Global Macro Strategy

Big Macro 08: The What, Why and So-What of Globalisation - III. Asset Implications

Global Macro Strategy

Global

Click below for the first two notes in this series:
The What, Why & So-What of Globalisation – I. Separating myth from reality
The What, Why & So-What of Globalisation – II. Cyclical or Structural?

The 'So-What' of Slowing Globalisation

In the previous two notes of this series we detailed precisely how and why globalisation is slowing. In our concluding note, we lay out the macro and asset market implications of globalisation being unable to lift off from its current plateau.

Growth and inflation: The great moderation in reverse?

There will be no absolute winners if trade remains weak. We model how trade and growth will interact under different trajectories of globalisation. In the optimistic scenario, we see DM growth rising to a trend of just under 2% and EM growth rising to around 4.2%. In the pessimistic scenario we see DM growth slipping to 1.4%, and EM slipping harder to 3.5%. Globalisation's ascent coincided with a generalised decline in inflation and real rates. We explain why its plateau is unlikely to lead to a reversal.

Asset market implications

(1) EM equities appear more vulnerable than DM equities to extended weakness in global trade. We dig further within these aggregates to delineate areas of relative strength and weakness. (2) The USD is unlikely to rise significantly against DM currencies should global growth soften; however EM FX is very likely to see further trade weighted depreciation, even if low DM yields slow the trend. (3) The cost of equity is likely to evolve very differently in EM as currency weakness and fiscal pressures intensify. Click on the links below for details on different assets.

UBS Tactical Q-trades: Two accompanying notes on US and EM Equities

We also release 2 notes detailing relative winners and losers in US and EM equities.

Macro and Asset market implications

1. How would growth behave in alternative trajectories of globalisation?
2. Globalisation saw inflation coming lower. Will its flattening reverse it?
3. Rates: Slowing growth or weaker financial flows – whose pull is stronger?
4. Equities: Relative winners and losers from slowing globalisation
5. Currencies: Running to stand still – mean-reversion based models break down
6. Lingering issues: How inequality and unemployment can impact markets
7. UBS Tactical Q trade: Our most preferred and least preferred stocks in the US
8. UBS Tactical Q trade: Our most preferred and least preferred stocks in EM

Bhanu Baweja
Strategist
bhanu.baweja@ubs.com
+44-20-7568 6833

Manik Narain
Strategist
manik.narain@ubs.com
+44-20-7567 3218

Daniel Waldman
Strategist
daniel.waldman@ubs.com
+1-203-719 4281

Julian Emanuel
Strategist
julian.emanuel@ubs.com
+1-212-713-3845

Omar Elangbawy
Strategist
omar.elangbawy@ubs.com
+1-212-713 3303

Nick Nelson
Strategist
nick.nelson@ubs.com
+44-20-756 81960

Joao Toniato
Strategist
joao.toniato@ubs.com
+44-20-756 74657

Geoff Dennis
Strategist
geoff.dennis@ubs.com
+1-617-748 5622

Matthew Gilman
Strategist
matthew.gilman@ubs.com
+852-2971 8173

Maximillian Lin
Strategist
maximillian.lin@ubs.com
+65-6495 8429

Summary and conclusions

Growth: How big will the hit to trend growth be?

Estimates of trend output and trade growth by multilateral organisations seem to be based on a decent rebound in investment, and a reversal of protectionism. In the event that we don't see the implied positive turn in globalisation, we estimate that trend growth may fall to around 1.4% y/y for DM and 3.5% y/y for EM. The IMF's medium term projections today are around 1.7% and 4.9%, respectively.

Inflation: Rising trade saw it decline, but flattening trade will not see it rise

Globalisation's rise took place alongside a synchronised decline in inflation and real rates across the world. However the causation does not flow from globalisation to disinflation. Demographics, technology, excess capacity in industrial goods and negative output gaps are all likely to keep inflation low. Rising protectionism bears watching in this regard, but isn't a big factor for the foreseeable future.

Equities: Advantage in services helps developed markets, particularly US

Given higher domestic revenues, and the ability to capture a large part of the value added in a supply chain, US companies will be in a strong relative position. We particularly like the Consumer Discretionary, Healthcare and Tech sectors. Earnings estimates are likely to prove much too generous in most regions, particularly so in EM, but EM will likely also face weakening FX and a more volatile cost of capital. Our equity strategy colleagues are releasing their top stock picks in two Tactical Q trade publications that accompany this note.

Rates: Likely to stay low. Portfolio flows are not de-globalising

Secular forces raising the propensity for savings over investment have started to compromise globalisation, and will likely keep neutral real rates low in most developed markets. There are also no signs that DM bond markets are directly at risk from de-globalisation of portfolio flows. As we noted in Part I of this series, the only form of capital that is obviously retrenching is lending among DM banks; cross border portfolio flows have largely held their pre-crisis trend. In EM, however, rates can rise in several countries, even as growth weakens.

FX: Running to stand still – mean-reversion based models break down

Continued weakness in trade and growth, should it occur, will likely weigh on Fed tightening prospects, keeping the USD from appreciating against DM FX. In EM, however, currencies will likely experience trade weighted depreciation to a far greater extent than predicted by REER mean-reversion based fair value models. Given how trade positively influenced productivity growth and FDI flows into EM, plateauing globalisation risks impeding EM capital flows even as global rates stay low. Low beta Asia FX not pricing these risks at all.

Globalisation brought inequality. Its flattening may bring bigger issues.

As governments try to compensate for inequality they could put corporate profits at risk. Rising inequality has recently been discussed mostly in DM, but several EM economies have bigger issues. They risk of squandering their demographic prime. Weakening fiscal balances here are a big risk, and can translate quickly into higher domestic investment rates, impacting companies already suffering from weaker revenues. We see value in buying protection in Mexico and Malaysia CDS.

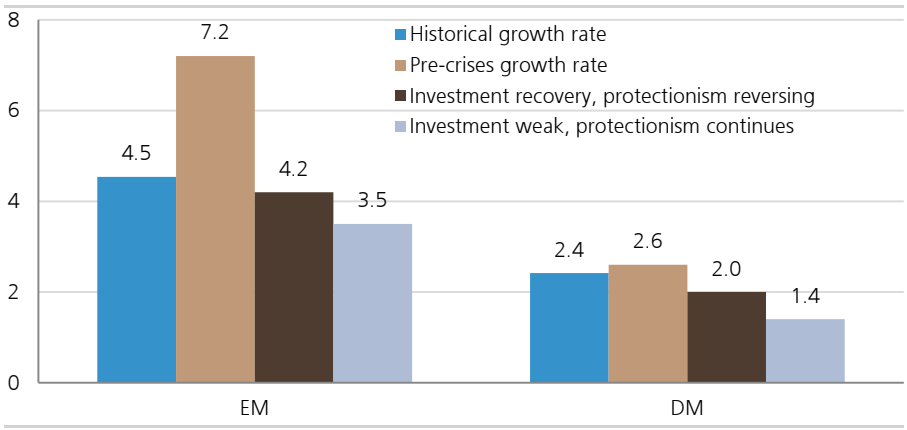
1. How will growth perform under different trajectories of globalisation?

- *We use a VAR model to estimate trend growth for EM and DM under different trajectories of globalisation.*
- *In the optimistic globalisation scenario we see DM trend growth rising to just under 2.0%, and EM growth rising to 4.2%. For context, growth in 2016 is likely to come in at 1.6% for DM and 3.9% for EM.*
- *In the pessimistic scenario DM growth slips to 1.4%, while EM growth slips to 3.5% in our estimates, well lower than IMF estimates for both regions.*

Two scenarios, hinged on the investment growth momentum and protectionism evolution

In an environment of lower global trade elasticity, how does the slowdown in global trade impact trend growth? In previous work Big Macro 07: The What, Why & So-What of Globalisation – II. Cyclical or structural?, we considered two alternative cases for the trend in trade growth volumes: a scenario where investment growth improves to the 25-year average and protectionism reverses; and a second scenario in which investment growth stays weak and protectionism lingers, a significantly more pessimistic backdrop for global growth. To look at this empirically, we use a Vector autoregressive (VAR) model to forecast trend growth for both DM and EM countries. This framework is important, as it accounts for the fact that the variables are endogenous, and impact each other. Using the VAR model, we generate impulse response functions which show the impact on trend growth in both DM and EM countries. These results are from a specific model and empirical methodology, and are not intended to show UBS baseline forecasts.

Figure 1: Historic and forecast growth scenarios for DM and EM under different trajectories of globalisation



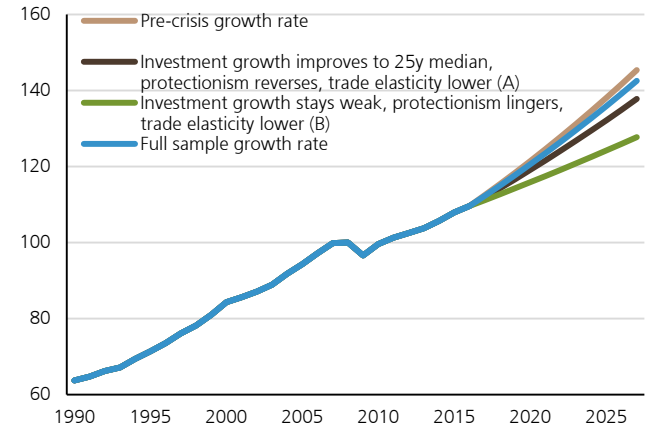
Source: Haver, UBS estimates

For DM countries, in the optimistic scenario, where investment growth picks up and protectionism reverses our model estimates of DM trend growth of just under 2.0%. In the weaker investment and more protectionist scenario, trend growth falls to 1.4%. It may help to contextualise these numbers. The optimistic scenario is not far from where IMF currently has its medium term (average of 2019-2021) forecasts for DM growth. Such an outcome would be in line with their view that trade is largely a function of weak investment, and that weak investment should reverse. As laid out in our previous note of this series, we found a slightly larger percentage of trade growth which is explained by structural factors. If this more pessimistic scenario gets more entrenched, we estimate DM growth will fall to 1.4% y/y.

For EM, our model estimates EM growth at 4.2% y/y in the more optimistic globalisation scenario. In this case even our more optimistic scenario yields results somewhat less than the IMF. In the pessimistic trade scenario, wherein protectionism lingers and investment growth is weak, EM trend growth falls to 3.5% y/y on our estimates.

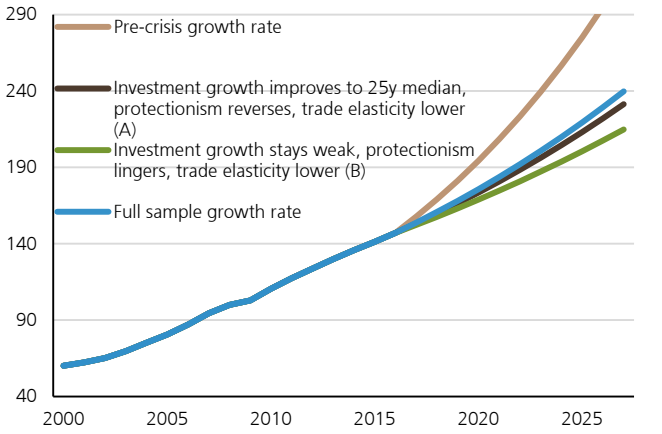
Even our optimistic scenario suggests a lower EM growth rate than IMF's forecast

Figure 2: DM growth rate



Source: Haver, UBS estimates

Figure 3: EM growth rate

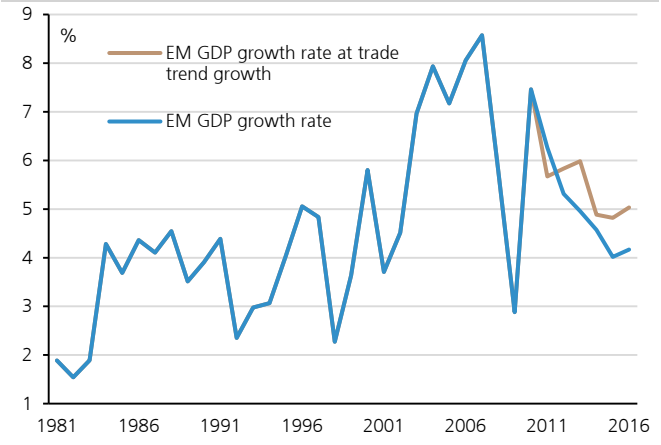


Source: Haver, UBS estimates

What if demand from China picks up? We model this as well, and quantify the sensitivity of our results to an improvement in global trade stemming from higher Chinese demand. To do so, we expand our VAR model adding real imports from China. We use the impulse responses to show how our results change if China import growth continues at a trend of 15%. In this scenario, DM and EM trend growth rise by about 0.3pp and 0.5pp, respectively, relative to base cases. Finally, we quantify how much global trade weakness has dragged on global growth, by creating a post-GFC global growth counterfactual. Our model indicates that weaker global trade has subtracted nearly 80-100bp from global growth during the last three years.

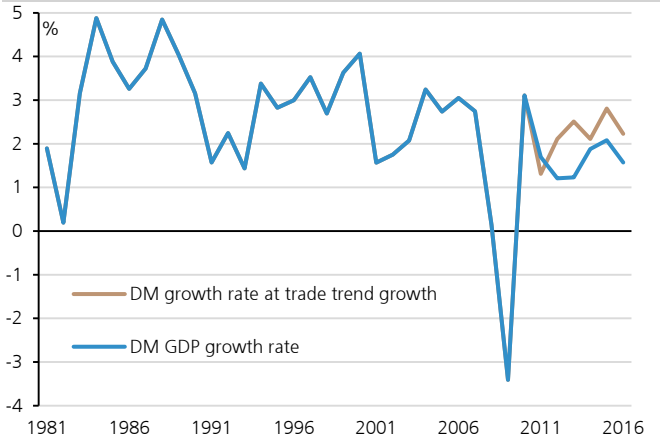
Higher Chinese demand is estimated to raise DM and EM trend growth by 0.3% and 0.5%

Figure 4: EM GDP growth rate



Source: Haver, UBS estimates

Figure 5: DM GDP Growth rate



Source: Haver, UBS estimates

2. Globalisation's rise saw rates and inflation fall. Will its plateauing cause the reverse?

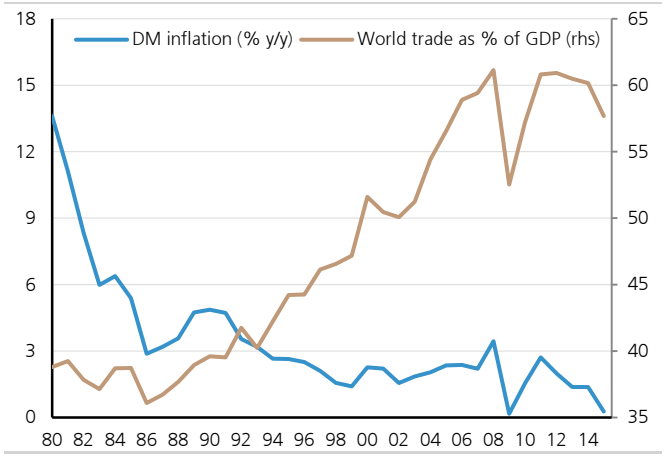
- *Globalisation saw inflation fall and become much more synchronised. However, it is unlikely that the flattening out of globalisation will see the reverse.*
- *Inflation is likely to be kept low by weak trend growth, which is reflected in weak investment, a key factor behind weak trade.*
- *Plateauing globalisation itself is being caused by the same shift in savings and investment propensities that have driven rates lower. It's difficult to see real rates in advanced economies rise aggressively.*
- *Some worry about a slowdown in financial globalisation leading to higher rates. However, it is only DM banks lending to other DM banks that has retrenched sharply; there has been little change in the strength of portfolio flows. We don't see any reason for major bond markets to choke up.*
- *The impact of sustained weak trade growth on emerging markets rates is less clear. Economies with weak macro balance sheets see rises in currency volatility credit risk, which can push real rates higher.*

Will inflation and rates rise from globalisation's plateau?

In the mid-1980s, just as many central banks embraced inflation targeting, globalisation was setting off on an exponential trajectory, with goods, labour and capital all crossing borders at an unprecedented rate (Figure 6). Amidst these forces inflation fell in a synchronised fashion across most countries (Figure 7).

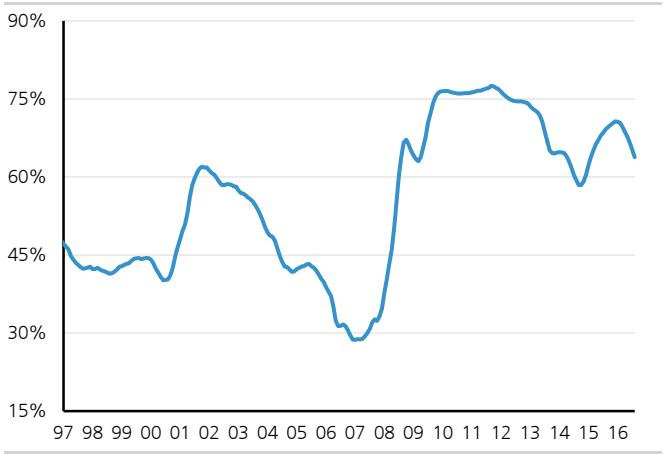
Globalisation took place alongside a clear decline in global inflation

Figure 6: Advanced economy inflation and trade/GDP



Source: Haver, World Bank, UBS

Figure 7: First principal component of inflation in advanced economies: the global factor explained inflation



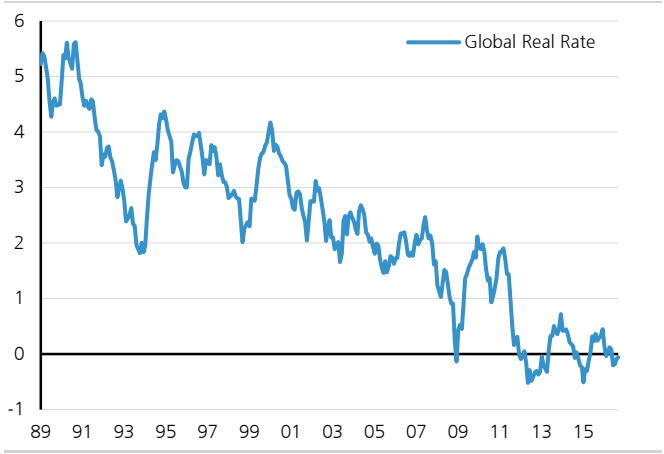
Source: Haver, UBS. Chart shows proportion of variance explained by first principal component of 5y rolling inflation in DM

Nominal rates also became synchronised and declined even faster than inflation, with real rates dropping 450 bps over the last three decades (Figure 8). These developments were regarded as one half of the 'great moderation' thesis associated with globalisation, the twin aspect of which was low volatility in growth. Will low inflation, and therefore rates, also reverse course amidst flattening globalisation?

Globalisation saw rates falling at an even faster pace than falling inflation

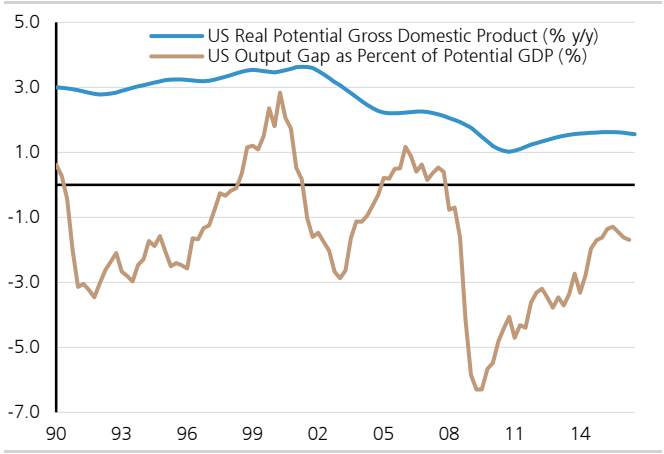
We don't believe they will.

