2016 Q3 China's banking sector: Performance of listed banks and hot topics

December 2016

INTRODUCTION

China's banking sector: Performance of listed banks and hot topics is a quarterly publication from KPMG China that provides its readers with analysis of important topics and key performance indicators in China's banking industry. It aims to track the latest developments in the sector and provides commentary on issues affecting the future direction of the industry. This publication also gathers considerable data to assess the financial performance of China's listed banks, and combined with KPMG China's professional experience, helps readers better grasp the current environment in China's banking sector.

This issue focuses on big data used to promote the transformation of banking outlets; how to build a data mart for banking credit risk from the basics; the interpretation of the implications of Circular No.42 on banking business; the discussion and analysis of the accounting treatment of the business of investment-loan linkage of banks; and the implications of blockchain technology on commercial banks and proposed countermeasures. These topics are receiving more and more attention in the banking industry, and we hope that our discussion will help our readers gain a firmer understanding. Furthermore, this issue provides an overview of the financial position and performance of listed banks in the third quarter of 2016, which will allow readers to better understand the overall performance of the sector.

For more information, please contact any of the KPMG China professionals listed in the 'Contact us' section.

Content

1 2016 Q3 economy and finance

Q3 data analysis

In the third quarter of 2016, the Chinese Government, facing complicated circumstances both at home and abroad, actively adapted itself and took the lead under the 'new normal'. Sticking to the general plan of advancing economic growth while maintaining stability, it has unwaveringly promoted supply-side structural reform, moderately expanded aggregate demand and ramped up efforts to cultivate new driving forces. The Chinese economy, while stable, has achieved quality growth and performed better than expected.

In terms of demand, fixed asset investment stabilised while continuing to slow down in the third quarter of 2016. The saleable area of commodity housing continued to drop. Sales in the market increased slightly and consumer goods for upgraded consumption grew rapidly. Import and export trade dropped, though at a slower rate. The price of consumer goods increased moderately. The industry structure continued to improve, and the services sector accounted for 52.8% of overall gross domestic product (GDP). In terms of supply, agricultural and industrial production remained stable. The government's efforts to advance supply-side reform received encouraging results. The quality and benefits of economic growth improved steadily.

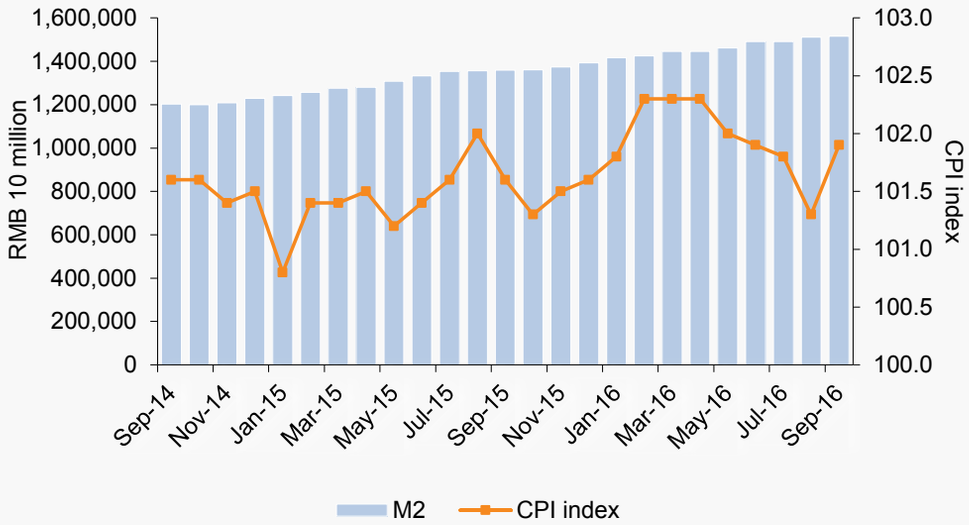
- **GDP growth slowdown in the third quarter:** Based on preliminary calculations, China's GDP in the first three quarters of 2016 was RMB 52.9971 trillion, a year-on-year (YoY) increase of 6.7% at comparable prices. In terms of quarters, China's GDP grew by 6.7%, 6.7% and 6.7% YoY in the first, second and third quarters respectively. In terms of sectors, the value added by the primary, secondary and tertiary sectors was RMB 4.0666 trillion, RMB 20.9415 trillion and RMB 27.9890 trillion respectively, representing an increase of 3.5%, 6.1% and 7.6% YoY. China's GDP in the third quarter of 2016 increased by 1.8% on a quarter-on-quarter basis.
- **Drop in import and export trade:** In the first three quarters of 2016, the total volume of import and export trade amounted to RMB 17.5318 trillion, a YoY decrease of 1.9%, which is 1.7% lower than that in the first half of 2016. Exports reached RMB 10.0585 trillion, down 1.6% which is 1.1% lower than the drop in the first half of 2016, while imports reached RMB 7.4733 trillion, down 2.3% which is 2.4% lower than the drop in the first half of 2016. The trade balance provided China with a surplus of RMB 2.5852 trillion.
- **Steady growth of consumption:** In the first three quarters of 2016, total retail sales of consumer goods reached RMB 23.8482 trillion, a nominal increase of 10.4% (9.8% in real terms without the price impact). This was 0.1% higher than the growth rate in the first half of the year.

Overview of key macroeconomic indicators	Unit	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3
GDP	YoY（%）	7.1	7.2	7.0	7.0	6.9	6.8	6.7	6.7	6.7
CPI	YoY（%）	2.1	2.0	1.2	1.3	1.4	1.4	2.1	2.1	2.0
PPI	YoY（%）	(1.6)	(1.9)	(4.6)	(4.6)	(5.0)	(5.2)	(4.8)	(3.9)	(2.9)
Industrial added value	YoY（%）	8.5	8.3	6.4	6.3	6.2	6.1	5.8	6.0	6.0
Total retail sales of consumer goods	YoY（%）	12.0	12.0	10.6	10.4	10.5	10.7	10.3	10.3	10.4
Fixed asset investment	YoY（%）	16.1	15.7	13.5	11.4	10.3	10.0	10.7	9.0	8.2
Exports	YoY（%）	5.1	6.1	4.7	0.9	(1.9)	(2.9)	(9.6)	(7.8)	(7.5)
Imports	YoY（%）	1.3	0.4	(17.6)	(15.6)	(15.3)	(14.2)	(13.5)	(10.2)	(8.2)
Trade surplus(USD)	$100 million	1,280.8	1,495.0	1,237.3	1,401.6	1,636.1	1,747.8	1,257.4	1,434.5	1,442.5
M2	YoY（%）	12.9	12.2	11.6	11.8	13.1	13.3	13.4	11.8	11.5
RMB loan growth	YoY（%）	13.2	13.6	14.0	13.4	15.4	14.3	14.7	14.3	13.0

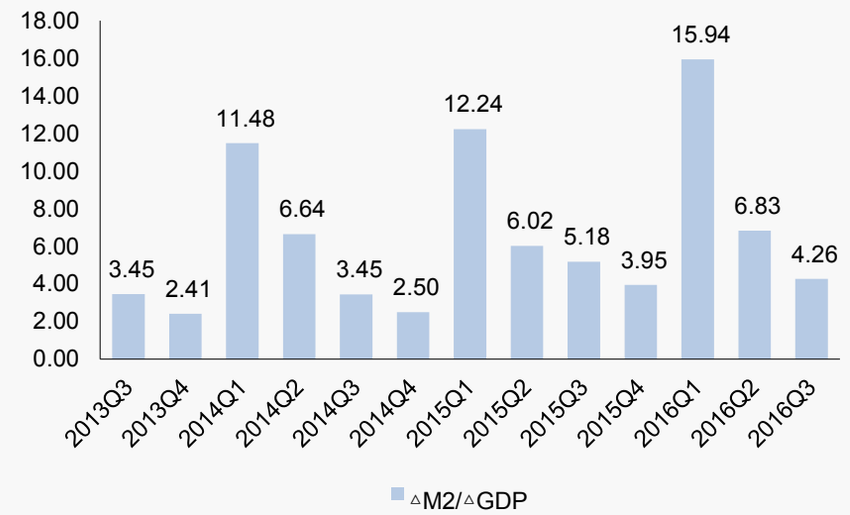
Source: National Bureau of Statistics of the People's Republic of China; Wind Info

Monetary expansion and national economic output

Money supply and inflation rate



Velocity of money

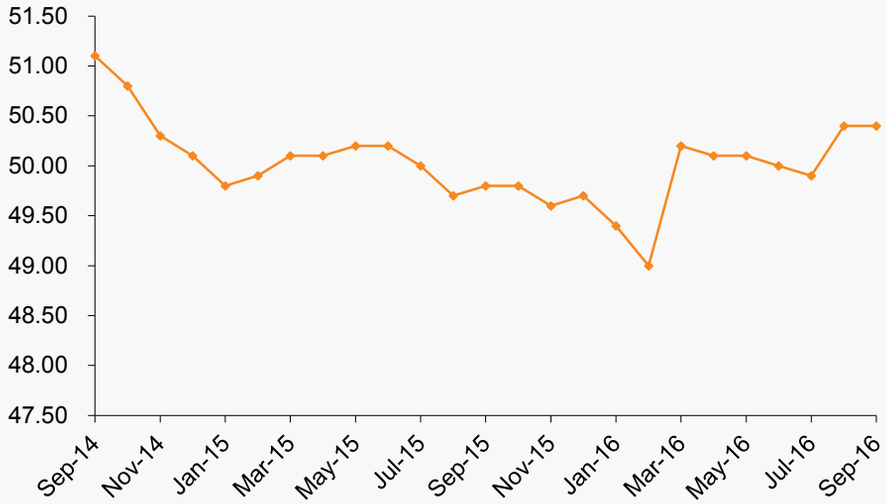


- The consumer price index (CPI) grew 2.0% YoY in the first three quarters of 2016, which is 0.1% lower than the growth rate in the first half of the year. It increased by 2.0% in urban areas and 1.8% in rural areas.
- Specifically, food, tobacco and liquor prices increased by 4.1% YoY, clothing prices by 1.5%, housing prices by 1.5%, prices for household equipment and maintenance services by 0.5%, prices for educational and entertainment products and services by 1.4%, prices for medical and healthcare products by 3.6%, and prices for other products and services by 2.4%, while prices for transportation and communication fell by 1.8%.
- At the end of September 2016, the broad money (M2) balance was RMB 151.6 trillion, a YoY increase of 11.5%. The RMB loan balance was RMB 104.1 trillion, a YoY increase of 13.0% and the RMB deposit balance was RMB 148.5 trillion, a YoY increase of 11.1%. The RMB loan increment amounted to RMB 10.2 trillion, representing a YoY increase of RMB 255.8 billion, while the RMB deposit increment was RMB 12.8 trillion, representing a YoY decrease of RMB 188.9 billion.
- At the end of September 2016, the narrow money (M1) balance was RMB 45.4 trillion, a YoY increase of 24.7%. The amount of money in circulation (M0) was RMB 6.5 trillion, a YoY increase of 6.6%. The central bank released a net amount of RMB 185.2 billion into the banking system.
- In the first three quarters of 2016, the overall financing increment reached RMB 13.5 trillion, an increase of RMB 1.5 trillion compared with the same period in the previous year. At the end of September 2016, the financing balance amounted to RMB 151.5 trillion, a YoY increase of 12.5%, which is 0.1% higher than that at the end of June 2016.
- Structurally, the proportion of financing in the corporate bond and stock markets increased. Entrusted loans and trust loans also accounted for a larger share. RMB loans and loans in foreign currencies to the real economy dropped. The proportion of undiscounted bank acceptance bills fell noticeably.

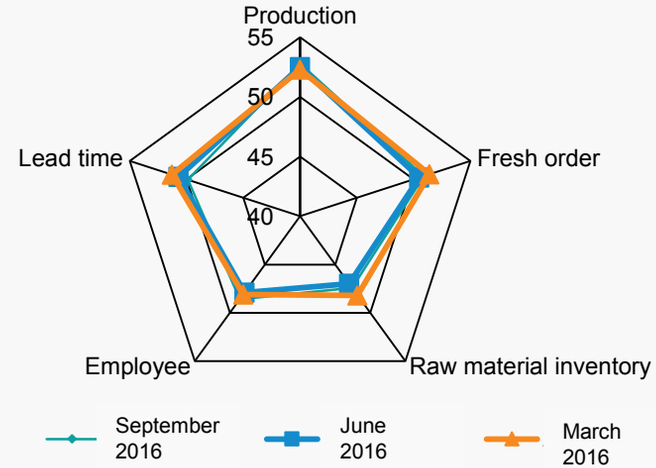
Source: National Bureau of Statistics of the People's Republic of China; People's Bank of China

Operating performance

China manufacturing PMI



China manufacturing PMI sub-index



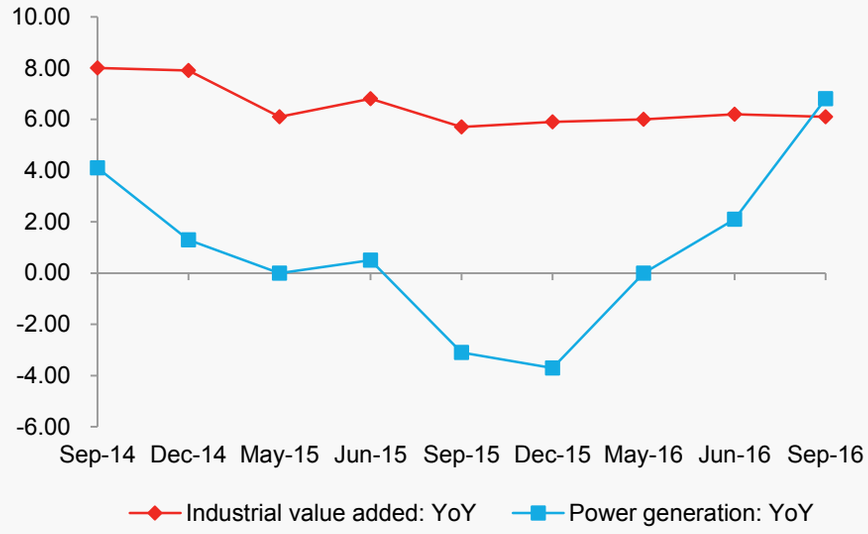
- Overall, China's economy operated steadily in the third quarter of 2016. A number of main indicators were encouraging. However, there was still considerable downward pressure on the economy. In Q3 2016, China's manufacturing Purchasing Managers' Index (PMI) was basically in line with previous quarters and showed signs of stabilising. In September 2016, manufacturing PMI was 50.4%, the same as that in August 2016.
- In terms of company scales, the PMI of large enterprises was 52.6%, up 0.8% compared to the previous month, and continued to be above the break-even mark. The PMI of medium-sized enterprises was 48.2%, down 0.7% compared to the previous month, and was still below the break-even mark. The PMI of small enterprises dropped 1.3% to 46.1% and was still below the break-even mark.
- In terms of sub-indexes, of the five sub-indexes that make up the manufacturing PMI, the production and fresh orders indexes were above the break-even mark, while the employment, raw materials inventory and lead time indexes were below this threshold.

Source: National Bureau of Statistics of the People's Republic of China

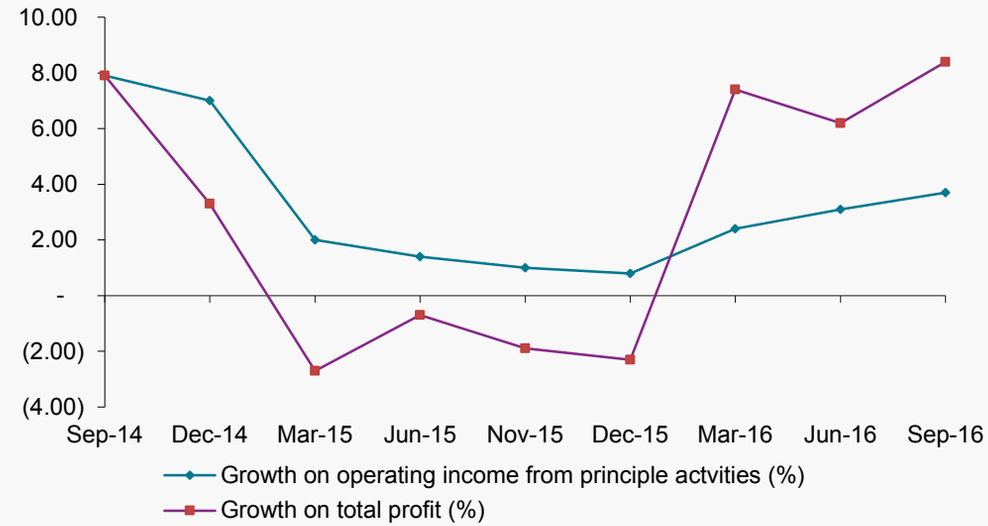
- The production index was 52.8%, up 0.2% compared with the previous month, and continued to be above the break-even mark, indicating accelerated growth of manufacturing production.
- The fresh orders index was 50.9%, down 0.4% compared with the previous month, but was still above the break-even mark, indicating that demand for manufacturing products continued to expand, though at a slower rate.
- The employment index was 48.6%, up 0.2% compared with the previous month but still below the break-even mark, indicating that the number of workers employed by manufacturing enterprises continued to fall at a slower rate.
- The raw materials inventory index was 47.4%, down 0.2% compared with the previous month but still below the break-even mark, indicating that the raw materials inventory of manufacturing enterprises continued to drop.
- The lead time index was 49.9%, down 0.7% compared with the previous month and slightly lower than the break-even mark, indicating that the delivery of raw materials by suppliers slowed down slightly.

Operating performance (continued)

Industrial production



YoY growth of accumulative operating income from principal activities and total profits



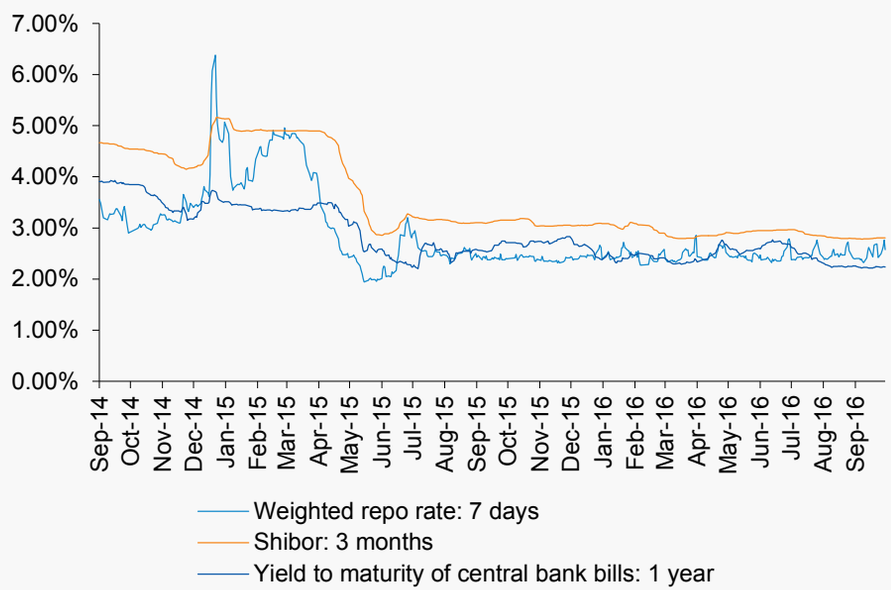
- The value added by the above-scale industry in September 2016, net of price factors, increased by 6.1% YoY in real terms, down 0.2% compared with August 2016. On a month-on-month basis, it increased by 0.5%. In the first three quarters of 2016, the added value of above-scale industry increased by 6.0% YoY. In terms of the type of companies, state-owned enterprises, joint-stock enterprises, and foreign-invested and Hong Kong, Macau and Taiwan invested enterprises grew by 3.3%, 6.4% and 6.2% respectively. while collective enterprises fell by 3.8% in September 2016.
- With regard to specific industries, the value added by the mining, manufacturing and the electricity, heating power, gas and water production and supply industries grew by 0.1%, 6.5% and 7.3% respectively in September 2016. As for specific regions, the value added by the eastern, central and western regions increased by 6.5%, 7.6% and 7.9% respectively, while the north-east region decreased by 3.0%. In September 2016, the sales to output ratio of above-scale industrial enterprises reached 97.9%, down 0.1% compared with the same period in the previous year.
- In September 2016, power generation amounted to 491.3 billion kWh, a YoY increase of 6.8%.

- As at September 2016, operating income from the principal activities of above-scale industrial enterprises was RMB 81.85608 trillion, a YoY increase of 3.7%. Operating costs for these principal activities was RMB 70.28982 trillion, a YoY increase of 3.5%, indicating that operating income grew slightly faster than operating costs.
- Above-scale industrial enterprises realised a total profit of RMB 4.63806 trillion, a YoY increase of 8.4%, flat compared with January to August 2016.
- On the other hand, in terms of industries, the mining industry recorded a total profit of RMB 76.14 billion, down 62.1% YoY. The manufacturing industry realised a total profit of RMB 4.17438 trillion, a YoY increase of 13.5%, and the electricity, heating power, gas and water production and supply industry realised a total profit of RMB 387.54 billion, down 3.6%.

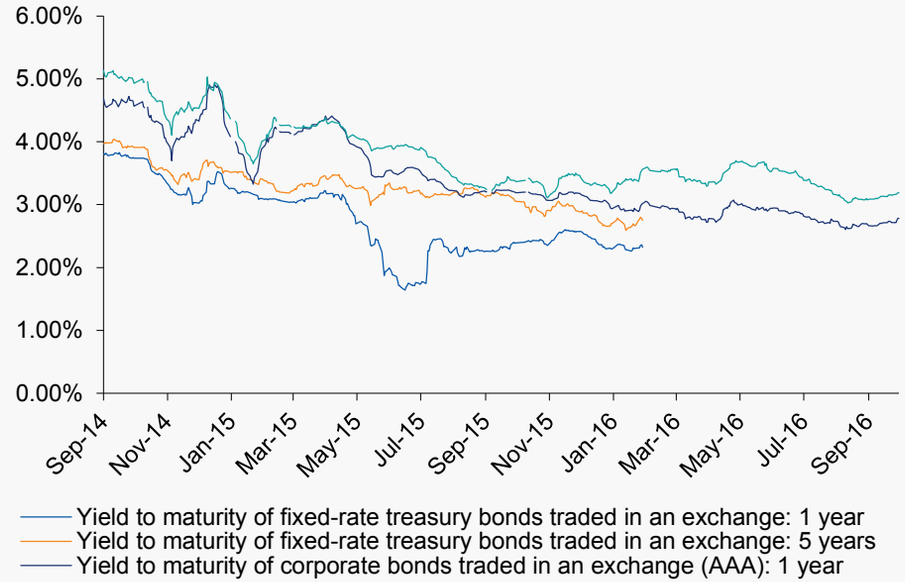
Source: National Bureau of Statistics of the People's Republic of China; Wind Info

Dynamics of money and bond market interest rates

Money market rate



Bond yields



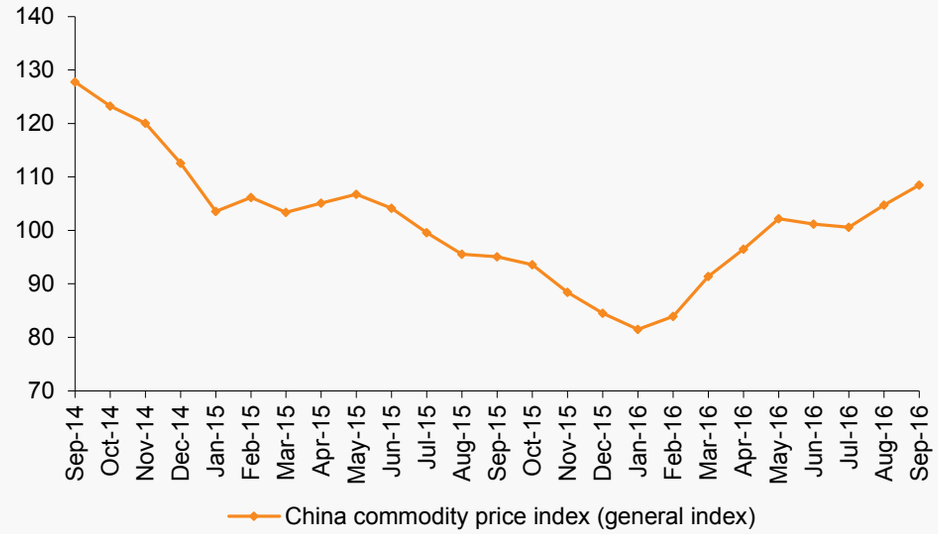
- Overall, the financial markets were stable in the third quarter of 2016. Based on data published by the People's Bank of China (PBOC), the total turnover of the currency markets in Q3 2016 amounted to RMB 202.8 trillion, a YoY increase of 41.7%. In September 2016, the total turnover of the currency markets totalled RMB 59.3 trillion, a YoY increase of 29.5% and a month-on-month decrease of 19.9%.
- At the end of Q3 2016, the yield to maturity of one-year central bank bills fell significantly compared with the same period in the previous year. At the end of September 2016, average yields were down 2.2%, 48 basis points lower than the end of September 2015 and down 15 basis points compared with the end of 2015.
- Compared with early 2016, the overnight Shanghai Interbank Offered Rate (Shibor) increased by 33.6 basis points and closed at 2.3270%, seven-day Shibor increased by 12.2 basis points and closed at 2.4770%, and one-month Shibor fell by 26.10 basis points and closed at 2.7410% at the end of September 2016.

Source: Wind Info; People's Bank of China

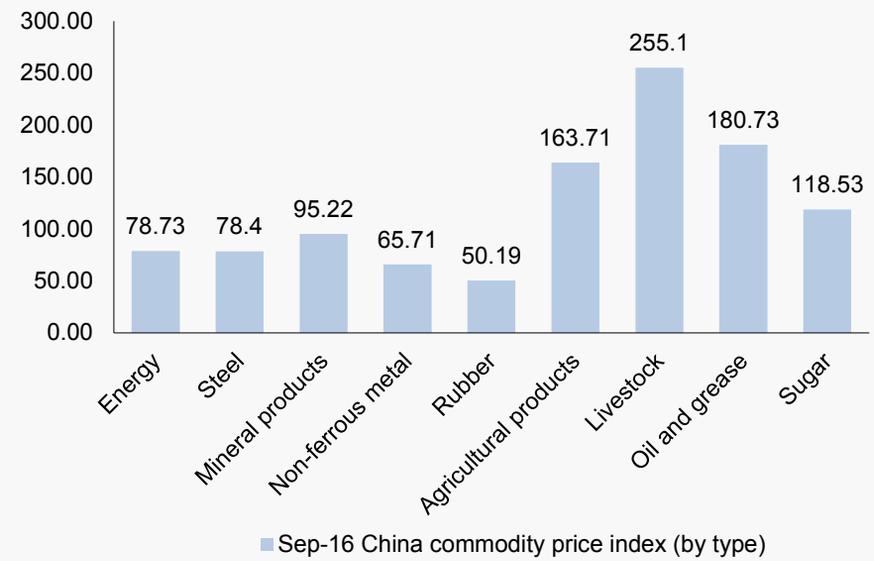
- In Q3 2016, against the backdrop of the 'new normal', the Chinese Government continued to adopt a proactive fiscal policy and a sound and flexible monetary policy to ensure that the economy operated steadily. Due to the macroeconomic situation, the yield curve of all bonds fluctuated to some degree.
- In Q3 2016, the accumulated turnover of the interbank bond market was RMB 36.4 trillion, representing a YoY increase of 46.2%. In September 2016, the turnover of the interbank bond market was RMB 11.2 trillion, a YoY increase of 32.0% and a month-on-month (MoM) decrease of 10.8%. At the end of September 2016, the total interbank index was 177.01, up 0.74 basis points or 0.4% from the end of the previous month.

Analysis of the commodity price index

China commodity price index (general index)



China commodity price index (by type)

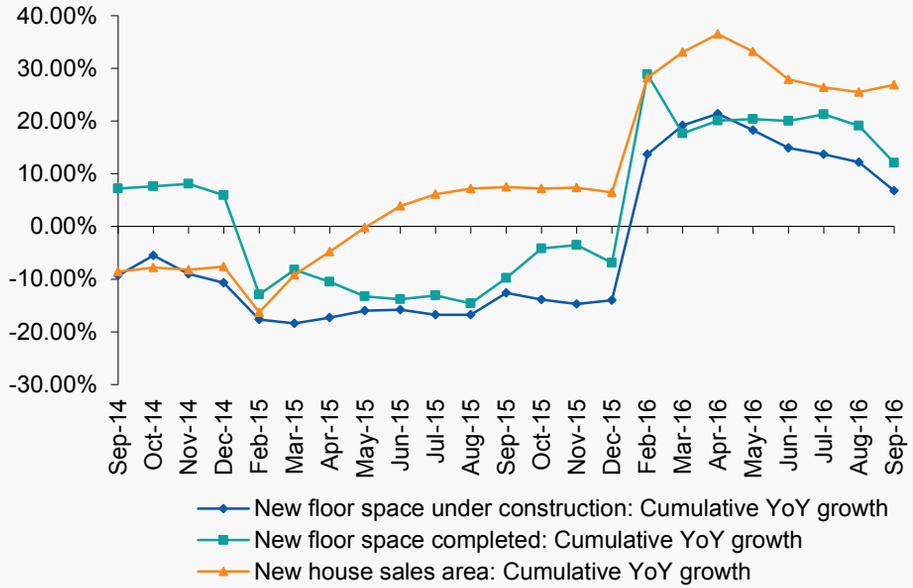


- In Q3 2016, the China commodity price index (CCPI) recorded a noticeable increase and was higher compared to the same period in the previous year.
- In September 2016, the CCPI continued to rise. Statistics show that the CCPI average in September was 108.46 points, up 3.69 points or 3.5% from the previous month, and up 13.39 points or 14.1% compared to the same period in 2015. Compared to the beginning of the year, it increased by 26.98 points or 33.1%.
- Commodity prices by type: Compared to the same period in 2015, price indices of agricultural products fell by 4.5%, while price indices of the other eight major commodities increased in September 2016. Price indices of steel, energy, oil and grease, sugar, non-ferrous metal, mineral products, livestock, and rubber increased by 25.6%, 21.9%, 19.7%, 16.9%, 4.4%, 3.7%, 1.0% and 1.0% respectively.
- Compared to the beginning of the year, the price index of agricultural products decreased by 0.8% while price indices of the other eight commodities all increased in September 2016. Price indices of energy, steel, mineral products, oil and grease, non-ferrous metal, sugar, rubber, and livestock increased by 61.3%, 33.3%, 32.5%, 23.0%, 15.1%, 14.8%, 9.4% and 2.8% respectively.

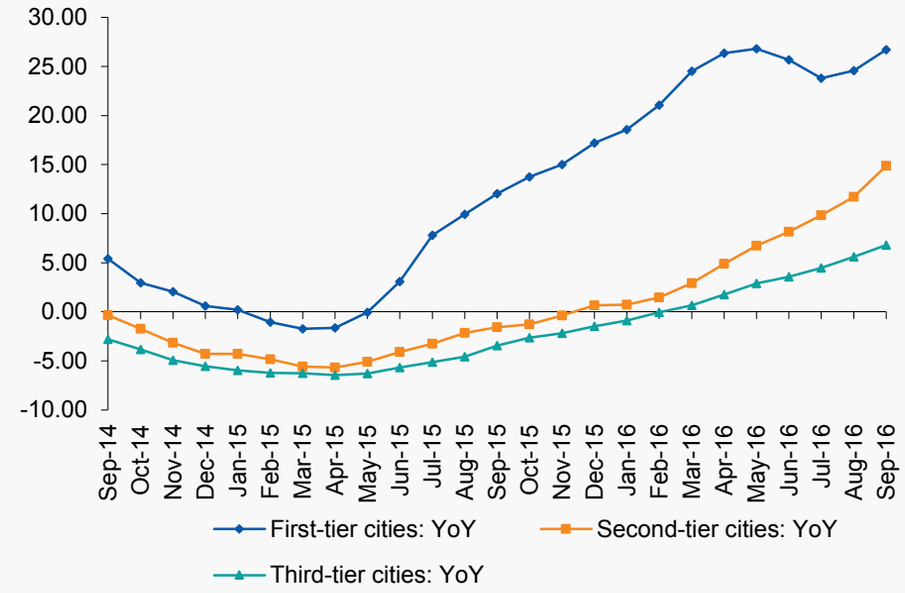
Sources: E-circulation.cn

Residential housing

Growth of saleable area, floor space completed and new floor space under construction



Housing price indexes of 100 cities

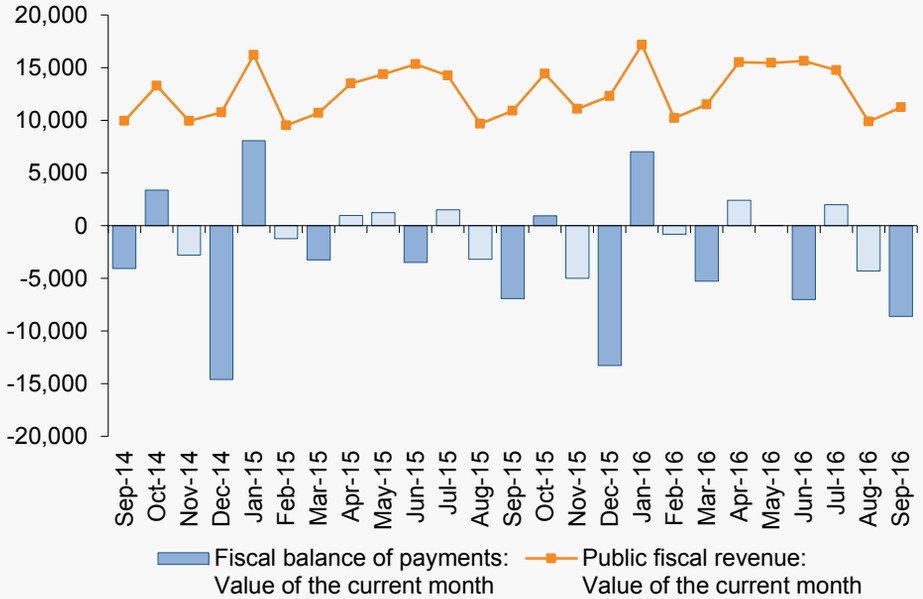


- In the first three quarters of 2016, real estate investment amounted to RMB 7.4598 trillion, a nominal YoY increase of 5.8% (7.1% in real terms without the price impact). The growth rate was 0.3% lower than that in the first half of the year, but was 0.4% higher than that during the period from January to August 2016. Out of this total, residential housing investment increased by 5.1%. The new floor space under construction was 1.22655 billion m^2, a YoY increase of 6.8%, while the new floor space under construction for residential housing increased by 6.7%.
- The saleable area of commodity housing amounted to 1.05185 billion m^2, a YoY increase of 26.9%, while the saleable area of residential housing increased by 27.1%. Commodity housing totalled RMB 8.0208 trillion, a YoY increase of 41.3%, while sales of residential housing increased by 43.2%. The area of land acquired by real estate developers was 149.17 million m^2, a YoY decrease of 6.1%.
- At the end of September 2016, the available-for-sale areas of commodity housing amounted to 696.12 million m^2, down 18.04 million m^2 compared with the end of June 2016. The capital of real estate development enterprises in the first three quarters was RMB 10.4711 trillion, a YoY increase of 15.5%.
- In September 2016, the difference between the house prices of the 70 large and medium-sized cities widened. First-tier cities, some popular second-tier cities and other cities had different price directions.
- Among first-tier cities and a handful of second-tier cities, there were 14 which saw the prices of new commodity residential housing increase by above 2% on a month-on-month basis. Among the rest, 6 cities experienced a month-on-month fall, 1 maintained the prices at the same level as the previous month and 40 experienced an increase of less than 2%.
- There were 14 cities which saw the prices of new commodity residential housing increase by above 10% YoY. Among the rest, 6 cities saw their house prices fall and 42 experienced an increase of less than 10%.

