

China Banks

A deeper dive into hidden NPLs

Equities

China
Financial

Hidden NPLs highly sensitive to declining EBITDA margins

A key finding in our hidden NPL analysis was that if we reduce the EBITDA margin of all non-financial A-share companies by 3ppt, then our hidden NPL ratio would increase from 11.7% to 22.0% for H115. Interestingly, we note the impact is asymmetrical, as a 3ppt improvement in EBITDA margin only reduces the hidden NPL ratio to 10.6%. Intuitively, we think this is sensible given the current asset quality deterioration environment means there are probably many companies just barely making ends meet. This is reflected by the fact that about 6% of the total liabilities of all non-financial A-share companies range between 1x and 2x EBITDA/interest coverage. However, the more encouraging news is that nearly half of the companies are still >5x covered.

Hidden NPLs not so sensitive to rate cuts

Assuming no changes to pricing power, the hidden NPL ratio could decline by just over 1ppt after accounting for 1.5% benchmark lending rate cut according to our calculation. The second line in Figure 3 shows the case since three rate cuts of 75bp since end-June 2015. Figures 1 and 3 show how different levels of 1) revenue, 2) EBITDA margin and 3) interest rates (compared with the existing level) can affect the hidden NPL ratio. At the sector level, changes to the manufacturing sector have the greatest impact on overall NPLs (Figure 4).

Lowering bond spreads could be affected by short-term rates

We believe the rising leverage of fixed income funds (driven by the low short-term rates) and the assumed bailout are driving lower credit spreads in the bond market (interestingly, this coincided with the beginning of A-share volatility back in June). If short-term liquidity tightens, leading to sudden spikes in short-term rates, then counterparty risks could increase significantly (due to duration mismatch). This could be triggered by rising maturities for bonds and trusts beginning in December 2015. Lower credit spreads mean banks are subject to anti-selection because corporates with better access to funding can raise funds at a lower rate from the bond market.

We maintain our cautious sector view; top picks BOC and CCB

We remain selective in our stock picks and continue to prefer Bank of China (BOC) for the "One Belt, One Road" initiative and rising US rates, and China Construction Bank (CCB) for its strong capital positioning and likely rising infrastructure spending in China.

Valuation comparison

Banks	Price	PT	PT Upside	Rating	Market cap (US\$ bn)	A-H premium	P/E (x)		P/BV (x)		ROA		ROE		Dividend yield	
	(HK\$)	(HK\$)	%				15E	16E	15E	16E	15E	16E	15E	16E	15E	16E
BOC	3.67	4.5	23%	Buy	169	30%	5.2	5.2	0.7	0.7	1.1%	1.0%	14.9%	13.4%	6.1%	6.1%
CCB	5.63	6.5	15%	Buy	183	19%	5.0	5.1	0.8	0.7	1.3%	1.2%	17.4%	15.2%	6.4%	6.2%
CITIC	5.03	5.0	-1%	Neutral	42	56%	4.7	5.2	0.6	0.6	1.0%	0.8%	14.3%	11.7%	6.1%	5.7%
CMB	20.35	20.0	-2%	Neutral	71	8%	7.4	7.8	1.2	1.1	1.2%	1.0%	17.0%	14.3%	4.0%	3.8%
ABC	3.18	3.0	-6%	Neutral	159	21%	4.7	4.9	0.8	0.7	1.1%	0.9%	17.1%	14.8%	6.8%	6.6%
BoCOM	5.74	6.0	5%	Neutral	55	36%	5.4	5.8	0.7	0.6	1.0%	0.8%	13.3%	11.5%	5.6%	5.2%
Cinda	3.03	3.0	-1%	Neutral	14	na	6.8	7.0	0.9	0.8	2.2%	1.8%	13.4%	11.9%	4.4%	4.3%
CQRCB	4.89	4.0	-18%	Sell	6	na	5.1	5.4	0.8	0.7	1.1%	0.9%	16.3%	13.9%	5.2%	5.0%
Huishang	3.34	2.8	-16%	Sell	5	na	5.2	5.4	0.8	0.7	1.1%	0.9%	15.5%	13.4%	5.8%	5.6%
BoCQ	5.81	4.5	-23%	Sell	2	na	4.4	4.7	0.7	0.6	1.0%	0.9%	17.2%	14.4%	5.9%	5.6%

Note: Above data as at 30 October 2015.

Source: Bloomberg, UBS estimates

www.ubs.com/investmentresearch

This report has been prepared by UBS Securities Asia Limited. **ANALYST CERTIFICATION AND REQUIRED DISCLOSURES BEGIN ON PAGE 8.** UBS does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

Lucy Feng

Analyst

lucy.feng@ubs.com

+852-2971 7157

David Chung

Analyst

david.chung@ubs.com

+852-3712 4512

Ben Huang

Analyst

ben.huang@ubs.com

+852-2971 5526

The good, the bad and the ugly – hidden NPL analysis 2.0

We have had overwhelming interest in our hidden NPL analysis ([LINK](#) to note) published on 8 October 2015. We continue to fine-tune or adjust our analysis to ensure it can best help answer investors' queries.

Declining EBITDA margins could significantly increase NPLs

A question that has arisen with investors is: how would an adjustment to revenue or EBITDA margin affect the hidden NPL ratio?

As Figure 1 demonstrates, positive increments to revenue or EBITDA margin only mildly reduce the hidden NPL ratio. However, negative increments to revenue and especially EBITDA margin can significantly increase the hidden NPL ratio.

Intuitively, we believe this makes sense given the current asset quality deterioration environment means NPLs are highly sensitive to negative movements in revenue or EBITDA margin. Moreover, the sensitivity is asymmetrical, meaning even if revenue or EBITDA margin improve, NPLs cannot improve significantly.

