

# APAC Equity Strategy

## Asia's de-rating and the new theory of relativity

### Equity Strategy

Asia Pacific

#### De-rating has left Asia ex Japan at 11 year relative valuation lows

In the low rate environment of the last few years most asset classes have re-rated. Asia ex Japan equities on the other hand have de-rated. This has left the forward P/E relative to MSCI World at 0.74x. In mid-2010, it was non-consensus to view Asia as overvalued versus global equities. Even in 2013, Asia's credit problems and further de-rating were not widely held views. But today our Debttopia view and the de-rating process, which we started writing about in 2013, are well understood. Asia is at 11 year valuations lows versus the world and sentiment toward the region is negative.

#### The relative credit cycle matters for relative valuations

We think the relative credit cycle explains a lot of the relative de/rating of equities in Asia. Generally, when Asia is leveraging up compared to the US, Asian equities de-rate, while the reverse is also true (see figure 1 below). As the US has been deleveraging and Asia leveraging up this cycle, like the 1990s, this region has de-rated. Alongside lacklustre earnings growth, this has led to paltry returns and big underperformance.

#### The relative credit cycle for non-China Asia may have run its course

Credit growth in Asia is slowing (five countries may have seen limited increase in credit to GDP in 2015 - Indonesia, Singapore, India, Hong Kong, Taiwan). Meanwhile, US deleveraging appears to be largely over. Asia's *relative* leveraging up versus the US may be closer to a peak. It also suggests that the worst of the *relative* de-rating may be over from this perspective. It's still too early to celebrate. Slowing credit growth is not uniform (it's still expanding in China) and the end of financial cycles are usually bumpy, albeit valuations are to some degree reflecting risks of this. However if the worst of the de-rating has happened, one of the drivers of Asia's relative underperformance may be easing.

#### Singapore, Indonesia appear to be pricing in many of our Debttopia concerns

Alongside deleveraging, other factors that matter for the re-rating of countries as they near the end of their credit cycles, are valuations (the cheaper the better), whether their current account balances are improving and their real exchange rates are inexpensive. On this basis, Indonesia and Singapore look interesting today through having a combination of these features. We recently lifted our long-standing underweights on Indonesia and Singapore back to neutral.

**Niall MacLeod**

Strategist

niall.macleod@ubs.com

+852-2971 6186

**Matthew Gilman**

Strategist

matthew.gilman@ubs.com

+852-2971 8173

**Yuka Murata**

Strategist

yuka.murata@ubs.com

+852-3712-4951

**Duncan Wooldridge**

Economist

duncan.wooldridge@ubs.com

+852-2971 6046

**Figure 1: Asia ex Japan's relative rating inversely correlated to relative credit growth**



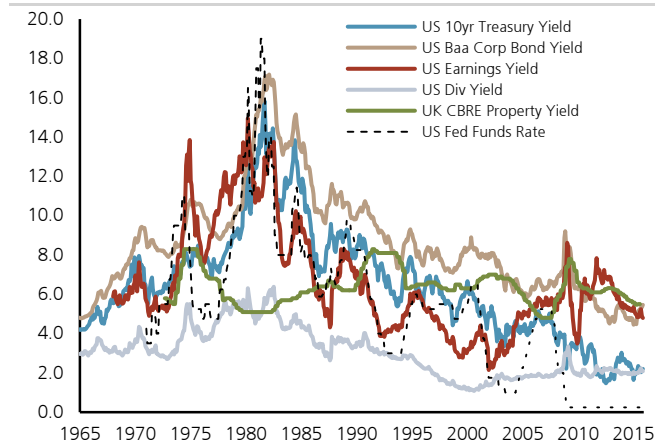
Source: BIS, Datastream, UBS where debt is defined as private non-financial sector credit

[www.ubs.com/investmentresearch](http://www.ubs.com/investmentresearch)

This report has been prepared by UBS Securities Asia Limited. **ANALYST CERTIFICATION AND REQUIRED DISCLOSURES BEGIN ON PAGE 11.** 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.

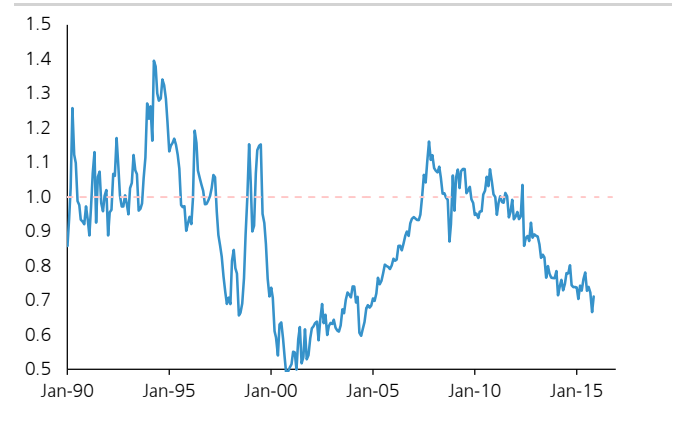
One of the pivotal issues for Asia ex Japan equity investors is the continued underperformance of the asset class versus global equities. A major component of this is the continuous drip-drip de-rating. This is despite ultra-low interest rates globally which have pushed up valuations of most asset classes, leading to an even more dramatic de-rating in relative terms of Asia ex Japan versus MSCI World.