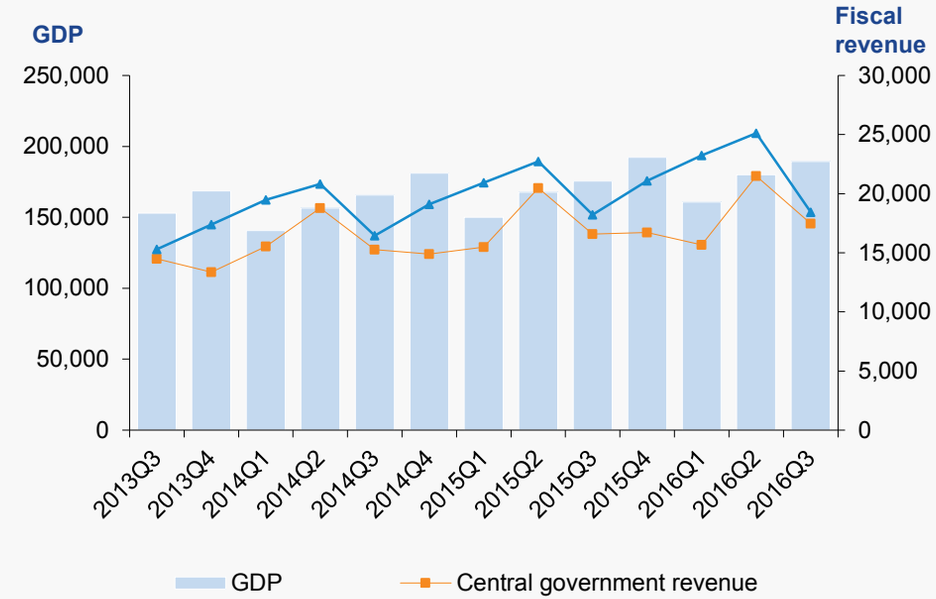
Source: National Bureau of Statistics of the People's Republic of China; Wind Info

Government finance

Monthly fiscal balances (RMB 10 million)



Fiscal revenue and GDP (RMB 10 million)

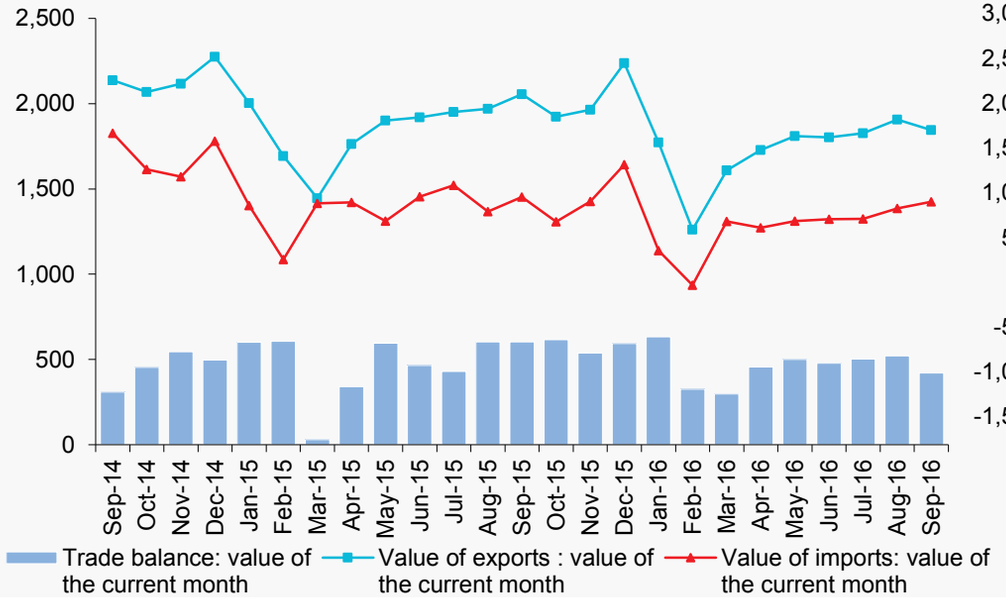


- In the first three quarters of 2016, public fiscal revenue amounted to RMB 12.14 trillion at the national level, a YoY increase of 5.9%. The general budgetary revenue of the central government reached RMB 5.4628 trillion, a YoY increase of 4.4% (1.5% with the same calibre as the previous year), and the general budgetary revenue of local governments reached RMB 6.6772 trillion, a YoY increase of 7.2% (9.8% with the same calibre as the previous year). Taxes raised by the central government amounted to RMB 10.0881 trillion, a YoY increase of 6.6%. It is expected that due to downward pressure on the economy and the impact of the VAT reforms, the government faces a very difficult situation with regard to the collection of fiscal revenue.
- In the first three quarters of 2016, national public expenditure reached RMB 13.5956 trillion, representing a YoY increase of 12.5%. The central government spent RMB 1.9463 trillion, a YoY increase of 5.4%, while local governments spent RMB 11.6493 trillion, a YoY increase of 13.8%.
- GDP amounted to RMB 18.9334 trillion in the third quarter of 2016, representing a YoY increase of 6.7% calculated by comparable prices. In terms of sectors, the value added by the primary, secondary and tertiary sectors was RMB 1.8569 trillion, RMB 7.5165 trillion and RMB 9.56 trillion respectively, which represented a YoY increase of 4.0%, 6.1% and 7.6%.
- The proportion of national fiscal revenue to GDP stabilised at around 19% in the third quarter of 2016, which is similar to the corresponding period for 2015.

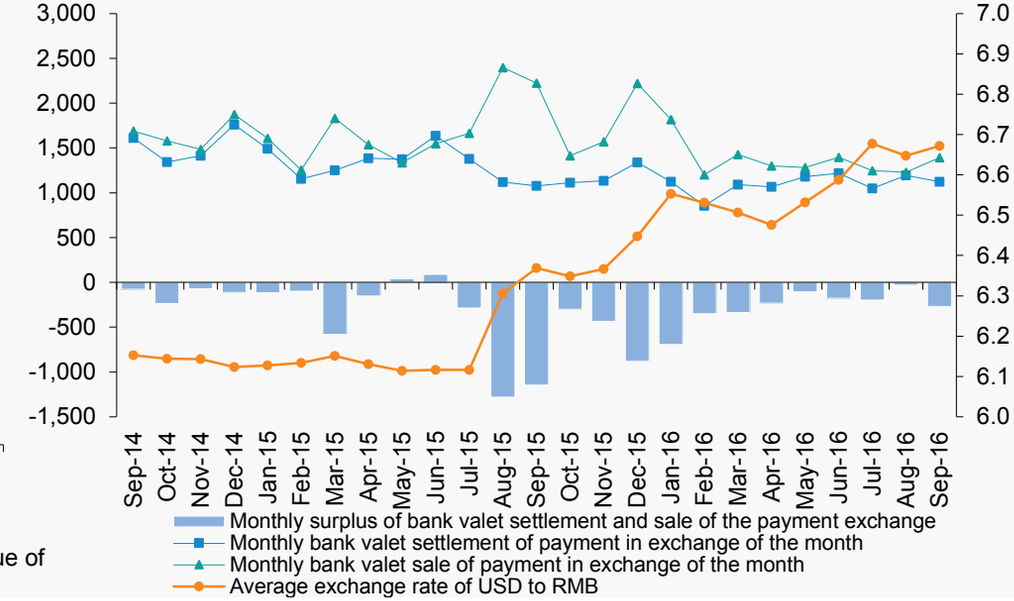
Source: National Bureau of Statistics of the People's Republic of China; Wind Info

Foreign trade and exchange rate

Import and export trade (USD 100 million)



Bank valet exchange settlement(USD 100 million) and sale and exchange rate



- In the third quarter of 2016, the total volume of import and export trade was USD 2.6773 trillion, which represents a YoY decline of 7.81%.
- The volume of export trade reached USD 1.5369 trillion, a decline of 7.64% and the volume of import trade was USD 1.1404 trillion, a decline of 8.03%. The trade surplus was USD 396.4 billion.
- In September 2016, the total volume of import and export trade reached USD 327 billion, a YoY decrease of 6.6%. Exports accounted for USD 184.5 billion, down 10% and imports accounted for USD 142.5 billion, up 1.9%.

- In the third quarter of 2016, bank valet exchange settlements added up to USD 336.8 billion, a YoY decline of 5.8%. Bank valet exchange sales reached USD 386.7 billion, a YoY decline of 38.5%. Settlement and sales accounted for a deficit of USD 49.9 billion, down 2.5% compared with the fourth quarter of 2015.
- Compared with the second quarter of 2016, the RMB depreciated against the USD in the third quarter of 2016. The monthly average exchange rate of USD to RMB rose from 6.5317 to 6.6654.

Source: National Bureau of Statistics; Wind Info; and State Administration of Foreign Exchange

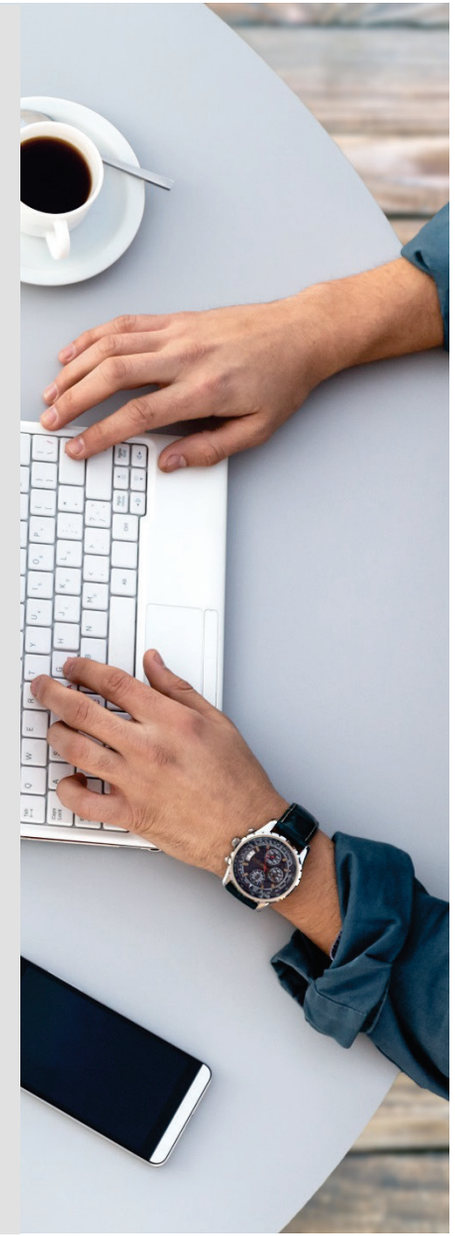
2 Analysis of 2016 Q3 financial data of listed banks

Conditions of assets – Asset scale and quality

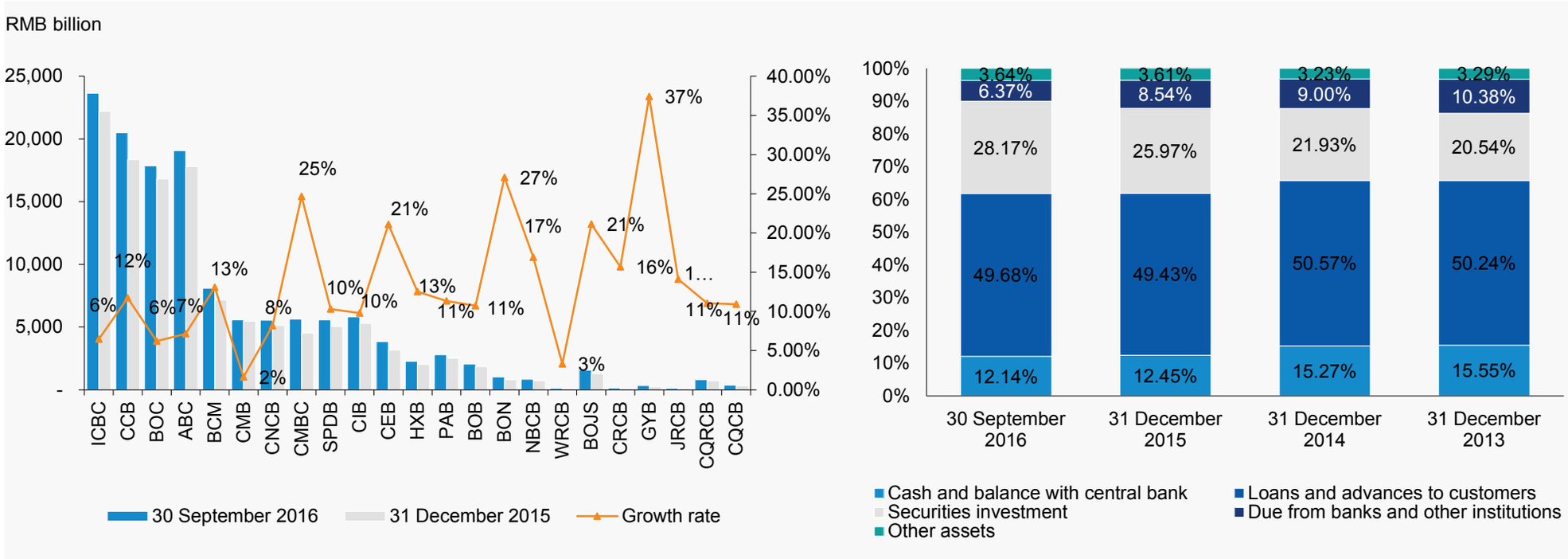
In the third quarter of 2016, the structure of assets and liabilities in the banking sector continued the same trend as the first half of the year. Banks placed more emphasis on balancing capital, risk and income, and further optimising their asset allocation structures. While striving to expand interest-bearing assets, they also intensified risk control efforts. As non-credit assets became increasingly important, banks started to take an active stance on their liability businesses and tried to diversify the risk though their bond, interbank deposits and asset securitisation businesses.

In Q3 2016, investment took up an increasing share of banks' total assets. Affected by the exposure to bill risks in early 2016 and narrowed gains from interest arbitrage resulting from stronger regulations in the interbank market, interbank assets declined in the third quarter of 2016, while investment increased. Bank deposits grew at a slower rate. Both bank deposits and interbank liabilities saw a decline in their share in banks' asset structures. The optimisation of liability structures continued to be an ongoing process for listed banks.

Overall, China's economy has grown steadily since 2016. The performance of enterprises has improved. The government has continued to implement prudent monetary policies as part of its efforts to support and facilitate economic restructuring and transformation. The banking sector has continued to provide increased funding services for *San Nong* (agriculture, farming and rural areas), small and micro businesses, government-subsidised housing and other livelihood projects. Loans to *San Nong* and small and micro enterprises, and consumption loans have increased significantly. In respect of credit risk control, the overall non-performing loans (NPL) of listed banks have increased. The NPL ratio rose slightly, while asset quality declined slightly compared to the second quarter. The NPL ratio and allowance to NPL ratio have flattened since the second quarter. The number of banks with decreased NPL ratio and increased allowance to NPL ratio have increased, reflecting more steady asset quality in the banking sector.



Conditions of assets – Asset scale and structure



In the third quarter of 2016, the total asset size of all listed banks expanded, mainly due to increased investment, loans and advances to customers, and other assets.

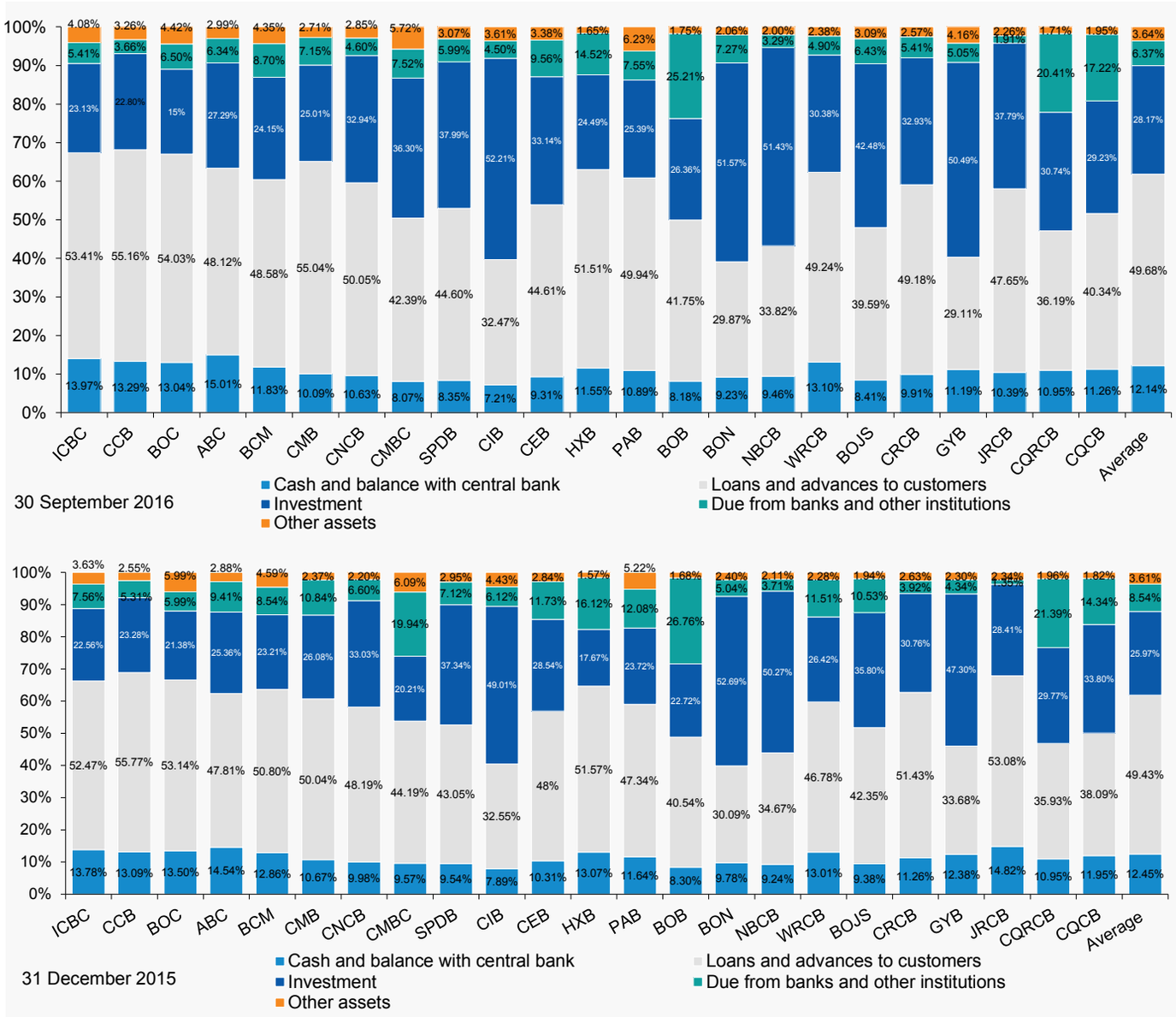
Compared with the five major state-owned banks, some of the joint-stock commercial banks and city commercial banks were more aggressive in their pursuit of expansion. The total asset size of GYB increased by 37.42%, which represented the largest increase of the listed banks. This was mainly due to the growth in its investment and loans and advances to customers. The total asset sizes of BON and CMBC increased by 27.10% and 24.68% respectively.

The asset structures of the listed banks also changed compared to the end of last year. The ratio of investment increased by 2.20%. The ratio of loans and advances to customers increased by 0.25%. The ratio of other assets rose by 0.03%. The ratio of cash on hand and deposits with the central bank decreased by 0.31%, while the ratio of amounts due from banks and other institutions fell by 2.17%.

Following the slowdown in China's economy, banks tried to lower their risk exposure by adjusting the direction of loans being approved towards different industries and optimising asset structures.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Conditions of assets – Asset structure



Compared with the end of 2015, the average ratio of loans and advances to customers among 11 listed banks increased in the third quarter of 2016, with CMB recording the highest growth rate of 5.00%. Of the four major state-owned banks, only CCB saw its ratio of loans and advances to customers fall. The ratio of investment among most listed banks increased, with the ratios of CMBC and JRCB growing 16.09% and 9.38% respectively.

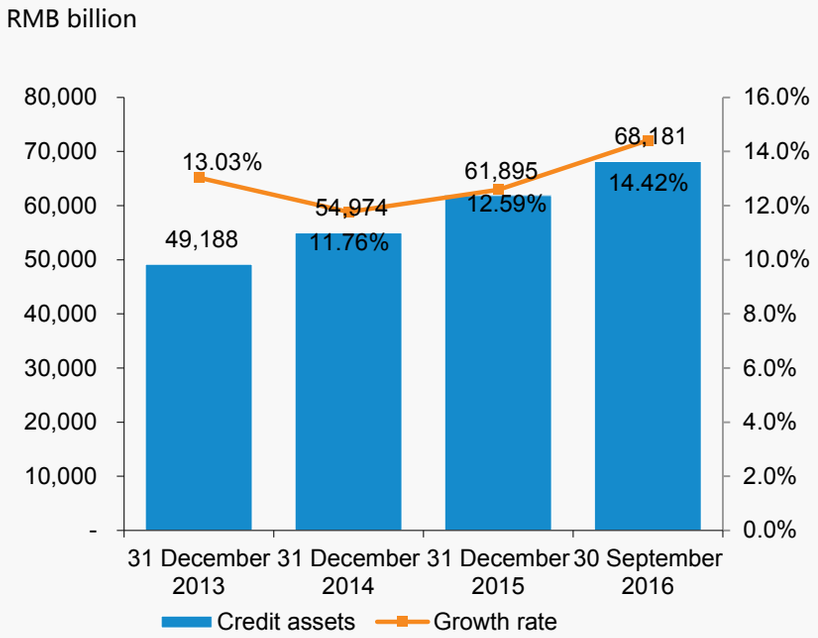
Meanwhile, compared with the end of 2015, the average ratio of amounts due from banks and other institutions to 17 listed banks decreased, with the sharpest decline recorded by CMBC at 12.42%.

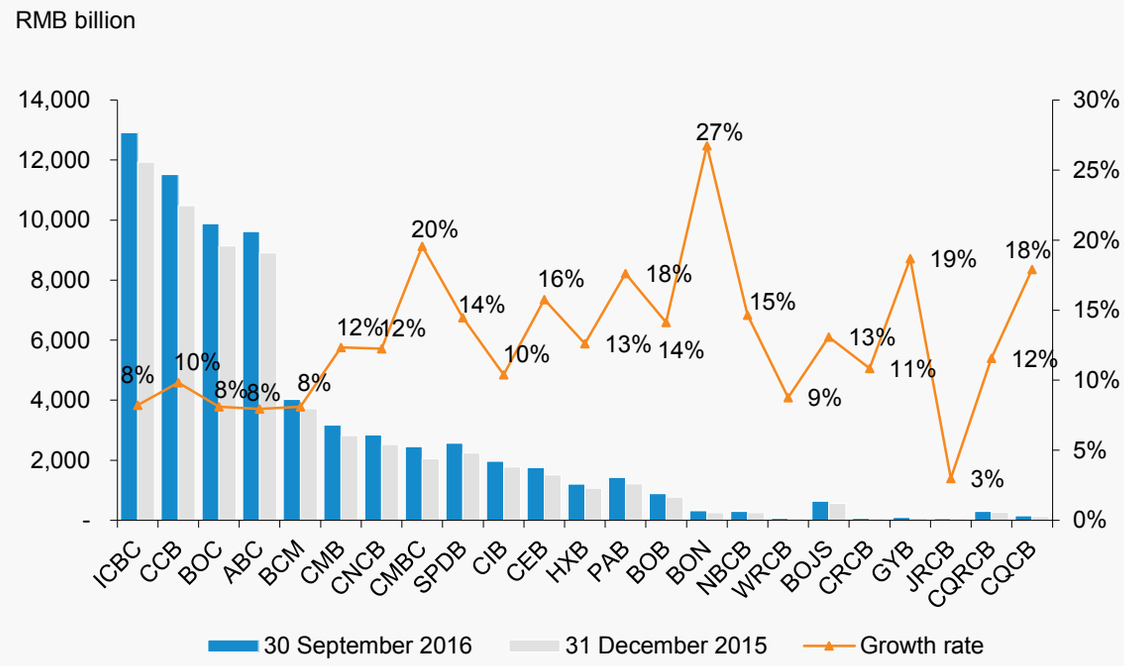
In Q3 2016, the banking sector remained supportive of China's real economy, strengthened risk management and control functions, and adjusted loan structures accordingly.

Meanwhile, with tougher regulations, interbank assets increasingly served the purpose of liquidity management. Amid internal structural adjustments to interbank assets, changes in risk weighting reduced the gains that banks were able to make from interest arbitrage, resulting in a decline in the growth of the share of interbank assets in banks' total assets.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Conditions of assets – Total loans





In Q3 2016, the total scale of credit assets of listed banks was RMB 68.18 trillion, which represents a YoY increase of 14.42%.

Since the beginning of 2016, China's Government has begun to make progress with its economic reforms and the central bank has continued to pursue prudent monetary policies. Under these circumstances, demand for loans has risen, and while listed banks expanded their lending, they also engaged in asset restructuring and strengthened their risk control efforts.

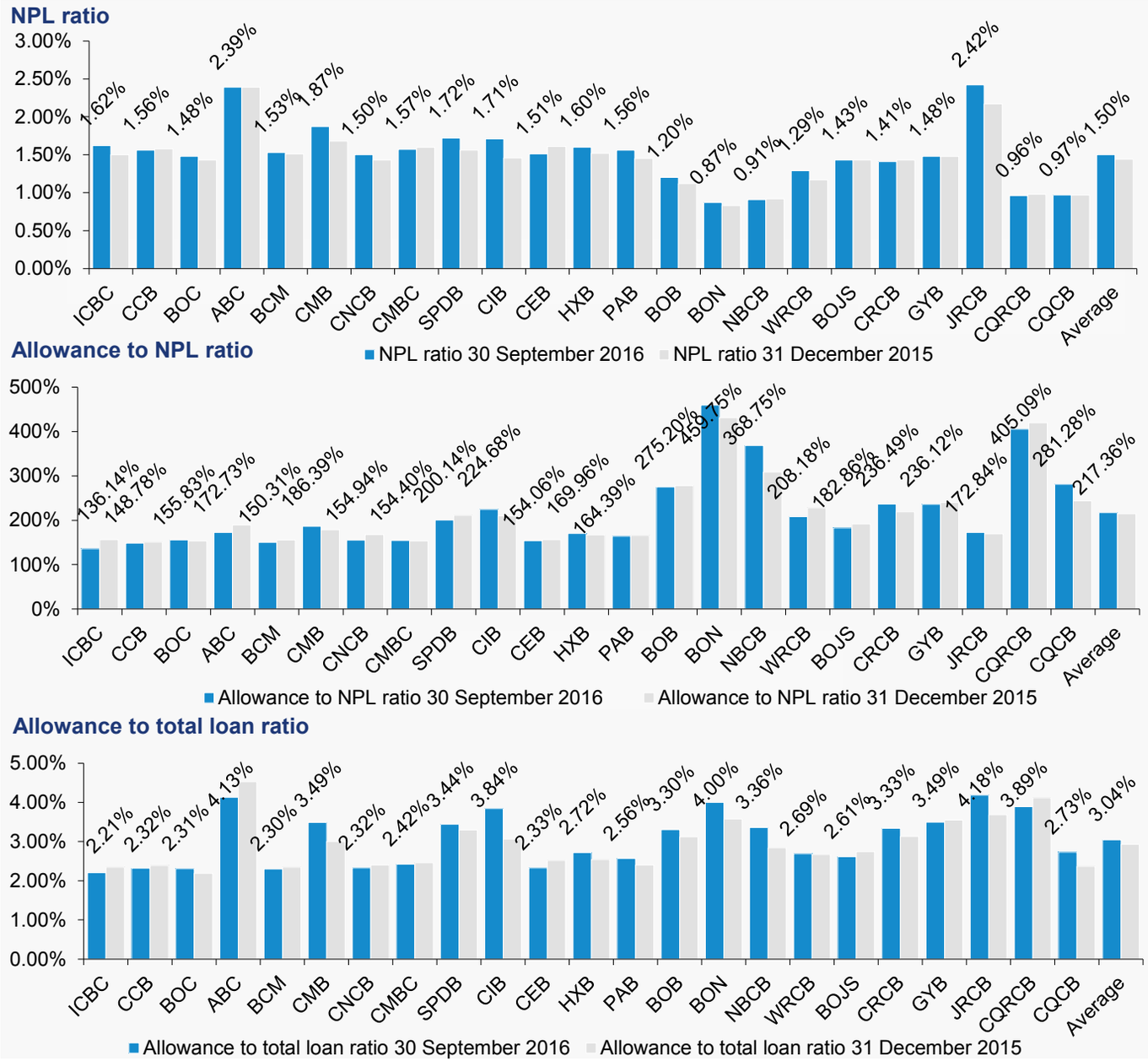
In the third quarter of 2016, the growth rate of credit assets among listed banks began to slow even though the credit assets of 23 banks still increased compared with the end of last year.

Some of the smaller banks recorded higher than average growth rates such as BON, CMBC and GYB.

CMBC's loans were more targeted towards supporting the growth of consumption. BON's new loans were mostly granted to support the development of the real economy, small and micro businesses, and *San Nong* (agriculture, farming and rural areas) and livelihood projects. GYB's loans were used for the benefit of small and micro businesses.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Conditions of assets – Loan quality



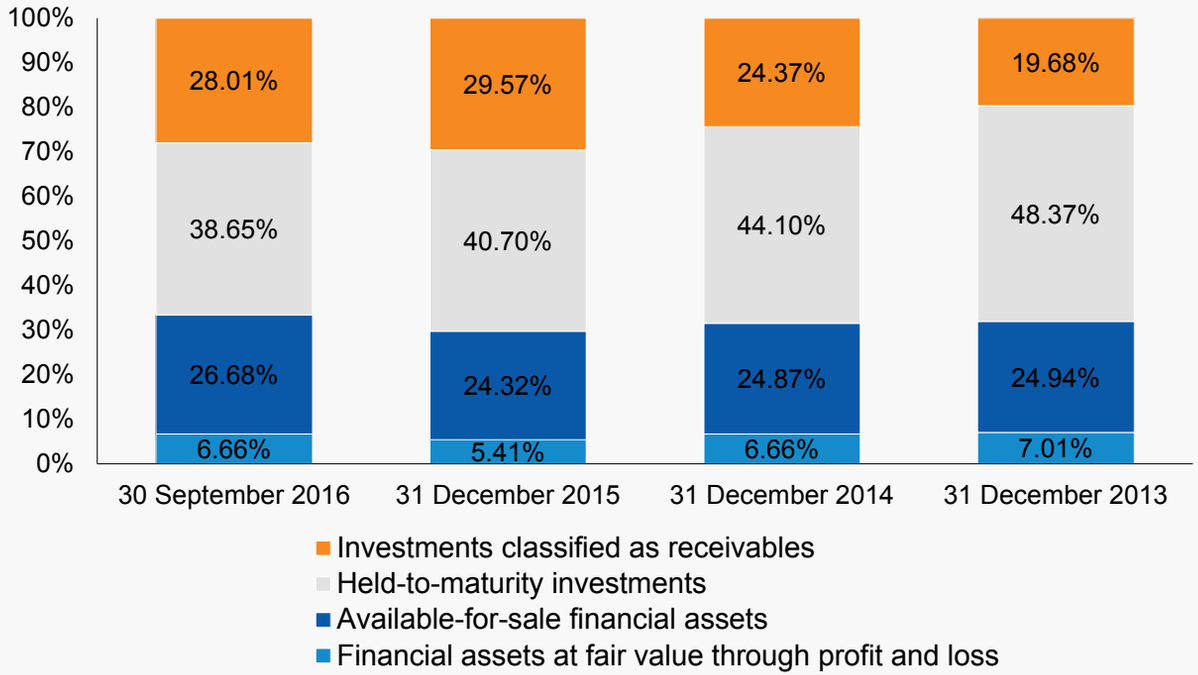
In Q3 2016, NPL ratios among most listed banks increased compared to the end of 2015, with the ratio for 12 listed banks exceeding 1.50%. This meant that the average NPL ratio was 1.50% compared with 1.44% during the previous year. BON recorded the lowest NPL ratio at 0.87%, which represents an increase of 0.04% compared with the end of last year, while JRCB recorded the highest NPL ratio at 2.42%, up 0.25%.

The rising NPL ratio caused decreased allowance to NPL ratios among 13 listed banks. BON recorded the highest allowance to NPL ratio with 459.75%.

The allowance to the total loan ratio of listed banks varied between 2.21% and 4.18%. Due to the increased allowance provided by banks based on their credit qualities, the average allowance to total loan ratio rose by 0.12% to 3.04%.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Conditions of assets – Investment



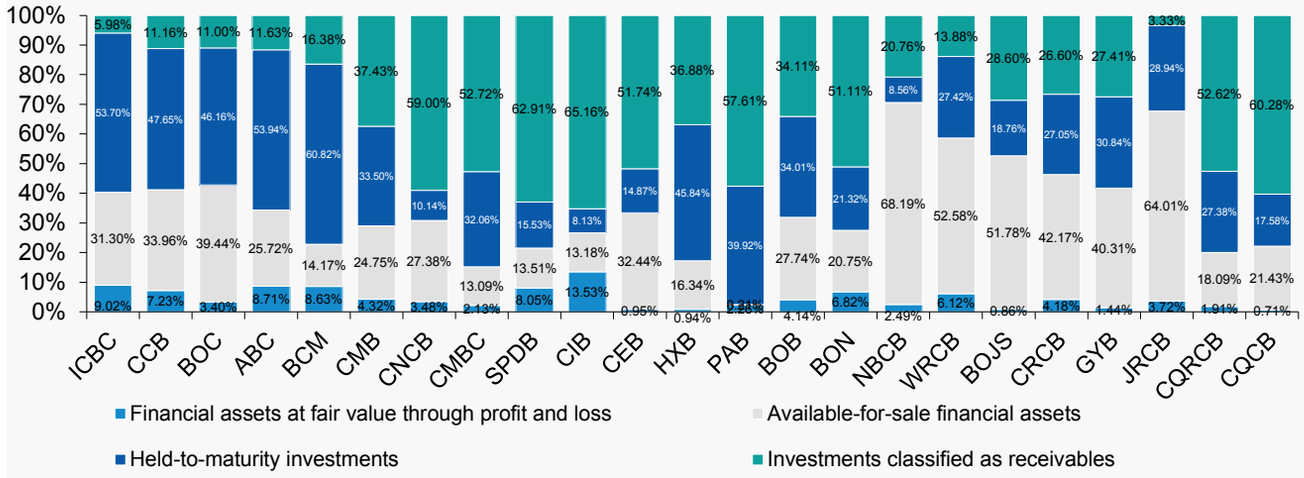
During the third quarter of 2016, listed banks increased the scale of their investment within their asset structures. Overall investment increased by an average rate of 18.96% compared with the end of 2015.

