

Global Economics View

Is China Leading the World into Recession?



- We analyse how the world economy could slide into recession during the next two years.
- We conclude that if the global economy slides into a recession of moderate depth and duration during 2016, it will most likely be dragged down by slow growth in a number of key emerging markets (EMs), and especially by a recession in China.
- We believe that there is a high and rising likelihood of a Chinese, EM and global recession scenario playing out.
- We discuss preventive and reactive policy responses that could mitigate or even prevent the recession scenario from materializing.

Willem Buiter

+1-212-816-2363

willem.buiter@citi.com

With thanks to

Ebrahim Rahbari, Michael Saunders, Johanna Chua, Sergio Luna, Jeremy Hale, Robert Buckland, Guillaume Menuet, David Lubin, Mark Schofield, Fan Bu and Andrew Hollenhorst.

Related Reports

[U.S. Macro Focus: FOMC Edition - September Remains Most Likely But Later Meetings Gaining Ground: Dudley and Fischer Highlight New FOMC Behavior](#)

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

Citi Research is a division of Citigroup Global Markets Inc. (the "Firm"), which 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. Certain products (not inconsistent with the author's published research) are available only on Citi's portals.

Is China Leading the World into Recession?

Introduction

Citi's Global Economics Team views a global recession as a high and rapidly rising risk

This paper develops the idea that a global recession – a period of global output below potential output – is a high and rapidly rising risk. We argue that recession may now be the most likely outcome over the next few years. This is indeed the view now held by Citi's Global Economics team, although the debate across our broader Economics team remains fervent.

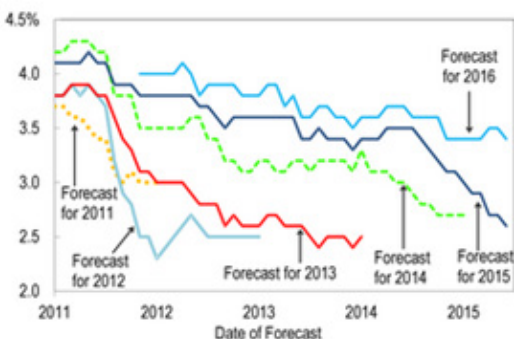
It is to be expected that economists – even economists working for the same team – have different views about the likelihood of different future outcomes. Economics isn't rocket science, and even rockets frequently land in the wrong place or explode in mid-air. We believe we provide a better service to our clients if we don't pretend there is a consensus if there isn't one. It is better to provide a range of alternative forecasts, and to explain the reasons for the differences between them, than to present a phony consensus.

A global recession was not envisaged in the last round of Citi's benchmark global growth forecasts made in August 2015; however the theme of a China-led global slowdown has been a consistent risk scenario in our Global Economic Outlook and Strategy for a considerable time.

Since 2010, Citi's global growth forecasts for the next year, like the consensus global growth forecasts, have started each year at a consistently high level, only to be revised downwards systematically during that year. The forecast for the next year, made at the beginning of that year, was invariably higher than the final estimate of growth in the previous year. This is apparent from Figure 1 below.

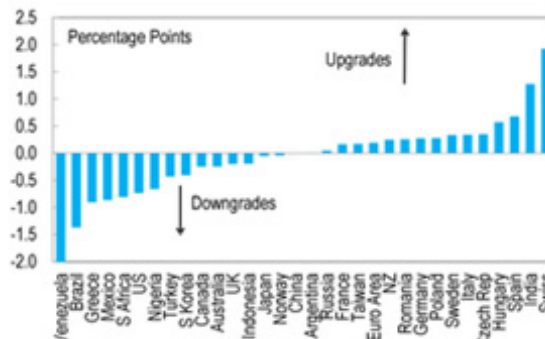
Figure 2 shows that over the course of this year our downgrades have been mostly for EMs while our upgrades have been mostly for DMs. That has also been the pattern for the earlier years. A notable exception is the US, where the pattern of starting high and ending low has also been evident. For instance, the January 2015 forecast for US real GDP growth for the year 2015 was 3.6%. By August 2015 it had fallen to 2.5%.¹

Figure 1. Global – Citi Forecasts for Global GDP Growth (At Current Exchange Rates), 2011-15



Source: Citi Research

Figure 2. Global – Changes to Citi 2015-16 GDP Growth Forecasts Since January 2015



Source: Citi Research

Note: Our Venezuela forecast has been cut by more than 5 percentage points.

¹ [Global Economic Outlook and Strategy - Global Economic Outlook and Strategy – January 2015, https://www.citivelocity.com/t/eppublic/pjFq](https://www.citivelocity.com/t/eppublic/pjFq)

This Global Economics View was originally intended to examine these serially correlated, predictable forecast revisions, but it has evolved into something that is both a counterfactual – what if – analysis and a predictive exercise that has led us to conclude that the risk of global recession is higher than many believe.

This scenario of a global recession of moderate depth and duration, starting in the second half of 2016, is not yet reflected in Citi's benchmark forecasts for China's growth, EM growth and global growth. When Citi's most recent forecasts for global economic growth and for economic growth in China (shown in Figure 3 below) were made, in the August 2015 issue of our Global Economic Outlook and Strategy (GEOS), a global recession was not the most likely (modal) scenario.

Consider the benchmark forecasts in Figure 3. For global real GDP growth at purchasing power parity exchange rates (the measure most often quoted by the IMF), add 0.5% to the growth rates at market exchange rates.

Figure 3. Forecasts of Real GDP Growth Rates (%)

	Forecasts of real GDP growth rates (%)				
	2015	2016	2017	2018	2019
Global¹	2.7	3.1	3.3	3.1	3.4
China	6.8	6.3	6.5	6.4	6.2
EMs	3.8	4.3	4.9	5.1	5.0
AEs	1.9	2.3	2.1	2.2	2.1

Source: GEOS, August 2015

1 At market exchange rate

2. In GEOS referred to as Industrial Countries

These forecasts are clearly too optimistic to be consistent with a modal recession scenario. Our best guess of potential output growth for the global economy is 3% per annum or just below it. According to Citi's benchmark forecast, actual global growth is therefore likely to be at or just below potential growth for the current year, rising slightly above it for the four years following.

A global recession is now the modal forecast for Citi's Global Economics team

In the Global Economics team, however, we believe that a moderate global recession scenario has become the most likely global macroeconomic scenario for the next two years or so. That does not mean that a moderate recession as described in this paper, starting in the second half of 2016, has a likelihood of more than 50%. We do believe that a recession is the most likely outcome during the next few years, but it is important to distinguish between a moderate recession without a regional or global financial crisis and a deep or severe recession accompanied by a regional or global financial crisis.

To clarify further, the most likely scenario (40% probability), in our view, for the next few years is that global real GDP growth at market exchange rates will decline steadily from here on and reach or fall below 2% around the middle of 2016. Growth is likely to bottom out in 2017 and start recovering again from late 2017 or early 2018. The output gap could be closed (the world exits recession) late 2018 or 2019.

The next most likely outcome (30%) is that the global economy will avoid recession during the next few years and grow at a rate roughly equal to that of potential.

There is also a probability of 15% that the global economy goes into severe recession and financial crisis, and a 15% likelihood that the global economy will enter a boom (a period of overheating), with output above potential and, for a while, growing faster than potential.

In our view, the probability of some kind of recession, moderate or severe, is therefore 55%. A global recession of some kind is our modal forecast. A moderate

This recession is likely to originate in EMs in general with China in particular at risk of a hard landing

recession is our modal forecast if we decompose recession outcomes into moderate and severe ones and assign separate probabilities to them.

In this publication, we analyse how, starting from where we are now, the world economy could slide into recession, defined as an extended period of excess capacity: the *level* of potential output exceeds the *level* of actual output, or the actual unemployment rate is above the natural rate or Nairu. The recession scenario is that of a recession of moderate depth and duration, without a major regional or global financial crisis. We conclude that if the global economy slides into a recession of moderate depth and duration during 2016 and stays there for most of 2017 before staging a recovery, it will most likely be dragged down by slow growth in a number of key emerging markets (EMs), and especially in China. We see such a scenario as increasingly likely. Indeed, we consider China to be at high and rapidly rising risk of a cyclical hard landing.

A cyclical recession could be avoided, but only by a rapid policy response

The reasons behind China's downturn and likely recession are familiar from the long history of business cycles everywhere: rising excess capacity in a growing number of sectors, excessive leverage in the private sector and episodes of irrational exuberance in asset markets – in China there were two thus far, for residential real estate and equity – resulting in booms, bubbles and busts. This is the classical recipe for a recession in capitalist market economies. This time is unlikely to be different for China. Policy options to prevent a recession exist but are, in our view, unlikely to be exercised in time.

Recession in China and other EMs would likely slow DM growth too

Should China enter a recession – and with Russia and Brazil already in recession – we believe that many other EMs, already weakened, will follow, driven in part by the effects of China's downturn on the demand for their exports and, for the commodity exporters, on commodity prices. We also consider it likely that, should the EMs enter recession territory, the advanced economies or developed markets (DMs) will not have enough resilience, either spontaneous or policy-driven, to prevent a global slowdown and recession, even though many large DMs will not experience recessions themselves but will merely grow more slowly, and possibly more slowly than potential, and more slowly than expected.

China's official GDP data are unreliable

When forecasting the outlook for growth in China we have the further problem that the official GDP data are 'manipulated' to such an extent that 'true' real GDP growth is likely to be at most weakly positively correlated with real GDP growth according to the official data. There has been a long history in China of the official GDP data understating true GDP during a boom and overstating it during a slowdown, but the degree of overstatement of 'true' growth by the official data since about 2010 goes well beyond such 'smoothing'. Incorporated in our August forecast in Figure 3 is our best forecast of what the official data will report as real GDP growth for 2015 (6.8%) and for the next four years between 6.2% and 6.5%.

'True' GDP growth could be as low as 4%.

Citi's own best prediction of 'true' real GDP growth for 2015 is based on Citi's version of the Li Keqiang index, subjectively adjusted for the growing weight of the service sector. It suggests a likely number of 4% or less.² Other activity indices – a good summary can be found at the China Growth Tracker of World Economics Website³ – also overwhelmingly suggest an economy in which the growth of industrial production and capital expenditure is slowing down rapidly.

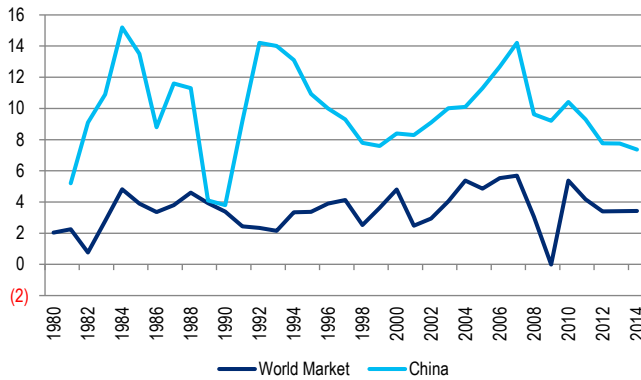
Figure 4 shows the historical real GDP growth rates for the global economy (at market exchange rates) and for China (using the official data) from 1980 till 2014.

² Citi's Li Keqiang index is based on rail freight tonnage miles growth, electric power consumption growth and the growth of total social funding.

³ See: http://www.worldeconomics.com/Papers/China%20Growth%20Monitor_cac90741-8882-4311-969e-3ae0e3e2575c.paper

Figure 5 looks at real GDP growth in China according to the official data and the growth rate based on Citi's Li Keqiang index alone is; that is, not corrected for possible outperformance by the service sector, which is under-represented in the Li Keqiang index.

Figure 4. Historical Real GDP Growth for China and for the Global Economy, 1980-2014



Source: Citi Research, Haver

Figure 5. Quarterly Real GDP Growth for China Compared with Growth Estimates Based on Citi's Li Keqiang Index



Source: Citi Research

For June 2015, the official data give a year-on-year growth rate of GDP of 7%. The Li Keqiang index yields 4.2%. For July 2015, the Li Keqiang index is down to 3.4%. Even a generous allowance for outperforming service sector growth is unlikely to raise the July year-on-year growth rate much above 4%.

What would a China-led global recession look like?