Figure 8: Real rates declining across the world



Source: Bloomberg, UBS. Chart shows 45% of US real rates, 45% of Germany real rates and 10% of Japan real rates. Real rates are nominal yields deflated by 36m exponential average CPI

Figure 9: US potential output and output gap: The output gap has not been positive for long even as potential output is revised lower



Source: Haver, UBS

Although inflation and rates have fallen in a more globalised world, globalisation is by no means the sole driver of lower inflation and rates, in our view. It is important to a) recognise other factors behind lower rates and inflation and b) identify whether the reason globalisation is slowing itself is inflationary or dis-inflationary.

The primary reason behind low inflation today is weak growth. As noted in the previous section, if businesses remain averse to investment and nascent protectionism doesn't again give way to trade liberalisation, trend growth is likely to decline even from current low levels. Despite continuous downward revisions to estimates of potential output across the world, output gaps remain negative in most countries today. In the US for instance the output gap has been positive only twice in the last 20 years – first, at the time of the tech bubble of the 1990s, and then during the housing bubble of the 2000s (Figure 9). So, the economy has met official estimates of trend growth only during extreme disequilibria. This suggests that estimates of trend growth have been continually too generous. This has been consistent with a fall in neutral real rates.

Output gaps remain negative in most major economies today, even as potential output is revised lower. Neutral rates have fallen.

Why is trend growth declining? The secular headwinds to growth have been documented by many, but in our view most clearly by Robert Gordon[1] and Larry Summers who have argued that demographics, high debt, weakening growth in educational attainment, slower innovation and rising inequality are pulling down growth in per capita incomes almost to the level of stagnation.[2]

We argued in the previous note of this series that growth is being compromised by structural factors

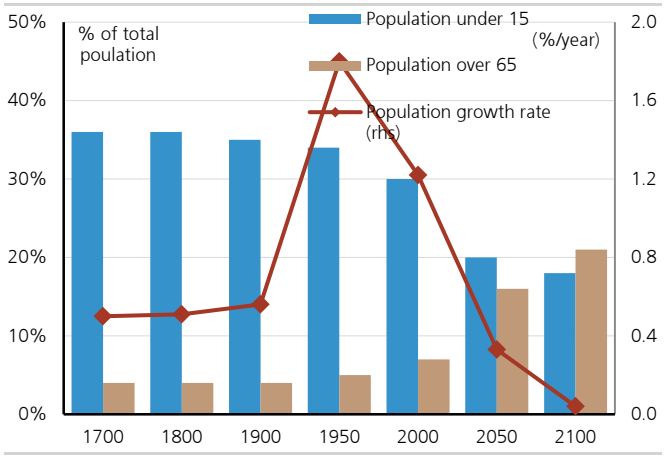
It is important to note though, that weaker growth and inflation alone don't explain the magnitude of the decline in rates over the last twenty years. Structural forces such as ageing, higher debt, and rising inequality have also widened the gap of savings over investment, contributing to lower neutral real rates. We think that these factors have also driven the flattening out of globalisation more recently.

The causation today doesn't run from globalisation to inflation; both these variables are being impacted by other, secular forces

[1] R Gordon 'Is US economic growth over? Faltering innovation confronts the six headwinds' Sept 2012

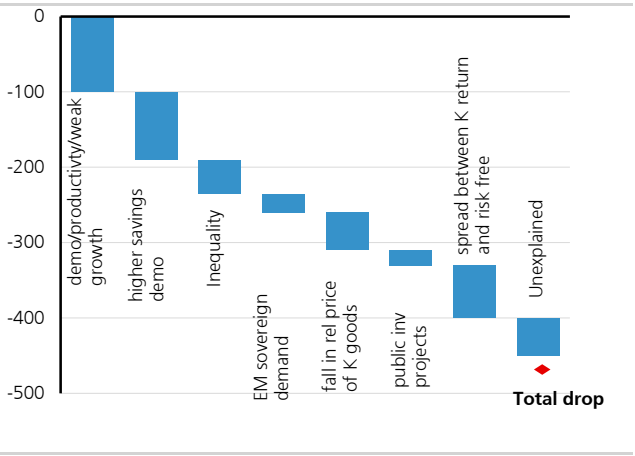
[2] Most of these factors link directly with the reasons for investment being weak – a trend that we argued in The What, Why & So-What of Globalisation – II. Cyclical or Structural? goes well beyond cyclical factors.

Figure 10: Age structure of the world over 4 centuries[3]



Source: The Demographics transition: Three centuries of Fundamental Change - Ronald Lee, UBS

Figure 11: Factors explaining the drop in global real rates (Lukasz Rachel and Thomas D Smith of Bank of England)



Source: Bank of England: Secular drivers of the global real interest rate, UBS

Research by the Bank of England[4] has tried to decompose the drivers of declining real rates. Lower growth accounts for only 100 bps of the total decline in real rates. Of the remaining 350 bps decline in real rates, 160 bps are explained by an increase in desired savings (a larger proportion of long-living retirees needing to save more, rising income inequality, and a desire for precautionary savings by EM sovereigns) and further 140 bps by a decline in desired investment (fall in the relative price of capital goods, lower government spending and a rising spread between capital returns and the risk free rate). Only 50 bps of the decline in real rates is left unexplained.

Most of the decline in real rates has been due to non-cyclical factors such as shifts in savings and investment preferences

Here's the key point – there is a very large overlap between the factors that are now causing globalisation to flatten out (see The What, Why & So-What of Globalisation – II. Cyclical or Structural?) and the factors that have led to the changes in the desired levels of investments (lower) and savings (higher) to change. So, far from reversing the decline in real rates, flattening globalisation itself is being caused by the same shift in savings and investment propensities that are driving real rates lower.

These are also the variables that are causing a slowdown in globalisation. As such, slowing globalisation is unlikely to change the secular forces driving disinflation

Weaker globalisation and weak growth will mean higher public debt - is that a worry for rates?

There are three related channels through which high public debt can impact rates.[5]

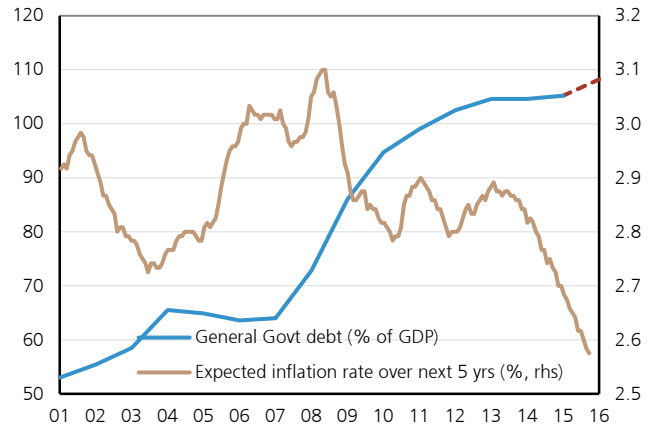
The first is higher public debt creating inflation through creating too much money. Many have been surprised that despite public debt rising in the context of central banks buying government paper, inflation has not risen. However, it is useful to remind ourselves that this is only happening in the context of much lower growth and with the private sector, especially financials, retrenching. As this happens, and businesses feel too uncertain to invest, base money growth isn't translating into broad money growth. Higher public debt driven inflation can be a risk for the

No inflation today despite higher public debt

[3] The Demographics transition: Three centuries of Fundamental Change Ronald Lee (2003)
[4] Bank of England: Secular drivers of the global real interest rate
[5] Labauch argued in 2003 that a 1pc increase in public debt would lead to an increase of 25 bps in long term rates while Enger and Hubbard argued a much smaller hit of 2 bps from the same increase in public debt. Nonetheless, pre-crisis consensus has been that high public debt does lead to higher inflation and rates, especially if financed by government purchases.

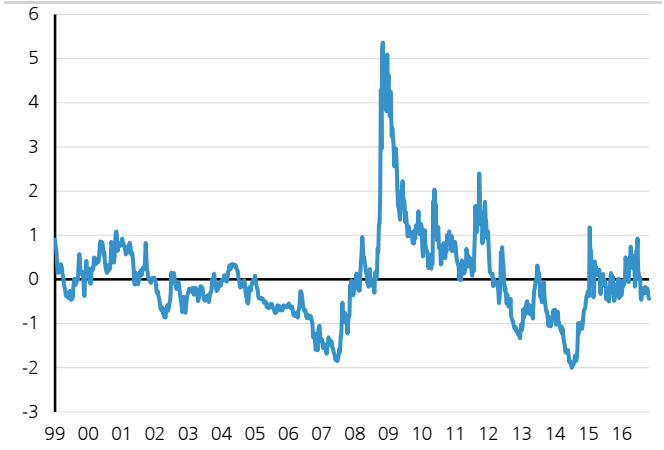
future, but today if central banks lose credibility, it will likely only be so because inflation expectations of economic agents continue to be too low despite monetary policy's best efforts (Figure 12).

Figure 12: US public debt and University of Michigan 5-10y ahead inflation expectations



Source: Haver, UBS estimates

Figure 13: First principal component of 3m implied volatility across developed market FX crosses



Source: Bloomberg, UBS estimates

No capital flight either, and currency volatility remains low

High currency volatility and capital flight is another channel through which high public debt can lead to higher interest rates. The risk of capital flight and debasement of the currency are both linked to the first point - economic agents losing faith in the central bank and the Treasury's ability to keep inflation low. All the forces mentioned earlier in this chapter will, we believe, strongly counteract any panic over higher inflation. Also, as we will explain shortly, portfolio capital flows remain well behaved in the developed world. Currency volatility is at or below median levels of the last 15 years for most major crosses (Figure 13).

Weak financials can impact sovereign but there has been active deleveraging here

The third route through which high public debt can drive rates is higher credit risk due to an intimate relationship of the sovereign with weak corporates, and, more importantly, with financials. This was the reason sovereign debt of peripheral Europe countries came under pressure in 2011. Since then, most major financials in the US and Europe have de-levered aggressively. Confidence is fragile and it would be naïve to extrapolate current low rate levels even as public debt rises. Equally though, it is important to understand the root cause of high public debt. Rates may not rise in countries where low growth is the main driver, and may be more vulnerable in countries where weak growth has only exacerbated fiscal balances which were already weak due to irresponsible spending. We'd put most of the developed economies in the former category today.

Higher public debt, a corollary of weaker globalisation can impact rates in emerging markets more aggressively

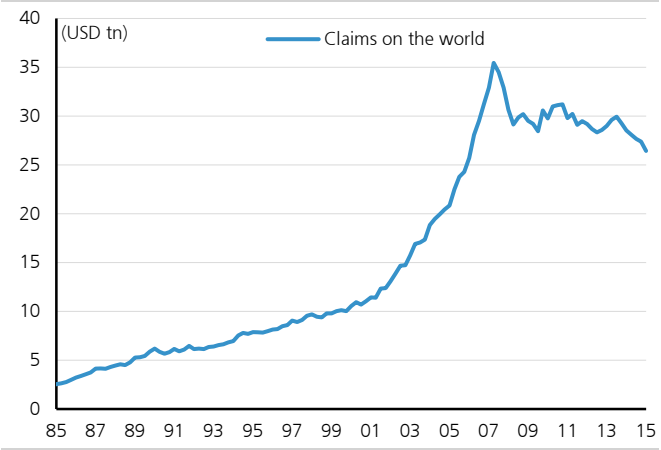
We think EM credit spreads are more vulnerable to high public debt through the 3 channels noted above[6]. Levels of public debt here are low, but the trends are quite worrying (See Globalisation exacerbated inequality). Many governments and central banks here don't have the inflation credibility that developed markets policy makers do. The slope is made more slippery by the fact that there are typically closer links between large corporates and/or financials and EM governments, making for a greater risk of contagion across the economy when one sector is weak. Public confidence typically gets compromised at much lower levels of public debt in emerging markets than in developed markets.

[6] See also IMF working paper 'Public debt in advanced economies and its spillover effects on long term yields' by Alper and Forni, August 2011

Can rates rise as capital turns more local?

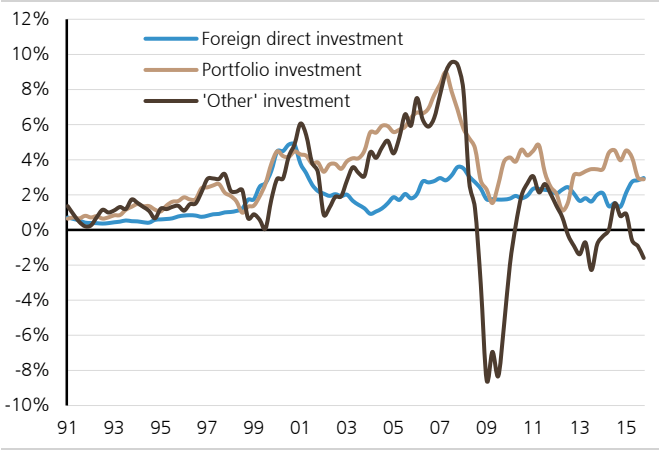
What about cross border capital flows being shut down in the response against globalisation? Won't that make bond markets more parochial, pushing up the cost of capital? Won't China sell all US Treasuries if trade tensions ratchet up? Haven't we ourselves argued that financial globalisation, being the reflection of trade globalisation, has also slowed down?

Figure 14: Cross border bank lending



Source: BIS Locational Banking Statistics, Haver, UBS

Figure 15: DM portfolio inflows (% GDP, 4q rolling)



Source: IMF, Haver, UBS

As noted in detail in The What, Why & So-What of Globalisation – I. Separating myth from reality, it is really one type of financial flows that has really collapsed – bank lending from DM banks to DM banks (Figure 14). Portfolio flows and FDI flows are largely stable and have seen little de-globalisation (Figure 15). This aspect has been surprising for some observers like Joseph Stiglitz, who note that typically short term capital flows are the first thing that gets shut down post a major economic shock. Since the 2008 crisis, however, trade protectionism has risen somewhat without any restriction whatsoever on capital flows. As such, we see few signs of portfolio capital becoming more parochial today, and don't hold this as our base case thesis for the future.

We see few signs of portfolio capital becoming more parochial today, and don't hold this as our base case thesis for the future.

3. Slower globalisation & equities: A macro mountain to climb, but some inviting micro paths along the way

- *Being more domestic, and with a preponderance of services companies, US equities stand out as the clear relative winner in an environment of slowing globalisation. Consumer Discretionary, Health Care and Technology should provide decent protection from the dynamics of subdued trade. We lay out our most and least preferred stocks in a UBS Tactical Q-Trade: US released with this document.*
- *Being more open, Europe trades more in line with emerging markets than the US. As with EM too, the variance of valuation within Europe is high, and is already pricing in weak trade to a certain degree.*
- *Amidst weak exports, it will be difficult for EM to outperform DM on a sustained basis. However, the EM benchmark, particularly Asia ex Japan, has changed character, and is no longer only an old economy bet. We separate EM's winners and losers in an UBS Tactical Q-Trade: EM.*
- *Weak top-line growth will likely plague both EM and DM. However, currency weakness and a more volatile cost of equity further down the road will likely impact EM more significantly.*

Figure 16: Assessing sensitivity to trade: a simple revenue growth model for EM and DM

	EM	Trade Growth		
		15% down	No change	15% up
Commodity Prices	15% down	-16.12	-4.98	6.15
	No change	-10.82	0.32	11.45
	15% up	-5.52	5.62	16.75

	DM	Trade Growth		
		15% down	No change	15% up
Commodity Prices	15% down	-10.74	-3.13	4.47
	No change	-8.52	-0.92	6.69
	15% up	-6.31	1.30	8.91

Source: Haver, IBES, UBS

Equity investing 101: EM revenues are more sensitive to trade

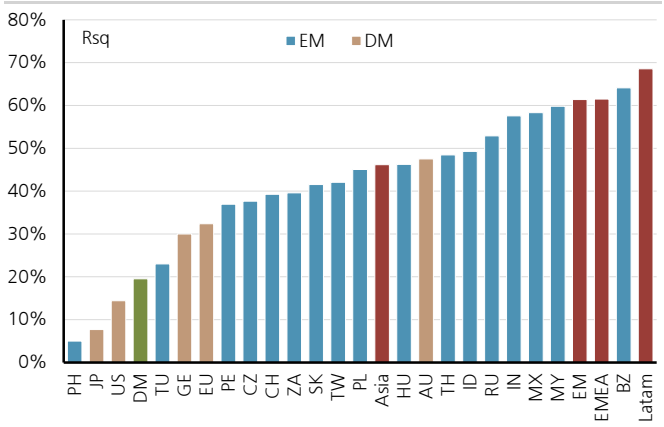
We've already noted in Big Macro 06: The What, Why & So-What of Globalisation – I. Separating myth from reality that in a world of slowing globalisation, the hit to trend growth would be more pronounced in EM than in DM. But rather than just model a GDP hit, it is more informative to assess the impact on DM and EM revenue growth of different growth rates of world trade and commodity prices.[7] It is no surprise that EM revenues are more sensitive than DM to changes in global trade/commodity prices.

[7] These results are based on regressions that control for a liquidity proxy

$$\text{Sales} = c + \beta_1 \text{EXIP}(-6) + \beta_2 M1(-6) + \beta_3 CRB$$

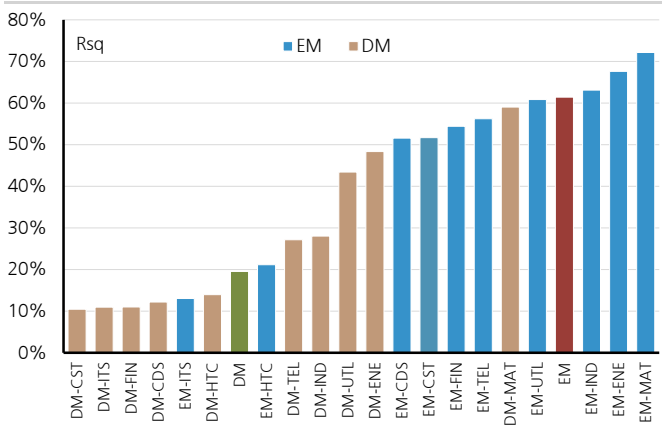
Where EXIP (Trade growth) is a linear combination of exports and industrial output growth. M1 is the real M1 money supply growth. Both EXIP and real M1 are given a 6 months lag. CRB is the commodity Index.

Figure 17: Goodness of fit (Rsq) of a regression of country or regional performance on trade, controlling for domestic growth and liquidity[8]



Source: DataStream, UBS. Data is since Mar-2003 excl. crisis period (Jun-2008 to Dec-2010)

Figure 18: Goodness of fit (Rsq) of a regression of regional sectors' performance on trade, controlling for domestic growth and liquidity



Source: DataStream, UBS. Data is since Mar-2003 excl. crisis period (Jun-2008 to Dec-2010)

This lower sensitivity of DM equity markets also comes across in the market performance of different countries and regions relative to shifts in global trade (Figure 17). Returns in US and Japan seem least closely associated with global trade while LatAm and EMEA returns have been most closely linked[9].

