

## Global Economics View

### What Does The Chinese Devaluation Mean For the World?

- Last week, the People's Bank of China changed its exchange rate mechanism to – at face value – allow the market to play a greater role in setting the renminbi (RMB) exchange rate and the RMB has since depreciated by 3%.
- We expect the PBOC to continue to manage the RMB heavily, and expect a modest further depreciation to 6.8 RMB per USD within 12 months. As the Chinese economy slowed, it made little sense for the RMB to appreciate alongside the USD over the last year. But the positive impact on Chinese growth from the depreciation we expect is likely to be moderate – perhaps boost Chinese GDP by up to 0.5% and CPI by 1.5% over a year, and there could be some negative balance sheet effects in China due to unhedged dollar borrowing. Additional policy easing in China therefore remains likely (we expect five RRR cuts and two policy rate cuts within 12 months).
- There are many channels of transmission of the changes in the RMB exchange rate (and system) and exchange rate system to the rest of the world. By themselves, the RMB weakening and associated FX volatility will be a modest drag on growth and inflation for the rest of the world.
  - We therefore expect a weaker RMB to reinforce the theme of 'lower for longer' monetary policy in the US and other advanced economies. We have not changed our calls at this point, but the recent developments increase the risk of a later and shallower hiking path for the Fed and the BoE, earlier and more extensive additional easing by the ECB and additional and/or more extended easing by the Bank of Japan. In Australia and New Zealand, the developments reinforce our expectation of further rate cuts this year and a later start to their hiking cycles.
  - Emerging markets that articulate their product chain and/or compete with China in China, at home or in third markets, including Korea, Taiwan, Philippines, and Thailand are likely to manage their currencies down alongside the weakening RMB. Those countries whose exchange rate is closely tied to the USD (Hong Kong, Singapore, Argentina, Ecuador, Saudi Arabia and some of the other Gulf states, will find themselves at a competitive disadvantage and the viability of their dollar (crawling) pegs will be tested.
  - The likely policy responses in other countries, especially looser monetary, credit and exchange rate policies, moderate the otherwise negative effect of a weaker RMB on global growth and inflation. The main risk to that outlook is a greater focus on 'beggar thy neighbor' policies, including greater resort to protectionism, which would damage growth prospects.
  - The recent developments also highlight the trend for higher FX volatility and the potential for occasional discontinuous changes in FX, often following periods of relative calm and stability.

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## The Renminbi and the World

On 11 August, the People's Bank of China (PBOC) announced what at first blush may seem like a modest change, but what in reality over time could evolve into a dramatically different arrangement for the renminbi (RMB) exchange rate. The RMB regime could become a managed float, i.e. a market-determined exchange rate subject to periodic intervention by the PBOC. With a continuing albeit gradual liberalization of cross-border capital flows, the effectiveness of direct foreign exchange market interventions will steadily diminish.

Effective from 11 August, market makers submit their quotations of the RMB central parity based on the closing rate on the previous day, *"in conjunction with demand and supply conditions in the foreign exchange market and exchange rate movement of the major currencies."* The new daily fixing will be a weighted average of those submitted quotations. The weighting is determined by China Foreign Exchange Trading System (CFETS), a subordinate of the PBOC (previously, the CFETS asked for the price quotations from market makers based on the fixing in the previous day). The PBOC has not, thus far, changed the size of the band of +/-2% around which the exchange rate is allowed to deviate from the daily fixing. Furthermore, the central bank will continue to intervene even if the exchange rate is within the bands.

This decision by the PBOC is a significant event, even if its implications and motivations are not yet fully clear. It appears that the Chinese government has moved from operating a pretty stable peg to something closer to a managed float, raising questions about how strongly it will manage it. As liberalization proceeds, (sterilized) foreign exchange market intervention will effectively only work through signaling and announcement effects. However, 'domestic' interest rate policies, credit and other financial and/or fiscal policies are likely to gain strength as well as they affect the 'market-determined' exchange rates. As such, monetary policy and exchange rates will work in tandem as there is no such thing as a policy-independent exchange rate, regardless of how freely it floats.

Given our foreseen path for activity and policies, we envisage a path of the renminbi with an additional depreciation (to RMB 6.8 per dollar in the next 12 months vs 6.3 in the next 12 months previously). That path is likely to be characterized with greater volatility and uncertainty over the future policy intentions of the Chinese authorities. These factors are likely to have significant implications for the rest of the world given the major role China now plays in virtually all areas of the world economy. In this note, we explore the decision of the PBOC, its implications for China and for the rest of the world.

Even though we stress that the decision of the PBOC has the potential to be significant, we are skeptical that the actual changes we will see will be dramatic in the near-term. In our view, it is not obvious that the Chinese government would like to engineer a large depreciation (of, say, 20% vs the USD) and quite unlikely that it will have suddenly found an appetite for more volatility. The new system therefore will gradually transition to its ultimate destination of managed float. Along this process it can be made to work similarly to the old system (in terms of inducing a path for the exchange rate desired by the authorities): the authorities can influence the closing rate on the last trading hour by outright intervention or, through moral suasion they can influence the quotations submitted by market makers; they can also discreetly choose and change the weighting of the closing quotations as they constitute private information. Nevertheless, it is now significantly more difficult to manipulate the information as market participants observe transaction prices and it is also costly in terms of reserves to intervene on a large scale, if the objective is to engineer large changes in market prices.

An indisputable implication of the change is that now the fixing allows an easier drift in the exchange rate (daily moves can accumulate more easily) and, therefore, the costs of leaning against the changes in the value of the currency are likely to be higher and ultimately more observable. A corollary of this is that the new system is likely to generate more RMB volatility and – given the challenges the Chinese economy faces – also a weaker path for the RMB over the next twelve months. But we caution against expecting dramatic changes in the level of the RMB or its volatility in the near-term.

## A Surprising move

Despite the repeatedly proclaimed commitment of the Chinese authorities to domestic financial market liberalization and Renminbi internationalization, which includes (controlled) capital account liberalization, the recent developments were a surprise to us. This is in part because China's recent experience with financial market volatility (in the stock market) – which seems to be the almost inevitable byproduct of liberalization – appears to have taken aback the Chinese leadership. It is also because sometimes the original objectives of the attempted liberalizations proved elusive.

Of course, the equity market is not the full story: the Chinese government has implemented reforms to interest rate setting for bank deposits and loans, encouraged the creation of a market for certificates of deposit, liberalized and induced a rapid development of a market for corporate and local government bonds, and permitted the emergence of a significant and lightly regulated shadow banking sector. In the equity market, the authorities created a pipeline connecting the onshore and offshore equity markets. They also opened up opportunities for Chinese institutional investors to buy foreign assets and for foreign qualified institutional investors to participate in the domestic bond market. They have also pump-primed the equity market with a number of policies directed at liberalizing participation in the market and facilitating the build-up of leveraged positions.

The result of the reforms in the equity market was a huge run-up in valuations that many considered to be at least policy-tolerated and quite possibly policy-encouraged or induced. Amongst the macroeconomic justifications for this particular policy were, people argued, the potential emergence of wealth effects as a new transmission mechanism for monetary policy. In addition, rapidly rising stock valuations appeared to be an easy way to induce a change in the capital structure of many corporations, both directly and by encouraging additional equity issuance, which, in turn, would help resolve their excessive leverage.

After increasing since June 2014 to June 2015 by more than 150%, the equity market has suffered a sharp decline in prices of 24% since then. The decline might have been much larger absent a series of aggressive interventions by policymakers, including restrictions on trading and cancellations of IPOs, instructions to many market participants (banning short selling and in some cases direct selling and mandating share re-purchases) and the provision of a huge line of credit (reported to be up to Rmb 3trn) coordinated by the PBoC to be deployed for the purchase of equities. The sharp correction and the revealed aversion to facing the inevitable consequence of market volatility that follows liberalization, led us to conclude that the Chinese government would be reluctant to rush into liberalizing other key macroeconomic relative prices (see [Emerging Markets Macro and Strategy Outlook - China's Wobbly Stabilization](#)).