We now consider in more detail our modal scenario, that the world economy will enter a moderate recession towards the second half of 2016. This recession is primarily an emerging market (EM) phenomenon. The advanced economies will be impacted, of course: growth in the DMs will be lower than it would have been with a stronger performance (stronger domestic demand growth) in the EMs, and DM growth in 2016 and 2017 is likely to both be weaker than in 2015 and lower than our current benchmark forecast. Among the major emerging markets, China's growth decline is likely to be the largest. Because of China's weight in global production and trade, and because of the high commodity intensity of its production and demand, China's recession is the one that matters most for the global economy.

We define a recession as a negative output gap – the *level* of actual output is below the *level* of potential output.

There is a lot of loose and non-standardized usage of the term 'recession'. We use the only definition of a recession we know that makes sense when it is used consistently. As stated earlier, we define a recession as a period during which the actual unemployment rate is above the natural unemployment rate or Nairu, or during which there is a negative output gap: the *level* of actual real GDP is below the *level* of potential real GDP.⁴ To avoid excessive attention to mini-recessions, the period of excess capacity should have a duration of a year or longer. So an economy can be in recession (with a negative output gap) but growing and even growing at a rate faster than potential. An economy with a negative but closing output gap is in recession *and* in recovery. The euro area today is an example. The US and the UK were in that position until recently. Most likely the output gap has become or is about to become positive in the US and the UK, and output in both countries continues to grow faster than potential: if recent growth patterns were to continue, these economies are about to enter into a boom or overheating phase.⁵

Actual output growing more slowly than potential output is neither necessary nor sufficient for there to be a recession.

So much for the semantics. Translating this definition of a moderate recession into GDP growth rates for the next few years, a moderate global recession starting in the second half of 2016 means global real GDP growth at market exchange rates declining between now and the middle of 2016 to 2% or less and staying at 2% or less for a year or longer. A moderate recession in China starting in the second half of 2016 and starting the recovery no later than 2018 translates as 'true' real GDP growth declining from its likely current rate of 4% or slightly less to 2.5% or less by the middle of 2016 and staying at or below 2.5% for a year or more. What this translates to in terms of official real GDP growth depends on the evolution of the degree of doctoring of the official data. If that were to remain constant, an official real GDP growth rate of 5% or less for a year or longer starting in the middle of 2016, with a recovery starting no later than 2018, would qualify as a moderate recession in China.

Economists seldom predict cyclical downturns or recoveries. As a profession, we are notoriously bad at calling turning points. This may seem strange, as the capitalist economies that emerged all over the globe following the British industrial revolution in the second half of the 18th century have always exhibited cyclical

⁴ This used to be called a 'growth recession'.

⁵ To illustrate the same point with a numerical example, consider an economy where the level of potential output is 100 and the growth rate of potential output 2% per annum. If the level of actual output is 90 the economy is in recession, even if the growth rate of actual output is 4%, which is higher than the growth rate of potential output. Such an economy is in recession but also in recovery or in an upturn of economic activity. If the level of actual output is 110, the economy is in a boom or overheating. If the actual growth rate of GDP is zero at the same time (less than the growth rate of potential output), the economy is also in a slowdown or downturn of economic activity.

fluctuations alongside positive trend growth.⁶ Smooth, steady growth has never been on the menu. The “end of boom and bust” has been announced many times, most recently by the former UK Chancellor of the Exchequer and Prime Minister Gordon Brown⁷ and by the creators and propagandists of the Great Moderation⁸, but the business cycle has obstinately refused to die. It is true that the duration and amplitude of fluctuations in economic activity around the level consistent with full utilization of potential are highly variable and uncertain. Because potential output is inherently unobservable (as opposed to actual output, which is merely impossibly difficult to measure), it is quite likely that potential output too is subject to fluctuations. Recent theories of hysteresis, according to which the paths of actual output and employment influence the future paths of potential output and full employment, are consistent with that view.

For these and other reasons, economists seldom call recessions, downturn, recoveries or periods of boom, unless they are staring them in the face. We believe this may be one of these times. To say that a recession is likely next year is no cause for panic. The difference between peak real GDP growth and trough growth in a cycle is seldom more than four or five percentage points. True depressions, like the Great Depression of the 1930s and the Great Recession that followed the Great Financial Crisis (which lasted from the second half of 2007 till 2010 or later in some regions), are as remarkable for the rarity of their occurrence as for their devastating impact. Unless policymaking in the key nations of the world (we are counting the euro area as a nation here) is singularly incompetent and/or ‘beggar thy neighbor’ through trade restrictions and other forms of protectionism, we could see global growth recovering as early as 2018.

The evidence for a global slowdown is everywhere

The evidence for a global slowdown is everywhere. Global growth is weakening since 2010 as is evident from Figure 6, which shows global real GDP growth since 1980 at both market and PPP exchange rates, as well as EM and DM real GDP growth at PPP exchange rates. A modest pickup in GDP growth in the DMs since 2012 is swamped by a sharp decline in EM growth. There are other informative indicators of global weakness, notably the very weak – indeed negative - world trade growth in the first quarter of 2015, the continued weakening of (real) commodity prices, the weakness of the global inflation rate (measured by the GDP deflator), the recent decline in global stock prices, measured by the MSCI ACWI, plus indications that corporate earnings growth is slowing down in most countries, and the unprecedented decline in nominal interest rates, shown in Figure 7 – Figure 11. David Lubin has argued (David P. Lubin (Emerging Markets Macro and Strategy Outlook; The world trade slowdown, part 2 - 119 page(s), June 2015)⁹), that the slowdown in world trade has hit EMs particularly hard.

⁶ Even prior to the industrial revolution, crop cycles and ‘hog cycles’ made for fluctuations in economic activity. The duration of these cycles, which were, in the case of crop cycles, mainly driven by supply shocks was shorter than the modern business cycle that characterises industrial and post-industrial demand shocks. The modern business cycle is driven both by shocks to aggregate demand (sometimes policy induced) and by supply shocks.

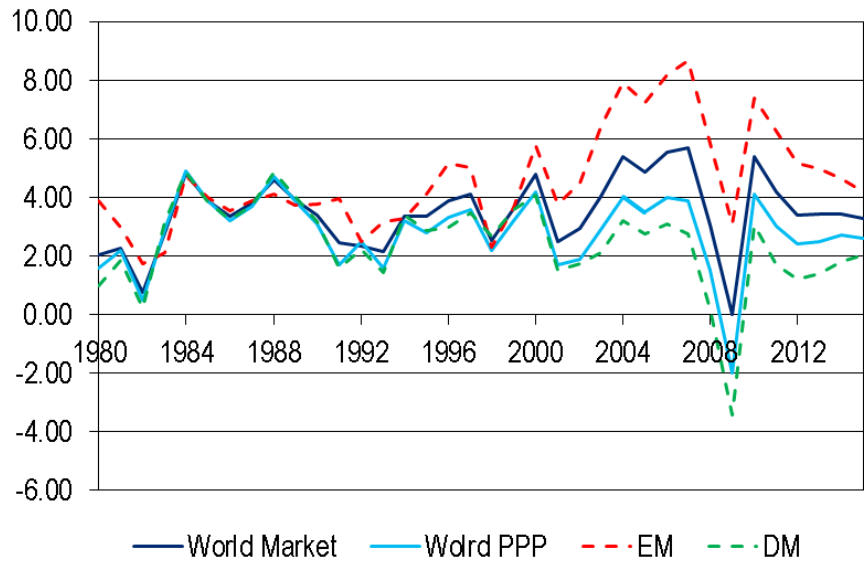
⁷ See “No return to boom and bust: what Brown said when he was chancellor”, Deborah Summers, politics editor, The Guardian, Thursday 11 September 2008, <http://www.theguardian.com/politics/2008/sep/11/gordonbrown.economy>

⁸ See Stock and Watson (2002) and Ben Bernanke (2004).

⁹

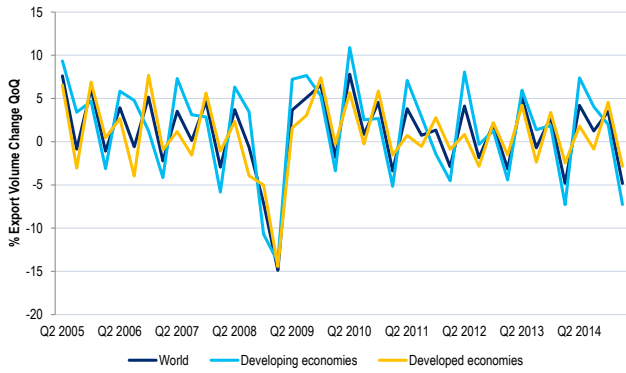
<https://www.citivelocity.com/rendition/eppublic/documentService/dXNlcl9pZD1CUFdgQVphU1VoUHN0M3RWcEJJVn1nJmFsPXR3WWdaZWtmbkhaQWxrak9hUVVwQktkSE5hMTZkRlQyMFE4djZLZWdEY2xPQU1MTyUyRnV6MHZnJTNEJTNE/ZG9jX2lkPTU4MzgxMCZwdWJlZD0yMjg5MjcyMjY2V0Q2xhc3M9RUNPTk9NSUNTLEVD05PTUIDU19FTSZjaGFubmVsPURDTSZzdWltY2hhbm5lbD1FbWVpbA#/>

Figure 6. Global, EM and DM real GDP growth since 1980



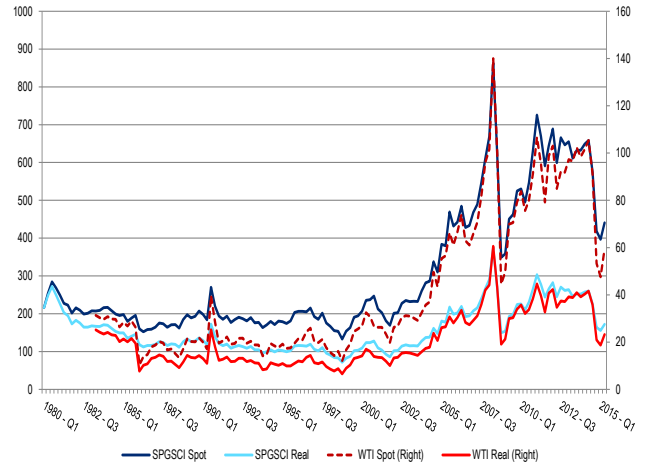
Source: Citi Research, Haver

Figure 7. Growth of Global and regional merchandise exports



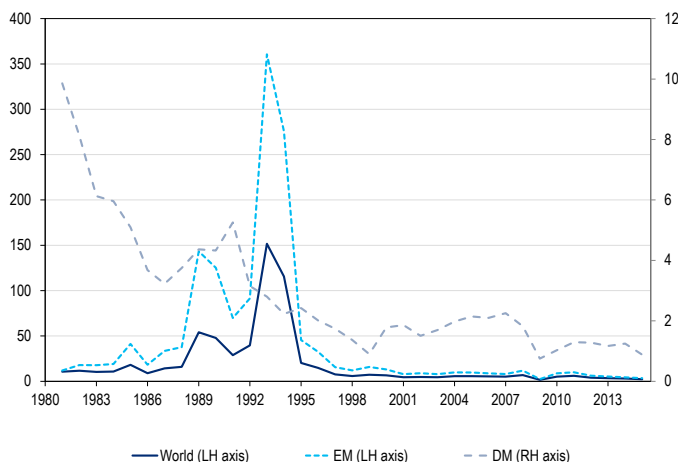
Source: Citi Research, WTO and UNCTADstat

Figure 8. Nominal (\$) and real commodity prices



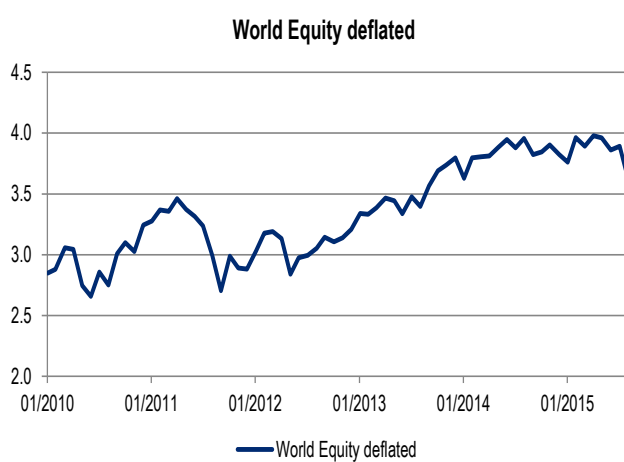
Source: Citi Research, Bloomberg, Haver

Figure 9. Global, EM and DM inflation (% change in GDP deflator, Annual)