Another interesting point is that the sensitivities are not linear, so extrapolation is not possible. In fact, the hidden NPL ratio appears to deteriorate faster as the incremental change increases.

Figure 1: Sensitivity of changes in revenue and EBITDA margin on hidden NPL ratio

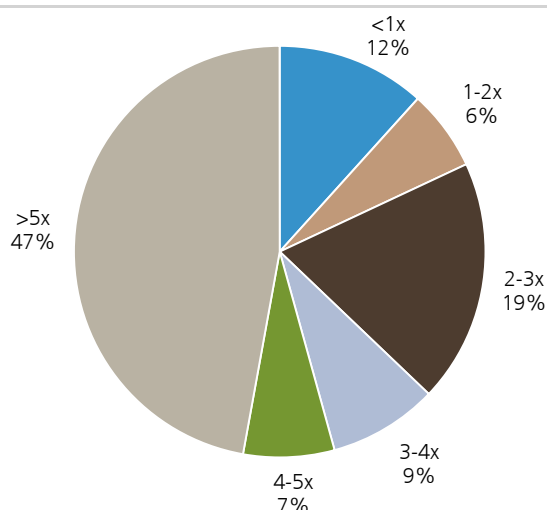
Adjustments to revenue	Hidden NPL ratio (%)	Adjustments to EBITDA margin	Hidden NPL ratio (%)
+30%	10.9	+3ppt	10.6
+20%	11.0	+2ppt	10.7
+10%	11.0	+1ppt	10.9
Base case	11.7	Base case	11.7
-10%	12.7	-1ppt	13.1
-20%	13.4	-2ppt	16.5
-30%	13.8	-3ppt	22.0

Source: WIND, UBS estimates

6% of corporate liabilities are only 1-2x interest covered

Figure 2 demonstrates the breakdown of the hidden NPLs by their interest coverage multiples. About 6% of corporate liabilities' interest coverage ranges between 1-2x; implying they could be vulnerable if economic growth were to slow further. However, the more encouraging news is that nearly half of the companies are still >5x covered.

Figure 2: Distribution of hidden NPLs by interest coverage multiples in H115



Source: WIND, UBS estimates

Hidden NPL ratio to fall by <1% assuming another 100bp rate cut

Following the rate cut on 23 October ([LINK](#) to our note), we calculated that the 0.75% benchmark lending rate cut since 29 June 2015 could improve the hidden NPL ratio to 11.0% (from 11.7%), given declining interest expenses. Figure 3 demonstrates how the hidden NPL ratio will react to different percentage rate cuts. Note that we assume no changes to pricing power in our calculation.

The second line in Figure 3 shows the case since three rate cuts of 75bp since end-June 2015.

Figure 3: Sensitivity of benchmark lending rate cuts on hidden NPL ratio

Adjustments to interest rate	Hidden NPL ratio (%)
Base case	11.7
Post three rate cuts since the end of June 2015	11.0
Assuming additional rate cuts:	
-25bp	11.0
-50bp	10.9
-75bp	10.4
-100bp	10.4

Source: WIND, CEIC, UBS estimates

Changes to manufacturing industry could impact NPLs the most

We also look more specifically at adjusting revenue or EBITDA margins for a particular sector and the impact it would have on the overall hidden NPL ratio. We find the manufacturing sector has a greater impact than the wholesale/retail and real estate sectors.

Figure 4: Sector-specific sensitivity to changes in revenue and EBITDA margins on hidden NPL ratio

	Manufacturing	Wholesale/retail	Real estate
Adjustments to revenue			
+30%	11.4	11.7	11.0
+20%	11.4	11.7	11.2
+10%	11.5	11.7	11.2
Base case	11.7	11.7	11.7
-10%	12.0	11.7	12.4
-20%	12.5	11.7	12.6
-30%	14.3	12.1	12.9
Adjustments to EBITDA margin			
+3ppt	11.3	10.9	11.2
+2ppt	11.4	10.9	11.2
+1ppt	11.6	11.2	11.2
Base case	11.7	11.7	11.7
-1ppt	12.4	12.2	11.7
-2ppt	13.9	12.5	12.7
-3ppt	14.6	12.6	13.5

Source: WIND, UBS estimates

Credit spreads declining; more bonds to mature from late-2015

Another of our concerns is that credit spreads in the bond market are declining despite the asset quality deterioration. We attribute this to rising leverage of fixed income funds (driven by the low short-term A rate, ie, seven-day repo is currently at about 2.3%) and assumed bailout. Other than the apparent credit risk, if short-term liquidity tightens, leading to sudden spikes in short-term rates (similar to situations in 2013), then counterparty risks could increase significantly (due to duration mismatch in the funds invested in the bond market currently).

If we compare the current bond yield of AA-rated corporate bonds at about 7% to the actual lending rate of 6%, then weak loan demand is understandable (because corporates will prefer to issue bonds given the distortion in risk asset pricing).

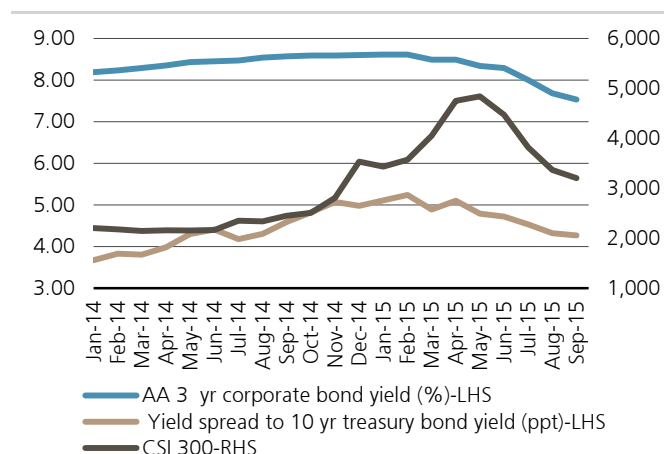
Note that this rate differential was at >2% as early as June 2015. Since then, A-share market volatility has increased, implying investors asking for a higher cost of equity (but in contrast the cost of debt has fallen).