**Figure 2: Long run asset yields of major asset classes**



Source: CEIC, Datastream, UBS

**Figure 3: MSCI Asia ex Japan – fwd P/E ratio rel. MSCI World**



Source: Datastream

## Q. Why has Asia ex Japan de-rated?

We've long held that this is a function of the credit cycle. In mid 2009, we were cynically championing the [credit cycle as a likely source of growth and real asset price gains](#). We did at that time recognise the limits of this and the likely problems that credit growth would bring. By early 2013 we began to see more evidence of these problems regionally, and started to refer to the credit cycle as [Debttopia](#), with a nod to the negative consequences of aggressive credit growth.

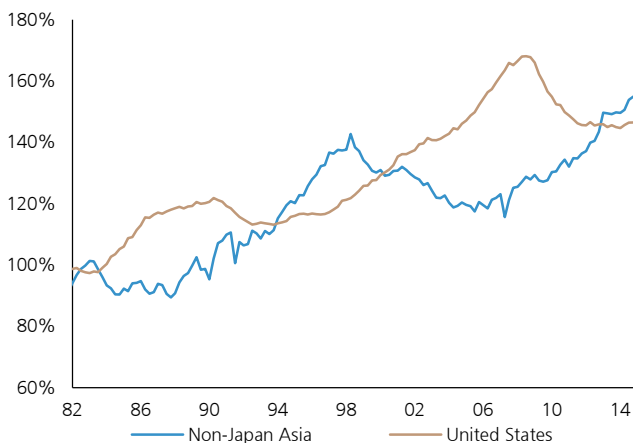
At its heart is a belief that where we are in the 'Financial Cycle' matters. This is a concept we referenced in our original Debttopia note. Broadly defined, the Financial Cycle is the time from the end of one credit cycle to the next. Generally they last two business cycles - the first business cycle being characterised as dealing with the after-effects of the last credit cycle, while in the second business cycle, or second half of the financial cycle, leverage starts to pick back up<sup>1</sup>.

While the absolute level of debt has risen over the last 30 years compared to GDP, Asia ex Japan and the US are going through their relative financial expansions at different points (Figure 4), leading to the relative rates of debt/GDP expanding and contracting (Figure 5) roughly every 7-8 years.

**The financial cycle matters to relative valuation**

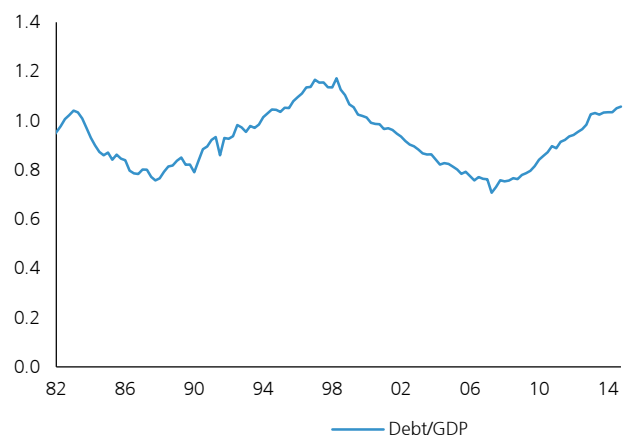
<sup>1</sup> For background on the Financial Cycle, the Bank of International Settlements (BIS) working paper 395 is a good starting point: <http://www.bis.org/publ/work395.htm>.

**Figure 4: Debt/GDP for US and Asia ex Japan**



Source: BIS, UBS where debt is defined as private non-financial sector borrowing

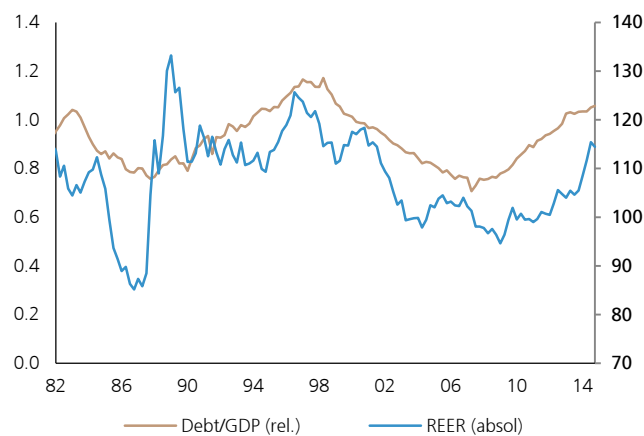
**Figure 5: Debt/GDP for Asia ex Japan (rel. US)**