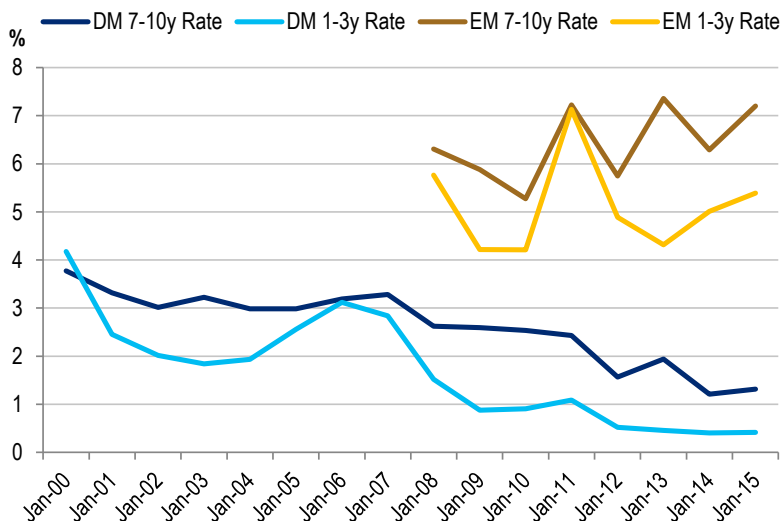
Source: Citi Research, Haver

Figure 10. Global equity prices since 2010



Source: Citi Research, MSCI ACWI, deflated by US GDP deflator

Figure 11. Nominal interest rates in EM and DM



Source: Citi Research, Haver

Note: DM is average YTM on debt in Citi's WGBI, weighted by market value of debt outstanding

EM is average YTM on debt in Citi's EMGBI, weighted by market value of debt outstanding

“Real” commodity and oil prices in Figure 8 are US\$ prices deflated by the US GDP deflator. The EM inflation rates in Figure 9 show a massive spike starting in 1991 because of the hyperinflations resulting from the breakup of the Soviet Union. This also affects the global inflation rate in the first half of the 1990s.

A global recession driven by EMs

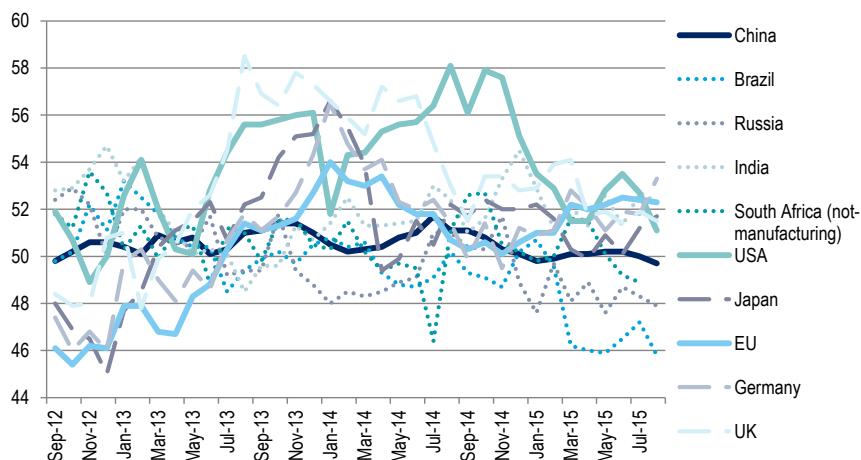
The recession will be driven by EMs

The main driver of global underperformance during the past two years has been EM weakness. No EM of any significant size is outperforming our forecasts since the beginning of the year or earlier; most are underperforming. Even the success stories, like India, central and eastern Europe, and to a certain extent Mexico, are

not outperforming our forecasts. Brazil and Russia are in recession, and GDP growth there has turned negative. South Africa is in a recession, with output below potential and output growth below potential output growth. The most significant underperformer is China. For reasons explained earlier, we don't think there is much point in forecasting official GDP growth. We therefore focus on our best guess as to the 'true' growth rate of real GDP, which, as noted earlier, is probably somewhere around 4% now.

Consider the onset of a recession in the second half of 2016 in China (defined by us as growth of (our best estimate of) 'true' real GDP of 2.5% or less for a year or longer starting from the middle of 2016). If the official data remain as distorted and biased to the same degree as currently appears to be the case, that would correspond to something like official GDP growth at 5% or less for a year or more starting in 2016, H2. Further evidence of the relative weakness of the EMs can be obtained by comparing the behaviour of the PMIs for the EMs and the AEs, shown in Figure 12.

Figure 12. PMIs of EMs and AEs



Source: Citi Research, Haver

Policy response in the EMs will be too little and too late to avert a recession

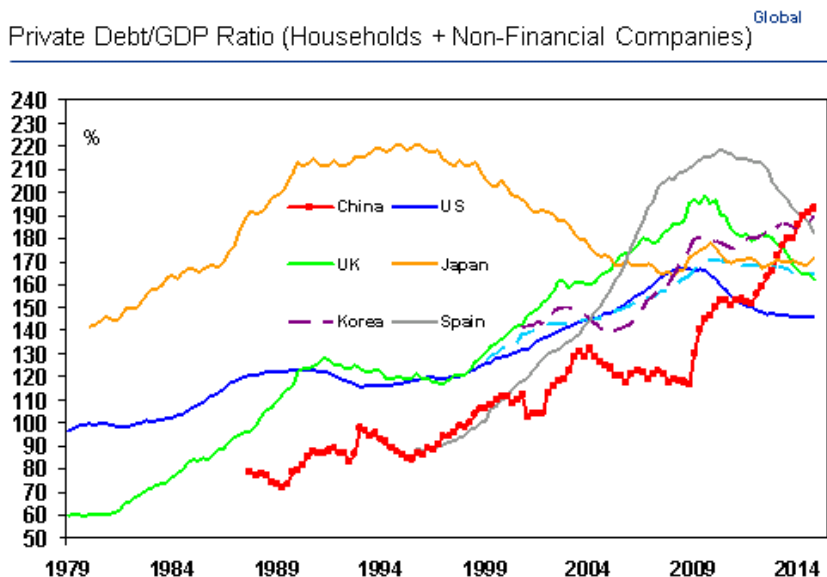
The policy response to the unfolding recession in the EMs is likely to be mostly inadequate. Of course, the impact of weaker commodity prices (regardless of whether weak demand or strong supply causes this weakness) will depend almost entirely on whether the affected country is a net importer or a net exporter of the commodities in question. The one qualification is that the 'redistribution' towards those long a commodity and away from those short that commodity may, if the price change is unexpected and large, be disruptive for the losers, over and above the pain of the negative income and wealth effects. A large net oil importer like India is a major beneficiary from lower oil prices. Net oil exporters like the Gulf States, Russia, Kazakhstan, Azerbaijan, Iran, Nigeria and Venezuela, would be the losers.

High private leverage and low fiscal space make an effective policy response unlikely in many EMs

Many large EMs have high private sector leverage. Even in this crowd, China stands out both because of the *level* of the ratio of private non-financial debt to GDP and because of its continuing rapid rise (see Figure 13). Korea's private debt to GDP ratio too continues to rise steadily. In key advanced countries like the US,

Japan and the UK, the private debt to GDP ratio has come down – in Japan since the early 1990s, following its financial crisis, and in the US, the UK, and the euro area since the GFC. The levels remain, however, disturbingly high, and would create serious private debt servicing problems but for the extraordinarily low level of interest rates.

Figure 13. Private Leverage in selected countries



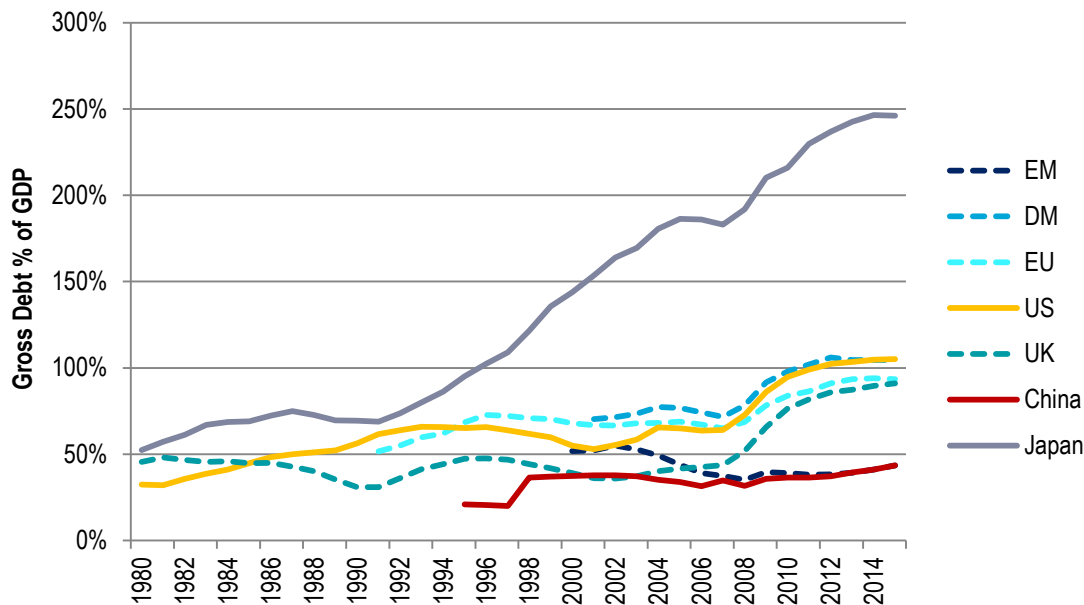
Source: IMF and Citi Research

There is a long history of bad private debt held by entities that are deemed too systemically significant or too politically connected to fail migrating to the balance sheet of the public sector – in EMs as in AEs. So even countries where public debt burdens don't seem particularly high, like Brazil, may not have as much "fiscal space" as would appear to be the case based on the present public debt and deficit situation (see Figure 14). A number of them have in fact engaged in fiscal tightening (or at least have attempted to do so, as in the case of Brazil), fearful of a sovereign downgrade (see also David P. Lubin, *Emerging Markets Macro and Strategy Outlook; Can EM save itself from downgrades?* - 172pp, January 2015)¹⁰.

China's public debt burden, although likely somewhat understated in Figure 14 because of incomplete data, is nevertheless manageable when looked at in aggregate on its own. There are, however, two reasons for the Chinese fiscal authorities not to feel too relaxed. The first is that most of this debt is owed by local and provincial governments, many of which don't have the discretionary recurrent revenue sources (local real estate tax, local land tax, local income tax etc.) to service that debt. Second, the soaring non-financial private sector debt burden and the matching soaring banking and shadow banking sector balance sheets suggest that a future financial rescue of systemically important and/or politically well-connected insolvent private entities and SOEs by the central government is likely. This could seriously strain even the fiscal capacity of the central government.

¹⁰<https://www.citivelocity.com/cv2/#go/Research/X19OQVZJR0FUSU9OX0JBU0U2NF9fL2N2ci9wYWdlL2Vjb25vbWljcy5jdnl/dXJsPWFIUjBjSE02THk5cGNpNWphWFJwTG1OdmJTOW1VMVlZU0dWU2NVNGxNa0pMV21odFNuWk9iMEprYTJOM1NFNXVjemxTZG10SIYwNUpWMkpxVmxCMxSk1hMFEVsTWtaSFJtSTJSM2hSSIRORUpUTkUmchV/SWQ9MTkzMTY3MA==>

Figure 14. Public sector Leverage in EMs and DMs



Source: Citi Research

Note: Public sector is general government sector

Compensating for declining export demand by boosting domestic demand will therefore, in many EMs, have to rely mainly on monetary and credit loosening and the likely associated weakening of their exchange rates. In economies with a highly leveraged private sector, the interest-responsiveness of domestic demand tends to be low, and weak demand for credit may well be the binding constraint on credit growth.