One may have thought that would apply in particular to the external financial account. After all, rapid liberalization of the financial account in a country subject to

internal and/or external economic imbalances is deemed, by many, to be one of the main triggers for the 1997 Asian crisis. A lesson that was drawn from that experience was that liberalization needs to be carefully thought out and follow proper sequencing. In particular, cross-border financial liberalization should follow domestic financial liberalization and even domestic financial liberalization is fraught with risks in the presence of major economic imbalances (and therefore should probably follow after the necessary internal reforms and adjustments have been implemented).

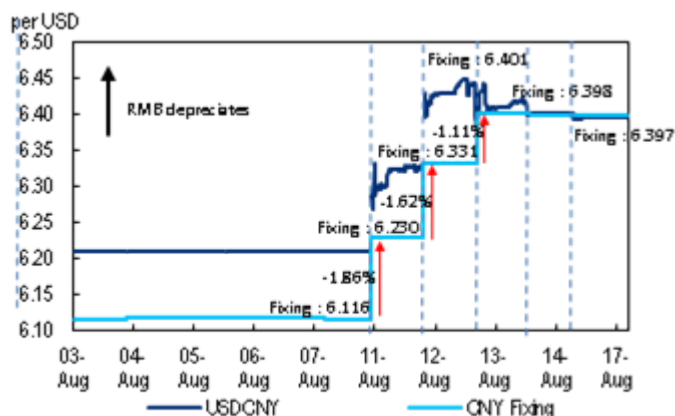
China faces two large and interacting imbalances: excessive leverage (particularly in the local government and SOE sectors) and excess capacity (in many sectors populated by SOE, old-economy champions and in real estate). The Chinese government has in the past also often expressed a preference for stability— not least in its published GDP growth statistics. In the case of China we therefore expected that any market-oriented reforms, including capital account liberalization and introducing a more flexible exchange rate (or more properly, a managed float or market-driven crawling peg), would proceed quite slowly.

So why did the Chinese government do it? Perhaps the Chinese government made more of the IMF report on the SDR last week than we did, when the IMF suggested a more market-determined exchange rate would be needed (as opposed to simply a more freely convertible currency). Perhaps the Chinese government is less worried than we are about the risk of domestic and international financial instability (including the scale and scope of its imbalances) or more confident than we are about its ability to manage it. If the driver was instead that growth prospects were worse than the Chinese government previously thought or that the RMB was more out of sync with the state of the Chinese economy, that would only partly explain it: it would explain a one-off devaluation that would long have been appropriate, but it would not explain the move to a more market-determined exchange rate system.

A combination of the above explanations is probably behind the move. In practice, we think that the Chinese authorities continue to value stability and probably aim to move slowly with the capital account liberalization and the flexibility of the exchange rate (see [China Macro Flash - Which Is More Likely, Regime Flexibility or Currency Stability?](#)).

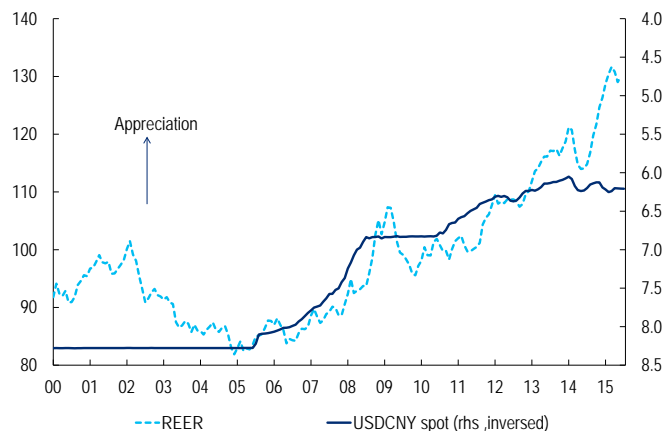
### How far will the currency go?

Figure 1. China - Daily fixing of USDCNY, 3-17 August 2015



Source: Bloomberg and Citi Research

Figure 2. China - RMB exchange rate: USDCNY vs. REER, 2000-15



Source: Citi Research

We acknowledge that there are now major (certainly larger than previously) uncertainties about the path of the renminbi. In part, this is the inevitable result of moving to a more market-determined exchange rate. This is true despite the fact that the PBOC is likely to stay very heavily involved in managing the RMB through interventions and trading restrictions. In addition to market pressures, the path of the renminbi will therefore depend on the i) the motives behind the move – in particular, how much the Chinese government wants to engineer a depreciation to boost growth (this would require a significantly weaker effective exchange rate) vs. how much the primary motivation of the reforms is a desire to signal that the external value of the Renminbi will be more market-driven (thus boosting the odds that the Renminbi will be added to the SDR basket sooner rather than later), and ii) the tolerance of the Chinese government for FX instability.

For the time being, we have no reason to believe that the authorities are aiming for a major depreciation. In its briefing on 13 August, the PBOC argued that the old fixing was 3% stronger than the true market rate, and denied the speculation that China will devalue its currency by 10% to stimulate exports (The IMF in June also deemed the RMB to be close to its equilibrium level). This may suggest a possible tolerance level between for the exchange rate to fluctuate between 6.3 and 6.8.

We now expect the USDCNY to go to 6.8 within three months vs to 6.3 over twelve months, which implies a 9.5% depreciation vs the US dollar over the next 12 months compared to the pre-announcement level and a 6.3% depreciation from today (on the day before the announcement, the USDCNY closed at 6.21 and the latest fixing on 17 August is at 6.397, Figure 1). We therefore expect that the USDCNY exchange rate will head back towards the range it held after the Global Financial Crisis up until mid-2010, thereby unwinding the CNY appreciation vs. USD since then (a period of huge central bank balance sheet expansions and accumulation of large open/unhedged FX liabilities by many Chinese corporates), but still leave the RMB higher on a (nominal and real) trade weighted basis compared to 2010 (Figure 2).

As regards the timing, at least for the managed part of the renminbi depreciation, one would think that the Chinese government would want to engineer it as quickly as possible, thereby limiting the scope of outflows trying to beat an anticipated further weakening of the currency – until we reach the new local equilibrium (should it exist).

## Implications and effects for China

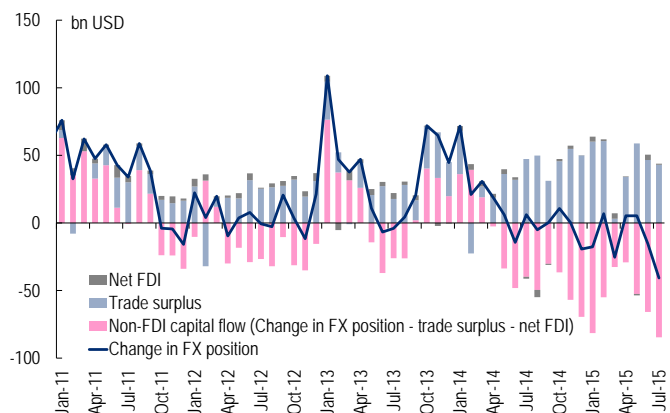
Estimating the effects of a weaker exchange rate on China's exports, imports and GDP is complex, since much will depend on what drives the depreciation to begin with. If, for example, the depreciation is the product of large capital outflows that result from lack of profitable domestic opportunities, it is likely that the impact on growth will be rather modest. Even worse, in the unlikely case that the depreciation leads to financial turmoil, it could prove counter-productive, forcing an adjustment in domestic spending (lower domestic spending resulting in lower output despite a higher trade balance!). On the opposite extreme, if a weaker currency is the result of expansionary policies, then the new managed float may add effectiveness to monetary policy by improving the transmission mechanism.