When we break this down to the sector level (Figure 18), it is interesting that, while the sensitivity of EM cyclical sectors is the highest, the performance of even some of the more defensive sectors in EM is more closely tied to global trade than some of the more cyclical sectors in DM.

Even the performance for some EM defensive sectors is more closely associated with trade than with the cyclical sectors of DM

US: A clear relative winner amidst slowing globalisation

The impact of slowing globalization on US equities is likely to be more moderate than the rest of the developed world and, certainly, than emerging markets in general. The composition of the US equity market – using the S&P 500 as a proxy – is more of a "closed" market with a relatively higher degree of leverage to the US economy and consumer, and is also significantly more services-focused. Despite the fact that on a capitalisation basis there appears to be a near even split between domestic-focused companies and exporters, as well as goods manufacturers and service-oriented companies, the revenue weighted figures paint a slightly different picture. On a revenue basis, nearly 70% of the S&P 500's revenues are sourced domestically, with a 60-40 split between services and goods.

The US equity market is more domestically focussed and dominated by service oriented companies. It is in a 'relatively' better place to withstand a globalisation losing dynamism

[8] Goodness of fit of the following regression

$$\text{MSCI Index Returns (QoQ)} = c + \beta_1 \text{EXIP} + \beta_2 \text{M1}$$

Where EXIP is a linear combination of exports (with 2 quarters lead) and industrial output growth. M1 is the M1 money supply growth

[9] Here we are measuring trade in value terms, so commodity price movements play a big role in how trade moves

Figure 19: Breakdown by index weighting – Goods / Services / Domestic / Exporter

Sector	Goods	Services	Exporter	Domestic	Goods Exporter	Goods Domestic	Services Exporter	Services Domestic
Energy	80.3%	19.7%	68.1%	31.9%	54.8%	25.5%	13.3%	6.4%
Materials	94.2%	5.8%	81.1%	18.9%	75.3%	18.9%	5.8%	0.0%
Consumer Discretionary	18.1%	81.9%	22.5%	77.5%	8.9%	9.2%	13.6%	68.3%
Consumer Staples	78.6%	21.4%	54.4%	45.6%	54.4%	24.2%	0.0%	21.4%
Industrials	47.5%	52.5%	50.3%	49.7%	32.0%	15.5%	18.2%	34.3%
Financials	0.0%	100.0%	25.6%	74.4%	0.0%	0.0%	25.6%	74.4%
Real Estate	4.3%	95.7%	6.1%	93.9%	0.0%	4.3%	6.1%	89.6%
Health Care	83.2%	16.8%	58.7%	41.3%	58.7%	24.5%	0.0%	16.8%
Information Technology	47.9%	52.1%	91.4%	8.6%	46.3%	1.6%	45.0%	7.1%
Telecommunication Services	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
Utilities	0.0%	100.0%	1.3%	98.7%	0.0%	0.0%	1.3%	98.7%
Total	**45.6%**	**54.4%**	**52.0%**	**48.0%**	**34.1%**	**11.4%**	**17.8%**	**36.6%**

Source: FactSet, Bloomberg, UBS

As a result, many of the non-cyclical (i.e. structural) drivers behind the slowdown in globalization we've previously identified (See The What, Why & So-What of Globalisation – II. Cyclical or Structural?) are unlikely to serve as major headwinds to US equities. For example:

(1) **The changing level and texture of growth in China:** The impact to US equities is fairly limited, as 11% of sales are sourced from Asia. China in particular, accounts for less than 5% of overall sales.

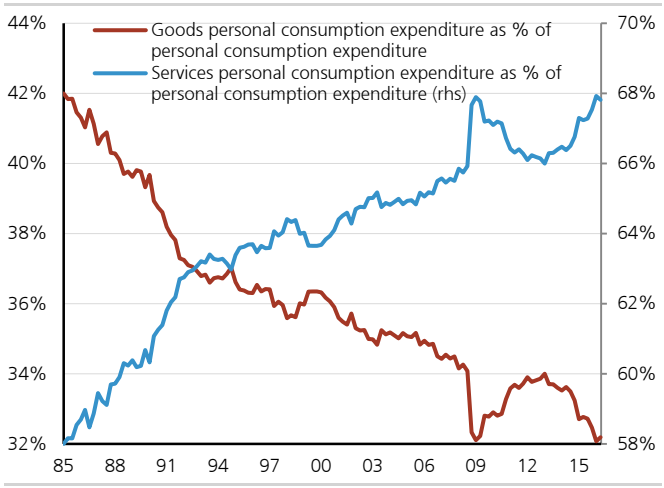
(2) **The shrinking of global value chains:** While this points to a continued slowdown in capital expenditures given continued high levels of economic policy uncertainty, higher levels of industry concentration and rapid technological change, the relatively higher concentration of services is a mitigating factor. Value chains were largely a goods trade phenomenon.

(3) **The shift from trade liberalism to protectionism:** A higher concentration of domestically-exposed companies limits the potential impact of further protectionism. And yet, while a trend towards greater protectionism could modestly exacerbate the move towards lower trend growth (Big Macro 04: Secular stagnation and equities; the new normal), the balance sheet flexibility enjoyed by US corporates, particularly large caps, is likely to remain supportive of share prices.

(4) **The 'de-materialisation' of the economy: the move from stuff to fluff:** US equities are likely to derive a net benefit from a continued trend away from goods given the relatively high services exposure and the composition of the broader economy (Figure 20 and Figure 21).

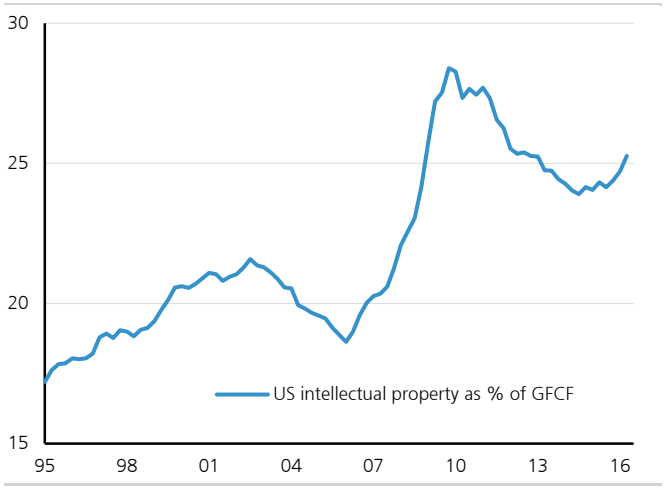
(5) **Control of the cost of equity:** As noted earlier in this document, weakening globalisation and growth is only going to mean low and stable risk free rate, keeping the discount rate from disrupting valuations for large US companies, which have strong balance sheets. This is much better in comparison with some weaker emerging markets where not only has the private sector become much more levered, but also where the sovereign yield curve, which defines the funding cost for companies, can become much more unstable.

Figure 20: US services consumption as a proportion of total consumption



Source: Haver, UBS

Figure 21: Investment in services rising : US investment in intellectual products as a % of total fixed investment



Source: Haver, UBS

So what is the impact on S&P 500 revenues?

To quantify this impact, we stressed the primary drivers of revenue growth in our top-down model for S&P 500 earnings, namely personal consumer expenditures and private, non-residential fixed investment (i.e. business fixed spending), in line with the scenario in which protectionism does not reverse and trade growth stays very weak. The pessimistic scenario, which assumes PCE growth at 3.5% (compared to our base case of 4.7%) and business fixed investment growth at 3.5% (6% base case) takes down our earnings growth 2.9%, as against our current base case of 5.9%.

A risk case scenario where protectionism continues to rise, and investment fails to recover will see US earnings growth at just under 3%, as against our base case of 5.9%.

Winners and Losers

Given the composition of the US equity market and the relatively high level of exposure to both the domestic market and services industry, the sectors most likely to benefit from a continued slowdown in global trade are Consumer Discretionary, Technology and Health Care, all US Equity Strategy overweight sectors. While Technology is reasonably fairly valued on an historical basis, the ample balance sheet flexibility, attractive growth profile, and propensity to lead late cycle, provide ample support for the sector (see Sector Selector: Technology). Health Care, on the other hand, continues to trade near historically low levels given increased political scrutiny surrounding the US Presidential Election. The combination of favourable demographic tailwinds longer term, balance sheet flexibility and historically low valuations (see Health Care: Brighter Prognosis Ahead?) are not exposed to the trend of muted globalization; the high level of domestic exposure and service-oriented nature of the sector is likely to be rewarded.

US Consumer Discretionary, Healthcare and Technology are the clear relative winners.

At the single stock level, we've identified two lists of stocks investors should focus on in the case of a continued trend towards slower global trade (see UBS Tactical Q-Trade: US). The first list highlights stocks that would be positively and is comprised of UBS buy-rated stocks with an above-average quality score (on a quantitative basis – see Investing in Quality) that have greater than 70% of the revenues derived domestically (i.e. 'higher quality, domestic businesses"). The second list contains stocks that are likely to be negatively impacted and is comprised of UBS neutral/sell-rated stocks with a below-average quality score that have greater than 30% of their revenues sourced derived from outside the US

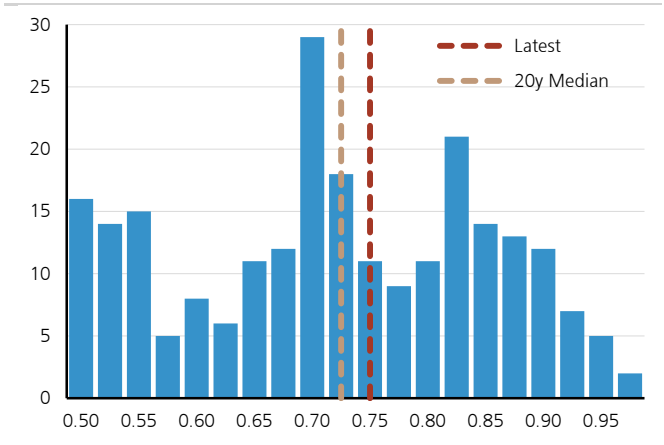
Focussing on high and improving quality stocks of services businesses with the bulk of revenues domestically sourced.

EM: The steepest challenge. Is it all in the price?

The relative vulnerability of EM does make intuitive sense, but is this not all priced in by now? As it happens, EM valuations are 0.4 standard deviations higher than its 20y mean on an fPE basis. That may not be a convincing argument at a time when most markets are rich. So, we tried to assess where we are today in a distribution of EM valuations relative to DM in the context of a similar distribution of EM growth differentials against DM.

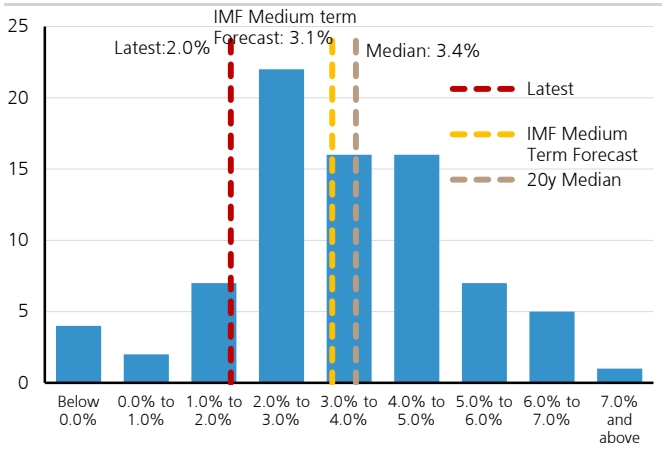
Is weak growth priced in- EM valuation support is questionable on both absolute and relative bases.

Figure 22: 20y distribution of EM fP/E relative to DM fP/E



Source: IBES,UBS

Figure 23: 20y distribution of (MSCI) EM growth spread against DM

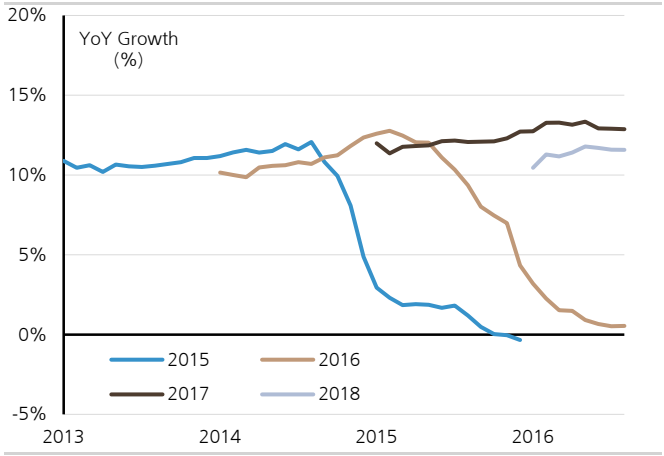


Source: Haver, MSCI, UBS

Figure 22 and Figure 23 suggest EM valuations are not cheap relative to DM even when seen in context of growth differentials forecast by the IMF, which believes world trade and EM growth will rebound noticeably. It must also be added that the fP/E itself is based on earnings expectations which remain quite optimistic. Two-years out, EPS growth expectations in EM are 13.5% (against a 25-year mean of 8%) (Figure 25). We can back out what kind of trade and GDP growth this would be consistent with. Assuming commodity prices rise by 5% p.a. and there is no retrenchment in liquidity, these implied long term EPS growth rates are consistent with about 12-13% trade growth, and about 6-6.5% real growth. In 2016 (MSCI weighted EM) growth should be 3.8%. The new reality is not priced in.

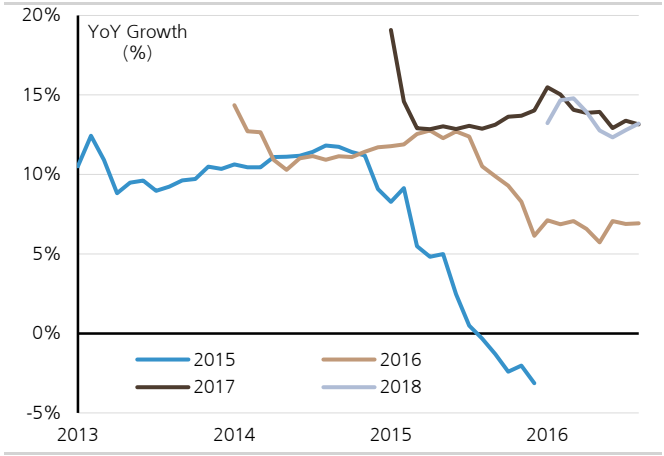
Earnings growth expectations in EM are consistent with a 12-13% nominal trade growth and about 6% real growth in EM. This year (MSCI wted) EM growth will be around 3.8%

Figure 24: Earnings expectations developed markets



Source: IBES, UBS

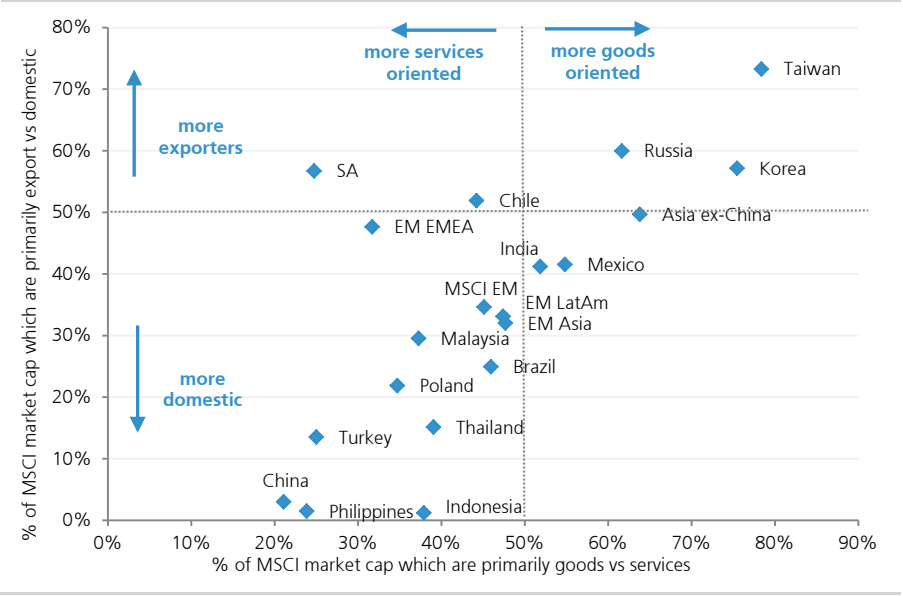
Figure 25: Earnings expectations emerging markets



Source: IBES, UBS

As with our framework for the US, we asked our EM analysts to also help us to divide EM universe into goods v. services producers (services are doing much better than goods exports) and exporters v. domestic producers[10]. This created four sub-groups: goods/exporters, goods/domestics, services/exporters and services/domestics (Figure 26) for the 17 biggest markets in MSCI GEMs on a market-cap weighted basis. Markets with high weights in goods/exporters (top-right) are Taiwan, Korea and Russia; those with high weights in services/domestics (bottom-left) include the ASEAN, China, Turkey, and to a lesser extent India.

Figure 26: MSCI EM: Market weights - Goods vs Services, Exporters vs Domestics



Source: Haver, Datastream, UBS

The dilemma in EM is that to a large extent the market has already expressed these relative country views. It must be admitted that while EM remains expensive at an aggregate market level, when one looks at countries, the high variance does suggest that cheaper countries are pricing in some bad news. This will present opportunities wherein investors avoiding weak sectors will keep clear of certain countries, presenting good opportunities in solid sectors the same countries which have cheapened as a result of popular country allocation. This is why our Asia strategists Niall Macleod and Matt Gilman currently like Korea and Taiwan.

EM investors have already been long the more domestic countries, and this has meant valuations have moved

However, our Asia strategists also point out that while valuations in the more export oriented countries and commodity oriented sectors are cheap, structurally speaking, if globalisation doesn't pick up meaningfully, we would expect these valuations to remain cheap. Already with the strong fixed income and weak USD driven rally this year deep cyclicals in EM have gained considerably, and now may be expensive.

But the theme of the rise of the EM consumer and services sector has legs. We identify the single name opportunities in the Emerging Markets UBS Tactical Q-Trade: EM released with this document

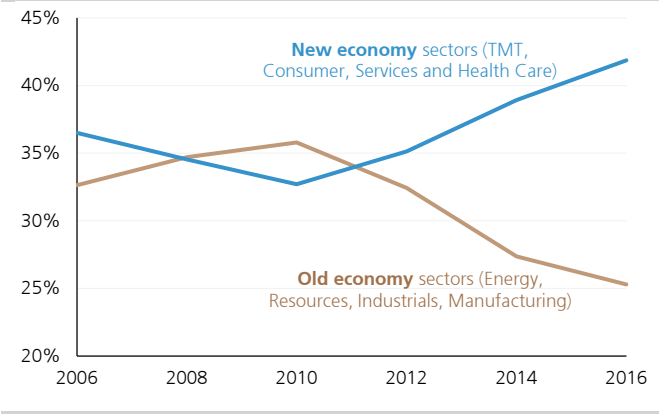
Rather than make sweeping country and sector allocation statements then, it would make sense to pursue the theme of domestic and good quality services exporters sector at a micro level. In the UBS Tactical Q-Trade: EM we are releasing with this document, we identify key single stock opportunities in this transition.

10 We define an 'exporter' as a company that generates 40% or more of its revenues from overseas.

Our China A-share strategist, Gao Ting, has highlighted shifts in consumption dynamics as one of his key themes (click here). He expects rising disposable income, urbanisation and demographic trends to support more discretionary and service consumption. Areas such as health care, insurance, education, entertainment, domestic and international travel, and online and mobile shopping are expected to continue to see fast growth. Our research team have written a number of reports on potential beneficiaries from the growth of China outbound travel, including boosting tourism in Japan, Korea and Australia and supporting cruise line operators (see link), airlines, airports, hotels, casinos, and travel agencies (click here and here).