Interestingly, we note the contraction of credit spreads in the bond market coincided with the beginning of A-share volatility in June 2015 (see Figure 5). We believe this suggests that liquidity remains sufficient but has likely been channelled away from the more volatile equity market to the bond market during the past few months.

Deleveraging in the equity market is also coupled with higher leveraging in the bond market, although we note that the funding costs are different. That is, margin financing in the equity market is >8%, whereas short-term interbank funding is only >2%.

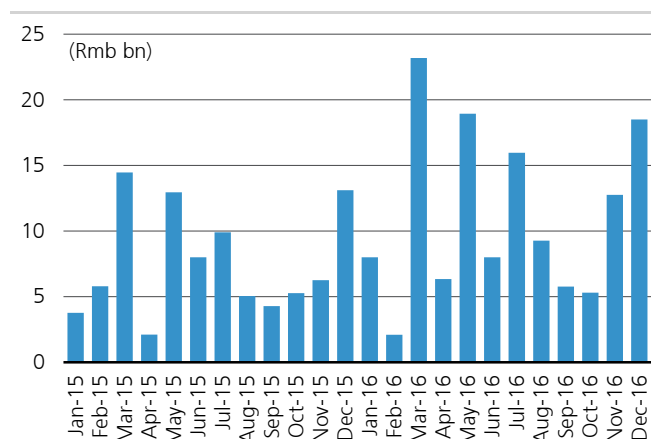
Figure 6 shows that more bonds are due to mature in December 2015 (with March 2016 a near-term peak). Therefore, we would advise investors to demonstrate more caution during these periods.

Figure 5: Average corporate bond yield (AA, 3-year), yield spread of 3-year corporate bond (AA) to 10-year treasury bond and CSI300 Index



Source: CEIC, WIND, UBS

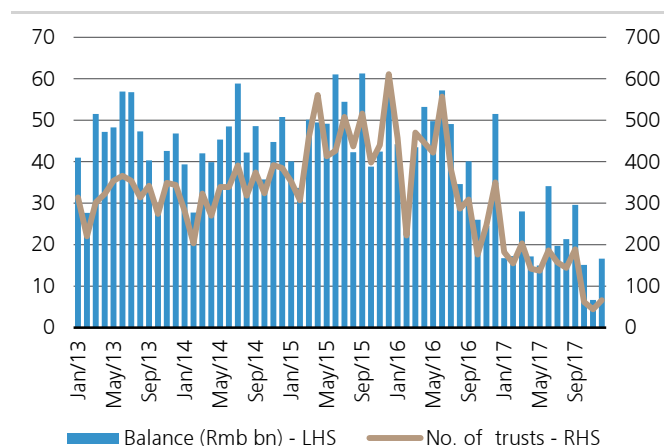
Figure 6: Distribution of corporate bonds by maturity



Source: WIND, UBS

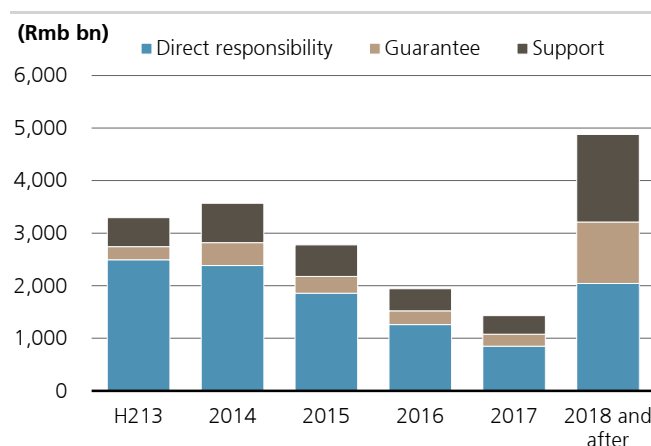
Short-term liquidity could also be affected by an increase in the number of upcoming maturities and in the amount of trust products in late-2015 and gradually towards the middle of 2016, although LGFV maturities will become more moderate.

Figure 7: Distribution of trust products by maturity



Source: WIND, UBS

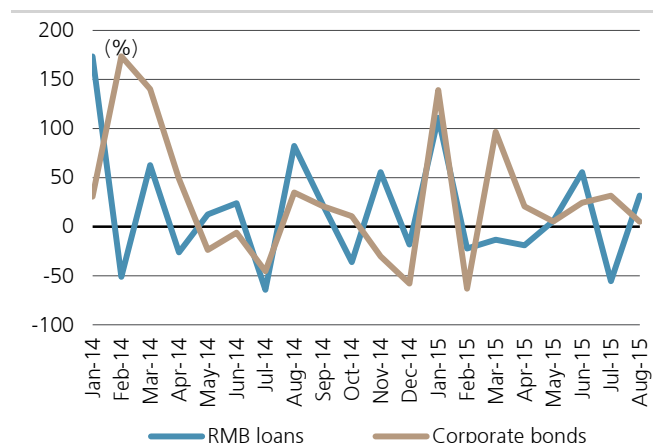
Figure 8: Distribution of LGFV by maturity