As for general investment structures:

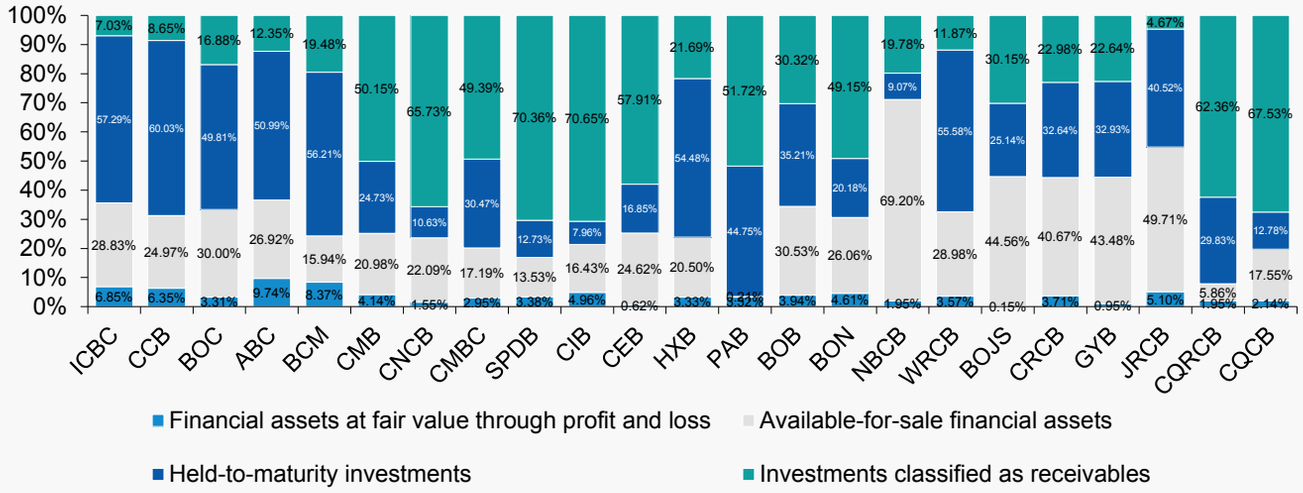
- Held-for-trading financial assets took up 6.66%, representing an increase of 1.25%.
- Available-for-sale financial assets accounted for 26.68%, increasing 2.36%.
- Held-to-maturity investments accounted for 38.65%, decreasing 2.05%.
- Investments classified as receivables took up 28.01%, down 1.56%。

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Conditions of assets – Investment (continued)



30 September 2016



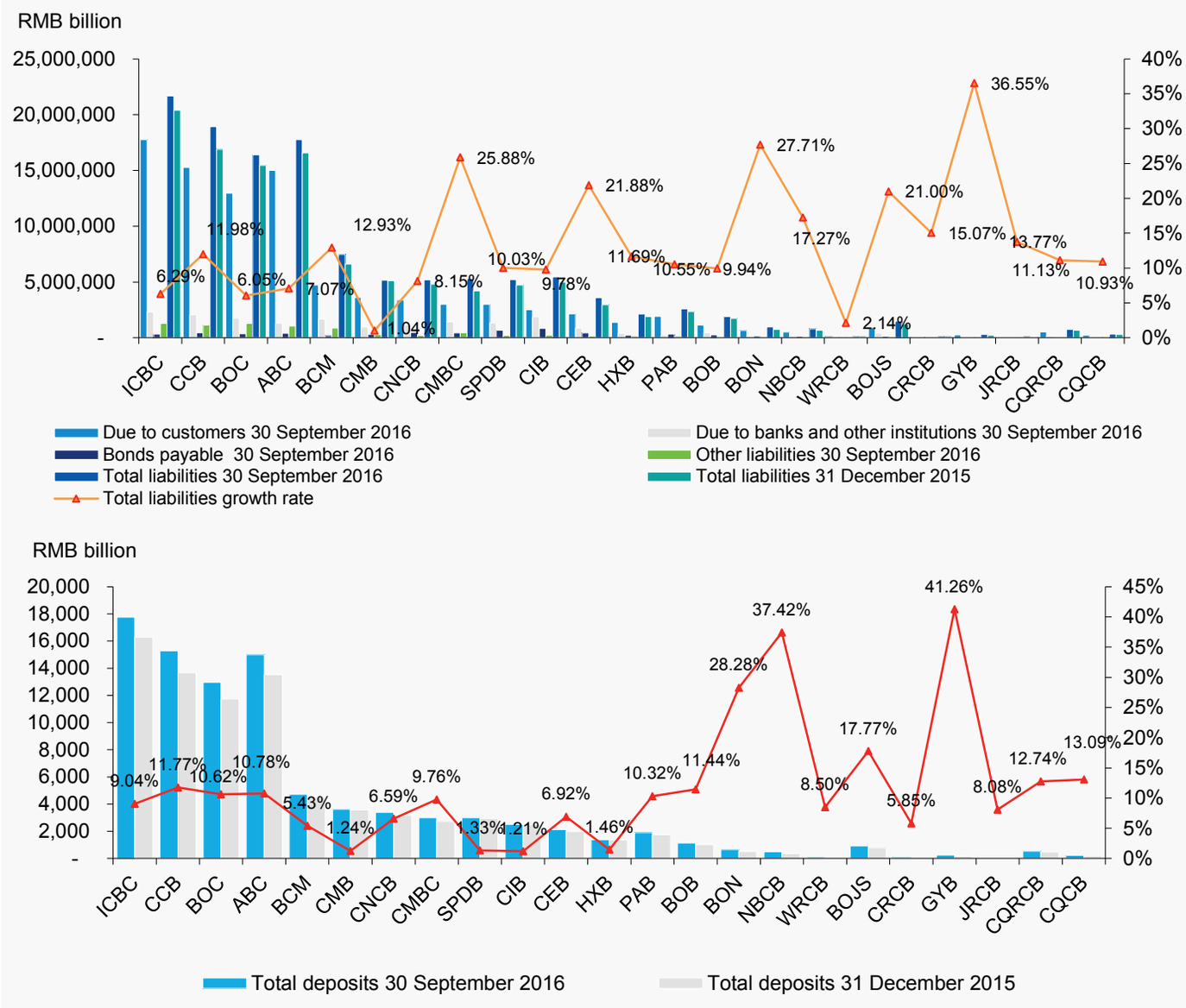
31 December 2015

In Q3 2016, the investment structures of listed banks differed. The five major state-owned banks still held a high percentage of held-to-maturity investments, while other commercial banks increased the proportions of their investments classified as receivables and available-for-sale financial assets to varying degrees.

The share of held-for-trading financial assets in investments of CMBC, ICBC, ABC, BCM and SPDB were relatively higher, remaining at more than 8%.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Conditions of liabilities —Liability structure



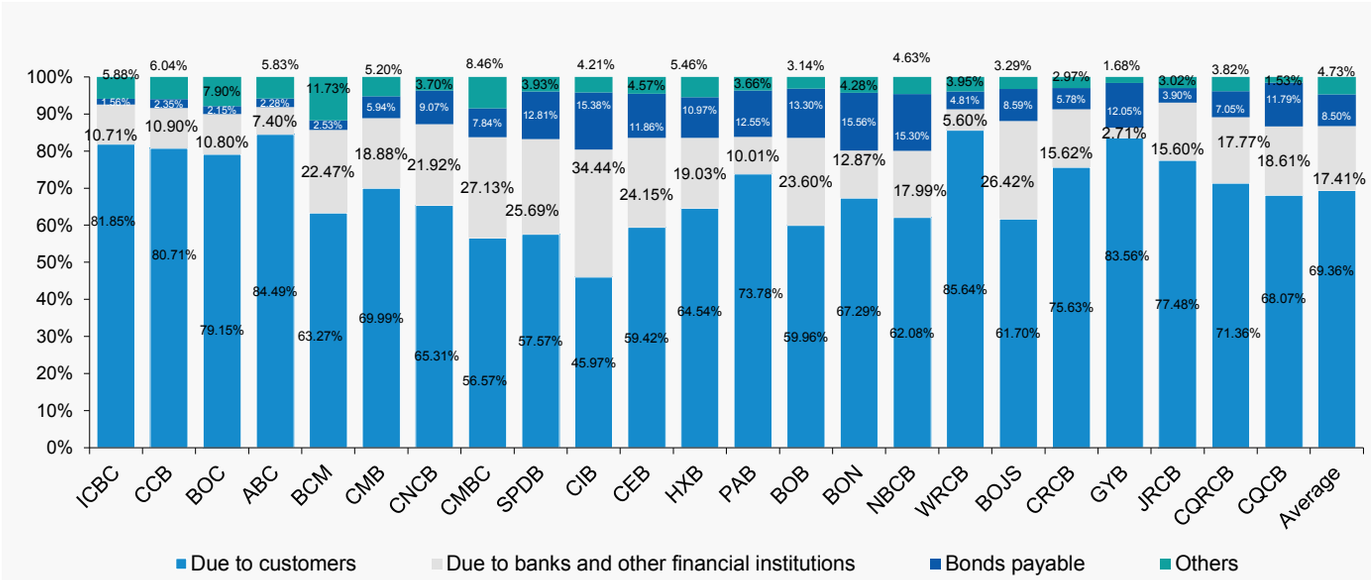
In the third quarter of 2016, the total liabilities of listed banks increased on average by 13.38% compared with the end of 2015, demonstrating a similar trend to total assets.

Joint-stock commercial banks' liabilities grew much faster. GYB recorded the highest increase of 36.55%, followed by BON with 27.71% and CMBC with 25.88%. This increase was mainly due to the increase in deposits from customers and the increase in bonds payable.

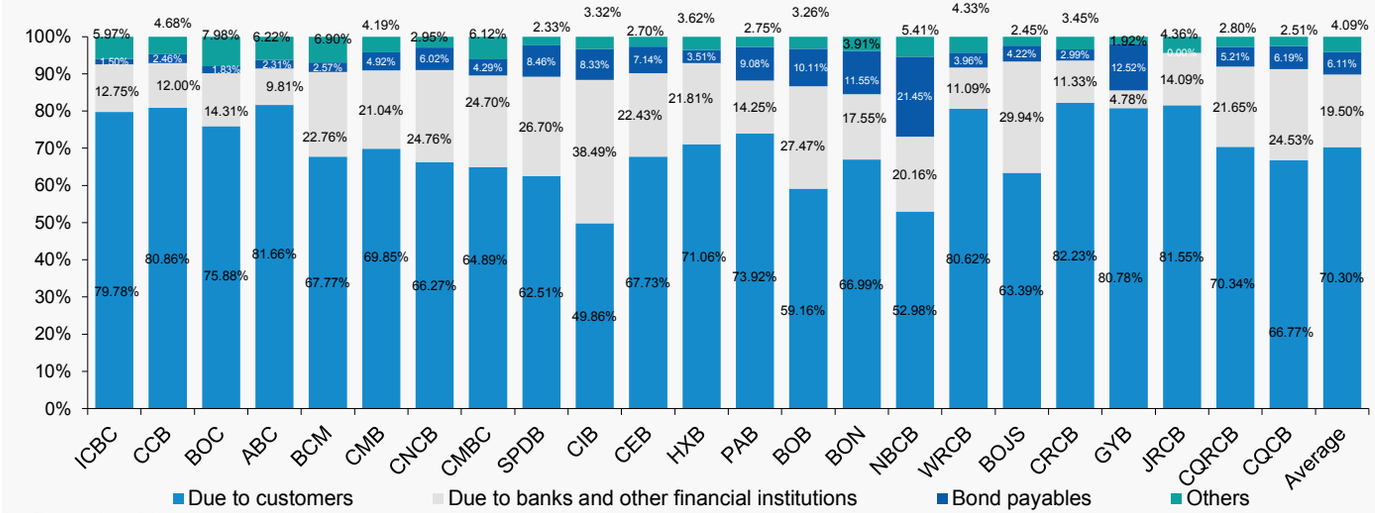
In Q3 2016, total deposits reached RMB 91.12 trillion, an increase of 9% compared with the end of 2015. GYB recorded the highest increase in deposits of 41.26% followed by NBCB with 37.42%. CIB recorded the slowest growth of 1.21% in deposits, while CMB grew by 1.24% in deposits.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Conditions of liabilities – Liability structure (continued)



30 September 2016



31 December 2015

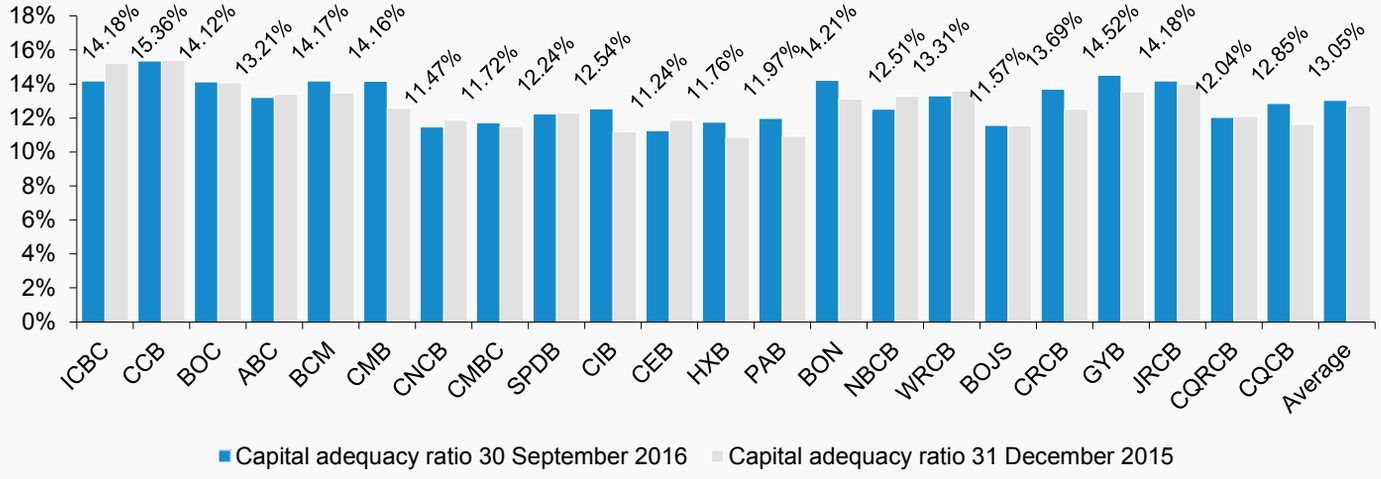
In the third quarter of 2016, customer deposits formed the largest component of listed banks' liabilities. The five major state-owned banks had higher deposit totals, with ICBC, CCB and ABC each recording a proportion of over 80%, reflecting the advantages they hold in attracting customers.

In comparison, non-state commercial banks held a higher proportion of interbank liabilities than the big five state-owned banks; for example, the proportion of interbank liabilities held by CIB was 34.44%. Since non-state banks often lack deposit resources, they need to regularly borrow in the interbank market. At the same time, they also have to take steps to develop a diversified range of products in order to optimise asset allocation. Liquidity gaps arising from the allocation of interbank assets often need to be filled by their interbank liability businesses.

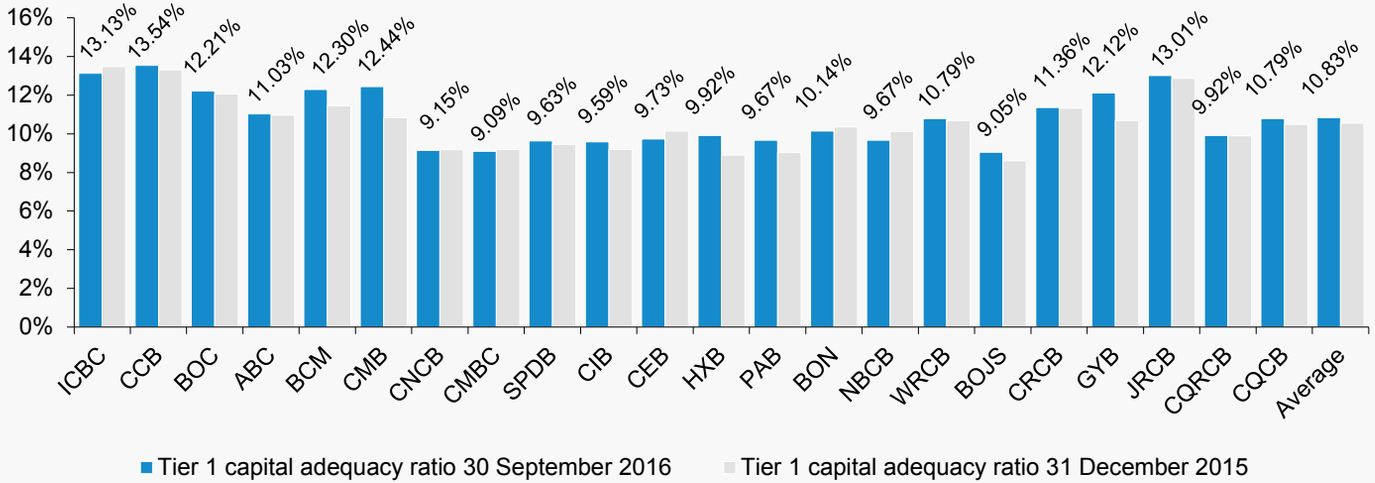
Amid interest rate liberalisation and the emergence of various fintech start-ups, there exists intense competition for funding. In response to this, listed banks continue to improve the structure of their liability businesses, increase efforts to boost deposits and expand the channels for raising liabilities in order to develop their liability businesses.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Risk management – Capital adequacy ratio and tier 1 capital adequacy ratio



NOTE: Relevant data not released by BOB.



NOTE: Relevant data not released by BOB.

As at 30 September 2016, the average capital adequacy ratio of listed banks was 13.05%, an increase of 0.33% compared with the end of 2015. Half of the listed banks saw their capital adequacy ratios increase, with the highest increase recorded by CMB with 1.59%. This is explained by the fact that the growth rate of average risk-weighted assets was lower than the growth rate of net capital.

As at 30 September 2016, the average tier 1 capital adequacy ratio of listed banks was 10.83%, an increase of 0.28% compared with the end of 2015. NBCB posted the sharpest decrease, with its ratio falling 0.45%, due to the growth rate of its average risk-weighted assets being higher than the growth rate of its tier 1 core capital.

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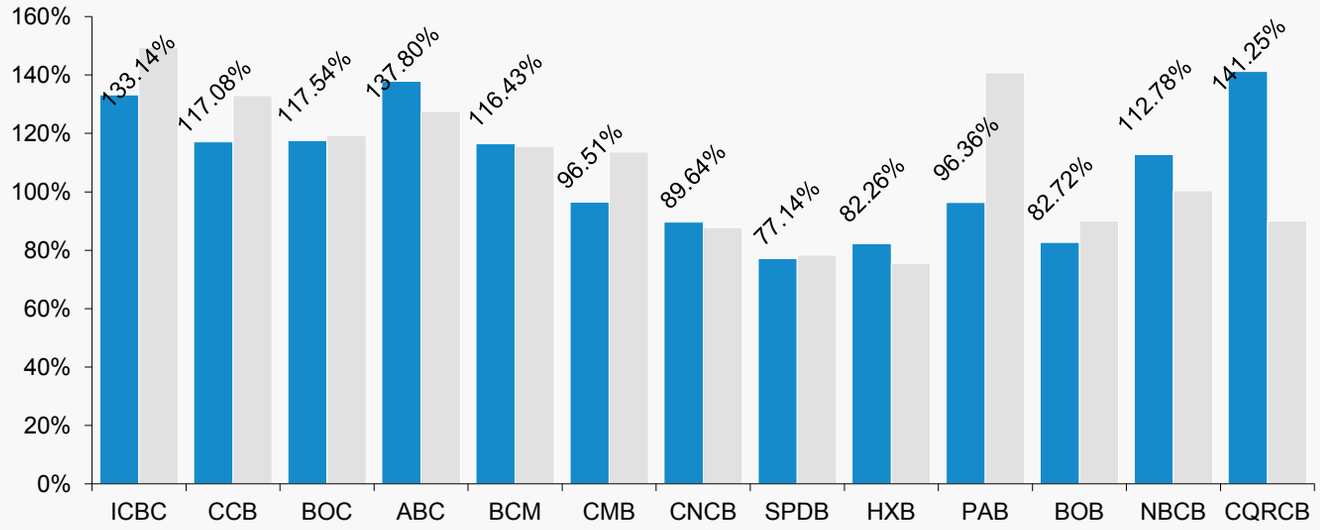
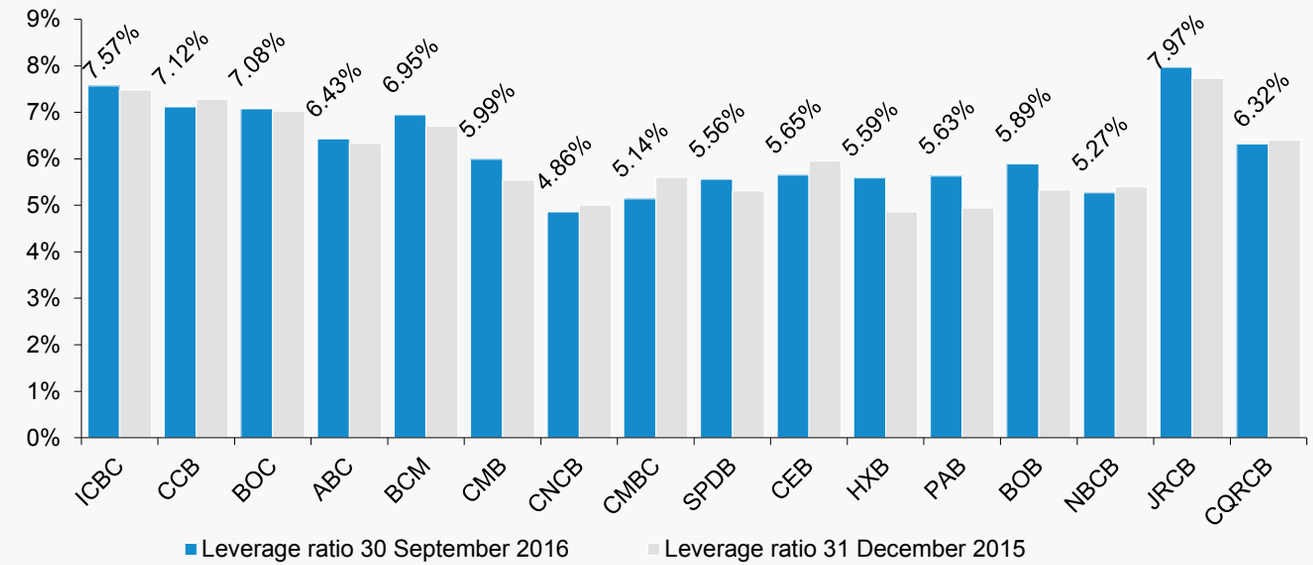
Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Risk management – liquidity coverage ratio and leverage ratio





Overall, the liquidity coverage ratio (LCR) of most listed banks reached 80% in the third quarter of 2016. CQRCB, ABC and HXB recorded the highest growth in LCR, increasing 51.21%, 10.30% and 6.72% respectively.

The leverage ratio of all listed banks (consolidated) exceeded 4% in the third quarter of 2016. JRCB, ICBC and CCB recorded the highest leverage ratio of 7.97%, 7.57% and 7.12% respectively.

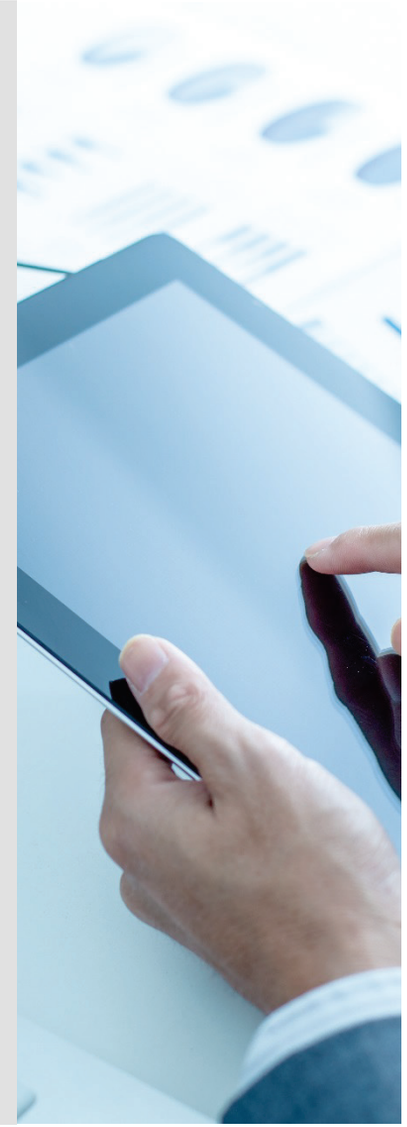
Sources: The banks' 2015 annual reports and 2016 Q3 reports; Wind Info; KPMG China research

Profitability – Analysis

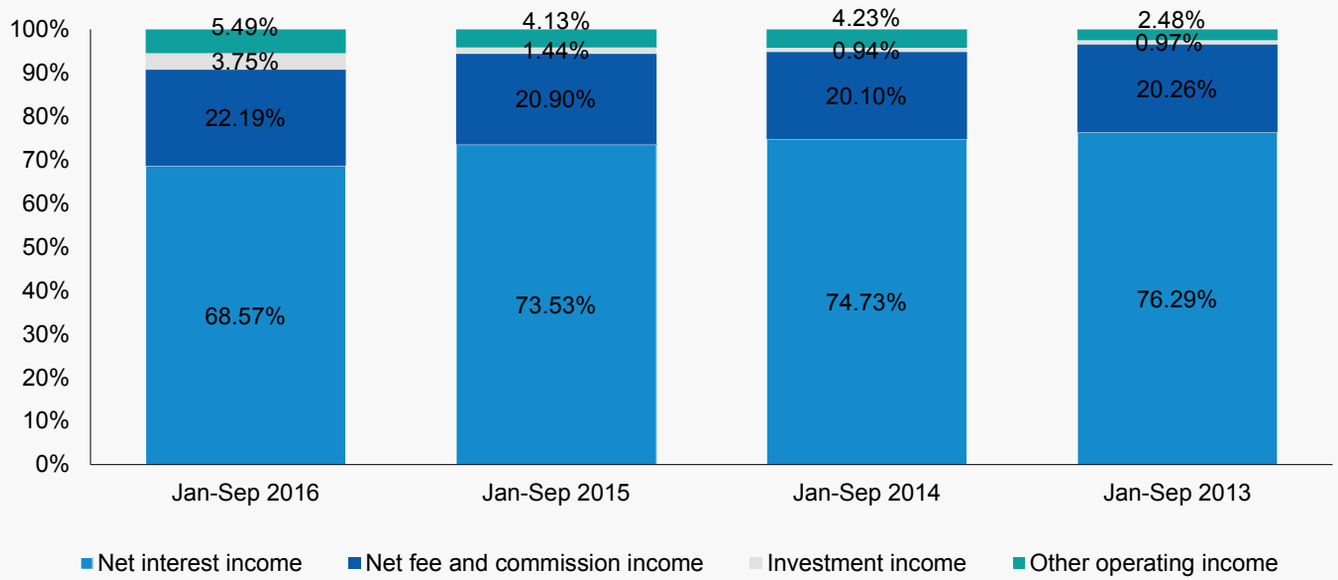
During Q3 2016, net profits of listed banks increased YoY, albeit at a slower rate, as the central bank released a lower benchmark loan rate. This assisted listed banks in their asset repricing, resulting in narrower net interest margins.

The expansion of interest-bearing assets and non-interest income, along with cost reductions, have been the main drivers of listed banks' net profits. In the third quarter of 2016, interest-bearing assets grew steadily. Thanks to banks' intensified efforts to adjust income structures in 2016, non-interest income was growing at a fast rate. Banks also strengthened cost management initiatives, resulting in an improvement in their cost-to-income ratios.

At the same time, banks' NPL ratios continued to rise, with credit costs hovering at a high level. Accrued allowances remained high and have become a major drag on net profits.



Profitability – Operating income and income structure analysis



The total operating income of listed banks increased by 2.32% YoY in Q3 2016.

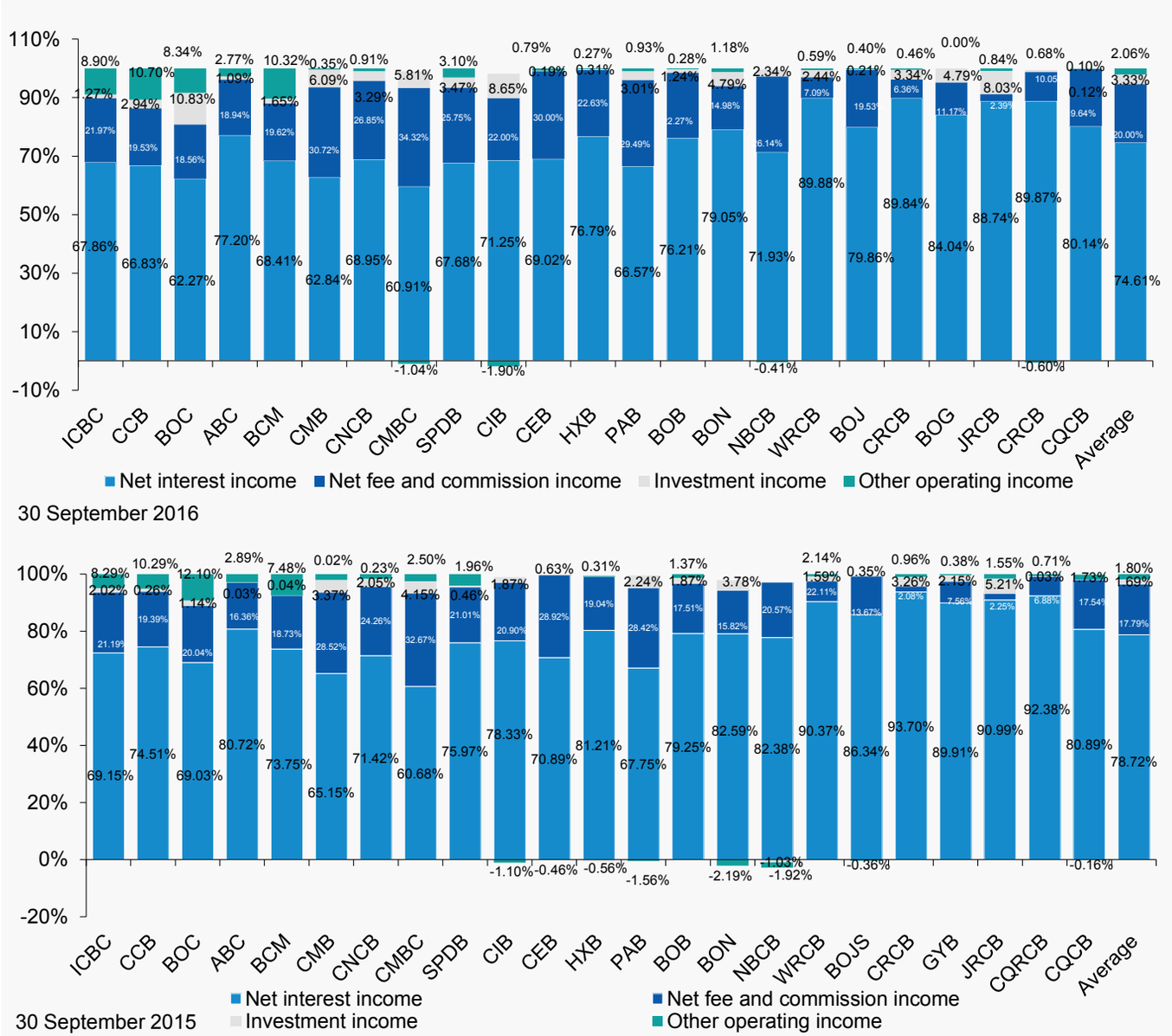
Components of operating income during Q3 2016 were as follows:

- Net interest income accounted for 68.57%, declining by 4.96% YoY.
- Net fee and commission income accounted for 22.19%, increasing by 1.29% YoY.
- Investment income accounted for 3.75%, increasing by 2.31% YoY.
- Other operating income accounted for 5.49%, increasing by 1.36% YoY.

Other operating income mainly consists of gains from changes in fair value, foreign exchange and other operating income.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Profitability — Operating income and income structure analysis (continued)



Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

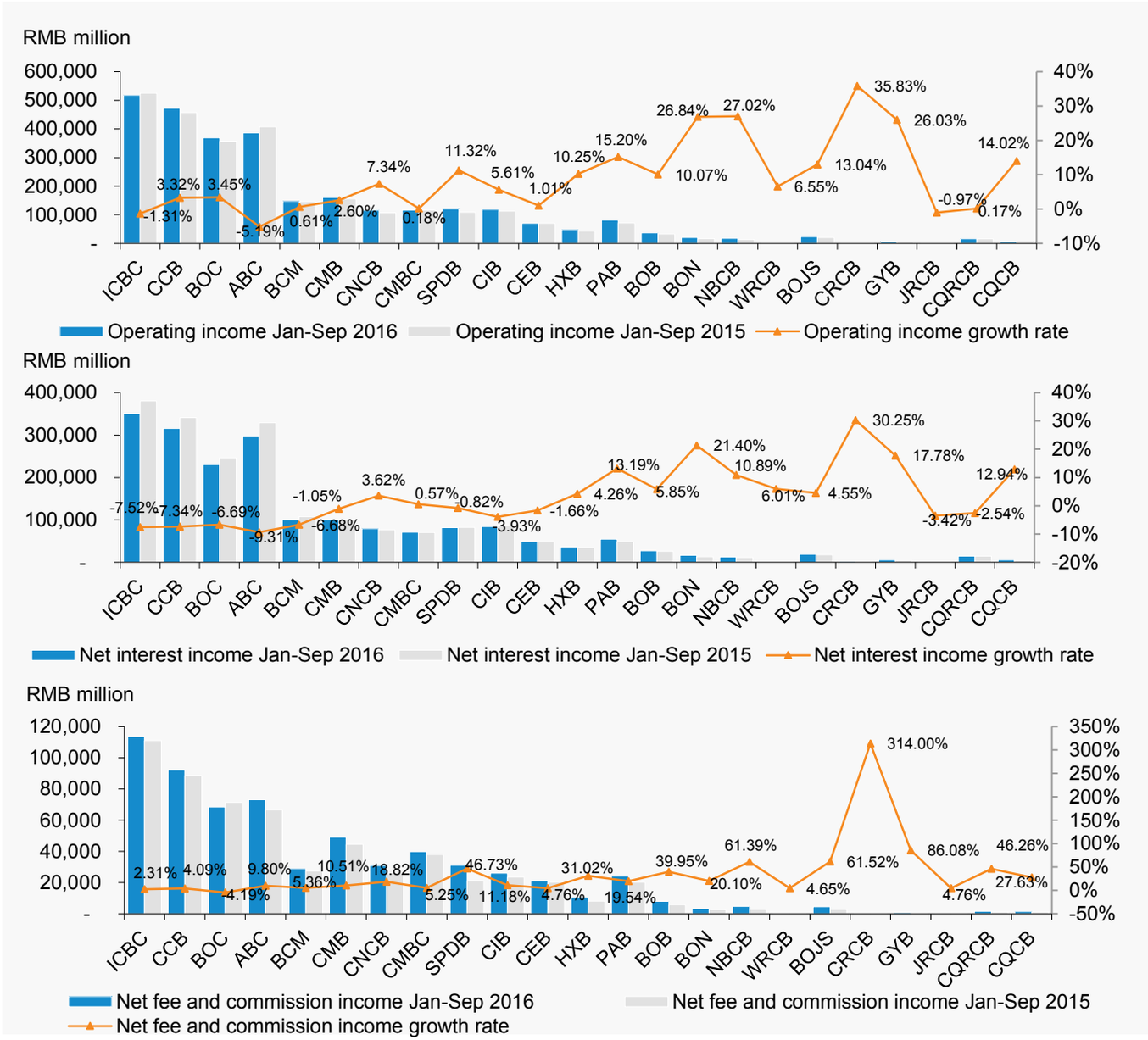
In the third quarter of 2016, net interest income among listed banks accounted for 74.61% of operating income on average, while net fee and commission income and investment income accounted for 20.00% and 3.33% respectively.

Compared to Q3 2015, the average ratio of net interest income among listed banks declined, mainly due to listed banks adjusting their income structures and reducing their reliance on interest income against the backdrop of tightening net interest spreads and net interest margins.

In the third quarter of 2016, the average ratio of net fee and commission income for listed banks increased by 2.21% YoY, mainly due to the increase in income sourced from consulting, wealth management, agency and commission, and bank card services.

In Q3 2016, the average ratio of investment income for listed banks increased by 1.64%, while other operating income increased by 0.26% YoY. CCB and BCM had the highest proportion of other operating income among the listed banks, with 10.70% and 10.32% respectively.

Profitability — Operating income and income structure analysis (continued)



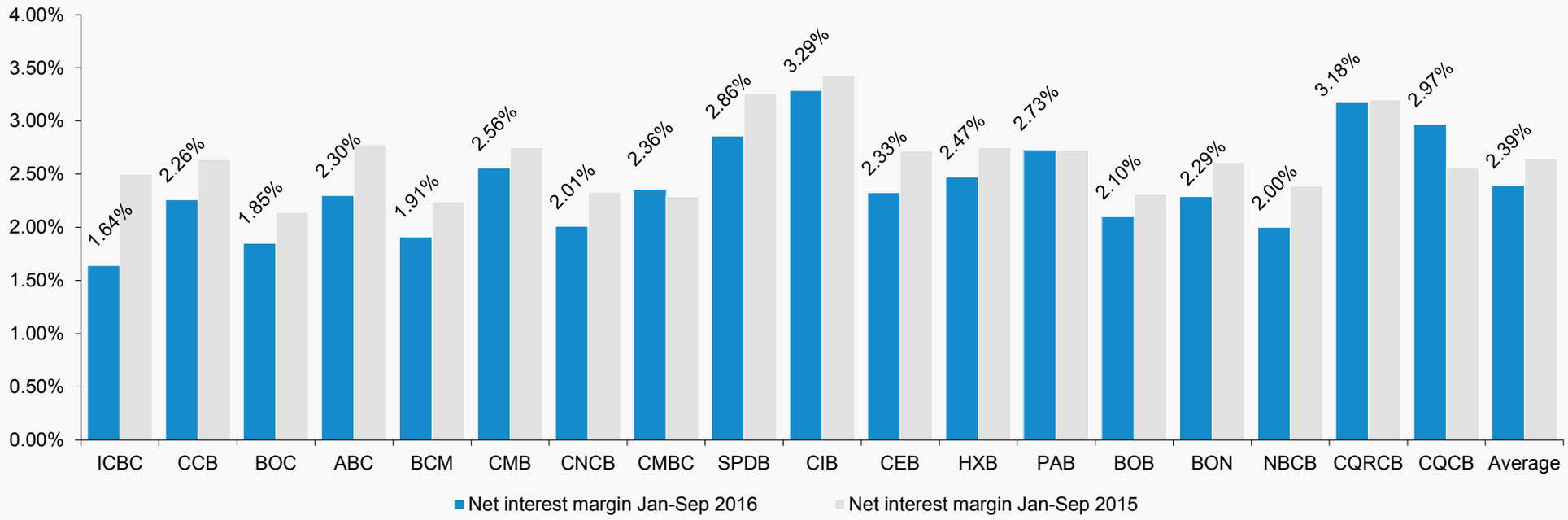
In Q3 2016, many listed banks experienced an increase in operating income compared with the same period in the previous year. This was due to the increase in net interest income and net commission income. CRCB and NBCB posted an increase of 35.83% and 27.02% respectively. In addition, the operating income of joint-stock banks grew significantly faster than that of the four major state-owned banks. ICBC and ABC saw a slight decline in operating income.