It is likely that attempts at exchange rate depreciation will be part of the policy response of many of the adversely affected EMs. China's recent mini-devaluation of the RMB fix vis-à-vis the US dollar by 4% (now partly reversed) resulted in an even smaller weakening of its effective (trade-weighted) exchange rate, as many countries exporting to China, competing with Chinese exporters in their home markets or competing with China in third markets adopted measures to weaken their currencies. If most EMs end up pursuing similar competitive depreciation policies, the US could end up as appreciator of last resort, with the effective exchange rate of the US dollar strengthening significantly. If the ECB and the Bank of Japan also pursue policies that weaken the euro and the yen respectively, there could be material damage to the US recovery, both through the trade channel and through the stock market valuation of US firms operating and competing in global markets and competing at home with competitors whose currencies have weakened.

Competitive depreciation/devaluation is inevitably a zero-sum game as regards international competitiveness. This is not quite true as regards the total impact of the policies that support the competitive depreciation process. Such policies will include expansionary monetary and credit policies, which will have a net expansionary impact even as the competitive effects of exchange rate depreciations wash out.

The same is not the case for the other beggar-thy-neighbor policy set: restrictive trade practices¹¹ and other forms of protectionism, affecting cross-border finance, FDI, intellectual property rights, procurement and migration. Creeping protectionism is widespread, as Simon Evenett's Website "Global Trade Alert" makes clear.¹² In recent years, EMs account for most of the new protectionist measures, many of which are targeted at other EMs. Should this unfortunate trend strengthen, the consequences for EMs and the global economy could be highly damaging.

Policy response in China

The policy response in China to weakening economic activity is likely to be ineffective

The policy response to the weakening of domestic (and external) demand in China is likely to be too little and too late. China is not a command economy or a centrally planned economy – indeed, unlike the former Soviet Union, it never was. Like most real-world economies today, it is a messy market economy of the state-capitalist/crony-capitalist variety, where policy ambitions are not matched with effective policy instruments and where macroeconomic management and financial crisis prevention and mitigation competence are in short supply. The often-heard statement "The authorities would not tolerate growth falling below 7%" only makes sense if it is meant to convey the unhappiness of the authorities, should growth fall below 7%. It does not mean they have the command and control tools, or the conventional monetary, credit and fiscal tools, to prevent it.

The stock market fiasco and the clumsy attempt to give market forces more influence on the value of the RMB don't inspire confidence in the quality of financial and macroeconomic management.

The mishandling of the housing boom, bubble and bust, and of the latest stock market boom, bubble and bust together with the recent RMB kerfuffle don't inspire confidence in the ability of the authorities to prevent a cyclical hard landing for China. Even if, at this late hour, a fiscal stimulus is undertaken immediately to avoid a recession in 2016, it will do no more than postpone the recession and increase its depth and duration unless: (1) the composition and funding of the fiscal stimulus are appropriate (and unlike anything seen in China in the past); and (2) the authorities end the financial 'extend-and-pretend' game and restructure the balance sheets of the over-leveraged and often crypto-insolvent SOEs, local governments and banks.

Capital expenditure and exports are unlikely to strengthen

Excess capacity in the construction sector and in the traditional manufacturing sectors (not just those dominated by SOEs), the excessive leverage of the corporate sector and the local government sector, the unwillingness of the central government to tackle the suppressed insolvency of many local governments and much of the banking and shadow-banking sector, and the luxury consumption- and investment demand-weakening effect of the continuing anti-corruption campaign are the factors that, in our modal scenario, push China into recession and take the world with it.

The policy response to the dramatic slowdown in investment growth and export growth has been underwhelming.

Local government is burdened with unsustainable debt. 'Extend-and-pretend' is not a solution to this

Local government is burdened with unsustainable debt. The fiscal stimulus program launched in 2008 and its successors mainly took the form of, first, heavy-lifting infrastructure projects implemented by local governments, funded mainly through local government special purpose vehicles that borrowed from banks, and, second, investment by industrial sector SOEs, also funded mainly through bank loans. Many of these fiscal stimulus-driven local government projects have not yielded and are unlikely ever to yield a cash rate of return greater than or equal to

¹¹ Global Trade Alert. Independent monitoring of policies that affect world trade, http://www.globaltradealert.org/measure?tid=All&tid_1=366&tid_3=All

¹² See <http://www.globaltradealert.org/>.

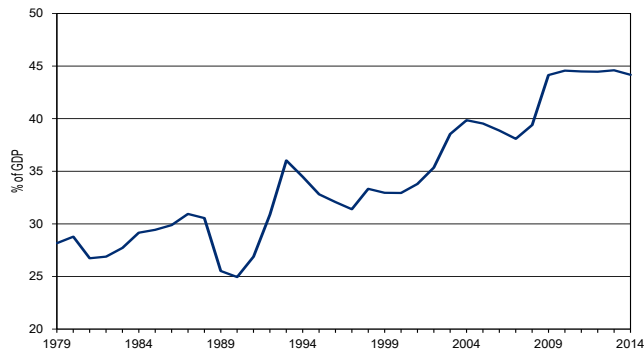
the interest rate on the bank loans that funded them. These counter-cyclical projects ought to have been funded directly by the central government, the only state entity with deep fiscal pockets and access, at its discretion, to the seigniorage of the PBOC. The local authorities therefore need either to have their debt written down (written off in many cases) or will have to cut other spending/increase recurrent revenues to generate the primary surpluses required to service their debt. 'Extend and pretend' avoids the second option by making the then inevitable first option much more onerous.

Instead of writing off the local governments' debt promptly, the central government has engaged in an extend-and-pretend bond swap program. The total envelope at the moment is RMB 3.2 trillion, of which about 90% is refinancing of maturing bank loans and the rest net new issuance.¹³ There is a small quasi-fiscal subsidy involved, as the duration of and terms on the provincial government bonds that are swapped for the maturing bank loans are longer, respectively better, than the local authorities would have been able to get from the banks without the implicit backing of the central government. But without a major increase in the primary surpluses of the local government sector, that sector remains fundamentally insolvent. Land sales, the major 'own' source of local government revenues, are asset sales – equivalent to borrowing as regards its effect on government net worth. Raising recurrent revenues, say through the introduction of a local government real estate tax or land tax would be part of the obvious solution. But this: (1) is politically not feasible at the moment; and (2) would be deleterious from an effective demand or counter-cyclical perspective.

China invests too much and in the wrong sectors

Investment in China has been, on average, woefully inefficient – especially since 2008. Most of it continues to be allocated to infrastructure, construction, and traditional industrial and extractive activities. A sharp deterioration in the quality of capital expenditure appears to have taken place since the start of the stimulus program to counter the impact of the Great Financial Crisis and the global downturn on the Chinese economy in 2008. The country still spends more than 44% of GDP on fixed capital expenditure (see Figure 15).

Figure 15. Fixed capital expenditure in China (% of GDP)



Source: Citi Research, Haver

The incremental capital output ratio (ICOR) – a measure of the inefficiency of capital expenditure as a driver of (potential) GDP growth – is estimated to have increased

¹³ See "China expands debt-for-bond swap plan to 3.2 trillion yuan: Xinhua, Reuters, Thursday, 27 August 2015. <http://www.reuters.com/article/2015/08/27/china-economy-debt-idUSB9N10E01T20150827>

from 2.6 for the period 1979-1996 to 4 for the period 1997-2013 in China.¹⁴ Some estimates for 2008 and the most recent years put it as high as 6 or even 8.¹⁵ Much of this is due to the increase in the share of capital expenditure in GDP during the past couple of decades (from 31.6% in 1998 (a cyclical trough year, impacted by the Asian Crisis) to 44.2% in 2014). The boost in infrastructure and SOE investment since 2008 has been subject to severely diminishing and at times negative returns as regards incremental potential output growth. A reduction in the share of fixed investment in GDP by 10% is overdue, even if we don't allow for the severe negative environmental externalities associated with China's investment storm. The question is whether this reduction in investment can be achieved without Keynesian aggregate demand damage: unless planned domestic consumption (private and or public) or net external demand are boosted by the same amount as the reduction in planned capital expenditure, demand will weaken.

It is unlikely that a significant reduction in the investment share can be accomplished without going through a recession

Can such a necessary structural rebalancing of aggregate demand (and a corresponding change in the structure of production from physical goods production to services and from capital goods to consumer goods and services) be achieved in China without passing through a recession? In principle, certainly. In practice, we consider this unlikely.

Monetary and credit policy are likely to be ineffective

Monetary and credit policy have limited power to boost aggregate demand, in part because the corporate sector is highly leveraged and the banking and shadow banking system have extremely weak balance sheets. As noted earlier, the banking sector (and more recently the shadow banking sector too) has been used as the funding vehicle for the fiscal stimuli ordered since 2008 by the central government and implemented mainly through local government infrastructure projects and SOE capital expenditure. Since most of this 'emergency lending' was engaged in without regard for the commercial and financial returns on the projects that were funded, many of these loans cannot be serviced. Regulatory forbearance by the CBRC, the CSRC, the PBOC and the Ministry of Finance allows the banks to practice lender forbearance ('extend and pretend'). Almost RMB 3 trillion (out of a total provincial government bond issuance of RMB 3.2 trillion) has been committed in a loan for bond swap, giving the banks (and their debtors) more time before the bad investments have to be recognised as such. The overhang of bad debt acts as a tax on good new lending. This will not improve until the bad assets are recognised and the lending institutions are liquidated or recapitalised, which can only happen with central government funds.

The second reason monetary policy can do little to boost demand is that a key asset price, the exchange rate, is, after a short-lived experiment with a greater degree of market-determination, once more firmly under the control of the PBOC. For a variety of reasons – hope of the RMB being included in the SDR basket of global reserve currencies is one of them – the PBOC and its political masters don't want to see a rapid near-term depreciation of the RMB.

Further interest cuts and cuts in the required reserve ratio (RRR) are possible and will likely be implemented, but benchmark lending and deposit rates have little impact on interest rates set in the markets. The PBOC is also likely to engage in quantitative and qualitative easing (QEE) in the future, expanding its balance sheet and either buying lower-grade financial instruments outright or accepting them as collateral from risky counterparties. Indeed, it has already started this process, by

¹⁴ See The Economist, 28 November 2014, Wasted Investment? China's \$6.8 trillion hole.

¹⁵ See China's Macroeconomic Outlook, Quarterly Forecast and Analysis Report, March 2015, Center for Macroeconomic Research of Xiamen University, Springer, page 54.

accepting in repos the bonds issued as part of the debt/loans-for-bonds swap program. Except for the quasi-fiscal transfer to the counterparties and/or the issuers of the collateral, this QEE is unlikely to significantly boost lending and borrowing for productive activity or for spending on real goods and services. Monetary policy without deleveraging/debt restructuring and without permitting the RMB to depreciate significantly is little more than pushing on a string.

The recent mismanagement of the stock market and the RMB don't have first order direct macroeconomic effects ...

We don't think that the recent boom, bubble and bust in the stock market and the even more recent swiftly reversed regime change in the foreign exchange market will have a first-order effect on aggregate demand. Undoubtedly wealth effects from stock price changes do operate in China, but these are small and the stock market is still at a higher level than it was a year ago. Very little equity funding of capital expenditure takes place in China, and with future profitable investments likely to be found in sectors and industries very different from those in the past, average Tobin's q (the ratio of market capitalization of existing capital to the current reproduction cost of capital) is bound to be less than marginal Tobin's q (the ratio of the NPV of future profits on new capital expenditure to the current reproduction costs of capital). And it is marginal Tobin's q that drives investment.

... but they raise questions about policy competence and about future reforms

The reason why the extraordinary and at times chaotic measures aimed at stabilizing the stock market and the smaller rumpus in the foreign exchange market matter is that they put question marks behind the competence of the Chinese authorities as financial supervisors/regulators and as guarantors of financial and macroeconomic stability. It also raises doubts about their willingness to reform in directions that will permit the rebalancing of the Chinese economy necessary to avoid the middle-income trap. The development of more efficient and more internationally integrated financial markets has probably been set back by several years by the response of the Chinese authorities to the stock market crash and the remarkable policy reversals in foreign exchange market management, culminating in the imposition of 1-year unremunerated 20 percent reserve requirements on swaps and forward transactions in the foreign exchange market and 10 percent reserve requirements for foreign exchange options.