Source: National Audit Office of PRC

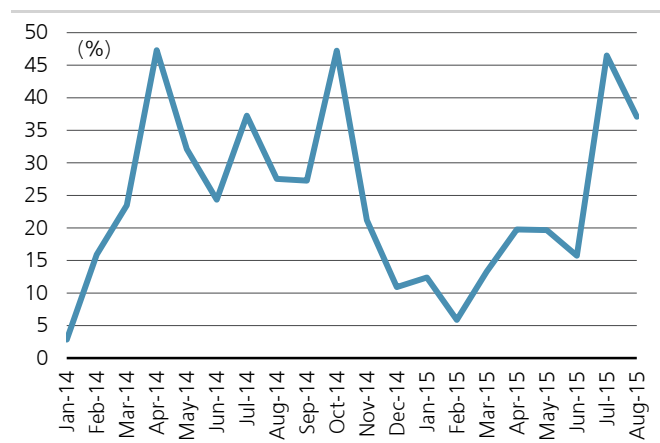
Given lower credit spreads in the bond market, we believe bonds, rather than bank loans, appear to be the more preferred funding source for corporates. We think this will subject banks to anti-selection as corporates with better access to funding can raise funds at a lower rate from the bond market.

Figure 9: YoY growth – monthly RMB new loans and corporate bonds issuance



Source: PBOC

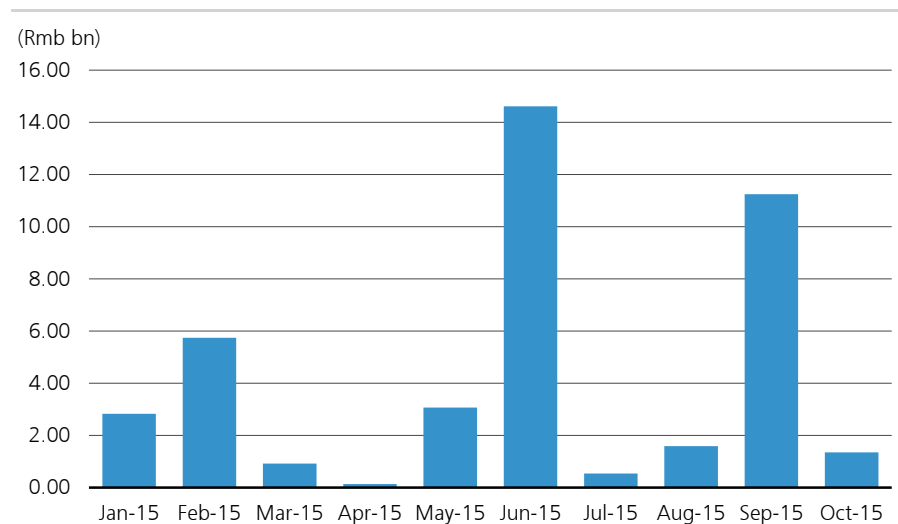
Figure 10: Ratio of monthly corporate bonds issuance to RMB new loans



Source: PBOC

Bond fund issuance has increased since July 2015.

Figure 11: Monthly issuance of bond funds in 2015

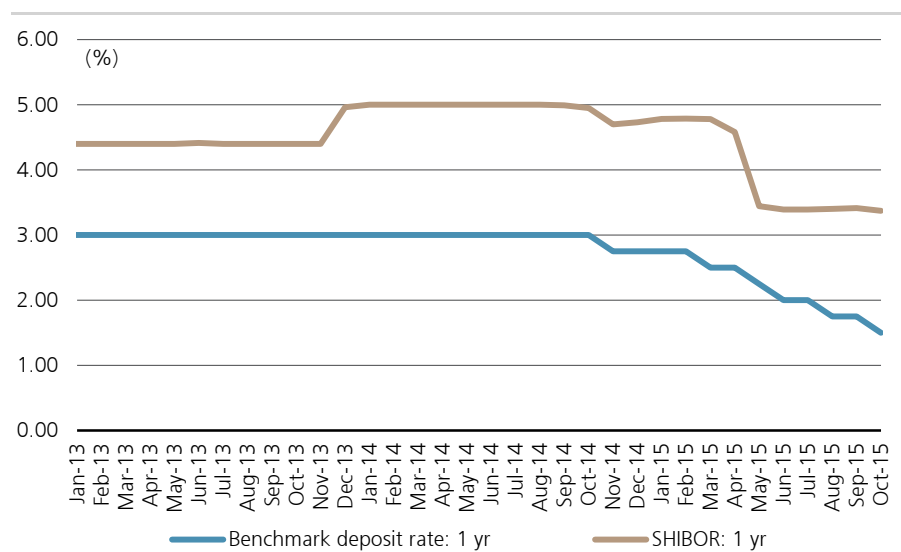


Source: WIND

LDR removal to boost loan supply structurally

The removal of the loan-to-deposit ratio (LDR) requirement in June 2015 should lead to more interbank funding for loans as interbank rates are not very high compared to deposits. The one-year interbank rate currently stands at about 3.36%, while the one-year time deposit benchmark is 1.50%, assuming actual rates are priced at 1.1-1.5x, implying 1.65-2.25%.

Figure 12: One-year SHIBOR versus one-year benchmark deposit rate



Source: CEIC

Statement of Risk

We think the major risks for Chinese banks are: 1) deterioration in asset quality underpinned by a slower macro environment and domestic property market activity; 2) regulatory risks related to capital and liquidity regulations as well as the off-balance-sheet activities of banks; 3) deterioration in funding structures and weakening balance sheet liquidity positions, driven by a potential rollover of loans and a lengthening of asset durations; and 4) the liberalisation of interest rates in the medium term and pressure on banks' profitability.