In Q3 2016, the big four banks experienced a slower growth in net interest income YoY, mainly due to narrower interest margins. Many joint-stock banks saw their net interest income increase compared with the same period in the previous year. In the context of accelerating interest rate liberalisation, the increase in net interest income was mainly derived from the continued growth of interest-bearing assets. The net interest income of BON and CRCB increased by 21.40% and 30.25% respectively compared with the same period for 2015.

In Q3 2016, all listed banks experienced an increase in net commission income compared with the same period last year. In spite of stricter monitoring of fee policies, new financial shocks and intense market competition, China's banks took proactive steps to adjust their income structures, promote financial innovation, diversify profit-making sources and reduce their reliance on traditional businesses. At the same time, they were responsible for a significant increase in investment banking, bank card and custody business, gold leasing, and other intermediary business. As a result, CRCB's net commission income increased by 314.00%, and that of GYB and BOJS increased by 86.08% and 61.52% respectively.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Profitability – Net interest margin

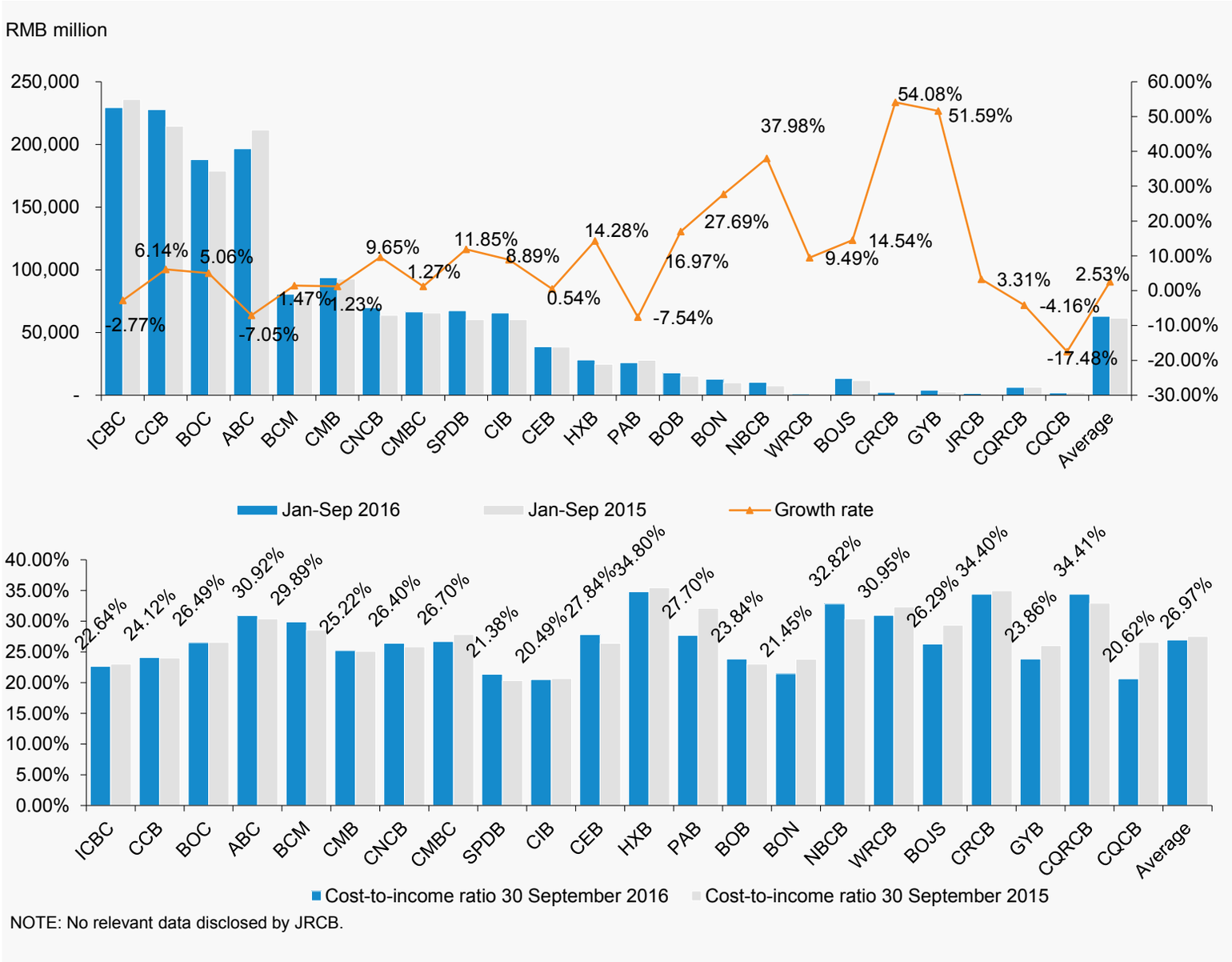


NOTE: WRCB, BOJS, CRCB, GYB and JRCB did not disclose the relevant data.

In the third quarter of 2016, the average net interest margin was 2.39%, down from the same period in 2015. Affected by the ongoing process of interest rate liberalisation and the impact of a lowered benchmark interest rate in 2015 on repricing in 2016, net interest margins narrowed for the 15 listed banks. However, thanks to the improved deposit and loan portfolio, accelerated transformation of asset business, and decreased interest costs, some city commercial banks, such as CQCB, recorded a slight YoY increase in their net interest margins.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Profitability — Cost controls — Operating expenses and cost-to-income ratio



NOTE: No relevant data disclosed by JRCB.

The operating expenses of most listed banks increased in Q3 2016, due to the increased business scale and asset impairment.

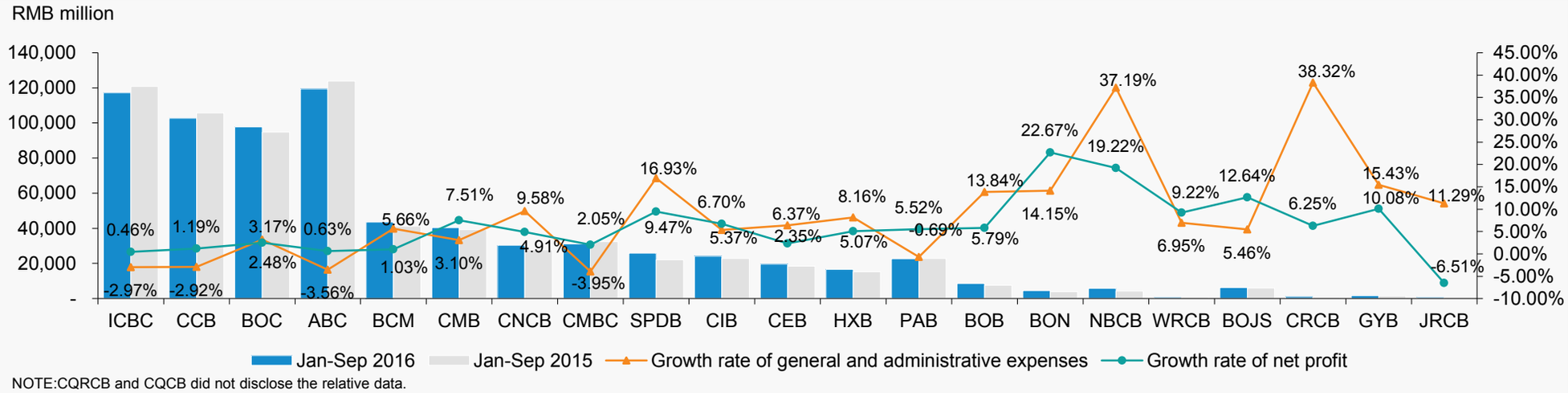
CRCB, GYB and NBCB experienced the highest growth in operating expenses of 54.08%, 51.59% and 37.98% respectively. The main reason for this was the increase in asset impairment provision for loans and advances among the three banks.

In Q3 2016, the average cost-to-income ratio among listed banks was 26.97%, a decline of 0.58% compared with the same period in 2015. CQCB and PAB experienced the sharpest decline, falling 5.97% and 4.44% respectively. This was caused by optimisation in cost control.

Banks need to deal with the increasing rigour of external regulations, and must remain competitive through continual innovation of their products and services. Sustaining this low cost-to-income ratio will be a key challenge affecting listed banks' profitability going forward.

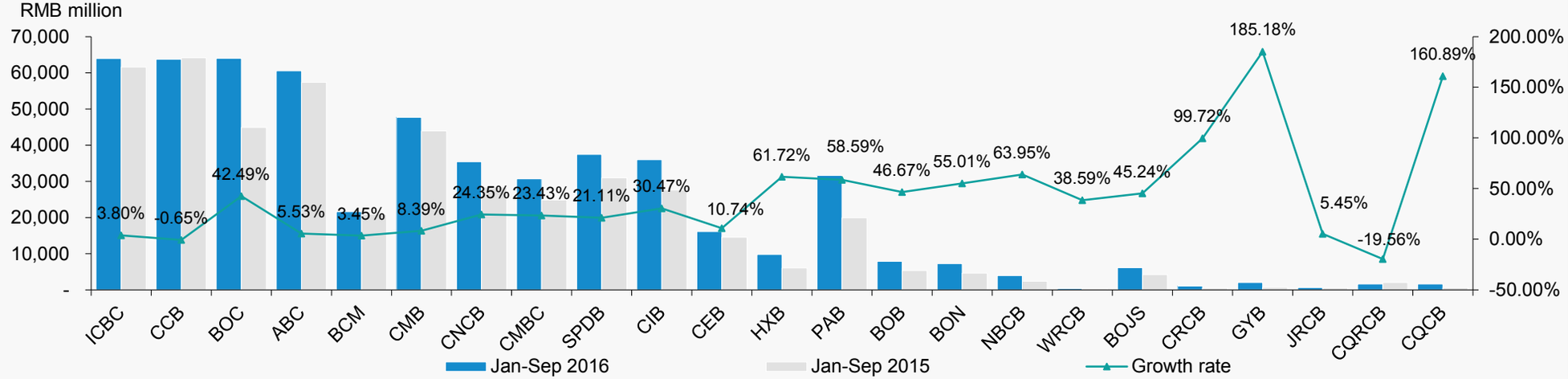
Sources: The banks' 2015 annual reports and 2016 Q3 reports; Wind Info; KPMG China research

Profitability – Cost controls – General and administrative expenses and impairment losses



NOTE:CQRCB and CQCB did not disclose the relative data.

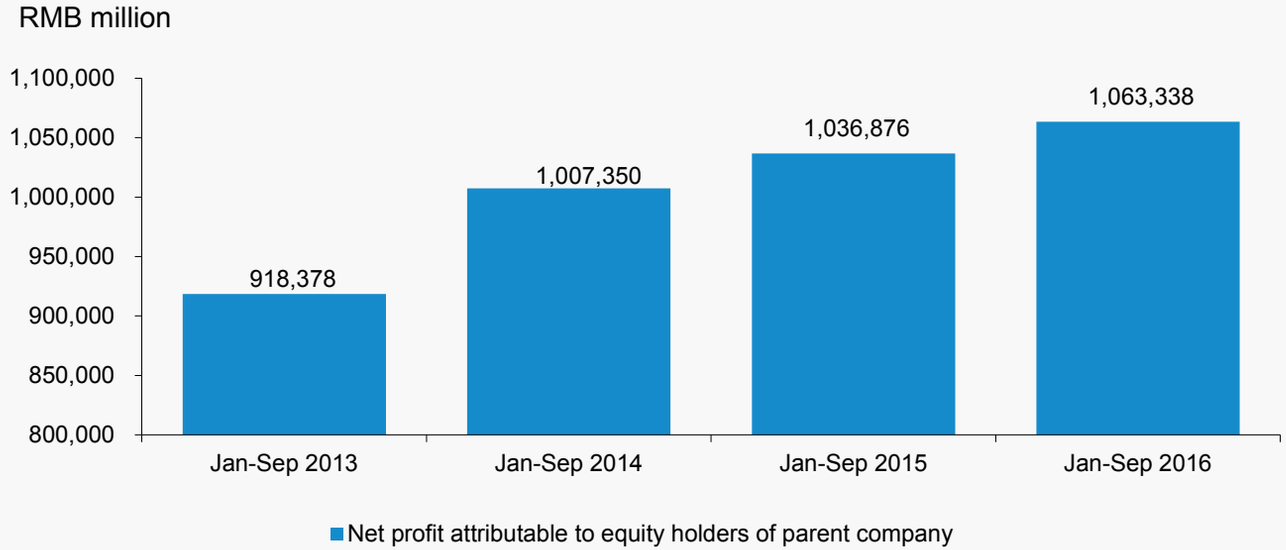
In Q3 2016, most listed banks saw an average increase of 8.90% in general and administrative expenses. CRCB and NBCB experienced the highest growth rates, reporting increases of 38.32% and 37.19% respectively. This was mainly due to increased investment in the establishment of new outlets and IT technologies, and the building of electronic channels (CRCB) and increase in employee expenses (NBCB).

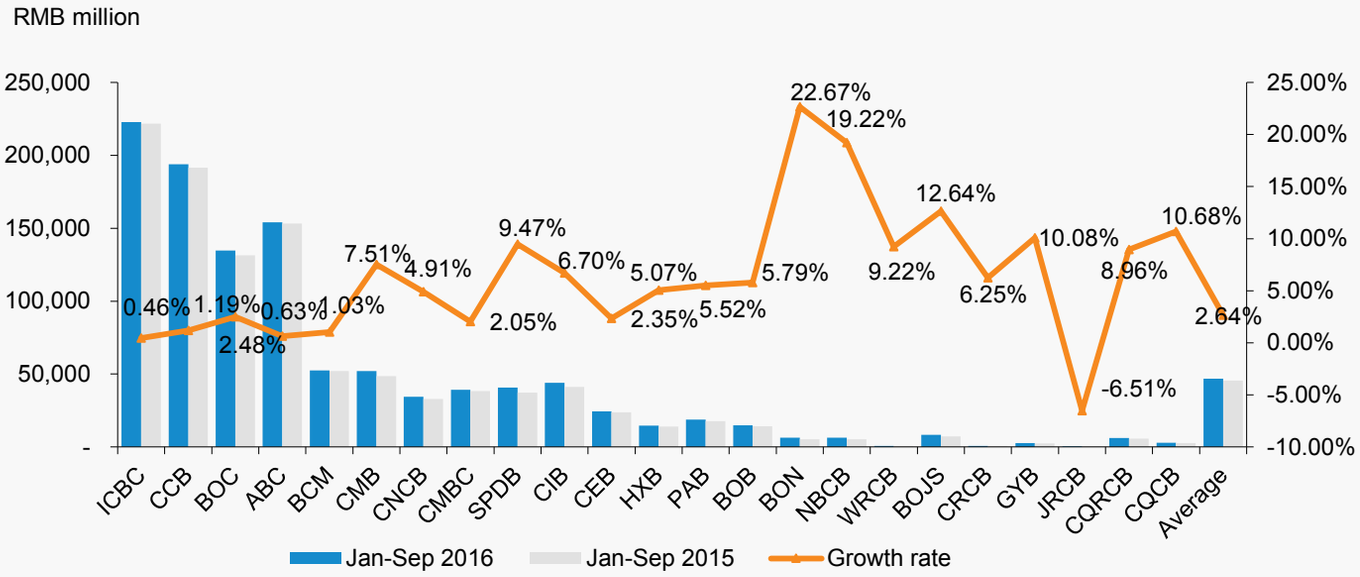


In Q3 2016, due to the effects of the economic slowdown, accelerated industrial restructuring and other factors, the banking sector faced continued pressure in relation to asset quality, with credit risk remaining at a high level. In order to remain prepared for risks, banks made more asset impairment provision, with an average growth rate of 18.08%. GYB and CQCB led the way, with a YoY increase of over 100%.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; Wind Info; KPMG China research

Profitability – Net profit attributable to equity holders of the parent company





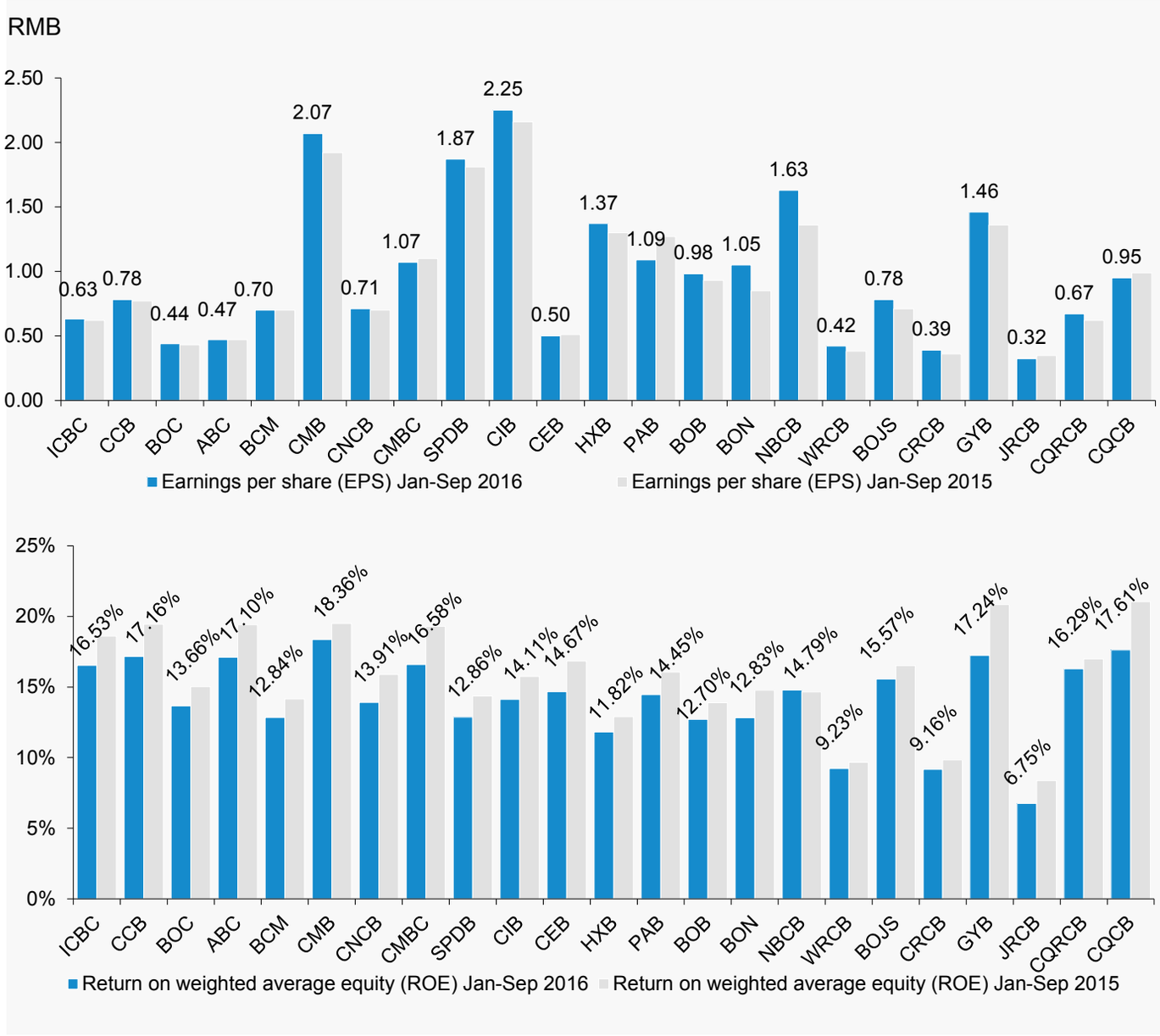
Overall, net profit attributable to parent company equity holders increased in the third quarter of 2016 and the growth rate was higher than it was in the same period in 2015, rising from 2.14% to 2.55%.

BON enjoyed the fastest growth rate with 22.67%, and NBCB posted a growth rate of 19.22%.

The increase in net profit recorded by BON, NBCB and other joint-stock commercial banks was mainly due to an increase in net interest income and net fee and commission income.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; KPMG China research

Profitability — Financial performance indicators

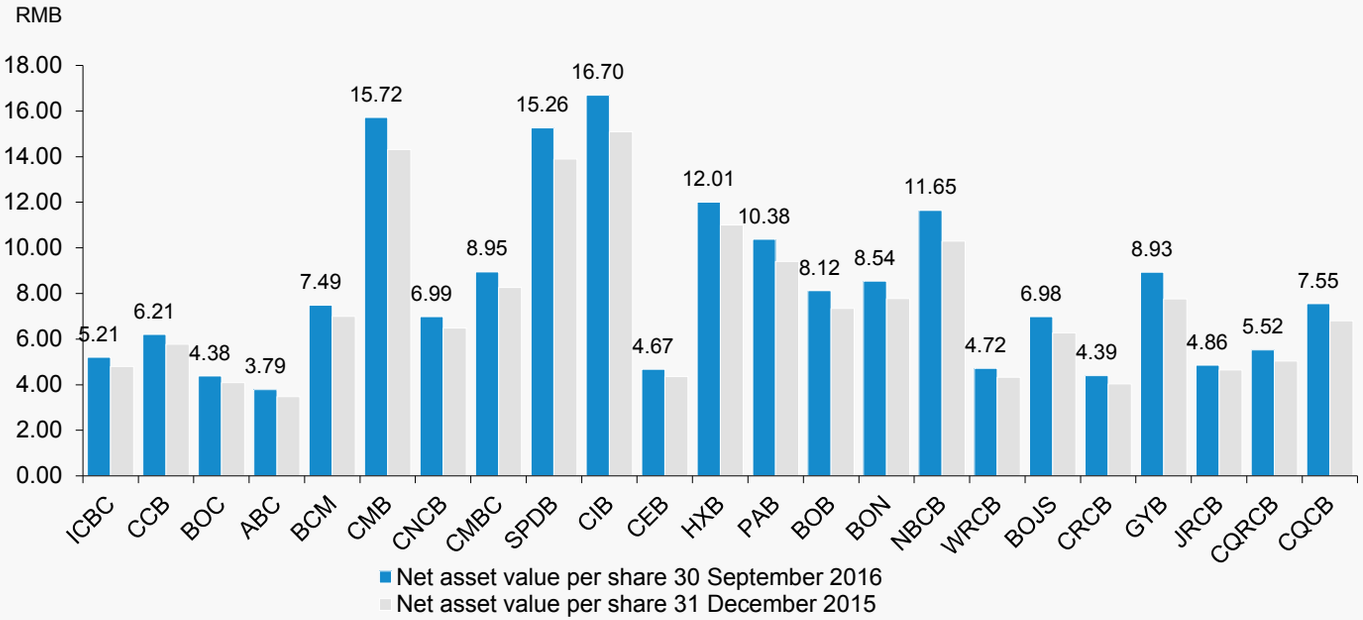


In Q3 2016, most listed banks experienced flat earnings per share (EPS). NBCB's EPS was RMB 0.27 higher than that for the same period in 2015 due to significantly higher income in the current period compared with the same period in the previous year.

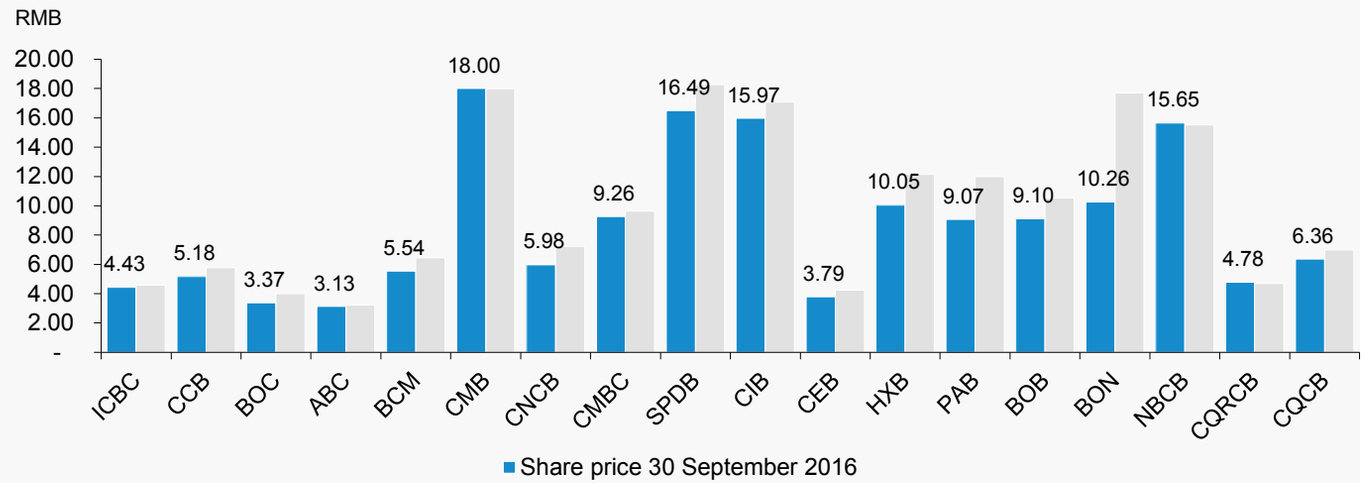
In Q3 2016, the return on weighted average equity (ROE) among listed banks decreased by 1.63% YoY, mainly due to the flat-lining of the increase in net profit as net assets increased in line with the expansion of the banking business. The ROE of GYB and CQCB fell by 3.60% and 3.43% respectively.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; Wind Info; KPMG China research

Profitability — Financial performance indicators (continued)



Generally speaking, the net asset value per share of all listed banks continued its upward trend in Q3 2016. By the end of the third quarter, CIB and CMB enjoyed the highest net asset value per share with RMB 16.70 and RMB 15.72 respectively, representing an increase of 10.60% and 9.85% YoY respectively.



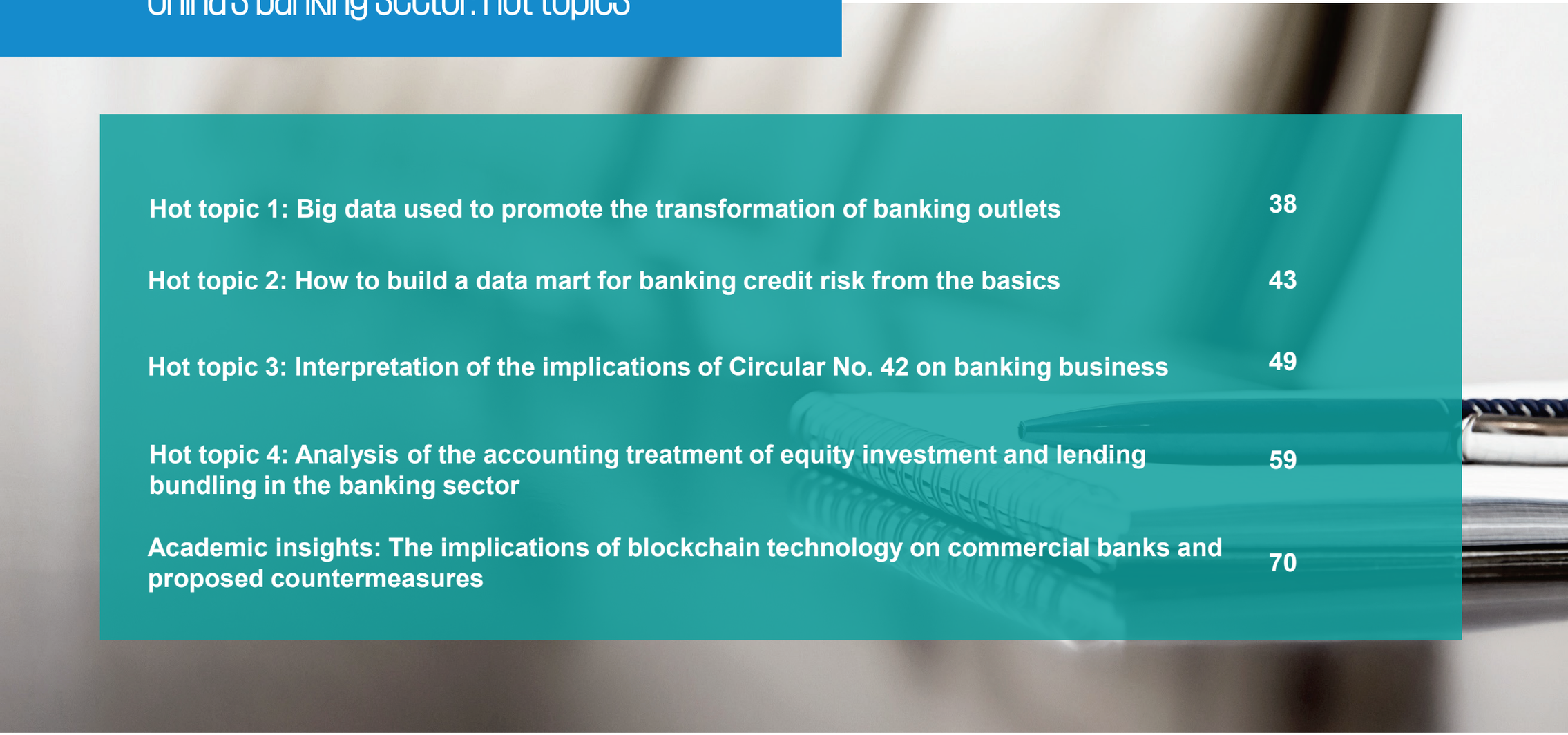
Due to pressure from the economic downturn, competition from the growth of internet finance, and interest rate liberalisation, the share price of most listed banks fell in Q3 2016. The share prices of BON, PAB and HXB recorded the sharpest declines of 42.03%, 24.35% and 17.22% respectively to RMB 10.26, RMB 9.07 and RMB 10.05 respectively.

NOTE: WRCB, BOJ, CRCB, GYB and JRCB did not disclose the relevant data.

Sources: The banks' 2015 annual reports and 2016 Q3 reports; Wind Info; KPMG China research

3 China's banking sector: Hot topics

China's banking sector: Hot topics



Hot topic 1: Big data used to promote the transformation of banking outlets

Background

As the internet grows rapidly and consumer attitudes change, consumer behaviour is also vastly different from what it was. Whether it is to pay water and electricity bills, withdraw or deposit money, or buy wealth management products, banking outlets can no longer monopolise such services. In addition, most people do not like the idea of waiting in line.

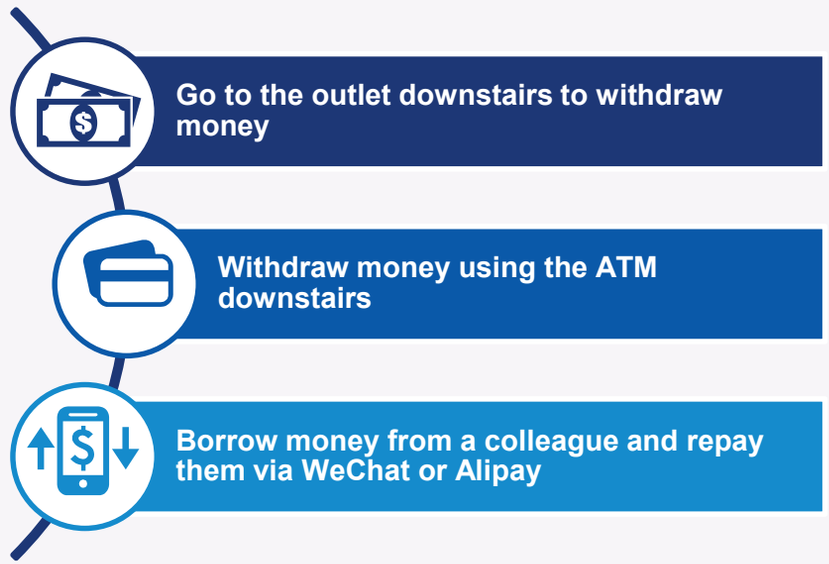
How important a role do bank outlets play in our lives? Some data on profits might give us a clue to the answer. According to *The Asian Banker*, 43% and 32% of bank outlets in emerging markets and developed markets respectively in the Asia Pacific region cannot make a profit. As for China, the growth rate of overall net profits of China's banking sector has dropped to single digits. According to data released by the China Banking Regulatory Commission (CBRC), as at the end of Q4 2015, Chinese commercial banks realised a total net profit of RMB 1.59 trillion, representing an increase of only 2.43%.

Slower earnings growth has led to tremendous cost pressures, which have become the main driving force for the banking sector in the Asia Pacific region to promote the transformation of outlets. With a competitive external environment and high operating costs, many outlets are struggling to make a profit. If expenses on redundant staff do not bring in greater profit in return, they will become a burden on banks. The transformation of outlets is the concept most frequently mentioned by Chinese commercial banks as a response to the problem.

How?

A relatively mature approach to transforming outlets is to combine **'hard transformation' and 'soft transformation'**. It argues that outlets should be transformed to focus on selling services instead of settling transactions. Importance should be attached to improving the services process and customer experience. However, such an approach is rather general, and is not backed up with data. Are outlets to be maintained in their current state, transformed or abolished? If transformation is the answer, which direction should they go? More specific solutions have to be found to answer these questions.

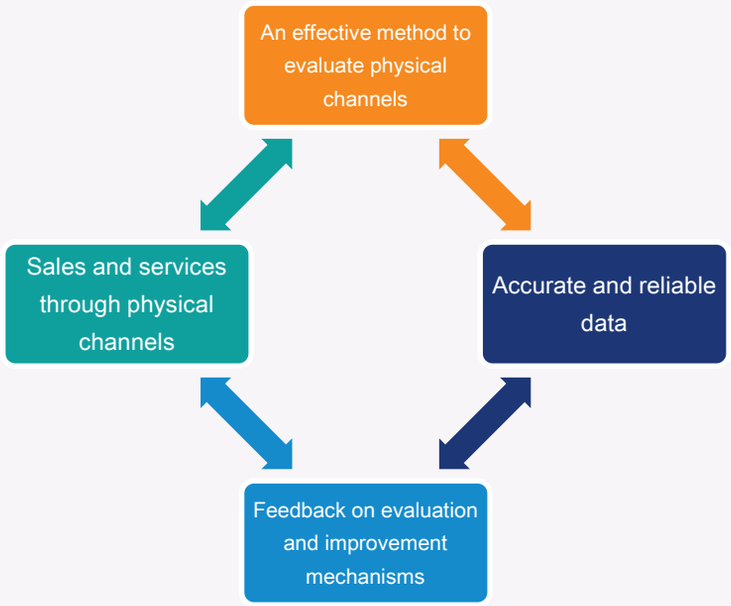
How many times have you gone to the outlet downstairs to wait in the line since e-banking, mobile banking, Alipay and WeChat Wallet have become available? Let us suppose that you are in need of some cash. You usually have the following three choices:



Hot topic 1: Big data used to promote the transformation of banking outlets (continued)

Big data-based outlet evaluation system

Speaking broadly, a comprehensive system for assessing the competitiveness of outlets is still absent in most banks. This could be used to evaluate the level of development of outlets and their relative level among bank outlets, and serve as a guide for the transformation of outlets, marketing positioning and target customers. Based on our analysis of the current status of the transformation of Chinese commercial bank outlets, KPMG China has designed the following closed-loop system to evaluate the physical channels in order to provide systematic and data-based support for the transformation of outlets:



As the chart on the left shows, we can evaluate bank outlets systematically by continuously improving the evaluation of physical channels based on accurate and reliable data. The following four principles have to be observed in evaluating outlets' performance.

Principle	Details
Balance	Importance should be attached to combining financial metrics and non-financial metrics
Orientation	Performance evaluation is conducted for the purpose of guiding assessed outlets in an appropriate and timely manner to comply with the business management strategies and practices of higher-level branches, so that they can continuously adjust their own strategies and practices.
Practicality	Applicability, or operability, should be kept in mind when setting performance indicators.
Representation	Representative core indicators should be adopted to comprehensively evaluate the business operations, management and development of outlets.

The four principles above should be observed in designing evaluation indicators, and their coverage is very important. We believe that in practice, financials, customer growth, business volume, risk control and quality of services are the indicators that best reflect the performance of outlets.