Construction activity is unlikely to pick up soon ...

The construction sector is unlikely to be a major contributor to aggregate demand in the near future. There still is an overhang of unsold residential and commercial property.¹⁶ This coincides with a shortage of affordable housing or social housing, which will become especially acute if the government makes good on its plans to give more urban immigrants full urban hukou. Without central government funding, the social need for additional affordable housing will not be translated into effective demand for affordable housing. Residential property prices are rising again in tier 1 and tier 2 cities, but remain stagnant at best in the lower-tier cities.¹⁷

... and neither are exports

With the global economy slowing down and China having lost its status as the low-cost manufacturing hub of the world because of rapidly rising unit labor costs and the continuing close link between the appreciating US dollar and the RMB, the chances of an export-led recovery are minimal.

The right kind of fiscal stimulus, properly funded, can prevent a recession even now

Fiscal policy can undoubtedly come to the rescue and prevent a recession in China. But what is needed is not another dose of the familiar post-2008 fiscal medicine: heavy-lifting capital expenditure on infrastructure with dubious financial and social returns, and capital expenditure by SOEs that are already struggling with excess

¹⁶ See George Magnus (2015) "China's economy: no collapse, but it's serious, and so are the politics", Viewpoints blog, <http://www.georgemagnus.com/viewpoints/>, 1 September 2015

¹⁷ See: <http://www.tradingeconomics.com/china/housing-index>

A helicopter money drop would be effective and prudent

capacity, all funded, as if these were commercially viable ventures, through the banking or shadow banking sectors. As regards funding the fiscal stimulus, only the central government has the deep pockets to do this on any significant scale. The first-best would be for the central government to issue bonds to fund this fiscal stimulus and for the PBOC to buy them and either hold them forever or cancel them, with the PBOC monetizing these Treasury bond purchases. Such a 'helicopter money drop' is fiscally, financially and macro-economically prudent in current circumstances, with inflation well below target and likely to fall further.

As regards the size of the fiscal stimulus, a total boost to public spending or cut in tax revenues of around 3% of annual GDP (around \$360bn at market exchange rates), spread over a year, would be a good place to start. This has to be a serious fiscal blast. A mini-stimulus or acupuncture stimulus will not suffice.

As regards the composition of the fiscal stimulus itself, some additional, carefully selected infrastructure investment in projects that assist and support urbanization would be desirable.

Additional capital for the development banks and the 'One Belt, One Road' program are unlikely to boost demand in the short run

The government has instructed the three government-owned policy banks (the Agricultural Development Bank of China (ADBC), the China Development Bank (CDB) and the Export-Import Bank of China (EXIMC) to lend proactively to SMEs and to firms, often new and small, operating at the cutting edge of technological change. In April this year, it was announced that the PBOC (interestingly not the Ministry of Finance – the existing owner of the policy banks) would inject capital into the policy banks, \$32 billion into CDB (raised to \$48bn in June) and \$30 billion (raised to \$45 billion in June) into EXIMC.¹⁸ Although the lending will be in RMB, this capital injection is funded out of the foreign exchange reserves of the PBOC, for reasons that are not clear. The Ministry of Finance will put another \$16 billion into the ADBC, making a total of \$109 billion worth of additional capital for the policy banks. Some of this new capital is intended to fund projects under the 'New Silk Road' or 'One Belt, One Road' program.

Even good supply side measures may not boost demand on time

Funding SMEs and high-tech ventures may be good supply-side economics. Unless the money is spent in a hurry, however, and in China, it is not helpful from the point of view of boosting aggregate demand and preventing a recession. It is also not clear at all, even when projects under the 'One Belt, One Road' program actually lead to expenditures on goods and services, how much will be spent in China and how much of what is spent abroad will boost demand for Chinese exports. All this may pay off in the medium and long term, in the form of supply-side enhancements and potential output growth. It is, however, likely to do little or nothing to boost aggregate demand in the short run, say during the coming two years.

The fiscal stimulus should be targeted at mainly at public and private consumption

A boost to public or private consumption would be highly desirable. The central government could spend much more on health, education and social support. Health expenditures don't have to be restricted to training more doctors and nurses and building hospitals and clinics. It could also mean the central government picking up a larger share of the cost of health services and medication and of the cost of supplementary, private schooling – costs that are currently paid for largely by private households. Direct transfer payments to the old (a one-off social security

¹⁸ See Reuters "China to inject FX reserves into policy banks: Caixin", Monday, April 20, 2015, <http://www.reuters.com/article/2015/04/20/us-china-economy-banks-idUSKBN0NB0YY20150420> and Reuters "Update 1: China injects massive funds into policy lenders – Caixin", Tuesday, 21 July 2015, <http://www.cnbc.com/2015/07/21/reuters-america-update-1-china-injects-massive-funds-into-policy-lenders--caixin.html>

retirement bonus payment) or to the rural poor would also boost private consumption spending directly and promptly. Such a consumption-targeted, central government-funded and permanently monetised fiscal stimulus would provide cyclical support to the government's structural target of rebalancing demand and production: from external demand to domestic demand, from investment to consumption, from the production and consumption of physical commodities to the production and consumption of services, and from environmentally destructive production and demand to greener production and demand.

Unfortunately, the same officials and government advisors who argue that rebalancing towards consumption is both necessary and central to the government's economic strategy, respond to the suggestion of a cyclical stimulus targeted at consumption rather than investment with words like "consumption only yields benefits for an instant, but investment yields returns for decades". Because of this cognitive dissonance, we fear that even if a timely fiscal stimulus is implemented, its composition is likely to be such that excess capacity in the traditional industries and sectors is enhanced, thus avoiding an early recession only by raising the risk of a later but deeper and longer recession.

It is important to note that a moderate recession in China, as we define it, does not mean a collapse of the economy. It does mean a significant increase in unemployment and excess capacity. In the SOEs, some of this increase in unemployment may be disguised by 'work sharing', or by continuing to employ and pay employees that are idle. In the private sector, open unemployment is the more likely outcome.

A recession in China also does not automatically entail a serious financial crisis in China (or anywhere else). Most of the bad investments are inside China, funded domestically in RMB. The central government has the means to restructure and recapitalise systemically important financial institutions and other enterprises that may be threatened with insolvency as the current downturn deepens.

Ample foreign exchange reserves allow China to control the severity of any financial crisis that may result from the downturn

Many past financial crises, in EMs and elsewhere, have involved large external exposures denominated in foreign currency, with the central banks holding inadequate foreign exchange reserves. This is true for the Asian crises in 1997/98, the most recent Turkish financial crisis that started in November 2000, Mexico's Tequila crisis in 1994-95, and the euro area financial crises in Greece, Ireland, Portugal and Spain since 2010, where the unwillingness of the Eurosystem to provide sufficient euro liquidity to the national central banks of the afflicted nations plays the role of insufficient foreign exchange reserves.

It may be thought that China is safe from serious financial crisis risk because it is a large net foreign creditor (see Figure 18 below) with large foreign exchange reserves, even after the reserve drains during the current year. China started 2015 with just over \$3.8 trillion of foreign exchange reserves. Even in the most pessimistic case, this is unlikely to have fallen below \$3.3 trillion at the end of August 2015.¹⁹

But serious financial crises occur even when foreign reserve adequacy is no problem: Japan and US are examples

It is, however, important not to be lulled into a false sense of security by the likely absence of foreign exchange shortages in China, and by the associated likely absence of a material external dimension to a financial crisis in China. The presence of ample foreign exchange reserves means that well-informed and competent supervisory, regulatory, monetary and fiscal authorities, working together

¹⁹ See: <http://www.tradingeconomics.com/china/foreign-exchange-reserves>

harmoniously can prevent a serious domestic financial crisis. The absence of a binding foreign exchange reserve constraint on the authorities' capacity to act is, however, no guarantee that they will act appropriately. Japan's financial crisis in 1990 was entirely 'domestic' and occurred despite the fact that foreign exchange reserve inadequacy never was an issue. The Great Financial Crisis in the US, which started at the end of 2007, occurred despite the fact that the US authorities had something even better than a huge stock of foreign exchange reserves: a national currency, the US dollar, that was (and is) the only serious reserve currency in the world - it can be thought of as a potentially infinite stock of reserves. Lacking in Japan and in the US were well-informed and competent supervisory, regulatory, monetary and fiscal authorities, working together harmoniously. It is an open question whether China will be able to do better. The Chinese authorities at least have the advantage of having been able to learn from the most recent Japanese, US and European financial crises.

A cyclical hard landing also has no direct implications for whether China will avoid the middle-income trap. It is certainly possible that a significant step-up in economic, social and political reforms will allow China to grow, when the recession ends, say by 2018, at a true growth rate of 3-4% for a considerable period of time. That will depend on the depth and speed of the economic, social and political reforms necessary to move China towards a flexible, innovative, creative, entrepreneurial, high tech, service sector-dominated economy.

Transmission to the advanced economies

Transmission from the EMs to the DMs will be through trade flows, through the financial markets and through a direct confidence channel

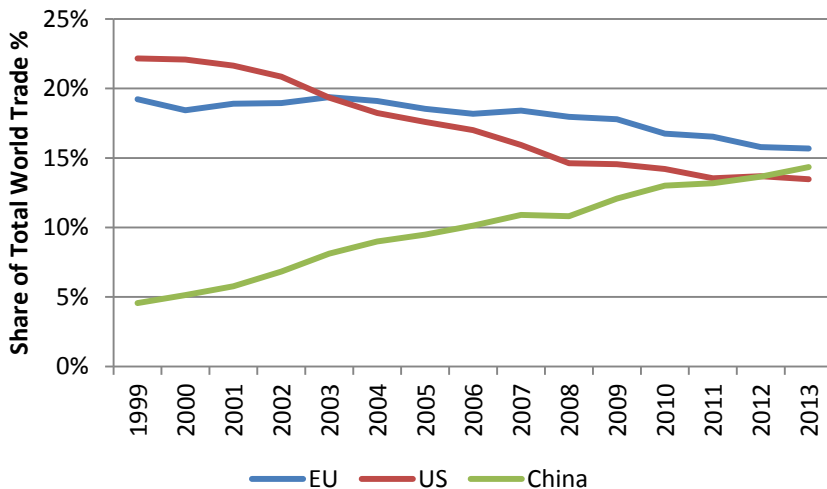
The transmission of China's recession, and the wider EM recession, to the DMs will be through trade, through commodity prices, through the asset and credit markets and financial flows, and through direct confidence contagion. The trade and commodity price channels are obviously important. At PPP exchange rates, China's GDP in 2014 accounted for 16.5% of global GDP in 2014, compared to 16.9% for the EU and 16.3% for the US.²⁰ At market exchange rates – for the purpose of determining the impact on global activity rather more relevant – China's share of world GDP was 13.3% of GDP in 2014, against 23.7% for the EU and 22.4% for the US.²¹ China accounted in 2013 for 14.3% of global trade, against 15.7% for the EU and 13.5% for the US (see Figure 16).²²

²⁰ Source: http://www.economywatch.com/economic-statistics/economic-indicators/GDP_Share_of_World_Total_PPP/

²¹ Source: http://www.economywatch.com/economic-statistics/economic-indicators/GDP_Current_Prices_US_Dollars/

²² The trade share is calculated as ((national imports + national exports) as a percentage of (global imports + global exports).