In the case of the present RMB depreciation, we think the most relevant effects on China will come through i) effects on the relative price of tradables, ii) effects on Chinese inflation, iii) the effects on capital outflows, iv) wealth and balance sheet effects, v) the induced changes in other Chinese policies and (vi) the response of foreign policy makers.

A (policy induced) weaker renminbi can have a reflation effect at home. It may induce an increase in profits and local currency valuations of equities, supporting the market and inducing a wealth effect. Also, a weaker currency is likely to increase the domestic price of tradable goods and services, reducing the real burden of debt, but raising the cost of imported goods for consumers. The magnitude of these effects is hard to pin down, as estimates of FX pass-through in China are unreliable (even more so than in other countries, as the exchange rate has been heavily managed and has not been very volatile).

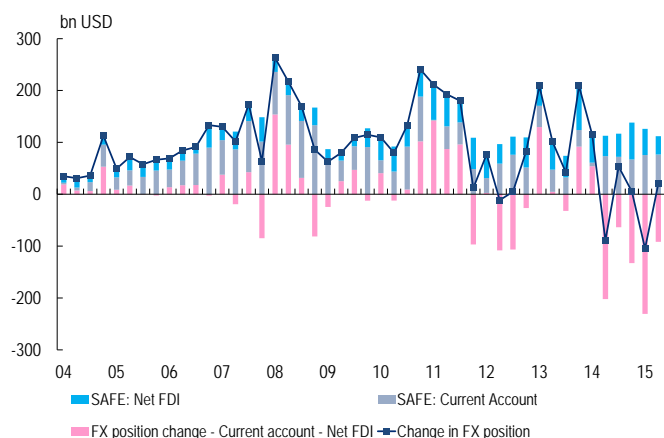
There is considerable uncertainty as to what the equilibrium level of the renminbi might be and over the path of future economic growth. Prior to the recent decision, China's capital outflows have been so significant that they not only mopped up the whopping current account surplus but also resulted in a reduction in international reserves – a clear sign of the FX being out of equilibrium. Figure 3 and Figure 4 show different approximations to the large capital outflows observed (the pink lines pointing south since early 2014) and the fall in international reserves – though some of the fall in reserves is explained by valuation effects amid the surge in USD (Figure 5).

Figure 3. China capital outflows based on trade surplus



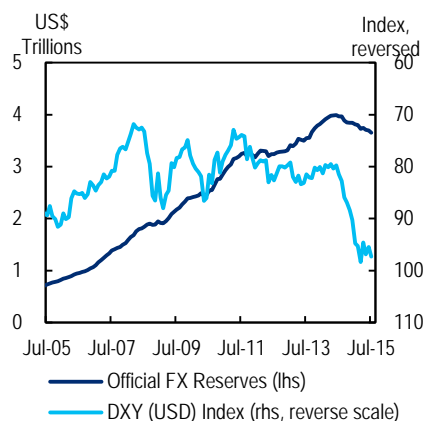
Source: Citi Research

Figure 4. China capital outflows based on current account activities



Source: Citi Research

Figure 5. China – Foreign Exchange Reserves (in US\$ Trillion) vs. DXY Index



Source: CECL, Bloomberg, Citi Research

Note that in principle, a one-off depreciation should lower the pressure for further capital outflows, if it adequately removes further depreciation expectations (or it is close to where market perceives it to be at equilibrium). In reality, assessing RMB equilibrium is highly complex and will depend on various fundamental developments in the economy that impact supply and demand for RMB vs USD. In the case of China, however, at least in the near-term, the current depreciation probably will increase expectations of further moves in a similar direction, creating a risk of more damaging exchange rate volatility, some adverse balance sheet effects, and even perhaps an increased risk of a hard landing.

China's external liabilities have increased raising the potential risk of balance sheet effects and/or demand for FX hedges. SAFE recently reported that China's gross external debt according under a new revised definition compliant with IMF Special Data Dissemination Standards (SDDS) has reached \$1.67trn in Mar-2015, with an extra US\$804.7bn of external liabilities not counted in previous historical series (reported external debt was only \$895bn in end of 2014) with the discrepancy accounted largely by non-resident deposits and foreign debt in RMB, mostly in trade finance (Figure 6). This means that China's external debt is really around 16% of GDP and 67% of exports of goods and services instead of earlier reported 9% and

36%, respectively. Moreover, while the older external debt series suggest external borrowings doubled since 2009, we estimate that the revised series suggest they have risen 170% instead. Furthermore, citing PBoC data, the IMF noted that China has about US\$710bn of non-resident holding of RMB-denominated bank liabilities. Larger than previously thought external liabilities and sizable foreign holdings of RMB assets suggest there is still a large potential demand for FX hedges in the near future.

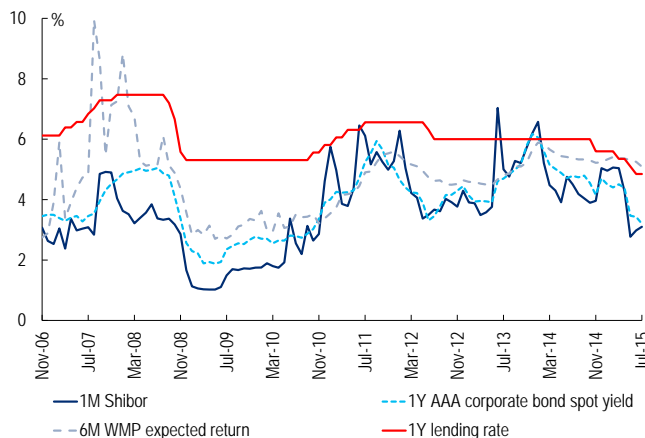
Further policy action needs to reflect the effect of the depreciation-cum-FX intervention-cum-asset market and inflation effects. The silver lining of a genuine float is that it should improve the transmission mechanism of monetary policy, adding punch to any monetary and credit-easing policies as leakages through capital outflows ought to be reduced and the movement of the currency is likely to add another vehicle through which policies might work. Therefore, since the depreciation would, other things equal, boost Chinese real GDP growth (by boosting the prospects of growth in exports and import-competing production) and inflation, one may think that at the margin it can somewhat reduce the need for further monetary easing. However, this is only true once the move towards a floating FX regime is completed.

Figure 6. China – Significant build-up of External Debt in Recent Years



Source: SAFE, CEIC, BIS and Citi Research; Note: In 1Q2015, SAFE revised the external debt data to comply with IMF's SDDS template, resulting in a sharp jump in external debt from \$895bn at end of 2014 to \$1.673 trillion in March 2015. We adjust the historical data to create a consistent series by including estimate for nonresident deposits and RMB-denominated trade finance.

Figure 7. China - Evolution of Key Chinese interest rates (%), 2006-15



Source: Citi Research

In an environment with increased uncertainty and potentially larger capital outflows, market interest rates may increase and domestic liquidity conditions tighten (see Figure 7), which in turn could potentially call for more, rather than less additional monetary and credit easing. It is also worth noting that the exchange rate and interest rate cuts or credit easing are not equivalent: tradable sector firms will be more directly affected by the exchange rate, while domestically-oriented firms or households may well be more directly affected by changes in interest rates. There are likely to be some losers from these policy actions – and if recent months and years are any guide, the Chinese government may be sensitive to the fate of those losers and respond to it. In fact, the experience in the equity market shows that things don't always turn out as the Chinese government wants, which could lead it to adopt potentially conflicting measures in response to undesired (and potentially unexpected) volatility.