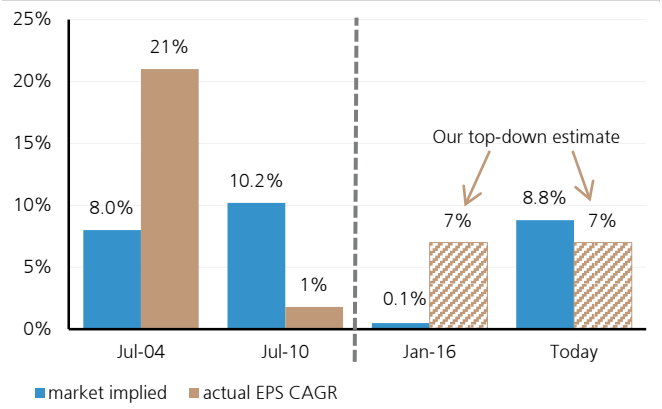
The new economy has become a more important part of Asia ex Japan index.

Figure 27: New vs. Old economy sectors as weight of MSCI Asia ex Japan



Source: Haver, UBS. Old economy = primary and secondary industry. New economy = tertiary industry (services)

Figure 28: Implied future growth rates for MSCI Asia ex Japan (using residual income model)



Source: Datastream, UBS

If global investment picks up and protectionism reverses, trade should grow around 3.75-4.0% per year in volume terms in the coming 5 years. This is consistent with our expectations for Asian earnings to grow around 7% per year in nominal terms over a similar period (click here). In aggregate Asian (and EM) equities today look a little expensive – our residual income model suggests almost 9% EPS growth is implied at current valuations (Figure 28).

Asia ex Japan equities look modestly expensive as service driven sectors have re-rated

Europe suffers EM's symptoms, but there are differences

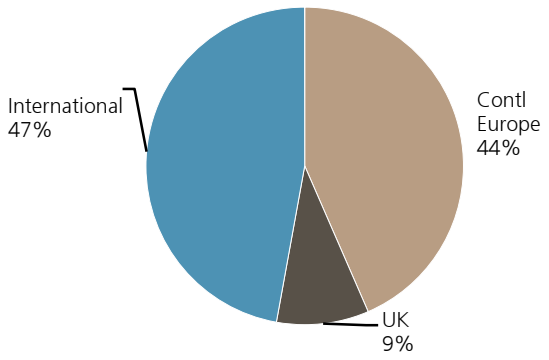
Unlike the US, and similar to EM, the European stock market has a very high international exposure with close to half of the sales of listed stocks going outside of Europe (Figure 29). This international exposure contributed to Europe's outperformance globally during the EM boom of 2003 to 2006. Conversely in a scenario of a slowdown in international trade European equities have suffered. The co-movement in EM and Europe relative over the years tells an interesting story (Figure 31).

Europe has high international exposure, similar to EM, with UK and Switzerland particularly high on international exposure

Within Europe the most exposed stock markets are the non-Eurozone countries of Switzerland, UK and Sweden, all of which have between 51% and 61% of their sales outside of Europe (Figure 30). Any decline in international trade could have significant consequences for these indices. Across sectors the ones which depend the most on international trade are Technology (Semiconductors and Hardware), Consumer staples and Pharmaceuticals as well as Mining and Construction. On the other extreme the more domestic are Financials, Retail, Utilities and Telecoms.

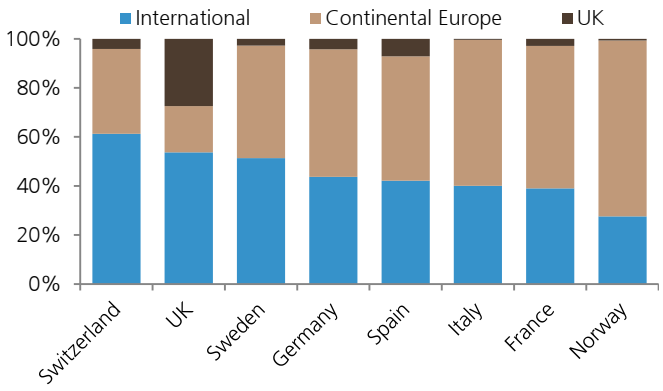
Unlike the US where they are more domestic, Europe's technology, staples and pharma sectors are quite exposed internationally

Figure 29: European sales exposure



Source: UBS European Equity Strategy

Figure 30: Sales exposure by country

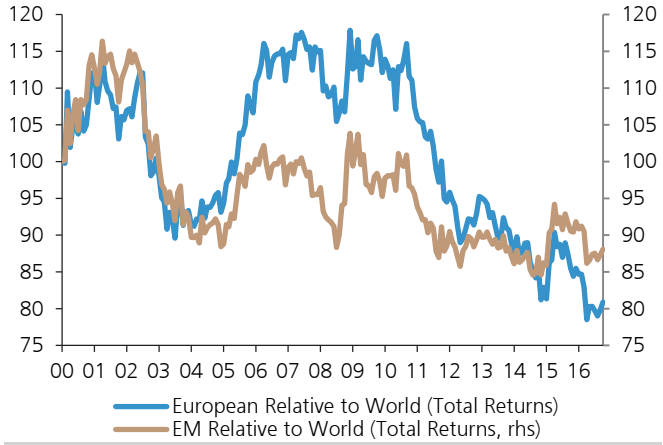


Source: UBS European Equity Strategy

In the here and now international exposure for European companies is exactly what's working out well. While the EPS momentum for domestics was largely positive over the last years; since May their earnings have been downgraded relative to international stocks and both US and EM exposed companies showed improvement in earnings momentum (Figure 32).

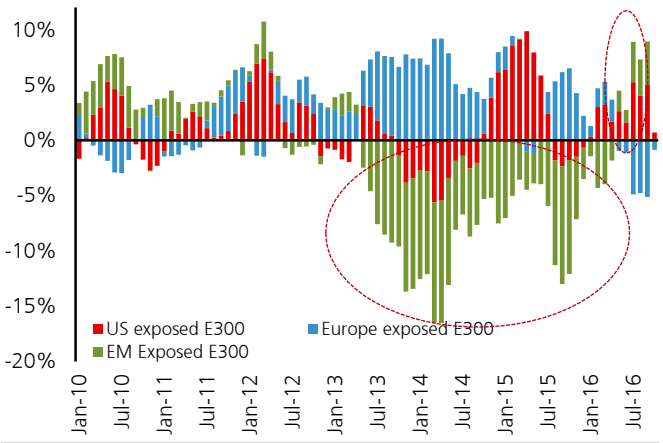
Today international exposure, particularly EM exposure is working quite well for Europe, but this may not be the structural trend.

Figure 31: European and EM equities move together



Source: MSCI, Datastream, UBS

Figure 32: 3m Relative EPS momentum - regionally exposed European stocks



Source: IBES, Datastream, UBS

However, in the long haul, if trade is weak, Europe will hurt more certainly compared to the US. European industrials may be hit particularly hard if China continues to onshore its production and its imports for construction and transport machinery slows.

Although Europe will face similar revenue challenges as EM if trade volumes remain weak, there are two key differences, which must be borne in mind over the medium term. We deal with these issues in different sections in this report

Revenue trajectory aside, there are other important differences between EM and developed market stocks in a world where trade weakness is prolonged

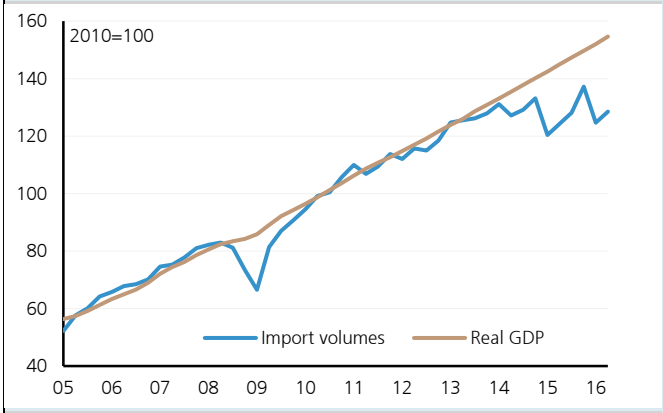
1) In a world of weak growth in trade volumes EM currencies are likely to create negative alpha for global investors. See Currencies – no mean reversion aversion

2) EM companies can suffer a much more volatile cost of capital than that of developed markets, including European firms. For more, see Globalisation exacerbated inequality. Its slowdown may bring bigger problems for some

Box: Winners and losers from China's on-shoring

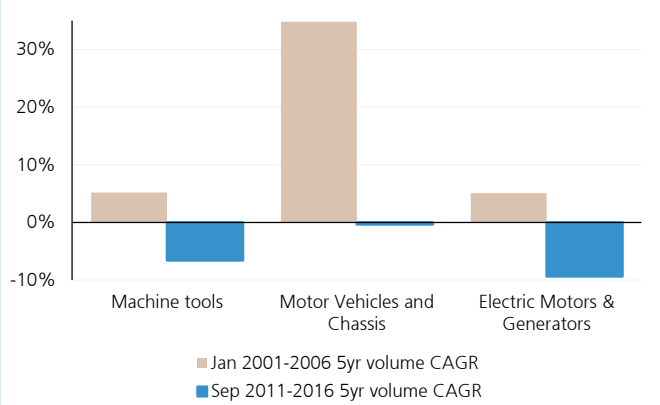
As China has moved up the value chain, from assembler (and component importer) to manufacturer, global trade has been hit. These trends are most evident in the slowdown of imports of Machinery and Transport Equipment. Having comprised almost half of China's total imports in 2002, this segment fell to ~35% in recent years

Figure 33: China real GDP vs import volumes



Source: Haver, UBS

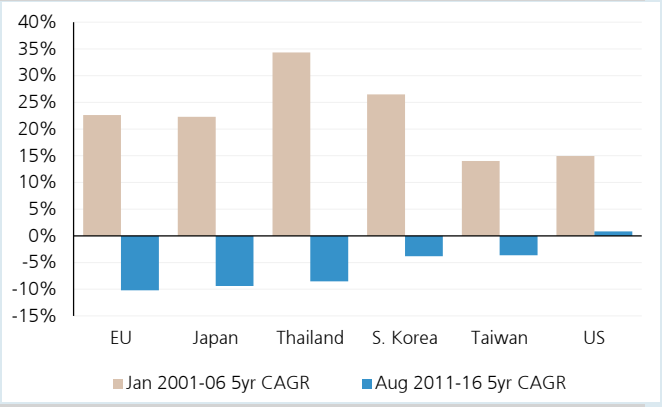
Figure 34: Import volumes are down sharply in some of the industrial sectors



Source: CEIC, UBS

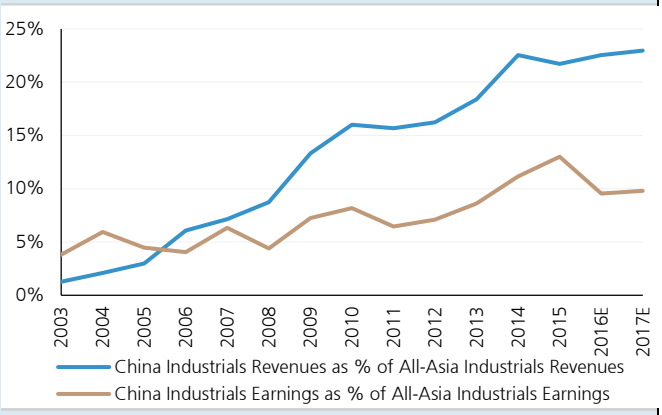
The growth of China's own industrial expertise has come at the expense of the major industrial equipment providers. North Asia (Japan, Korea and Taiwan) and Europe (e.g. Germany, Sweden) have been most negatively impacted and we have seen significant fall in machinery and equipment exports from these countries to China. Our industrials analysts have highlighted increasingly tough competition in the Chinese elevator, escalator and wind turbine space as China industrials have become a much larger part of the sector in Asia.

Figure 35: China imports of machinery and equipment from major supplier countries



Source: Haver, UBS

Figure 36: China industrials revenues and earnings as % of all Asia industrials



Source: IBES, MSCI, Thomson Datastream, UBS

As growth at home slows, these Chinese companies are now looking to grow overseas. Industrials is one area where overseas expansion has been most evident. Our industrials analysts expect Chinese Original Equipment Manufacturers (OEMs) to continue to take market share at the expense of the big industrial exporters in Europe, Japan, Korea, Taiwan and also the US. In a recent Q-series by our Global Industrials team (see here), our analysts estimate that if Chinese OEMs were able to gain 1% of share per year outside of China over the next 10 years, the Western profit pool could decline by mid-single percent a year over that period.

4. Currencies – Mean reversion aversion

- *Exports have always responded much more to changes in global demand than changes in currencies. Post-crisis, however, as globalisation has slowed, income elasticities have fallen strongly – a dynamic we think most mean-reversion based strategies fail to account for.*
- *The USD's safe haven characteristics in an environment of slowing globalisation are likely to be less robust than meets the eye, especially against DM currencies, as US rates may struggle to rise more than their forwards. Despite low US rates, EM currencies will likely weaken in trade-weighted terms.*
- *Global trade, productivity growth and FDI flows have been closely interconnected. We explain how globalisation's plateau risks undermining the structural currency call in EM through the lens of the Balassa-Samuelson framework. A relatively high dependence on goods exports and global supply chains, and a comparative advantage in goods rather than services will likely also weigh on EM FX over time.*

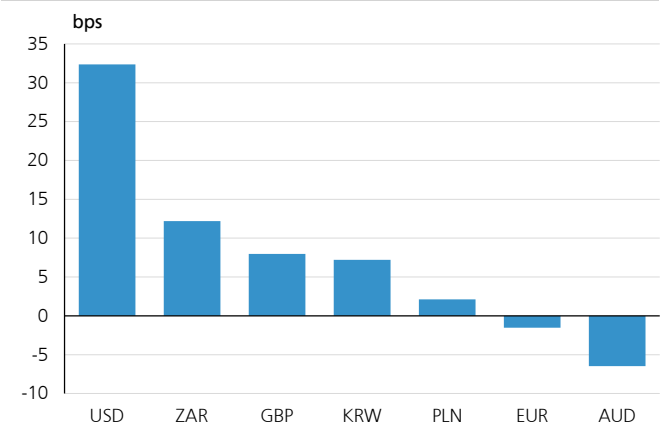
How will slower globalisation impact the USD?

Many investors assume that a tilt towards growing trade protectionism will benefit the USD given a) the dollar's traditional trait as a safe-haven currency and b) lower US trade/GDP ratio compared to most major economies. However, to the extent that slower global growth (including in the US) is contributing to the slowdown in trade, we believe the impact on the dollar can be less, or potentially even of a different sign, than often expected.

The US curve is the steepest in the majors and, as we have seen often over the past 18 months, global risk events in which markets have flattened all yield curves have tended to be negative, not positive, for the dollar. August 2015 and December 2015/January 2016 are good examples, as market fears regarding Chinese growth and currency policy saw the dollar fall versus the euro. With the Fed being the only major central bank raising rates, the dollar arguably has the most room for tightening to be priced out if globalisation exerts a negative pull on growth, lowering US rate differentials versus other currencies (Figure 37).

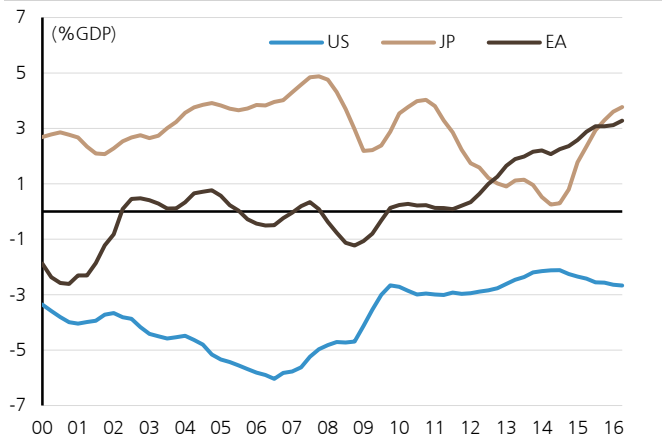
The USD's safe haven characteristics amid global growth shocks have been weak over the past 18 months

Figure 37: Monetary policy expectations over the next 12m



Source: Bloomberg, UBS estimates

Figure 38: US vs. Euro, Japan current account to GDP ratios



Source: Haver, UBS estimates

As such, the dollar may not necessarily strengthen if globalisation continues to slow, especially to the extent that this is being driven primarily by weaker global growth rather than trade protectionism. This is particularly likely to be true for the USD vs. the EUR and JPY, both of which are supported by large current account surpluses, and Japan's case, a very large net foreign asset position (Figure 38).

Rate differentials are a large part of the story here

What could cause declining globalization to be more clearly dollar positive against G10 currencies? In the case of the EUR and JPY, if the decline in globalisation were to become inflationary, the US may be more leveraged to a pick-up in global inflation – the Fed has already hiked, and a pick-up in inflation could ratify further moves. In this case, there could be some policy divergence supporting dollar strength versus the euro. That said, we have argued previously that for EUR/USD, unless rate differentials are supported by growth differentials, it will be difficult for the dollar to benefit on a sustained basis versus the euro.[11]

What's the risk case for the USD call?

Overall, we thus see limited scope for the USD to outperform other major currencies in an environment of waning globalisation. EM currencies, on the other hand, look considerably more exposed. We identify four reasons for this below.

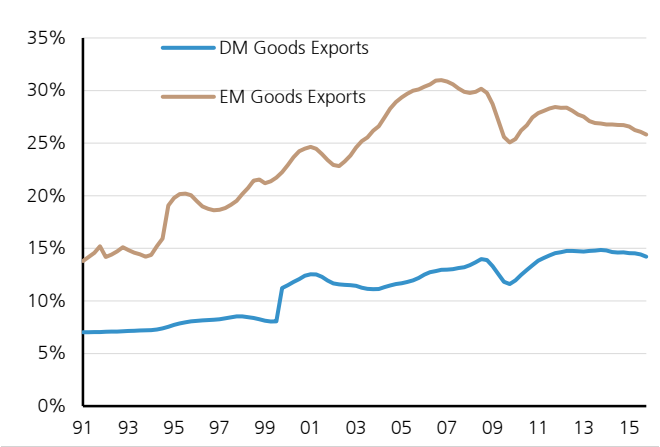
1) Balance of payments structures point to greater EM sensitivity to waning globalisation

Differences in the composition of DM and EM balance of payments will likely shape these regions' sensitivities to slowing growth in global trade. As Figure 39 shows, trade in goods forms a larger share of GDP and current account positions in EM than DM. Goods exports account for roughly 25% of GDP in EM, versus 15% for DM. If global trade in goods stays structurally weak, EM economies will feel the heat to a larger extent.