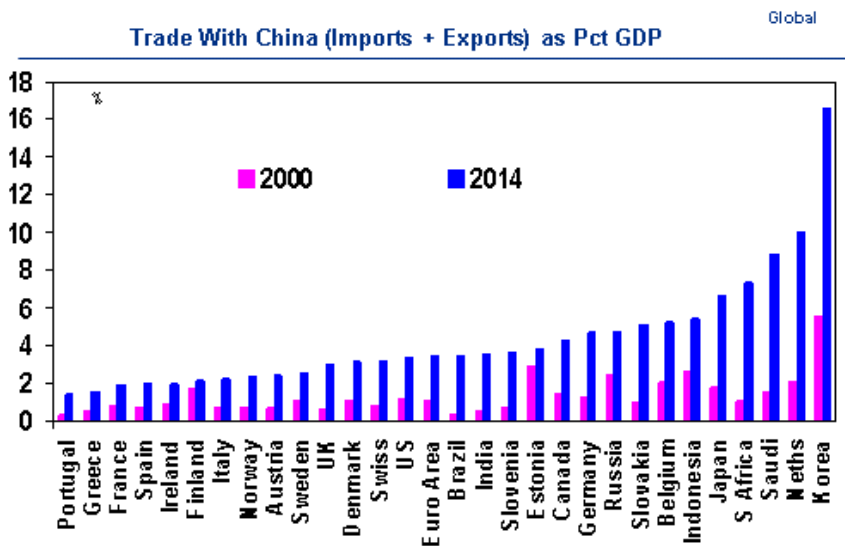
Figure 16. China's share in world trade



Source: Citi Research, Eurostat

We get but a very partial view of the impact of a Chinese slowdown or recession on other countries' growth by looking at the direct trade between China and individual other countries, especially China's direct imports from that country. These direct trade links are shown in Figure 17 below.

Figure 17. The strength of different countries' direct trade links with China



Source: Datastream and Citi Research

A country could, however export nothing to China directly (and import nothing from China directly) yet export raw materials or intermediate goods and services to third countries that, directly or indirectly, depend on demand from (exports to) China. We unfortunately have no up-to-date global input-output matrices with the necessary national or regional disaggregation to determine any country's total trade dependence on any other country.

Sometimes the direct trade links overstate the dependence of a country on other countries. This is the case, for instance, for the Netherlands, which in Figure 17 is shown to have the second highest level of exports to China as a share of GDP – just under 10% – after Korea. Much of these exports are re-exports through the Dutch ports, especially Rotterdam, of goods imported from other European countries, especially the UK. The Dutch value added contained in such (re-) exports is low.

China has the most commodity-intensive domestic demand and production of any large economy. With Chinese growth weakening further, continued downward pressure on global commodity prices is likely, reinforced by the significant efforts that are being undertaken by the Chinese authorities to reduce the environmental damage caused by the high commodity intensity of Chinese demand and production.

Immediate direct transmission through the capital markets is relatively modest, because of the many remaining obstacles to free international capital mobility in China. The large foreign exchange reserve losses experienced by the PBOC (despite a still sizeable current account surplus) since it initiated its new ‘fixing’ regime will undoubtedly have bid up the value of currencies like the US dollar and lowered the yields on DM debt, but this is unlikely to represent an enduring first-order effect. Following the familiar financial market volatility, overshooting and occasional near-panic when the PBOC unexpectedly initiated the new foreign exchange rate management regime, global financial markets have settled down again.

China has been a huge saver for decades and has accumulated a large gross stock of foreign assets and a significant net foreign investment position. Should economic and financial distress in China cause public and private investors to unload a material share of their holdings of foreign fixed income assets (e.g. US Treasuries) or of foreign equity and real estate, this could have a major impact on asset prices and yields. Figure 18 shows that at the end of 2013, China had just under \$6 trillion worth of external assets and a net foreign investment position of just under \$2 trillion.

Figure 18. External Assets and Liabilities of China, end 2013 (Mil. US\$)

Assets		Liabilities	
Direct Investment	609,095	Direct Investment	2,347,470
Equity	153,036	Equity	297,970
Debt Securities	105,491	Debt Securities	88,860
Other Investment	1,188,830	Other Investment	1,230,920
Reserve Assets	3,880,380	Debt Instruments	
Total Assets	5,936,830	Total Liabilities	3965,230
		Net Foreign Investment Position	1,971,600

Source: IMF, IFS and Citi Research

A recession in China is likely to depress Chinese investment more than Chinese saving. The current account surplus of China is therefore likely to increase, putting further downward pressure on global real interest rates.

Direct transmission through the ‘confidence channel’ is hard to quantify yet likely to be significant. There is no history of China entering a recession at a time when its economic and financial significance make it a key driver of global economic and financial market performance. Uncertainty creates fear and may tip bi-polar financial markets into depression.

Policy response in the advanced economies

For technical and/or political reasons, most DMs have limited stabilization ammunition at hand

Most advanced economies are, as regards countercyclical policy ammunition, in the position that either they don't have very much of it or are unwilling and/or unable (because of domestic or external political constraints) to use what ammunition they have.

One ray of light is that most advanced economies are net commodity importers. Obvious exceptions are New Zealand, Australia, the US and Canada for agricultural products, and Canada, Norway and Australia for oil, coal and other hard commodities. Japan, the Eurozone and the UK (except for Scotland) will therefore be net beneficiaries from the terms of trade improvement they enjoy as a result of weak commodity prices.

Expansionary monetary policy in the US, the UK, the Eurozone, Japan and most smaller advanced economies is operating in the zone of severely diminishing returns. With a few exceptions (like Australia and Norway), policy rates are at or near the effective lower bound. This is either because the (negative) official deposit rate makes hoarding cash look like a viable option (Sweden, Switzerland and Denmark are likely at or near the Effective Lower Bound or ELB) or because, for whatever reason, monetary policymakers have decided they won't set policy rates any lower (the Fed, ECB, BoE, BoJ have policy rates well above the ELB (less so for the ECB than for the others). Central bank balance sheet expansion (both quantitative and qualitative easing) runs into three obstacles. First, it is of limited effectiveness when financial markets are orderly; second, it risks creating distortions and froth in financial markets and credit markets; and third, it makes it much more difficult to hide the growing quasi-fiscal role of central banks, which creates the politically awkward situation of unelected officials making material (quasi-) fiscal decisions. The continued high indebtedness of the non-financial private sector and the unfinished repair job on the balance sheets of European banks are further obstacles to the effectiveness of expansionary monetary and credit policy in the EU.

Only the UK is likely to be able to deliver a strong fiscal stimulus

When it comes to fiscal policy, it is clear that in the US, the Eurozone, Japan and the UK, a significant fiscal stimulus would, despite the current low interest rate environment, threaten the creditworthiness of the sovereign unless the additional sovereign debt issued were bought by the central bank and held permanently or cancelled. Such a combined temporary fiscal stimulus and permanent monetization (or 'helicopter money drop') is, in our view, only politically feasible in the UK at the moment.

Helicopter money drops would be the best instrument to tackle a downturn in all DMs

In the Eurozone, a significant Teutonic fringe believe that a fiscal stimulus is contractionary and that monetization of public debt and deficits is a sure road to hyperinflation. It is a widely held view that Article 123 of the Treaty on the Functioning of the European Union forbids monetization of public debt and thus makes a helicopter money drop in the Eurozone impossible. Debt-financed (non-monetised) fiscal expansions run into the twin obstacles of an already excessive public debt in most Eurozone member states and the pro-cyclical nature of the constraints imposed by the Stability and Growth Pact and its myriad offspring, operated out of Brussels.

In the US, the fiscal stance is, from a cyclical perspective, not unlike a clock that is halted and points at the right time only twice a day. Fortunately, today is one of these times. Should the country need a fiscal stimulus (or indeed a fiscal contraction), it is in our view highly unlikely that the Congressional gridlock could be overcome sufficiently to do what is necessary when it is necessary. So as regards

countercyclical policy, the US, like the Eurozone, has to rely on progressively less effective monetary stimulus alone.

The fiscal position of the Japanese sovereign is by far the worst of any large advanced country, despite its large stock of foreign exchange reserves and the positive net foreign investment position of Japan as a whole. Only a permanently monetised fiscal stimulus would be feasible if the markets were to wake from their decades-long slumber and wonder whether, and how, the Japanese sovereign can reach the shores of solvency without inflating its debt away. It remains an open question as to whether the Ministry of Finance in Japan can be convinced to commit to a sizeable fiscal stimulus – its side of the helicopter money drop operation. The Bank of Japan would not stand in the way, we believe.

If the Fed raises its policy rate this year, it will likely cut it again next year

In summary, with the possible exception of the UK, the combined monetary-fiscal stimulus necessary to minimize the depressing effect of an EM recession on economic activity in the DMs is unlikely to be forthcoming in most advanced economies. This means that the monetary authorities once again will have to do the heavy lifting. If the Fed and the Bank of England raise rates this year or early next year, they may, if the global recession scenario materializes, be cutting rates again during the second half of 2016.

We are likely to see more QE(E) in the US, the UK, the euro area and Japan

We expect to see QE $\#N$, where N could become a large integer, as part of the monetary policy response in the US and the UK, and QEE2 in Japan. The ECB will likely have to continue its asset purchases beyond September 2016 and it may cut its policy rates further. All this will not be enough to prevent most advanced economies from performing worse in 2016 and 2017 than in 2015, and worse than our current forecasts for the next two years.

Conclusion

Helicopter money drops and debt restructuring can prevent a recession

The world appears to be at material and rising risk of entering a recession, led by EMs and in particular by China. This should not come as a surprise. Capitalism is cyclical – and always has been. It is likely that this recession will be shallower than the last one. Helicopter money drops in China, the euro area, the UK and the US, and debt restructuring in the corporate, local government and banking sectors in China, in the private non-financial, banking and government sectors in the euro area, and in the banking sector in the UK can mitigate and, if implemented immediately, prevent a recession during the next two years without raising the risk of a deeper and longer recession later.

There are two risks that could worsen the outlook.

The recession could be much worse if the global downturn were accompanied by a financial crisis ...

The first is that we get another systemic debt crisis, in DMs, in EMs or both. Both EMs and DMs remain very highly leveraged. In many advanced countries, the public debt burden is higher than it has ever been except during and in the aftermath of major wars, when the political economy of spending cuts and tax increases was very different. Combined public and private non-financial gross debt burdens are at a record high. In many EMs, private leverage has soared.

We simply don't know much about how to engage in effective macroeconomic stabilization in highly leveraged environments, or how to manage a financial crisis and limit the immediate damage it does without increasing the likelihood and the magnitude of the next crisis, and bringing it forward. The track record of the supervisory and regulatory authorities, central banks and finance ministries in most DMs (and in all large DMs) before, during and since the Great Financial Crisis has

been poor. For some of these actors, this may have been because of political constraints, beyond their control, on their ability to act. Many of the supervisory, regulatory, monetary and fiscal authorities in the EMs are untested in a severe financial crisis. The last time we faced a situation like this there were, outside Japan, policy interest rates that could be cut, and most countries had more fiscal space. Today, the interest rate is out of commission as a policy instrument in most DMs and fiscal space is more severely constrained than in 2008 almost everywhere.

... or if the world were to stumble into greater protectionism

The second risk is that the world lapses into protectionism. Competitive devaluations (currency wars) by themselves would not damage the global recovery. When every nation tries to devalue its currency against every other currency, all will fail. Even then, however, the uncoordinated attempts to depreciate each currency against all others will produce a globally expansionary set of national monetary and credit policies. If, however, protectionist measures other than competitive devaluations are resorted to support and boost national economic activity, things could get much worse and stay that way for much longer.

If the right combined monetary and fiscal stimuli are implemented immediately, a recession in 2016 can be avoided. Even the belated application of helicopter money drops in the cyclically afflicted countries can ensure that the coming bout of cyclical stagnation does not worsen the problem of secular stagnation. If, during and following the global recession, significant debt restructuring takes place in both EMs and DMs, and in both public and private sectors, we can look forward to a more durable and robust recovery after the next recession than we had following the last one. If in addition the necessary structural reforms of labor markets, professions, product markets and financial markets are initiated in a serious manner, if we can move from rule *by* law to rule *of* law in some key countries and from rule by lawyers to rule of law in others, if structures, institutions and policies are adapted to rapidly changing conditions, then future potential output growth will be enhanced and secular stagnation avoided. We are not holding our breath.

References

Bernanke, Ben S. (2004), "The Great Moderation", Remarks made at the meetings of the Eastern Economic Association, Washington, DC, February 2004, <http://www.federalreserve.gov/BOARDDOCS/speechES/2004/20040220/default.htm>

Stock, James; Mark Watson (2002). "[Has the business cycle changed and why?](#)" (PDF). *NBER Macroeconomics Annual*.

Appendix A-1

Analyst Certification

The research analyst(s) primarily responsible for the preparation and content of this research report are named in bold text in the author block at the front of the product except for those sections where an analyst's name appears in bold alongside content which is attributable to that analyst. Each of these analyst(s) certify, with respect to the section(s) of the report for which they are responsible, that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc and its affiliates. No part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst in this report.