Required Disclosures

This report has been prepared by UBS Securities Asia Limited, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS.

For information on the ways in which UBS manages conflicts and maintains independence of its research product; historical performance information; and certain additional disclosures concerning UBS research recommendations, please visit www.ubs.com/disclosures. The figures contained in performance charts refer to the past; past performance is not a reliable indicator of future results. Additional information will be made available upon request. UBS Securities Co. Limited is licensed to conduct securities investment consultancy businesses by the China Securities Regulatory Commission.

Analyst Certification: Each research analyst primarily responsible for the content of this research report, in whole or in part, certifies that with respect to each security or issuer that the analyst covered in this report: (1) all of the views expressed accurately reflect his or her personal views about those securities or issuers and were prepared in an independent manner, including with respect to UBS, and (2) no part of his or her compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in the research report.

UBS Investment Research: Global Equity Rating Definitions

12-Month Rating	Definition	Coverage ¹	IB Services ²
Buy	FSR is > 6% above the MRA.	49%	33%
Neutral	FSR is between -6% and 6% of the MRA.	40%	26%
Sell	FSR is > 6% below the MRA.	12%	18%
Short-Term Rating	Definition	Coverage ³	IB Services ⁴
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	less than 1%	less than 1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	less than 1%	less than 1%

Source: UBS. Rating allocations are as of 30 September 2015.

1:Percentage of companies under coverage globally within the 12-month rating category. 2:Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.

3:Percentage of companies under coverage globally within the Short-Term rating category. 4:Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

KEY DEFINITIONS: **Forecast Stock Return (FSR)** is defined as expected percentage price appreciation plus gross dividend yield over the next 12 months. **Market Return Assumption (MRA)** is defined as the one-year local market interest rate plus 5% (a proxy for, and not a forecast of, the equity risk premium). **Under Review (UR)** Stocks may be flagged as UR by the analyst, indicating that the stock's price target and/or rating are subject to possible change in the near term, usually in response to an event that may affect the investment case or valuation. **Short-Term Ratings** reflect the expected near-term (up to three months) performance of the stock and do not reflect any change in the fundamental view or investment case. **Equity Price Targets** have an investment horizon of 12 months.

EXCEPTIONS AND SPECIAL CASES: **UK and European Investment Fund ratings and definitions are:** **Buy:** Positive on factors such as structure, management, performance record, discount; **Neutral:** Neutral on factors such as structure, management, performance record, discount; **Sell:** Negative on factors such as structure, management, performance record, discount. **Core Banding Exceptions (CBE):** Exceptions to the standard +/-6% bands may be granted by the Investment Review Committee (IRC). Factors considered by the IRC include the stock's volatility and the credit spread of the respective company's debt. As a result, stocks deemed to be very high or low risk may be subject to higher or lower bands as they relate to the rating. When such exceptions apply, they will be identified in the Company Disclosures table in the relevant research piece.

Research analysts contributing to this report who are employed by any non-US affiliate of UBS Securities LLC are not registered/qualified as research analysts with the NASD and NYSE and therefore are not subject to the restrictions contained in the NASD and NYSE rules on communications with a subject company, public appearances, and trading securities held by a research analyst account. The name of each affiliate and analyst employed by that affiliate contributing to this report, if any, follows.

UBS AG Hong Kong Branch: Lucy Feng; David Chung; Ben Huang.

Company Disclosures

Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
Agricultural Bank of China ¹⁶	1288.HK	Neutral	N/A	HK\$3.16	29 Oct 2015
Bank of China ^{2, 4, 5, 16}	3988.HK	Buy	N/A	HK\$3.72	29 Oct 2015
Bank of Chongqing	1963.HK	Sell	N/A	HK\$5.81	29 Oct 2015
Bank of Communications ^{4, 5, 16}	3328.HK	Neutral	N/A	HK\$5.77	29 Oct 2015
China Cinda Asset Management ^{2, 4, 13, 16}	1359.HK	Neutral	N/A	HK\$3.00	29 Oct 2015
China CITIC Bank ^{2, 4, 5, 16, 22}	0998.HK	Neutral	N/A	HK\$5.05	29 Oct 2015
China Construction Bank ^{2, 4, 5, 16}	0939.HK	Buy	N/A	HK\$5.68	29 Oct 2015
China Merchants Bank ^{2, 4, 16}	3968.HK	Neutral	N/A	HK\$19.70	29 Oct 2015
Chongqing Rural Commercial Bank	3618.HK	Sell	N/A	HK\$4.73	29 Oct 2015
Huishang Bank ^{2, 4, 5}	3698.HK	Sell	N/A	HK\$3.36	29 Oct 2015

Source: UBS. All prices as of local market close.

Ratings in this table are the most current published ratings prior to this report. They may be more recent than the stock pricing date

2. UBS AG, its affiliates or subsidiaries has acted as manager/co-manager in the underwriting or placement of securities of this company/entity or one of its affiliates within the past 12 months.
4. Within the past 12 months, UBS AG, its affiliates or subsidiaries has received compensation for investment banking services from this company/entity or one of its affiliates.
5. UBS AG, its affiliates or subsidiaries expect to receive or intend to seek compensation for investment banking services from this company/entity within the next three months.
13. UBS AG, its affiliates or subsidiaries beneficially owned 1% or more of a class of this company's common equity securities as of last month's end (or the prior month's end if this report is dated less than 10 days after the most recent month's end).
16. UBS Securities (Hong Kong) Limited is a market maker in the HK-listed securities of this company.
22. UBS AG, its affiliates or subsidiaries held other significant financial interests in this company/entity as of last month's end (or the prior month's end if this report is dated less than 10 working days after the most recent month's end).