Weaker trade flows will matter more for EM; trade in goods forms a much higher share of GDP in EM, while DM is typically dominated by capital flows

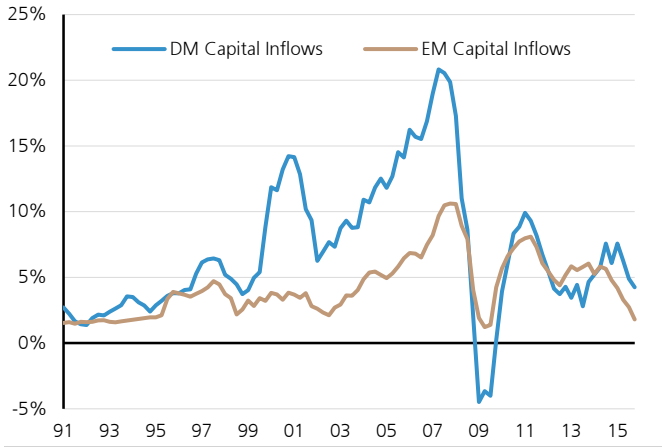
By contrast, capital flows are a more important component for DM balance of payments than EM. As we explored in Part I of this series, gross capital inflows have consistently been larger in G10 than EM, and financial flows show less evidence of de-globalisation than that of goods.

Figure 39: EM vs. DM – goods exports (% GDP)



Source: Haver, UBS estimates. GDP-weighted.

Figure 40: EM vs. DM – capital inflows (% GDP)



Source: Haver, UBS estimates. GDP-weighted.

[11] This may be less of an issue for USD/JPY, where we have noted recently that back-end yield differentials have been a key driver. If inflation stemming from slower trade growth were to widen rate differentials, particularly at the back end, it could benefit USD/JPY.

2) Income elasticity of exports falling; more so in EM

Export growth has always been far more responsive to trading partner GDP growth than fluctuations in the currency markets. In Figure 41 we quantify the income and price elasticity of exports for a broad list of economies pre- and post-crisis. The results show that the income effect has consistently been at least 10 times more powerful.

Export growth is driven far more by changes in global demand than changes in currencies

Figure 41: Results from regressing EM exports growth (% y/y) on REER changes (% y/y) and G4 GDP growth (% y/y)

	Full sample (2000 - 2016Q2)		Post-crisis (2012 - 2016Q2)		Pre-crisis (2000 - 2007)	
	REER	GDP growth	REER	GDP growth	REER	GDP growth
Korea	-0.08	**3.51**	-0.12	-1.76	0.16	**2.95**
Thailand	-0.03	**4.06**	0.23	**-6.06**	**-0.32**	**5.27**
Brazil	**-0.13**	**3.46**	**-0.41**	**4.02**	-0.12	**1.29**
Mexico	0.13	**3.31**	0.01	**5.05**	0.10	**3.89**
South Africa	**-0.09**	**3.18**	0.11	**2.93**	-0.08	**3.00**
Turkey	0.10	**1.53**	**-0.38**	**-5.43**	**0.16**	**2.04**
Singapore	**-0.38**	**3.78**	0.22	**4.58**	**-1.93**	**4.46**
Poland	-0.06	**2.55**	-0.05	**1.37**	-0.16	**3.62**
Taiwan	0.22	**5.19**	-0.27	-4.05	0.44	**3.73**
Malaysia	**-0.57**	**4.07**	-0.10	**4.99**	**-0.93**	**4.27**
Indonesia	-0.19	**3.33**	**-0.40**	**3.87**	**-0.30**	**5.78**
Russia	-0.04	**2.01**	-0.11	-1.23	**-0.37**	**-0.56**
China	**-1.40**	**2.81**	**-0.83**	-2.46	**-0.83**	**4.46**
US	**-0.50**	**2.06**	**-0.46**	0.39	**-0.57**	**4.65**
Japan	-0.07	**5.82**	-0.12	**8.38**	**0.40**	**4.04**
Euro Area	**-0.34**	**3.14**	-0.10	1.30	**-0.43**	**2.19**
Australia	**-0.11**	0.54	0.06	0.70	**-0.23**	**1.04**
EM average	-0.19	3.29	-0.16	0.45	-0.32	3.40
DM average	-0.26	2.89	-0.16	2.69	-0.21	2.98

Source: Haver, UBS. Bolding denotes significance at 90% confidence level. *G4 trading partner share weighted. REER denotes real effective exchange rate. We use a 1-quarter lag for the REER.

Post-crisis, however, as globalisation has slowed, there have been important changes. Price and (especially) income elasticities have become considerably weaker[12]. Indeed, we find that the income elasticity is no longer statistically significant for 40% of the countries analysed. The change has been particularly stark in EM, where the income elasticity of exports has dropped from 3.4 to 0.5, relative to a drop from 3.0 to 2.7 in DM. Put differently, each unit of trading partner GDP growth has been making much fewer demands on EM exporters post-crisis. The changing composition of demand in key global markets that we highlighted in Part II, marked by a greater emphasis on services and growing 'dematerialisation' of goods, is likely a big part of the story here.

Post-crisis, income elasticities have fallen and are no longer statistically significant in several countries. EM is at the forefront of this change.

[12] The circled areas in Figure 41 compare income elasticities in the pre- and post-crisis periods

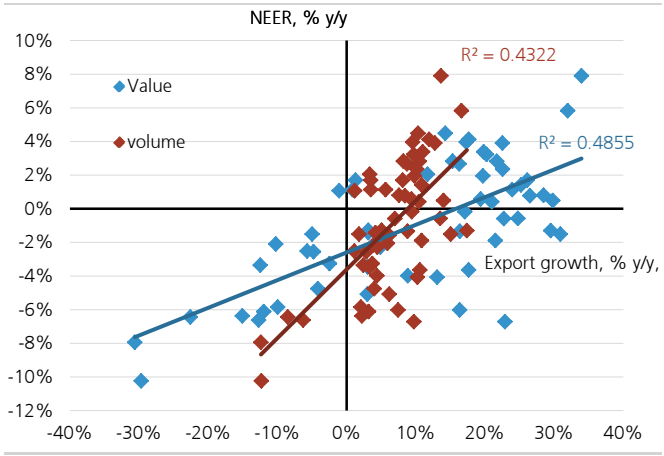
Faced with falling income and price elasticities, FX fair value models based on the concept of mean-reverting real exchange rates will be rendered less useful[13]. Currencies will need to work harder for export growth to be rekindled i.e. by staying lower, for longer. With exports less responsive to global growth, those economies running current account deficits will risk having to keep domestic demand restrained - and thus risk passively eroding fiscal and leverage metrics that influence sovereign credit ratings – to keep external deficits in check. Brazil, South Africa, Russia and Turkey are recent cases in point.

Currencies will need to stay lower for longer to support exports. The trade-off between growth and current accounts will tighten

More broadly, for currencies of the current account surplus economies that make up the bulk of the EM complex, though the risk of a 'sudden' stop in external financing is less relevant, persistent export weakness is still a major headwind. Figure 42 and Figure 43 show that export growth has typically been a much more important driver of EM currencies than delta on the current account[14]. Current account surpluses should help to contain FX volatility, but will likely not counterbalance the depreciation pressures induced by persistent export weakness over the medium term.

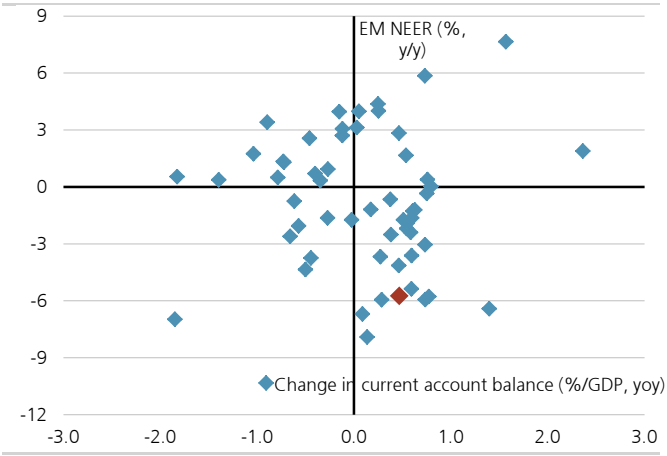
Though most of EM run balanced/surplus current accounts, exports will likely still determine the direction of travel.

Figure 42: EM NEER performance vs. export growth



Source: Haver, UBS; Quarterly data since 2002; Latest: June 2016

Figure 43: EM NEER performance vs. current account delta



Source: Haver, UBS; Quarterly data since 2002; Latest: March 2016

3) Weaker trade to impede productivity, investment growth in EM. Why does this matter?

International economists widely agree that trade growth positively influences productivity growth, through three main channels:

3 ways trade growth positively influences productivity growth

1) Increasing competition, which is an important driver of efficiency gains;

2) Accelerating the transfer of foreign technologies and inputs that expand productive capacity;

[13] We have previously back-tested strategies based on buying (selling) EM currencies trading cheap (expensive) relative to their long run CPI based REERs. Performance was weak.

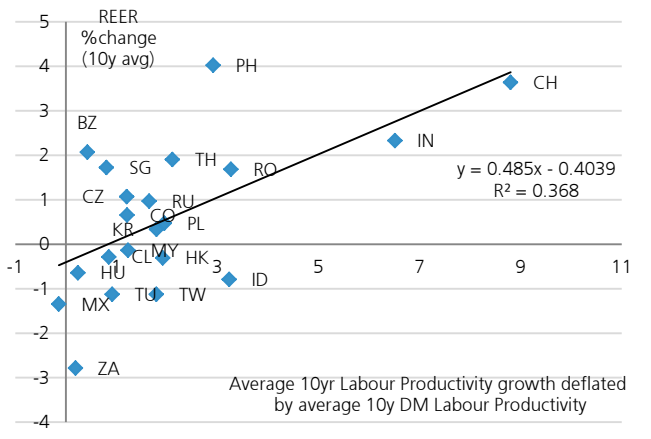
[14] While our research has examined why export volumes are likely to remain weak relative to global GDP growth, a continued (supply-centric) recovery in global commodity prices could feasibly extend into 2017, supporting EM currencies. In our view this would certainly help oil-centric currencies such as the RUB but, as we have noted in earlier research, supply-driven oil price rallies typically do not reflate global assets more broadly. Currencies outside the oil exporting complex would be far less likely to appreciate in such an environment, we think.

3) Encouraging industrial specialisation to maintain comparative trade advantages.[15]

In turn, as we illustrate in the Box overleaf, there is a direct link between tradeables sector productivity growth and the real effective exchange rate over the medium term, as the Balassa-Samuelson theory explains. Supporting this logic, Figure 44 confirms a clear historical co-movement between REER performance and productivity differentials over the past decade. Lower trade and productivity growth is thus a clear risk to the structural currency call in EM[16].

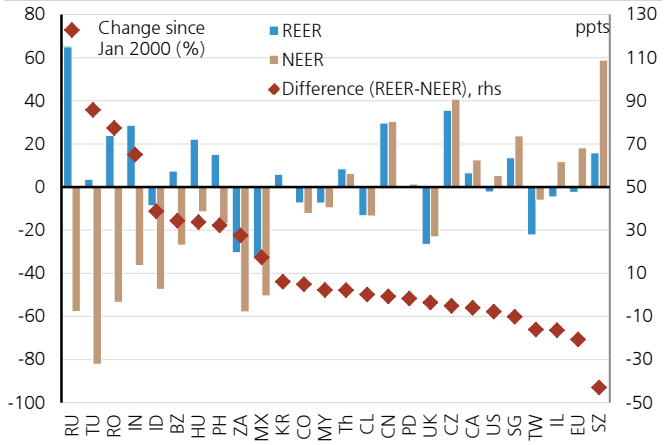
The Balassa-Samuelson effect links REER appreciation directly to tradeable sector productivity growth

Figure 44: EM relative labour productivity growth vs REER performance over the past 10 years



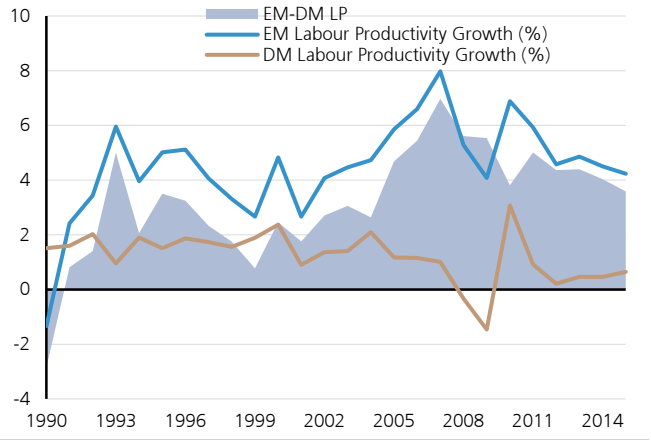
Source: Haver, UBS. DM is a simple average of EU, UK, US and Japan. Annual data from 2005 to 2015.

Figure 45: REER and NEER changes across EM and DM since 2000



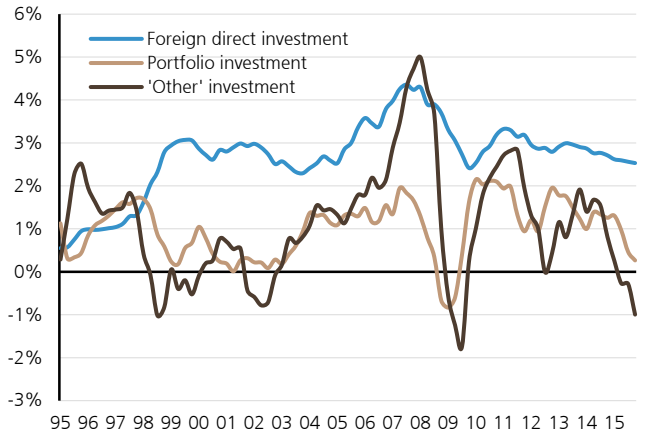
Source: BIS, Haver, UBS. Monthly data from Jan-2000 to Sept 2016.

Figure 46: EM and DM labour productivity growth



Source: Conference Board, IMF, UBS

Figure 47: EM breakdown of capital inflows



Source: Haver, UBS

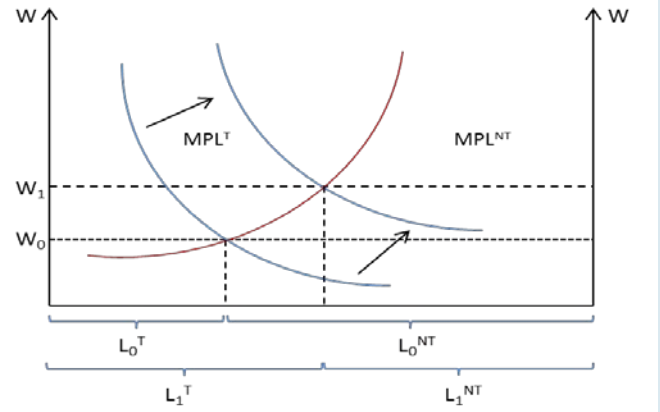
[15] See "How lowering trade barriers can revive global productivity and growth", Norris and Duval, IMF, June 2016 & "Increased Trade: a Key to Improving Productivity", Hufbauer and Lu, PIIE, October 2016. Both papers also highlight the importance of redistributive and labour mobility-enhancing measures to maximise the benefits of higher productivity growth.

[16] While we see the logic of the Balassa-Samuleson theorem, we have long questioned its application for currency investors in practice. While most developed markets tend to experience real FX movements through nominal currency moves that investors can directly benefit from, Figure 45 shows that the experience in EM has tended to been very different. Large parts of EMs have experienced the real FX appreciation expected by the Balassa-Samuelson theory through higher inflation, rather than appreciating nominal exchange rates. What is worrying is that the prospects for REER appreciation become more muted in a world of plateauing globalisation, even if they were hard to profit from in the first place.

Box : Understanding the link between FX and productivity growth: the Balassa-Samuelson model

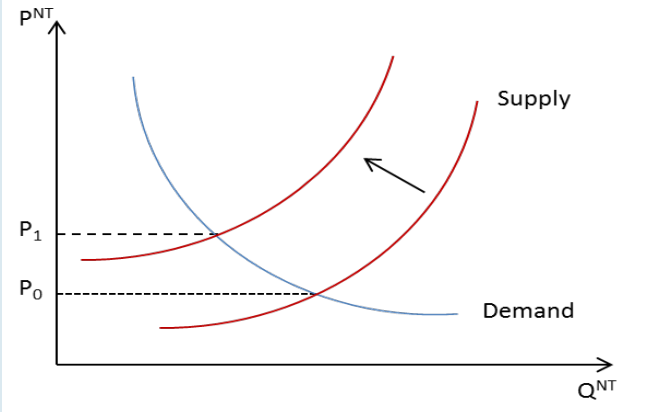
- The Balassa-Samuelson effect is the tendency for real exchange rates (REERs) to appreciate in economies experiencing high tradeables sector productivity growth. While its application to investment strategy has, to us, always been clouded by the fact that most EMs experience REER appreciation through high inflation rather than nominal FX appreciation (Figure 49), the logic that productivity growth is central to medium-term currency trends rests on solid foundations.
- Consider the case of an individual economy, say Mexico, trading freely with the rest of the world. Mexico and the rest of the world each produce two types of products: tradeables e.g. cars and non-tradeables e.g. haircuts. Assume that a) cars produced in Mexico and the rest of the world are perfect substitutes for one another (that the "law of one price" in the tradeables sector holds), b) labour supply within Mexico can move flexibly between the auto and hairdressing sector to arbitrage away wage differentials between these sectors, and c) that any productivity growth differentials between hairdressers in Mexico and the rest of the world are insignificant.
- Under this approach, differentials in the price of Mexican autos relative to the rest of the world are quickly arbitraged away, either as domestic price levels or the nominal exchange rate adjust. It is price growth in the non-tradeable sector that influences the REER over the long run.
- Now consider that a positive productivity shock through technological innovation affects the Mexican automobile sector. Mexican auto workers are now able to produce more cars with the same amount of labour, shown through the upward shift in the marginal product of labour curve in Figure 48. This drives an increase in profits and wages in this sector. Soon, higher wages in the auto sector attract greater numbers of workers away from the non-tradeable sector, in turn exerting upward pressure on the wage levels for hairdressers due to the drop in labour supply in that sector (Figure 49). Rising aggregate price levels across the economy then exert an upward tendency on the Mexican REER. While rising price levels without productivity growth would soon impede Mexico's international competitiveness and eventually depreciate the nominal exchange rate, rising productivity growth in the tradeables sector enables economies to sustain appreciation in the real exchange rates. The degree to which inflation rather than the nominal exchange rate drives REER appreciation is not predicted by the Balassa-Samuelson approach, but likely influenced by the monetary authorities' ability to manage inflation.
- The model makes several assumptions, e.g. perfect labour substitutability between the non-tradeable and tradeable sectors, no material barriers to international trade. However shows that over the long run productivity differentials and REER movement tend to be closely correlated. The slowdown in EM productivity growth currently being seen, and that we think will extend in a world of slower trade growth, implies that the prospects for trend EM REER appreciation are weakening; implying even lower prospects for nominal appreciation.

Figure 48: Positive productivity shock in tradeables raises wage levels, attracts L supply away from non-tradeables



Source: UBS. L = Total Labor Supply (Fixed); L^T=Labor in Non-Tradeable Sector; L^{NT}= Labor in the Non-Tradeable Sector; W = wage; MPL^T = Marginal Productivity of Labor in Tradeables; MPL^{NT} = Marginal Productivity of Labor in Non-Tradeables.

Figure 49: Fall in non-tradeable sector L supply increases wages to restore equality with tradeable sector = higher aggregate price levels, sustained REER appreciation



Source: UBS; P^{NT} = Price of non-tradeables; Q^{NT} = Quantity of non-tradeabales

Another important link between trade growth and EM can be seen from Figure 50. EM exports and investment have typically trended in the same direction over the last 30 years. While correlation does not imply causation, in our view exports are an important channel through which EM financed a secular rise in the investment/GDP ratio (which in turn had lifted trend GDP growth) without racking up large current account deficits.