For the time being, we continue to expect five more reserve requirement ratio (RRR) cuts (50x5=250bps) and two more 25 bps policy rate cuts in next 12 months. We think that RRR cuts will probably come before the next policy rate cut. The RRR cuts may be directed to compensate for the tightening of liquidity conditions due to capital outflows. On the other hand, the authorities may feel that the pressure on interest rates to account for most of the policy response has been reduced. This factor and a desire to reduce the incentive for further capital outflows may lead the PBOC to decide to postpone interest rate reductions. This logic notwithstanding, for now we expect two rate cuts will still take place once the authorities have recovered confidence on the valuation of the currency or when they become (even) more concerned with the path of economic activity. Of course, the Chinese government can always complement or substitute for RRR or interest rate cuts with other policy measures with similar impact (such as leaning on policy banks and even on commercial banks to lend more or to adjust rates, carrying out special tenders to provide liquidity, etc).

Figure 8. Impact of a 1% RMB depreciation on China's Economic Variables (%)

	1 year	5yrs
Real GDP	0.06	0.02
Consumption Exp	-0.01	-0.04
Real Investment	0.03	0.07
CPI	0.18	0.53
Current Acct (% of GDP)	0.05	-0.01
Fiscal Bal (% of GDP)	-0.02	-0.04

Source: Oxford Economics

The impact of a policy-induced RMB depreciation on China is therefore complex and dependent on a number of other policy decisions. As a benchmark, we use the Oxford Economic Forecasting Model to estimate the short-run (1 year) and long term (5 year) response of a range of Chinese macro variables to a 10% RMB devaluation, assuming that the path of monetary policy in China will not be affected by the FX move (see Figure 8). We find that in the short-run, the depreciation raises China's real GDP by 0.6%, but that the impact fades over time. Contrary to the desire to rebalance the economy towards consumption, the model estimates that any positive growth lift in China from a weaker RMB comes at the expense of consumption, as it raises the price level (which increase by 1.8% in the first year) more than nominal incomes.

An important question for China is what the change means for the risk of a hard landing. On the one hand, surely, given the travails of the Chinese economy, the renminbi should be weaker than it currently is to act as a shock absorber. On the other hand, we fear that greater international financial liberalization when the imbalances in the Chinese economy are large probably raises the risk of a financial crisis at some point. A competing narrative is that opening up the capital market would lead to some inflows, and that China would eventually be able to shift some of its losses onto those foreign investors. That may well be true, but this will unlikely be enough to avert an eventual financial crisis, only that some of the losses would be borne by foreigners.

A secondary question is whether this form of capital account liberalization also means that domestic financial liberalization will be accelerated, too.

### China Matters for the World Economy – on Many Dimensions

The potential significance of the developments in China of course relates to its importance in the world economy – as a producer, a source of demand and in many other areas. For instance,

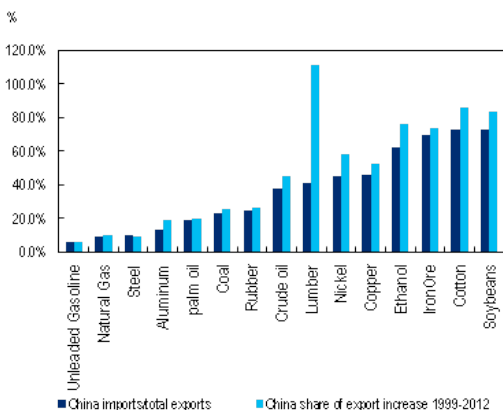
- China accounted for 15% of global GDP in 2014 at market-exchange rates (ME) and 17% at purchasing-power-parity (PPP)-based exchange rates. In recent years, China accounted for roughly one third of global GDP growth (both in ME and PPP terms).
- China accounted for 10% of global exports of goods and services (in USD) and 9% of global imports in 2014 (and over the last five years China has gained



export market share of over 3ppts to account for 13% of world exports, as well as accounted for 13% of global growth in imports).

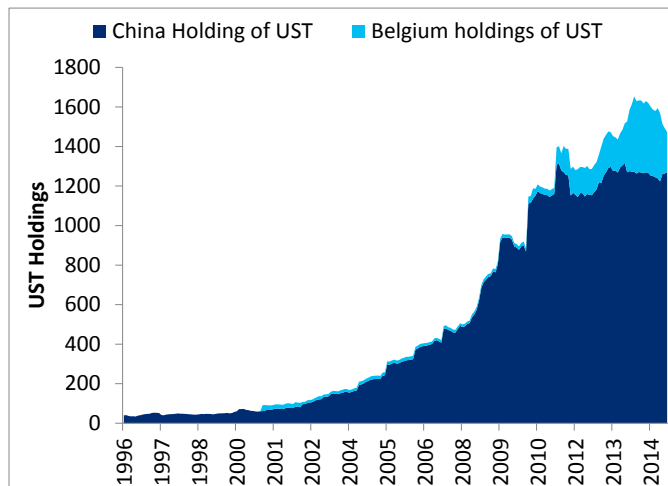
- China is a major consumer of commodities (Figure 9). Chinese imports account for more than 50% of global exports in ethanol, iron ore, cotton or soybeans and a significant share of the exports of a number of other commodities.

Figure 9. China – Imports By China As a Share of World Export of Commodities (%),



Source: Citi Research

Figure 10. China – Holdings of US Treasury Securities (US Bn), 1996-2014



Source: Citi Research

- The PBOC's foreign exchange reserves in July amounted to \$3.65trn, around 30% of the world's total, down from a peak of \$4trn in mid-2014. We estimate that China holds roughly \$1.5trn of US Treasuries alone (including an estimate of Chinese holdings via clearing houses), roughly 12% of the total amount outstanding of marketable US debt (Figure 10).

- China also accounts for a significant share of the revenues and profits of foreign companies.<sup>1</sup>

### Effects on the Rest of the World

If the effects of the change in the RMB and its determination on China are complex, that is even more true for their effect on the rest of the world. There are a variety of channels, including direct and indirect effects on the trade of goods and services, effects on relative prices, balance sheet and wealth effects, changes to the volatility of many key prices and quantities and of course the effects will also depend on the policy responses of the other countries.

### Trade exposure

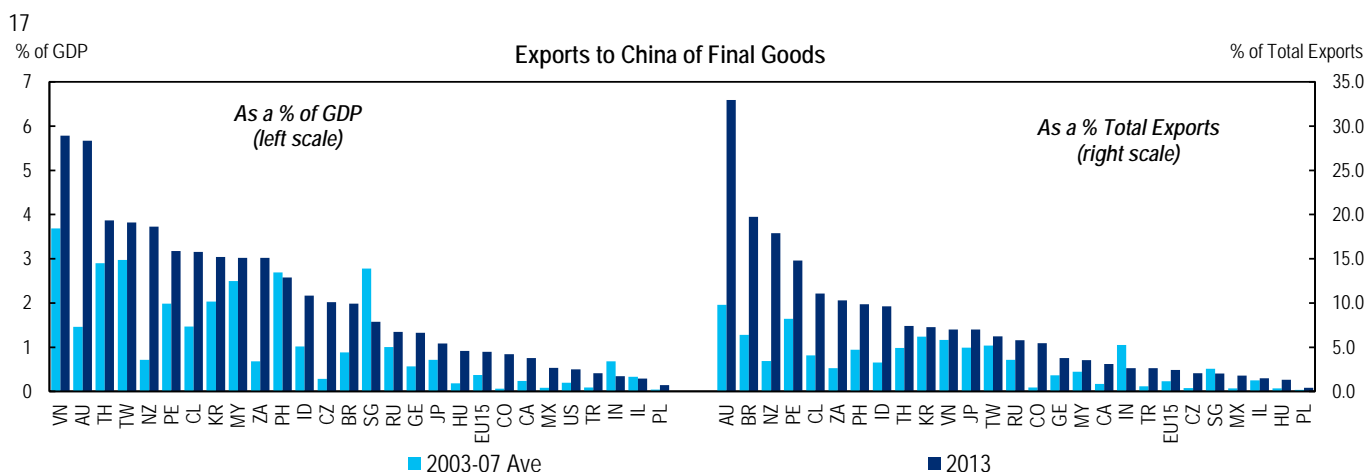
One place to start is the direct exposure of other countries to trade with China. As in [Emerging Markets Macro View - The China Syndrome](#), for the export exposure to China we focus on a proxy for the exports of final goods to China, due to the large

<sup>1</sup> See [Global Equity Strategy - China Exposed Stocks](#), [European Equity Strategy - China Risk & European Equity Exposure](#), [Equity Strategy - Tactically Thinking](#) and [Australia Equity Strategy - Alert: Companies' Sales Exposure to Asia and China](#)

share of processing trade in China's overall trade (we do this by using only a country's exports to China that are classified as primary, consumption and capital goods in the RIETI database, see Figure 11).