For a complete set of disclosure statements associated with the companies discussed in this report, including information on valuation and risk, please contact UBS Securities LLC, 1285 Avenue of Americas, New York, NY 10019, USA, Attention: Publishing Administration.

Unless otherwise indicated, please refer to the Valuation and Risk sections within the body of this report.

Global Disclaimer

This document has been prepared by UBS Securities Asia Limited, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS.

Global Research is provided to our clients through UBS Neo, the UBS Client Portal and UBS.com (each a "System"). It may also be made available through third party vendors and distributed by UBS and/or third parties via e-mail or alternative electronic means. The level and types of services provided by Global Research to a client may vary depending upon various factors such as a client's individual preferences as to the frequency and manner of receiving communications, a client's risk profile and investment focus and perspective (e.g. market wide, sector specific, long-term, short-term, etc.), the size and scope of the overall client relationship with UBS and legal and regulatory constraints.

When you receive Global Research through a System, your access and/or use of such Global Research is subject to this Global Research Disclaimer and to the terms of use governing the applicable System.

When you receive Global Research via a third party vendor, e-mail or other electronic means, your use shall be subject to this Global Research Disclaimer and to UBS's Terms of Use/Disclaimer (<http://www.ubs.com/global/en/legalinfo2/disclaimer.html>). By accessing and/or using Global Research in this manner, you are indicating that you have read and agree to be bound by our Terms of Use/Disclaimer. In addition, you consent to UBS processing your personal data and using cookies in accordance with our Privacy Statement (<http://www.ubs.com/global/en/legalinfo2/privacy.html>) and cookie notice (<http://www.ubs.com/global/en/homepage/cookies/cookie-management.html>).

If you receive Global Research, whether through a System or by any other means, you agree that you shall not copy, revise, amend, create a derivative work, transfer to any third party, or in any way commercially exploit any UBS research provided via Global Research or otherwise, and that you shall not extract data from any research or estimates provided to you via Global Research or otherwise, without the prior written consent of UBS.

For access to all available Global Research on UBS Neo and the Client Portal, please contact your UBS sales representative.

This document is for distribution only as may be permitted by law. It is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or would subject UBS to any registration or licensing requirement within such jurisdiction. It is published solely for information purposes; it is not an advertisement nor is it a solicitation or an offer to buy or sell any financial instruments or to participate in any particular trading strategy. No representation or warranty, either expressed or implied, is provided in relation to the accuracy, completeness or reliability of the information contained in this document ('the Information'), except with respect to Information concerning UBS. The Information is not intended to be a complete statement or summary of the securities, markets or developments referred to in the document. UBS does not undertake to update or keep current the Information. Any opinions expressed in this document may change without notice and may differ or be contrary to opinions expressed by other business areas or groups of UBS. Any statements contained in this report attributed to a third party represent UBS's interpretation of the data, information and/or opinions provided by that third party either publicly or through a subscription service, and such use and interpretation have not been reviewed by the third party.

Nothing in this document constitutes a representation that any investment strategy or recommendation is suitable or appropriate to an investor's individual circumstances or otherwise constitutes a personal recommendation. Investments involve risks, and investors should exercise prudence and their own judgement in making their investment decisions. The financial instruments described in the document may not be eligible for sale in all jurisdictions or to certain categories of investors. Options, derivative products and futures are not suitable for all investors, and trading in these instruments is considered risky. Mortgage and asset-backed securities may involve a high degree of risk and may be highly volatile in response to fluctuations in interest rates or other market conditions. Foreign currency rates of exchange may adversely affect the value, price or income of any security or related instrument referred to in the document. For investment advice, trade execution or other enquiries, clients should contact their local sales representative.

The value of any investment or income may go down as well as up, and investors may not get back the full (or any) amount invested. Past performance is not necessarily a guide to future performance. Neither UBS nor any of its directors, employees or agents accepts any liability for any loss (including investment loss) or damage arising out of the use of all or any of the Information.

Any prices stated in this document are for information purposes only and do not represent valuations for individual securities or other financial instruments. There is no representation that any transaction can or could have been effected at those prices, and any prices do not necessarily reflect UBS's internal books and records or theoretical model-based valuations and may be based on certain assumptions. Different assumptions by UBS or any other source may yield substantially different results.

This document and the Information are produced by UBS as part of its research function and are provided to you solely for general background information. UBS has no regard to the specific investment objectives, financial situation or particular needs of any specific recipient. In no circumstances may this document or any of the Information be used for any of the following purposes:

- (i) valuation or accounting purposes;
- (ii) to determine the amounts due or payable, the price or the value of any financial instrument or financial contract; or
- (iii) to measure the performance of any financial instrument.

By receiving this document and the Information you will be deemed to represent and warrant to UBS that you will not use this document or any of the Information for any of the above purposes or otherwise rely upon this document or any of the Information.

Research will initiate, update and cease coverage solely at the discretion of UBS Investment Bank Research Management. The analysis contained in this document is based on numerous assumptions. Different assumptions could result in materially different results. The analyst(s) responsible for the preparation of this document may interact with trading desk personnel, sales personnel and other parties for the purpose of gathering, applying and interpreting market information. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS into other areas, units, groups or affiliates of UBS. The compensation of the analyst who prepared this document is determined exclusively by research management and senior management (not including investment banking). Analyst compensation is not based on investment banking revenues; however, compensation may relate to the revenues of UBS Investment Bank as a whole, of which investment banking, sales and trading are a part.