Export growth has helped finance EM's rapid investment growth over the past two decades

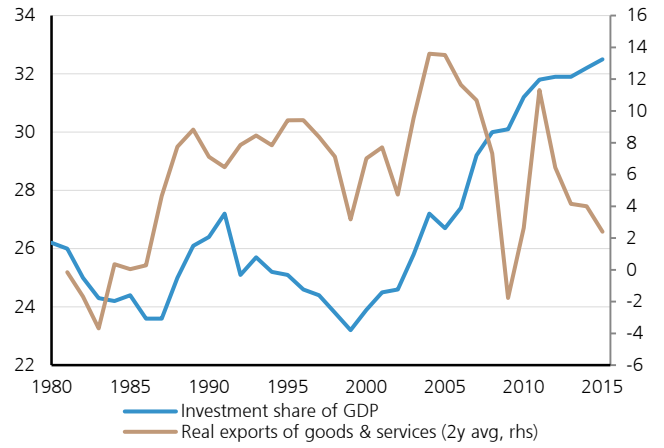
The post-crisis period, where investment has only just begun to slow despite amid anaemic export growth, is rather unusual in this context. We think this reflects the extraordinary surge in Chinese domestic leverage which is less likely to represent a reliable growth model in the years ahead.

What is showing more concrete signs of slowdown today is EM inward FDI. Figure 51 shows that exports, productivity growth and FDI inflows have been closely correlated in EM over the past 25 years. In our view, these dynamics are mutually reinforcing: more productive labour forces typically attract greater amounts of foreign investment, that foreign capital further helps labour productivity and export capacities to expand, which in turn helps finance domestic investment and productivity growth, and so on.

Lower productivity growth will likely accentuate the nascent deceleration in FDI flows into EM

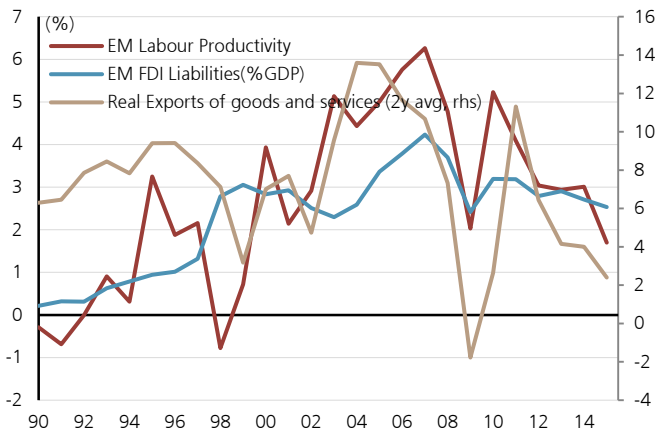
While productivity is highly cyclical and the recent decline in EM productivity growth shouldn't be simply extrapolated forward, a structural trend of slower trade and productivity growth suggests that the recent trend of decelerating FDI flows into EM is unlikely to reverse materially. Given that FDI inflows are typically the least cyclical, most growth-enhancing form of capital inflow, and traditionally have outweighed portfolio and 'other' investment capital in EM, lower FDI flows should further contribute to the theme of currencies drifting weaker in trade-weighted terms.

Figure 50: EM Investment/GDP vs. Export growth (%)



Source: IMF, Haver, UBS. Exports represents Goods and Services Export volumes

Figure 51: EM FDI inflows vs. labour productivity growth



Source: Conference Board, IMF, Haver. FDI data is 12m rolling

4) EM is more exposed to peaking global supply chains

As we noted earlier in this series, while the expansion of global supply chains over the past 20 years flattered the growth of gross global trade volumes, domestic value added content was still the key determinant of global trade. We estimated that shrinking supply chains only accounted for 11% of the global trade slowdown between the pre- and post-crisis periods. Within this trend, however, lie key differences between DM and EM.

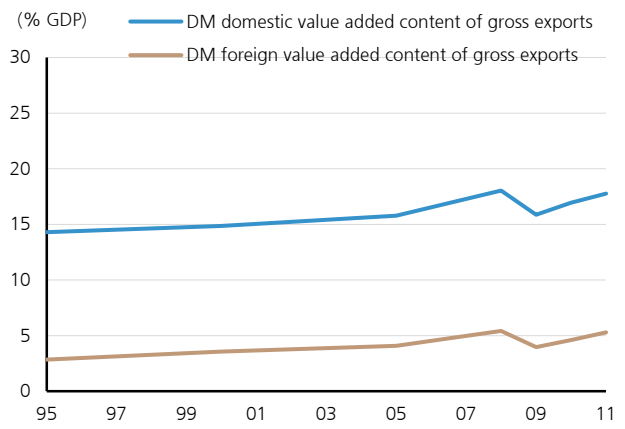
In DM we estimate that the domestic value added content of exports rose from 14 to 18%/GDP from 1995-2011, a faster pace than the foreign value added component (via supply chains), which grew from 3% to 5%/GDP.

Domestic value added content dominated DM's export growth between 1995-2011

In EM China also saw a large increase in domestic value added content, as did (not surprisingly) EM's major commodity exporters amid a secular boom in their terms of trade. For the rest of EM, however, domestic value added content in exports did not rise relative to GDP (Figure 53). Instead the foreign value added component contributed over 80% of gross export growth between 1995 and 2011. Both the high relative size (25%/GDP) and growth rate of foreign value added content thus point to greater risks for these economies should the shrinkage in global supply chains broaden in the months and years ahead.

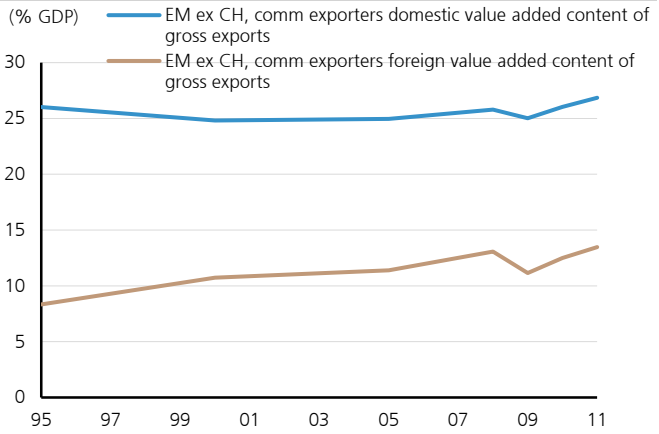
In large parts of EM, however, supply chains drove >80% of export growth.

Figure 52: DM domestic vs. foreign value added content



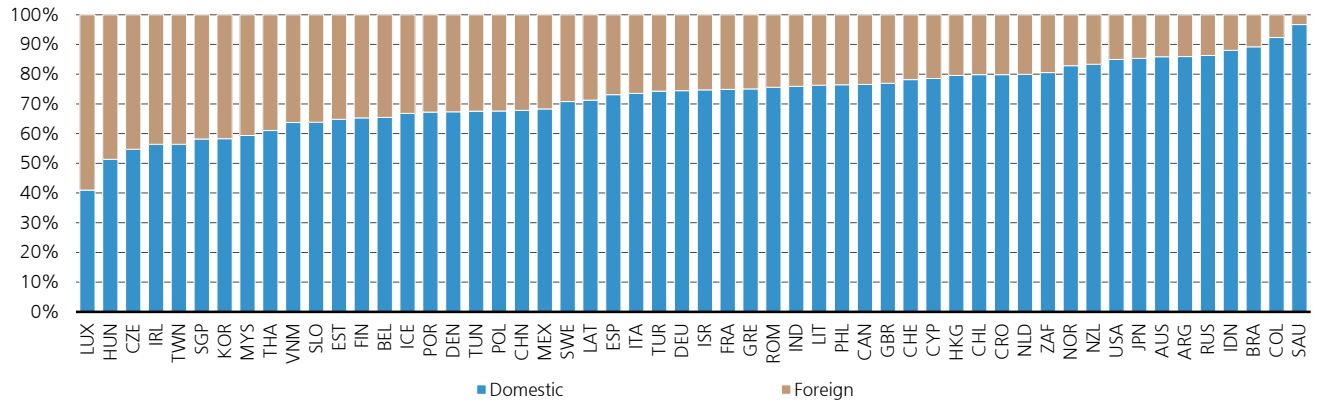
Source: Haver, OECD-TIVA, UBS. TiVA data presently only runs to 2011. DM is a GDP weighted average of 12 economies.

Figure 53: EM domestic vs. foreign value added content



Source: Haver, OECD-TIVA, UBS. TiVA data presently only runs to 2011. *Excludes China, Saudi Arabia, Indonesia, Brazil and Russia..

Figure 54: Gross exports broken down into foreign contribution (supply chain) and domestic value added*



Source: OECD-TiVA, IMF, UBS. *Note data is as of 2011, the last available print from the OECD's TiVA database.

As Figure 54 shows, small, open economies have a relatively high proportion of foreign value added content in their total exports. Amongst EM economies, the Hungary, the Czech Republic, Hungary, Singapore and Taiwan have the lowest domestic value added (highest supply chain) export content as a share of total exports. In DM, the Baltics, Ireland, Finland, and Belgium have the highest supply chain content. These markets are likely to need to pay particularly close attention to increasing cost competitiveness to remain key cogs in otherwise shrinking global supply chains.

Smaller countries tend to have a larger dependence on gross exports

So then why did EM currencies rally this year despite little trade improvement?

If weak global trade is such a risk to EM currencies, it's reasonable to ask: why did currencies hold up so well this year? In our view this represented the prevalence of several mostly one-off factors that are less likely to dominate into 2017 and beyond:

- The recovery in oil prices from below $30/bl in mid-January helped to relieve US high yield and EM credit markets January from distressed valuations and supported US inflation expectations. In doing so, the oil really simultaneously boosted credit risk appetites and depressed US real yields, helping EM assets rally. While oil prices can strengthen further into 2017, their ability to reflate global assets from these levels seems much lower now that volatility and distress have been priced out considerably. Our research has shown that supply-induced oil moves typically do not reflate global assets for long.

- The Fed's decision not to defer a series of rate hikes (60ps of hikes were priced for 2016 at the start of the year) helped USD appreciation to reverse for a significant part of the year. Today, with 33bps of hikes priced over the next 12 months, the Fed's ability to relieve EM assets is not as high.

- Similarly, the recovery in CNY forward premia (3m forwards in late January had priced in as much as 8% annualised depreciation) helped to boost market expectations. Here, too, there is much less risk premium to de-price. EM is likely to need to motor off its own growth and reform momentum if the drag from weaker globalisation is not to exact a pound from flesh from the currency market next year.

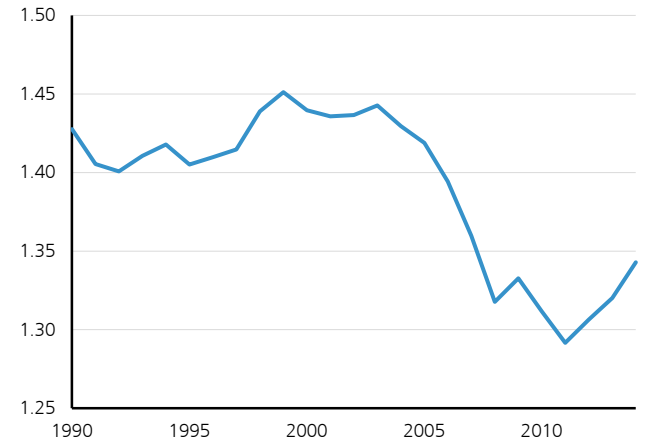
5. Globalisation brought inequality. Its flattening may bring bigger issues

- *Even as it reduced gaps across countries, globalisation widened the gulf between winners and losers within them. As governments become redistributive to compensate for this, an important support for corporate profits may be called into question.*
- *Rising globalisation helped growth and employment in EM manufacturing. Now, as trade loses its dynamism, it will be a bigger challenge for young EM countries to capture their demographic dividend.*
- *We believe an underappreciated medium-term fallout from slowing globalisation will be significantly weaker fiscal positions in EM. Sustained fiscal slippage will impact the cost of equity much quicker in EM than in DM.*

Lower inter-country inequality, but greater intra-country inequality

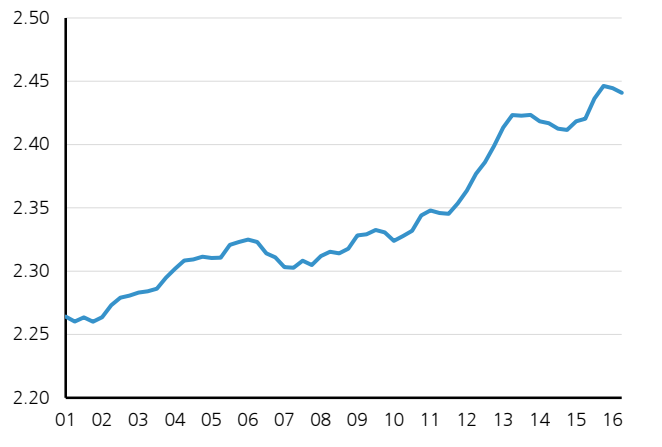
Economic theory predicts that greater trade will maximise welfare for all trading parties. This has been true at a macro level – the degree of inequality across countries has fallen (Figure 55). However, inequality within countries has increased significantly (Figure 56). The rise of skills-based technology and the process of financial deepening, both of which have been reinforced by globalisation, have created a wide gulf in the distribution of welfare gains within societies.

Figure 55: Inter-country inequality fell: Coefficient of variation in per capita income growth for the top 25 economies in the world



Source: Haver, UBS

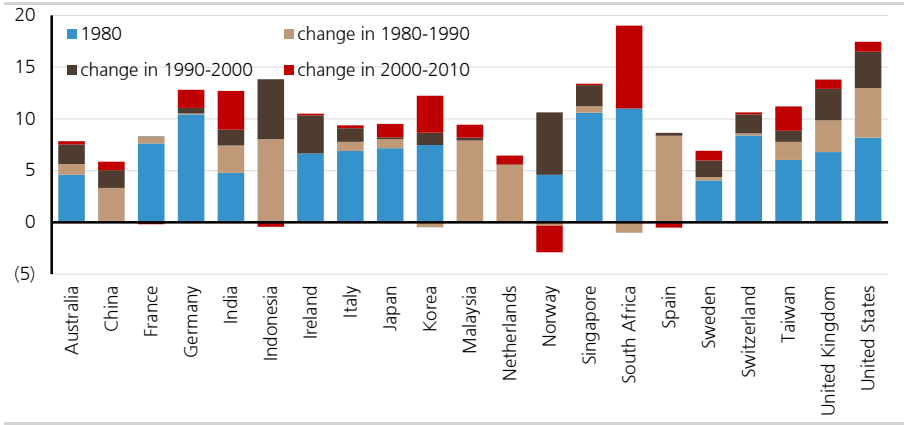
Figure 56: Intra-country inequality rose: ratio of US third quartile to first quartile earnings (weekly earnings in $s)



Source: Haver, UBS. Data presented here is for the United States.

Looking across time, we find that as the world became more globalised the degree of income inequality rose persistently, with the top 1% of earners gaining an even larger share of total income with each passing decade (Figure 57).

Figure 57: The % share of income accruing to the top 1% of the population

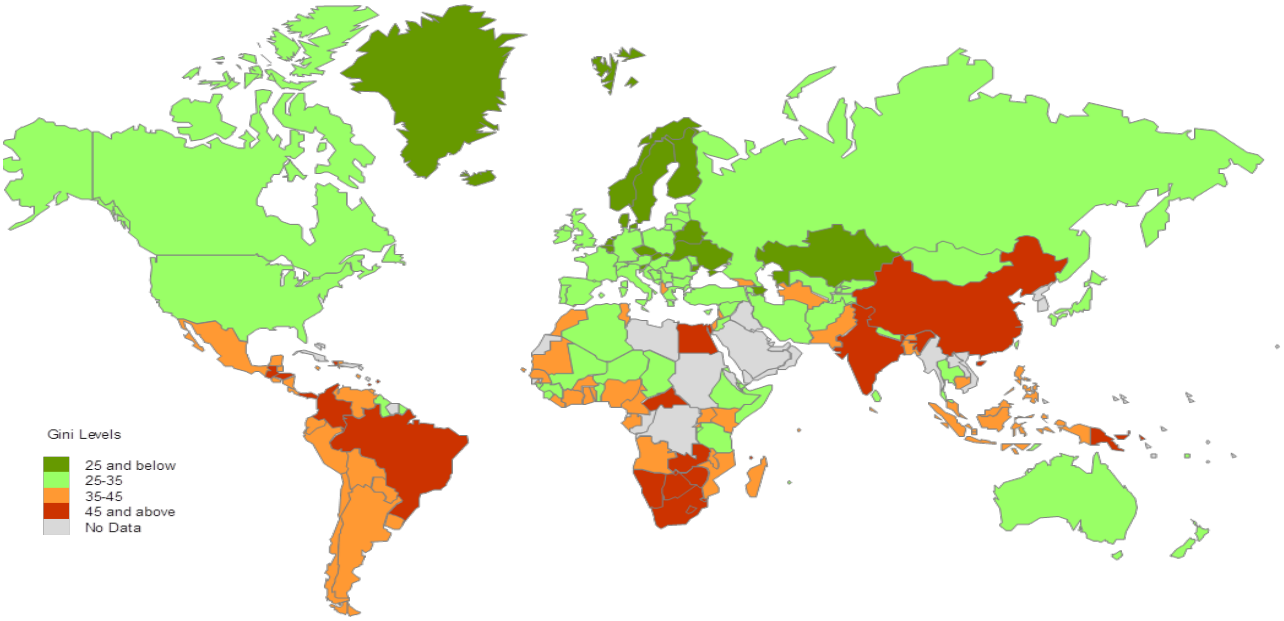


Source: World Top Incomes Database, UBS

Higher inequality across EM than DM, but it has risen in most regions

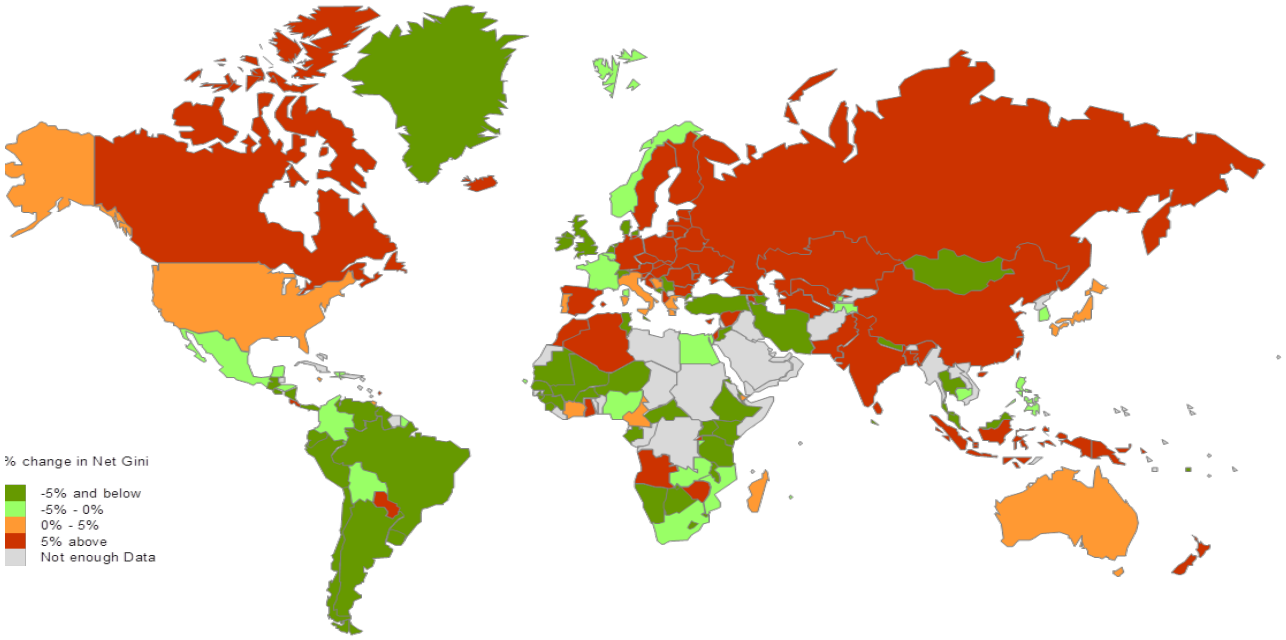
Looking across space, income is distributed in a much more unequal fashion in emerging markets compared with developed markets (Figure 58). However, the change – the rise in inequality - has been high across both DM and EM economies (Figure 59). LatAm economies are a welcome exception in seeing the levels of inequality fall, albeit from a high level.