The increase in exposure to China (both as a share of exports and a share of GDP) is evident in virtually all countries. The largest exposures (and often the largest increases over the last decade or so) can be found among commodity exporters (especially Australia, New Zealand, Brazil, Chile, Peru, South Africa and Indonesia) – final goods export exposure in many of these countries amounts to more than 3% of GDP and more than 5% of GDP in Australia.

Figure 11. Exports to China for China's 'Inferred' Final Goods (% of GDP and % of Total Exports) – 2003-07 Average vs. 2013



Source: RIETI, Citi Research; Note: We use the RIETI database which is only updated until 2013 and provides a relatively granular approach to categorizing exports by classifying over 1,200 product segments into five product categories that distinguish intermediate and final goods. Singapore data only includes domestic exports to China. (See <http://www.rieti-tid.com>). Note: EU5 includes Germany, UK, France, Italy and Spain.

But a number of non-commodity exporters are also heavily exposed, in particular in Asia (e.g. Vietnam, Thailand, Taiwan, and Korea) – in Vietnam again, final goods exports to China account for more than 5% of GDP. Among the EMs, the export exposure of the Indian sub-continent, Mexico and parts of CEEMEA are much lower. The same applies to varying degrees to the US, the EU or Japan (where exports of final goods to China amount to 1% of GDP or less). To estimate the effect of a Chinese depreciation on other countries' GDP growth and exports through direct trade exposure, we would need to multiply the export exposure with the relevant sensitivities of GDP and exports to the exchange rate (and also take into account the import response).

A different route to compute direct trade exposures is to use China's share in the BIS's effective exchange rate indices (Figure 12). These weights have the advantage of reflecting some competitive effects and not just the direct trade exposures. They can be used to calculate the size of the effective appreciation of each country vs the RMB. If we multiply the effective appreciation with the respective country's sensitivity of GDP or exports growth to the effective exchange rate change, that could give us a sense of the GDP or export response to the RMB depreciation (usually over a horizon of 1-2 years). For instance, in the Eurozone, several studies suggest that the exchange rate sensitivity of exports is roughly around 0.5 over three years and the sensitivity to GDP around 0.1.<sup>2</sup> Coupled with

<sup>2</sup> Di Mauro et al (2008), "The Changing Role of The Exchange Rate In a Globalised Economy", ECB Occasional Paper Series, September 2008, <https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp94.pdf>

Figure 12. Selected Countries – Weight in BIS Effective Exchange Rate Indices (in %)

In the EER for:		CNY	EUR	JPY	USD
Australia	AU	21.1	17.2	11.1	14.4
Brazil	BR	14.3	21.1	4.9	18.9
Chile	CL	23.3	17.2	6.2	17.0
China	CN		19.4	15.9	19.0
Euro area	EA	17.0		6.0	6.8
India	IN	16.6	22.1	5.3	14.1
Indonesia	ID	16.3	11.0	15.7	10.1
Israel	IL	10.3	26.8	4.6	25.7
Japan	JP	29.5	14.0		16.6
Korea	KR	27.9	13.4	16.3	13.0
Malaysia	MY	17.4	12.6	13.1	14.3
Mexico	MX	13.0	9.3	4.4	53.1
New Zealand	NZ	18.0	13.4	9.8	11.9
Philippines	PH	14.9	11.5	17.9	14.9
Poland	PL	9.9	53.4	2.3	3.8
Russia	RU	17.1	39.8	6.5	5.9
Singapore	SG	17.2	12.8	11.0	13.3
Taiwan	TW	26.8	11.1	18.7	13.5
Thailand	TH	17.9	11.3	20.5	10.5
Turkey	TR	11.6	44.2	2.7	6.0
United States	US	20.9	17.4	8.8	

Source: BIS and Citi Research

an effective exchange rate weight of 17% and a 10% depreciation of the RMB vs the euro yields a potential impact on Eurozone GDP of less than 0.2% and of Eurozone export volumes of less than 1%.

Figure 13. Modified Finger-Kreinin (Net) Export Similarity Index with China\*



Source: UN Comtrade, Citi Research; Note: \*See J.M. Finger and M.E. Kreinin. "A Measure of Export Similarity and its Possible Uses" *The Economic Journal* (1979) and revised version used by Australia's Dept of Foreign Affairs & Trade. *China's Industrial Rise: East Asia's Challenge* (2003) and YW Cheung & XW Qian. *Southeast Asia: Similarity in Trade Structures* (May 2009). When calculating the index, only net export values with positive values are used, while those with negative net export values will take zero values. We use single digit SITC codes for commodity 0-5 and 8-9 and 2-digit SITC codes 6 & 7. For index formula details, please see our older report on this topic: [Asia Macro Flash - Asia – External Competitiveness Sensitivity to JPY Weakness](#)

Given China's role as a major producer of a broad range of commodity and manufactured goods – RMB depreciation, especially at a time of weak global demand, could raise some external competitiveness concerns in countries with relatively similar traded goods structure as China, but does not see similar magnitude of FX adjustment. As a quick gauge, we estimate the relative export competitiveness pressures from China by calculating a 'net export similarity index' which is summarized in Figure 13. Despite some caveats to the index, we find that parts of Europe, Asia (Vietnam, India, Taiwan, Malaysia, Philippines, Thailand, and Korea), and some middle income EM countries (Turkey, CEE and Mexico) have relatively high net export similarity with China, and thus, will likely be sensitive to any prospective RMB depreciation relative to their own domestic currency (though some – like MYR and TRY – have been underperforming CNY for far longer).

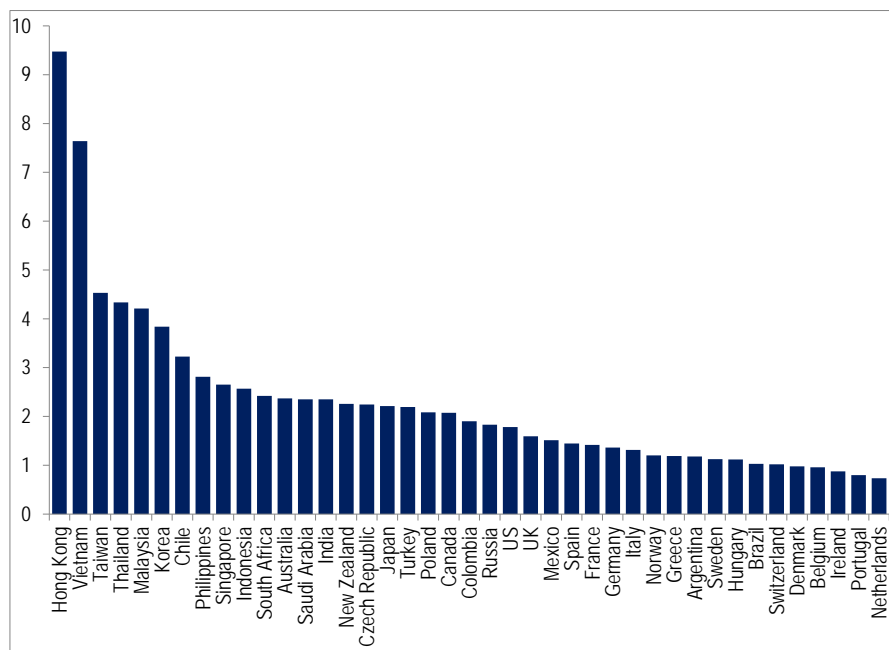
On the inflation side, assuming full pass-through, the share of imports (really value-added) from China in total household consumption expenditure can yield a rough estimate of the potential effect of the Chinese depreciation on the price level in each country.<sup>3</sup> In the US, the St Louis Fed in 2011 estimated this share at 2%.<sup>4</sup> Under the assumption of full pass-through of the RMB depreciation to US import prices, but keeping all else constant, a 10% RMB depreciation would therefore lower the US price level by 0.2%, probably over two years.