For financial instruments admitted to trading on an EU regulated market: UBS AG, its affiliates or subsidiaries (excluding UBS Securities LLC) acts as a market maker or liquidity provider (in accordance with the interpretation of these terms in the UK) in the financial instruments of the issuer save that where the activity of liquidity provider is carried out in accordance with the definition given to it by the laws and regulations of any other EU jurisdictions, such information is separately disclosed in this document. For financial instruments admitted to trading on a non-EU regulated market: UBS may act as a market maker save that where this activity is carried out in the US in accordance with the definition given to it by the relevant laws and regulations, such activity will be specifically disclosed in this document. UBS may have issued a warrant the value of which is based on one or more of the financial instruments referred to in the document. UBS and its affiliates and employees may have long or short positions, trade as principal and buy and sell in instruments or derivatives identified herein; such transactions or positions may be inconsistent with the opinions expressed in this document.

United Kingdom and the rest of Europe: Except as otherwise specified herein, this material is distributed by UBS Limited to persons who are eligible counterparties or professional clients. UBS Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. **France:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities France S.A. UBS Securities France S.A. is regulated by the ACPR (Autorité de Contrôle Prudentiel et de Résolution) and the Autorité des Marchés Financiers (AMF). Where an analyst of UBS Securities France S.A. has contributed to this document, the document is also deemed to have been prepared by UBS Securities France S.A. **Germany:** Prepared by UBS Limited and distributed by UBS Limited and UBS Deutschland AG. UBS Deutschland AG is regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin). **Spain:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities España SV, SA. UBS Securities España SV, SA is regulated by the Comisión Nacional del Mercado de Valores (CNMV). **Turkey:** Distributed by UBS Limited. No information in this document is provided for the purpose of offering, marketing and sale by any means of any capital market instruments and services in the Republic of Turkey. Therefore, this document may not be considered as an offer made or to be made to residents of the Republic of Turkey. UBS AG is not licensed by the Turkish Capital Market Board under the provisions of the Capital Market Law (Law No. 6362). Accordingly, neither this document nor any other offering material related to the instruments/services may be utilized in connection with providing any capital market services to persons within the Republic of Turkey without the prior approval of the Capital Market Board. However, according to article 15 (d) (ii) of the Decree No. 32, there is no restriction on the purchase or sale of the securities abroad by residents of the Republic of Turkey. **Poland:** Distributed by UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce regulated by the Polish Financial Supervision Authority. Where an analyst of UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce has contributed to this

