one such driving force will be the demand for renminbi loans by borrowers based in Hong Kong, the Mainland, and also from overseas. Hence, future studies will have to take into account new developments to provide a more comprehensive picture of the determinants.[44]

Chart B4.1
Decomposition of long-term renminbi deposits growth



Sources: HKMA and staff estimates.

[43] The estimation of the long-term attributions assumes that, other things being equal, renminbi deposit growth will converge to an equilibrium level in the long run so that the growth (i.e. $\Delta(DEP\_RMB)$) in the current period is *ceteris paribus* equal to that in the previous period in the estimated equation.

[44] For example, the impact of the renminbi qualified foreign institutional investor (RQFII) scheme should also be considered.