Source: BIS, UBS

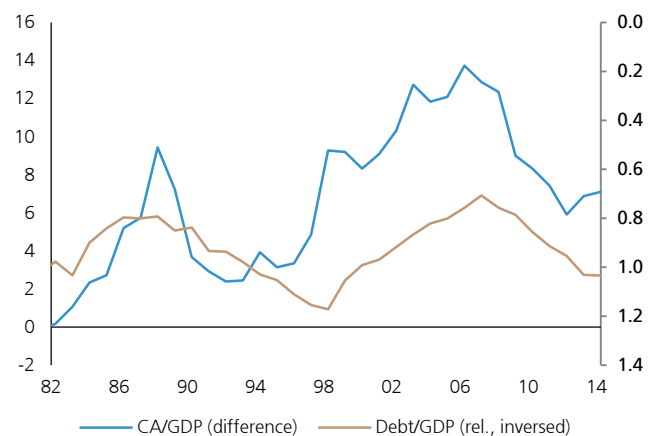
The deeper we get into a Financial Cycle, the more credit growth pushes up debt relative to equity, the more domestic inflation and asset prices rise, in turn pushing up the real effective exchange rate, thereby weakening global competitiveness. And the more this combination hits the trade balance alongside any rise in foreign borrowings, the more it reduces current account surpluses (or increases deficits).

**Figure 6: Asia ex Japan – Debt/GDP (rel.) versus REER (absolute)**



Source: BIS, Bloomberg, UBS

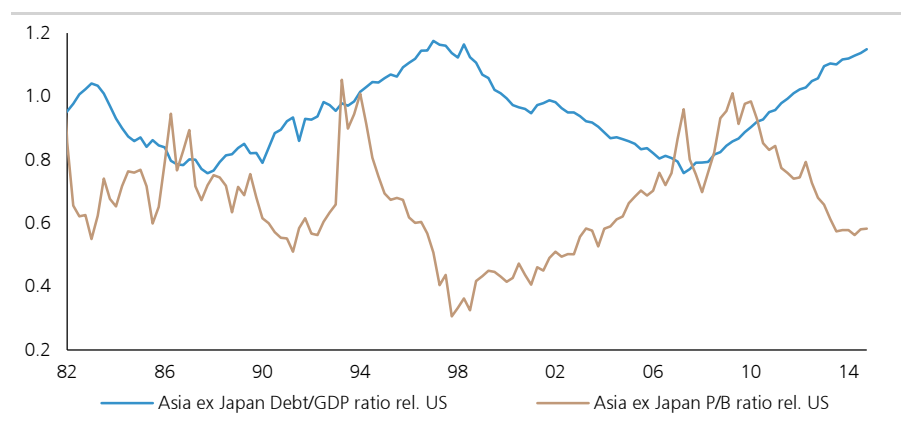
**Figure 7: Asia ex Japan – CA/GDP ratio (AxJ minus US) versus Debt/GDP (relative)**



Source: BIS, Bloomberg, CEIC, UBS

All these features should conceptually be bad for equity valuations. Is there evidence of this? Indeed there is. Figure 8 shows relative price/book valuations for Asia ex Japan compared to the US and the relative debt/GDP ratios. These two concepts move in opposite directions.

**Figure 8: Asia ex Japan - Debt/GDP (rel.) versus P/B ratio (rel.)**



Source: BIS, Datastream, UBS

There have been five distinct relative cycles that we have data for: Asia leveraging up pre the 1982's crisis; US leveraging up through the early 1990s, Asia leveraging up through 1998, the US leveraging up through 2008, and Asia again leveraging up since 2008. There are periods like 1994 and the summer of 2010 when there is a dramatic divergence between credit growth and valuations (Asia leveraging up, but multiples expanding). These periods tend to be short-lived and self-correcting. Otherwise, generally relative valuations move in opposite direction to relative credit growth over the course of the financial cycle.

Figure 9 shows that returns tend to be better in the first half of a Financial cycle (characterised by de-leveraging) than the second half (characterised by leveraging up). Equities tend to do well when leverage is falling and cash flow is accruing in an aggregate sense to equity holders. This was the US and Europe in the 1990s, Asia in the 2003-2007 period, the US since 2009. The opposite is also true. Returns tend to be much weaker in periods of re-leveraging.

**Returns tend to be better when a country/region is deleveraging**

**Figure 9: Returns for US equities and Asia ex Japan equities**

	US S&P Index returns	Asia ex Japan returns
Phase 1 (1983-1989)	10.8%	15.7%
Phase 2 (1989-1998)	13.2%	1.2%
Phase 3 (1998-2008)	1.8%	9.3%
Phase 4 (2008-2015)	6.7%	4.0%

Source: Datastream, UBS

Our Debtopia thesis has characterised Asia ex Japan as being firmly in the second half of the Financial Cycle, and vulnerable to de-rating. In mid-2010, it was non-consensus to view Asia as overvalued versus global equities. Even in 2013, Asia's credit problems and further de-rating were not widely held views. But today our Debtopia view and the de-rating process, which we started writing about in 2013, are well understood. Asia is at 11 year valuations lows versus the world and sentiment toward the region is negative.