<sup>3</sup> On the one hand, as the exchange rate passthrough to domestic prices tends to be less than full, assuming full pass-through could potentially overstate the effect of the depreciation on the price level. On the other hand, import-competing production would likely react, too, which would magnify the effect on the domestic price level.

<sup>4</sup> In the case of the US, the St Louis Fed has estimated the share of PCE sourced from China, which amounted to around 2% in 2010, reflecting imported intermediate goods but also the share of import spending that falls on US services (for freight, transportation, etc). See <http://www.frbsf.org/economic-research/publications/economic-letter/2011/august/us-made-in-china/> and <https://research.stlouisfed.org/publications/es/11/ES1117.pdf>.

We are not aware of a source of such data for a broad range of countries. In Figure 14, we plot the share of imports from China in 2011 (latest data) in value-added terms relative to GDP for a range of countries instead and use that as a proxy for the share of Chinese imports in consumption spending.<sup>5</sup> Unsurprisingly, the share of Chinese imports in GDP is largest in Asia. But in a large number of countries, the GDP share of imports ranges from 1-2.5% of GDP. Assuming the same share for Chinese imports in the consumer price basket implies that a 10% appreciation of the renminbi with full pass-through and no other changes would yield price level effects of roughly 0.1-0.25% over two years.

Figure 14. Selected Countries – Imports of Goods From China (% of GDP), 2011



Note: Imports are in value added terms.

Source: OECD and Citi Research

## Other Channels of Transmission

But our calculations above are, at best, a first guess. There are a number of – often related – other potential channels of transmission of the change in the level and volatility of the RMB, which will of course in the end also feed back into the overall effect on GDP and inflation.

### Exchange Rates

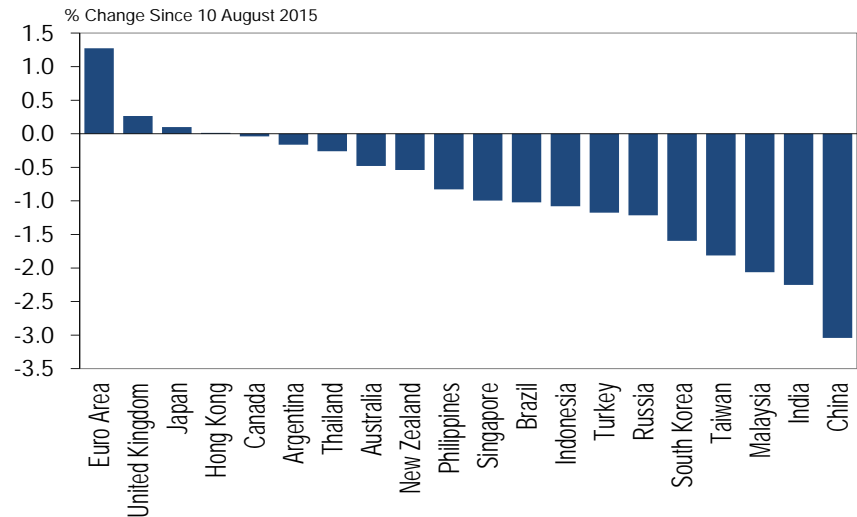
Many of these will manifest themselves through financial markets. There are obvious repercussions of the recent developments for other exchange rates – on average, we would expect there to be pressure to devalue or adopt policies to encourage depreciation of the currency for the currencies of countries that, other things equal, are either exporting a lot to China or competing with Chinese exports.<sup>6</sup>

<sup>5</sup> In many countries, capital expenditure are more import-intensive than consumption spending. If the share of Chinese imports is equal in both consumption and capex, our assumption will therefore deliver an overestimate of the effect of the Chinese depreciation on the CPI.

<sup>6</sup> In general, if a country imports a lot from China, there should not really be any reason to desire a weaker currency (after all, it is essentially mostly a benign terms of trade shock). An exception may be

Above we noted that Australia, New Zealand, Brazil, Chile, Peru, South Africa, Indonesia, Vietnam, Thailand, Taiwan, and Korea are in the category of countries with large trade exposure to China. India, Malaysia and Taiwan are among the EM countries that also have high export similarities with China.<sup>7</sup> Unsurprisingly, exchange rates in this group of countries also mostly depreciated alongside the RMB (vs the dollar) in the last few days (Figure 15), with the currencies of India, Malaysia, Taiwan and South Korea most affected.

Figure 15. Change in Selected Exchange rates vs USD (%) Since 10 August



Source: Bloomberg and Citi Research

The mirror depreciation of these currencies (even if usually by less than for the RMB), also means that those countries and currencies that are typically supposed to be less affected will experience an even larger (trade-weighted) appreciation than their appreciation relative to the RMB alone. For instance, if we define a 'China' bloc with the countries with high exposures to China, their weight (e.g. in the BIS trade-weighted exchange rate indices), including China, often roughly doubles China's weight, from 21% to 39% for the US, from 17% to 34% for the Eurozone and from 11% to 22% for the UK.<sup>8</sup> If we assume that the currencies of the countries in this bloc depreciate by roughly half of the depreciation of the RMB on average, the movement in those exchange rates would therefore increase the trade-weighted appreciation of the USD, euro or pound by roughly 50% relative to the direct effect of the RMB appreciation alone.

### Wealth and Balance Sheet Effects

Changes in exchange rates can of course have notable wealth and balance sheet effects in addition to their effect on relative prices of tradables. Countries (mostly households and corporates) with large unhedged dollar borrowing may be vulnerable, if their exchange rates weaken significantly, not least as we are close to the start of a US rate hike cycle.

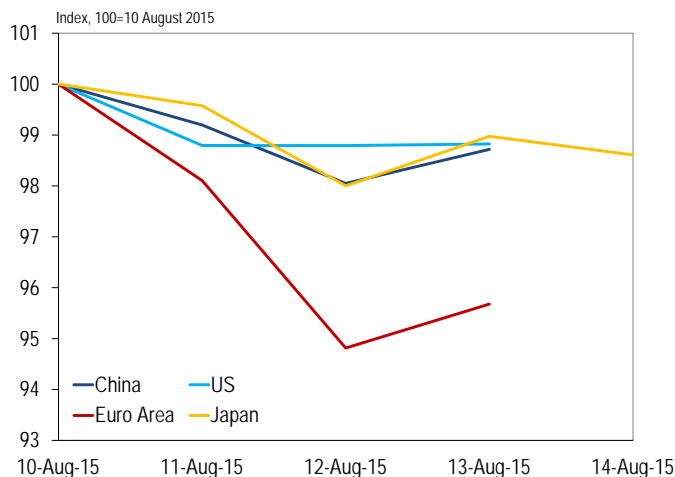
if the disinflationary effect, even if in principle driven by benign factors, is itself of concerning, e.g. because it could destabilize inflation expectations. This could be a concern in the Eurozone.

<sup>7</sup> On export similarities, see e.g. [Asia Macro View - Revisiting Impact of BoJ Policies on Asia](#).

<sup>8</sup> The countries we define to be part of this China bloc are: Australia, New Zealand, South Africa, Brazil, Chile, Colombia, Peru, Venezuela, Saudi Arabia, UAE, Taiwan, Hong Kong, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand and China.

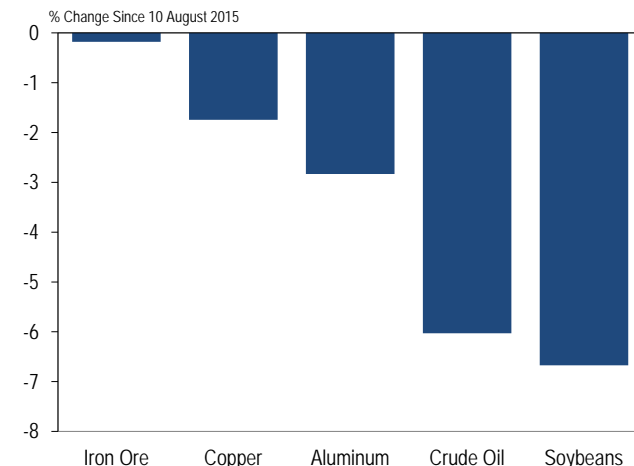
Equity prices in other countries have mostly reacted negatively to the RMB announcement so far (Figure 16), but it is not clear whether this is because the announcement in China was a signal that the economy was weaker than previously thought or due to the negative impact of competitiveness and potentially margins for firms exporting to China or competing with Chinese firms.

Figure 16. Reaction of Selection Equity Markets Since 10 August (%)



Source: Bloomberg and Citi Research

Figure 17. Selected Commodity Price Changes Since 10 August (%)



Source: Bloomberg and Citi Research

One market that may be particularly in focus may be the US Treasury market, given the size of Chinese holdings. However, in our view, the implications for this market are not all that clear. On balance, it seems likely that demand for dollar reserve assets from China will probably weaken over time (demand for reserves overall and demand for dollar reserves relative to other reserves), as China moves gradually away from an effective dollar peg. In the near-term, the Chinese government may indeed step up its interventions to stabilize the currency by selling dollar reserves in size. Other things equal that could raise US interest rates, but both the expected US appreciation and the volatility associated with the change in the RMB regime may overturn this effect on US rates. So far, US (10Y) Treasuries have risen in value (yields have slightly fallen), even though the change in yields is probably more closely related to differences in Fed policy rate expectations than the demand for dollar assets per se.

**Terms of Trade Effects**

Commodity prices have also fallen in recent days (Figure 17), particularly for soybeans and crude oil (even though China is, of course, not the only driver of the prices of these and other commodities). Why that would be is not entirely clear. The most plausible fundamental expectation is, again, that the Chinese action is taken as a sign of a weaker underlying Chinese economy. Also, since these prices are typically quoted in dollars, denomination effects may play a role too.

What will happen to Chinese demand, however, is unclear. On the one hand, if prices rise in RMB terms, the relative price effect should reduce Chinese demand for these commodities. But the RMB depreciation is also shifting demand towards China, which is more commodity-hungry than most other economies, and which would, other things equal, boost overall commodity demand. Perhaps one factor in the commodity price decline was an expectation that Chinese buyers – which have significant market power in some of the commodity markets – would try to keep prices stable in RMB terms (and therefore lower them in USD terms).

## Volatility

At least in the near-term, the change in the exchange rate regime is likely to lead to more uncertainty and to volatility in a range of asset markets, most notably FX markets, particularly in countries that have high exposure to China or are otherwise particularly vulnerable. Other things equal, this increase in uncertainty will be weighing on demand and be somewhat disinflationary.

## Policy Responses In Other Countries

The effect of the developments we describe above will probably be to shift demand away from the rest of the world and towards China. Without policy responses elsewhere, China exports deflation/disinflation to the rest of the world and weakens activity in the rest of the world. Globally, the inflationary/expansionary impact on China and the disinflationary/contractionary effects on the rest of the world would probably largely cancel each other out (the uncertainty and volatility it creates may be mildly disinflationary/contractionary initially). To the extent that the Chinese devaluation is supported by Chinese credit expansion, the net global effect could ultimately be slightly positive. The rest of the world would, however, probably still be faced with disinflation and weakening demand. Other things equal, countries in the rest of the world are therefore likely to respond with additional demand-supporting policies of their own – we mostly think that it would take the form of changes in monetary or FX policies.

In some countries, the exchange rate as a shock absorber may do part of the job and therefore reduce pressure for explicit policy reactions. For instance, as noted above the exchange rates of many of China's Asian neighbors have weakened alongside the RMB, reducing the growth-dampening and disinflationary impact on these countries. We think that countries where inflation is currently low and FX mismatches, too, such as Korea, Taiwan, Thailand, Philippines will probably welcome the FX weakness (see [Asia Macro Flash - Implications of PBoC's Shock FX move on Asia](#)). India would probably welcome the initial disinflationary effect of of RMB weakness via commodity price weakness -- we still expect a rate cut in 4Q) and we don't see a significant change in its policy path, despite some FX weakness.

An interesting question is whether there are any countries that currently have a peg that may loosen it in response to the PBOC decision (or indeed, for any other reason). The obvious candidates are in China's vicinity. Vietnam already widened the Dong's trading band. If we see increased FX volatility with the Singaporean dollar (SGD)'s nominal effective exchange rate persistently at the bottom of the band, it raises the likelihood that the Monetary Authority of Singapore (MAS) will widen the band of the SGD (as the MAS did in 1997 & 2001). In Hong Kong, we think that the Hong Kong Monetary Authority (HKMA) will likely absorb the external shock and leave the Hong Kong Dollar (HKD) peg intact for now as they continue to prize the stability the peg provides and, in their view, the RMB appreciation would only wind down a fraction of the change observed since 2010. Elsewhere, speculation has risen that Saudi Arabia could loosen its peg to the dollar (with low oil prices a major driver), which could quite possibly happen eventually, but is unlikely in the near-term, in our view ([Saudi Arabia Macro View - Why Saudi Riyal revaluation is a long shot](#)).

Even where the exchange has weakened, it may not have weakened sufficiently to compensate for the effects of the RMB. In those cases, explicit policy intervention will be likely. We are wary of calling for immediate policy rate cuts elsewhere yet, even though some of the countries with low inflation and vulnerable growth and that have not eased recently (e.g. the Philippines or Taiwan) are candidates for further

easing. In a number of other countries, rate hikes that may otherwise be plausible, have become less likely.

But there are also countries that are affected where policies may be constrained. For example, countries that are worried about asset bubbles may try to avoid further monetary easing, while countries with large unhedged dollar liabilities or at risk of major capital outflows may resist further exchange rate depreciation. For instance, Indonesia's external vulnerabilities and the sensitivity of its bond market to the exchange rate means that the Bank of Indonesia is now less likely than before to cut interest rates (we still expect a cut next year). Malaysia, in turn, facing political uncertainty and capital outflows may be wary of further Ringgit weakness. Yet, their relatively modest reserves and concerns over activity are likely to restrict policy actions in the near term to stem the appreciation.

Of course, not all exchange rates can depreciate at the same time. Countries that face a (trade-weighted) appreciation may choose to alter their policy mix. At a minimum that may mean that the prospects for monetary tightening may weaken somewhat. In the US, we think that the RMB depreciation is unlikely to deter a first rate hike in September, but we acknowledge that it has still somewhat increased the risk of a more gradual pace. A stronger path for the dollar is likely to reinforce the slow pace of hiking and a significant USD appreciation could even prematurely arrest the hiking cycle altogether ([U.S. Macro Flash: FOMC Edition - China Is Important But Not Likely to Deter Fed September Move](#)).

A similar case applies to the UK – a stronger pound probably increases the risk of a later start to the hiking cycle and a slower path, but probably does not prevent a hike in the coming 6-12 months (see [UK - How Much Does the UK Trade With China?](#)).

In the Eurozone, the appreciation of the euro vs the RMB (in addition to the weak economy in China and weaker commodity prices, even though of course the three are all related), further strengthens the case for our expectation that the ECB's QE programme will be extended beyond September 2016 ([Euro Area - The relative near-term importance of China](#)).

In Australia and New Zealand, the key factors are the potential impacts on commodity demand, and other imports. China is Australia's and New Zealand's largest export destination, thus the RMB devaluation could have other ripple effects as well. Given the developments and the downside risks to Chinese growth, we continue to expect a further 25bp interest rate cut by the Reserve Bank of Australia (RBA) before year-end and two more 25 bps cuts by the Reserve Bank of New Zealand (RBNZ). We also recently pushed out the timing for the start of the hiking cycles in Australia and New Zealand to the end of 2016 ([Australia & New Zealand Economics Weekly - Implications for the RBA and RBNZ of China's RMB depreciation](#)).

In Latin America, the impact of the Chinese devaluation arrives at a difficult time. Growth is low across the region and adjustment is proving to be quite challenging, in an environment where all governments enjoy low levels of approval ratings (in some cases extraordinarily low). Argentina, Venezuela and Ecuador have, thus far, abandoned the use of the exchange rate as an adjustment mechanism and, therefore, fully transmit the external shock (from weaker commodity prices) to domestic income and demand. The likelihood that the exchange rate arrangements in these countries last into 2016 has therefore declined and we could see discrete movements in the FX with potential side effects on domestic stability.



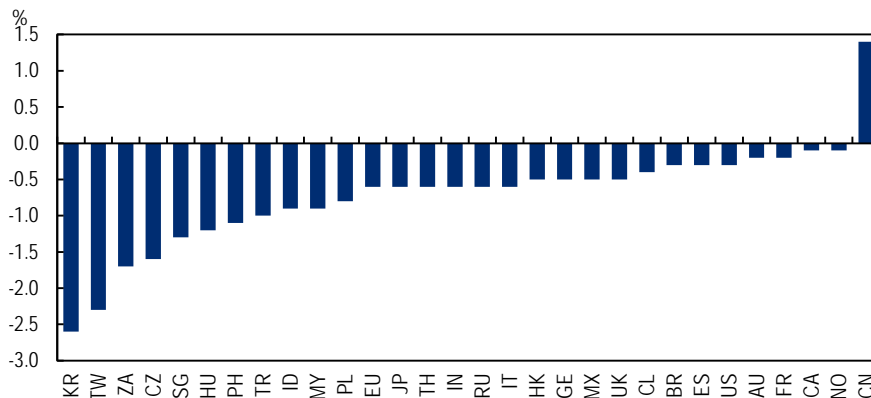
The exchange rate is more likely to carry the brunt of any adjustment in the cases of Brazil, Chile, Peru, Colombia and Mexico. The first four countries have close ties to China through commodities and are facing in 2015 a significant economic slowdown. Their currencies have depreciated in the last few months and added another leg of weakness after China's move. As a result, inflation could pick an additional push in the short term. However, they all face other domestic large challenges and therefore, we do not think that either monetary or fiscal policies will be altered much from their previous path. Mexico is more a competitor of China in the North American market and thus stands to lose competitiveness against potentially more aggressive Chinese exports. Mexico's currency had depreciated 6.5% against the dollar since early June, but only moved 0.5% after the Chinese announced the change in regime. It is unlikely that the authorities will respond in the short term as the central bank is focused on Fed actions and the Treasury needs to deliver an already sizable fiscal adjustment to absorb the effects stemming from low oil prices.

All in all, the main thrust of the policy reactions across the globe is therefore likely to be (probably modest) additional stimulus, mainly through monetary policy. One risk, however, is that some of China's competitors respond to their worsening competitive position with protectionist measures – currency wars potentially leading to mild versions of trade wars. A large-scale trend towards more protectionism is – next to the potential for major financial disruption, either in China, or in a major dollar borrowing country – the main downside risk for global growth.

### So where does this leave us?

China's recent changes to the exchange rate system have certainly been a 'shock' to the world. For China, a moderate depreciation would certainly be welcome, even though higher volatility and the potential acceleration of capital outflows could also bring risks and may dampen the initial boost of the FX weakening on growth. Over time, however, we think that the weaker RMB will give a modest boost to both growth and inflation in China.

Figure 18. Simulating the Cumulative Impact (2015-18) on Real GDP on a 10% RMB Devaluation in 3Q15 (% Difference from Baseline)

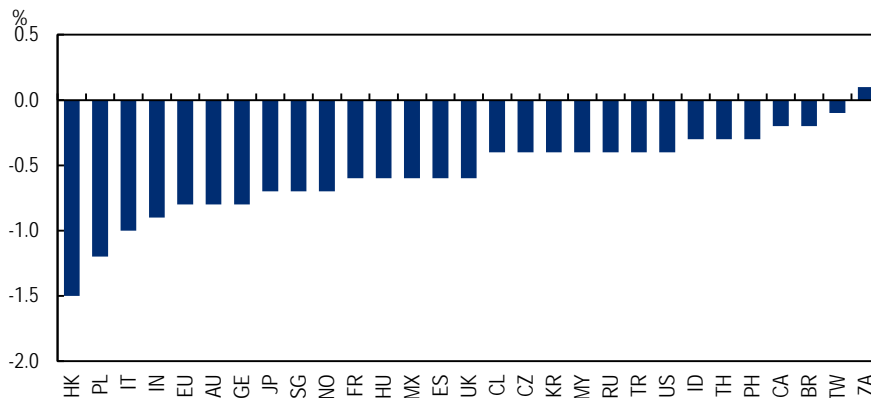


Source: Oxford Economics

The effects on the rest of the world are likely to vary across countries. Excluding the policy responses, the effects on the rest of the world would probably be mostly disinflationary and contractionary, even though, given the expected modest size of the depreciation, they are also likely to be relatively small.

For reference, we again turn to the Oxford Economic Forecasting Model and simulate the effects of a 10% CNY depreciation vs the USD on the level of GDP and CPI in a range of countries (In Figure 18 and Figure 19). Of course the Oxford model only features a subset of the channels we describe above and the estimates are subject to significant uncertainty. Nevertheless, we think they are informative and provide a benchmark against which to consider other considerations.

Figure 19. Simulating the Cumulative Impact (2015-18) on CPI Level on a 10% RMB Devaluation in 3Q15 (% Difference from Baseline)



Source: Oxford Economics

The OEFM suggests that a 10% RMB depreciation would overall moderately dampen global growth outside of China. The countries most affected are a combination of those in East Asia (especially Korea and Taiwan) that likely have significant product overlap and those that are probably competing with China (or the China bloc) most intensively, including among some unsuspecting European countries (Czech, Hungary, Poland and the Eurozone). According to the model, the effects on growth are moderate yet not negligible in the Eurozone and Japan (just above 0.5% on GDP).

While a 10% yuan depreciation in this model is reflationary for China (raising CPI by an estimated 8.9% in the subsequent three years), the yuan depreciation tends to be disinflationary for the rest of the world (Figure 19) according to the simulation. This reaction is despite the fact that policy in those other countries is endogenously responding (by and large monetary policy eases in the model as the exchange rate appreciates), as China exports its disinflationary pressures to the rest of the world. The disinflationary impact is particularly strong in Hong Kong (not surprising, given the high share of imported goods and services from China in its CPI basket), followed by Europe (-0.7%) and other developed countries such as Japan and Australia, with smaller effects on the US. Admittedly, we find the effects on prices to be larger than our own intuition suggests and acknowledge that the model results would need to be refined. But these results suggest that even though the implications of the Chinese developments at this point on the rest of the world are unlikely to be dramatic, they still need to be carefully monitored and may well turn out to affect policy decisions.

## Appendix A-1

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