document, the document is also deemed to have been prepared by UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce. **Russia:** Prepared and distributed by UBS Bank (OOO). **Switzerland:** Distributed by UBS AG to persons who are institutional investors only. UBS AG is regulated by the Swiss Financial Market Supervisory Authority (FINMA). **Italy:** Prepared by UBS Limited and distributed by UBS Limited and UBS Italia Sim S.p.A. UBS Italia Sim S.p.A. is regulated by the Bank of Italy and by the Commissione Nazionale per le Società e la Borsa (CONSOB). Where an analyst of UBS Italia Sim S.p.A. has contributed to this document, the document is also deemed to have been prepared by UBS Italia Sim S.p.A. **South Africa:** Distributed by UBS South Africa (Pty) Limited (Registration No. 1995/011140/07), an authorised user of the JSE and an authorised Financial Services Provider (FSP 7328). **Israel:** This material is distributed by UBS Limited. UBS Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. UBS Securities Israel Ltd is a licensed Investment Marketer that is supervised by the Israel Securities Authority (ISA). UBS Limited and its affiliates incorporated outside Israel are not licensed under the Israeli Advisory Law. UBS Limited is not covered by insurance as required from a licensee under the Israeli Advisory Law. UBS may engage among others in issuance of Financial Assets or in distribution of Financial Assets of other issuers for fees or other benefits. UBS Limited and its affiliates may prefer various Financial Assets to which they have or may have Affiliation (as such term is defined under the Israeli Advisory Law). Nothing in this Material should be considered as investment advice under the Israeli Advisory Law. This Material is being issued only to and/or is directed only at persons who are Eligible Clients within the meaning of the Israeli Advisory Law, and this material must not be relied on or acted upon by any other persons. **Saudi Arabia:** This document has been issued by UBS AG (and/or any of its subsidiaries, branches or affiliates), a public company limited by shares, incorporated in Switzerland with its registered offices at Aeschenvorstadt 1, CH-4051 Basel and Bahnhofstrasse 45, CH-8001 Zurich. This publication has been approved by UBS Saudi Arabia (a subsidiary of UBS AG), a Saudi closed joint stock company incorporated in the Kingdom of Saudi Arabia under commercial register number 1010257812 having its registered office at Tatweer Towers, P.O. Box 75724, Riyadh 11588, Kingdom of Saudi Arabia. UBS Saudi Arabia is authorized and regulated by the Capital Market Authority to conduct securities business under license number 08113-37. **Dubai:** The information distributed by UBS AG Dubai Branch is intended for Professional Clients only and is not for further distribution within the United Arab Emirates. **United States:** Distributed to US persons by either UBS Securities LLC or by UBS Financial Services Inc., subsidiaries of UBS AG; or by a group, subsidiary or affiliate of UBS AG that is not registered as a US broker-dealer (a 'non-US affiliate') to major US institutional investors only. UBS Securities LLC or UBS Financial Services Inc. accepts responsibility for the content of a document prepared by another non-US affiliate when distributed to US persons by UBS Securities LLC or UBS Financial Services Inc. All transactions by a US person in the securities mentioned in this document must be effected through UBS Securities LLC or UBS Financial Services Inc., and not through a non-US affiliate. UBS Securities LLC is not acting as a municipal advisor to any municipal entity or obligated person within the meaning of Section 15B of the Securities Exchange Act (the "Municipal Advisor Rule"), and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of the Municipal Advisor Rule. **Canada:** Distributed by UBS Securities Canada Inc., a registered investment dealer in Canada and a Member-Canadian Investor Protection Fund, or by another affiliate of UBS AG that is registered to conduct business in Canada or is otherwise exempt from registration. **Brazil:** Except as otherwise specified herein, this material is prepared by UBS Brasil CCTVM S.A. to persons who are eligible investors residing in Brazil, which are considered to be: (i) financial institutions, (ii) insurance firms and investment capital companies, (iii) supplementary pension entities, (iv) entities that hold financial investments higher than R\$300,000.00 and that confirm the status of qualified investors in written, (v) investment funds, (vi) securities portfolio managers and securities consultants duly authorized by Comissão de Valores Mobiliários (CVM), regarding their own investments, and (vii) social security systems created by the Federal Government, States, and Municipalities. **Hong Kong:** Distributed by UBS Securities Asia Limited and/or UBS AG, Hong Kong Branch. **Singapore:** Distributed by UBS Securities Pte. Ltd. [MCI (P) 018/09/2015 and Co. Reg. No.: 198500648C] or UBS AG, Singapore Branch. Please contact UBS Securities Pte. Ltd., an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110); or UBS AG, Singapore Branch, an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110) and a wholesale bank licensed under the Singapore Banking Act (Cap. 19) regulated by the Monetary Authority of Singapore, in respect of any matters arising from, or in connection with, the analysis or document. The recipients of this document represent and warrant that they are accredited and institutional investors as defined in the Securities and Futures Act (Cap. 289). **Japan:** Distributed by UBS Securities Japan Co., Ltd. to professional investors (except as otherwise permitted). Where this document has been prepared by UBS Securities Japan Co., Ltd., UBS Securities Japan Co., Ltd. is the author, publisher and distributor of the document. Distributed by UBS AG, Tokyo Branch to Professional Investors (except as otherwise permitted) in relation to foreign exchange and other banking businesses when relevant. **Australia:** Clients of UBS AG: Distributed by UBS AG (Holder of Australian Financial Services License No. 231087). Clients of UBS Securities Australia Ltd: Distributed by UBS Securities Australia Ltd (Holder of Australian Financial Services License No. 231098). Clients of UBS Wealth Management Australia Ltd: Distributed by UBS Wealth Management Australia Ltd (Holder of Australian Financial Services License No. 231127). This Document contains general information and/or general advice only and does not constitute personal financial product advice. As such, the Information in this document has been prepared without taking into account any investor's objectives, financial situation or needs, and investors should, before acting on the Information, consider the appropriateness of the Information, having regard to their objectives, financial situation and needs. If the Information contained in this document relates to the acquisition, or potential acquisition of a particular financial product by a 'Retail' client as defined by section 761G of the Corporations Act 2001 where a Product Disclosure Statement would be required, the retail client should obtain and consider the Product Disclosure Statement relating to the product before making any decision about whether to acquire the product. The UBS Securities Australia Limited Financial Services Guide is available at: www.ubs.com/ecs-research-fsg. **New Zealand:** Distributed by UBS New Zealand Ltd. The information and recommendations in this publication are provided for general information purposes only. To the extent that any such information or recommendations constitute financial advice, they do not take into account any person's particular financial situation or goals. We recommend that recipients seek advice specific to their circumstances from their financial advisor. **Korea:** Distributed in Korea by UBS Securities Pte. Ltd., Seoul Branch. This document may have been edited or contributed to from time to time by affiliates of UBS Securities Pte. Ltd., Seoul Branch. **Malaysia:** This material is authorized to be distributed in Malaysia by UBS Securities Malaysia Sdn. Bhd (Capital Markets Services License No.: CMSL/A0063/2007). This material is intended for professional/institutional clients only and not for distribution to any retail clients. **India:** Prepared by UBS Securities India Private Ltd. (Corporate Identity Number U67120MH1996PTC097299) 2/F, 2 North Avenue, Maker Maxity, Bandra Kurla Complex, Bandra (East), Mumbai (India) 400051. Phone: +912261556000. It provides brokerage services bearing SEBI Registration Numbers: NSE (Capital Market Segment): INB230951431, NSE (F&O Segment) INF230951431, NSE (Currency Derivatives Segment) INE230951431, BSE (Capital Market Segment) INB010951437; merchant banking services bearing SEBI Registration Number: INM000010809 and Research Analyst services bearing SEBI Registration Number: INH000001204. UBS AG, its affiliates or subsidiaries may have debt holdings or positions in the subject Indian company/companies. Within the past 12 months, UBS AG, its affiliates or subsidiaries may have received compensation for non-investment banking securities-related services and/or non-securities services from the subject Indian company/companies. The subject company/companies may have been a client/clients of UBS AG, its affiliates or subsidiaries during the 12 months preceding the date of distribution of the research report with respect to investment banking and/or non-investment banking securities-related services and/or non-securities services. With regard to information on associates, please refer to the Annual Report at: http://www.ubs.com/global/en/about_ubs/investor_relations/annualreporting.html

The disclosures contained in research documents produced by UBS Limited shall be governed by and construed in accordance with English law.

UBS specifically prohibits the redistribution of this document in whole or in part without the written permission of UBS and UBS accepts no liability whatsoever for the actions of third parties in this respect. Images may depict objects or elements that are protected by third party copyright, trademarks and other intellectual property rights. © UBS 2015. The key symbol and UBS are among the registered and unregistered trademarks of UBS. All rights reserved.