## **Q. How much more de-rating pain?**

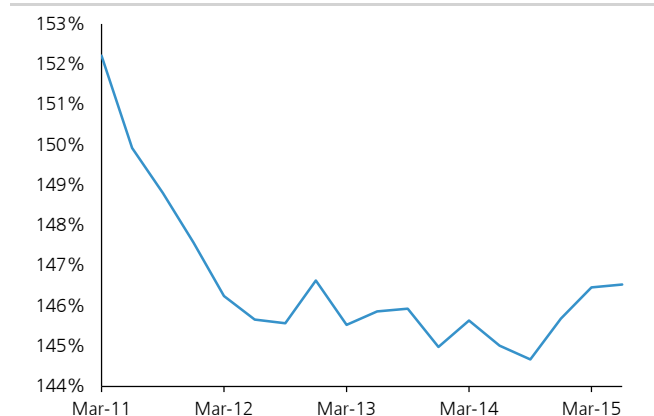
There is some potentially better news that suggests this de-rating might be nearing its end. One, valuations have already materially de-rated. Two, credit growth in Asia ex Japan has slowed. In 2015 for example five countries in Asia ex Japan saw limited increase in credit to GDP. Three, US credit growth compared to GDP is starting to pick-up as the financial sector's balance sheet has adjusted, and the economy continues to grow.

**Figure 10: Asia ex Japan countries debt to GDP (annual) where shaded countries indicate stabilization in 15E v 14**

	2013	2014	2015E
China	173%	180%	190%
Hong Kong	186%	200%	200%
India	70%	73%	74%
Indonesia	51%	51%	52%
Korea	187%	192%	196%
Malaysia	180%	179%	189%
Philippines	62%	66%	68%
Singapore	206%	214%	211%
Taiwan	168%	169%	167%
Thailand	144%	148%	149%

Source: BIS, UBS where 2015E is calculated from latest monthly credit growth rate and UBS forecast nominal GDP growth

**Figure 11: US debt to GDP (%)**



Source: BIS

Our analysis suggests that it doesn't really matter for the relative de or re-rating for Asia equities whether the relative move in the credit/GDP ratio is a function of one region's de-leveraging or the other's leveraging up. What matters most is the **structural** direction of the relative rate of credit growth. Relative valuations tend to follow.

Given that credit growth in Asia ex Japan is now slowing relative to nominal GDP and the pick-up in the US, if this marks a significant structural shift, then we may be close to a bottom in the relative de-rating of Asia ex Japan.

However we think it too early to call for a relative re-rating versus the rest of the world. Why? Firstly, although we continue to think that credit growth will remain subdued in Asia ex Japan in many countries, in China, it is still expanding. Meanwhile though credit data in the US seems to have turned, how robust this will be in the face of rising US rates remains to be seen.

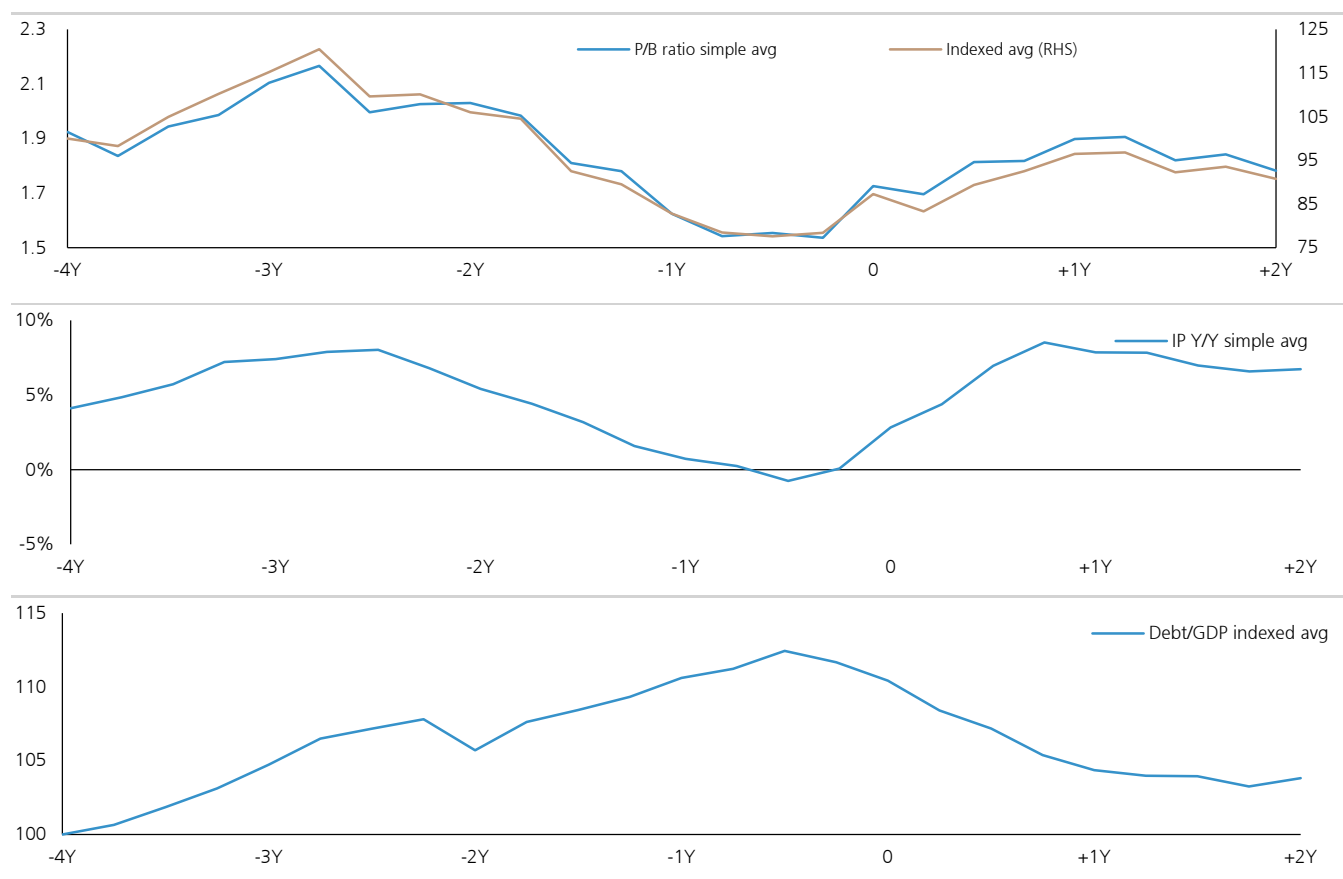
Secondly, there is always the very real risk of a crisis at the tail end of credit build up – the charts don't visually capture the risk of a considerable relative loss of capital at the end of a financial cycle. None of the financial cycles have ended without some casualties. Clearly 1998 in Asia and 2008 in the US were particularly aggressive in this regard, but Hong Kong's early 1980s crisis and instatement of the US\$ peg or the 1990 savings/loan and European banking crisis while not as dramatic as the '98 or '08 experiences were nevertheless painful.