Hot topic 1: Big data used to promote the transformation of banking outlets (continued)

Big data-based outlet evaluation system (continued)

Of course, not all outlets can be lumped together. We classify outlets into flagship outlets, integrated outlets and light outlets, using the outlet gap analysis method. Systems with different weights are established to calculate their competitiveness scores. Outlets of different kinds are diagnosed, provided with guidance and accurately supervised on a case-by-case basis. A multi-angle analysis is performed on the current status of outlets' business operations based on their growth, the distribution of data and the performance evaluation system.

The data we collect focuses on the external environment, business type and customer analysis.

External environment	• What are the surroundings of the outlet? How is the population mobility? How much is the per capita disposable income of the residents within 2km of the outlet? • How is the prospective individual customer base distributed? What corporate customers are included? Individual industrial households, enterprises and institutions? What is the size of the customers? • Does the outlet have a target customer base or specific business and products? Are outlets different from each other?
Business type	• What kinds of business and product transactions does the outlet support? What is the proportion of each kind of business? • How is everyday footfall distributed? And during peak hours? • Are there different kinds of business/service processes for different customers? How can we improve their experience?
Customer analysis	• How are customers grouped? How are customers allocated? • What age groups are customers with different amounts of assets under management (AUM) classified into? How frequently do customers come to the outlet? Are customers loyal to the bank? Do they appreciate the products?

Based on the above data, we should set five targets for transforming outlets: enhance outlets' marketing capabilities, improve customer experience, boost efficiency in processing business transactions, reduce operating costs and strengthen business management. Using the data analysis method mentioned above, we can provide a diagnosis of the outlet, taking into consideration the targets we have set for the transformation. The outlet will receive a reminder on the important business indicators that affect its competitiveness score, its level in terms of type of operation and its ranking in the province. It will be guided to play to its strengths, understand its weaknesses and know where it loses points so that it can come up with measures to improve its situation and have a clear idea about where to direct its efforts. The results of the transformation will be monitored on an ongoing basis.

Hot topic 1: Big data used to promote the transformation of banking outlets(continued)

Outlet evaluation system: Example

Let's take the following two outlets as examples to further illustrate our idea. They are not real and are not representative of actual circumstances.

Case A:
According to our outlet performance evaluation system, outlet A's total score in terms of performance is above average in the region, its score in terms of business volume is below average, but its score in terms of financials is outstanding. Based on our data analysis, we have the following findings:

Surroundings	Business analysis	Distribution of customers
• The outlet is located in a high-end residential area. • The residents are well-educated. • They have a high per capita disposable income. • The outlet has almost no corporate banking business.	• The daily business of the outlet consists of providing information on and selling wealth management products. • Its customers are evenly distributed during peak hours.	• Its customers are evenly distributed in terms of age groups. • It is difficult to acquire new high-value customers. • Compared with other outlets, the contribution made by its existing customers has increased significantly.

Diagnosis

Light outlet

Based on the analysis above, outlet A is defined as a light outlet and the following recommendations for improvement are given:

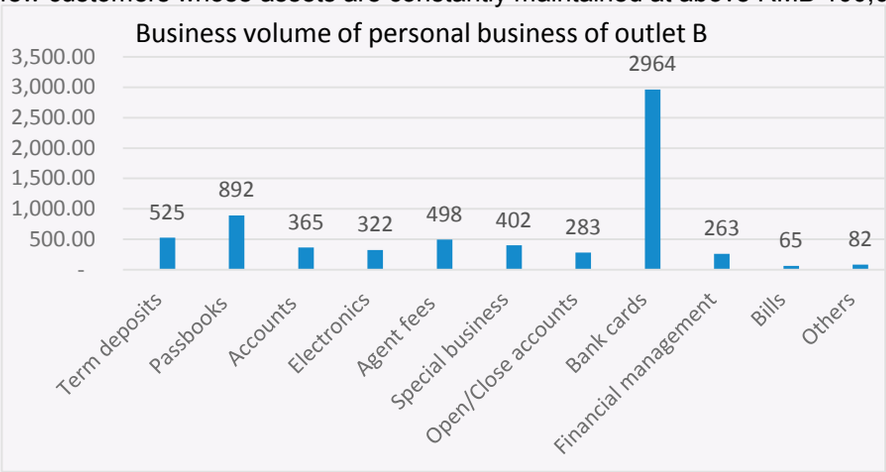
- In designing the layout of an outlet, both privacy and openness have to be taken into account. High-value customers should have private spaces to transact their business, while in open spaces they are provided with consulting services in an easy and enjoyable manner.
- As much additional information as possible about each customer should be collected, such as the size of the family, the nature of their employment, and their parents and children. With such information, marketing can be more targeted.

Hot topic 1: Big data used to promote the transformation of banking outlets(continued)

Outlet evaluation system: Example (continued)

Case B:

If we look at outlet B, its total score in terms of performance is below average in the region and its scores in terms of financials and business volume are also below average. It is located on an ordinary street. There is not much traffic or foot traffic. Depositing and withdrawing money for customers is its main business. Its business volume is evenly distributed during peak hours. Its customers are also evenly distributed in terms of age groups. It has quite a high customer churn, with few customers whose assets are constantly maintained at above RMB 100,000.



This chart shows the distribution of outlet B's personal banking business which is focused on settlement. Its value-adding business, such as wealth management and asset management, is not significant. Its location and customer base mean that there is not much room for improvement in this regard. We believe that outlet B is not well-positioned to create value or make a profit. Abolishing, merging or relocating is the best choice.

Summary:

In coming up with a diagnosis for the outlet, the bank's strategic target, customer service system, performance evaluation system, linked marketing system, industry competition and market share should be taken into consideration. It is not advisable to take a sweeping approach, fitness is the best. In this fast-changing world, if banks are to adapt themselves and meet consumers' needs, they must take the initiative to look for new business models and profit models. To cope with this, continuous adaptation is always necessary.

Hot topic 2: How to build a data mart for banking credit risk from the basics

Introduction to risk management

Risk management is vital to the operation and management of commercial banks and, at the same time, is easily compromised. In the course of deepening market-oriented reform, the presence of a premature risk management system across China's banking sector has become the biggest threat to the stability and prosperity of the sector, and even China's financial system as a whole. The ability of banks to scientifically and effectively manage and prevent various risks is directly tied to their security and development. **The management of credit risk**, which tops the three major risks of the banking sector, is evidently of vital importance to banks.

In order to effectively execute credit risk management, banks need to put in place sound credit risk management policies and effective supervision, and raise the awareness of risk management to the point that it takes root in banks' corporate culture. However, this is not enough. Banks also need to follow the sweeping trend to build and improve their information system and empower their data governance and application capabilities so as to integrate all business activities under the information system and provide the indicator data needed for credit risk management.

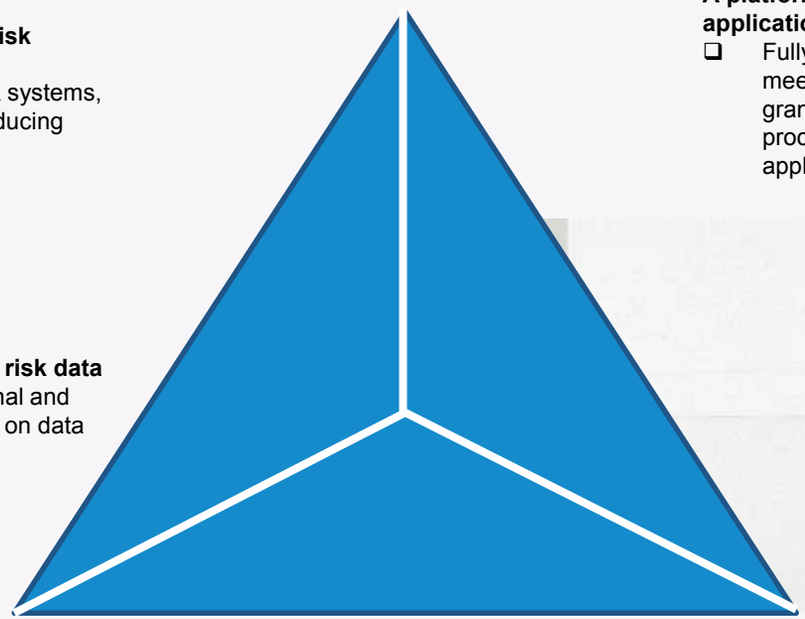
Under such circumstances, it is imperative that commercial banks build a data mart for credit risk to facilitate their credit risk management. As shown below, such a data mart performs various functions by providing:

A platform for sharing and exchanging data for risk indicators

- ❑ Sharing and exchanging data from various risk systems, eliminating information-isolated islands and reducing wasted use of system resources

A platform for collecting, integrating and storing risk data

- ❑ Adopting a unified approach to collecting internal and external credit risk data, managing data based on data types and feeding reliable data to risk systems



A platform for fully supporting various risk management applications

- ❑ Fully supporting risk management applications and meeting the needs of all risk systems with different data granularity and access frequency, and handling and processing indicators shared by various credit risk applications in a unified manner to improve data quality

Hot topic 2: How to build a data mart for banking credit risk from the basics (continued)

Significance of building a risk data mart

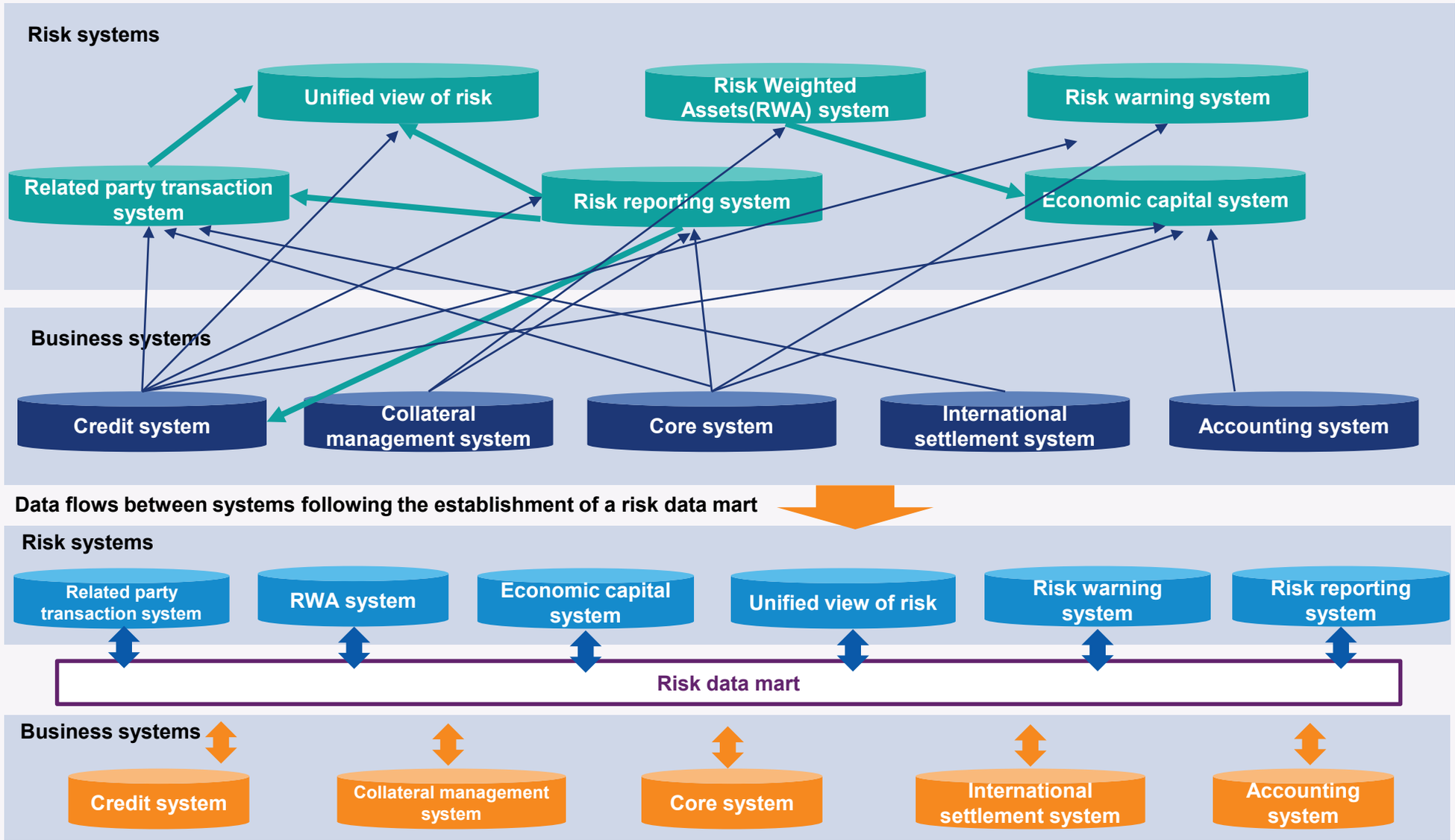
Given the complexity of bank systems, massive data, and a large number of statistical standards and dimensions, it may be a good choice to use data warehousing technology in developing banks' decision analysis system. Currently, most banks have their own data warehouse or a similar system. However, as most of the banks with data warehouses rely on data provided by such warehouses to directly feed their risk management systems, they are exposed to tremendous risk.

- First, the subject-oriented nature of data warehousing can result in highly dispersed data, making it difficult for users with inadequate knowledge of data warehousing to understand and use. The structure of a risk data mart, however, can reorganise dispersed data into understandable and easy-to-use data that is oriented to risk-prone business lines.
- Second, since the back-end use of data mining and analytics will rely on risk data that is sporadically stored in different data sources, users need to spend considerable time and effort to understand the meaning of data and establish correlations between various data sources and sheets. This process is further complicated by inconsistent data quality and a lack of a subject-specific and unified approach to data cleansing, supply of missing data and data integration to ensure data quality.
- Third, repetitive computing on risk indicators by various risk systems leads to wasted use of system resources. The same data is collected and used by different departments over and over again, although in different forms. Due to different statistical standards and the absence of unified management, data discrepancies reflected on various reports are unable to be accounted for.
- Finally, each risk management system has its own detailed data requests. Although they are massive, many of them are the same. Significant resources and time will be wasted if each back-end application system is to store and process such requests separately. Allowing a risk data mart to conduct unified processing can greatly reduce storage space and processing time.

In light of the above problems, it is of great importance to build and insert a risk data mart between the back-end use of data mining and analytics and data warehouses. The data mart will provide business-oriented risk data, sort out logical relations among various data to facilitate understanding, and offer unified storage and management to allow back-end efforts to focus on the processing of business logic.

Hot topic 2: How to build a data mart for banking credit risk from the basics (continued)

Significance of building a risk data mart (continued)



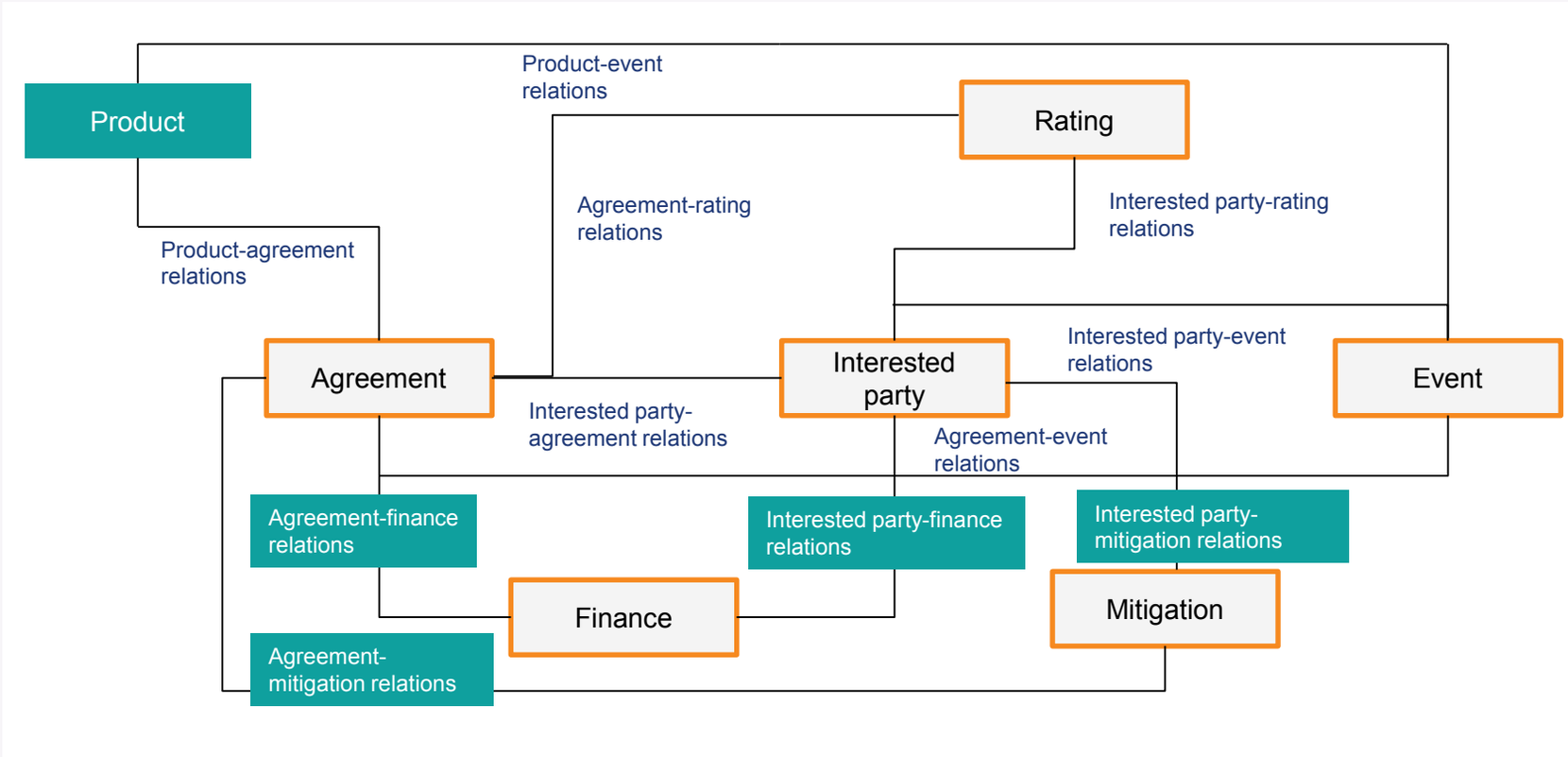
Hot topic 2: How to build a data mart for banking credit risk from the basics (continued)

Design of a basic data model for a credit risk data mart

A credit risk data mart is built within a data warehouse at the corporate level. As a subordinate data mart, it draws data from a corporate data warehouse (it can also be built without an existing data warehouse and will extract data from various source systems). It is designed to leverage data used for risk measurement to specifically serve banks' various risk management needs with powerful access capabilities.

A credit risk data mart needs to be built on a rational model with sufficient historical data stored to meet the needs of risk management programmes for searching and extracting credit risk data. The model for a credit risk data mart can be further divided into two models: one for basic data and one for application data. Due to space limitations, only the design of a basic data model will be discussed here.

The basic data model for a credit risk data mart adopts a subject-specific and model-based approach to storing various business data. There are seven subjects that give rise to seven subject models:



Hot topic 2: How to build a data mart for banking credit risk from the basics (continued)

Design of a basic data model for a credit risk data mart (continued)

Interested party

- 'Interested party' refers to any individuals or organisations in which banks are interested. They purchase and accept banks' products and services through various means to meet their financial needs. They may also be individuals or organisations with which banks have other business, or in which banks are interested due to banks' marketing, management and other needs.
- The interested party model for a credit risk data mart mainly covers: basic information of interested parties (the main sheet of related parties), information of corporate interested parties (including corporate customers, factoring agents and third-party appraisers), information of retail interested parties (including individual customers, business owners and micro-loan applicants), information of internal institutions (internal institutions within banks under a flat organisational structure, internal institutions under various systems, superior and subordinate reporting institutions, etc.), financial information of corporate interested parties (data on financial indicators, definitions of financial indicators, financial statements, etc.), relationships among interested parties (relationship history, history of agreement-interested party relations, etc.), system users (teller information, information of credit system users), etc.

Agreement

- 'Agreement' refers to a covenant entered into between interested parties for certain products or services. Under the agreement model, the contractual relationship between banks and their customers is reflected in the history of interested party-agreement relations, and changes in various agreements are recorded historically.
- The agreement model for a credit risk data mart mainly covers: corporate agreements (corporate lending contracts and agreements on discounts, interbank discounts, the opening and acceptance of acceptance bills, L/C opening and acceptance, bank acceptance, factoring, entrusted loans, supply chain guarantees, buy-back, interbank borrowing and lending, marketable securities, corporate credit lending, etc.), retail agreements (retail credit contracts, retail credit lending agreements, the master sheet of credit lines, information of retail lending guarantors), credit card agreements (a summary of credit card accounts and credit cards), examination and approval of corporate credit (applications for corporate credit, credit line information, opinions on credit examination and approval, information of previous procedures, bulk credit relations, etc.), examination and approval of retail credit (retail lending programmes, the master sheet of application, applications, etc.), examination and approval of microloans (applications for microloans, discounted microloans, bank acceptance credit, etc.), and more.

Rating

- In a general sense, 'rating' refers to an overall appraisal of an entity's ability and willingness to perform contractual obligations and economic commitments.
- The rating model for a credit risk data mart mainly covers: public rating (history of interested parties' scores and rating), national rating (national rating information), rating of corporate customers (the sheet that includes customer rating results, rating models, rating tasks, default probability based on customer credit rating, etc.), corporate customer debt rating (rating results of a single debt, rating results of bulk debt), retail pools (Lose Given Default(LGD) pool results, asset pool results), bond rating (the bond rating sheet), etc.

Mitigation

- 'Mitigation' refers to the process in which banks transfer or reduce risk loss frequency and impacts through qualified pledges and collaterals, net settlement, guarantees, credit derivatives and other means.
- The mitigation model for a credit risk data mart mainly covers: information of risk mitigation products, history of settlement asset relations, information of security deposits for corporate loans, insurance information of collaterals, history of asset valuation, lists of deposit slips, information of security deposits for retail loans, etc.

Hot topic 2: How to build a data mart for banking credit risk from the basics (continued)

Design of a basic data model for a credit risk data mart (continued)

Product

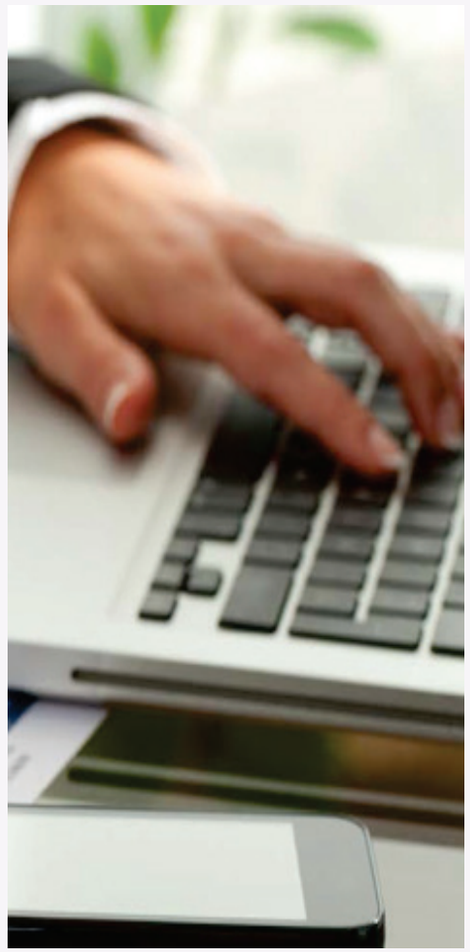
- 'Product' refers to financial services that can create value for banks and can be sold on a standalone basis, including financial services that banks provide for their customers and financial services under capital market transactions that banks enter into.
- The product model for a credit risk data mart mainly covers: information of loan products, product categories, product types, correlations between products and product types, etc.

Event

- 'Event' refers to business interactions between participants and banks, as well as banks' internal interactions. It includes detailed data on behaviours and transactions, including deposits, withdrawals, payments, annual fees for credit/debit cards, interest and expenses, complaints, searches, online transactions, etc.
- The event model for a credit risk data mart mainly covers: accounting events, transaction events on general ledgers, schedules of repayments from corporate borrowers, history of repayment plans, schedules of repayments from retail borrowers, schedules of credit card repayments, etc.

Finance

- 'Finance' is used to record information pertaining to banks' internal financial management and risk management, and analyse and evaluate financial information to facilitate the understanding of an enterprise's past and current operating performance and financial position, as well as any changes to them.
- The finance model for a credit risk data mart mainly covers: general ledger accounting calibres, the chart of accounts in general ledgers, product-related accounts and their relations with corporate entities, a summary of general ledgers, a summary of general ledgers following carry-forward treatment, relations between provisions and debt-related items, etc.



Conclusions

The seven subjects provided above as the foundation for constructing the basic data model for a credit risk data mart may need to be specified in further detail in accordance with a bank's specific needs and business model. It takes long-term and systematic efforts to build a risk data mart. Changes in the regulatory environment and requirements, as well as industry users' deepening understanding of the systems and their applications can set a higher standard for such systems, requiring constant adjustments and improvements. Only by designing and developing a model that has practical value for banks and performing data mining based on such a model can the advantage of a data mart be fully harnessed and ultimately bring tangible benefits to banks.

Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business

Background

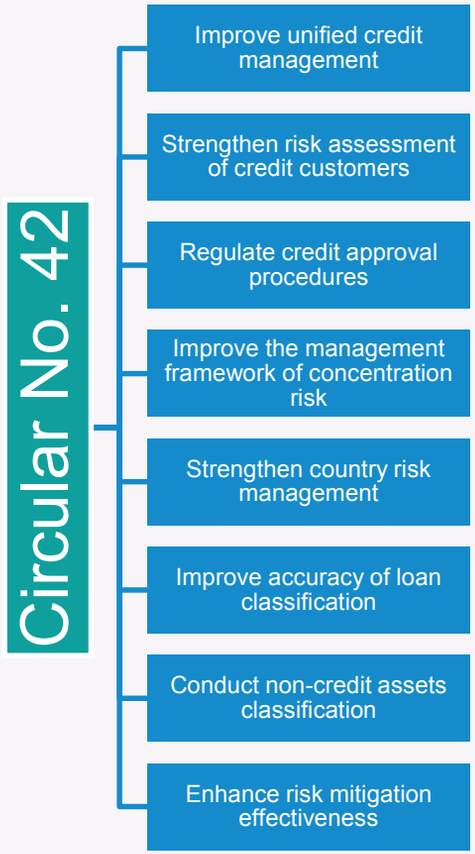
In light of the current economic downturn, rapidly rising credit risk and higher NPLs in the banking sector, new requirements on credit risk management and control should be established. In mid-September 2016, the CBRC issued the *Notice on Further Strengthening Credit Risk Management* (Yin Jian Fa [2016] No. 42, hereinafter referred to as 'Circular No. 42'), which requires the banks to enhance credit risk management from eight aspects, including improving unified credit management and strengthening risk assessment of credit customers, and conducting system review and risk inspections. Looking back upon the reform on regulation policies, Circular No. 42 is consistent with Circulars No. 127 and No. 27 in terms of the provisions on unified credit management, 'penetrating' management and comprehensive risk management. It is an extension and elaboration of the regulation thinking under the current economic situation, and attempts to prevent credit risk from transferring to 'off-balance sheet' and non-credit activities. In addition, Circular No. 42 fully reflects the requirements set out in Circular No. 44, which defines the compatibility principle and full coverage principle of comprehensive risk management, and pushes comprehensive risk management to cover non-traditional businesses. This requires that timely adjustments be made based on changes in the operating environment of banks, risk alerts, and further management and control.

Regulation policy	Interpretation
In May 2014, the PBOC, CBRC, CSRC, CIRC and SAFE jointly issued the *Notice on Regulating the Interbank Business of Financial Institutions* (Yin Fa [2014] No. 127, hereinafter referred to as 'Circular No. 127')	❖ **Circular No. 127 has clarified the types and scope of interbank business,** and stipulated that special purpose vehicles (SPVs) include, but are not limited to, commercial bank financial products, trust investment plans, securities investment funds, asset management plans of the securities companies, asset management plans of the fund management companies and their subsidiaries, as well as asset management products of insurance asset management institutions. ❖ **It has also clarified the regulation framework of interbank business** and required that unified credit management policies for interbank business within the institution should be established and improved, and interbank business should be incorporated into the **unified credit system of the whole institution**. In addition, **in accordance with the principle of 'substances outweighing forms'**, financial institutions should measure risks and accrue the corresponding capital and provisions **based on the nature of the underlying assets invested**.
In February 2016, *Opinions of the General Office of the China Banking Regulatory Commission on Prevention and Resolution of Financial Risks and Upholding of the Bottom Line of Risk Control* was released (Yin Jian Ban Fa [2016] No. 27, hereinafter referred to as 'Circular No. 27')	❖ Banking financial institutions should improve their comprehensive risk management framework and **incorporate non-credit business and off-balance sheet business into the comprehensive risk management system so that they are under unified credit management along with the on-balance sheet business**, and establish an asset quality monitoring system which includes all types of assets. ❖ **Banking financial institutions should continue to strengthen credit risk prevention and control from the aspects of key customers, industries and regions**, and implement the five-tier classification of credit assets, and enhance capabilities of risk warning and elimination. ❖ **They should also strengthen the risk regulation of non-traditional business**, including: ➢ Cross-industry, cross-border and cross-market businesses to prevent 'cross infection' risk ➢ Equity investments held on behalf of customers, bonds and foreign currencies to reinforce market risk management ➢ Wealth management business should be compliant with the 'penetrating principle' and its risk management should be included in the comprehensive risk management system. ❖ They should continue to strengthen capital regulation and constantly enhance their risk offsetting capabilities. They should **make sufficient provision for non-traditional business with credit nature and emerging business in accordance with the 'penetrating principle' and strengthen provision management of country risks.**
In September 2016, the CBRC issued the *Notice on Further Strengthening Credit Risk Management* (Yin Jian Fa [2016] No. 42, hereinafter referred to as 'Circular No. 42')	❖ Circular No. 42 puts forward eight requirements in respect of strengthening credit risk management.
In September 2016, the CBRC issued the *Notice on Further Strengthening Credit Risk Management* (Yin Jian Fa [2016] No. 42, hereinafter referred to as 'Circular No. 42')	❖ The comprehensive risk management should adhere to four principles, namely compatibility, full coverage, independence and effectiveness principles. ➢ Compatibility principle: The comprehensive risk management system should be **compatible with the relevant risk profile and systemic significance, and should be adjusted in accordance with environmental changes.** ➢ Full coverage principle: Comprehensive risk management should cover each and every business line, including **renminbi and foreign currencies, on-balance sheet and off-balance sheet, and domestic and overseas businesses**; it should cover all branches, subsidiaries, departments, job positions and staff, as well as all types of risks and the mutual impact between different risks; and it should run through all management phases of decision-making, implementation and supervision.

Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business (continued)

Main content

Circular No. 42 requires all banks to strengthen credit risk management, and conduct system review and risk inspection from eight aspects, including improving the unified credit management and strengthening risk assessment of credit customers. Its core content includes five aspects: 1) extension of unified credit management to cover three aspects, 2) prospective identification of customer risks, 3) comprehensive management of credit risk limits, 4) classification of non-credit assets and provision for impairment or estimated liabilities, and 5) enhancement of risk mitigation effectiveness.



Core content:

Firstly, Circular No. 42 has extended the coverage of unified credit management to the extent that:
1. Credit business has been fully covered, which includes traditional credit assets, investment assets, interbank business and off-balance sheet business whose credit risk is actually borne by banking financial institutions.
2. The consolidated institutions of the banking group have been fully covered, including the total credit of banking financial institutions and their consolidated institutions.
3. Affiliates of customers have ben fully covered and under 'penetrating management'; that is to manage customers with economic correlation with reference to the treatment of group customers during the course of credit granting and concentration management, and match the SPV investment with the ultimate debtor according to the 'penetrating principle'.

Secondly, Circular No. 42 calls for the implementation of information mining from various dimensions based on the integration and sharing of internal and external customer information to realise prospective identification, prevention and control of customer risks.

Thirdly, Circular No. 42 has clarified the indicator system, measurement method, threshold, and management and control process of the comprehensive credit limit.
1. The indicator system, which includes customers, industries, areas, currencies, collateral, markets, and countries/regions based on the source of risk; and includes credit, investment, derivative trading, acceptance and guarantee based on the source of business
2. The measurement method, which measures the total credit at the level of the group's consolidated statements (namely the banking financial institutions and their consolidated institutions), and matches the SPV investment with the ultimate debtor according to the 'penetrating principle', rather than implementing credit management based on the issuer of the SPV or the SPV itself
3. The threshold of limit indicator, which has clarified larger risk exposure with reference to the relevant regulation requirements. In addition, financial institutions also have to comply with the requirements on interbank debt concentration and country risk provision ratio
4. The process of management and control, which has clarified the management framework for concentration risk and country risk to better connect to Circular No. 44.

Fourthly, Circular No. 42 has strictly regulated the quantitative criteria and approval levels regarding the transfer of NPLs into non-NPLs. At the same time, it requires that on-balance sheet and off-balance sheet business with credit risk should go through asset classification and provision for impairment or estimated liabilities should be made. Though the coverage of provision for impairment or estimated liabilities has been extended, **the expanded scope of measurement has a limited impact on the profits and capital level of financial institutions**, given that there are few (almost no) defaults or loss events in respect of non-credit assets.

Fifthly, Circular No. 42 strives to enhance risk mitigation effectiveness through the establishment, valuation and subsequent management of collateral to counter major issues that appear in the course of collateral management, including loose access control, overvaluation, lack of independence during valuation, and collateral being misappropriated or damaged.

Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business

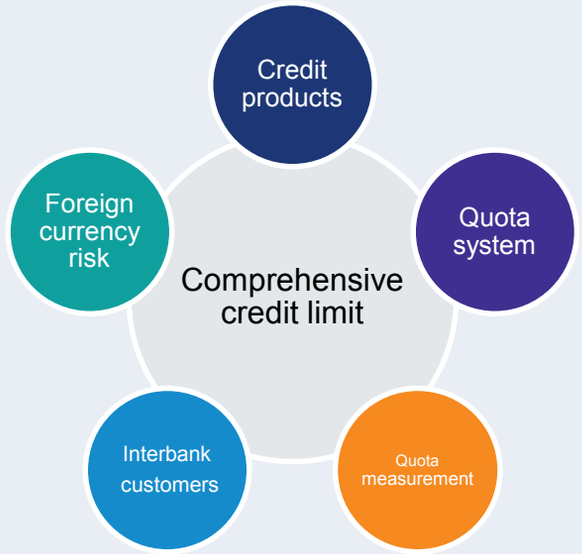
Interpretation of Circular No. 42 (continued)

Improve unified credit management

Original text:
Banking financial institutions should incorporate **loans (including trade finance), bill acceptance and discounting, overdrafts, bond investments, SPV investments, opening of letters of credit, factoring, guarantees, loan commitments, and other businesses whose credit risks are actually borne by banking financial intuitions** into unified credit management where SPV investments should be matched with the ultimate debtor based on the 'penetrating principle'. Banking financial institutions should also determine the comprehensive credit line for a single corporate customer, group customer, as well as different regions and industries based on the fully covered credit businesses. The comprehensive credit limit should include the total credit of banking financial institutions and their consolidated institutions. In addition, banking financial institutions should incorporate interbank customers into the scope of unified credit granting, set a reasonable risk limit for interbank customers and monitor their overall risk exposure. They should also consider the impact of changes in exchange rate on risk exposure when determining the credit limit of customers, with larger credit granted in foreign currencies.

Interpretation:
Circular No. 42 puts forward the key points of unified credit management from five aspects.

- **Firstly, it has broadened the types of credit products** and included investment assets, interbank business and off-balance sheet business whose credit risk is actually borne by banking financial institutions into unified credit management. According to the statistics on asset structure of listed banks, as at the end of September 2016, the share of traditional credit assets, securities investments and interbank assets in the banks' balance sheet assets was 49.68%, 28.17% and 6.34% respectively. Therefore, the unified credit management required by Circular No. 42 will cover over 80% of the on-balance sheet assets.
- **Secondly, it has clarified the system of comprehensive credit limit**, which includes single corporate customers, group customers, and different regions and industries.
- **Thirdly, it has clarified the measurement method of comprehensive credit limit indicators**, which measure the total credit at the level of the group's consolidated statements (namely the banking financial institutions and their consolidated institutions), and matches the SPV investment with the ultimate debtor according to the 'penetrating principle', rather than implementing credit management based on the issuer of the SPV or the SPV itself.
- **Fourthly, it has incorporated interbank customers into the scope of unified credit granting,** which is an extension of Circular No. 127. However, Circular No. 42 contains no additional concentration requirements.
- **Lastly, it has warned of the foreign currency risk of credit granted in a foreign currency**. Given the recent fluctuation of the RMB exchange rate, market risks will affect credit management. In the case of credit limits set in RMB, RMB depreciation will result in the foreign currency transactions of certain customers exceeding the credit limit, which in turn will require additional collateral or affect business handling; in the case of credit limits set in a foreign currency, if the debtors have currency mismatch (e.g. operating cash flows are mainly denominated in RMB while loans are denominated in USD), though exchange rate fluctuation does not affect quota occupation, attention should be paid to the debtors' currency mismatch risk and increased pressure of debt repayment.



Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business (continued)

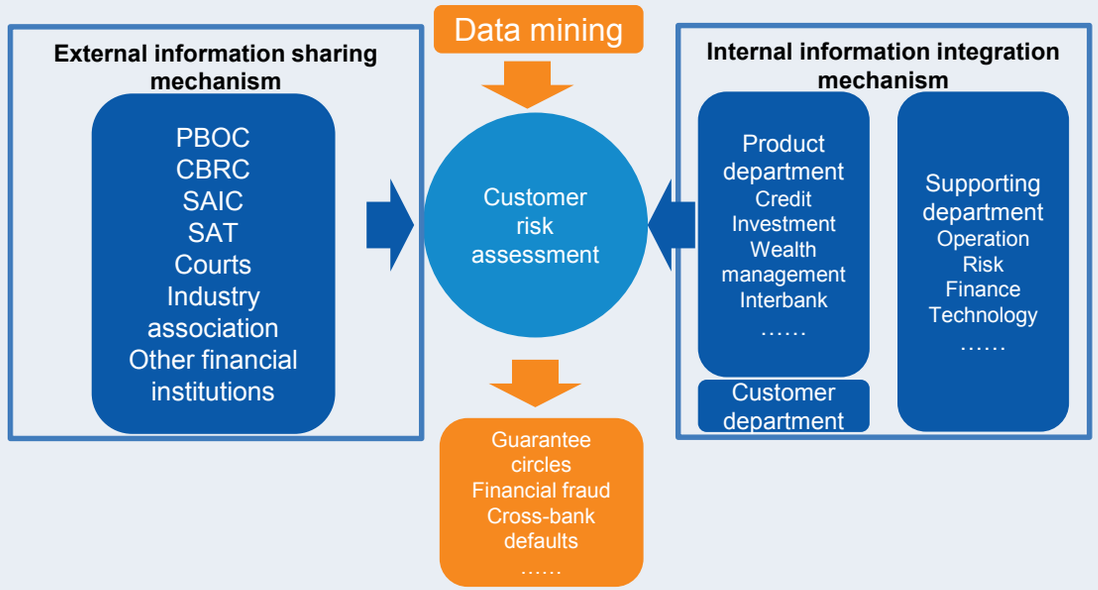
Interpretation of Circular No. 42 (continued)

Strengthen risk assessment of credit customers

Original text:
Banking financial institutions should strengthen the internal sharing of customer risk information, explore the implementation of unified management of customer risk information and conduct integrated analysis regarding customers' various credit risk information. They should accelerate the establishment of an information sharing mechanism across the sector, collect customers' non-traditional financing information from various channels, and enhance their capability to monitor and assess the total liability of credit customers. Before granting credit to new customers or increasing credit to existing customers, banking financial institutions should check internal and external sharing information to understand the total liability of the customers to determine whether the customers have been granted excessive credit or involved in a guarantee circle, financial fraud or cross-bank defaults to effectively warn of, prevent and control risks.

Interpretation:
Circular No. 42 offers suggestions for risk prevention and control from aspects such as external and internal information integration channels, monitoring methods and key risk areas.

- **First, financial institutions should strengthen the internal information integration mechanism**. They should break down barriers from within and integrate all customer information form the customer department, product department and support department to create multi-dimensional customer information.
- **Second, financial institutions should realise external information sharing**. Available information sources include information sent back from regulators and external information inquiries.
- **Third, financial institutions should establish effective prospective risk monitoring**. They should make use of customer information from various channels for information processing and risk modelling, and conduct prospective risk warning and prevention based on big data.
- **Fourth, financial institutions should identify key credit risk areas**, which include risk factors such as guarantee circles, financial fraud and cross-bank defaults.



Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business (continued)

Interpretation of Circular No. 42 (continued)

Regulate credit approval procedures

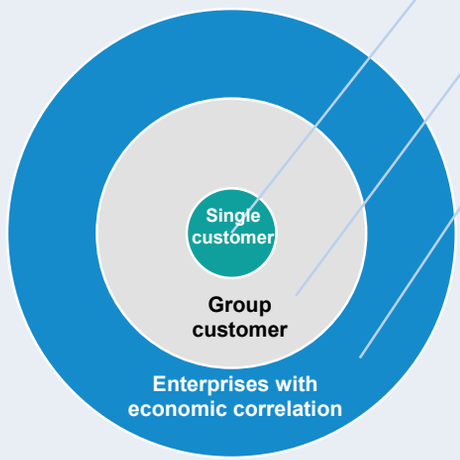
Original text:

Banking financial institutions should clarify the approval criteria, policies and procedures regarding the increase of credit lines, extension of existing credit and roll financing, and should clarify approval authority at different levels based on the scale and complexity of risk exposure. Where the total credit granted to a group customer exceeds 10% of the financial institution's net capital or the total credit granted to a single customer exceeds 5% of the financial institution's net capital, the credit should be considered as large risk exposure and should be determined and approved by the board of directors or senior management. Banking financial institutions can develop their own management policy regarding large risk exposure based on their own risk management needs, which, however, should meet the above minimum requirements. When calculating large risk exposure, customers with economic correlation should be under concentration management and their credit should be determined with reference to the treatment of group customers. 'Economic correlation' refers to a situation where the bankruptcy of one party may have a significant adverse impact on the other party's solvency, including but not limited to the situations where one party provides the other party with a large amount of guarantee; where one party acts as the purchaser of a vast majority of products from the other party and cannot easily be replaced; and where the cash flows of one party primarily originated from transactions with the other party.

Interpretation:

In addition to the clarification of unified credit products, limit indicator systems and indicator measurement, Circular No. 42 further clarifies the regulation on large risk exposure.

- **First, it sets out the minimum requirement of large risk exposure,** where the total credit granted to a group customer exceeds 10% of the financial institution's net capital or the total credit to a single customer exceeds 5% of the financial institution's net capital.
- **Second, it puts forward the concept of 'economic correlation'** and requires that customers with economic correlation should be under concentration management and their credit should be granted with reference to the treatment of group customers. According to the concept of economic correlation and the requirements on credit granting and concentration management, financial institutions should increase their efforts in identifying enterprises with economic correlation, and enhance the collection of consolidated data and model optimisation in areas such as credit limit setting, customer assessment and early warning.



Where the total credit granted to a single customer exceeds 5% of the financial institution's net capital, the credit should be considered as larger risk exposure.

Where the total credit granted to a group customer exceeds 10% of the financial institution's net capital, the credit should be considered as larger risk exposure.

Customers with economic correlation should be under concentration management and their credit should be granted with reference to the treatment of group customers.

Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business (continued)

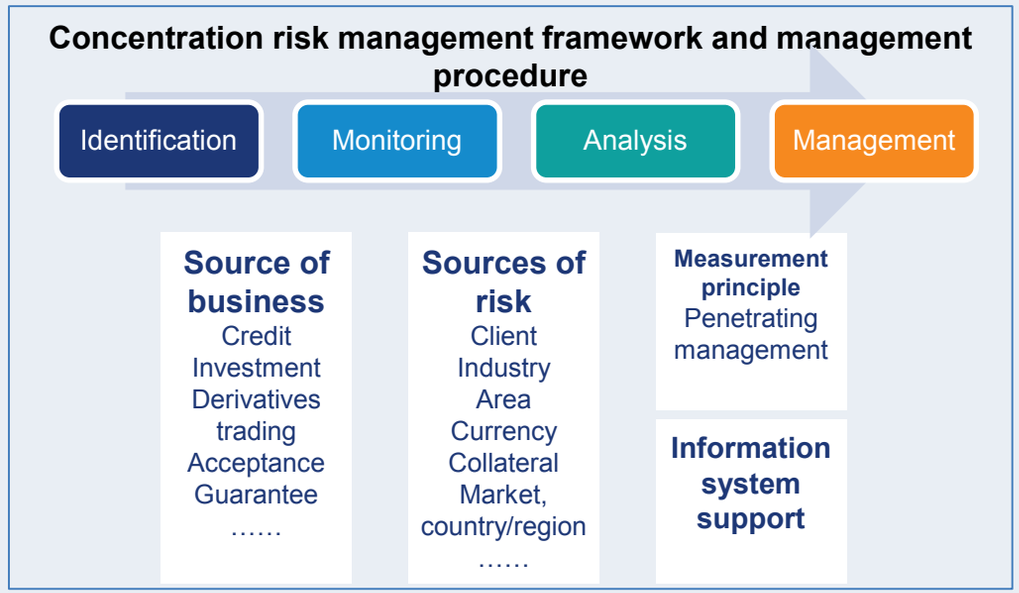
Interpretation of Circular No. 42 (continued)

Improve the management framework of concentration risk

Original text:
Banking financial institutions should establish concentration risk management frameworks which cover various sources of risk, such as customers, industries, areas, currencies, collateral, markets and countries/regions; which include all on-balance sheet and off-balance sheet exposures such as credit, investment, derivatives trading, acceptance and guarantee; and which can fully reflect the 'penetrating principle'. In addition, banking financial institutions should establish information systems for concentration risk management that can meet the needs of 'penetrating' management, and identify, monitor, analyse and manage concentration risk from multi-dimensions and set corresponding limits.

Interpretation:
Circular No. 42 clarifies the concentration risk management framework from the aspects of management procedure, business scope and sources of risk.

- **First, it clarifies the concentration risk management procedure**, namely identification, monitoring, analysis and management of concentration risk.
- **Second, it clarifies the sources of concentration risk**, namely customers, industries, areas, currencies, collateral, markets, and countries/regions. Financial institutions should set corresponding limits regarding different sources of risk.
- **Third, it determines the scope of business with concentration risk**, namely all on-balance sheet and off-balance sheet risk exposures such as credit, investment, derivatives trading, acceptance, and guarantee. Financial institutions should allocate the concentration limits of the above items to different lines of business, consolidate, monitor relevant data and make dynamic adjustment. Given the above provision and the requirement of matching relevant business with the ultimate borrower, Circular No. 42 presents a greater challenge to the current management level and system support of financial institutions.



Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business (continued)

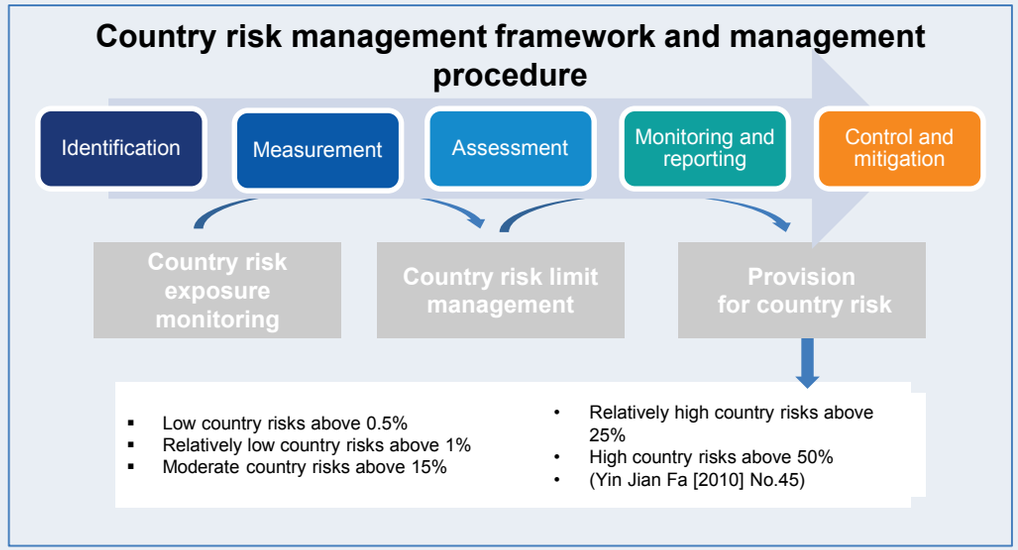
Interpretation of Circular No. 42 (continued)

Strengthen country risk management

Original text:
Banking financial institutions should establish and improve their policies and processes which should be consistent with their systemic importance, risk profile and risk preference. They should also efficiently identify, measure, assess, monitor and report, and control and mitigate the country risk and transfer risk that involves the banking groups. In addition, banking financial institutions should strictly monitor country risk exposure in a timely, accurate and comprehensive manner, and strictly implement country risk limit management. They should develop written policies of country risk provision, make sufficient provision for country risks and submit relevant reports to the CBRC. For banks without enough provision for country risk, they should take actions to increase provision or reduce country risk exposure.

Interpretation:
Circular No. 42 clarifies the country risk management framework from aspects of management procedure, country risk exposure monitoring, limit management and provision.

- **First, it clarifies the country risk management procedure**, namely identification, measurement, assessment, monitoring and reporting, control and mitigation.
- **Second, it requires financial institutions to monitor country risk exposure, manage risk limits and make provisions for country risks**. The ratio of provisions for country risks should be determined based on the level of country risks, ranging from 0.5% to 50%. (*Guidelines for Banking Financial Institutions on the Management of Country-related Risks* (Yin Jian Fa [2014] No. 45)).



Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business (continued)

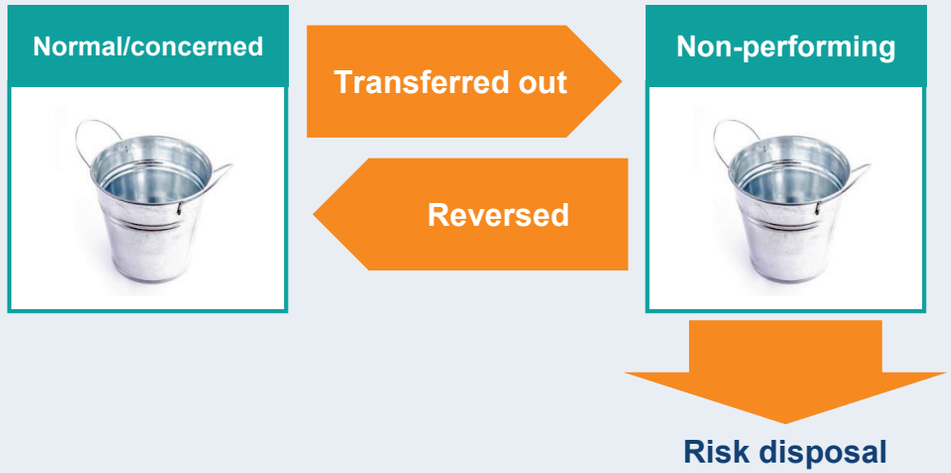
Interpretation of Circular No. 42 (continued)

Improve accuracy of loan classification

Original text:
Banking financial institutions should strengthen loan classification management, carry out loan classification policies on a regular basis and conduct an internal audit on the implementation of procedures. Institutions which falsify loan classifications to conceal the actual loan quality should be held accountable and punished more strictly. The institutions should work out clear criteria and procedures for raising loan classification and should be prudent in raising NPLs to performing loans. Only when all the overdue principal, interest and other outstanding balance have been repaid and the remaining principal and interest are at least repaid regularly in the subsequent two repayment periods or within six months (determined by the longer period) and are expected to be continuously repaid based on contract terms in the future, can the NPLs be classified as performing loans. Raising loan classification should be approved by headquarters or tier 1 branches authorised by the headquarters. The financial institutions can make specific criteria and procedures for raising the NPLs to performing loans based on their actual situations, but should at least meet the requirements mentioned above. Regulatory institutions at all levels should strengthen supervision on asset transfer practices by the financial institutions. Assets which are transferred out through channels but whose credit risk still remains in the original institution should be classified based on their original risk exposure.

Interpretation:
Circular No. 42 provides strict management and control processes for transferring NPLs into performing loans, and strengthens supervision on 'transferring assets out of balance sheet'.

- **Stipulates clear quantification standards.** Only when all the overdue principal, interest and other outstanding balance have been repaid and the remaining principal and interest are repaid regularly in the subsequent two repayment periods or within six months (determined by the longer period) and are expected to be continuously repaid based on contract terms in the future, can the NPLs be classified as performing loans.
- **Identifies authorities responsible for approval of raising NPL classification.** Raising loan classification should be approved by headquarters or tier 1 branches authorised by the headquarters.
- **Strengthens supervision of 'transferring assets out of balance sheet'.** Assets which are transferred out through channels but whose credit risk still remains in the original institution should be classified based on their original risk exposure.



Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business (continued)

Interpretation of Circular No. 42 (continued)

Conduct non-credit assets classification

Original text:
Banking financial institutions should further improve rules and measures based on related regulations on loan classification to clarify criteria and processes for the classification of various on-balance sheet and off-balance sheet non-credit assets, so as to reflect risk exposures of the non-credit assets on a true, accurate and dynamic basis. On-balance sheet and off-balance sheet business of which the financial institutions undertake the actual credit risks should in principle be classified. Adhering to the principle of focusing on substance rather than formality in classifying non-credit assets, the institutions should conduct 'penetrating' management and determine risk categories reasonably based on the risk exposure of underlying assets. The institutions should also enhance their risk offsetting capabilities through impairment provisions or estimated liabilities based on risk categories and the nature of non-credit assets.

Interpretation:
Circular No. 42 stipulates that financial institutions should conduct asset classification for on-balance sheet and off-balance sheet businesses which undertake credit risks and accrue impairment provisions or estimated liabilities to enhance risk offsetting capabilities.

- **First, the coverage of impairment provisions or estimated liabilities is expanded.** Currently, impairment provisions accrued for credit risks mainly cover traditional loans and bond investment facing credit risks. Circular No. 42 requires financial institutions to classify non-credit assets and accrue impairment provisions.
- **Second, the 'incurred loss model' will continuously be adopted to calculate impairment provisions.** Considering that the historic loss ratio of non-credit assets is small as few of them involve defaults or loss events, the expansion of the coverage of impairment provisions may not significantly impact the profits and capital levels of the financial institutions.

  At this stage, banks should make the following preparations in respect of the impairment provisions for non-credit assets. First, data preparation: Banks should put forward specific data requirements based on the proposed and adopted model building method, and complete data collection and cleaning after evaluating the existing data. Second, model building and verification: Banks should consider different model building methods based on their data status, and in the meantime conduct scenario analyses and sensitivity analyses to provide references for determining the final model. Third, building of impairment calculation information system: This may involve significant changes in the existing system, governance structure and data process.

  Considering that the 'expected loss model' required by *International Financial Reporting Standard No. 9 – Financial Instruments* (IFRS 9) will be effective on 1 January 2018 and that the Ministry of Finance issued the *Notice on Soliciting Public Opinions on Accounting Standards for Business Enterprises No. 22 – Recognition and Measurement of Financial Instruments (Revised) (Draft for Comments)* and *Other Two Accounting Standards* (Cai Ban Kuai [2016] No. 33) on 8 January 2016, many financial institutions are adopting or will adopt the 'expected loss model'. Asset classification can be one of the input parameters of the 'expected loss model' and non-credit asset classification is of significance to the banks to implement IFRS 9. Therefore, it is recommended that the banks should balance the non-credit asset classification and preparations for the implementation of the 'expected loss model'.

Hot topic 3: Interpretation of the implications of Circular No. 42 on banking business (continued)

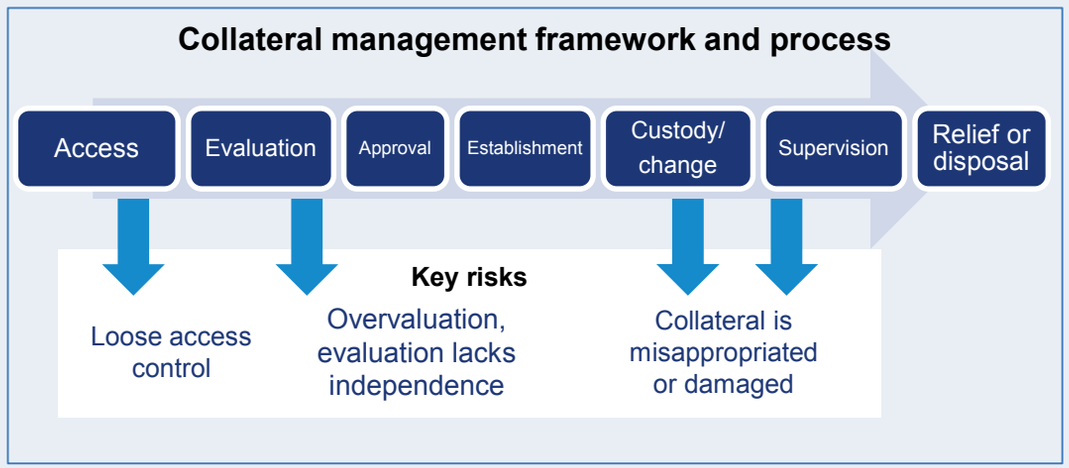
Interpretation of Circular No. 42 (continued)

Enhance risk mitigation effectiveness

Original text:
Banking financial institutions should establish credit risk mitigation systems, policies and procedures based on their business characteristics to assess the effectiveness of risk mitigation measures on a regular basis. The institutions should focus on assessing whether the collateral is real, legitimate and realisable; whether the evaluation of collateral is prudent and deliberate; and whether the relevant pledge documents are complete and the contract terms strict. The institutions should also determine the frequency of collateral re-evaluation based on the classification and nature of the collateral, and re-evaluate the collateral on a regular basis. The institutions should take effective actions in a timely manner when the changes in the value of the collateral significantly affect risk mitigation effectiveness. In assessing the effectiveness of the risk mitigation measures, the institutions should fully consider the impacts of fluctuations in the micro economy, financial market and related industries.

Interpretation:
Circular No.42 strengthens risk mitigation management in respect of the access and evaluation of collateral and its subsequent supervisions.

- **First, enhance management and control regarding the establishment of collateral and prevent risks from happening in the first place,** including management and control of the truthfulness, legitimacy and feasibility of the pledges.
- **Second, enhance collateral evaluation management and ensure prudent collateral evaluation.** For better practices, a prudent evaluation system should fully consider the reasonability of evaluation models, availability of market parameters, independence of evaluation practices and activity of disposal markets.
- **Third, enhance subsequent collateral management**. For better practices, integrated management of pledge documents, regular check and 'unannounced inspection' can effectively mitigate the risk of misappropriation and substitution of collateral.



Hot topic 4: Analysis of the accounting treatment of equity investment and lending bundling in the banking sector

Background

In order to tackle the difficulties of financing scientific and technological innovation and implementing the innovation-driven development strategy, the banking sector has been exploring how to bundle equity with debt in financing. Equity investment and lending bundling, as an important mechanism of fintech, has drawn much attention.

In the *Guidance on Providing More Credit Support to Small and Medium Technological Enterprises* (Circular No. 37) issued in 2009, the CBRC states that "Banks are encouraged to cooperate with venture capital firms to expand financing channels for small and medium technological enterprises."

Comments of the Central Committee of the Party and the State Council on Intensifying the Reform of Institutional Mechanisms to Expedite the Implementation of Innovation-driven Development Strategy released in March 2015 states that "Banks are encouraged to carry out a pilot project providing equity and debt financing services for innovation activities, and cooperate with venture capital and equity investment institutions to bundle equity investment and lending."

The *Opinion of the State Council on Implementing Mass Entrepreneurship and Innovation Policies and Measures* released in June 2015 states that "Banks are encouraged to work with other financial institutions to provide equity and debt financing for entrepreneurial and innovation activities."

The CBRC, the Ministry of Science and Technology and the PBOC jointly issued *Guidance on Encouraging Financial Institutions in the Banking Sector to Carry out a Pilot of Equity Investment and Lending Bundling for Scientific and Technological Start-ups* (hereinafter referred to as "the Guidance"). According to the Guidance, five pilot zones and ten banks, as the first batch of selected entities, have been approved to carry out investment and lending bundling. The Guidance also stipulates the general and guiding rules on the banking sector engaging in equity investment and lending bundling.

These fintech policies have enabled financial institutions to fund technological start-ups at earlier stages, i.e. the seed stage, the start-up stage and the development stage. As a result, financial support to technological start-ups will be enhanced, and the financial support structure will be optimised.

Hot topic 4: Analysis of the accounting treatment of equity investment and lending bundling in the banking sector (continued)

I. Brief introduction of the Guidance

The Guidance clearly defines equity investment and lending bundling. Equity investment and lending bundling refers to the financing model where a financial institution in the banking sector cooperates with a subsidiary of the group designed for making investments in an arrangement by offering credit and conducting equity investment respectively, to fund scientific and technological start-ups on an ongoing basis. Under equity investment and lending bundling, investment income offsets credit risk to balance risk and returns for scientific and technological start-ups. The subsidiary as the investor can choose to make an equity investment into a non-listed scientific and technological start-up at the seed stage, the start-up stage or the growth stage, by sharing investment income and bearing investment risk. It will also participate in the management of the start-up, and withdraw in terms of management and investment in good time.

The Guidance requires that risks with equity investment and lending bundling must be prevented and controlled from different aspects, since it is a new business model.

Firewall

- A subsidiary designed for making investments must invest with its own funds, and the proportion of investment into a single scientific and technological start-up should not exceed 10% of its own funds. Investments into scientific and technological start-ups must be separated from those into other enterprises. Subsidiaries designed for making investments should be independent of their parent banks, and their funds should also be isolated from their parent banks'.
- Banks must use their on-balance sheet funds to offer loans to scientific and technological start-ups.

Risk tolerance and taking mechanism

Selected entities should set a reasonable risk tolerance for scientific and technological start-ups. They should determine an NPL principal sharing and compensation mechanism and relevant proportions among banks, subsidiaries designed for making investments, government loan risk compensation funds, guarantee companies and insurance companies, to ensure NPL ratios within the risk tolerance.

Revenue sharing mechanism

Selected entities should develop a reasonable revenue sharing mechanism for equity investment and lending.

Exit mechanism

Selected entities should dynamically monitor business risks associated with equity investment and lending bundling, and develop exit procedures based on risk appetite.

Subsidiaries designed for making investments should strictly examine investment projects related to scientific and technological start-ups. Loans to scientific and technological start-ups should be managed separately through pre-loan investigations, loan reviews, post-loan inspections, a loan pricing mechanism, a credit management system and an incentive and control mechanism.[1]

Hot topic 4: Analysis of the accounting treatment of equity investment and lending bundling in the banking sector (continued)

II. Features of equity investment and lending bundling

The Guidance indicates that equity investment and lending bundling is designed to upgrade lending services of the banking sector and provide financial support to scientific and technological start-ups by balancing investment income with credit risk. Equity investment and lending bundling has matured overseas, and banks have used it to obtain higher returns, while scientific and technological start-ups have prospered. The substance of a transaction determines its accounting. According to international and domestic policy interpretations and practical experience, we conclude that equity investment and lending bundling mainly has the following features:

Banks offer loans, while subsidiaries designed for making investments make investments

The principal activities of a bank include absorbing deposits, granting loans, and discounting bill and intermediary services, so it is a depository institution rather than an investment institution. For banks, equity investment and lending bundling is in essence venture debt; that is, banks provide credit funds while acquiring a small amount of share options or other interests. Equity investors are subsidiaries designed for making investments, venture capital firms or private equity firms. Shareholding proportions of banks should be rigorously controlled to avoid diverting them from principal activities.

Silicon Valley Bank has bundled equity investment and lending since the 1990s, and has now transformed into a technology bank by reasonably balancing high yield from equity investment and risks with bond investment. To alleviate the high risk of investments in scientific and technological start-ups, Silicon Valley Bank has controlled the proportion of share options obtained within 1% of the share capital of an investee, and ensured that bad debt losses should be lower than 1%[2] through risk control measures. Liao Min, director-general of the CBRC Shanghai, determines that the equity ratio of banks in Shanghai should temporarily range from 3% to 5%.[3]

Offset risks while still making interest income a principal activity

The investment income from equity investment and lending bundling is used to cover the high risk of loan offerings, which can address the mismatch of loan risk and investment income. The acquisition of share options or other interests is at the expense of lower interest on loans, so investment income is employed to cover losses resulting from loan offering risks.

Invest at an the early stage, and bundle during the whole life cycle

The Guidance encourages selected entities to invest in scientific and technological start-ups at the seed and start-up stage, and grant credit in the early stage of development, so as to fund scientific and technological start-ups at the high-risk phases of the life cycle. The banking sector may make good use of the ecosystem of venture capital as a bridge and medium, to connect entrepreneurs, venture capitalists, incubators, intermediaries, government and other entities, to set up a 'financial service chain' [4] covering the whole life cycle of a scientific and technological start-up.

As share options or other equity instruments held by subsidiaries designed for making investments are to offset potential losses arising from high risks with loans, parent banks and subsidiaries designed for making investment should account separately according to actual circumstances, and consider adjustments in consolidated financial statements. The accounting treatment of share options when they are held and disposed of should align with the nature of equity instruments and the substance of transactions.

Hot topic 4: Analysis of the accounting treatment of equity investment and lending bundling in the banking sector (continued)

III. Status quo of the pilot project of equity investment and lending bundling, and relevant accounting treatment

Equity investment and lending bundling started in the 1950s and developed fast in the 1980s. It has now matured in the overseas banking sector. The business model of Silicon Valley Bank is typical. In the 1990s, the rise of high-tech industries and the surge in demand for entrepreneurial enterprises for financing stimulated Silicon Valley Bank to explore how to bundle equity investment with lending:

Investees

Silicon Valley Bank mainly invests in high-tech, life science, venture capital and high-end wine industries.

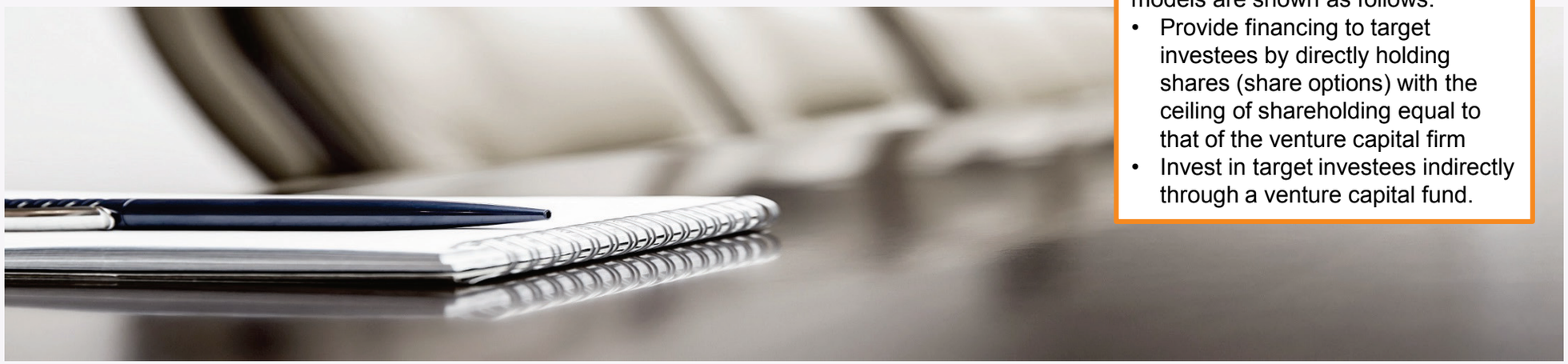
Opportunity to enter

Approach scientific and technological start-ups when venture capital firms start to make investments in the first or second round; offer credit in the early stages of development; and serve small and micro technology enterprises by combining equity and debt financing.

Investment model

For indirect financial services, Silicon Valley Bank usually issues loans at an interest rate 2-3% higher than the interest rate of loans to average mature enterprises, but generally lower than the interest rate of loans to the same type of small and micro technology enterprises where Silicon Valley Bank does not hold any equity investment. Silicon Valley Bank provides direct equity financing mainly through its subsidiary, Silicon Valley Capital. The investment models are shown as follows:

- Provide financing to target investees by directly holding shares (share options) with the ceiling of shareholding equal to that of the venture capital firm
- Invest in target investees indirectly through a venture capital fund.



III. Status quo of the pilot project of equity investment and lending bundling, and relevant accounting treatment (continued)

1. Status quo of the pilot project of equity investment and lending bundling

According to the available public information, the status quo of the pilot project is as follows:

Selected entities have proactively engaged in equity investment and lending bundling since 21 April 2016 when the Guidance was released. As the selected entities are still looking for solutions, the specific pilot programme is yet to be disclosed.

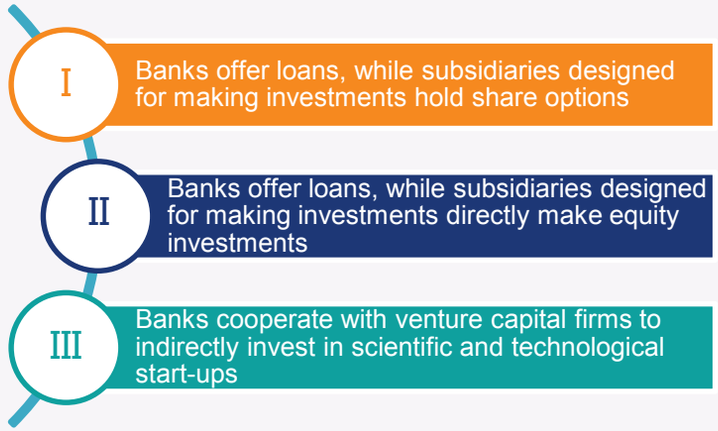
One pilot zone and three banks are on the list of the first batch of pilot zones and financial institutions respectively. The three selected banks are Bank of Shanghai, Shanghai Huarui Bank and SPD Silicon Valley Bank. Bank of Shanghai and Shanghai Huarui Bank both established subsidiaries designed for making investments into scientific and technological start-ups, while SPD Silicon Valley Bank has not set up any such subsidiary, restrained by shareholders. In the pilot schemes, the three banks all use share options to mitigate risks and compensate for possible losses arising from high loan risks.[5]

Other selected banks also believe that the share option model would become the main trend,[6] owing to the advantages of capital sparing, low shareholding and short vesting period. Under the share option model, banks do not get very involved in management. Share options are only regarded as a tool offsetting loan offering risks, which is in line with the actual situations of a scientific and technological start-up in its early stages. The Guidance defines a subsidiary designed for making investments as a 'financial investor' instead of a 'strategic investor', so banks should make financial services as the goal without exerting too much control over investees.

In summary, the share option model connecting subsidiaries designed for making investments and financial institutions specialising in serving technology start-ups is used by selected entities to bundle equity investment and lending. Referring to the accounting treatment adopted by Silicon Valley Bank, and considering the nature and characteristics of the pilot model, we will briefly analyse the accounting treatment of equity investment and lending bundling in the Chinese banking sector in accordance with applicable Chinese accounting standards.

2. Accounting treatment of equity investment and lending bundling

The substance of equity investment and lending bundling is that banks offer loans, while subsidiaries make investments. Bundling banks with subsidiaries designed for making investments enables investment income to make up for possible losses arising from high credit risks, so as to meet the financing demand of scientific and technological start-ups. From the status quo of the pilot project, investment firms mostly cushion losses arising from credit risks by holding share option instruments of scientific and technological start-ups. Loan offering and investment making, the two elements of equity investment and lending bundling, are directly related.



III. Status quo of the pilot project of equity investment and lending bundling, and relevant accounting treatment (continued)

Accounting treatment of equity investment and lending bundling – "Banks offer loans, while subsidiaries designed for making investments hold share options"

This model is used by selected entities to test the water. Under such a model, banks grant loans to scientific and technological start-ups and determine the interest rate taking into consideration both risk premium and expected benefits brought about by future value addition for investees. Meanwhile, subsidiaries designed for making investments hold share options of scientific and technological start-ups, but the face value of the share options occupy a small proportion of the total capital of the borrower (the dilution of the borrower's equity is insignificant), and the future proceeds of the share options can make up for potential losses arising from high credit risks. The accounting treatment is analysed as follows:

Business model	**Banks offer loans, while subsidiaries designed for making investments hold share options**		
	Initial measurement	Recognition of interest income when a loan is held	Changes in fair value when a loan is held
Accounting treatment	• The borrower expects to obtain a loan at an interest rate lower than the market interest rate by attaching share options. Funds offered by a bank are shared between the loan and share options. On the grant date of the loan, the cost of the loan and share options should both initially be measured at fair value at the group level. • The bank should use appropriate valuation techniques to determine the effective interest rate and fair value of a loan under equity investment and lending bundling, taking into account the market conditions at the time when the loan is issued, and the terms and conditions of peers and other comparable loans received by the borrower. • Share options held by a subsidiary designed for making investments should be recognised as a financial asset measured at fair value through profit or loss. Loans and equity investments should both be included in consolidated financial statements.	Interest income when a loan is held should be calculated at the effective interest rate in accordance with the *Accounting Standard for Business Enterprises No. 22 – Recognition and Measurement of Financial Instruments*. The loan is generally measured at amortised cost.	• In accordance with Article 38 of the *Accounting Standard for Business Enterprises No. 22 – Recognition and Measurement of Financial Instruments*, gains or losses arising from changes in the fair value of financial assets or financial liabilities at fair value through profit or loss are recognised in profit or loss. • Under the exit mechanism, banks can exercise options to acquire shares or cash. The shares acquired can be recognised as a new financial asset.