IMPORTANT DISCLOSURES

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of United States

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of China

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Mexico

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Venezuela

Citigroup Global Markets Ltd is currently mandated as advisor to the Hellenic Republic in relation the announced privatisation process of various State owned airports and Hellinikon.

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Argentina

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of France

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of United Kingdom

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of CANADA (GOVERNMENT)

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Germany

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Switzerland

Citigroup Global Markets Inc. owns a position of 1 million USD or more in the debt securities of Brazil

Within the past 12 months, Citigroup Global Markets Inc. or its affiliates has acted as manager or co-manager of an offering of securities of United States, Mexico, South Korea, Japan, France, Norway, United Kingdom, Indonesia, Canada, Australia, Turkey, Germany, Italy, Poland, Spain, Sweden.

Citigroup Global Markets Inc. or its affiliates has received compensation for investment banking services provided within the past 12 months from United States, China, Mexico, Venezuela, Greece, Nigeria, South Korea, Japan, Argentina, Russian Federation, Taiwan, France, Norway, United Kingdom, Indonesia, Canada, Australia, Turkey, Germany, Italy, New Zealand, Romania, Poland, Czech Republic, Hungary, Spain, Switzerland, Brazil, Sweden, South Africa.

Citigroup Global Markets Inc. or its affiliates expects to receive or intends to seek, within the next three months, compensation for investment banking services from China, Mexico, Greece, South Korea, Japan, France, Norway, Indonesia, Canada, Italy, New Zealand, Romania, Poland, Czech Republic, Hungary, Brazil, Sweden.

Citigroup Global Markets Inc. or an affiliate received compensation for products and services other than investment banking services from United States, China, Mexico, Venezuela, Greece, Nigeria, South Korea, Japan, Argentina, Russian Federation, Taiwan, France, Norway, United Kingdom, Indonesia, Canada, Australia, Turkey, Germany, Italy, New Zealand, Romania, Poland, Czech Republic, Hungary, Spain, Switzerland, Brazil, Sweden, South Africa in the past 12 months.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as investment banking client(s): United States, China, Mexico, Venezuela, Greece, Nigeria, South Korea, Japan, Argentina, Russian Federation, Taiwan, France, Norway, United Kingdom, Indonesia, Canada, Australia, Turkey, Germany, Italy, New Zealand, Romania, Poland, Czech Republic, Hungary, Spain, Switzerland, Brazil, Sweden, South Africa.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as clients, and the services provided were non-investment-banking, securities-related: United States, China, Mexico, Venezuela, Greece, Nigeria, South Korea, Japan, Argentina, Russian Federation, Taiwan, France, Norway, United Kingdom, Indonesia, Canada, Australia, Turkey, Germany, Italy, New Zealand, Romania, Poland, Czech Republic, Hungary, Spain, Switzerland, Brazil, Sweden, South Africa.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as clients, and the services provided were non-investment-banking, non-securities-related: United States, China, Mexico, Venezuela, Greece, Nigeria, South Korea, Japan, Argentina, Russian Federation, Taiwan, France, Norway, United Kingdom, Indonesia, Canada, Australia, Turkey, Germany, Italy, New Zealand, Romania, Poland, Czech Republic, Hungary, Spain, Switzerland, Brazil, Sweden, South Africa.

United States or its affiliates beneficially owns 5% or more of any class of common equity securities of Citigroup Inc.

Analysts' compensation is determined based upon activities and services intended to benefit the investor clients of Citigroup Global Markets Inc. and its affiliates ("the Firm"). Like all Firm employees, analysts receive compensation that is impacted by overall firm profitability which includes investment banking revenues.

For important disclosures (including copies of historical disclosures) regarding the companies that are the subject of this Citi Research product ("the Product"), please contact Citi Research, 388 Greenwich Street, 28th Floor, New York, NY, 10013, Attention: Legal/Compliance [E6WYB6412478]. In

addition, the same important disclosures, with the exception of the Valuation and Risk assessments and historical disclosures, are contained on the Firm's disclosure website at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures. Valuation and Risk assessments can be found in the text of the most recent research note/report regarding the subject company. Historical disclosures (for up to the past three years) will be provided upon request.

NON-US RESEARCH ANALYST DISCLOSURES

Non-US research analysts who have prepared this report (i.e., all research analysts listed below other than those identified as employed by Citigroup Global Markets Inc.) are not registered/qualified as research analysts with FINRA. Such research analysts may not be associated persons of the member organization and therefore may not be subject to the NYSE Rule 472 and NASD Rule 2711 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account. The legal entities employing the authors of this report are listed below:

Citigroup Global Markets Inc

Willem Buitier

OTHER DISCLOSURES

Many European regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of investment research. The policy applicable to Citi Research's Products can be found at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures.

Citigroup Global Markets Inc. and/or its affiliates has a significant financial interest in relation to Mexico, Venezuela, Japan, Argentina, Taiwan, United Kingdom, Indonesia, Canada, Turkey, Romania, Poland, Czech Republic, Hungary, Spain, Switzerland, Brazil, Sweden, South Africa. (For an explanation of the determination of significant financial interest, please refer to the policy for managing conflicts of interest which can be found at www.citiVelocity.com.)

For securities recommended in the Product in which the Firm is not a market maker, the Firm is a liquidity provider in the issuers' financial instruments and may act as principal in connection with such transactions. The Firm is a regular issuer of traded financial instruments linked to securities that may have been recommended in the Product. The Firm regularly trades in the securities of the issuer(s) discussed in the Product. The Firm may engage in securities transactions in a manner inconsistent with the Product and, with respect to securities covered by the Product, will buy or sell from customers on a principal basis.

Citigroup Global Markets India Private Limited and/or its affiliates may have, from time to time, actual or beneficial ownership of 1% or more in the debt securities of the subject issuer.

Citi Research generally disseminates its research to the Firm's global institutional and retail clients via both proprietary (e.g., Citi Velocity and Citi Personal Wealth Management) and non-proprietary electronic distribution platforms. Certain research may be disseminated only via Citi's proprietary distribution platforms; however such research will not contain changes to earnings forecasts, target price, investment or risk rating or investment thesis or be otherwise inconsistent with the author's previously published research. Certain research is made available only to institutional investors to satisfy regulatory requirements. Individual Citi Research analysts may also opt to circulate published research to one or more clients by email; such email distribution is discretionary and is done only after the research has been disseminated. The level and types of services provided by Citi Research analysts to clients may vary depending on various factors such as the client's individual preferences as to the frequency and manner of receiving communications from analysts, the 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 Citi and legal and regulatory constraints.

Pursuant to Comissão de Valores Mobiliários Rule 483, Citi is required to disclose whether a Citi related company or business has a commercial relationship with the subject company. Considering that Citi operates multiple businesses in more than 100 countries around the world, it is likely that Citi has a commercial relationship with the subject company.

Securities recommended, offered, or sold by the Firm: (i) are not insured by the Federal Deposit Insurance Corporation; (ii) are not deposits or other obligations of any insured depository institution (including Citibank); and (iii) are subject to investment risks, including the possible loss of the principal amount invested. Although information has been obtained from and is based upon sources that the Firm believes to be reliable, we do not guarantee its accuracy and it may be incomplete and condensed. Note, however, that the Firm has taken all reasonable steps to determine the accuracy and completeness of the disclosures made in the Important Disclosures section of the Product. The Firm's research department has received assistance from the subject company(ies) referred to in this Product including, but not limited to, discussions with management of the subject company(ies). Firm policy prohibits research analysts from sending draft research to subject companies. However, it should be presumed that the author of the Product has had discussions with the subject company to ensure factual accuracy prior to publication. All opinions, projections and estimates constitute the judgment of the author as of the date of the Product and these, plus any other information contained in the Product, are subject to change without notice. Prices and availability of financial instruments also are subject to change without notice. Notwithstanding other departments within the Firm advising the companies discussed in this Product, information obtained in such role is not used in the preparation of the Product. Although Citi Research does not set a predetermined frequency for publication, if the Product is a fundamental research report, it is the intention of Citi Research to provide research coverage of the/those issuer(s) mentioned therein, including in response to news affecting this issuer, subject to applicable quiet periods and capacity constraints. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security. Any decision to purchase securities mentioned in the Product must take into account existing public information on such security or any registered prospectus.

Investing in non-U.S. securities, including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of the U.S. Securities and Exchange Commission. There may be limited information available on foreign securities. Foreign companies are generally not subject to uniform audit and reporting standards, practices and requirements comparable to those in the U.S. Securities of some foreign companies may be less liquid and their prices more volatile than securities of comparable U.S. companies. In addition, exchange rate movements may have an adverse effect on the value of an investment in a foreign stock and its corresponding dividend payment for U.S. investors. Net dividends to ADR investors are estimated, using withholding tax rates conventions, deemed accurate, but investors are urged to consult their tax advisor for exact dividend computations. Investors who have received the Product from the Firm may be prohibited in certain states or other jurisdictions from purchasing securities mentioned in the Product from the Firm. Please ask your Financial Consultant for additional details. Citigroup Global Markets Inc.

takes responsibility for the Product in the United States. Any orders by US investors resulting from the information contained in the Product may be placed only through Citigroup Global Markets Inc.

Important Disclosures for Bell Potter Customers: Bell Potter is making this Product available to its clients pursuant to an agreement with Citigroup Global Markets Australia Pty Limited. Neither Citigroup Global Markets Australia Pty Limited nor any of its affiliates has made any determination as to the suitability of the information provided herein and clients should consult with their Bell Potter financial advisor before making any investment decision.