Figure 12 shows the general behaviour of the equity market running up to the tail end of the credit cycle. This data is an amalgamation of five separate episodes (Asia ex Japan 1982, 1998, the US 1974, 1990, 2008). Equities tend to be de-rating for two-three years before the end of the financial cycle (consistent with what has happened this time round). Industrial production tends to slow/contract albeit equities bounce before the trough in growth, and finally, credit starts to come off after the equity market has already bottomed and IP started recovering.

**Credit to GDP is slowing. In four countries (Indonesia, Singapore, India, Hong Kong, Taiwan) leverage may have fallen in 2015**

**This suggests the de-rating may be nearing an end. But too early to call a re-rating**

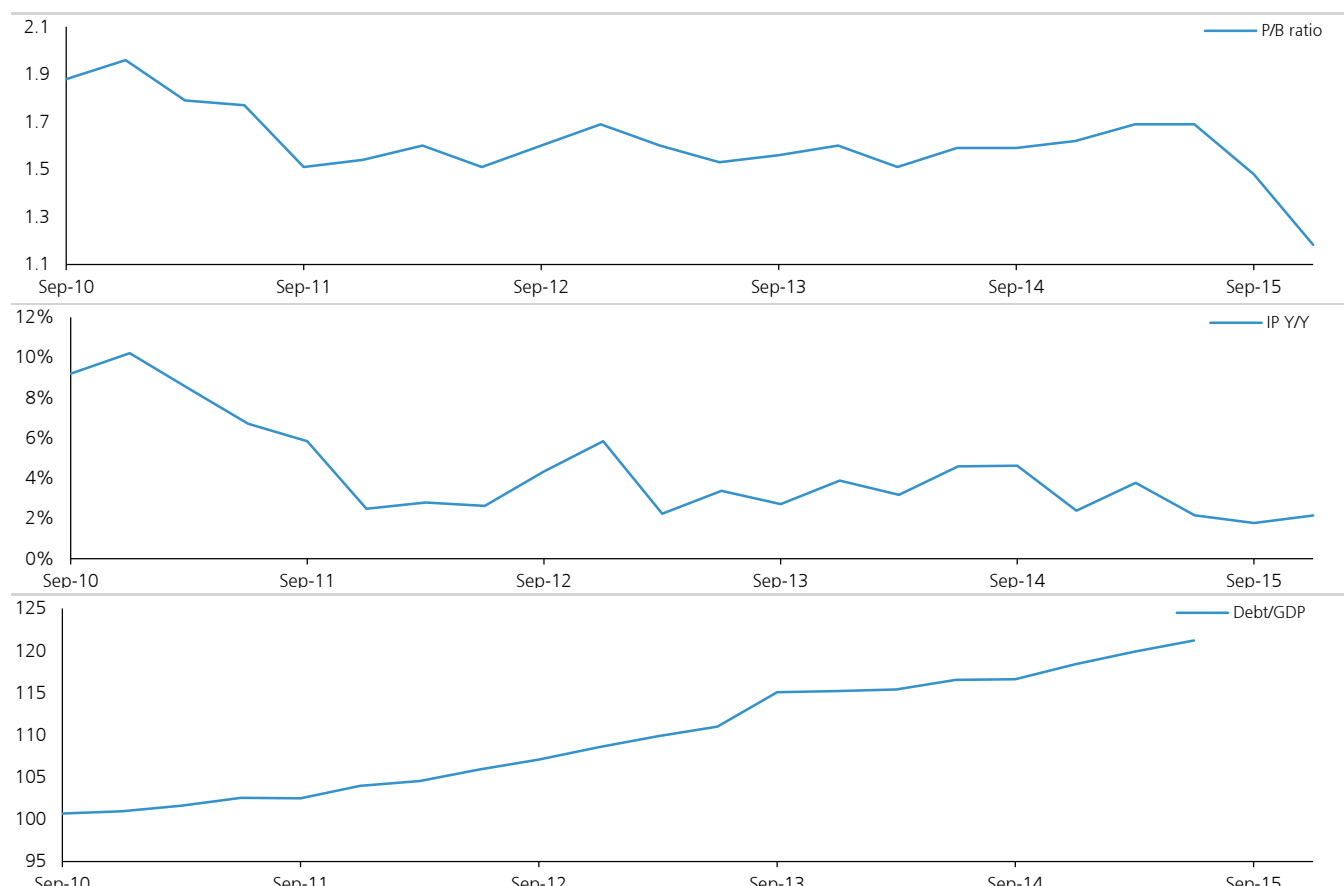
**Figure 12: Aggregate of 6 different instances of deleveraging in Asia ex Japan and the U.S.**