III. Status quo of the pilot project of equity investment and lending bundling, and relevant accounting treatment (continued)

Accounting treatment of equity investment and lending bundling – "Banks offer loans, while subsidiaries designed for making investments directly make equity investments"

Under this model, banks provide lending services for selected scientific and technological start-ups with promising prospects of growth, and make direct equity investments through banks' investment subsidiaries. By directly holding the equity that provides them with dividends and a claim on residual assets, banks are able to offset possible losses arising from high credit risk.

Pursuant to the *Accounting Standard for Business Enterprises No. 22 – Recognition and Measurement of Financial Instruments* and the *Accounting Standard for Business Enterprises No. 2 – Long-term Equity Investments*, investment subsidiaries should classify their direct equity investments as financial assets held for trading, available-for-sale financial assets or long-term equity investments according to their intent and purpose of holding such investments and their rights and obligations in their investees, and make initial recognition and subsequent measurement accordingly.

Accounting treatment of equity investment and lending bundling – "Banks cooperate with venture capital firms to indirectly invest in scientific and technological start-ups"

Under this model, banks partner with venture capital funds that specialise in investing in scientific and technological start-ups, and by directly investing in venture capital funds, indirectly hold the equity of such enterprises. In the meantime, banks provide loans for venture capital funds or scientific and technological start-ups. Leveraging the advantages of venture capital funds, banks are able to provide lending and financing support for promising scientific and technological start-ups to meet their capital demand, and realise a win-win outcome for all.

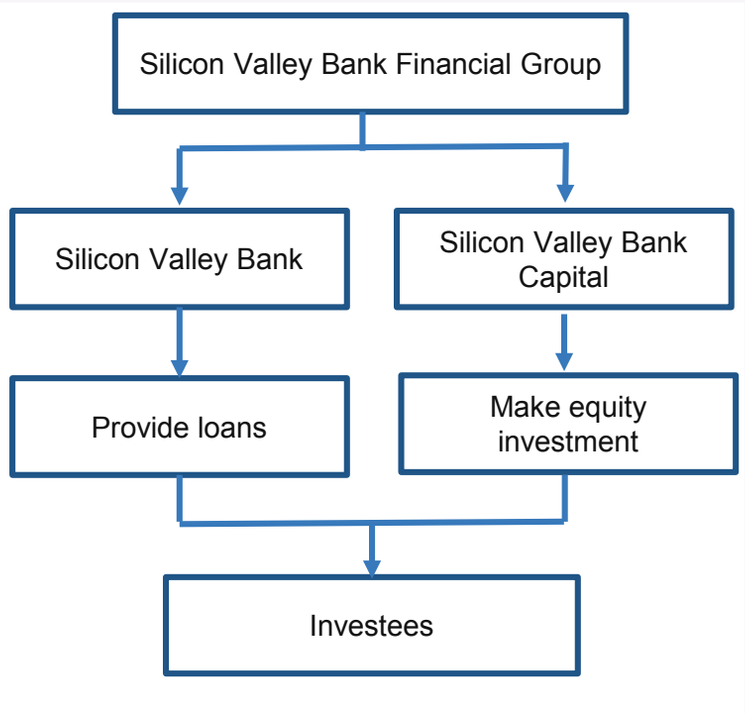
With regard to the above indirect investment model, banks should take into account the substance of the transactions and arrangements with venture capital funds that act as an intermediary and scientific and technological start-ups, and account for their loans and investments in accordance with the *Accounting Standard for Business Enterprises No. 2 – Long-term Equity Investments*.

IV. The equity investment and lending bundling model of Silicon Valley Bank, and accounting treatment

Founded in 1983, Silicon Valley Bank took advantage of the rise of the high-tech industry in the Silicon Valley in the 1990s to explore the fusion of equity investment and lending aimed at reaching a balance between high returns on equity investment and credit risk, and successfully transformed itself into a technology-focused bank. It focuses its investment on four industries: high-tech, life science, venture capital and high-end wine.

As at the end of 2015, Silicon Valley Bank's balance of total loans was USD 16.7 billion or around RMB 110 billion. Although this is not a considerable amount, Silicon Valley Bank plays a key role in the venture lending market of the US. With a mature model that integrates equity investment and lending, Silicon Valley Bank offers valuable insights into the business and accounting treatment.

It is worth noting that accounting treatment of Silicon Valley Bank is based on US GAAP, which differs from IAS and CAS. Therefore, while the accounting treatment of Silicon Valley Bank is a valuable reference, Chinese banks should tailor accounting treatment according to their applicable accounting standards and approach accounting issues on a case-by-case basis.



Business model

I. Silicon Valley Bank provides loans for enterprises while Silicon Valley Bank Capital makes direct equity investments in the enterprises

II. Silicon Valley Bank provides loans for enterprises while Silicon Valley Bank Financial Group holds equity warrants

III. Partnering with venture capital funds, Silicon Valley Bank indirectly invests in high-tech start-ups

Silicon Valley Bank and Silicon Valley Bank Capital, both of which are subsidiaries of Silicon Valley Bank Financial Group, assume separate roles of providing loans and making equity investments. They are linked with venture capital funds and investees through a variety of financial services to reduce credit risk and acquire investment returns. Silicon Valley Bank mainly adopts the three business models on the following pages to achieve an investment-lending integration.[7]

Hot topic 4: Analysis of the accounting treatment of equity investment and lending bundling in the banking sector (continued)

IV. The equity investment and lending bundling model of Silicon Valley Bank, and accounting treatment (continued)

I. Silicon Valley Bank provides loans for enterprises while Silicon Valley Bank Capital makes direct equity investments in the enterprises

Under this model, Silicon Valley Bank encourages enterprises to pledge their intellectual property rights for loans, and charges interest at a rate 2% to 3% higher than that for general established businesses to compensate credit risk. In the case of promising start-ups, Silicon Valley Bank Capital and venture capital funds will jointly make equity investments to access high yields arising from high growth or IPO-induced capital appreciation.

Accounting treatment for this model:

Silicon Valley Bank Capital's direct equity investments in enterprises are included in the following items under 'equity investment':

1. Available-for-sale financial assets at fair value for publicly quoted equity

2. Non-marketable and other securities at amortised cost for non-publicly quoted equity.

II. Silicon Valley Bank provides loans for enterprises while Silicon Valley Bank Financial Group holds equity warrants[8]

This model applies to tech companies at the seed stage in terms of technology and intellectual property rights. While providing them with loans at a high interest rate, Silicon Valley Bank enters into an agreement with them allowing Silicon Valley Bank Financial Group to hold a certain amount of equity warrants. Silicon Valley Bank Financial Group can exercise the warrants or exit by liquidating them in the event of an IPO or acquisition, and is thus entitled to yields from equity appreciation to compensate for possible losses from credit risk.

Accounting treatment for this model (i.e. accounting treatment for equity warrant assets):

1. Grant date

Equity warrant assets are recognised as credit expenses at fair value at the grant date and deferred as unrealised income.

2. Balance sheet date during the term of a loan

At the balance sheet date of a subsequent period, changes in the fair value of equity warrant assets are reflected in the carrying value of derivative financial instruments in the balance sheet, and recognised as gains/losses from changes in the fair value of derivative financial instruments in the income statement.

Equity warrant assets are recognised as credit expenses at fair value and included in deferred income at the grant date, and adjusted as loan interest income using the effective interest rate method or the straight-line method.

IV. The equity investment and lending bundling model of Silicon Valley Bank, and accounting treatment (continued)

II. Silicon Valley Bank provides loans for enterprises while Silicon Valley Bank Financial Group holds equity warrants (continued)

3. Vesting date and exercise date

When an investee completes its IPO or is acquired in the open market, Silicon Valley Bank Financial Group can obtain shares or cash by exercising equity warrants.

In the event of a warrant exercise, Silicon Valley Bank Financial Group derecognises derivative financial assets and recognises equity investment at the later of the vesting date and the exercise date. The shares of a listed company are classified as available-for-sale securities in the absence of selling restrictions. The shares of a private company are classified as non-marketable and other securities.

The shares of a listed company are subsequently measured as available-for-sale financial assets, whose fair value changes are recognised as other comprehensive income separately presented under owners' equity. Non-marketable and other securities are generally measured at cost, and their fair value changes are recognised as net profit or loss from securities investment under non-interest income at the time of exit or liquidation.

III. Partnering with venture capital funds, Silicon Valley Bank indirectly invests in high-tech start-ups[9]

Under this model, Silicon Valley Bank makes equity or debt investments in venture capital funds, or partners with venture capital funds to jointly build an investment fund, which is drawn by venture capital funds to make direct equity investments in start-ups. Silicon Valley Bank and venture capital funds become close business partners through the provision of loans, share high-quality client resources and promote mutual benefits.

Accounting treatment for this model:

Silicon Valley Bank Capital directly invests in venture capital funds, and thus indirectly invests in start-ups. Its investment in venture capital funds is classified as non-marketable and other securities subsequently measured using the equity method. It recognises its share of an investee's financial performance based on its shareholding ratio and performs an impairment test at least on a quarterly basis. The loans provided by Silicon Valley Bank for venture capital funds are accounted for as ordinary loans.

Hot topic 4: Analysis of the accounting treatment of equity investment and lending bundling in the banking sector (continued)

Summary and outlook

Loans and equity investment under the aforementioned three models should be included in the consolidated financial statements of a bank at the group level. The financial statements should fairly reflect the equity investment and lending bundling business to the extent that the relationship and interaction between loans and equity warrants are clearly demonstrated. Although a general framework for accounting treatment is provided in this publication based on China's accounting standards, the nature of the business in question and the current situation of China's pilot programmes, discretion is advised in practice, as treatment may vary according to transaction details and specific business characteristics that may necessitate proper adjustments.

With the expanded scope of the business and banks' continuous explorations, new practical issues and new business models are set to surface, presenting new accounting challenges. Governed by the principle that accounting should reflect business substance, accounting treatment will change accordingly. In light of this, the development of the business will push for the progress of accounting theories.

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[7] See the section about liquidity and market risk of equity warrants, venture capital, private equity and direct equity investment on p. 22 of Silicon Valley Bank's 2015 Annual Report

[8] See the sections about Silicon Valley Bank Financial on p. 28 of Silicon Valley Bank's 2015 Annual Report, non-marketable and other securities; the cost method on p. 99; loans on p. 100; and equity warrant assets on p. 107

[9] See the section about non-marketable and other securities: the equity method on pp. 98-99 of Silicon Valley Bank's 2015 Annual Report

Academic insights: The implications of blockchain technology on commercial banks and proposed countermeasures

With the rapid development of blockchain technology in recent years, the prospect of its applications is drawing increasing attention from various industries and academia, especially with respect to its use in innovating the business of the financial industry, and commercial banks in particular. Characterised by its decentralised structure, openness and transparency, and its rule not to allow data to be altered retrospectively, blockchain technology has enormous potential in the financial industry, despite its impact on traditional financial services businesses. In light of this, other than providing an introduction to its principles, current applications and impact on and challenges to commercial banks, this publication offers some countermeasures for commercial banks to adapt to an age of blockchain technology.

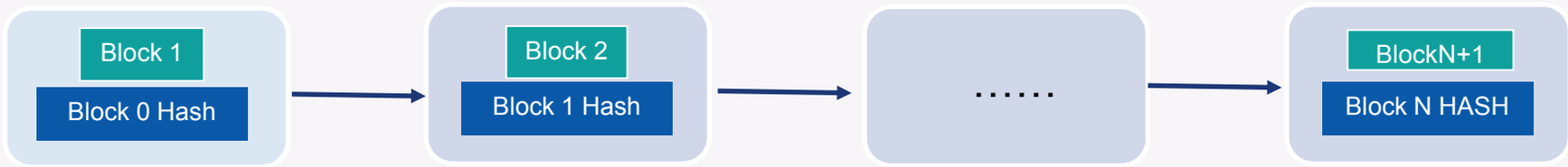
Academic insights: The implications of blockchain technology on commercial banks and proposed countermeasures (continued)

The principles and applications of blockchain technology

Originating from bitcoin technology, a blockchain contains a ledger of massive data records maintained by numerous computers. The use of distributed ledgers to record data means that each computer maintains a set of information and that new information cannot be added without the authorisation of all computers. This technology, built on the idea of decentralisation, can prevent unauthorised modification of information and single point vulnerabilities, thus effectively safeguarding data security.

1 Blockchain structures

A blockchain is a storage unit composed of numerous blocks chained to each other through hashing, i.e. every block contains a hash of the previous block.



Each blockchain also contains transaction records and other information.[1]

2 Characteristics of blockchains

(1) Decentralisation

A blockchain must be built on a decentralised, peer-to-peer (P2P) structure without hardware or a management agent that acts as the centre. All nodes form a network that allows for automatic and secure exchanges of recorded data on the basis of an open consensus protocol, in a centreless environment that needs and permits no human intervention.

(2) Openness and transparency

All recorded information and details of a blockchain are open. Anyone can search and input information at zero or almost zero cost through the internet, such as a blockchain platform website. There is no need to reveal the identity of the person who inputs the information. This provides a certain level of anonymity. In other words, while information is open to the public, information providers can be anonymous.

(3) Resistance to modification of historical records

Information that has been confirmed many times and become historical record in a blockchain will be stored permanently and can never be modified. This is where the value of a blockchain lies. Modifications to the database on a single node are invalid, unless over 51% of the nodes in the whole system are controlled. However, even with 51% control, historical or new information still cannot be modified. Newly created blockchain records are the only thing that may be modified, but this needs an attack of 51% hash power from some mining pool nodes. Historical records, however, can never be modified, even with 51% hash power.

Academic insights: The implications of blockchain technology on commercial banks and proposed countermeasures (continued)

The principles and applications of blockchain technology (continued)

3 Blockchain applications

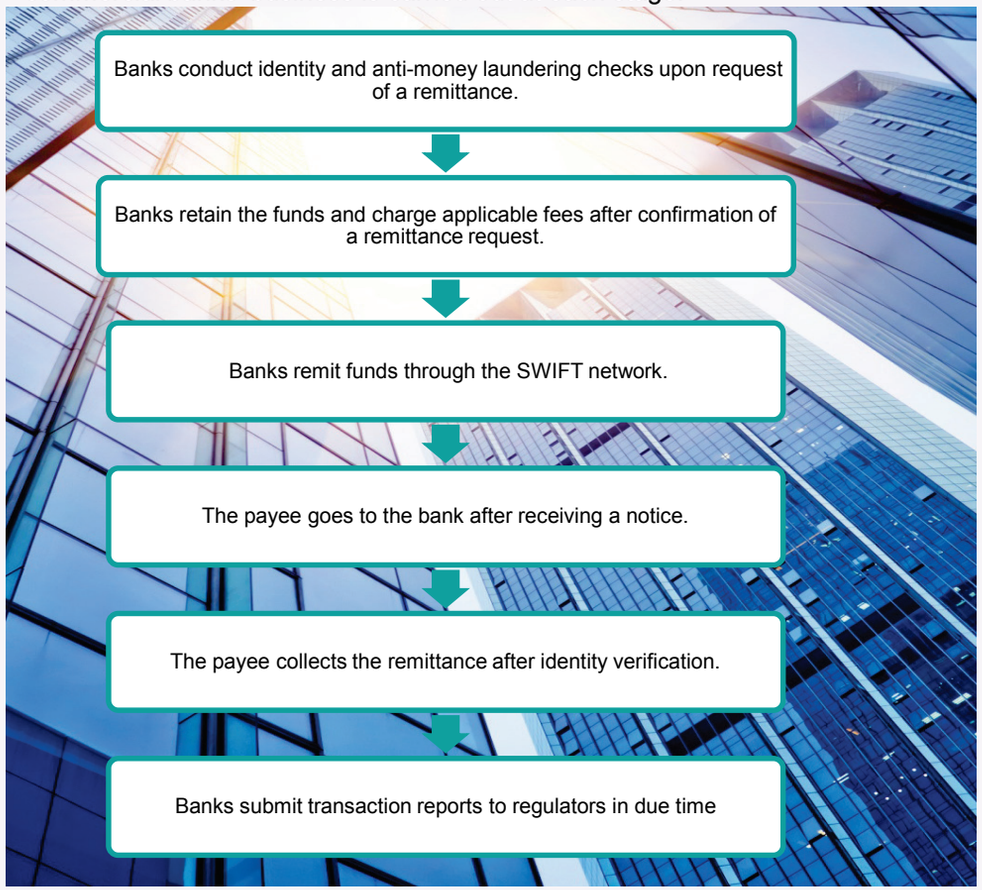
New digital currencies	At present, Bitcoin, Dogecoin, Ripple and other encrypted digital currencies are the biggest applications of blockchains. However, blockchain technology is only one of the technologies to construct bitcoin and other systems. A blockchain is a recording system used to record content, which may include a financial ledger. The data in such a ledger is bitcoin.
Coin amounts used for certification of registered shares	The blockchain format can be used for the circulation of crowdfunding-based shares. Simply put, one unit of coin equals one share. Records on a centralised server are moved to blockchains for open and transparent recording.
Blockchain applications in real-world voting	Blockchains are open, transparent and modification-resistant. Such advantages have a role to play in voting. Blockchains can be considered for selecting the person of the year in certain fields, voting contestants to the next round in variety shows, and even for national elections. Blockchain-based voting can greatly reduce the risk of fraud, as voting processes are transparent, and all votes are accessible to everyone. This ensures that the results are just, fair and open, and allows for a certain level of privacy at the same time.
Blockchain technology used for certification of recorded information	In addition to recording transactions, blockchains can also record other information, such as a note accompanying an account transfer. If such information is collected, it looks like Twitter. The blockchain-based notes can never be modified or blocked, nor can they accept timestamps. If too much information or certification is needed, hash compression, coin signatures and other technologies can provide effective certification for recorded information.

Academic insights: The implications of blockchain technology on commercial banks and proposed countermeasures (continued)

Commercial banks' current blockchain applications and their implications

(1) Blockchain solutions to banks' existing business problems

Real-time fund transfer is one of the important applications of blockchains. To gain a better understanding of the benefits of blockchains, we will take traditional cross-border fund transfers as an example to illustrate how commercial banks' business is carried out at each stage.



The following problems are present in a traditional cross-border fund transfer:

- Complex, high cost, time-consuming and error-prone remittance procedures
- Difficulty in conducting thorough and accurate identity checks
- Banks need to reserve funds in their current accounts, which may reduce liquidity and incur opportunity costs
- Varied data sources and collection methods make it difficult for banks to submit reports to regulators.

Blockchain technology can effectively solve the above problems:

- Transfers are not made through bank remittance; real-time transfers are enabled with lower cost
- Leveraging digitalised personal information on distributed ledgers to verify the identity of a remitter
- No need to reserve funds in banks' current accounts; regulators can monitor transactions on a real-time basis and receive anti-money laundering warnings.

Theoretically, blockchain technology can allow the two parties involved in a transaction to carry out economic activities in the absence of a trusted third-party intermediary. This can simplify banks' business, but on the other hand, it will put an end to many lucrative businesses of commercial banks, such as the Letter of Credit (L/C) business.

Commercial banks' current blockchain applications and their implications (continued)

(2) Implications for regulation of the banking sector

Blockchains can be used to monitor asset conditions in the financial industry and potential financial risk to prevent, among others, front-running in stock transactions and cross-border money-laundering crimes. As China's financial system may lack effective and mature regulation, offenders can take advantage of legal and institutional loopholes to carry out illegal acts that harm China's national interest. By leveraging blockchain technology to access more financial information, the Chinese Government can combat criminal activities more effectively to maintain fairness and stability in the financial market.

As the blockchain format allows no modification to each transaction and consequently guarantees data authenticity, blockchain technology can greatly facilitate the regulation of commercial banks. In addition, the convenience brought by blockchain technology can push up the utilisation rate of financial assets, accelerate capital flows and increase money multipliers, ultimately promoting economic growth. The resultant higher measurability of capital flows can help central banks analyse monetary structures to develop appropriate monetary policies.

However, strong decentralisation that lies at the core of a blockchain poses a great challenge to centralised regulators' efforts to execute administrative interventions. Overcoming such a challenge requires regulators to be more adaptive to the development of new technology and change their regulatory methodology accordingly.

(3) Newest development of blockchain technology in the banking sector and its significance

December 2015: David Rutter founded R3 Alliance, a blockchain-based transaction platform sponsored by 42 global financial institutions. This marks the beginning of cooperation among financial institutions of various countries in jointly using a blockchain platform, and is a sign that more participating countries and a wider service scope are to be expected.

June 2016: The Canadian central bank launched CAD-Coin, the digital form of Canadian dollars. Leveraging blockchain technology, participants put pledged cash into a special pool to be converted into CAD-Coin by the central bank.

August 2016: UBS, Deutsche Bank, Santander and BNY Mellon jointly developed a new digital currency, hoping to use blockchain technology for transaction settlements and set a universal standard across the global banking sector. New technology can help central banks issue, transfer or dispose of assets. Tempted by the prospect of blockchain technology, banks assume the role of technology companies in developing new technologies on their own. The idea of blockchains is the result of cooperation among various countries and institutions, running counter to the traditional mindset of competition to bring about a win-win outcome for all.

September 2016: Barclays completed the world's first trade transaction settled by blockchain technology.
Traditional trade settlements are prone to the risk of trade documentation loss and fraud, and may need one month to process. Blockchain technology, however, can eliminate such risk and reduce processing time.

September 2016: Visa invited banks to perform payment tests on a blockchain-based system that aimed to reduce transfer cost, speed up settlement and reduce credit risk involved in transfers.

Academic insights: The implications of blockchain technology on commercial banks and proposed countermeasures (continued)

Challenges posed by blockchain technology to commercial banks

The benefits of blockchains have been recognised by Western countries and large financial institutions. But how practical are they in China? Will the Chinese Government allow this new technology to flourish in an immature financial system? We strive to investigate the challenges facing China's commercial banks from various perspectives.

(1) Security

The digital currency of RMB

CAD-Coin, the digital form of Canadian dollars, was issued directly to the public by the Canadian central bank. However, in China, banknotes issued by China's central bank are first transferred to the reserve of a commercial bank, through which the bank provides the public with deposit and withdrawal services.

If China were to follow Canada's practice of directly issuing the digital currency to the public, the central bank may engage in head-on competition with commercial banks, undermining the stability of the banking system.

Therefore, China's central bank may adopt the current banknote issuance model to issue the digital currency. This can prevent the impact on commercial banks and, more importantly, motivate commercial banks to facilitate the circulation of the statutory digital currency.

Cross-border transactions

In recent years, China's central bank has been committed to increasing transparency pertaining to the RMB exchange rate against a basket of currencies, making it more responsive to market supply and demand. The long-term goal of the central bank is to make the RMB an international currency and have a greater say in the global financial system.

Thanks to the Chinese Government's concern over capital outflows, free circulation of RMB may not be achieved on a short-term basis. However, if China leads Western countries in adopting blockchain technology in, for instance, RMB transactions, it will increase RMB circulation, propelling the RMB to take the place of the USD as an international safe-haven currency.

Cyber attacks and system stability

In June 2016, due to significant flaws in smart contracts, assets worth over 3 million ether were stolen, worth more than $50 million, following an attack on the DAO, the largest blockchain-based crowdfunding project. The incident sent shock waves across the tech world, as it was living proof of technical loopholes under immature blockchain technology, undermining blockchain technology's widely advocated merit of security. Even mature blockchain technology cannot escape the fate of being controlled in the event of powerful group acts.

Currently, blockchain-based systems can only process several transactions per second. This capacity is dwarfed by thousands of transactions per second for a traditional financial institution. If blockchain technology were to be adopted in stock trade and fund transfers, current systems may easily become overloaded. This demonstrates tremendous room for improvement in terms of technology and supporting facilities.

In addition, the threat from a 51% hash power attack still exists.

(2) Regulation

Illegal fund transfers

Ever since April 2015 when public security authorities launched a special campaign to combat illegal private banks, nearly RMB 1.2 trillion was found to be involved in illegal transactions. Illegal private banks were used to transfer illicit money and for money laundering, which dealt a blow to foreign exchange management and the capital market.

Blockchain technology, when mature, can help track fund sources and fight against money laundering activities. However, before such maturity is reached, the technology may be used illegally to transfer funds to overseas countries. China contributed over 90% of the global turnover of blockchain-based bitcoin. Such a large share is possibly powered by the need for outbound transfers of domestic funds, as it is difficult to trace capital flows given that bitcoin technology is not yet fully fledged.

Spread of risk

The convenience brought by digital currencies to convert deposits to cash may deteriorate the liquidity of financial institutions in the event of a crisis, posing a threat to the stability of the financial system.

On the other hand, blockchain technology accelerates algorithmic trading, but erroneous algorithmic trade may have ripple effects, leading to a small financial crisis that saw Dow Jones Indices fall 1,000 points in 2010.

Academic insights: The implications of blockchain technology on commercial banks and proposed countermeasures (continued)

Challenges posed by blockchain technology to commercial banks (continued)

(3) Competitive pressure

Profit erosion

As the payment business is a major source of income for commercial banks, they exercise great care when it comes to blockchains and distributed ledgers. Continuous interest rate cuts by China's central bank have narrowed banks' interest rate spread, resulting in operating difficulties. Therefore, the idea of decentralisation, with the potential of replacing banks, may not be easily accepted by banks.

Lowered industry thresholds

Although still a new technology, blockchain technology may bring disruptive changes to the traditional approach to the creation of credit. Records on its distributed ledgers cannot be modified, which can provide financial institutions with reliable and detailed information.

Traditional commercial banks that live and thrive on information asymmetry may lose their hard-earned competitive advantage under the rise of blockchain technology. The technology may also bring the added benefits of significantly reducing the operating costs of financial institutions and providing more precise financial services when combined with internet finance and big data analytics. When technologically advanced internet companies make their formidable forays into the financial industry, traditional banks may have no choice but to painstakingly seek transformation under fierce competition.

Countermeasures for commercial banks under the rise of blockchain technology

As an emerging technology, blockchain technology is believed to have promising applications in the financial industry. However, it is still too early to tell how it will be received in the financial market. Under the sweeping effects of continued technological innovation, commercial banks should prepare themselves to adapt to and even thrive on an upcoming age of blockchain-based finance.

(1) Commercial banks should be technically prepared for globally accepted technical standards for blockchain technology to be developed in the future

Ever since its founding, R3 Alliance has been committed to developing blockchain technology and applying it in the financial industry, as well as formulating industry standards and protocols. Commercial banks in China, however, fall behind such international efforts in terms of technological innovation of and research on blockchain technology and digital currencies. Currently, China's commercial banks cannot engage in digital currency transactions, thanks to cautious measures to prevent risk associated with digital currencies. This situation appears to be at odds with the enthusiasm of the public for blockchain development and research.

At present, as large global financial institutions join hands in their innovation endeavours, blockchain technology, P2P and other emerging decentralised models are being transformed from simple ideas to practical application. Banks in China should stay informed about the newest innovation activities of their international counterparts, make early efforts to study and develop blockchain products and adjust their development strategies in a timely manner to adapt to the business model of internet finance in a new age.

To achieve this goal, they can set up R&D laboratories or work with fintech companies. In addition to developing a variety of blockchain application scenarios, they can innovate the fusion of blockchain technology and inclusive finance to serve China's specific needs. For instance, efforts can be made on studying how to leverage blockchain technology to achieve low-cost transfers and payments in China's underdeveloped regions to provide them with more accessible and better financial services.

In addition, they should actively participate in the formulation of international standards and protocols to seek more say in the matter and avoid simply becoming a passive follower. China's Ping An Bank reportedly joined the R3 Alliance in 2015.[2]

Academic insights: The implications of blockchain technology on commercial banks and proposed countermeasures (continued)

Countermeasures for commercial banks under the rise of blockchain technology (continued)

(2) ZCash, an emerging new technology, can encrypt transaction source data in a blockchain

ZCash, a digital currency that promises total anonymity, was officially launched on 4 November 2016. Originating from the Zerocoin project, it was initially designed to provide encryption for bitcoin but then evolved to become an independent cryptocurrency.

ZCash bears great resemblance to bitcoin as both of them are digital currencies. Like bitcoin, it is traded based on distributed ledgers (blockchains). However, what distinguishes it from bitcoin is that it is totally anonymous.

ZCash relies on zero-knowledge proofs from a technology called zero-knowledge Succinct Non-interactive Argument of Knowledge (zk-SNARK) to verify the authenticity of a transaction. It uses a public blockchain to display transactions, but hides the amounts of transactions. The owner holding an access key, i.e. the owner of ZCash, can grant access to others to view information locked by the key.

Simply put, the algorithm allows users to provide proof that they have in their possession digital currencies without disclosing any unnecessary information. It works in the same way that zero-knowledge proof verifies a password typed into a website through a server without having to truly transmit it and disclose it.

Although bitcoin and other digital currencies are known for their ability to conceal transactions, it is quite common to access information about the sender and transaction location of bitcoin by tracking transactions recorded on the blockchains of bitcoin. Unlike bitcoin, which makes transaction data available to the public, ZCash applies encryption to the source data of a transaction. Therefore, with its advantage of total anonymity that places unremitting insistence on the protection of privacy, ZCash is poised to have enormous value in the financial industry.

Theoretically, encrypted blockchains based on zero-knowledge proofs can improve blockchain technology flawed by complete and uncontrollable exposure of transaction records, and help commercial banks ensure the security and authenticity of transactions while protecting their business secrets and allowing privacy management. [3]

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4 Appendix: 2016 Q3 financial data of listed banks

Appendix - Net profit attributable to equity holders of the parent company

RMB million	Jan-Sep 2016	Jan-Sep 2015	Growth rate	Jan-Jun 2016	Jan-Jun 2015	Growth rate
ICBC	222,792	221,761	0.46%	150,217	149,021	0.80%
CCB	193,835	191,557	1.19%	133,410	131,895	1.15%
BOC	134,813	131,545	2.48%	93,037	90,746	2.52%
ABC	154,170	153,210	0.63%	105,148	104,315	0.80%
BCM	52,578	52,040	1.03%	37,661	37,324	0.90%
CMB	52,142	48,500	7.51%	35,231	32,976	6.84%
CNCB	34,543	32,926	4.91%	23,600	22,586	4.49%
CMBC	39,163	38,377	2.05%	27,223	26,778	1.66%
SPDB	40,682	37,162	9.47%	26,770	23,903	11.99%
CIB	43,982	41,221	6.70%	29,441	27,744	6.12%
CEB	24,437	23,875	2.35%	16,439	16,241	1.22%
HXB	14,617	13,912	5.07%	9,826	9,263	6.08%
PAB	18,719	17,740	5.52%	12,292	11,585	6.10%
BOB	14,955	14,136	5.79%	10,621	10,036	5.83%
BON	6,352	5,178	22.67%	4,362	3,568	22.25%
NBCB	6,343	5,321	19.22%	4,139	3,552	16.53%
WRCB	698	639	9.22%	N/A	N/A	N/A
BOJS	8,280	7,351	12.64%	5,610	4,918	14.07%
CRCB	775	729	6.25%	N/A	N/A	N/A
GYB	2,698	2,451	10.08%	N/A	N/A	N/A
JRCB	510	546	-6.51%	N/A	N/A	N/A
CQRCB	6,255	5,740	8.96%	N/A	N/A	N/A
CQCB	2,960	2,675	10.68%	N/A	N/A	N/A
Total	1,076,299	1,048,592	2.64%	725,027	706,451	2.63%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Financial performance indicator

	Return on weighted average equity (ROE)		Basic earnings per share (EPS)		Net asset value per share (in RMB)	
	Jan-Sep 2016	Jan-Sep 2015	Jan-Sep 2016	Jan-Sep 2015	30 September 2016	31 December 2015
ICBC	16.53%	18.60%	0.63	0.62	5.21	4.80
CCB	17.16%	19.45%	0.78	0.77	6.21	5.78
BOC	13.66%	15.02%	0.44	0.43	4.38	4.09
ABC	17.10%	19.41%	0.47	0.47	3.79	3.48
BCM	12.84%	14.15%	0.70	0.70	7.49	7.00
CMB	18.36%	19.50%	2.07	1.92	15.72	14.31
CNCB	13.91%	15.89%	0.71	0.70	6.99	6.49
CMBC	16.58%	19.29%	1.07	1.10	8.95	8.26
SPDB	12.86%	14.37%	1.87	1.81	15.26	13.90
CIB	14.11%	15.75%	2.25	2.16	16.70	15.10
CEB	14.67%	16.83%	0.50	0.51	4.67	4.36
HXB	11.82%	12.90%	1.37	1.30	12.01	11.01
PAB	14.45%	16.06%	1.09	1.27	10.38	9.41
BOB	12.70%	13.88%	0.98	0.93	8.12	7.34
BON	12.83%	14.77%	1.05	0.85	8.54	7.78
NBCB	14.79%	14.65%	1.63	1.36	11.65	10.30
WRCB	9.23%	9.66%	0.42	0.38	4.72	4.33
BOJS	15.57%	16.52%	0.78	0.71	6.98	6.27
CRCB	9.16%	9.83%	0.39	0.36	4.39	4.04
GYB	17.24%	20.84%	1.46	1.36	8.93	7.76
JRCB	6.75%	8.36%	0.32	0.35	4.86	4.64
CQRCB	16.29%	16.99%	0.67	0.62	5.52	5.03
CQCB	17.61%	21.04%	0.95	0.99	7.55	6.81
Average	14.18%	15.82%	0.98	0.94	8.22	7.49

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Net interest margin

	Jan-Sep 2016	Jan-Sep 2015	Jan-Jun 2016	Jan-Jun 2015
ICBC	1.64%	2.50%	2.21%	2.53%
CCB	2.26%	2.64%	2.32%	2.67%
BOC	1.85%	2.14%	1.90%	2.18%
ABC	2.30%	2.78%	2.31%	2.78%
BCM	1.91%	2.24%	1.97%	2.27%
CMB	2.56%	2.75%	2.58%	2.78%
CNCB	2.01%	2.33%	2.12%	2.32%
CMBC	2.36%	2.29%	2.01%	2.35%
SPDB	2.86%	3.26%	2.14%	2.42%
CIB	3.29%	3.43%	2.18%	2.44%
CEB	2.33%	2.72%	1.88%	2.27%
HXB	2.47%	2.75%	2.48%	2.63%
PAB	2.73%	2.73%	N/A	N/A
BOB	2.10%	2.31%	N/A	N/A
BON	2.29%	2.61%	2.44%	2.65%
NBCB	2.00%	2.39%	2.04%	2.39%
WRCB	2.06%	N/A	N/A	N/A
BOJS	2.07%	N/A	N/A	N/A
CRCB	3.72%	N/A	N/A	N/A
GYB	3.33%	N/A	N/A	N/A
JRCB	2.43%	N/A	N/A	N/A
CQRCB	3.18%	3.20%	N/A	N/A
CQCB	2.97%	2.56%	N/A	N/A
Average	2.47%	2.65%	2.22%	2.49%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Operating income