Figure 58: Level of inequality today: Gini coefficients across the world (Higher= greater inequality)



Source: Solt, Frederick. 2016. "The Standardized World Income Inequality Database." Social Science Quarterly 97. SWIID Version 5.1, July 2016

Figure 59: % Change in Gini coefficient over 20 years (to 2012) (Rising Gini coefficients = rising inequality)

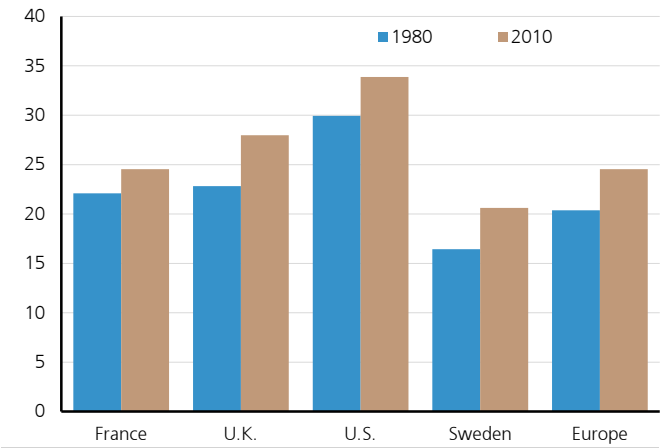


Source: Solt, Frederick. 2016. "The Standardized World Income Inequality Database." Social Science Quarterly 97. SWIID Version 5.1, July 2016

Even greater asset inequality than income inequality

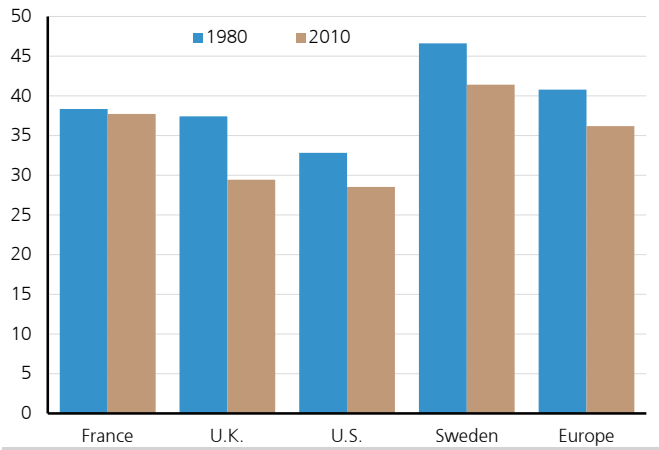
As assets have re-rated through the years of falling rates, the inequality in wealth has become even starker than that of incomes – a larger proportion of wealth is held by the top 1% than the proportion of income earned by them (compare the scale of Figure 60 with that of Figure 57).

Figure 60: % share of wealth held by the top 1%



Source: Piketty (2014), IMF, UBS

Figure 61: % share of wealth held by the bottom 90%



Source: Piketty (2014), IMF, UBS

Why inequality matters

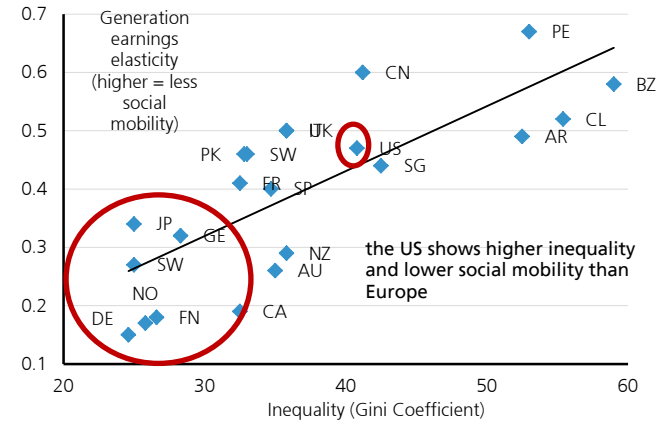
Recent research by the IMF[17] finds that not only does income inequality (as measured by the Gini coefficient) have a negative impact on growth, so does the distribution of income itself. Specifically, they find that a rise in the proportion of income accruing to the top 20% of the population can itself have a negative impact on growth over a five-year period, a notion that is counterintuitive to the 'trickle down' phenomenon.

Higher inequality can hurt growth through limiting social mobility, increasing financial risks

In causing differential access to education and health facilities, higher inequality creates barriers to social mobility (Figure 62), which, in turn, is associated with rising political risk. The impact on social mobility becomes compounded if wealth gaps are driven by rent, as opposed to investment. Inequality also raises financial risks through higher leverage in low income segments of society. Former IMF chief economist and RBI Governor Raghuram Rajan have argued that inequality was one of the key reasons of the financial crisis.

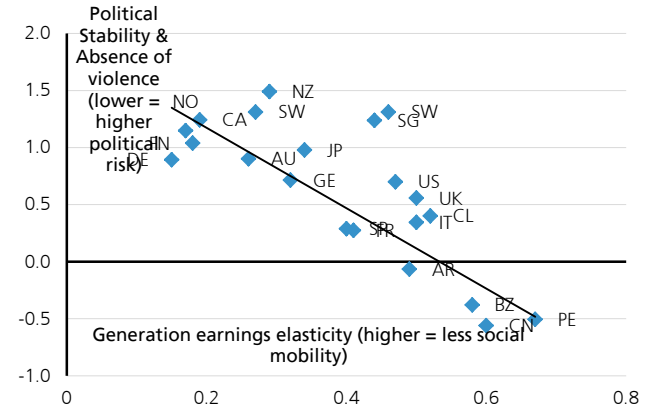
Higher inequality is associated with lower social mobility over time

Figure 62: Income inequality and social mobility: Higher inequality is connected to weaker social mobility



Source: M Corak (2012), UBS

Figure 63: Social mobility and political risk: Higher political risk is connected to weaker social mobility



Source: M Corak (2012), Haver, UBS

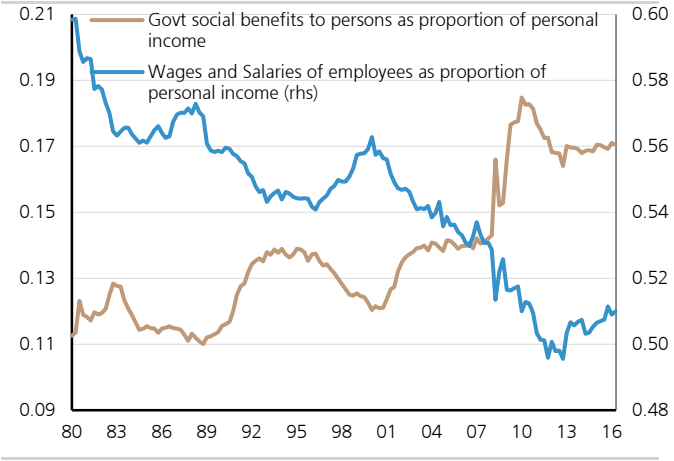
Note: Inequality from generation to generation: the US in comparison. An intergenerational elasticity in earnings of .6 tells us that if one father makes 100% more than another then the son of the high income father will, as an adult, earn 60% more than the son of the relatively lower income father. An elasticity of 0.2 says this 100% difference between the fathers would only lead to a 20% difference between the sons. A lower elasticity means a society with more mobility

As inequality climbs, governments typically have to take a more active redistributive role. In many economies this has already happened (Figure 64) and yet income inequality has not abated. This could make it difficult for the size of government to shrink, risking putting public debt on an unsustainable path. To be clear, direct efforts to address inequality are not the main reason public debt is high and rising. Demographics, inelastic entitlement expenditures and weaker revenue growth are the key culprits. But inequality is linked to these, and legitimate efforts to compensate for it are adding to debt levels at a time when they are already at, or through, the 85-90% GDP thresholds identified in literature as being growth destructive[18] (Figure 65).

In trying to address extreme inequality government spending may have to remain high for sustained period, pushing pubic debt levels higher through 85-90% of GDP threshold, beyond which it is regarded as being growth destructive

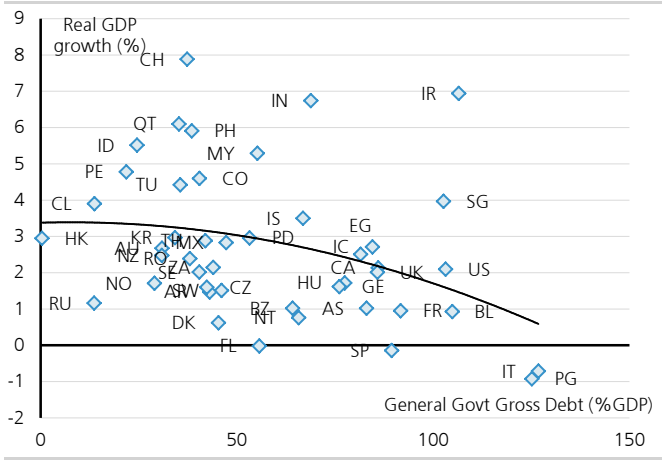
[17] See 'Causes and consequences of income inequality: A global perspective', Era Dabla-Norris et al. IMF staff discussion note June 2015. See also 'Redistribution, Inequality, and Growth. Jonathan D Ostry et al. IMF discussion note February 2014.
[18] See Reinhart and Rogoff 'Growth in a time of debt' , NBER Jan 2010 and S Ceccetti et al 'The real effects of debt', BIS September 2011

Figure 64: Sources of personal income in the United states (% of total personal income in the economy)



Source: Haver, UBS estimates

Figure 65: Public debt to GDP and real GDP growth

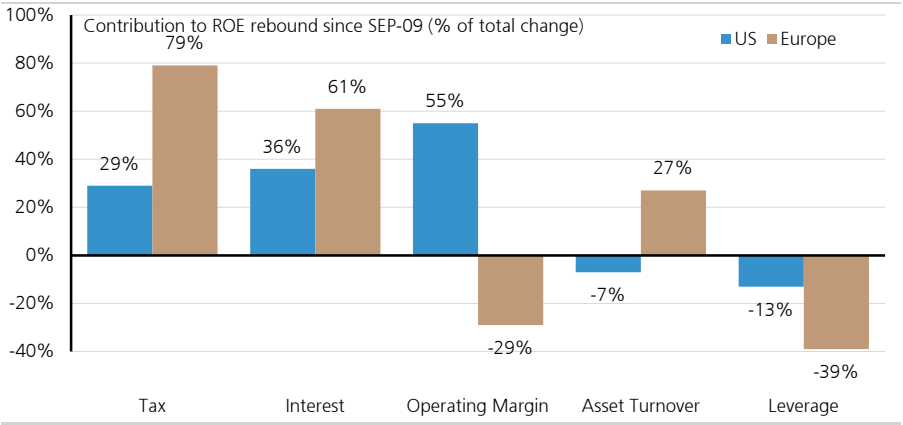


Source: Haver, UBS estimates

The effect of more government is very heavily debated – will it crowd-in the private sector at a time when it is not investing, or will it create more uncertainty about future tax and growth implications, and push them away from increasing investment? Our prior work on corporate leverage (Q-Series) highlighted that US government issuance did indeed crowd out corporate issuance, even after normalizing for growth, capacity utilization, and asset prices.

Either way, what is important is that low taxes have been an important contributor of the ROE improvement in developed market equities post-crisis (Figure 66). If redistributive policies to address inequality need to be financed by higher taxes, markets are likely to take notice.

Figure 66: Extended DuPont: Contributions to change in RoE since Sept 2009



Source: Datastream, UBS

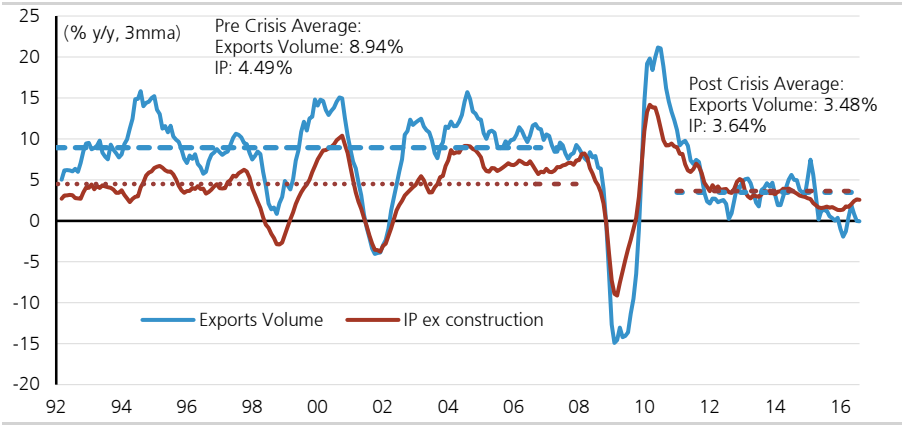
Slowing globalisation may bring even bigger issues to EM – will they bank in their demographic dividend?

Even as it has raised relative inequality, it's difficult to overstate the importance of globalisation towards EM's growth over the past 25 years. Stronger industrialisation and growth in the developing world has moved millions out of poverty. To the extent that globalisation of trade is now slowing down because of value chains shortening, changing technology, greater demand for services, and excess capacity, manufacturing growth in EM, already weak, could stay so for a

Will young EM countries be able to bank in their demographic dividend when manufacturing is weak?

long time. This will then not just be a problem of output, it means that large parts of the young emerging world could face a major employment challenge.

Figure 67: Weak exports will hurt manufacturing sectors in EM – with potentially sizeable consequences for the rising young labour forces in EM



Source: Haver, UBS estimates * Dotted line represents average over that period

EM economies like Taiwan, Korea, China and Thailand that have banked in their demographic dividend displayed a clear pattern - when their demographic prime arrived, they saw sectoral shifts in employment away from agriculture to the more productive and labour-intensive manufacturing sector.

Why is manufacturing so important? Looking at EM success stories gives us a clue.

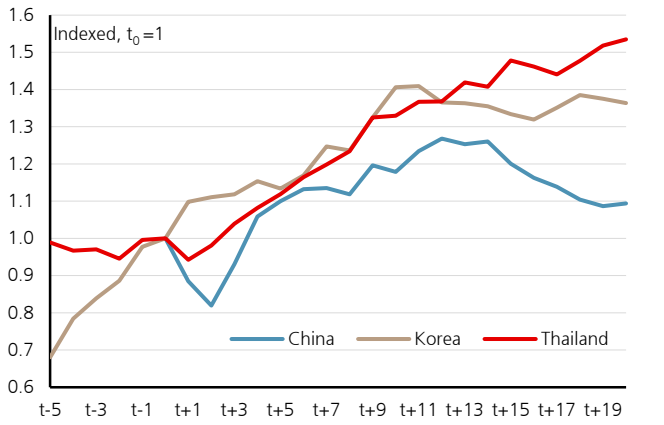
In Figure 68 and Figure 69 we show how manufacturing has evolved along with demographics in various EM economies. We define t_0 as the year when the working age population as a proportion of the total population rose above 60%. This is the time we subjectively define as the beginning of an economy's demographic bulge[19]. We track how manufacturing as a % of GDP evolved just prior to and beyond this inflexion point.

EMs that have now graduated to middle or high income status displayed a common pattern – they saw big increases in manufacturing when they reached their demographic prime

China, Korea and Thailand are past their demographic primes today, but they made the most of their demographic dividends. In these countries manufacturing as a % of GDP rose significantly once working age population rose above 60%. This coincided with a big rise in per capita incomes, savings, and export shares.

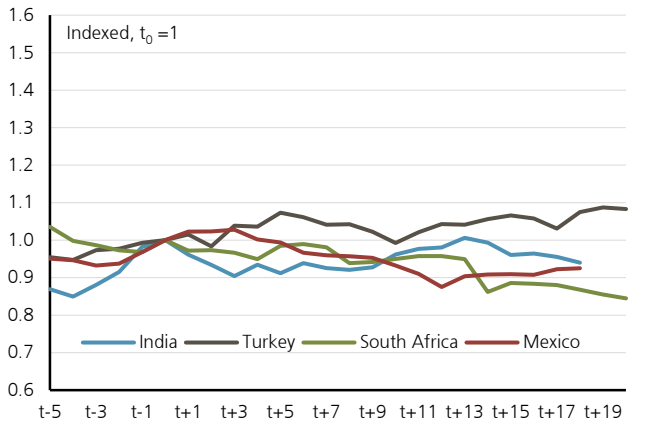
[19] These years for the various economies we studied are as follows. India: 1996; China: 1981; Korea: 1977; Thailand: 1984; Indonesia: 1991; Brazil: 1990; South Africa: 1995; Mexico: 1997; Turkey: 1992; Malaysia: 1993; Vietnam: 1998; Bangladesh: 2003; Egypt: 2002.

Figure 68: Manufacturing as % of GDP (t_0= time when working age population rises through 60% of total population)



Source: Haver, UBS

Figure 69: Manufacturing as % of GDP (t_0= time when working age population rises through 60% of total population)



Source: Haver, UBS

As Figure 69 shows, several EM economies have however failed to make this transition to a manufacturing success. Economies like South Africa, Turkey, and India are often credited with strong demographics, but these strong demographics will only help the economy and asset markets if workers in their demographic prime are gainfully employed. These economies risk squandering their potential demographic dividends if structural weakness in global trade and manufacturing keeps them from raising the participation rates which today linger in the low 50%s, with unemployment as high as 8-25%.

This will become difficult for young EM countries of today. Changing technology and weakening globalization are hurting manufacturing employment. Services are not big enough to absorb the large unskilled labour force.

The truth is that even at the peak of globalization this set of economies was not able to rapidly gain market share in manufacturing globally. But although their share of the pie was the same or modestly falling, they benefited from the pie growing rapidly amid strong global growth and trade. A slowdown in globalization, along with changes in technology, will likely hurt their employment prospects. Seen in this light, inequality is likely to become an even bigger problem in emerging markets over time.