Source: Datastream, CEIC, BIS, UBS

Although we haven't had an IP contraction or financial hiccups typical of the end of a financial cycle, credit growth to nominal GDP is slowing.

**Figure 13: Asia ex Japan in the last 4 years**



Source: Datastream, CEIC, BIS, UBS

Moreover, valuations do in our view somewhat reflect the risk of a crisis. Asia ex Japan is trading at 1.3x book, compared to typical financial crisis trough levels of 0.96x. Figure 14 shows our valuation table that we use to categorise where Asia is relative to its history.

**Valuations are not at crisis lows, but closer to them than more normal levels**

**Figure 14: Asia ex Japan valuation in different phases of market cycle**

	PB at start	PB at trough/peak	Avg PB thru period
Bubbles	2.40	(P) 2.91	2.49
Normal	1.75	NA	1.84
Slowdown / Fears of Recession	1.75	(T) 1.52	1.67
Recession	1.94	(T) 1.32	1.65
Financial Crisis	1.60	(T) 0.96	1.32
Normalization	1.23	NA	1.41

Source: Datastream, UBS

Secondly, at UBS we do not expect a financial crisis (but then the financial community rarely has this as the base case heading into a crisis), rather a muddle through. This doesn't mean that an NPL cycle won't ensue or there won't be capital raising by banks. Rather, we don't see an abrupt ending of credit creation that more typically marks an aggressive financial crisis.

So in answer to the question, how much more de-rating pain? Although most financial cycles end with a bump, the downside in valuations is limited in our view. In absolute terms, the region is not far off pricing in a crisis on various measures. In relative terms, the de-rating plus recent shifts in the rates of relative credit growth suggests most of the de-rating is behind us. But it's probably too early to call for a relative re-rating. We need to get deeper into the adjustment for that.

## Q. Which countries are best placed in a rebound?

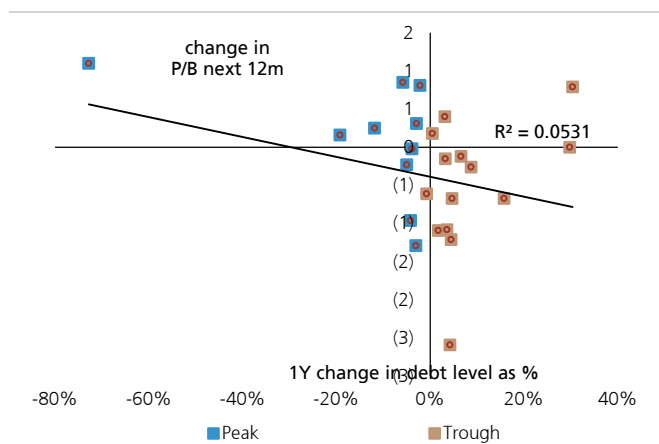
If the relative de-rating of Asia ex Japan may be closer to an end, which countries are best placed for a relative re-rating?

There are four factors that seem to matter. Firstly, the degree to which the relative debt ratio of a particular country in Asia is falling versus the US. Secondly, is valuation – the cheaper the country at the peak of its credit cycle the better. Thirdly, the degree to which the real effective exchange rate is inexpensive (our EM FX colleagues led by Bhanu Baweja prefer using fundamental exchange rates, [please click here](#) for more details). And finally, the degree to which the current account improves over the next 12 months.

When we have looked at the relative importance of these factors, valuations matters most, followed by the degree of the current account improvement over the next 12 months. The exchange rate and degree of credit fall matter less. Figure 15 - Figure 18 show these factors since 1990 where we have data. There is some asymmetry in these factors, for example the current account improvement matters a lot for countries at the peak of their credit cycles, less so any deterioration at the trough of a credit cycle.

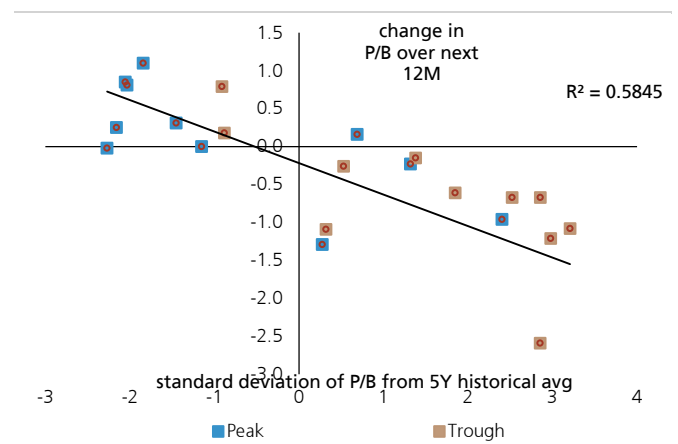
**Valuations, the degree of de-leveraging, real exchange rate levels and current account improvement all matter**

**Figure 15: 12M fwd change in debt ratio (%) vs change in P/B over next 12M**



Source: BIS, Datastream, UBS

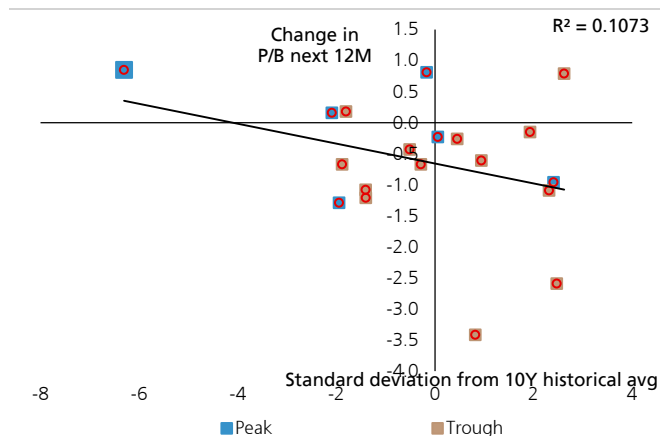
**Figure 16: standard deviation of P/B at inflexion point from 5Y historical avg vs change in P/B over next 12M**



Source: BIS, Datastream, UBS

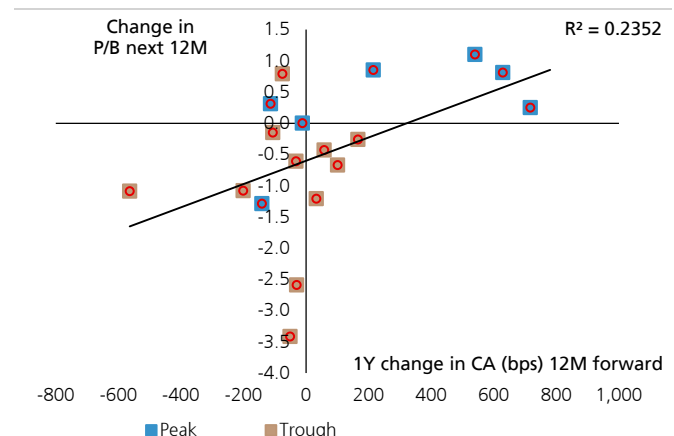


**Figure 17: standard deviation of REER at inflexion point from 10Y historical avg vs change in P/B over next 12M**



Source: BIS, Datastream, UBS

**Figure 18: 12M fwd change in current a/c (bps) versus change in P/B over next 12M**



Source: BIS, Datastream, UBS

Taking these factors into account, Figure 19 sets out where each country sits today on these measures. We've used current valuation data and real effective exchange rate data, and UBS forecasts for debt/GDP for each country in Asia (these are the absolute levels, not what debt is doing relative to the US) along with our economists' forecasts on the current accounts. For Singapore, we have used bank loan growth rather than total credit growth, as we think this may be a better reflection of domestic credit growth.