The Citigroup legal entity that takes responsibility for the production of the Product is the legal entity which the first named author is employed by. The Product is made available in **Australia** through Citigroup Global Markets Australia Pty Limited. (ABN 64 003 114 832 and AFSL No. 240992), participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in Australia to Private Banking wholesale clients through Citigroup Pty Limited (ABN 88 004 325 080 and AFSL 238098). Citigroup Pty Limited provides all financial product advice to Australian Private Banking wholesale clients through bankers and relationship managers. If there is any doubt about the suitability of investments held in Citigroup Private Bank accounts, investors should contact the Citigroup Private Bank in Australia. Citigroup companies may compensate affiliates and their representatives for providing products and services to clients. The Product is made available in **Brazil** by Citigroup Global Markets Brasil - CCTVM SA, which is regulated by CVM - Comissão de Valores Mobiliários, BACEN - Brazilian Central Bank, APIMEC - Associação dos Analistas e Profissionais de Investimento do Mercado de Capitais and ANBID - Associação Nacional dos Bancos de Investimento. Av. Paulista, 1111 - 11º andar - CEP. 01311920 - São Paulo - SP. If the Product is being made available in certain provinces of **Canada** by Citigroup Global Markets (Canada) Inc. ("CGM Canada"), CGM Canada has approved the Product. Citigroup Place, 123 Front Street West, Suite 1100, Toronto, Ontario M5J 2M3. This product is available in **Chile** through Banchile Corredores de Bolsa S.A., an indirect subsidiary of Citigroup Inc., which is regulated by the Superintendencia de Valores y Seguros. Agustinas 975, piso 2, Santiago, Chile. The Product is distributed in **Germany** by Citigroup Global Markets Deutschland AG ("CGMD"), which is regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin). CGMD, Reuterweg 16, 60323 Frankfurt am Main. Research which relates to "securities" (as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong)) is issued in **Hong Kong** by, or on behalf of, Citigroup Global Markets Asia Limited which takes full responsibility for its content. Citigroup Global Markets Asia Ltd. is regulated by Hong Kong Securities and Futures Commission. If the Research is made available through Citibank, N.A., Hong Kong Branch, for its clients in Citi Private Bank, it is made available by Citibank N.A., Citibank Tower, Citibank Plaza, 3 Garden Road, Hong Kong. Citibank N.A. is regulated by the Hong Kong Monetary Authority. Please contact your Private Banker in Citibank N.A., Hong Kong, Branch if you have any queries on or any matters arising from or in connection with this document. The Product is made available in **India** by Citigroup Global Markets India Private Limited (CGM), which is regulated by the Securities and Exchange Board of India (SEBI), as a Research Analyst (SEBI Registration No. INH000000438). CGM is also actively involved in the business of merchant banking, stock brokerage, and depository participant, in India, and is registered with SEBI in this regard. CGM's registered office is at 1202, 12th Floor, FIFC, G Block, Bandra Kurla Complex, Bandra East, Mumbai – 400051. CGM's Corporate Identity Number is U99999MH2000PTC126657, and its contact details are: Tel:+9102261759999 Fax:+9102261759961. The Product is made available in **Indonesia** through PT Citigroup Securities Indonesia. 5/F, Citibank Tower, Bapindo Plaza, Jl. Jend. Sudirman Kav. 54-55, Jakarta 12190. Neither this Product nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens wherever they are domiciled or to Indonesian residents except in compliance with applicable capital market laws and regulations. This Product is not an offer of securities in Indonesia. The securities referred to in this Product have not been registered with the Capital Market and Financial Institutions Supervisory Agency (BAPEPAM-LK) pursuant to relevant capital market laws and regulations, and may not be offered or sold within the territory of the Republic of Indonesia or to Indonesian citizens through a public offering or in circumstances which constitute an offer within the meaning of the Indonesian capital market laws and regulations. The Product is made available in **Israel** through Citibank NA, regulated by the Bank of Israel and the Israeli Securities Authority. Citibank, N.A., Platinum Building, 21 Ha'arba'ah St, Tel Aviv, Israel. The Product is made available in **Italy** by Citigroup Global Markets Limited, which is authorised by the PRA and regulated by the FCA and the PRA. Via dei Mercanti, 12, Milan, 20121, Italy. The Product is made available in **Japan** by Citigroup Global Markets Japan Inc. ("CGMJ"), which is regulated by Financial Services Agency, Securities and Exchange Surveillance Commission, Japan Securities Dealers Association, Tokyo Stock Exchange and Osaka Securities Exchange. Shin-Marunouchi Building, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6520 Japan. If the Product was distributed by SMBC Nikko Securities Inc. it is being so distributed under license. In the event that an error is found in an CGMJ research report, a revised version will be posted on the Firm's Citi Velocity website. If you have questions regarding Citi Velocity, please call (81 3) 6270-3019 for help. The Product is made available in **Korea** by Citigroup Global Markets Korea Securities Ltd., which is regulated by the Financial Services Commission, the Financial Supervisory Service and the Korea Financial Investment Association (KOFIA). Citibank Building, 39 Da-dong, Jung-gu, Seoul 100-180, Korea. KOFIA makes available registration information of research analysts on its website. Please visit the following website if you wish to find KOFIA registration information on research analysts of Citigroup Global Markets Korea Securities Ltd. <http://dis.kofia.or.kr/websquare/index.jsp?w2xPath=/wq/fundMgr/DISFundMgrAnalystList.xml&divisionId=MDIS03002002000000&serviceId=SDIS03002002000>. The Product is made available in **Korea** by Citibank Korea Inc., which is regulated by the Financial Services Commission and the Financial Supervisory Service. Address is Citibank Building, 39 Da-dong, Jung-gu, Seoul 100-180, Korea. The Product is made available in **Malaysia** by Citigroup Global Markets Malaysia Sdn Bhd (Company No. 460819-D) ("CGMM") to its clients and CGMM takes responsibility for its contents. CGMM is regulated by the Securities Commission of Malaysia. Please contact CGMM at Level 43 Menara Citibank, 165 Jalan Ampang, 50450 Kuala Lumpur, Malaysia in respect of any matters arising from, or in connection with, the Product. The Product is made available in **Mexico** by Acciones y Valores Banamex, S.A. De C. V., Casa de Bolsa, Integrante del Grupo Financiero Banamex ("Accival") which is a wholly owned subsidiary of Citigroup Inc. and is regulated by Comision Nacional Bancaria y de Valores. Reforma 398, Col. Juarez, 06600 Mexico, D.F. In **New Zealand** the Product is made available to 'wholesale clients' only as defined by s5C(1) of the Financial Advisers Act 2008 ("FAA") through Citigroup Global Markets Australia Pty Ltd (ABN 64 003 114 832 and AFSL No. 240992), an overseas financial adviser as defined by the FAA, participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in **Pakistan** by Citibank N.A. Pakistan branch, which is regulated by the State Bank of Pakistan and Securities Exchange Commission, Pakistan. AWT Plaza, 1.1. Chundrigar Road, P.O. Box 4889, Karachi-74200. The Product is made available in the **Philippines** through Citicorp Financial Services and Insurance Brokerage Philippines, Inc., which is regulated by the Philippines Securities and Exchange Commission. 20th Floor Citibank Square Bldg. The Product is made available in the Philippines through Citibank NA Philippines branch, Citibank Tower, 8741 Paseo De Roxas, Makati City, Manila. Citibank NA Philippines NA is regulated by The Bangko Sentral ng Pilipinas. The Product is made available in **Poland** by Dom Maklerski Banku Handlowego SA an indirect subsidiary of Citigroup Inc., which is regulated by Komisja Nadzoru Finansowego. Dom Maklerski Banku Handlowego S.A. ul.Senatorska 16, 00-923 Warszawa. The Product is made available in the

Russian Federation through ZAO Citibank, which is licensed to carry out banking activities in the Russian Federation in accordance with the general banking license issued by the Central Bank of the Russian Federation and brokerage activities in accordance with the license issued by the Federal Service for Financial Markets. Neither the Product nor any information contained in the Product shall be considered as advertising the securities mentioned in this report within the territory of the Russian Federation or outside the Russian Federation. The Product does not constitute an appraisal within the meaning of the Federal Law of the Russian Federation of 29 July 1998 No. 135-FZ (as amended) On Appraisal Activities in the Russian Federation. 8-10 Gasheka Street, 125047 Moscow. The Product is made available in **Singapore** through Citigroup Global Markets Singapore Pte. Ltd. ("CGMSPL"), a capital markets services license holder, and regulated by Monetary Authority of Singapore. Please contact contact CGMSPL at 8 Marina View, 21st Floor Asia Square Tower 1, Singapore 018960, in respect of any matters arising from, or in connection with, the analysis of this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). The Product is made available by The Citigroup Private Bank in Singapore through Citibank, N.A., Singapore Branch, a licensed bank in Singapore that is regulated by Monetary Authority of Singapore. Please contact your Private Banker in Citibank N.A., Singapore Branch if you have any queries on or any matters arising from or in connection with this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). This report is distributed in Singapore by Citibank Singapore Ltd ("CSL") to selected Citigold/Citigold Private Clients. CSL provides no independent research or analysis of the substance or in preparation of this report. Please contact your Citigold/Citigold Private Client Relationship Manager in CSL if you have any queries on or any matters arising from or in connection with this report. This report is intended for recipients who are accredited investors as defined under the Securities and Futures Act (Cap. 289). Citigroup Global Markets (Pty) Ltd. is incorporated in the **Republic of South Africa** (company registration number 2000/025866/07) and its registered office is at 145 West Street, Sandton, 2196, Saxonwold. Citigroup Global Markets (Pty) Ltd. is regulated by JSE Securities Exchange South Africa, South African Reserve Bank and the Financial Services Board. The investments and services contained herein are not available to private customers in South Africa. The Product is made available in the **Republic of China** through Citigroup Global Markets Taiwan Securities Company Ltd. ("CGMTS"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan and/or through Citibank Securities (Taiwan) Company Limited ("CSTL"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan, subject to the respective license scope of each entity and the applicable laws and regulations in the Republic of China. CGMTS and CSTL are both regulated by the Securities and Futures Bureau of the Financial Supervisory Commission of Taiwan, the Republic of China. No portion of the Product may be reproduced or quoted in the Republic of China by the press or any third parties [without the written authorization of CGMTS and CSTL]. If the Product covers securities which are not allowed to be offered or traded in the Republic of China, neither the Product nor any information contained in the Product shall be considered as advertising the securities or making recommendation of the securities in the Republic of China. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security or financial products. Any decision to purchase securities or financial products mentioned in the Product must take into account existing public information on such security or the financial products or any registered prospectus. The Product is made available in **Thailand** through Citicorp Securities (Thailand) Ltd., which is regulated by the Securities and Exchange Commission of Thailand. 399 Interchange 21 Building, 18th Floor, Sukhumvit Road, Klongtoey Nua, Wattana, Bangkok 10110, Thailand. The Product is made available in **Turkey** through Citibank AS which is regulated by Capital Markets Board. Tekfen Tower, Eski Buyukdere Caddesi # 209 Kat 2B, 23294 Levent, Istanbul, Turkey. In the **U.A.E.**, these materials (the "Materials") are communicated by Citigroup Global Markets Limited, DIFC branch ("CGML"), an entity registered in the Dubai International Financial Center ("DIFC") and licensed and regulated by the Dubai Financial Services Authority ("DFSA") to Professional Clients and Market Counterparties only and should not be relied upon or distributed to Retail Clients. A distribution of the different Citi Research ratings distribution, in percentage terms for Investments in each sector covered is made available on request. Financial products and/or services to which the Materials relate will only be made available to Professional Clients and Market Counterparties. The Product is made available in **United Kingdom** by Citigroup Global Markets Limited, which is authorised by the Prudential Regulation Authority ("PRA") and regulated by the Financial Conduct Authority ("FCA") and the PRA. This material may relate to investments or services of a person outside of the UK or to other matters which are not authorised by the PRA nor regulated by the FCA and the PRA and further details as to where this may be the case are available upon request in respect of this material. Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB. The Product is made available in **United States** by Citigroup Global Markets Inc, which is a member of FINRA and registered with the US Securities and Exchange Commission. 388 Greenwich Street, New York, NY 10013. Unless specified to the contrary, within EU Member States, the Product is made available by Citigroup Global Markets Limited, which is authorised by the PRA and regulated by the FCA and the PRA. The Product is not to be construed as providing investment services in any jurisdiction where the provision of such services would not be permitted. Subject to the nature and contents of the Product, the investments described therein are subject to fluctuations in price and/or value and investors may get back less than originally invested. Certain high-volatility investments can be subject to sudden and large falls in value that could equal or exceed the amount invested. Certain investments contained in the Product may have tax implications for private customers whereby levels and basis of taxation may be subject to change. If in doubt, investors should seek advice from a tax adviser. The Product does not purport to identify the nature of the specific market or other risks associated with a particular transaction. Advice in the Product is general and should not be construed as personal advice given it has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to their objectives, financial situation and needs. Prior to acquiring any financial product, it is the client's responsibility to obtain the relevant offer document for the product and consider it before making a decision as to whether to purchase the product. Citi Research product may source data from dataCentral. dataCentral is a Citi Research proprietary database, which includes Citi estimates, data from company reports and feeds from Thomson Reuters. The printed and printable version of the research report may not include all the information (e.g., certain financial summary information and comparable company data) that is linked to the online version available on Citi's proprietary electronic distribution platforms.

© 2015 Citigroup Global Markets Inc. Citi Research is a division of Citigroup Global Markets Inc. Citi and Citi with Arc Design are trademarks and service marks of Citigroup Inc. and its affiliates and are used and registered throughout the world. All rights reserved. Any unauthorized use, duplication, redistribution or disclosure of this report (the "Product"), including, but not limited to, redistribution of the Product by electronic mail, posting of the Product on a website or page, and/or providing to a third party a link to the Product, is prohibited by law and will result in prosecution. The information contained in the Product is intended solely for the recipient and may not be further distributed by the recipient to any third party. Where included in this report, MSCI sourced information is the exclusive property of Morgan Stanley Capital International Inc. (MSCI). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, disseminated or used to create any financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness

for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI, Morgan Stanley Capital International and the MSCI indexes are services marks of MSCI and its affiliates. The Firm accepts no liability whatsoever for the actions of third parties. The Product may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the Product refers to website material of the Firm, the Firm has not reviewed the linked site. Equally, except to the extent to which the Product refers to website material of the Firm, the Firm takes no responsibility for, and makes no representations or warranties whatsoever as to, the data and information contained therein. Such address or hyperlink (including addresses or hyperlinks to website material of the Firm) is provided solely for your convenience and information and the content of the linked site does not in anyway form part of this document. Accessing such website or following such link through the Product or the website of the Firm shall be at your own risk and the Firm shall have no liability arising out of, or in connection with, any such referenced website.

ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST