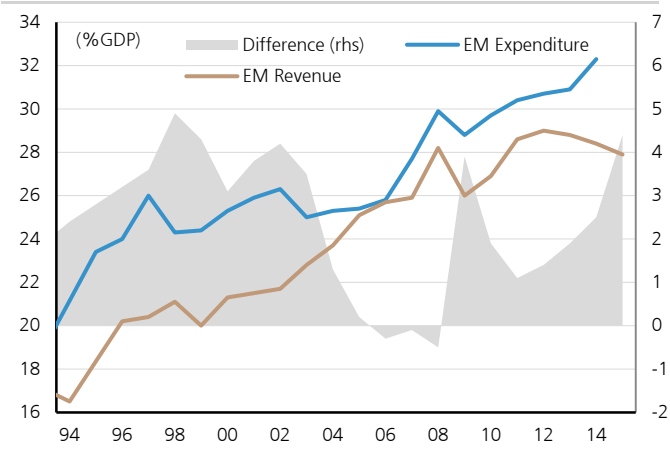
A worrying fiscal future for EM… with a much quicker transmission to the cost of equity

As governments have tried to compensate for unskilled workers losing out to skilled workers, the government's footprints in emerging economies have become larger. Through the boom years, revenue growth kept pace but as globalisation slowed, the employment challenges are mounting and sources of revenue growth are dwindling. Over time this will certainly put more pressure on already worsening EM fiscal balances (Figure 70). Public debt in EM is at a much lower level than that in DM (where it rose post the crisis), but the direction of travel is quite worrying.

EM public debt is lower than DM, but the fiscal metrics are steadily getting worse

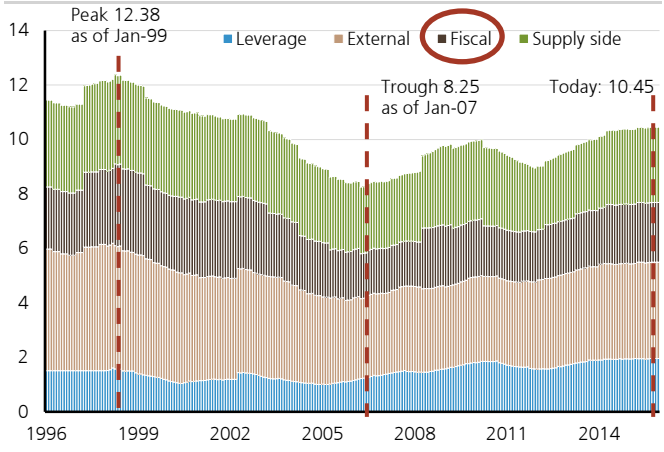
Worsening fiscal balances (and rising private leverage) are one of the key reasons why our EM macro balance sheet scores are slowly worsening (Figure 71) despite some stability in external scores. We use this macro balance sheet score as the key fundamental input into our credit model.

Figure 70: EM government expenditure and revenue (%) of GDP



Source: Haver, UBS

Figure 71: Macro Balance sheet risk score for EM



Source: Haver, UBS; Score of 0 = lowest risk / 20 = highest risk

Our model (See An EM turnaround? III –Valuation optics vs. reality) suggests that with EM trend growth falling by 0.6-0.8%, as we think can happen if globalisation doesn't pick up steam again, EM credit spreads can widen out by 60 bps through a worsening macro and fiscal score. This is just the 'passive' hit from growth, without yet accounting for any active (expenditure based) fiscal worsening.

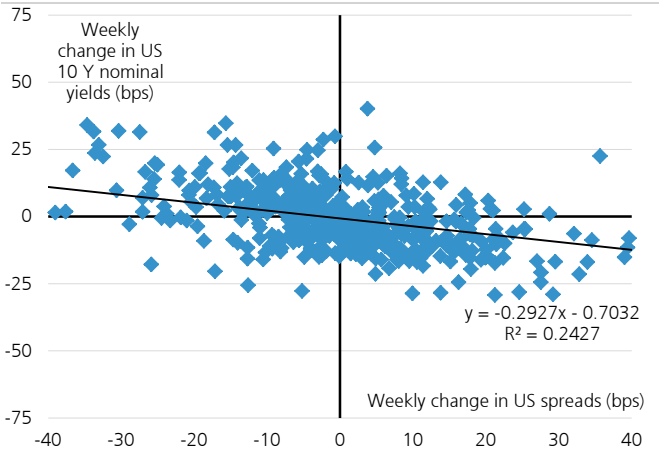
Weaker trend growth owing to slower globalisation will mean a passive 60 bps widening, even before accounting for active fiscal worsening

Unlike developed markets, wider credit (corporate or sovereign) spreads in EM are typically associated with higher local yields (Figure 72 and Figure 73). This is likely because a weakening credit evokes a quick response from the currency, higher volatility in which, then impacts local currency duration- the risk free rate.

We had noted this key difference in (See Theme #6: Simmering trouble – Mapping the path of EM pain) where we had shown that credit stresses in a particular sector of the economy, say energy, evoke a lower risk free rate in DM, but a higher risk free rate in EM, thereby hitting the cost of equity of firms not only the affected sector, but of all sectors in the economy. By contrast, in DM higher public debt or wider corporate spreads typically makes for weaker growth, but lower yields, providing some cushion against weak revenues in the form of low cost of equity.

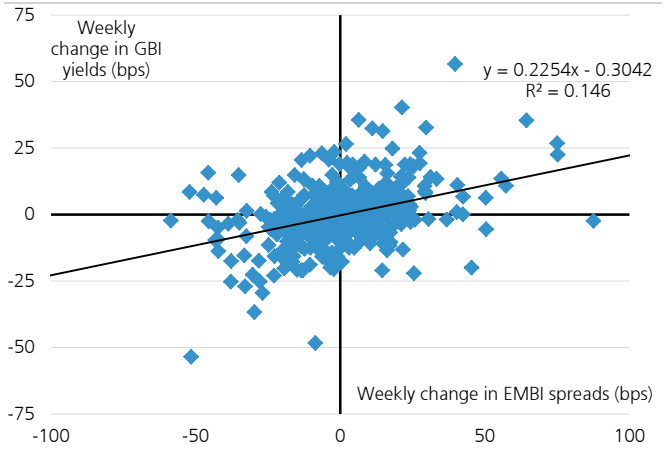
Widening credit spreads in EM impact the risk free rate, and through this, the cost of equity of all firms

Figure 72: Changes in US credit spreads and US nominal rates: lower government yields fall amid wider credit spreads



Source: Bloomberg, UBS

Figure 73: Changes in EM credit spreads and local currency bond yields: wider credit spreads infect local government yields, pushing up the cost of equity



Source: Datastream, UBS

Valuation Method and Risk Statement

Risks of multi-asset investing include but are not limited to market risk, credit risk, interest rate risk, and foreign exchange risk. Correlations of returns among different asset classes may deviate from historical patterns. Geopolitical events and policy shocks pose risks that can reduce asset returns. Valuations may be adversely affected during times of high market volatility, thin liquidity, and economic dislocation.

Required Disclosures

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

For information on the ways in which UBS manages conflicts and maintains independence of its research product; historical performance information; and certain additional disclosures concerning UBS research recommendations, please visit www.ubs.com/disclosures. The figures contained in performance charts refer to the past; past performance is not a reliable indicator of future results. Additional information will be made available upon request. UBS Securities Co. Limited is licensed to conduct securities investment consultancy businesses by the China Securities Regulatory Commission. UBS acts or may act as principal in the debt securities (or in related derivatives) that may be the subject of this report. This recommendation was finalized on: 31 October 2016 08:54 PM GMT.

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

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

UBS Securities LLC: Julian Emanuel; Omar Elangbawy.

Unless otherwise indicated, please refer to the Valuation and Risk sections within the body of this report. For a complete set of disclosure statements associated with the companies discussed in this report, including information on valuation and risk, please contact UBS Securities LLC, 1285 Avenue of Americas, New York, NY 10019, USA, Attention: Investment Research.

Global Disclaimer

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

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

All Global Research is available on UBS Neo. Please contact your UBS sales representative if you wish to discuss your access to UBS Neo.

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

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

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

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

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

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

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

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

(i) valuation or accounting purposes;

(ii) to determine the amounts due or payable, the price or the value of any financial instrument or financial contract; or

(iii) to measure the performance of any financial instrument.

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

UBS has policies and procedures, which include, without limitation, independence policies and permanent information barriers, that are intended, and upon which UBS relies, to manage potential conflicts of interest and control the flow of information within divisions of UBS and among its subsidiaries, branches and affiliates. For further information on the ways in which UBS manages conflicts and maintains independence of its research products, historical performance information and certain additional disclosures concerning UBS research recommendations, please visit www.ubs.com/disclosures.

Research will initiate, update and cease coverage solely at the discretion of UBS Investment Bank Research Management, which will also have sole discretion on the timing and frequency of any published research product. The analysis contained in this document is based on numerous assumptions. All material information in relation to published research reports, such as valuation methodology, risk statements, underlying assumptions (including sensitivity analysis of those assumptions), ratings history etc. as required by the Market Abuse Regulation, can be found on NEO. Different assumptions could result in materially different results.

The analyst(s) responsible for the preparation of this document may interact with trading desk personnel, sales personnel and other parties for the purpose of gathering, applying and interpreting market information. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS into other areas, units, groups or affiliates of UBS. The compensation of the analyst who prepared this document is determined exclusively by research management and senior management (not including investment banking). Analyst compensation is not based on investment banking revenues; however, compensation may relate to the revenues of UBS Investment Bank as a whole, of which investment banking, sales and trading are a part, and UBS's subsidiaries, branches and affiliates as a whole.

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

United Kingdom and the rest of Europe: Except as otherwise specified herein, this material is distributed by UBS Limited to persons who are eligible counterparties or professional clients. UBS Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. **France:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities France S.A. UBS Securities France S.A. is regulated by the ACPR (Autorité de Contrôle Prudentiel et de Résolution) and the Autorité des Marchés Financiers (AMF). Where an analyst of UBS Securities France S.A. has contributed to this document, the document is also deemed to have been prepared by UBS Securities France S.A. **Germany:** Prepared by UBS Limited and distributed by UBS Limited and UBS Deutschland AG. UBS Deutschland AG is regulated by the Bundesanstalt fur Finanzdienstleistungsaufsicht (BaFin). **Spain:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities España SV, SA. UBS Securities España SV, SA is regulated by the Comisión Nacional del Mercado de Valores (CNMV). **Turkey:**

Distributed by UBS Limited. No information in this document is provided for the purpose of offering, marketing and sale by any means of any capital market instruments and services in the Republic of Turkey. Therefore, this document may not be considered as an offer made or to be made to residents of the Republic of Turkey. UBS AG is not licensed by the Turkish Capital Market Board under the provisions of the Capital Market Law (Law No. 6362). Accordingly, neither this document nor any other offering material related to the instruments/services may be utilized in connection with providing any capital market services to persons within the Republic of Turkey without the prior approval of the Capital Market Board. However, according to article 15 (d) (ii) of the Decree No. 32, there is no restriction on the purchase or sale of the securities abroad by residents of the Republic of Turkey. **Poland:** Distributed by UBS Limited (spolka z ograniczona odpowiedzialnoscia) Oddzial w Polsce regulated by the Polish Financial Supervision Authority. Where an analyst of UBS Limited (spolka z ograniczona odpowiedzialnoscia) Oddzial w Polsce has contributed to this document, the document is also deemed to have been prepared by UBS Limited (spolka z ograniczona odpowiedzialnoscia) Oddzial w Polsce. **Russia:** Prepared and distributed by UBS Bank (OOO). **Switzerland:** Distributed by UBS AG to persons who are institutional investors only. UBS AG is regulated by the Swiss Financial Market Supervisory Authority (FINMA). **Italy:** Prepared by UBS Limited and distributed by UBS Limited and UBS Limited, Italy Branch. Where an analyst of UBS Limited, Italy Branch has contributed to this document, the document is also deemed to have been prepared by UBS Limited, Italy Branch. **South Africa:** Distributed by UBS South Africa (Pty) Limited (Registration No. 1995/011140/07), an authorised user of the JSE and an authorised Financial Services Provider (FSP 7328). **Israel:** This material is distributed by UBS Limited. UBS Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. UBS Securities Israel Ltd is a licensed Investment Marketer that is supervised by the Israel Securities Authority (ISA). UBS Limited and its affiliates incorporated outside Israel are not licensed under the Israeli Advisory Law. UBS Limited is not covered by insurance as required from a licensee under the Israeli Advisory Law. UBS may engage among others in issuance of Financial Assets or in distribution of Financial Assets of other issuers for fees or other benefits. UBS Limited and its affiliates may prefer various Financial Assets to which they have or may have Affiliation (as such term is defined under the Israeli Advisory Law). Nothing in this Material should be considered as investment advice under the Israeli Advisory Law. This Material is being issued only to and/or is directed only at persons who are Eligible Clients within the meaning of the Israeli Advisory Law, and this material must not be relied on or acted upon by any other persons. **Saudi Arabia:** This document has been issued by UBS AG (and/or any of its subsidiaries, branches or affiliates), a public company limited by shares, incorporated in Switzerland with its registered offices at Aeschenvorstadt 1, CH-4051 Basel and Bahnhofstrasse 45, CH-8001 Zurich. This publication has been approved by UBS Saudi Arabia (a subsidiary of UBS AG), a Saudi closed joint stock company incorporated in the Kingdom of Saudi Arabia under commercial register number 1010257812 having its registered office at Tatweer Towers, P.O. Box 75724, Riyadh 11588, Kingdom of Saudi Arabia. UBS Saudi Arabia is authorized and regulated by the Capital Market Authority to conduct securities business under license number 08113-37. **Dubai:** The information distributed by UBS AG Dubai Branch is intended for Professional Clients only and is not for further distribution within the United Arab Emirates. **United States:** Distributed to US persons by either UBS Securities LLC or by UBS Financial Services Inc., subsidiaries of UBS AG; or by a group, subsidiary or affiliate of UBS AG that is not registered as a US broker-dealer (a **'non-US affiliate'**) to major US institutional investors only. UBS Securities LLC or UBS Financial Services Inc. accepts responsibility for the content of a document prepared by another non-US affiliate when distributed to US persons by UBS Securities LLC or UBS Financial Services Inc. All transactions by a US person in the securities mentioned in this document must be effected through UBS Securities LLC or UBS Financial Services Inc., and not through a non-US affiliate. UBS Securities LLC is not acting as a municipal advisor to any municipal entity or obligated person within the meaning of Section 15B of the Securities Exchange Act (the "Municipal Advisor Rule"), and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of the Municipal Advisor Rule. **Canada:** Distributed by UBS Securities Canada Inc., a registered investment dealer in Canada and a Member-Canadian Investor Protection Fund, or by another affiliate of UBS AG that is registered to conduct business in Canada or is otherwise exempt from registration. **Mexico:** This report has been distributed and prepared by UBS Casa de Bolsa, S.A. de C.V., UBS Grupo Financiero, an entity that is part of UBS Grupo Financiero, S.A. de C.V. and is an affiliate of UBS AG. This document is intended for distribution to institutional or sophisticated investors only. Research reports only reflect the views of the analysts responsible for the reports. Analysts do not receive any compensation from persons or entities different from UBS Casa de Bolsa, S.A. de C.V., UBS Grupo Financiero, or different from entities belonging to the same financial group or business group of such. For Spanish translations of applicable disclosures, please see www.ubs.com/disclosures. **Brazil:** Except as otherwise specified herein, this material is prepared by UBS Brasil CCTVM S.A. to persons who are eligible investors residing in Brazil, which are considered to be: (i) financial institutions, (ii) insurance firms and investment capital companies, (iii) supplementary pension entities, (iv) entities that hold financial investments higher than R$300,000.00 and that confirm the status of qualified investors in written, (v) investment funds, (vi) securities portfolio managers and securities consultants duly authorized by Comissão de Valores Mobiliários (CVM), regarding their own investments, and (vii) social security systems created by the Federal Government, States, and Municipalities. **Hong Kong:** Distributed by UBS Securities Asia Limited and/or UBS AG, Hong Kong Branch. **Singapore:** Distributed by UBS Securities Pte. Ltd. [MCI (P) 007/09/2016 and Co. Reg. No.: 198500648C] or UBS AG, Singapore Branch. Please contact UBS Securities Pte. Ltd., an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110); or UBS AG, Singapore Branch, an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110) and a wholesale bank licensed under the Singapore Banking Act (Cap. 19) regulated by the Monetary Authority of Singapore, in respect of any matters arising from, or in connection with, the analysis or document. The recipients of this document represent and warrant that they are accredited and institutional investors as defined in the Securities and Futures Act (Cap. 289). **Japan:** Distributed by UBS Securities Japan Co., Ltd. to professional investors (except as otherwise permitted). Where this document has been prepared by UBS Securities Japan Co., Ltd., UBS Securities Japan Co., Ltd. is the author, publisher and distributor of the document. Distributed by UBS AG, Tokyo Branch to Professional Investors (except as otherwise permitted) in relation to foreign exchange and other banking businesses when relevant. **Australia:** Clients of UBS AG: Distributed by UBS AG (Holder of Australian Financial Services License No. 231087). Clients of UBS Securities Australia Ltd: Distributed by UBS Securities Australia Ltd (Holder of Australian Financial Services License No. 231098). This Document contains general information and/or general advice only and does not constitute personal financial product advice. As such, the Information in this document has been prepared without taking into account any investor's objectives, financial situation or needs, and investors should, before acting on the Information, consider the appropriateness of the Information, having regard to their objectives, financial situation and needs. If the Information contained in this document relates to the acquisition, or potential acquisition of a particular financial product by a 'Retail' client as defined by section 761G of the Corporations Act 2001 where a Product Disclosure Statement would be required, the retail client should obtain and consider the Product Disclosure Statement relating to the product before making any decision about whether to acquire the product. The UBS Securities Australia Limited Financial Services Guide is available at: www.ubs.com/ecs-research-fsg. **New Zealand:** Distributed by UBS New Zealand Ltd. UBS New Zealand Ltd is not a registered bank in New Zealand. The information and recommendations in this publication are provided for general information purposes only. To the extent that any such information or recommendations constitute financial advice, they do not take into account any person's particular financial situation or goals. We recommend that recipients seek advice specific to their circumstances from their financial advisor. **Korea:** Distributed in Korea by UBS Securities Pte. Ltd., Seoul Branch. This document may have been edited or contributed to from time to time by affiliates of UBS Securities Pte. Ltd., Seoul Branch. **Malaysia:** This material is authorized to be distributed in Malaysia by UBS Securities Malaysia Sdn. Bhd (Capital Markets Services License No.: CMSL/A0063/2007). This material is intended for professional/institutional clients only and not for distribution to any retail clients. **India:** Distributed by UBS Securities India Private Ltd. (Corporate Identity Number U67120MH1996PTC097299) 2/F, 2 North Avenue, Maker Maxity, Bandra Kurla Complex, Bandra (East), Mumbai (India) 400051. Phone: +912261556000. It provides brokerage services bearing SEBI Registration Numbers: NSE (Capital Market Segment): INB230951431, NSE (F&O Segment) INF230951431, NSE (Currency Derivatives Segment) INE230951431, BSE (Capital Market Segment) INB010951437; merchant banking services bearing SEBI Registration Number: INM000010809 and Research Analyst services bearing SEBI Registration Number: INH000001204. UBS AG, its affiliates or subsidiaries may have debt holdings or positions in the subject Indian company/companies. Within the past 12 months, UBS AG, its affiliates or subsidiaries may have received compensation for non-investment banking securities-related services and/or non-securities services from the subject Indian company/companies. The subject company/companies may have been a client/clients of UBS AG, its affiliates or subsidiaries during the 12 months preceding the date of distribution of the research report with respect to investment banking and/or non-investment banking securities-related services and/or non-securities services. With regard to information on associates, please refer to the Annual Report at: http://www.ubs.com/global/en/about_ubs/investor_relations/annualreporting.html

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