**Figure 19: Asia ex Japan countries – indicators today where LTM = Last 12 Months, NTM = Next 12 Months**

	Debt/GDP (%)		Valuation P/B (x)			Real Effective Exchange Rate			Current Acc./ GDP (%)			Debt/GDP stabilizing (15E-14≤100t)	Cheap valuation	Cheap REER	CA/GDP improvement
	2014	2015E	LTM	Today	std. dev.	LTM	Today	std. dev.	LTM	Today	NTM				
CN	180%	190%	1.32	1.15	(0.87)	119	130	2.17	2.1	3.4	3.3	✗	✓	✗	✗
HK	200%	200%	1.37	1.32	(1.65)	111	125	3.01	NA	NA	NA	✓	✓	✗	✗
India	73%	74%	2.69	2.65	0.96	98	103	1.57	(1.4)	(0.1)	(0.4)	✓	✗	✗	✗
Indo	51%	52%	3.48	3.57	(2.89)	87	85	(1.31)	(3.1)	(1.8)	(1.8)	✓	✓	✓	✗
KR	192%	196%	1.07	1.10	(0.86)	120	116	0.54	6.0	8.1	7.5	✗	✓	✗	✗
MY	179%	189%	1.90	1.88	(2.38)	101	84	(6.11)	4.3	2.6	2.1	✗	✓	✓	✗
PH	66%	68%	2.59	2.48	0.20	111	115	1.67	3.8	4.6	4.6	✗	✗	✗	✗
SG	214%	211%	1.37	1.19	(2.27)	116	112	0.94	19.1	24.7	27.3	✓	✓	✗	✓
TW	169%	167%	1.89	1.72	(1.59)	108	110	1.72	12.3	14.6	14.2	✓	✓	✗	✗
TH	148%	149%	2.30	1.92	(1.79)	103	100	0.33	3.8	7.0	6.7	✗	✓	✗	✗

Source: BIS, Datastream, UBS

While nobody is seeing outright aggressive deleveraging Hong Kong, India, Indonesia, Singapore and Taiwan have all seen a stabilisation in their debt/GDP ratios. Indian data does not at first glance suggest this. However credit growth is the slowest in 20 years (private sector credit growth has averaged 17% since 1990, currently growth is 9% year on year). This is higher than nominal GDP growth right now, but given the changes in GDP calculations, we would prefer to focus on the low absolute level of credit growth, rather than relative to nominal GDP. At the other end of the spectrum, China continues to leverage up, as does Korea.

Most countries score well on valuation. Only Malaysia and Indonesia look attractive on a real effective exchange rate basis – our FX colleagues are still broadly bearish on Asian FX. After seeing some improvement in current account ratios in 2015, UBS is only forecasting Singapore to see further improvement in 2016.

Currently, both Singapore and Indonesia score on three features. Of these Singapore scores better on the current account forecast improvement, which tends to work better over time than the real effective exchange rate on which Indonesia scores better, albeit we are expecting no real worsening in the current account in Indonesia – just no improvement either.

We recently took our underweights on both Singapore and Indonesia back to neutral reflecting that in Indonesia's case credit growth was slowing, the current account improving and valuations more reflective of some of the challenges the country faces at the tail end of its credit cycle. In Singapore's case, it reflects valuation considerations (the banks are trading close to 1.0x book with little capital needs in our view), albeit higher rates are likely to continue crimping demand.

Both these calls are consistent with what our model is suggesting should work better if aggregate debt to GDP compared to the US starts to turn up and Asia finally reaches the top of its relative and (for now) absolute credit expansion.

Finally, we've taken a look at what our bank sector colleagues are projecting for loan growth in 2016 and compared this to our economists' forecasts for nominal GDP growth. At the moment, we are not forecasting meaningful deleveraging in any country – indeed in most countries, our analysts are forecasting that loans will grow slightly above nominal GDP. Loan growth is only one component of credit in the economy but it is consistent with the idea that the region is in a much slower stage of credit creation than at the start of this leveraging up and de-rating process. While Asia might not be deep into de-leveraging, it does seem to us that most of the credit cycle de-rating is likely behind us not ahead of us.

**Singapore and Indonesia look better and pricing in many of our Debtopia concerns – we recently moved both from underweight to neutral**

**Figure 20: UBS growth forecasts for 2016 (shaded countries where GDP growth to exceed loan growth)**

2016E	Nominal GDP gr.	Loan growth
China	4.9%	10.0%
Hong Kong	2.5%	5.5%
India	12.2%	14.0%
Indonesia	9.9%	12.0%
Korea	2.6%	4.3%
Malaysia	7.3%	6-7%
Philippines	8.7%	13.0%
Singapore	1.9%	5.1%
Taiwan	2.0%	1.5%
Thailand	5.4%	4.1%

Source: UBS Asia Economics team, UBS Asia Banks team

## Statement of Risk

Although there are many uncertainties with equity investing, generally economic and policy surprises pose the most consistent and continuous risks. Economic growth can be volatile, leading to earnings uncertainty. Inflation volatility can likewise lead to interest rate uncertainty. The direction and level of policy rates has a substantial impact upon equity valuations.

## 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](http://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 <sup>1</sup>	IB Services <sup>2</sup>
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 <sup>3</sup>	IB Services <sup>4</sup>
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 FINRA. Such analysts may not be associated persons of UBS Securities LLC and therefore are not subject to the FINRA restrictions 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:** Niall MacLeod; Matthew Gilman; Yuka Murata; Duncan Wooldridge.

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](http://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](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 2016. The key symbol and UBS are among the registered and unregistered trademarks of UBS. All rights reserved.