	Net interest income			Net fee and commission income			Investment income			Other operating income			Operating income		
RMB million	Jan-Sep 2016	Jan-Sep 2015	Growth rate	Jan-Sep 2016	Jan-Sep 2015	Growth rate	Jan-Sep 2016	Jan-Sep 2015	Growth rate	Jan-Sep 2016	Jan-Sep 2015	Growth rate	Jan-Sep 2016	Jan-Sep 2015	Growth rate
ICBC	351,358	379,945	-8%	113,748	111,183	2%	6,565	7,570	-13%	46,103	25,930	78%	517,774	524,628	-1%
CCB	315,802	340,808	-7%	92,314	88,686	4%	13,912	4,712	195%	50,544	23,185	118%	472,572	457,391	3%
BOC	229,805	246,280	-7%	68,486	71,484	-4%	39,974	6,212	543%	30,805	32,797	-6%	369,070	356,773	3%
ABC	298,121	328,740	-9%	73,141	66,612	10%	4,193	118	3,453%	10,699	11,806	-9%	386,154	407,276	-5%
BCM	100,764	107,975	-7%	28,898	27,428	5%	2,428	61	3,880%	15,211	10,949	39%	147,301	146,413	1%
CMB	100,722	101,787	-1%	49,236	44,552	11%	9,755	6,744	45%	578	3,141	-82%	160,291	156,224	3%
CNCB	79,524	76,746	4%	30,973	26,068	19%	3,799	2,885	32%	1,040	1,754	-41%	115,336	107,453	7%
CMBC	70,889	70,489	1%	39,943	37,952	5%	6,764	4,818	40%	-1,215	2,911	-142%	116,381	116,170	0%
SPDB	81,850	82,529	-1%	31,140	21,222	47%	4,202	498	744%	3,736	4,383	-15%	120,928	108,632	11%
CIB	84,547	88,008	-4%	26,104	23,479	11%	10,259	2,103	388%	-2,252	-1,236	82%	118,658	112,354	6%
CEB	48,832	49,658	-2%	21,225	20,261	5%	136	177	-23%	561	-49	-1245%	70,754	70,047	1%
HXB	36,550	35,058	4%	10,770	8,220	31%	147	-241	-161%	128	135	-5%	47,595	43,172	10%
PAB	54,563	48,206	13%	24,174	20,223	20%	2,466	3,081	-20%	765	-358	-314%	81,968	71,152	15%
BOB	27,662	26,132	6%	8,082	5,775	40%	451	617	-27%	101	450	-78%	36,296	32,974	10%
BON	16,649	13,714	21%	3,155	2,627	20%	1,008	628	61%	249	-364	-168%	21,061	16,605	27%
NBCB	12,903	11,636	11%	4,690	2,906	61%	420	-145	-390%	-73	-273	-73%	17,940	14,124	27%
WRCB	1,711	1,614	6%	135	129	5%	47	28	68%	10	15	-33%	1,903	1,786	7%
BOJS	18,995	18,168	5%	4,647	2,877	62%	50	74	-32%	95	-76	-225%	23,787	21,043	13%
CRCB	2,919	2,241	30%	207	50	314%	108	78	38%	15	23	-35%	3,249	2,392	36%
GYB	5,936	5,040	18%	789	424	86%	339	120	183%	-	21	-100%	7,064	5,605	26%
JRCB	1,639	1,697	-3%	44	42	5%	148	97	53%	16	29	-45%	1,847	1,865	-1%
CQRCB	14,540	14,919	-3%	1,625	1,111	46%	111	4	2,675%	-97	117	-183%	16,179	16,151	0%
CQCB	5,846	5,176	13%	1,432	1,122	28%	7	-10	-170%	10	110	-91%	7,295	6,398	14%
Total	1,962,127	2,056,566	-5%	634,958	584,433	9%	107,289	40,229	167%	157,029	115,400	36%	2,861,403	2,796,628	2%

RMB million	Net interest income	Net fee and commission income	Investment income	Other operating income	Total operating income
Jan-Sep 2016	1,962,127	634,958	107,289	157,029	2,861,403
Jan-Sep 2015	2,056,566	584,433	40,229	115,400	2,796,628

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Operating income structure

	Net interest income %		Net fee and commission income %		Investment income %		Other operating income %	
	2016	2015	2016	2015	2016	2015	2016	2015
	Jan-Sep	Jan-Sep	Jan-Sep	Jan-Sep	Jan-Sep	Jan-Sep	Jan-Sep	Jan-Sep
ICBC	67.86%	72.42%	21.97%	21.19%	1.27%	1.44%	8.90%	4.95%
CCB	66.83%	74.51%	19.53%	19.39%	2.94%	1.03%	10.70%	5.07%
BOC	62.27%	69.03%	18.56%	20.04%	10.83%	1.74%	8.34%	9.19%
ABC	77.20%	80.72%	18.94%	16.36%	1.09%	0.03%	2.77%	2.89%
BCM	68.41%	73.75%	19.62%	18.73%	1.65%	0.04%	10.32%	7.48%
CMB	62.84%	65.15%	30.72%	28.52%	6.09%	4.32%	0.35%	2.01%
CNCB	68.95%	71.42%	26.85%	24.26%	3.29%	2.68%	0.91%	1.64%
CMBC	60.91%	60.68%	34.32%	32.67%	5.81%	4.15%	-1.04%	2.50%
SPDB	67.68%	75.97%	25.75%	19.54%	3.47%	0.46%	3.10%	4.03%
CIB	71.25%	78.33%	22.00%	20.90%	8.65%	1.87%	-1.90%	-1.10%
CEB	69.02%	70.89%	30.00%	28.92%	0.19%	0.25%	0.79%	-0.06%
HXB	76.79%	81.21%	22.63%	19.04%	0.31%	-0.56%	0.27%	0.31%
PAB	66.57%	67.75%	29.49%	28.42%	3.01%	4.33%	0.93%	-0.50%
BOB	76.21%	79.25%	22.27%	17.51%	1.24%	1.87%	0.28%	1.37%
BON	79.05%	82.59%	14.98%	15.82%	4.79%	3.78%	1.18%	-2.19%
NBCB	71.93%	82.38%	26.14%	20.57%	2.34%	-1.03%	-0.41%	-1.92%
WRCB	89.88%	90.37%	7.09%	7.22%	2.44%	1.59%	0.59%	0.82%
BOJS	79.86%	86.34%	19.53%	13.67%	0.21%	0.35%	0.40%	-0.36%
CRCB	89.84%	93.70%	6.36%	2.08%	3.34%	3.26%	0.46%	0.96%
GYB	84.04%	89.91%	11.17%	7.56%	4.79%	2.15%	0.00%	0.38%
JRCB	88.74%	90.99%	2.39%	2.25%	8.03%	5.21%	0.84%	1.55%
CQRCB	89.87%	92.38%	10.05%	6.88%	0.68%	0.03%	-0.60%	0.71%
CQCB	80.14%	80.89%	19.64%	17.54%	0.10%	-0.16%	0.12%	1.73%
Average	74.61%	78.72%	20.00%	17.79%	3.33%	1.69%	2.06%	1.80%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Operating expenses

RMB million	Jan-Sep 2016	Jan-Sep 2015	Growth rate
ICBC	229,224	235,754	-2.77%
CCB	227,699	214,519	6.14%
BOC	187,801	178,761	5.06%
ABC	196,547	211,461	-7.05%
BCM	80,447	79,281	1.47%
CMB	93,774	92,637	1.23%
CNCB	69,872	63,722	9.65%
CMBC	66,395	65,565	1.27%
SPDB	67,416	60,271	11.85%
CIB	65,586	60,230	8.89%
CEB	38,642	38,436	0.54%
HXB	28,096	24,585	14.28%
PAB	25,808	27,912	-7.54%
BOB	17,694	15,127	16.97%
BON	12,720	9,962	27.69%
NBCB	10,342	7,496	37.98%
WRCB	1,014	926	9.49%
BOJS	13,320	11,630	14.54%
CRCB	2,223	1,442	54.08%
GYB	3,959	2,612	51.59%
JRCB	1,291	1,250	3.31%
CQRCB	6,154	6,421	-4.16%
CQCB	1,743	2,112	-17.48%
Total	1,447,767	1,412,112	2.52%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Cost-to-income ratios

	Jan-Sep 2016	Jan-Sep 2015	Growth rate
ICBC	22.64%	23.03%	-1.69%
CCB	24.12%	24.04%	0.33%
BOC	26.49%	26.57%	-0.30%
ABC	30.92%	30.40%	1.71%
BCM	29.89%	28.57%	4.62%
CMB	25.22%	25.09%	0.52%
CNCB	26.40%	25.86%	2.09%
CMBC	26.70%	27.85%	-4.13%
SPDB	21.38%	20.35%	5.06%
CIB	20.49%	20.67%	-0.87%
CEB	27.84%	26.44%	5.30%
HXB	34.80%	35.47%	-1.89%
PAB	27.70%	32.14%	-13.81%
BOB	23.84%	23.05%	3.43%
BON	21.45%	23.83%	-9.99%
NBCB	32.82%	30.39%	8.00%
WRCB	30.95%	32.31%	-4.21%
BOJS	26.29%	29.37%	-10.49%
CRCB	34.40%	34.97%	-1.63%
GYB	23.86%	26.05%	-8.41%
JRCB	33.37%	N/A	N/A
CQRCB	34.41%	32.95%	4.43%
CQCB	20.62%	26.59%	-22.45%
Average	27.24%	27.55%	-2.11%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - General and administrative expenses

RMB million	Jan-Sep 2016	Jan-Sep 2015	Growth rate
ICBC	117,223	120,815	-2.97%
CCB	102,694	105,784	-2.92%
BOC	97,778	94,777	3.17%
ABC	119,392	123,794	-3.56%
BCM	43,541	41,209	5.66%
CMB	40,419	39,204	3.10%
CNCB	30,450	27,787	9.58%
CMBC	31,074	32,352	-3.95%
SPDB	25,851	22,109	16.93%
CIB	24,072	22,846	5.37%
CEB	19,699	18,519	6.37%
HXB	16,562	15,313	8.16%
PAB	22,708	22,866	-0.69%
BOB	8,654	7,602	13.84%
BON	4,517	3,957	14.15%
NBCB	5,888	4,292	37.19%
WRCB	588	550	6.91%
BOJS	6,255	5,931	5.46%
CRCB	1,118	808	38.37%
GYB	1,685	1,460	15.41%
JRCB	616	554	11.19%
Total	720,784	712,529	1.16%

The data of CQRCB and CQCB had not been disclosed.

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Impairment losses

RMB million	Jan-Sep 2016	Jan-Sep 2015	Growth rate
ICBC	63,906	61,569	3.80%
CCB	63,704	64,123	-0.65%
BOC	63,966	44,893	42.49%
ABC	60,535	57,365	5.53%
BCM	21,598	20,878	3.45%
CMB	47,640	43,952	8.39%
CNCB	35,396	28,465	24.35%
CMBC	30,665	24,844	23.43%
SPDB	37,485	30,950	21.11%
CIB	35,979	27,576	30.47%
CEB	16,113	14,550	10.74%
HXB	9,802	6,061	61.72%
PAB	31,615	19,935	58.59%
BOB	7,879	5,372	46.67%
BON	7,253	4,679	55.01%
NBCB	3,958	2,414	63.96%
WRCB	371	267	38.95%
BOJS	6,140	4,228	45.22%
CRCB	1,032	517	99.61%
GYB	2,039	715	185.17%
JRCB	630	597	5.53%
CQRCB	1,652	2,054	-19.57%
CQCB	1,621	621	161.03%
Total	550,979	466,626	18.08%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Total assets

RMB million	Cash and balances with central bank		Loans and advances to customers		Investments		Interbank assets		Other assets		Total assets	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec
ICBC	3,302,564	3,059,633	12,629,838	11,652,812	5,469,130	5,009,963	1,278,745	1,680,126	966,195	807,246	23,646,472	22,209,780
CCB	2,725,492	2,401,544	11,248,007	10,234,523	5,109,136	4,271,406	750,071	974,472	667,977	467,544	20,500,683	18,349,489
BOC	2,329,505	2,269,434	9,648,243	8,935,195	3,930,760	3,595,095	1,160,148	1,007,855	788,847	1,008,018	17,857,503	16,815,597
ABC	2,862,087	2,587,057	9,220,381	8,506,675	5,202,322	4,512,047	1,208,129	1,673,984	571,182	511,630	19,064,101	17,791,393
BCM	957,192	920,228	3,931,176	3,634,568	2,147,297	1,661,100	704,370	611,191	351,775	328,275	8,091,810	7,155,362
CMB	561,201	584,342	3,062,607	2,739,444	1,391,315	1,427,841	397,852	593,396	151,015	129,955	5,563,990	5,474,978
CNCB	529,776	511,189	2,772,772	2,468,283	1,825,617	1,692,127	255,179	338,140	158,191	112,553	5,541,535	5,122,292
CMBC	455,086	432,831	2,389,447	1,997,625	2,046,069	913,562	423,679	901,302	322,296	275,368	5,636,577	4,520,688
SPDB	464,525	481,157	2,481,542	2,171,413	2,113,603	1,883,327	333,502	359,412	171,110	149,043	5,564,282	5,044,352
CIB	419,173	417,911	1,888,745	1,724,822	3,037,338	2,597,027	261,587	324,607	210,061	234,513	5,816,904	5,298,880
CEB	357,017	326,735	1,711,472	1,475,424	1,271,443	903,871	366,579	371,717	129,856	89,963	3,836,367	3,167,710
HXB	262,536	264,094	1,171,201	1,041,937	556,820	357,075	245,536	325,763	37,630	31,735	2,273,723	2,020,604
PAB	303,936	291,715	1,393,854	1,186,872	708,621	594,803	210,905	302,973	173,922	130,786	2,791,238	2,507,149
BOB	167,076	153,182	852,875	747,917	538,422	419,104	448,590	493,628	35,880	31,078	2,042,843	1,844,909
BON	94,445	78,780	305,595	242,227	527,720	424,149	74,351	40,559	21,106	19,305	1,023,217	805,020
NBCB	79,253	66,189	283,309	248,399	430,841	360,200	27,518	26,562	16,769	15,114	837,690	716,464
WRCB	15,632	15,026	58,748	54,024	36,247	30,510	5,850	13,295	2,835	2,636	119,312	115,491
BOJS	131,468	121,097	618,715	546,389	664,003	461,939	100,425	135,929	48,357	24,978	1,562,968	1,290,332
CRCB	12,442	12,219	61,726	55,803	41,324	33,371	6,795	4,259	3,228	2,852	125,515	108,504
GYB	36,628	29,491	95,259	80,214	165,280	112,672	16,539	10,339	13,613	5,481	327,319	238,197
JRCB	10,730	13,410	49,199	48,020	39,018	25,708	1,970	1,221	2,336	2,120	103,253	90,479
CQRCB	87,134	78,500	288,048	257,541	244,628	213,384	162,394	153,314	13,637	14,066	795,841	716,805
CQCB	39,942	38,201	143,118	121,816	103,684	108,108	61,088	45,857	6,920	5,825	354,752	319,807
Total	16,204,840	15,153,965	66,305,877	60,171,943	37,600,638	31,608,389	8,501,802	10,389,901	4,864,738	4,400,084	133,477,895	121,724,282

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Total asset structure

	Cash and balances with central bank %		Loans and advances to customers %		Investment %		Interbank assets %		Other assets %	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec
ICBC	13.97%	13.78%	53.41%	52.47%	23.13%	22.56%	5.41%	7.56%	4.08%	3.63%
CCB	13.29%	13.09%	54.87%	55.77%	24.92%	23.28%	3.66%	5.31%	3.26%	2.55%
BOC	13.04%	13.50%	54.03%	53.14%	22.01%	21.38%	6.50%	5.99%	4.42%	5.99%
ABC	15.01%	14.54%	48.37%	47.81%	27.29%	25.36%	6.34%	9.41%	2.99%	2.88%
BCM	11.83%	12.86%	48.58%	50.80%	26.54%	23.21%	8.70%	8.54%	4.35%	4.59%
CMB	10.09%	10.67%	55.04%	50.04%	25.01%	26.08%	7.15%	10.84%	2.71%	2.37%
CNCB	9.56%	9.98%	50.05%	48.19%	32.94%	33.03%	4.60%	6.60%	2.85%	2.20%
CMBC	8.07%	9.57%	42.39%	44.19%	36.30%	20.21%	7.52%	19.94%	5.72%	6.09%
SPDB	8.35%	9.54%	44.60%	43.05%	37.99%	37.34%	5.99%	7.12%	3.07%	2.95%
CIB	7.21%	7.89%	32.47%	32.55%	52.21%	49.01%	4.50%	6.12%	3.61%	4.43%
CEB	9.31%	10.31%	44.61%	46.58%	33.14%	28.54%	9.56%	11.73%	3.38%	2.84%
HXB	11.55%	13.07%	51.51%	51.57%	24.49%	17.67%	10.80%	16.12%	1.65%	1.57%
PAB	10.89%	11.64%	49.94%	47.34%	25.39%	23.72%	7.55%	12.08%	6.23%	5.22%
BOB	8.18%	8.30%	41.75%	40.54%	26.36%	22.72%	21.96%	26.76%	1.75%	1.68%
BON	9.23%	9.78%	29.87%	30.09%	51.57%	52.69%	7.27%	5.04%	2.06%	2.40%
NBCB	9.46%	9.24%	33.82%	34.67%	51.43%	50.27%	3.29%	3.71%	2.00%	2.11%
WRCB	13.10%	13.01%	49.24%	46.78%	30.38%	26.42%	4.90%	11.51%	2.38%	2.28%
BOJS	8.41%	9.38%	39.59%	42.35%	42.48%	35.80%	6.43%	10.53%	3.09%	1.94%
CRCB	9.91%	11.26%	49.18%	51.43%	32.93%	30.76%	5.41%	3.92%	2.57%	2.63%
GYB	11.19%	12.38%	29.11%	33.68%	50.49%	47.30%	5.05%	4.34%	4.16%	2.30%
JRCB	10.39%	14.82%	47.65%	53.08%	37.79%	28.41%	1.91%	1.35%	2.26%	2.34%
CQRCB	10.95%	10.95%	36.19%	35.93%	30.74%	29.77%	20.41%	21.39%	1.71%	1.96%
CQCB	11.26%	11.95%	40.34%	38.09%	29.23%	33.80%	17.22%	14.34%	1.95%	1.82%
Average	10.62%	11.37%	44.64%	44.79%	33.69%	30.84%	7.92%	10.01%	3.14%	2.99%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Scale of loan

RMB million	30 September 2016	31 December 2015	Growth rate
ICBC	12,914,203	11,933,466	8.22%
CCB	11,515,397	10,485,140	9.83%
BOC	9,875,808	9,135,860	8.10%
ABC	9,617,343	8,909,918	7.94%
BCM	4,023,430	3,722,006	8.10%
CMB	3,173,088	2,824,286	12.35%
CNCB	2,838,800	2,528,780	12.26%
CMBC	2,448,871	2,048,048	19.57%
SPDB	2,570,186	2,245,518	14.46%
CIB	1,964,223	1,779,408	10.39%
CEB	1,752,246	1,513,543	15.77%
HXB	1,203,982	1,069,172	12.61%
PAB	1,430,514	1,216,138	17.63%
BOB	884,900	775,390	14.12%
BON	318,375	251,198	26.74%
NBCB	293,134	255,689	14.64%
WRCB	60,369	55,505	8.76%
BOJS	635,334	561,783	13.09%
CRCB	63,855	57,611	10.84%
GYB	98,705	83,174	18.67%
JRCB	51,348	49,857	2.99%
CQRCB	299,677	268,586	11.58%
CQCB	147,119	124,769	17.91%
Total	68,180,907	61,894,845	10.16%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Loan quality

	NPL ratio		Allowance to NPL		Allowance to total loans ratio	
	30 September 2016	31 December 2015	30 September 2016	31 December 2015	30 September 2016	31 December 2015
ICBC	1.62%	1.50%	136.14%	156.34%	2.21%	2.35%
CCB	1.56%	1.58%	148.78%	150.99%	2.32%	2.39%
BOC	1.48%	1.43%	155.83%	153.30%	2.31%	2.19%
ABC	2.39%	2.39%	172.73%	189.43%	4.13%	4.53%
BCM	1.53%	1.51%	150.31%	155.57%	2.30%	2.35%
CMB	1.87%	1.68%	186.39%	178.95%	3.49%	3.01%
CNCB	1.50%	1.43%	154.94%	167.81%	2.32%	2.40%
CMBC	1.57%	1.60%	154.40%	153.63%	2.42%	2.46%
SPDB	1.72%	1.56%	200.14%	211.40%	3.44%	3.30%
CIB	1.71%	1.46%	224.68%	210.08%	3.84%	3.07%
CEB	1.51%	1.61%	154.06%	156.39%	2.33%	2.52%
HXB	1.60%	1.52%	169.96%	167.12%	2.72%	2.54%
PAB	1.56%	1.45%	164.39%	165.86%	2.56%	2.40%
BOB	1.20%	1.12%	275.20%	278.39%	3.30%	3.12%
BON	0.87%	0.83%	459.75%	430.95%	4.00%	3.58%
NBCB	0.91%	0.92%	368.75%	308.67%	3.36%	2.84%
WRCB	1.29%	1.17%	208.18%	227.92%	2.69%	2.67%
BOJS	1.43%	1.43%	182.86%	192.06%	2.61%	2.75%
CRCB	1.41%	1.43%	236.49%	219.18%	3.33%	3.13%
GYB	1.48%	1.48%	236.12%	239.98%	3.49%	3.55%
JRCB	2.42%	2.17%	172.84%	169.72%	4.18%	3.68%
CQRCB	0.96%	0.98%	405.09%	420.03%	3.89%	4.12%
CQCB	0.97%	0.97%	281.28%	243.98%	2.73%	2.37%
Average	1.50%	1.44%	217.36%	215.12%	3.04%	2.93%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Liability

RMB million	Deposits from customers		Liabilities from banks and other financial institutions		Debt certificates issued		Other liabilities		Total	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec
ICBC	17,754,418	16,281,939	2,324,083	2,603,051	338,651	306,622	1,275,325	1,217,649	21,692,477	20,409,261
CCB	15,277,178	13,668,533	2,062,816	2,029,119	445,601	415,544	1,143,640	791,210	18,929,235	16,904,406
BOC	12,974,479	11,729,171	1,770,712	2,212,264	352,440	282,929	1,294,971	1,233,628	16,392,602	15,457,992
ABC	14,997,769	13,538,360	1,313,738	1,626,464	404,067	382,742	1,035,502	1,031,942	17,751,076	16,579,508
BCM	4,728,274	4,484,814	1,679,280	1,505,919	188,713	170,106	876,665	456,431	7,472,932	6,617,270
CMB	3,615,989	3,571,698	975,333	1,075,984	306,636	251,507	268,598	214,031	5,166,556	5,113,220
CNCB	3,392,444	3,182,775	1,138,313	1,188,960	470,981	289,135	192,369	141,736	5,194,107	4,802,606
CMBC	2,998,848	2,732,262	1,438,088	1,039,904	415,607	181,233	448,329	257,506	5,300,872	4,210,905
SPDB	2,993,443	2,954,149	1,335,555	1,261,742	666,311	399,906	204,367	109,955	5,199,676	4,725,752
CIB	2,514,084	2,483,923	1,883,564	1,917,401	840,980	414,834	230,265	165,345	5,468,893	4,981,503
CEB	2,131,891	1,993,843	866,266	660,244	425,563	210,061	164,006	79,515	3,587,726	2,943,663
HXB	1,371,454	1,351,663	404,224	414,832	232,970	66,893	115,993	68,828	2,124,641	1,902,216
PAB	1,912,878	1,733,921	259,682	334,249	325,419	212,963	95,031	64,516	2,593,010	2,345,649
BOB	1,139,250	1,022,300	448,381	474,786	252,718	174,639	59,572	56,370	1,899,921	1,728,095
BON	646,785	504,197	123,747	132,077	149,451	86,887	41,179	29,445	961,161	752,606
NBCB	488,773	355,686	141,626	135,331	120,487	144,057	36,439	36,294	787,324	671,367
WRCB	94,628	87,213	6,185	11,993	5,309	4,287	4,365	4,679	110,487	108,173
BOJS	914,419	776,428	391,546	366,659	127,300	51,649	48,719	30,062	1,481,984	1,224,799
CRCB	87,103	82,291	17,984	11,343	6,653	2,988	3,417	3,454	115,156	100,077
GYB	255,667	180,987	8,291	10,702	36,857	28,079	5,133	4,295	305,948	224,063
JRCB	73,122	67,653	14,727	11,691	3,682	-	2,853	3,620	94,384	82,964
CQRCB	530,158	470,228	132,003	144,757	52,340	34,847	28,401	18,686	742,901	668,517
CQCB	225,390	199,299	61,629	73,236	39,036	18,491	5,078	7,490	331,133	298,515
Total	91,118,444	83,453,333	18,797,773	19,242,708	6,207,772	4,130,399	7,580,217	6,026,687	123,704,202	112,853,127

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Total liability structure

	Deposits from customers %		Liabilities from banks and other financial institutions %		Debt certificates issued %		Other liabilities %	
	2016	2015	2016	2015	2016	2015	2016	2015
	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec
ICBC	81.85%	79.78%	10.71%	12.75%	1.56%	1.50%	5.88%	5.97%
CCB	80.71%	80.86%	10.90%	12.00%	2.35%	2.46%	6.04%	4.68%
BOC	79.15%	75.88%	10.80%	14.31%	2.15%	1.83%	7.90%	7.98%
ABC	84.49%	81.66%	7.40%	9.81%	2.28%	2.31%	5.83%	6.22%
BCM	63.27%	67.77%	22.47%	22.76%	2.53%	2.57%	11.73%	6.90%
CMB	69.99%	69.85%	18.88%	21.04%	5.94%	4.92%	5.20%	4.19%
CNCB	65.31%	66.27%	21.92%	24.76%	9.07%	6.02%	3.70%	2.95%
CMBC	56.57%	64.89%	27.13%	24.70%	7.84%	4.29%	8.46%	6.12%
SPDB	57.57%	62.51%	25.69%	26.70%	12.81%	8.46%	3.93%	2.33%
CIB	45.97%	49.86%	34.44%	38.49%	15.38%	8.33%	4.21%	3.32%
CEB	59.42%	67.73%	24.15%	22.43%	11.86%	7.14%	4.57%	2.70%
HXB	64.54%	71.06%	19.03%	21.81%	10.97%	3.51%	5.46%	3.62%
PAB	73.78%	73.92%	10.01%	14.25%	12.55%	9.08%	3.66%	2.75%
BOB	59.96%	59.16%	23.60%	27.47%	13.30%	10.11%	3.14%	3.26%
BON	67.29%	66.99%	12.87%	17.55%	15.56%	11.55%	4.28%	3.91%
NBCB	62.08%	52.98%	17.99%	20.16%	15.30%	21.45%	4.63%	5.41%
WRCB	85.64%	80.62%	5.60%	11.09%	4.81%	3.96%	3.95%	4.33%
BOJS	61.70%	63.39%	26.42%	29.94%	8.59%	4.22%	3.29%	2.45%
CRCB	75.63%	82.23%	15.62%	11.33%	5.78%	2.99%	2.97%	3.45%
GYB	83.56%	80.78%	2.71%	4.78%	12.05%	12.52%	1.68%	1.92%
JRCB	77.48%	81.55%	15.60%	14.09%	3.90%	0.00%	3.02%	4.36%
CQRCB	71.36%	70.34%	17.77%	21.65%	7.05%	5.21%	3.82%	2.80%
CQCB	68.07%	66.77%	18.61%	24.53%	11.79%	6.19%	1.53%	2.51%
Average	69.36%	70.30%	17.41%	19.50%	8.50%	6.11%	4.73%	4.09%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Investment structure

RMB million	Financial assets at fair value through profit or loss		Available-for-sale financial assets		Held-to-maturity investment		Investment classified as receivables		Total	
	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec	30 Sep	31 Dec
ICBC	492,992	343,272	1,712,001	1,444,195	2,937,066	2,870,353	327,071	352,143	5,469,130	5,009,963
CCB	369,906	271,173	1,734,867	1,066,752	2,434,381	2,563,980	569,982	369,501	5,109,136	4,271,406
BOC	133,588	119,062	1,550,270	1,078,533	1,814,401	1,790,790	432,501	606,710	3,930,760	3,595,095
ABC	453,036	439,261	1,338,168	1,214,542	2,806,081	2,300,824	605,037	557,420	5,202,322	4,512,047
BCM	185,227	138,999	304,323	264,739	1,305,974	933,683	351,773	323,679	2,147,297	1,661,100
CMB	60,141	59,081	344,407	299,559	466,028	353,137	520,739	716,064	1,391,315	1,427,841
CNCB	63,563	26,220	499,814	373,770	185,051	179,930	1,077,189	1,112,207	1,825,617	1,692,127
CMBC	43,504	26,959	267,756	157,000	655,932	278,364	1,078,877	451,239	2,046,069	913,562
SPDB	170,053	63,746	285,622	254,846	328,269	239,703	1,329,659	1,325,032	2,113,603	1,883,327
CIB	410,895	128,685	400,336	426,634	246,991	206,802	1,979,116	1,834,906	3,037,338	2,597,027
CEB	12,132	5,637	412,430	222,495	188,985	152,312	657,896	523,427	1,271,443	903,871
HXB	5,258	11,872	90,975	73,200	255,257	194,543	205,330	77,460	556,820	357,075
PAB	15,984	19,757	1,502	1,245	282,862	266,166	408,273	307,635	708,621	594,803
BOB	22,290	16,522	149,346	127,941	183,112	147,562	183,674	127,079	538,422	419,104
BON	36,008	19,552	109,519	110,546	112,488	85,577	269,705	208,474	527,720	424,149
NBCB	10,726	7,040	293,769	249,258	36,883	32,672	89,463	71,231	430,841	360,201
WRCB	2,220	1,088	19,057	8,843	9,939	16,957	5,031	3,622	36,247	30,510
BOJS	5,689	715	343,837	205,824	124,584	116,134	189,893	139,267	664,003	461,939
CRCB	1,728	1,239	17,429	13,570	11,176	10,893	10,991	7,669	41,324	33,371
GYB	2,373	1,073	66,638	48,976	50,969	37,108	45,300	25,514	165,280	112,672
JRCB	1,451	1,311	24,975	12,780	11,292	10,417	1,300	1,200	39,018	25,708
CQRCB	4,670	4,156	44,258	12,502	66,971	63,650	128,729	133,076	244,628	213,384
CQCB	738	2,313	22,223	18,971	18,228	13,817	62,496	73,008	103,684	108,108
Total	2,504,172	1,708,733	10,033,522	7,686,721	14,532,920	12,865,374	10,530,025	9,347,563	37,600,638	31,608,390

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Loan-to-deposit ratio

	30 September 2016	31 December 2015
ICBC	72.74%	71.40%
CCB	75.38%	69.80%
BOC	76.12%	77.89%
ABC	64.13%	65.81%
BCM	85.09%	74.08%
CMB	87.75%	73.93%
CNCB	83.68%	79.45%
CMBC	81.66%	71.00%
SPDB	85.86%	76.01%
CIB	78.13%	67.62%
CEB	82.19%	73.59%
HXB	80.50%	75.29%
PAB	74.78%	69.01%
BOB	77.67%	75.85%
BON	49.22%	49.82%
NBCB	54.04%	63.73%
WRCB	63.80%	63.64%
BOJS	69.48%	72.35%
CRCB	73.31%	70.01%
GYB	38.61%	45.96%
JRCB	70.06%	73.51%
CQRCB	56.53%	57.12%
CQCB	65.27%	62.60%
Average	71.57%	68.67%

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Capital adequacy ratio and tier 1 capital adequacy ratio

	Capital adequacy ratio		Tier 1 capital adequacy ratio	
	30 September 2016	31 December 2015	30 September 2016	31 December 2015
ICBC	14.18%	15.22%	13.13%	13.48%
CCB	15.36%	15.39%	13.54%	13.32%
BOC	14.12%	14.06%	12.21%	12.07%
ABC	13.21%	13.40%	11.03%	10.96%
BCM	14.17%	13.49%	12.30%	11.46%
CMB	14.16%	12.57%	12.44%	10.83%
CNCB	11.47%	11.87%	9.15%	9.17%
CMBC	11.72%	11.49%	9.09%	9.19%
SPDB	12.24%	12.29%	9.63%	9.45%
CIB	12.54%	11.19%	9.59%	9.19%
CEB	11.24%	11.87%	9.73%	10.15%
HXB	11.76%	10.85%	9.92%	8.89%
PAB	11.97%	10.94%	9.67%	9.03%
BON	14.21%	13.11%	10.14%	10.35%
NBCB	12.51%	13.29%	9.67%	10.12%
WRCB	13.31%	13.59%	10.79%	10.69%
BOJS	11.57%	11.54%	9.05%	8.60%
CRCB	13.69%	12.51%	11.36%	11.33%
GYB	14.52%	13.54%	12.12%	10.68%
JRCB	14.18%	13.99%	13.01%	12.87%
CQRCB	12.04%	11.99%	9.92%	9.89%
CQCB	12.85%	11.63%	10.79%	10.49%
Average	13.05%	12.72%	10.83%	10.56%

The data of BOB is not disclosed.

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Appendix - Liquidity coverage ratio and leverage ratio

	Liquidity coverage ratio		Leverage ratio	
	30 September 2016	31 December 2015	30 September 2016	31 December 2015
ICBC	133.14%	149.51%	7.57%	7.48%
CCB	117.08%	132.91%	7.12%	7.28%
BOC	117.54%	119.33%	7.08%	7.03%
ABC	137.80%	127.50%	6.43%	6.33%
BCM	116.43%	115.60%	6.95%	6.70%
CMB	96.51%	113.61%	5.99%	5.54%
CNCB	89.64%	87.78%	4.86%	5.00%
CMBC	N/A	88.21%	5.14%	5.60%
SPDB	77.14%	78.31%	5.56%	5.31%
CIB	N/A	90.35%	N/A	5.23%
CEB	N/A	84.78%	5.65%	5.95%
HXB	82.26%	75.54%	5.59%	4.86%
PAB	96.36%	140.82%	5.63%	4.94%
BOB	82.72%	90.11%	5.89%	5.33%
BON	N/A	118.88%	N/A	5.59%
NBCB	112.78%	100.34%	5.27%	5.40%
WRCB	N/A	N/A	N/A	N/A
BOJS	110.06%	N/A	N/A	N/A
CRCB	N/A	N/A	N/A	N/A
GYB	N/A	N/A	N/A	N/A
JRCB	N/A	N/A	7.97%	7.73%
CQRCB	141.25%	90.04%	6.32%	6.40%
CQCB	N/A	N/A	N/A	N/A

Source: The banks' 2015 Q3 & 2016 Q3 reports; KPMG China research

Glossary of abbreviated terms

Bank names

- PBOC – People's Bank of China
- ICBC – Industrial and Commercial Bank of China
- CCB – China Construction Bank
- BOC – Bank of China
- ABC – Agricultural Bank of China
- BCM – Bank of Communications
- CMB – China Merchants Bank
- CNCB – China CITIC Bank
- CMBC – China Minsheng Bank
- SPDB – Shanghai Pudong Development Bank
- CIB – Industrial Bank
- CEB – China Everbright Bank
- HXB – Hua Xia Bank Co.,Ltd
- PAB – PingAn Bank Co., Ltd
- BOB – Bank of Beijing Co., Ltd
- BON – Bank of Nanjing Co., Ltd
- NBCB – Bank of Ningbo Co., Ltd
- WRCB-Wuxi Rural Commercial Bank
- BOJS-Bank of Jiangsu
- CRCB-Changshu Rural Commercial Bank
- GYB-Bank of Guiyang Co., Ltd
- JRCB-Jiangyin Rural Commercial Bank
- CQRCB-Chongqing Rural Commercial Bank
- CQCB-Bank of Chongqing Co., Ltd

General terms

- MOF – Ministry of Finance
- CBRC – China Banking Regulatory Commission
- CSRC – China Securities Regulatory Commission
- SAFE – State Administration of Foreign Exchange
- SSE – Shanghai Stock Exchange
- SEHK – The Stock Exchange of Hong Kong
- SHIBOR – Shanghai Interbank Offered Rate
- NIM – Net interest margin

NOTE: As at 30 September 2016, there were 21 A-share listed banks. They are ICBC, CCB, COC, ABC, BCM, CMB, CNCB, CMBC, SPDB, CIB, CEB, HXB, PAB, BOB, BON, NBCB, WRCB, BOJ, JCRCB, BOG and JJRCB. Among them, ICBC, CCB, COC, ABC, BCM, CMBC, CNCB, CEB and CMB are listed on both the SSE and SEHK. PAB, NBCB and JJRCB are listed on the Shenzhen Stock Exchange. The rest are listed on the SSE.

As at 30 September 2016, there were 11 H-share listed banks. They are Postal Savings Bank of China, China Zheshang Bank, Bank of Jinzhou, Huishang Bank, Shengjing Bank, CRCB, Bank of Tianjin, BOCQ, Bank of Qingdao, Bank of Zhengzhou and Harbin Bank. So far, only BOCQ and CRCB have disclosed Q3 reports.

Contact us

KPMG China operates in 16 cities across China, with around 10,000 partners and staff in Beijing, Beijing Zhongguancun, Chengdu, Chongqing, Foshan, Fuzhou, Guangzhou, Hangzhou, Nanjing, Qingdao, Shanghai, Shenyang, Shenzhen, Tianjin, Xiamen, Hong Kong SAR and Macau SAR.

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